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CFTC Technology Advisory Committee (TAC)

Friday, October 5, 2018

Commodity Futures Trading Commission (CFTC)
Division of Enforcement
Three Lafayette Centre
Conference Center
1155 21st Street, NW
Washington, D.C. 20581

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(In Alphabetical Order by Last Name)

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CHAIRMAN J. CHRISTOPHER GIANCARLO

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COMMISSIONER BRIAN D. QUINTENZ

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P R O C E E D I N G S

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(10:02 a.m.)

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Opening Remarks

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MR. GORFINE: Good morning. Good morning. I'd like to ask everybody to please take your seats so we can get started.

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9

10

Okay. Well, good morning. As the TAC Designated Federal Officer and Acting Chair of this committee, it is my pleasure to call this meeting to order.

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We are very much looking forward to today's discussions, which build on our meeting earlier this year and the Commission's subsequent decision to follow the TAC's recommendation by creating four new subcommittees in order to pursue particular work streams.

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Before we get started, there are a few logistical items that I have been asked to mention to the committee members and invited speakers. Please ensure that your microphone is on when you speak and that you are speaking clearly into the mic, as I am hopefully doing now, so that the webcast and teleconference

1 audiences can hear you.

2 If you would like to be recognized during the
3 discussions, please change the position of your place
4 card so that it sits vertically on the table, or you
5 can raise your hand. For TAC members participating by
6 phone, please keep your phone on mute until you are
7 ready to speak, and identify yourself beforehand.

8 Finally, please refrain from using electronic
9 devices during the meeting. We have a full agenda
10 before us today, and we would like to ensure full
11 participation by all members of the TAC.

12 I would now like to turn to Commissioner Quintenz,
13 the TAC's sponsor, and then Chairman Giancarlo,
14 Commissioner Behnam, Commissioner Stump, and
15 Commissioner Berkovitz for their opening remarks.

16 COMMISSIONER QUINTENZ: Thank you, Dan.

17 Good morning, everybody. Welcome to our second
18 TAC meeting of 2018, the second meeting since the
19 reconstitution of the TAC.

20 Before we begin, I just wanted to thank all of the
21 committee members for being here this morning and
22 giving us your time and participating. We have such a

1 robust and esteemed group. But the flipside of that, I
2 know, is that there are a lot of demands on your time.
3 And we're very pleased that you've made this work and
4 this committee a priority. We are lucky, as a
5 commission, to be advised by you, so thank you for your
6 -- your efforts here.

7 At the conclusion of February's TAC meeting, as
8 Dan just said, the committee voted to form four
9 subcommittees around crypto assets, DLT, cybersecurity,
10 and the automated algorithmic trading environment.
11 Those subcommittees have been formed, have been
12 populated, and have been meeting, and I'd like to
13 extend a very warm welcome to all of the members of the
14 subcommittees that have volunteered to join that are
15 not on the full TAC that are here today, and the ones
16 that have been contributing and are listening, and the
17 ones that are still in process and working through some
18 of that paperwork. We really appreciate it.

19 Thanks again to Dan for all of your hard work with
20 the TAC and over the last two days and over the last
21 number of months in putting together this event as well
22 as the event yesterday that I'm sure the Chairman may

1 talk about briefly.

2 I'd also like to thank Jorge Herrada and John
3 Coughlin for their great work in supporting our
4 subcommittees.

5 We have an ambitious agenda today. We're going to
6 hear presentations from three of our subcommittees on
7 their progress to date and some of their plans for the
8 future. We also have the pleasure of hearing from
9 experts regarding the potential uses of RegTech to
10 facilitate compliance.

11 The first step, we're going to hear from the
12 Virtual Currencies Subcommittee that's going to present
13 on the evolving cryptocurrency landscape, including
14 questions surrounding the appropriate regulatory
15 framework for various crypto assets and trading
16 platforms. Issues revolving around cryptocurrency,
17 volatility, custody, cybersecurity, taxonomy, trading
18 practices are all ripe for further discussion. The
19 presentations should spur further discussion about how
20 the CFTC, other regulators, spot platforms, and market
21 participants can all contribute to enhancing this
22 market's credibility and safety.

1 After that, we will hear from the Automated and
2 Modern Trading Markets Subcommittee that's going to
3 discuss its planned work over the next year to assess
4 the true risks of the modern trading environment. At
5 the last TAC meeting, I highlighted my hope that the
6 TAC could assist the Commission in understanding
7 whether exchanges and the market participants are
8 following best practices with respect to automated and
9 algorithmic trading. To the extent market participants
10 are not currently incentivized to follow best
11 practices, or to the extent best practices are failing
12 to adequately address certain risks posed by automated
13 trading, the TAC can advise on whether regulation is
14 the best tool in alleviating those risks.

15 We are fortunate that the International
16 Organization of Securities Commissions, IOSCO, recently
17 published eight recommendations that we have here to
18 assist trading venues and regulatory authorities in
19 implementing practices to manage extreme volatility and
20 preserve orderly trading. The CFTC was involved with
21 this and supported this document; I'm very pleased
22 about that.

1 With that, with those overarching principles in
2 mind, Bryan Durkin, from the CME Group, is going to
3 present how the CME has implemented trading and
4 volatility controls that complement and, in some cases,
5 I think exceed the recommendations put forth by IOSCO.
6 I hope that presentation facilitates a broader
7 discussion on whether U.S. exchanges' trading controls
8 meet the principles outlined by IOSCO as whether -- as
9 well as what risks exist beyond those controls impacts,
10 if any.

11 The committee is then going to hear from a panel
12 about the feasibility of regulators issuing machine-
13 readable and executable regulatory rulebooks to
14 facilitate market participants' RegTech compliance
15 solutions. Although the financial markets are now
16 largely digitized, the regulatory landscape has
17 remained largely inaccessible from a digital
18 perspective for a number of reasons: antiquated data
19 formats, like PDFs, or the common practice of embedding
20 regulatory requirements and relief in no-action
21 letters, guidance, or preamble language rather than
22 rule text. I look forward to hearing from the

1 presenters about whether regulators have the tools to
2 make their regulatory frameworks more digitally
3 accessible.

4 Finally, the TAC will hear a presentation from the
5 DLT and Market Infrastructure Subcommittee regarding
6 DLT's potential for trade reporting. DLT's potential
7 to transform how firms handle execution, processing,
8 reporting, and recordkeeping of derivative transactions
9 is already being developed and tested. However, like
10 most opportunities, using DLT for regulatory purposes
11 also presents challenges. I look forward to hearing
12 about those and other large questions raised by using
13 DLT for trade reporting and the current status of the
14 landscape.

15 Taking a quick second to look ahead, I think we
16 would hope to schedule our next full TAC meeting in
17 January of 2019. We take a risk there since the last
18 two January scheduled meetings were canceled because of
19 snow. I think the third time is a charm. But at that
20 time, we would hope that each subcommittee will present
21 either additional analysis or some concrete
22 recommendations regarding its particular subject matter

1 area for the full TAC's consideration.

2 And with that, I would like to recognize Chairman
3 Giancarlo and then my fellow Commissioners to make
4 their opening remarks.

5 CHAIRMAN GIANCARLO: Thank you, Commissioner
6 Quintenz. And, as you know, whatever day you set that
7 January hearing for will be the day of the snowstorm,
8 so --

9 (Laughter.)

10 CHAIRMAN GIANCARLO: Good morning, everybody.
11 Thank you all for being with us this morning. As you
12 know, it's FinTech week at the CFTC, and today is our
13 third day of very high-level discussions of the FinTech
14 revolution that's taking place in our markets.

15 Let me again express on behalf of the Commission
16 our compliments to the Office of Consumer Education and
17 Outreach and the Office of General Counsel, including
18 LabCFTC, for a great inaugural FinTech Forward
19 conference. Let me say how remarkable is the
20 changeover in this room from yesterday. Pretty
21 amazing. I stopped by last night around 6:30, and
22 there was a dozen or so people in here making sure that

1 everything was perfectly set up for today. So let me
2 thank our Office of the Executive Director and all the
3 people that worked, our consultants and contractors, to
4 make sure that everything is right as it should be.

5 And let me also thank our fine officers and
6 security personnel for ably handling such a large
7 influx of people in and out of our building over the
8 last two days, three days today.

9 I'm really pleased to be here this morning for
10 this meeting of the Technology Advisory Committee. The
11 last time the TAC committee met in front of a full
12 Commission was April 30, 2013, five and a half years
13 ago. In fact, that was the last time any advisory
14 committee took place before a full CFTC Commission. So
15 it's very satisfying to have our new and full
16 Commission present here this morning.

17 You know, there's a logic to having a five-member
18 Commission, and it's right that all those
19 commissionerships be filled. So I want to express my
20 gratitude on behalf of the CFTC to the Senate Ag
21 Committee, to Senator Roberts, Senator Stabenow, for
22 their efforts in the current Commission to confirm all

1 five members of the Commission.

2 One of the capabilities of a full Commission is to
3 sponsor and activate all of the CFTC's advisory
4 committees, and I thank Commissioner Stump for agreeing
5 to sponsor the Global Markets Advisory Committee. In
6 that role, Dawn will be representing the CFTC at the
7 October IOSCO meeting in Madrid. It's been a long time
8 since the last meeting of GMAC, but it's now in good
9 hands and off to a good start.

10 And I also want to thank Commissioner Berkovitz
11 for taking on sponsorship of the Energy and
12 Environmental Markets Committee. Dan is busy
13 finalizing the EEMAC membership for an upcoming
14 meeting, and we look forward to that.

15 I'll be taking on sponsorship of the Agriculture
16 Advisory Committee and will be reaching out soon to its
17 members. The Ag Advisory Committee met last year in
18 Kansas City under Commissioner Behnam's interim
19 sponsorship.

20 Thank you, Commissioner Behnam, for making sure
21 that Ag issues remain front and center for the CFTC.
22 And thank you also for standing up the Market Risk

1 Advisory Committee so thoroughly.

2 The Commission, as you know, just unanimously
3 approved the MRAC's formation of a subcommittee to
4 address emerging issues related to the movement away
5 from LIBOR to SOFR. And I know the MRAC's work in this
6 area will complement and further the work of the
7 Alternative Reference Rate Committee. That MRAC
8 subcommittee has my support for such a coordinated
9 effort and for the fine work that is sure to come from
10 it.

11 Turning to today's meeting of the Technology
12 Advisory Committee, I want to thank Commissioner
13 Quintenz, Daniel Gorfine, and all the distinguished TAC
14 members around the table for preparing such a great
15 program today.

16 I won't walk through the agenda, you have it in
17 front of you, but it's a crucially important set of
18 issues to discuss. The format is designed to be
19 informative and allow for cross-currents of thought.
20 No doubt the discussion will build upon what we've
21 considered over the past two days.

22 This is our challenge today. We are racing into

1 the unknown faster and faster, exponentially quicker
2 than at any time in the past. It's a world that's
3 restricted only by our understanding, our imagination,
4 our learning, and our judgment. We have to see where
5 we're going and prepare for the complex requirements of
6 the future. That is why this TAC meeting, and, indeed,
7 all advisory committee meetings, are so essential for
8 the work of the CFTC, whether in matters of the
9 technological revolution in our markets and around the
10 globe, whether in our core Ag and energy futures
11 markets, or whether in identifying unassessed market
12 risk.

13 These advisory meetings are crucial for the work
14 of this agency. We receive the benefit of the
15 knowledge of experts in the field from your
16 perspectives here today. Our interactions together
17 improve and refine our policy responses to the
18 quickening pace of change in markets, the increased
19 complexities, and the concerns of market participants
20 and everyday American citizens.

21 So this meeting is timely. We perceive what is on
22 the horizon, and we must be prepared and be responsive.

1 And as we confront the challenges ahead, we will rely
2 on the wisdom of advisory committee meetings like this
3 one.

4 And I look forward to hearing today's discussions,
5 and I will especially enjoy doing so alongside my four
6 fellow Commissioners.

7 Thank you all very much.

8 COMMISSIONER BEHNAM: First off, I'd like to echo
9 Chairman Giancarlo's comments about our two new
10 Commissioners. It's great to have Commissioners Stump
11 and Berkovitz here, both friends and individuals I've
12 known for a number of years, and we're truly lucky to
13 have them here, and looking forward to the agenda for
14 the balance of the year in 2019. I would also like to
15 thank you for your comments about the Ag Advisory
16 Committee and the MRAC committee. I know we're all
17 very focused on our advisory committees, and a lot of
18 good work is always produced historically and in the
19 years to come.

20 Regarding today's advisory committee, a quick
21 thanks to Dan Gorfine for all his work. He's been
22 extremely busy for the last couple days with FinTech

1 Forward, which was an excellent meeting, and I'm sure
2 you're looking forward to a quiet weekend at home with
3 your kids.

4 MR. GORFINE: It won't be quiet.

5 COMMISSIONER BEHNAM: Right. And then, of course,
6 Commissioner Quintenz for holding this meeting. The
7 TAC has proven to be an excellent committee discussing
8 really important issues that the Commission cares about
9 and looking forward to today's discussion.

10 Thanks.

11 COMMISSIONER STUMP: So this is my first official
12 meeting as a Commissioner. And those of you who know
13 me well might find it a bit of an understatement if I
14 said I was excited to be here. So I decided to tell
15 you more specifically what I'm excited about today, and
16 it's continuing the work that many here at the agency
17 have done to advance solutions for a dynamic, ever-
18 evolving marketplace.

19 We, as Commissioners are only here for a short
20 time, and even though I just arrived, I am committed to
21 building upon the strong foundation this agency has
22 inherited in the way of tackling technological

1 challenges and solutions such that our successors can
2 continue to build upon our contribution.

3 The TAC was originally established in 1999. And
4 so yesterday I found one of the first agendas from the
5 year 2000. The first topic on this agenda was
6 "Oversight of Electronic Order Routing and Execution
7 Systems." So today this topic is very basic to the
8 function of our system, but many folks working in the
9 trades today don't remember open outcry pits or manual
10 order routing methods.

11 I actually remember my first Futures 101 class at
12 Texas Tech University, and I can assure you electronic
13 trading was not in the textbook. This either -- you
14 could draw two conclusions from this: either I'm
15 really old or the markets have evolved considerably in
16 the recent past. I think we can all agree that the
17 latter conclusion is the correct one.

18 My point in bringing this up is that somewhat
19 recently the Commission has solved very challenging
20 regulatory applications with regard to emerging
21 technologies that may not have nicely fit into the
22 familiar market structure of the day. And I'm very

1 much looking forward to the challenge of addressing
2 emerging regulatory questions that result from today's
3 evolving technology applications in hopes that future
4 Commissions can someday contemplate how we contributed
5 to the proper oversight of market utilization of these
6 advancements.

7 I would like to thank Commissioner Quintenz and
8 Dan Gorfine for their leadership of the Technology
9 Advisory Committee and all of my fellow Commissioners,
10 who have welcomed us here and have been so great to
11 work with over the past one month. I've been here one
12 month today.

13 And to all the members of the TAC and all the
14 participants, thank you for being here. And I look
15 forward to the presentations.

16 COMMISSIONER BERKOVITZ: Thank you. It's a great
17 privilege to be back at the Commission, particularly
18 with this Commission. And I thank the Chairman, I
19 thank my fellow Commissioners for the warm welcome that
20 I've had in also the approximately one month that I --
21 that I've been here. I've worked with I think each of
22 you in one capacity, we've all been in different

1 positions on tables like these, these before, over --
2 over many years on many issues, and it's an honor and
3 privilege to be at this same table here today and
4 before this advisory committee that Commissioner
5 Quintenz is chairing.

6 I would note that I was last here, last at the
7 CFTC, five and a half years ago, and looking at the
8 agenda today, virtually nothing on the agenda today
9 would have been on the agenda five and a half years
10 ago. And that's one of the great exciting things about
11 being back and where this agency is at today, as
12 exemplified by the activities throughout the week
13 really being at the cutting edge of technology and how
14 the Federal Government and how regulators should be
15 responsive to and address the appropriate role in the
16 face of such technologies. And I find that
17 particularly fascinating and an honor to be a part of,
18 and very much looking forward to learning from all the
19 panelists today.

20 So thank you, Mr. Chairman, thank you Commissioner
21 Quintenz, thank you Dan Gorfine, for all your work this
22 week.

1 MR. GORFINE: Great. I'd like to thank the
2 Chairman and all of our Commissioners for their opening
3 remarks.

4 TAC Meeting: Goals, Agenda, and Scope

5 MR. GORFINE: And now I want to build on what we
6 heard from Commissioner Quintenz and discuss the scope,
7 plan, and approach for today's meeting.

8 So as you have already heard, following our TAC
9 meeting earlier this year, the Commission acted on the
10 TAC's recommendations by creating four subcommittees:
11 Virtual Currencies, Automated Trading in Markets, DLT
12 in Market Infrastructure, and Cybersecurity. Today you
13 will hear presentations from members of three of our
14 subcommittees regarding the initial framing and
15 approach that each is taking to execute on the
16 workstreams discussed in our earlier TAC meeting this
17 year.

18 At the end of these presentations, we might
19 consider whether the current framing and approach to
20 the subcommittee work is in line with the expectations
21 of the TAC members and whether there are additional
22 elements the subcommittees should consider as they go

1 forward with their work. We will also hear, as you
2 heard from Commissioner Quintenz, from a panel today on
3 the topic of RegTech and facilitating machine-readable
4 and machine-executable rulebooks. These presentations
5 will highlight a promising area of innovation that will
6 require the ongoing attention of innovators, market
7 participants, and regulators. As part of that
8 discussion, you will hear from a member of our LabCFTC
9 team, Brian Trackman, on this topic.

10 Before we get started, though, with our first
11 panel, I would also like to take a moment to recognize
12 the work of my colleagues in making this meeting today
13 possible. Many have contributed, as you've heard,
14 including our technology teams, our logistics teams,
15 that I think are really sick of seeing me first thing
16 in the morning this week.

17 Also special thanks to Jorge Herrada, who's our
18 LabCFTC technology lead and the ADFO of our Virtual
19 Currency and DLT Subcommittees, as well as John
20 Coughlin, who is the ADFO over our Automated Trading
21 Subcommittee. Both have been instrumental over the
22 prior months in organizing our subcommittees and their

1 current workflow. I would also like to thank Michelle
2 Ghim and my other colleagues in the Office of General
3 Counsel.

4 Panel I: Virtual Currencies Subcommittee
5 Presentation & Digital Asset Security Discussion

6 MR. GORFINE: So with that, let's jump to our
7 first panel discussion, which will include
8 presentations from members of our virtual Currency
9 Subcommittee as well as a summary presentation on
10 issues related to safeguarding digital assets. So as I
11 go through who's going to be on the panel, if you want
12 to please take your seat, as panelists.

13 You will hear from our panelists, Richard
14 Gorelick, Gary DeWaal, and Andre McGregor, who is a new
15 member of our recently constituted Cybersecurity
16 Subcommittee. Our TAC members will also have the
17 opportunity to engage with -- in discussion with our
18 two remaining panelists, Alex Stein and Brad Levy.

19 So once everyone is situated, Mr. Gorelick, we
20 will begin with you.

21 MR. DeWAAL: I don't want you to be disappointed.
22 You're going to be beginning with me.

1 MR. GORFINE: Oh. Sorry to switch. Mr. DeWaal.

2 MR. DeWAAL: I just have to start before I give my
3 formal introduction, Dawn, maybe I'm going to be
4 showing my age, but when I entered the business in the
5 early 1980s, the discussion was how computerization was
6 going to save everybody lots of money. So that's more
7 a fundamental problem, and I think that really should
8 be an issue before the Technology Advisory Committee,
9 but a different day.

10 So I'm delighted to be the kickoff presenter for
11 the Virtual Committee -- the Virtual Currency
12 Subcommittee. Our emphasis is really the spot market
13 and some issues related to that. And, you know, we
14 don't have answers, but we'll certainly let you know
15 what our thinking is up till now.

16 We are basically going to try to deal with two
17 issues, which is what the subcommittee has wrestled
18 with over the last couple of weeks, which are really,
19 How can we look at the derivatives markets and leverage
20 the characteristics, the standards, the best practices,
21 that can be gleaned from this largely institutional
22 derivatives market to enhance the integrity and degree

1 of trust in the underlying spot markets? We think that
2 there's a lot to be learned here, and the issue is, How
3 can our lessons learned here over our years of
4 experience be leveraged?

5 The next topic we want to discuss is, there's been
6 lots of debate as to, you know, crypto assets are a
7 security, and we're going to be discussing the
8 implications of this debate, but we're going to be
9 looking at it from a different side, which is, What are
10 the characteristics of crypto assets that really would
11 subject them to not only the Commodity Exchange Act in
12 connection with enforcement authority, but render them
13 appropriate for regulated derivatives markets? To
14 date, there are a number of derivatives contracts based
15 on Bitcoin, but that's it. And the question is, What
16 guidance can we help give the Commission to feel more
17 comfortable in approving other crypto assets for
18 derivatives contracts?

19 And with that, I will turn the presentation over
20 to Richard, who will kick us off with substance.

21 MR. GORELICK: Thank you, Gary. And thank you
22 very much to the Commission for sponsoring this meeting

1 today and for having me present.

2 So I want to talk -- let's see if we can get this
3 working here -- talk a little bit about the virtual
4 currency spot markets. The question that we've been
5 asked about, "What are the practices from the more
6 institutional regulated markets that we should be
7 thinking about in connection with this spot markets?"
8 Sort of, you know, begs a number of questions, and
9 we're going to try and tackle each of those in order
10 here.

11 The first thing, though, I want to start with is,
12 Why should we care about any of this stuff? And I
13 think it's too easy to just sort of jump into the
14 details without that big picture. And we talked about
15 this a bit on the committee as well. And so our view
16 is that virtual currencies or digital assets or
17 cryptocurrencies or any of a number of terms that mean
18 almost the same thing, they offer great promise to
19 economies and to societies, you know, particularly
20 those who revolve around enhancing efficiency, privacy,
21 and trust, and they provide opportunities to boost
22 economic growth, to create jobs, to benefit businesses,

1 and to benefit consumers.

2 In general, we expect that these technological
3 developments will create new types of economic value
4 and will enable new types of decentralized competition
5 to gatekeepers of the Internet and to other sort of
6 centralized features of the economy. And we think that
7 these developments are almost inevitable at this point.

8 So there's a lot of good opportunity here, and
9 it's going to happen. So our view on the committee was
10 that we really need to be thinking about, How do we
11 boost the integrity and the quality of the markets for
12 these new digital assets?

13 So I'm going to talk a little bit about, What are
14 the virtual currency spot markets? What do we mean
15 when we talk about that? What are some of the good
16 features about those markets? What are some of the
17 concerns about those markets? And then, to really
18 bring it home and answer some of the questions that we
19 were asked, What are some of the solutions for some of
20 the concerns that have been raised?

21 Okay. So the spot markets are comprised of really
22 three different categories of types of marketplaces.

1 One is what we're calling centralized trading
2 platforms. They're often called exchanges even though
3 they're not regulated in the same way that traditional
4 asset-class exchanges are regulated. There's over 200
5 of these trading platforms, and they're located all
6 over the world. In fact, the most liquid exchanges at
7 this point tend to be located outside of the U.S. The
8 different technologies are used, so there's not a lot
9 of standardization of the technologies on all of these
10 platforms, very different technological models, and
11 very different business models as well.

12 Often these exchanges act as both a matching
13 platform in sort of the traditional role of an
14 exchange, they act as a broker in some cases, as a
15 custodian, as a clearinghouse, and in some instances,
16 as liquidity providers on those platforms. And so the
17 business models can be quite a bit different than we're
18 used to in the regulated futures markets, for example.

19 There are also different regulatory environments
20 for each of these markets, depending on where they're
21 based in the world, what their business model is, and
22 really how they've each decided to approach regulation.

1 The second category of marketplaces, spot
2 marketplaces, in the crypto space are what are called
3 decentralized exchanges, and these are really
4 information platforms where buyers and sellers can
5 meet, can find each other. And then the trades between
6 those buyers and sellers are often settled directly
7 between them using a smart contract, for example. So
8 it's really a way for people to meet to conduct
9 bilateral trades. There are numerous initiatives in
10 this area, but none of them have significant traction
11 yet. And the peer-to-peer nature of these transactions
12 open up additional risk and regulatory questions. I
13 think Gary had a couple of thoughts on some of those
14 issues that he wanted to talk about.

15 MR. DeWAAL: Yeah. I think that when folks think
16 about the regulatory issues related to the crypto asset
17 space, the emphasis is obviously on the coins, and
18 we'll get to that later on, that's one of the important
19 topics we want to discuss. But I think it's also
20 important to recognize that there are big issues. So
21 far, the headlines have been dominated by folks who are
22 allegedly committing fraud, and that obviously is a big

1 issue, and a proper issue, by not only the SEC, the
2 CFTC, and the States, as well as other regulators,
3 including the Department of Justice to be interested in
4 it, but, in fact, lots of folks are trying to figure
5 out how to do it right. Lots of folks are trying to
6 figure out legitimate players who want to trade, who
7 want to access the markets, who want to provide access
8 to the markets. They are struggling with how to do it
9 right.

10 And I'd just like to get just a few thoughts on
11 this because this is very, very important in thinking
12 about the environment and the issues we're dealing
13 with. We know -- we know that there are different
14 players in the markets. We know, for example, that
15 this Commission is involved in two ways. We know that
16 if a crypto asset is defined as a commodity, then the
17 CFTC has enforcement authority using its Dodd-Frank
18 broad-based manipulation and other bases to bring
19 enforcement actions. We know that the CFTC has
20 jurisdiction if someone trades or wants to offer a
21 derivative based on a virtual currency. We know that
22 participants may have to register as FCMs. We know

1 that offerors may have to, or exchanges may have to,
2 qualify as DCMs or SEFs. We know that they may need
3 clearing organizations associated with those -- with
4 those products.

5 That's actually sort of the easy one. The CFTC is
6 actually sort of the easy regulator so far. The issue
7 is, is when you're talking about the pure spot market,
8 separate and apart from the enforcement authority of
9 the CFTC, it really is very difficult today for
10 legitimate players to navigate the universe. The
11 States -- generally people understand that if somehow
12 you're involved in not investing for your own account,
13 and you're involved in the business of somehow
14 transacting in virtual currencies, you may be touched,
15 and likely are touched, by FinCEN. Okay? And again,
16 they're relatively easy. It's you know, you have to
17 play AML, that's a good thing. People understand that.

18 Then you go below that. The States have regimes
19 that touch this space in many different ways. Last
20 night, for the fun of it, I looked at one of the big
21 players, and I'll save their name, I'm not the New York
22 Department -- I'm not the New York AG, so I can't just

1 name names, and a very legitimate player was licensed
2 in what I call the NMLS State.

3 So first of all, if you're trying to do things
4 legitimately at the State level, about 35 to 40 States
5 have a common -- what I call a common college
6 application process, known as NMLS. It's just a simple
7 form. The other States sort of have their own form.
8 So just looking at the NMLS States, which is about 35
9 to 40, this entity was touched by 32 of them, 32 States
10 they were involved in.

11 In most of the jurisdictions, they had the money
12 transmitted, which is what most people it comes to mind
13 as to what you need to do somehow, and we're going to
14 get into that in a second. But in one State, required
15 payments of instrument license, even though that State
16 also has a money transmittal license, and in other
17 States, they required an electronic money transfers
18 license and sale of checks license, not a money
19 transmittal license. So even among the States, there
20 is not commonality as to what license is available.

21 Now, it gets more confusing. If you talk to the
22 States and if you look at the definition of what

1 constitutes money transmission, it really is not very
2 clear, and that's very important because a couple of
3 things are clear from looking at the different statutes
4 around the United States, which is there is, typically
5 in the money transmission world, not an institutional
6 exemption for transactions.

7 So if you're in, the fact that you're dealing only
8 with institutions doesn't necessarily get you out. So
9 that's issue number one. But second of all, the States
10 have different concepts of what constitute money
11 transmission. Basically money transmission is I take
12 money from A, I take some kind of fiat currency from A,
13 and I pass it on to B, and I'm the -- I'm the person in
14 the middle.

15 Well, a number of States have taken a view that,
16 you know, substitute the word "virtual" currency for
17 "fiat" currency. So that actually is very interesting
18 because a lot of folks, when they think about money
19 transmission application in the cryptocurrency space,
20 they're concentrating on the cryptocurrency side, and,
21 you know, maybe about 30, 35 States have addressed that
22 issue, but most of the States deal with the fiat

1 currency side, too, and in many circumstances these
2 transactions involve both the transmission of fiat
3 currency as well as the transmission of cryptocurrency,
4 and you could get caught on both ledgers. So it's a
5 very, very complicated circumstance. That's just at
6 the State level.

7 We continue. We know that if something is
8 considered to be a security, obviously, the SEC is
9 involved. There's potentially registration issues
10 unless there's an exemption. We know that people
11 offering to the public might have to be involved --
12 register as a broker-dealer. We know that exchanges
13 have to be involved if they're -- if they're offering
14 or somehow exempt, maybe as an ATS, which, by the way,
15 is an exemption, but you still have to register as a
16 broker-dealer to get to an ATS situation. We know that
17 the States have their own blue sky regime, so they have
18 securities regulation.

19 And then -- and we'll discuss this a little bit
20 later on -- what happens if something is considered not
21 to be a virtual currency or something is considered not
22 to be a security? Other laws may be involved.

1 Wyoming, for example, now has a law for something that
2 it may not fall in either crack, and when you get
3 outside the United States, it gets even more confusing.
4 It gets even more confusing.

5 But that's just to present the problem of
6 legitimate actors trying to play in this space. They
7 have to navigate the Scylla and Charybdis of
8 complicated, you know, regulations just to figure out
9 what to do, and it's not really 100% -- as someone
10 advising clients in this space, the precision of advice
11 is not great, and that's not because we're not trying,
12 it's because that's just the nature of how these laws
13 exist.

14 MR. STEIN: So I would just add to help motivate
15 clarity or adding clarity to this space, the -- today's
16 investor doesn't have access, whether you're retail or
17 institutional, to the large established institutions
18 that we're used to doing business with. So despite
19 that long list of U.S.-based regulators that one needs
20 to navigate, the reality is those who are participating
21 in this space today in many cases are going overseas to
22 the truly "Wild West." So it really behooves us to

1 help try to rationalize and provide clear direction for
2 these markets so that American institutions and retail
3 investors who participate in these markets have the
4 benefit of knowing that they're participating in a
5 well-regulated controlled market. But today most of
6 the action, as Gary said, is taking place overseas,
7 whether you're an American or not.

8 MR. DeWAAL: By the way, to be technically
9 correct, it's not the "Wild West" where most of these
10 exchanges are located, technically it's the "Wild
11 East."

12 (Laughter.)

13 MR. GORELICK: Okay. Thank you, guys. So talking
14 a little bit more about sort of the overview of the
15 spot markets, in addition to the decentralized
16 exchanges and the centralized exchanges, there is also
17 a significant over-the-counter market, and this is
18 where you have trading desks that negotiate and settle
19 trades bilaterally with counterparties. That is --
20 this is the market that my firm is very significant in.
21 Our subsidiary trading desk, Cumberland, is very
22 involved in this over-the-counter market, and that's

1 also a significant part of the spot market.

2 So moving ahead, there are some good things about
3 the market structure that we should be careful to
4 preserve and not to lose. It's sort of the first "do
5 no harm" mode. There's a lot of innovation and
6 creativity that's going on in the market right now.
7 Difficult problems are being solved both through
8 innovative technologies and business structures and
9 business models. We want to make sure that we are
10 welcoming some of that innovation. There's been rapid
11 adoption of these technologies and of people wanting to
12 trade on these platforms. The number of new users
13 signing up has been really impressive over the last
14 couple years. There's obviously a big demand to
15 participate in these markets.

16 And the user base is different than what we're
17 used to seeing in other markets. There's a lot of
18 younger folks participating in this market who may or
19 may not have participated historically in the futures
20 market or in stock markets. And so there is a lot of
21 interest that this is developing in the markets, and
22 that's also something we should be respectful of.

1 And there's also a lot -- you know, when I said
2 there were over 200 spot markets around the world,
3 there's a lot of competition in this space, and that
4 type of competition and diversity is really an
5 advantage of the current structure.

6 So what are the concerns? One of the big concerns
7 about these markets, as they exist today, is the lack
8 of transparency. There is much less disclosure about
9 the trading venues in this space than you typically see
10 in more regulated venues. So it's often hard to know
11 about ownership and control and governance on these
12 platforms, about the operating rules of these
13 platforms, about potential conflicts of interest, about
14 safety and soundness and security. A lot of those
15 issues are generally unanswered on these platforms.

16 There are venue risks. In particular, we've heard
17 a lot about these exchanges being subject to hacking
18 over the years and theft. There is also counterparty
19 risk that's sort of novel in this space since the
20 exchanges, particularly the centralized exchanges, tend
21 to also be custodians as well.

22 There are concerns about the behaviors on these

1 platforms. There's been a lot of reporting in recent
2 months about wash trades and spoofing and different
3 types of market manipulation that are going on in these
4 platforms. And there is concern about inadequate
5 surveillance on these platforms, and that's something
6 that needs to be addressed.

7 I mentioned briefly the concern about conflicts of
8 interest. I think there's still not a very good
9 definition of roles in this space like we see in other
10 markets, and we're going to have to work through some
11 of these issues to come up with a good alignment of
12 interest around different roles and responsibilities
13 within the marketplace.

14 And then there are just questions about
15 supervision. Gary touched on a lot of this, about who
16 exactly is responsible for regulating these markets
17 that operate in different places around the world with
18 customers and counterparties from different places
19 around the world. How does this fit into the current
20 legal framework?

21 And so this is sort of the concerns that I think
22 give rise to the question of, What can we look to, to

1 improve the integrity in these markets?

2 MR. STEIN: So it's important to add that while
3 all of these concerns are absolutely real, there are
4 exciting and material advancements that are taking
5 place, whether it be the subset of players who are
6 talking about creating SROs, whether it be the
7 application of technology. I have to say anyone who's
8 opened an account on some of these exchanges has to be
9 impressed by the quality and the speed of the AML/KYC.
10 We're seeing applications of technology to help secure
11 wallets and prevent the hacking.

12 So these concerns are all very real, but there are
13 solutions. They aren't insurmountable. We need to
14 work to promote that technology and promote that type
15 of cooperation so that we have the environment that
16 prevents these issues.

17 MR. GORELICK: To Alex's point, yeah, what are the
18 solutions? What can we look to in the traditional
19 financial markets and elsewhere to help improve the
20 situation? And one is smart regulation. I want to
21 start off by saying that that's part of the solution,
22 and an important part of the solution, but there are

1 tricky definitional and jurisdictional issues that need
2 to be taken into account as we go through the process
3 of figuring out what the right regulatory models are.

4 The CFTC, as Gary mentioned, has authority for
5 fraud and manipulation in the spot market for
6 commodities in the U.S. That's an important part of
7 the market, but it is relatively narrow. And so we
8 need to be thoughtful about, How does a single
9 regulator best influence the situation when there are
10 so many regulators who are going to touch upon these
11 markets from all over the world?

12 One of my -- one of the points that we raised on
13 the subcommittee was that there is an -- there is an
14 opportunity for industry-organized efforts to help fill
15 some of these gaps. They could be self-regulatory
16 organizations or similar structures that help to define
17 and enforce best practices and standards and
18 accountability across the industry. And I know there
19 are a number of efforts underway to start thinking
20 about and building these types of organizations.

21 There are lots of precedents in the traditional
22 financial markets that we can look to for innovative

1 governance structures that apply with markets that
2 touch multiple jurisdictions.

3 On the technology side, I think there's a big
4 advantage here to use some of the technology of crypto
5 in order to solve some of these problems: you know,
6 the advantages inherent in blockchain and identity
7 tokens in particular, smart contracts to enforce rules
8 and agreements. There's a lot of potential solutions
9 in the technology that we should not overlook, and when
10 there are technological solutions, my view is that
11 they'll often be more certain and predictable and
12 beneficial than relying on sort of outside third
13 parties to come in and, you know, call the balls and
14 strikes, if you will.

15 And then, you know, some technology exists in
16 traditional financial markets that we should look to as
17 well. There are surveillance systems that are
18 increasingly mature that help surveil markets,
19 electronic markets, in other parts of the world. There
20 are OMS and EMS systems, order management and execution
21 management systems, risk management systems, and
22 different compliance technologies that I think we

1 really need to be looking at and figuring out which
2 ones are applicable and beneficial to the new
3 developing virtual currency markets.

4 And, finally, I think there's a role for market
5 practices to evolve in this space. When we look at the
6 traditional financial markets, we see that there are
7 very well defined roles and requirements for different
8 types of market participants, and we should look at
9 those to see which are suitable and which are
10 beneficial and which problems they have been geared and
11 helpful in solving historically, and thinking about how
12 they apply in these markets.

13 There are important practices that have developed
14 over the years in terms of clearing and settlement that
15 obviously can be very different in the virtual currency
16 world, but there is some important learning that we can
17 get from those processes.

18 And then custody is an important issue. We've got
19 over the years, in traditional financial markets, there
20 have been very different custody models than what we're
21 seeing evolving so far in the virtual currency market.
22 And there's a real important role for qualified third-

1 party custodians and the like, people who are
2 accountable, who can look at an account and say, yes,
3 these assets exist and they are owned by and controlled
4 by a particular person or investor or company. We need
5 to be able to develop the practices around that in the
6 virtual currency space.

7 Now, I want to be -- I want to caution the group
8 that it would be a mistake to try and replicate the
9 traditional financial markets here, that I believe that
10 with looking at the technology that is developing and
11 where it's likely to go in the upcoming years, that
12 there are opportunities to be better, to build a market
13 with higher levels of integrity and more certainty, but
14 we need to be able to sort of pull both from the
15 learning of the traditional financial markets and the
16 opportunities from the new technologies, and I think we
17 can really improve upon what we're used to seeing.

18 I think I'll close by saying that the stakes are
19 high. It's important to get this right. We need to
20 make sure that -- you know, the world is going to move
21 on one way or another no matter what we do here in the
22 U.S. on the regulatory front. We want responsible

1 market participants to be able to invest and build
2 these important technologies and markets here in the
3 U.S., and that's going to take a lot of thought and
4 effort both from traditional financial markets and from
5 the sort of the digital natives in this world. I think
6 there's a lot of opportunity here when we combine the
7 best of both.

8 Thank you.

9 MR. DeWAAL: And so what I now want to do is help
10 start the conversation and give you ideas on how to
11 classify these crypto assets because, as confusing as
12 it is at the State level even when you can classify
13 which regime you're in, it's very difficult and
14 becoming increasingly difficult to classify which asset
15 you're speaking about, and are you changing the
16 regulatory regime that you're in? The last time we
17 met, we discussed the fact that there were three
18 effective types of crypto assets, what the common press
19 refers to as, you know, virtual currencies. We know
20 those are commodities because of two recent cases
21 decided on behalf and for the CFTC.

22 We -- you know, cryptocurrencies, virtual

1 currencies, are typically medium of exchanges, you
2 know, unit of value, store of accounts. Those are the
3 traditional concepts of a fiat currency. They are
4 applied generally to virtual currencies. Whether
5 they're 100 percent accurate, that's -- that's a debate
6 that's going to have to be had.

7 We know that there are security tokens that have
8 the quality of securities that are out there. Folks
9 keep talking about the 1946 *W.J. Howey* decision.
10 Investment contracts, people are investing collectively
11 in an enterprise where there's an expectation of
12 profits either exclusively or mostly through the
13 efforts of others, depending on which cases you look
14 at. And we know that those things are considered to be
15 securities and likely subject, as I said before, to the
16 SEC's oversight.

17 And then there's this other category, utility
18 tokens, consumption tokens. They're much more like the
19 admission ticket to Coney Island, where you get to ride
20 the Ferris wheel and the go-carts, but maybe there is a
21 secondary market in them. You know, what are they?
22 Does that make them securities? These are -- these are

1 challenges because they drive which regulations the
2 participants in those markets are subject to, what
3 regulations the offerors of the initial coins are
4 subject to.

5 Since we last met, William Hinman, Director of
6 Corporation Finance of the SEC mentioned something that
7 we discussed last time, but he acknowledged it a bit
8 more formally, although it was not the official view of
9 the SEC, that -- that you can have coins that morph.
10 You could have a coin like Ether, which like was a
11 security token at the point of initial offering because
12 it was done by a sponsor and had the hallmarks that
13 satisfied *Howey*, but today, given the fact that it's a
14 mined coin, given the fact it's much more
15 decentralized, in his view, was likely not a security.

16 So it may seem academic as to knowing what brings
17 a coin into what category, but it has very profound
18 regulatory consequences. And as we mentioned before,
19 folks are dealing with it differently. We know that
20 Malta, we know that Gibraltar, we know that Switzerland
21 are looking for and recognizing that there is this
22 third category of coin, and it is subject to some kind

1 of different regulation. We know that the State of
2 Wyoming has created a recognition of this third state
3 of coin.

4 So the universe of regulatory schemes is quite
5 evolving and becoming more and more different and more
6 and more confusing. So we do believe that it's
7 important to help determine, How can something fit into
8 categories? How can we help decide where something
9 belongs? And that's where we want to add some value.
10 We know it's a difficult conversation because it
11 involves a lot of regulators, but we think the
12 conversation has to begin and come to some kind of
13 conclusion.

14 From this agency's perspective, there will be
15 applications, there will be self-certifications, for
16 folks to trade derivatives based on coins other than
17 Bitcoin, and you will struggle and try to come up with
18 your own standards in how to decide whether you have
19 the authority to do that. We want to -- we want to
20 help you.

21 So we think that, looking at some of the
22 literature out there, looking at some of the guidance

1 in the foreign jurisdictions, looking at some of the
2 thought process that went in Wyoming, looking at some
3 of the literature, looking at William Hinman's
4 commentary. We think there are generally really three
5 broad categories of things that folks have to think
6 about, which is, How was the coin issued? Okay? Was
7 -- was there a -- was it -- was it meant to be an
8 investment vehicle, or was it meant to be something
9 else? It's sort of a binary question, at least at the
10 beginning. How did the sponsors promote it? What was
11 the initial enterprise or the initial sponsor's
12 retention of control of financial interests in the
13 tokens? Did the initial raise bring in more funds than
14 we needed for the actual project? These are very, very
15 important issues.

16 Second, the purpose of use in reality. Is the
17 token used for investment vehicle? Is it used for
18 consumption? Again, how is it marketed? And
19 typically, objectively, how is it used? And then
20 governance, is, what is -- how is consensus done within
21 the -- within the relevant blockchain that the token is
22 associated? How are forks determined on? How are

1 different elements of the blockchain decided? Are
2 these done by sponsors? Are they done by a limited
3 universe of miners or the equivalent of miners, of
4 consensus holders, or is it truly decentralized? These
5 are all issues.

6 Now, once you determine the issues, the issue then
7 becomes, Is it better to keep the criteria subjective,
8 or should quantitative measures be devised? Should we
9 be thinking in numbers? Are there ways to try to
10 quantify this so it's more formalistic? And even among
11 the subcommittee, there is debate about that. But
12 these are things that we think we want to continue to
13 discuss and help this Commission and help guide the
14 Commission in coming up with viable criteria.

15 MR. STEIN: So I would add to that that because
16 this is an industry and a technology that's evolving so
17 quickly, even in the past few years when crypto has had
18 a lot of focus, we've seen a dramatic growth. I mean,
19 when Bitcoin was the coin, it had a single use, and
20 then Ether came out with this concept of smart
21 contracts. Then all of these new mining mechanisms --
22 proof of stake, delegated proof of stake -- have some

1 out. The challenge of what are these, how are they
2 used, and how to regulate them evolves and will
3 continue to evolve. So I think there is consensus on
4 the group here that whatever we do going forward, it
5 should be more principles-based because it will be very
6 hard to stay ahead.

7 One rule of thumb is that humans tend to linearize
8 the world around them. They look at what happened
9 yesterday, today, and you think you can draw a line to
10 tomorrow. Crypto assets and blockchain technology are
11 technologies that are available open source to 7-plus
12 billion people in this world. Applications are being
13 thought up across the entire globe.

14 In particular, if you look at Gary's point, "How
15 are these blockchains or these coins being used?" one
16 of the critiques that comes up often is, well, today
17 really the only use is as a store of value. This is a
18 technology that is likely to change on an exponential
19 path, and, therefore, if we take what we saw yesterday
20 and rely upon that to tell us how we need to regulate
21 this tomorrow, we are likely to totally miss the puck,
22 and it's quite a challenge, but the opportunity is

1 really great. This -- these are enabling technologies,
2 they are enabling financial assets that won't just
3 affect the U.S. economy, but the global economy.

4 So we have a very worthwhile but substantial
5 challenge in keeping to the principles that keep our
6 markets safe and not overspecify.

7 MR. GORFINE: Thank you very much. And so one of
8 the issues that you all have raised is around, How do
9 you safeguard these assets? And then one of the risks
10 being, you know, security and the risk of hacking. So
11 I'd like to turn over to Mr. McGregor, who presented
12 this week at our FinTech conference, but will share
13 some remarks on safeguarding digital assets.

14 MR. MCGREGOR: All right. Thank you very much.
15 I'll just wait for the PowerPoint presentation to come
16 up.

17 I'm not sure who was in attendance on Wednesday
18 and Thursday for the conference, but what I found very
19 interesting was one of the panels around scams and
20 frauds, and specifically there's a statement that was
21 made that it's a lot of the same old fraud, fraudsters,
22 but with a new product, and that some similarities

1 dovetails directly in cybersecurity because while there
2 is a new, you know, industry, there is a new
3 technology, a lot of the concerns that we still have
4 are old cybersecurity problems.

5 (Technical difficulty with slides.)

6 MR. MCGREGOR: That just -- I don't think the --

7 MR. HERRADA: I'll help you out. I don't think
8 it's working.

9 MR. HERRADA: The technology is --

10 (Laughter.)

11 MR. MCGREGOR: All right. Okay. Technology,
12 works out well.

13 So with cybersecurity, just to -- you know, I say
14 that it's a lot of the old tactics, and really when I
15 -- when I look at it, I'm looking at it from the
16 vantage point of doing security both at Brown
17 University, at Goldman, Cardinal Health, at the FBI for
18 many years, with China, Russia, Iran, North Korea,
19 cyber criminals, and then in Silicon Valley. So, you
20 know, I got to look at a large swath of different
21 incidents, disrupted a fair amount of various cyber
22 hacks, and, you know, today, looking at security, one

1 of the things I've noticed is it's still very much the
2 same.

3 And so I would be remiss if I didn't bring up some
4 of the crypto hacks that were in the news. And it's
5 notable that more than 980,000 Bitcoins have been
6 stolen from exchanges, which would be about \$15 billion
7 at current exchange rates. And what's most interesting
8 about this is really the fact that as the FOMO, the
9 fear of missing out, you know, came about, you saw more
10 and more hacks, and specifically I'm only showing the
11 hacks that were north of \$10 million. There are many,
12 many more that happened in this space.

13 And really, you know, when you start to break it
14 down to try to figure out what actually happened, you
15 know, it's a lot of very simplistic attacks: you know,
16 employees failing to protect private keys; you know,
17 hackers sending a malicious file to exchange employees
18 and being opened on a machine that has access to
19 exchange wallets; deposits being on a single wallet and
20 allowing for extreme exposure; exchange owners, you
21 know, realizing that it might be an inside job. You
22 know, at a certain point, there is collusion and third-

1 party risks that are associated with this. And then,
2 of course, hackers realizing that it's a small
3 exchange, and so there is probably less likely to have
4 the robust security as a much larger exchange.

5 You know, it was interesting, and I think the
6 Commissioner mentioned yesterday about emails exposure
7 for attacks, and really, you know, it is as simple as
8 that. So, you know, when we're trying to have an open
9 Internet and a way to communicate with people, that
10 same openness allows for the adversary to come in, and
11 right now 90 percent of intrusions still happen via
12 email. It doesn't need to be a sophisticated attack,
13 it just needs to be a sophisticated attacker using
14 unsophisticated attack methods to gain entry into a
15 system, establish a foothold, laterally move around to
16 find the high-value target assets, and then complete
17 its mission usually through escalated privileges.

18 So the majority of my time will be spent talking
19 about custody. I'll caveat and say that each one of
20 these slides I could spend an hour talking about, but
21 really, you know, hammering home some of the more
22 important items. Why custody regulations are

1 important.

2 So, you know, dovetailing from the earlier
3 presentation, there is a lot of consumers that are in
4 the market. They want to be in this space, and they're
5 trusting their -- they're trusting their wallets,
6 they're trusting their money, with companies that, you
7 know, might not have the security acumen, the maturity,
8 and the space, or really the number of people needed to
9 protect that money.

10 If -- if, you know, we look at some of the more,
11 you know, cryptophiles, such as myself, we have
12 hardware wallets. We're concerned at some point in
13 time that we'll lose it. We're concerned that someone
14 will take it from us. You know, we've moved away from
15 the security of the FDIC and have now gone back very
16 much to the "Wild West," not just the "Wild East," in
17 how we actually are protecting this.

18 And then we're so archaic that we're looking at
19 scraps of paper, printouts. You know, there is
20 actually the idea of using Polaroid cameras to take a
21 picture of your private key and saving it somewhere so
22 that, you know, someone can't, quote/unquote, hack into

1 your system because it's not online. All of this
2 security is what really causes people to take a pause,
3 especially institutional investors.

4 And then when you do look at the exchanges and
5 when you look at the fact that they have about ten
6 percent of their currencies sitting on a hot wallet and
7 then the other 90 percent is in a cold storage
8 solution, they are rotating those around bank accounts
9 and safe deposit boxes very similar to how diamonds are
10 moved into a diamond district. You, you know, might be
11 on a plane with someone having, you know, \$20, \$30
12 million of diamonds in their pocket, and you just don't
13 know it. That is exactly what's happening in a lot of
14 these exchanges, especially overseas.

15 Looking at some of the limitations, you know,
16 there is truth in the fact that with 53 States and
17 Territories and their money transmission laws and the
18 various Federal agencies, it makes it very complicated
19 to be able to actually operate in this space. And so a
20 lot of people are moving overseas.

21 You know, there is a lot of credit given to places
22 like Bermuda and Jersey and Malta because everyone in

1 the government can actually walk across the street, be
2 in the same building, and create a regulation together.
3 It has allowed for some more maturity in the space.
4 Obviously, there are, you know, tax incentives that are
5 being used.

6 And then when you look at the United States, you
7 know, there are just simple questions, you know. Will
8 we be using new guidance versus existing guidance as it
9 relates to third-party custodial accounts? You know,
10 where are the standards as it relates specifically to
11 cryptocurrency?

12 And then insurance is the biggest deal. At a
13 certain point, institutions, endowments, funds,
14 pensions, would love to get into the space, but
15 without, you know, logical insurance, it's hard for
16 them to really sort of take that risk. And when we
17 look at insurance, the insurance industry itself has
18 broken it down into three spaces.

19 You have a hot wallet, which is constantly
20 connected to the Internet. You know, they're not
21 insuring that. It's just not something that they're
22 comfortable with, so it's either done by captives or

1 self-insurance.

2 Warm wallets, which are briefly connected to the
3 Internet to be able to publish a transaction to the
4 blockchain. That's under sort of the traditional
5 financial institution crime policies of theft and
6 similar.

7 And then there is cold storage, which is the
8 actual, physical, tangible holding of an object based
9 very much off of maritime law from the 1600s, and that,
10 for them, is, you know, a vault, something that's
11 etched on paper or metal and something that, you know,
12 if you were to compare all the ways that insurance is
13 outlined, it's the car in the garage that never moves
14 and really would only be destroyed if there was a fire
15 or some sort of catastrophic act; whereas, the warm
16 wallet is the car on the road that has the ability to
17 have a variety of different accidents that would pay
18 out.

19 And as a result, the risk in the insurance towers
20 are commensurate with that, so there is a \$50 million
21 policy that's about the most you can get on an
22 insurance tower for a warm wallet, \$500 million for

1 that cold -- that cold vaulted wallet, and really the
2 insurance industry itself is comfortable putting about
3 two billion dollars into the insurance market because
4 there is just not enough of a loss history. And this
5 is based off of dozens and dozens of conversations I've
6 had personally with underwriters educating them on this
7 space to try to move this forward.

8 And then, of course, we just move into all of the
9 traditional insurance risks that are there, everything
10 from technical hacking and vulnerabilities as well as,
11 you know, social engineering that would relate to that
12 -- that email fraud, third-party collusion counterparty
13 risks, you know, avoiding at any point in time some
14 insider could just take a billion dollars of
15 cryptocurrency and then run away with it, as well as a
16 customer could just defraud the insurance company in
17 support of that same effort as well as just losing a
18 key and then, you know, someone comes back and says,
19 "Hey, I want my \$50 million worth of coin."

20 And then moving into sort of the crypto-specific
21 insurance risks, everything does relate around the
22 private key. How is it generated? How is the entropy

1 or randomness of that, so that no one can have a copy
2 of it? And then is it destroyed? How is it destroyed?
3 We have obviously supply chain issues with hardware.
4 You know, the current news aside, there are issues
5 within the crypto space where even the hardware wallets
6 have been intercepted in the supply chain and have been
7 hacked at a certain point.

8 The decision of whether or not to have a pure
9 custodian or actually sharing that custodial effort
10 with another entity. So while multisignature is a
11 great idea and it does allow for the diffusion of
12 third-party risk, now I'm also concerned if I take part
13 of that key, that if I lose it, I lose all of my money.

14 Then, of course, we want to actually have some
15 controls in place. So how fast can transactions
16 happen? The velocity of the number of transactions
17 that you can do, as well as making sure that addresses
18 are white-listed so you're not just -- you know, there
19 is malware out there that you can actually think that
20 you're sending it to the wallet that, you know, is
21 visually there on the screen when in fact it's a
22 completely different wallet that you're sending the

1 money to. And, of course, there is Pen test code
2 validation, and then the backup keys, you know, where
3 appropriate.

4 What this all leads to is the fact that we do need
5 a standard, you know. And there is a standard out
6 there. It's not widely adopted, but it's important to
7 just take a couple minutes to really sort of go through
8 the fact that, you know, there are some best practices
9 that need to be employed. There are best practices
10 that could avoid a lot of the exchanges that are being
11 hacked from being -- being hacked, or if they are, it
12 doesn't result in a catastrophic failure.

13 So the CryptoCurrency Security Standard is one.
14 You could actually see that there's a variety of
15 different processes in place that -- that go into
16 extreme detail as to what people should be doing, but
17 really, you know, the primary areas that are
18 interesting is, you know, key creation. You know, how
19 is it created? How is the methodology validated? Is
20 there a system that allows for it to be created
21 properly? Looking at wallet creation, you know,
22 whether or not you use a unique wallet or address for

1 every transaction. Multisignature, of course, which we
2 talked about earlier. How that multisignature is
3 broken up, whether it's a two of three, three of five,
4 five of nine. And then, of course, how keys are
5 distributed.

6 You know, in many ways, you have the Federal
7 Reserve Bank idea of having, you know, a bunch of cages
8 underneath the ground that you could just move gold
9 from one cage to the other. And having been down there
10 and moved some of the gold bars, it's been -- it works,
11 but that only works in a vacuum for the most part
12 because we, you know, had a lot of security in place.
13 For all of these digital keys, they really need to not
14 be in a single location. And then, you know, as we
15 keep going, and I won't sort of go into each one of
16 these, there's ideas around key storage, key usage,
17 specifically with KYC/AML in mind and identity
18 verification on top of, you know, when we say
19 multifactor authentication being something you know,
20 something you have, like a token, something you are,
21 like your biometrics, where you are, specific location,
22 employing all of those multifactors, not just a single

1 one or two of three or three of four.

2 And then really processes in place, written,
3 codified, to be able to say, you know, Who has access?
4 What is their role? How do I revoke it? What happens
5 if a key is actually comprised? What are the steps in
6 place to be able to audit all of that so that we really
7 sort of stand by a "trust but verify" model for
8 security? and then using that and dovetailing it into a
9 policy that is really centered around establishing a
10 security program, dedicated security staff, and
11 external security audits that really report up, not to
12 any technologist, but to general counsel or anyone else
13 that's in a higher authority that cannot really avoid
14 some of the risks that are there.

15 And so at the end, some of the institutional
16 barriers, you know, it was mentioned earlier that
17 institutions really need to have insured, qualified
18 custodians. Right now, insurance premiums are quite
19 high. So for cold storage, it's 0.75 percent AUM; for
20 warm storage, it's anywhere from 1.25 percent to three
21 percent; and actually some companies are charging five
22 percent to have warm storage. You also have the fact

1 that there is the self-custody that's happening with
2 exchanges and funds, and they also don't know exactly
3 what they should be doing.

4 I spend a good amount of my time consulting with
5 some of the largest wealth managers, and, you know, top
6 five banks in the world, and they're still trying to
7 figure it out of how we should actually do digital
8 asset custody. We talked about no wide -- widely
9 recognized industry standards.

10 And then, of course, with everything that we're
11 talking about with the various companies that are out
12 there that are doing custody today, it's slow
13 liquidity. It takes 48 hours to be able to get my
14 money. If I do make an appointment and I schedule it,
15 they can do it within a 2-hour period, which makes it
16 very difficult to be able to be part of the market.

17 And so at the end of the day, we want more
18 standards. The government is great. I will say at a
19 time I was assigned to DHS at the NCCIC, and NIST came
20 out with its cybersecurity framework, and it was a
21 relief to the industry because everyone was looking for
22 just something, anything, to say this is what we should

1 be doing for cybersecurity, you know, and that worked.
2 And so it could be something that's from the
3 government, it could be a consortium like the CCSS, or
4 could be an SRO.

5 You know, obviously we want to have bank-level
6 physical cyber and crypto security. I do believe that
7 even though it's supposed to be a decentralized,
8 deregulated coin, we need a regulated market to be able
9 to actually operate safely. And then, of course,
10 KYC/AML and antibribery corruption process to ensure
11 the safety, and better education overall.

12 So thank you for the time.

13 MR. GORFINE: Great. Thank you to all of our
14 panelists.

15 And so I would like to actually open the floor now
16 to our members for reactions to what you've heard from
17 the panelists. Any additional observations that you
18 may have, as well as whether there are -- the work that
19 the subcommittee is currently doing is in line with
20 your expectations, or are there additional
21 considerations the subcommittee should explore going
22 forward with their work?

1 MS. VEDBRAT: I actually have a question. I
2 wanted to, you know, just get some sense on, How easy
3 is it or difficult to create a new cryptocurrency?

4 And then one of the panelists mentioned that the
5 user base is different, it's a younger user base, and
6 do we feel like, you know, the cryptocurrencies that
7 are out there today, are we providing, you know,
8 sufficient information and security to this new user
9 base?

10 MR. STEIN: So that's actually a great question
11 that comes up very often. And the issue is that one
12 can create a cryptocurrency in a matter of minutes. In
13 fact, there are tools to autogenerate a new
14 cryptocurrency, but that's not really the important
15 point. The important point is adoption. I could
16 create the Alex Stein coin today, but unless people
17 wanted to take it and use it for something, it would be
18 irrelevant.

19 So looking at how coins are being used, whether
20 they're backed by future functionality, whether they
21 are exchangeable on an exchange, those are the
22 important criteria that are actually quite hard. So if

1 you look at the, at this point, thousands of coins that
2 are nominally listed on sites like CoinMarketCap, once
3 you get past the first tens, there really is nothing
4 there.

5 So I wouldn't be concerned about the ease with
6 which one can create a coin, it's, How are these coins
7 being used and how are they regulated and how are they
8 secured?

9 MR. LEVY: And if I could just offer, the duality
10 of this conversation in terms of virtual currencies
11 being used as cash to acquire others or an asset that
12 increases in value, you know, the new generation
13 desires very fast acquisition of anything. It would be
14 clear that virtual currencies generally are very light
15 and could be used easily to acquire other goods and
16 services. That is very Gen Z and Millennial friendly.

17 So I think in terms of this conversation, drawing
18 a distinction between virtual currencies used as cash
19 effectively to do things in institutional markets like
20 settle trades or in buying Starbucks, you know, that's
21 important to understand because those are two very
22 different purposes, and, you know, one in terms of

1 being used as cash to acquire other goods, that's --
2 you know, there's some risk there, but it's probably
3 much lighter in terms of the downside of that versus
4 getting into it as a store of value or an asset. That
5 could have a lot of volatility, and people may not know
6 what that risk is going in, in terms of making an
7 investment versus just using a virtual currency --
8 i.e., crypto -- to exchange for other goods and
9 services.

10 MR. GORELICK: Supurna, also in terms of your
11 question about what the user base looks like, I think,
12 you know, in addition to sort of, you know, hand-wavy
13 age type categorizations, I think what's interesting
14 about this market is it's starting largely as a retail
15 market, albeit a very tech-savvy, early adopter retail
16 market, and it's moving out from there and becoming
17 increasingly attractive to institutions. You know,
18 we've seen over the last year and a half that prop
19 trading firms and family offices and hedge funds are
20 increasingly interested in getting involved in this
21 space, and we would expect that trend to continue over
22 the next couple years.

1 So it's both -- you know, it started out as
2 retails going institutional. A lot of the traditional
3 markets started out as institutional and became
4 increasingly retail, and that creates interesting
5 questions about market structure and regulation as
6 well.

7 MR. MCGREGOR: Just one thing to add. I -- when I
8 look at it from the security perspective, there's a
9 generational gap, and it's not what you expect. So
10 there's a generational gap in the sense that young
11 people are very interested in this space, and they want
12 to be involved, but they're not -- they don't have the
13 maturity to know that bad people are out there that are
14 trying to scam them.

15 And so they're -- and then on the other end, you
16 have, you know, older individuals that have that
17 experience and -- but are pausing because they know
18 that bad -- you know, that bad people are there that
19 are going to do things.

20 And so, you know, unfortunately, I deal with about
21 a hack a week from -- it's unfortunate that, you know,
22 it's high-net-worth individuals, it's companies, it's,

1 you know, all different types of individuals, whether
2 Ph.D.'s or a student, and the thing that you sort of
3 realize is that we're just moving at such a speed that
4 with the fear of missing out, unfortunately, people
5 sort of have to make that decision, and they do, and
6 sometimes it ends up being wrong.

7 MR. DeWAAL: Yeah. I think it's an excellent
8 question, too. I mean, I think sometimes we all forget
9 that it hasn't even been ten years since the 51st
10 Bitcoins were mined, that anniversary coming about in
11 January.

12 I think one of the great challenges right now --
13 and you may recall at the last TAC I gave sort of the
14 history of commodity options and the regulation of
15 commodity options in the 1970s -- right now, we're in a
16 world where the tokens are really disassociated from
17 the chains in many ways, and the tokens are being used
18 by, you know, too many fraudsters or purported
19 fraudsters, and the law is being driven by the desire
20 to eradicate the fraudsters, not that differently than
21 the law was being used in the 1970s, the best it could
22 be, to eliminate the fraudsters in the commodity

1 options space.

2 And the problem with that is that that will impede
3 not only institutional traders of -- or institutional
4 offerors of tokens down the line, but it will impede
5 potential the blockchain development. That's the
6 danger. That's -- that's the real danger here, you
7 know, because the law becomes very binary when there's
8 fraudsters involved. You know, it's good or bad, and
9 obviously you want to eradicate the bad, and the
10 problem is you get very binary legal decisions, which
11 seem great in the environment of trying to, you know,
12 uproot the fraudsters, but may not be, you know,
13 workable for everybody who wants to do it legitimately.

14 MR. GORFINE: Okay. I'm going to go down the
15 line. We'll go Mr. Tabb, Mr. McHenry, and then Mr.
16 Lothian.

17 MR. TABB: Certainly, the idea of custody is
18 really kind of critical in this whole market. Have you
19 guys thought or done anything in terms of
20 rehypothecation, securities lending, repo, finance, all
21 that other stuff? And, you know, is that good or bad
22 as this goes into the -- as we start moving into more

1 institutionalization of this market?

2 MR. GORELICK: I'm going to answer sort of in a
3 general way. I think that all of the processes and
4 devices and tools that have been useful in traditional
5 finance will be at least explored in the virtual
6 currency market. And I think there may be some
7 advantages, there may be some disadvantages, there may
8 be some concerns, there may be cultural mismatches.
9 But just the way that the economy works is that if
10 people want to lend their coins, they're going to
11 figure out a way to do it, and I think we need to be
12 aware of that whole process. You know, they're
13 extremely portable. They are, you know, easy to move.
14 So I do expect that a lot of those features will start
15 to develop in this market, and it will be important for
16 the community and the regulators to make sure that it's
17 done in a thoughtful and safe way.

18 MR. DeWAAL: And I'll point out this is one of the
19 areas where whether you take a view of what these
20 activities or not -- I mean, certainly, as a counsel,
21 we're seeing folks wanting to do lots of different
22 things with tokens, and this is where the law really

1 becomes challenging because we're talking about -- you
2 know, most people just think of the plain vanilla
3 transactions and how they fit in, but we start getting
4 to there as a rehypothecation, you get into the areas
5 of lending.

6 The New York BitLicense is a good example. That
7 law is triggered, if you engage in a virtual currency
8 business activity, which is very broad to begin with,
9 involving New York or a New York resident, every
10 transaction that you just talked about --
11 rehypothecation, lending -- if it involves New York or
12 a New Yorker -- it's just so broad, it gets captured
13 into that, and folks are scared to do business in or
14 involving New York State because they're afraid of
15 getting caught in the BitLicense requirement, which is
16 very, very time-consuming to obtain. There are less
17 than a dozen folks who can operate legally in New York
18 today in this space. And that's part of the problem
19 right now with the regulations and the laws out there
20 being so vague.

21 MR. LEVY: And just some --I'm sorry, just without
22 regard to any of the regulations that exist or the

1 complexity of that, which matters, just the idea of
2 segregation of assets and accounts, which is obviously
3 critical to safeguarding and certainly sits within the
4 stock loan and repo markets, et cetera, and the futures
5 markets, if you can safely protect an asset and really
6 identify it as someone's, the idea of holding it in a
7 broad account -- and these are for the purists in the
8 crypto space -- it's very easy to get your head around
9 that if you just believe that every coin can be hashed
10 and owned by an individual, and it could sit sort of
11 anywhere and always be known as owned by a particular
12 entity. If people are uncomfortable with that, then
13 you'll need many accounts segregated, so any one
14 institution can't commingle those.

15 So it really does turn everything on its head
16 depending on the coin, the model, and the ability to
17 identify an owner of that coin or an account with
18 assets in it. So it really -- it does force you to
19 rethink all of that potentially.

20 MR. TABB: Well, that gets -- that gets to the
21 heart of this, is that you may have two owners of one
22 coin because it's -- you know, you've got the

1 registered owner, the guy who bought it, then he lent
2 it, then somebody else bought it, you know, bought
3 something. So that opens up a whole can of --

4 MR. DeWAAL: Fractional art.

5 MR. TABB: Yeah.

6 MR. STEIN: So a related issue that we didn't
7 touch on today, but we should in the future, is the
8 impact and role of smart contracts. You know, smart
9 contracts were originally developed with the tagline
10 "Code is Law." Well, I'm a computer scientist myself,
11 and I would never rely on "Code is Law," certainly not
12 my own. Understanding the jurisdiction, understanding
13 the recourse, understanding arbitration provisions
14 underlying these smart contracts are all interesting
15 areas of research. That would be instrumental in
16 hypothecation scenarios to ensure you don't have two
17 owners simultaneously.

18 MR. GORFINE: Okay. Let's go to Mr. McHenry.

19 MR. McHENRY: Thank you. So does the scope of
20 regulation that's currently under consideration extend
21 beyond just trading to include aspects like mining?
22 Because I know there's a lot of potential manipulation

1 there.

2 MR. DeWAAL: The answer is yes and no.
3 Jurisdictions that have generated - that have
4 regulations that actually address mining typically
5 carve them out from the application, for example, money
6 transmission requirements or even being -- getting a
7 BitLicense. But the problem is, is once you -- once
8 you're done mining, and then you start getting involved
9 in -- you know, getting rid of the mined coins, then
10 you're potentially touching other laws, depending on
11 the business you're conducting.

12 I mean, the problem -- the issue is -- and, again,
13 it's not -- it's not that different than the problems
14 of the early 1970s when commodity options became a
15 very, very popular vehicle for fraudsters in the United
16 States. You know there was no doubt that there were
17 legitimate users.

18 Today, nobody thinks about commodity options as
19 primarily a fraud-based product. Okay. But in the
20 early 1970s, before the adoption of the amendments to
21 the Commodity Exchange Act that created the CFTC, there
22 was great -- there was great confusion as to who had

1 jurisdiction over commodity options. Was it the
2 States? Was it the SEC? It likely wasn't the
3 Commodity Exchange Authority. But, you know, the
4 problem was is that, you know, the concentration was
5 getting rid of fraudsters. There was even that ban
6 that I referenced last year from the end of the '70s to
7 the early '80s in commodity options.

8 Until people can get their hands around this,
9 okay, let's -- now we figured out we have an
10 environment, and the exchanges will start trading this
11 product. Right now, there are so many elements touched
12 by every types of transactions. That's why making
13 things -- doing things the right way is so difficult.

14 MR. LOTHIAN: So I'd like to take a little bit of
15 a big-picture look at this because when the -- when the
16 CBOE and the CME offered Bitcoin futures, I got a lot
17 of calls. I got calls from FCMs, risk managers,
18 general counsels, saying, "Hey, what do you think of
19 these things?" -- you know -- "Should we offer these
20 things?" whatever. And I had to really dig deep
21 because I had some preconceived notions, and I had to
22 work my way through those and take a different look at

1 this.

2 And so I want to take a different -- a different
3 look. So Bitcoin futures, the Genesis Block, Satoshi
4 Nakamoto, he supposedly, he or the group of people
5 supposedly, mined the original million Bitcoin or
6 thereabouts. Okay? It's worth six billion dollars
7 today. It hasn't been touched. Okay?

8 Now, why don't you touch a six billion dollar
9 asset? Okay? Now, you know, the reason that's most
10 given is if somebody touched it and, you know, took
11 some -- took some profits, a little portfolio
12 reallocation, whatever you want to call it, that it
13 would undermine the confidence in the product, and the
14 product would go down. But you know what? If it goes
15 down 90 percent and I get out with 600 million dollars,
16 I am still 600 million dollars ahead of the game.
17 Right?

18 But that's not the point. The point is, Why --
19 why don't you? And the reason is because you're making
20 so much money elsewhere. Okay? And that points to a
21 group of people having made the decision as opposed to
22 one that it would be beating down on.

1 And so I asked myself, okay, who -- who -- who can
2 make money from this product? And these are -- and
3 this is early days. You know, I'm talking about the
4 genesis of this, right? And I came up with the answer
5 of money launderers. Okay? It's the third largest
6 business or industry in the world. And if you think
7 about it, who might be behind that? That could be
8 Russia, oligarchs. We recently had the story of the
9 Russian security forces that were hacking into the U.N.
10 Okay? And they -- one of the ways that they were
11 supporting themselves was actually mining Bitcoin or
12 mining cryptocurrency. Okay?

13 And so that's my -- that's my theory, without any
14 proof. Okay? And it's just a -- it's just a
15 cautionary question. It's a "What if that's the case?"
16 because it makes -- when I tell people this theory,
17 they go, "You know what? It makes a lot more sense
18 than it's a Japanese guy who created this technology
19 and never touched the six billion dollars or 20 billion
20 dollars when it was at its high." Okay? And so what
21 -- you know, what are -- what is the risk of the
22 origins of this?

1 Now, I -- I get the tremendous opportunities in
2 the cryptocurrency. You guys do great work. I agree
3 with much of what I heard. I'm even pursuing a token
4 strategy myself, so I'm not -- I'm not anti. So to
5 Gary's point, commodity options can be good. Okay?
6 But what if there is a more nefarious beginning for
7 this?

8 But the biggest question is, Who's looking into
9 this? Because nobody that I've heard is looking into
10 this, you know, other than, you know, *Newsweek* tried to
11 do it a few years ago and got some -- some -- somebody
12 that's not Satoshi Nakamoto, and there's other people
13 that have come out and said it. But who's -- who --
14 you know, is this an issue for the concern underlying
15 the confidence? If it turns out that it is created by
16 money launderers, what does that do to the confidence
17 of all this wealth and all this money and all this
18 technology and investment? Okay?

19 And, quite frankly, if you think about it, if I
20 gave you a million dollars to launder in cash -- right?
21 -- and you take it maybe to your local mobster that you
22 know and your repeat customers, so it gives you 70

1 cents on the dollar, if you think about the billions of
2 dollars that are being invested in cryptocurrencies,
3 that 30 percent margin represents easy to invest in
4 making better technology for -- for laundering money.

5 And if -- and if the -- you know, if you look at
6 the money laundering through Danske Bank that was going
7 on and some other places, the huge amounts of money,
8 guess what. The regulators are never going to keep up
9 with -- with what's going on. The regulations are
10 never going to keep up with what's going on. There's
11 just too much money in it, and they're -- you know, and
12 they're way ahead of us.

13 So that's the question I want to ask, and just to
14 ask yourself that question, and --

15 MR. STEIN: So one of the biggest
16 misunderstandings about Bitcoin is that people say it's
17 anonymous. Not only is it not anonymous, to my
18 understanding, going all the way back to Silk Road in
19 2014, law enforcement has been incredibly successful in
20 using the pseudo-anonymity of the Bitcoin blockchain to
21 identify and apprehend people who are doing money
22 laundering or illegal activities.

1 Now, there are coins that have come about that
2 have real anonymity. They don't have anywhere near the
3 velocity or the market value that Bitcoin has. But
4 Bitcoin itself, you can see every wallet, you can see
5 every transaction.

6 So where is the Achilles' heel in Bitcoin? The
7 Achilles' heel is not transactions that are done on the
8 blockchain because they can be tracked; it's this
9 unregulated world of exchanges where the exchange may
10 or may not be employing AML/KYC. And if I can deposit
11 Bitcoin into some exchange outside of the United States
12 and find a counterparty, we may be able to transact --
13 that's not on the chain.

14 To Andre's point, I'm now taking full counterparty
15 risk. I'm not on the blockchain, but I could do that
16 as anonymously as this third-party organization allows.
17 But all of this speaks to the value of having regulated
18 qualified custodians and exchanges. And as we do with
19 equities and fixed income and commodities, ring-fencing
20 that space so that when I transact in shares of IBM, I
21 don't have to worry about my counterparty because I
22 know the entrance gate was manned. And so there are

1 solutions, and that drives much of what this panel was
2 thinking about.

3 MR. LOTHIAN: Yeah, no, I note -- and I was
4 actually kind of appalled by this when I looked into
5 some of the exchanges where if I deposit my Bitcoin at
6 the exchange and then go trade, my trades are actually
7 not written to the blockchain, they're written to some
8 other kind of system. So I'm really not trading
9 Bitcoin, I'm trading a derivative of Bitcoin, which you
10 might call a futures contract or some type of
11 derivative or swap.

12 MR. STEIN: Except it's probably on an Excel
13 spreadsheet.

14 MR. LOTHIAN: Yeah.

15 MR. DeWAAL: I mean -- I mean, and, also, John, in
16 fairness, FinCEN and OFAC are pretty out there trying
17 to tell people that just because you're trading this
18 new exciting asset doesn't mean that you're not subject
19 to AML and KYC concerns, and they're making it pretty
20 clear that there are applications that have to apply.
21 I mean, as I said, FinCEN has been pretty aggressive
22 both -- there have been criminal actions out there for

1 folks who didn't get the money service business
2 license, and they felt they should have, and they've
3 been prosecuted, and I'm sure there will be more. And,
4 you know, OFAC, make sure that you cannot do business
5 with people who are transacting on a blockchain if
6 they're a prohibited person. The fact that they're
7 creative and, you know, they vowed to start listing
8 addresses of, you know, that you shouldn't be dealing
9 with.

10 So I think the crime enforcement people are pretty
11 good. I had the pleasure of listening the other day to
12 the senior guy in the State of Alabama who was the guy
13 who actually helped the Iraqi government prosecute
14 Saddam Hussein and Chemical Ali, and he's now in this
15 crypto space and prosecuting reported bad guys, and he
16 was explaining the processes they use to actually
17 research and take advantage of the blockchain
18 technology to learn who the bad guys are. And his
19 problem isn't -- I mean, I'm sure there are guys out
20 there he can't find, but his problem is there are too
21 many guys he can find, they just don't have the
22 resources to prosecute.

1 MR. MCGREGOR: So just to --

2 MR. GORFINE: Sorry, Andre, I'm going to -- I'm
3 going to cut you for a second here because we're going
4 to try to stick to our timeline as best we can. So I'm
5 actually going to go to Ms. Peve for a question, and
6 then a question or comment from the Chairman and
7 Commissioner Berkovitz to round out this panel
8 discussion.

9 MS. PEVE: Thank you. So just real quick, stable
10 coins. So they seem to have all of the characteristics
11 and mechanics of a futures contract in that you're
12 locking in a value today and protecting against
13 volatility in the future. Have you guys looked at or
14 discussed the emergence of stable coins and what the
15 best practices or guiding principles should be around
16 them?

17 MR. STEIN: So individually, I'm sure we all have.
18 As a panel, we have not yet discussed it.

19 CHAIRMAN GIANCARLO: Just a little perspective
20 here. The last time I did the math, the total value of
21 all cryptocurrencies is a couple a hundred billion less
22 than one large-cap tech stock, certainly dwarfed by

1 mortgage bond IRS FX energy markets.

2 Richard, you said, I think when you closed your
3 presentation, that the stakes are high for a policy
4 response in the area of cryptocurrency. So the floor
5 is yours. Why are the stakes high if the magnitude of
6 this is as small as it is?

7 MR. GORELICK: That's a great point. I think we
8 do need to keep an eye on what is the overall size of
9 this market and how does it compare to other asset
10 classes that we should be concerned about?

11 I think my view is that this is an area that is
12 relatively small today, but it has a tremendous amount
13 of energy and enthusiasm behind it, and growth ahead of
14 it. And with that in mind, now is sort of the time to
15 get it right because we want that growth to occur by
16 responsible market participants hopefully in regulated
17 jurisdictions where there's appropriate safety and
18 soundness, you know, guards. And now is the time to be
19 doing that. It's not after this has grown to the point
20 where it's significant from a systemic standpoint or
21 compared to other asset classes.

22 COMMISSIONER BERKOVITZ: I just want to comment

1 that, Gary, your comments on trying to do smart
2 regulation and the subcommittee's comments regarding
3 that particularly resonated because over the past few
4 years, I've been engaged in some of the same exercises
5 that I think you are in terms of advising clients who
6 may be interested in this space on the regulatory
7 landscape. And I was frankly with a team of lawyers,
8 and we have securities lawyers, we have commodities
9 lawyers, we have AML lawyers, and just the barriers of
10 the legal costs in terms of prospective clients having
11 to arrange an array of lawyers to advise on how to get
12 in this space, I'm also aware your vast experience over
13 several decades, and I'm sure in advising clients of
14 what's a forward, what's a future even.

15 We -- in many areas, we've sort of developed a
16 common law of the Commodity Exchange Act, facts and
17 circumstances tests, case-by-case basis. That may not
18 be the best way to proceed for an industry trying to
19 off the ground, as you've noted, and some legal
20 certainty, but how we cut through that is a challenge
21 that I look forward to the committee's recommendations
22 how we can avoid the next 30 years of facts and

1 circumstances cases trying to address these.

2 MR. GORFINE: Okay. Maybe we'll take one more
3 question or comment from Paul, and then wrap up the
4 panel.

5 MR. CHOU: Thanks. I'll be fairly quick here.
6 So, you know, I mean, some of the discussion that you
7 guys had were the challenges of categorizing certain
8 cryptocurrencies, whether they're definitely commodity,
9 whether they have elements of security or not.

10 So my -- you know, from your review of the kind of
11 cryptocurrencies that are out there right now, do you
12 ever believe that it might be a realistic possibility
13 that some cryptocurrencies will eventually have to be
14 jointly regulated by the CFTC and the SEC similar to
15 how single stock futures work, for example?

16 MR. DeWAAL: That's a -- that's really a good
17 legal question. And, you know, as you know, I write a
18 lot in this area, and I've thought about doing
19 something in this area. And the answer is there is not
20 really a mechanism for joint regulation yet because
21 there's a mechanism in the world of security futures,
22 but that was created by law, and that sort of gave a

1 mechanism.

2 Without some kind of compromise, you know, by law,
3 either -- it's binary -- either it's a commodity that
4 is defined under the Commodity Exchange Act, and then
5 there is no preemption because it is a security, or
6 it's not. So absent an amendment to the Commodity
7 Exchange Act, the simple issue whether a particular
8 token is regulated by the SEC or the CFTC I believe is
9 binary. Others may disagree.

10 You know, there was -- again, going back, you
11 know, decades ago, when this agency was begun, there
12 were a lot of jurisdictional turf battles with the SEC
13 over particular products. I mean, there were court
14 battles. It was -- it was an interesting process to
15 watch. Hopefully, to the Chairman's point, and to
16 Richard's point, those things can be avoided by
17 thoughtful, you know, planning in advance because, you
18 know, that doesn't help anybody. But to me right now
19 it would really be binary in this space, not joint.

20 MR. GORELICK: Well, to Gary's point about this
21 being a binary determination, I think that's -- that's
22 accurate from the way I understand the law to be today.

1 But one real interesting thing that came out of the SEC
2 Hinman's speech a few months ago was that something can
3 start off as a security, and at some point, when it's
4 sufficiently decentralized, become a commodity.
5 Presumably, it might be able to go back if it
6 subsequently became less decentralized over time. And
7 this idea that something can transform in nature and
8 switch between regulatory regimes is really
9 interesting, and it will pose some interesting
10 questions for, you know, exactly what point does that
11 jurisdiction switch, and how do we know whether or not
12 it's occurred?

13 MR. LEVY: Just one point. I would argue -- I
14 don't think "trinary" is a word, but maybe trilateral.

15 (Laughter.)

16 MR. LEVY: I think the banking system and the
17 banking regulators will also have to play a role in
18 this. We have a system today that doesn't really work
19 that way. When we think about global competition where
20 the regulatory side is maybe a bit cleaner and there
21 are single regulators or broader regulators, especially
22 when you look to the east, I do think that we're going

1 to have to seriously look at it and figure out, how do
2 you get banking securities and commodities together
3 when it makes sense? And I know that's not possible
4 potentially in the practical world, but that is
5 probably a version of the right answer in the long run.

6 MR. DeWAAL: Yeah. I'm sorry. On the point I
7 mentioned before, I mean, already we're seeing, you
8 know, the New York State Department of Financial
9 Services has filed a lawsuit against the Office of the
10 Comptroller of the Currency over its supposed FinTech
11 -- the FinTech charter, and some other States are on
12 the queue to do that. I mean, that's what we want to
13 avoid. We want to avoid those kind of governmental
14 battles that don't benefit anybody by thoughtful
15 planning in advance.

16 MR. GORFINE: All right. Well, I'd like to thank
17 our panelists for their comprehensive presentations,
18 and our members for asking good questions and I think
19 raising some new elements that the subcommittee might
20 consider incorporating into their work going forward.
21 So as we think about kind of next steps for the
22 subcommittee, maybe formalizing some of the work that's

1 been done and the outline that essentially presents
2 today, some of this may help to inform that work. So
3 thank you very much to our panel.

4 Panel II: Automated and
5 Modern Trading Markets Subcommittee Presentation

6 MR. GORFINE: I would now like to turn to our next
7 panel, in which we will hear from our Automated and
8 Modern Trading Markets Subcommittee member, Mr. Bryan
9 Durkin.

10 So, Bryan, if you can -- assume the panel spot
11 there.

12 MS. KERSHAW: Perhaps your party has a muted line.
13 If he is online, he can press star-zero so I know which
14 line to open.

15 (Pause.)

16 MS. KERSHAW: No one is signaling me so far.

17 MR. DURKIN: Well, thank you, Commissioners for
18 this opportunity to present to you today on behalf of
19 the Subcommittee for Automated and Modern Trading
20 Markets.

21 First of all, congratulations, Commissioner Stump
22 and Commissioner Berkovitz. It's wonderful to be in

1 front of a full complement of Commissioners. And
2 Commissioner Stump, when you mentioned the genesis of
3 this very important committee -- and Commissioner
4 Quintenz, thank you for making sure you're carrying on
5 the importance of this committee -- some of us I think
6 were part of that original genesis.

7 And when you spoke about order routing mechanisms
8 and having controls in place, I think it underscores
9 the deep importance and commitment, not only of the
10 CFTC to having forums like this, but hopefully my
11 comments today will underscore the importance that this
12 committee has had in informing the topic that we're
13 going to talk about today.

14 So, first of all, electronic trading has emerged
15 as the principal trade execution method for futures
16 markets, resulting in important, well recognized public
17 benefits of increasing liquidity, promoting price
18 discovery, narrowing the bid ask spreads in markets,
19 and lowering risk management costs.

20 Now, in light of this fact, over the last several
21 years, this very committee and its subcommittees have
22 examined numerous topics associated with the increase

1 in algorithmic trading and the dynamic changes that
2 have occurred within our industry evolving from the
3 increased usage of technology. Now, these efforts have
4 unquestionably led to important and very noted
5 principles, base guidance, involving a range of
6 subjects directly related to the advancements in
7 technology and to the progression in an increasingly
8 automated marketplace.

9 Now, among other things, this guidance has
10 informed industry and this Commission on risk
11 management, pre- and post-trade protocols, systems
12 safeguards, access to co-location facilities, messaging
13 policies, and proposed Reg AT.

14 Now, today we're going to discuss a bit about
15 volatility controls and the IOSCO report that
16 Commissioner Quintenz referenced.

17 Now, this IOSCO consultation that was issued
18 earlier this year is significant not only in its
19 recommendations, but also more so in its continued
20 advocacy for a principles-based approach to the
21 application and to the oversight of controls and any
22 regulations that are governing those.

1 Now, we should be proud to say that the U.S.
2 markets are well ahead of the IOSCO report, and we
3 believe, as a subcommittee, our work here under the
4 Technology Advisory Committee, has largely contributed
5 to our position as standard-bearers and as leaders in
6 the advancement of risk and volatility controls.

7 Now, it goes without saying that everybody around
8 this table, protection, market integrity, has the
9 greatest import to every single one of us here today.
10 We all share in the responsibility to deploy multiple
11 and varying layers of controls across individual market
12 participants, trading entities, FCMs, and exchanges.
13 It's a collective effort. More than a significant
14 amount of work has been put in by this industry over
15 these years on this very front, and collectively we
16 have built the standards for excellence in this
17 industry in safeguarding these markets.

18 As I've noted, the work by this very advisory
19 committee and the ongoing dialogue with the Commission
20 around automated trading have created a forum, an
21 excellent forum, a productive forum, for very
22 productive, highly collaborative discussions between

1 our regulators and all layers of this industry, as
2 indicated by this panel here today. And this has
3 resulted in real demonstrative work products, such as
4 the FIA best practices and industry guidelines for risk
5 protocols and controls.

6 To take us back a bit, in 2010, the FIA formed a
7 working group to evaluate existing practices and to
8 provide recommendations for managing the risk of direct
9 access market trading. This was formed under the
10 Market Access Working Group. Now, this working group
11 established a set of principles for this industry to
12 rely on as matters of best practices, detailing risk
13 management controls that should be in place across the
14 marketplace, this being at the trading firm level, at
15 the clearing member level, and at the exchange levels.

16 Now, these recommendations broadly addressed
17 execution risk tools, such as pricing banding and
18 dynamic limits. It addressed intraday position limits,
19 post-trade checks, or drop copy functionality, co-
20 location policies, conformance and certification
21 testing, and guidelines for establishing strict error
22 trade policies.

1 Very logically, the recommendations are delineated
2 by trading and by clearing firms and by the exchanges
3 according to the policy that's being addressed,
4 according to the application of any tools, and the most
5 efficient and the most logical way for these to be
6 promoted. The goal has always been to promote enhanced
7 transparency, minimizing uncertainty and systemic risk,
8 and protecting and preserving these markets.

9 Now, soon thereafter, the FIA Working Group report
10 was released. The FIA Principal Traders Group issued a
11 comprehensive recommendation piece of work that
12 addressed risk controls for trading firms, further
13 expanding upon the FIA's market access risk management
14 recommendations.

15 Now, this combined document set forth what the
16 industry, after much deliberation, deemed essential,
17 operating risk controls across markets to address
18 market access, electronic trading, pre-trade risk
19 management, trading interruptions, volatility, post-
20 execution, and maintenance of overall business
21 continuity. And in 2010, that collective guidance and
22 the examination of the current practices was way ahead

1 of its time. In fact, the first FIA Working Group
2 report was issued just prior to the May Flash Crash,
3 and already the trading venues, such as our own at CME
4 Group, already had numerous of these controls in place.

5 The working group acknowledged market structures
6 and regulatory regimes differ across markets. They
7 differ across the globe, and some markets will find
8 themselves in different evolutionary stages.
9 Therefore, a principles-based approach was most fitting
10 in 2010, and it remains most fitting today.

11 Now, to that end, it is important that we, as
12 leaders within this industry, constantly review and
13 that we constantly assess where we are at collectively
14 in our practices to protect these markets against
15 market disruptions and to ensure that our markets
16 remain fair, that they remain transparent, that they
17 remain efficient.

18 This committee had extensive dialogue on the level
19 and the application of appropriate market protections,
20 the risks, and volatility controls during its Reg AT
21 deliberations. It was made most evident then, and
22 there are many of us still here around this table, that

1 a prescriptive approach would be detrimental and could
2 have the unintended effect of unraveling much of the
3 tremendously good work that has been accomplished over
4 these years by this very industry, working side by side
5 with this Commission, such as evidenced by the FIA best
6 practices.

7 In 2010 and in 2015, the FIA conducted a survey of
8 global exchanges' traded derivatives venues regarding
9 the types and the position of controls that are
10 offered. The FIA has performed a similar survey again
11 this year, and I understand they hope to publish the
12 survey results later on this year, but I'm fortunate
13 enough to be able to share some of those findings which
14 are relevant to today's discussion with you. And I
15 very much thank the FIA for sharing this information
16 with us in advance of their report's official
17 publishing. And I thank them for their excellent work.

18 Now, with regard to this year's survey, the FIA
19 found the following: out of 17 responses from major
20 derivatives exchanges globally, 11 have implemented
21 dynamic price bands, and 13 have implemented trading
22 halts during extreme volatility. Every exchange in the

1 Americas that responded to this survey has implemented
2 both price banding and trading halts without express
3 regulatory requirements to do so. All European
4 exchanges regulated under MiFID II that have responded
5 to this survey have also implemented both price banding
6 and trading halts under the requirements detailed in
7 RTS 7, and more than half of the Asian exchanges that
8 responded to the survey have now implemented price
9 banding and trading halts, again without regulatory
10 requirements.

11 Without question, our U.S. markets were well ahead
12 in 2010, but the EU and the Asian markets have
13 generally caught up by 2018. These findings prove out
14 that global derivatives markets have implemented and
15 have unquestionably improved upon market integrity
16 controls without explicit regulatory requirements to do
17 so. Why is this so? It's in our best interest to have
18 the very best protections in place. Much of what we
19 implement by way of risk controls is based upon our own
20 view of the markets that we operate and represent, and
21 also in response to our participants' demand.

22 It is important that regulators strike the right

1 balance in administering their oversight with allowing
2 the markets to evolve accordingly with advancements in
3 technology and market structures.

4 Now, moving on to the IOSCO consultation report
5 that was just issued this past March entitled,
6 "Mechanisms Used by Trading Venues to Manage Extreme
7 Volatility and Preserve Orderly Trading." And I quote
8 IOSCO, "The importance of establishment of volatility
9 control mechanisms is recognized by trading venues and
10 by regulatory authorities globally. And IOSCO believes
11 that these mechanisms support the goal of ensuring that
12 markets are fair, efficient, and transparent."

13 With the prevalence of automated trading in
14 markets, IOSCO has determined to focus its work on,
15 quote, automatic volatility interruptions and
16 mechanisms and controls deployed by trading venues, or
17 not, to halt trading or reject orders to minimize
18 market disruptions. The aim of this report is to
19 present a pathway, I believe, to establishing guidance
20 or regulations to ensure volatility control mechanisms
21 are appropriately implemented across markets globally
22 with oversight by its jurisdictions' regulators.

1 Now, IOSCO issued eight recommendations, the first
2 being that trading venues should have appropriate
3 volatility control mechanisms. Now, as evidenced by
4 recent events, extreme volatility can have a negative
5 impact on market stability, on its integrity, its
6 efficiency, and ultimately investor confidence. The
7 report is focused on mitigating impacts of, quote,
8 extreme volatility. The report very clearly recognizes
9 that normal volatility is a healthy, and it's a regular
10 component of market operations.

11 Their second recommendation is that trading venues
12 ensure that volatility control mechanisms are
13 appropriately calibrated. IOSCO recognized the
14 importance in promoting a flexible approach to how
15 venues might establish and calibrate volatility
16 controls. Differences, and I quote, in approaches to
17 managing excessive volatility reflect differences in
18 market structure and flexibility needed by regulatory
19 authorities and trading venues, thus, emphasizing a
20 "one size fits all" model is not ideal. And I'll speak
21 more to this point in a bit.

22 Their third recommendation is that trading venues

1 should regularly monitor volatility control mechanisms.
2 In their report, IOSCO recommends that trading venues
3 conduct regular reviews of their mechanisms, ensure
4 that mechanisms are adapted to market changes and
5 changing dynamics, and adjust mechanisms where it's
6 warranted.

7 Their fourth recommendation is regulatory
8 authorities should determine what information they
9 require to effectively monitor volatility control
10 mechanism frameworks.

11 The fifth recommendation, trading venues should
12 provide regulatory authorities information regarding
13 the triggering of volatility control mechanisms to
14 regulatory authorities. The exchange markets work
15 closely with our CFTC, and we share information
16 routinely, and we're proud to do so. We have a very
17 strong collaborative relationship in that regard.

18 And certainly upon a formal request by the
19 Commission, as suggested by the IOSCO report, an SRO
20 could be compelled to provide data to the CFTC at any
21 time.

22 Their recommendation number six is that trading

1 venues should communicate information to market
2 participants and to the public about volatility control
3 mechanisms.

4 Their seventh recommendation is that trading
5 venues should make available market participants -- to
6 market participants, and, if appropriate, to the
7 public, information regarding the triggering of a
8 volatility control mechanism.

9 And, finally, the IOSCO recommends that where the
10 same or related instruments are traded on multiple
11 trading venues, there should be communication between
12 the relevant trading venues.

13 Now, going back a moment into the IOSCO report,
14 that trading venues should have appropriate volatility
15 control mechanisms and ensure that those mechanisms are
16 appropriately calibrated, I'd like to walk through some
17 of the CME risk and volatility controls by way of
18 example.

19 This is not comprehensive, but it gives you an
20 outline of the framework that has been informed by this
21 very Commission and by this very committee, noting some
22 controls that have been in place for a number of years

1 by our institution, but also noting that this is an
2 evolutionary program, and it's an adaptable program,
3 and you'll see some that have been more recently
4 introduced by our organization.

5 The goal here is to illustrate the need for
6 markets to develop proprietary functionality that can
7 be customized to the respective markets and the
8 respective dynamics, as appropriate.

9 Inline credit controls, for example. CME Group
10 now offers pre-trade risk management capabilities
11 through its inline credit controls. ICC, as we refer
12 to it, allows clearing member firms and Globex
13 executing firms to set daily position limits for CME
14 Globex at a per-product level and at the account level.
15 Velocity Logic, which is an outgrowth of our stop logic
16 capabilities, implemented in 2013. Velocity Logic is a
17 patented and proprietary functionality within our
18 Globex trading engine that has been designed to detect
19 significant price moves of futures contracts occurring
20 within a predetermined time period. And when those
21 parameters are met, there are momentary pauses that are
22 introduced into the system to allow the marketplace to

1 find its equilibrium and regroup.

2 Price limits and circuit breakers. Numerous CME
3 Group products, including equity indices and energy
4 products, have rules establishing daily price limits
5 and/or circuit breakers in order to promote market
6 confidence and to mitigate risks to the market
7 infrastructure by allow market participants time to
8 assimilate information and to mobilize liquidity during
9 periods of sharp and potentially destabilizing price
10 swings. Of note, circuit breakers are calibrated at
11 defined levels and completely halt for defined periods
12 of time for balance of the day's trading session when
13 those parameters have been met. And price limits allow
14 trading to continue, but only within defined limits.

15 Protection points for market and stop orders. As
16 these controls are to control against price swings in
17 illiquid markets, these price protection points prevent
18 market and stop orders from being filled at
19 significantly aberrant prices because of the absence of
20 sufficient liquidity in a particular marketplace.

21 Pricing banding. Price banding is designed to
22 prevent the entry of orders at clearly erroneous

1 prices. It's calibrated by a product basis thereby
2 mitigating the potential for market disruption. And we
3 have many other risk controls and protocols in place,
4 but this gives you a sampling of how this marketplace
5 has evolved and these risk management protocols, not
6 unlike other institutions, have been implemented.

7 Although the IOSCO report and recommendations
8 focused on recommendations deployed by market operators
9 to mitigate potential impacts of extreme volatility,
10 we, at the CME Group, obviously do not look at
11 volatility controls singularly, but as part of a more
12 robust offering of risk and a more robust offering of
13 volatility mitigation tools. It's critical that
14 markets continue to build upon existing controls and to
15 protect the markets and address dynamic changes in our
16 industry. It's incumbent upon all of us.

17 As the markets evolve, we must continue to evolve
18 with it, and we have, and we do. To that end, a
19 principles-based approach to regulatory administration
20 and oversight of risk management capabilities used
21 across this industry is essential in allowing our
22 markets and allowing our market participants the

1 flexibility to keep pace with change, to keep pace with
2 market and technology developments.

3 This has been absolutely most evident in the area
4 of automated trading. Given the rapid and given the
5 highly complex trading innovations that we are seeing,
6 a regulatory standard must be flexible to adapt quickly
7 and to adapt efficiently to changes in trading behavior
8 and trading capacity. I think we have found
9 prescriptive rules cannot keep pace with nor can it
10 anticipate every technological innovation and may
11 actually allow new methods to slip through regulatory
12 cracks by doing so. Hence, a principles-based
13 structure we believe avoids these types of pitfalls.

14 I'm proud to say that the Technology Advisory
15 Committee has led much of the dialogue, has informed
16 the great work, the principles, the guidelines, the
17 risk protocols that have been outlined. It's been,
18 from our ongoing discussions, many years of work by
19 this Commission that has led us to this path.

20 It's encouraging to see recognition by IOSCO --
21 IOSCO, by the way, which is a global standard setter --
22 of the import of the value in relying on a principles-

1 based regime. And I'm confident that this industry,
2 that the Commission, that the Technology Advisory
3 Committee, will continue to build on the good work
4 we've already accomplished thus far. I believe that
5 this Commission and this committee will remain
6 critically attuned to the developments that might
7 require regulatory insight, guidance, and possibly
8 oversight. I'm deeply proud to be a part of that
9 evolution.

10 MR. GORFINE: Thank you very much, Mr. Durkin.

11 So with that, I again want to open the floor to
12 any observations or questions that the TAC members may
13 have, but also keep an eye towards, you know, some of
14 the next steps for the subcommittee, including whether
15 it's around the IOSCO recommendations and how they
16 currently map to existing requirements or previously
17 proposed requirements, or if there are new items that
18 the subcommittee should be considering.

19 I'll begin with you, Mr. Tabb.

20 MR. TABB: Thanks.

21 Hi, Bryan. It seems like the IOSCO rules seem to
22 be aligned with where we're headed. You know, where

1 would you say this committee and the regulators should
2 focus on, you know, as we move forward? Do you see
3 gaps? Do you see things that, you know, we should be
4 thinking about as we move into the future? And what
5 future steps, you know, should we help -- be able to
6 help with, with the committee?

7 MR. DURKIN: Well, thank you, Larry. We do feel
8 that the IOSCO report is very aligned with the work
9 that we have done as part of the TAC and that the CFTC
10 has led. They were very emphatic about a principles-
11 based approach, which is something that I think
12 everyone around this table has advocated for a number
13 of years. The -- what they outlined in terms of
14 volatility control mechanisms, many of us have already
15 adapted those types of mechanisms in our -- on our
16 second or third generation.

17 And that gets to my final point. I don't believe
18 that this is an area that you're ever done. We have
19 continued to introduce some more granular capabilities.
20 I alluded to the inline credit controls. That was the
21 most recent generation of risk controls that we
22 introduced in the past year. So this is something that

1 as the markets continue to evolve, become more
2 sophisticated, we have to continue to make sure that we
3 have the protocols in place to address that.

4 I think you'll also find that with some of the
5 capabilities that are in place, they bear a relook in
6 some respects because of the sophistication and
7 complexities associated with automated trading that
8 maybe some of these areas could bear some refinement or
9 calibration.

10 MR. GORFINE: Okay. I'll come over to Mr.
11 Chattaway.

12 MR. CHATTAWAY: This is a little bit less of a
13 question and more of just a general comment. One of
14 the lessons learned from the Swiss de-peg in 2015 was
15 where quantitative calibrations can go wrong,
16 particularly in the provision of margin or leverage.
17 And, you know, I think it's important for market
18 participants and exchange operators to keep in mind the
19 sort of nuances of various markets and, where
20 appropriate, apply, you know, qualitative safeguards on
21 markets where, you know, there may be government
22 intervention or nuances that could result in extreme

1 volatility in a very sort of unpredictable manner.

2 MR. GORFINE: Thank you.

3 Mr. Hehmeyer.

4 MR. HEHMEYER: Thank you. Bryan knows that if I
5 have a criticism of the CME, I usually speak up pretty
6 quickly, and I have to agree with him that --
7 completely, that this principle-based approach has
8 worked pretty well, knock on wood. And so as Bryan
9 said, it evolves, it's an "earn your wings every day"
10 type of endeavor.

11 But when I was at NFA, when we were talking about
12 possibly going into different types of regulation and
13 doing it differently, it became very complex on how to
14 do that. And I would, for my two cents' worth, from
15 the prop trading community, any of those tools that you
16 all continue to -- you all, the exchanges -- continue
17 to develop are very helpful for the -- for the trading
18 companies, for the FCMs, for the entire community.
19 These tools are very helpful in the firms trying to
20 manage their risks. So I would definitely urge the
21 exchanges to do that.

22 But it's -- the principle-based approach has

1 worked pretty well, and it gets extremely difficult to
2 try to fix a problem that really isn't there. So I
3 just would really encourage everybody, what Bryan said
4 makes a lot of sense, they've done a great job at that
5 for my two cents' worth from that community, given what
6 we heard from the previous panel, the challenges with
7 these digital assets and how that is so thirsty for
8 regulation and attention.

9 My two cents. Thank you.

10 MR. GORFINE: So let me just pause for a moment
11 because I heard the line beep twice, and I don't know
12 if that's an indication that one of our members is
13 trying to participate by phone. So if so, this is your
14 opportunity to jump in.

15 (No audible response.)

16 MR. GORFINE: Okay. So then we'll move along.

17 So, Ms. VedBrat, please.

18 MS. VEDBRAT: So, you know, I'm participating in
19 the subcommittee with Bryan, and, you know, one of the
20 things we wanted to actually ask the broader TAC is if
21 there is benefit in, you know, all of us looking for,
22 you know, areas in the market that might have actually

1 been impacted by automated trading in a way that we
2 might need to revisit.

3 And just, you know, to give you, you know, a
4 little bit insight into where I'm going from here, you
5 know, there are advancements in technology, there has
6 been advancements in automated trading, there have
7 been, you know, evolution in business models. You
8 know, it's like Commissioner Stump had indicated, like
9 from open outcry to exchange traded to algorithmic
10 trading for many, you know, of the futures contracts
11 that we -- that we invest in today.

12 And, you know, one example that comes to mind is,
13 you know, we have some -- we have self-matching
14 prevention engines that many of the exchanges, you
15 know, offer. And what's happening is that, you know,
16 many end users, they actually use algos to trade these
17 contracts, and there was the self-matching prevention
18 engines were designed in order to prevent, you know,
19 prearranged trades in the same contract, same month,
20 from happening for, you know, the same beneficial
21 owner.

22 And what we're experiencing today is that you

1 could be using algos for different beneficial owners
2 that are actually provided by different -- you know, by
3 different banks, and those trades are getting rejected,
4 which, you know, essentially is complicating the
5 methodology for trading, and it is actually inserting
6 unnecessary or redundant rejections, and at times, it
7 may be for time-sensitive trades that we're trying to
8 execute.

9 So, you know, this is just an example of how like,
10 you know, there may be, you know, a rule or regulation
11 that was written, you know, for prevention of certain
12 activity, but because of the advancements along the
13 way, they -- you know, they may not actually be
14 providing the same type of -- or there may not be the
15 need for the same type of regulation, and should we be
16 addressing it? So what I would like to ask the TAC is,
17 If you see these type of examples, please let the
18 subcommittee know so we can, you know, further
19 investigate them.

20 MR. GORFINE: Okay. Thank you.

21 I'll turn to Mr. Randich and any reactions to Ms.
22 VedBrat's comments as well.

1 MR. RANDICH: Thanks. Yeah, looking at the
2 parallels to the equity markets, you know, obviously,
3 as the equity venues and exchanges went algorithmic and
4 electronic 15 to 20 years ago, most, if not all, of
5 these volatility controls were put in place with
6 varying degrees of success; yet, we still ended up in
7 2010 with the Flash Crash. So now the SEC and others
8 are focusing more on the root cause of the volatility,
9 which are technology issues, and recently implemented
10 the Reg SCI system compliance and integrity as well,
11 you know, not only looking at the venue's system
12 integrity, but also in other cases, the participants'.

13 And so that -- that element or dimension of this
14 is in the content here. And I was just wondering if
15 there is a focus on actually looking at the underlying
16 technology that often is the root cause of why we get
17 volatility.

18 MR. DURKIN: I would say yes, it is within our
19 agreement to do so, but I could also get into a debate
20 about the Flash Crash since I lived it very deeply at
21 the time, and there actually were mechanisms that on
22 the futures side we had in place, the stop logic

1 capability to be very specific, that did intercede and
2 did have an effective impact in reversing the situation
3 on the futures side.

4 So, you know, I would say it's a combination of
5 factors. It is having those capabilities built into
6 the system and also, you know, looking ahead in terms
7 of understanding the technical components that are
8 interfacing with these markets and making sure that the
9 appropriate protocols are in place from beginning to
10 end.

11 And I think in my comments I indicated that this
12 is not a one-segment responsibility. So this committee
13 has been very affirmative in saying -- and this
14 Commission -- that, you know, it is all the players of
15 the system that have a responsibility in terms of the
16 risk management and risk protocols in place at the
17 trading level, the clearing firm level, at the exchange
18 level, at the participant level.

19 MR. GORFINE: Okay. I'll go to Mr. Levy and then
20 Mr. Tabb.

21 MR. LEVY: This is maybe a bit of a stretch, but
22 just picking up on some points. Bryan, you mentioned

1 never done on looking out and, you know, this is an
2 evolution. Chris, at Goldman, talked about
3 quantitative calibration gone wrong. Obviously, the
4 markets have benefited from automated market-making,
5 co-location, fiber and microwaves over time, and those
6 are things 10, 20, 30 years ago that weren't as
7 prevalent. And then from FINRA, Steven, the underlying
8 tech is the cause or not.

9 I'm assuming that this hasn't come up in
10 conversations, but in the next ten years, quantum
11 computing will come online in a meaningful way, and
12 what we -- you know, just as Tesla redefined what
13 torque means in a production car, you know, that may
14 redefine what the markets look like from an automation
15 perspective and a trading perspective as it relates to
16 electronic.

17 I assume the group hasn't talked about the impact
18 of quantum computing on CME market-making and kill
19 switches, et cetera. That may be a question or
20 rhetorical, but that may be something to contemplate as
21 you look to 2025 and beyond where quantum computing
22 will be a reality and completely bend all of the

1 technology laws that we know exist today.

2 MR. TABB: Given the conversation between, you
3 know, Bryan and Steve, how -- how have we done in terms
4 of being able to, you know, deal with the
5 jurisdictional issues between equities and futures
6 given that a lot of your businesses, you know, e-minis
7 are really very tied to the underlying cash markets.
8 Are we getting better at that and harmonizing these
9 stops and the cross-market, cross-jurisdictional
10 issues?

11 MR. DURKIN: I'll just state that the capabilities
12 that we have developed are, you know, very clearly
13 accessible, they're publicized. We, you know, engage
14 in public dialogues such as this one today to hopefully
15 help each other learn and to be stronger in terms of
16 learning from each other, the capabilities that are out
17 there, and hopefully refining the tools that exist on
18 our respective marketplaces.

19 MR. GORFINE: Commissioner Behnam.

20 COMMISSIONER BEHNAM: Bryan, thanks for the
21 presentation. Appreciating the efficacy and the
22 usefulness of a principles-based approach, what do you

1 think -- and you spoke to this a little bit, but I just
2 want to unpack it a little bit more -- what can we do,
3 I think as regulators, in relationship with the
4 registrants? How can the relationship be better so
5 that under a principles-based approach, we know that
6 you're complying with the principles, as registrants,
7 and then also from your shoes, you have a clear
8 understanding of what the principles are? And I think
9 we do that generally pretty well, but, you know, if
10 we're going to have a principles-based approach, it's I
11 think very important for all of us to understand what
12 the principle -- what the principles are, what the
13 expectations are, and that the registrants are meeting
14 those principles.

15 MR. DURKIN: I think you coined it, Commissioner,
16 yourself by saying ensuring that people understand the
17 guidance or the principles, delineating those
18 principles, making it incumbent upon the people that
19 those principles apply to, to apply them appropriately,
20 and to hold us all accountable in the context of
21 carrying out those guidelines or principles. And
22 there's a wonderful track record from this Commission

1 where that's been applied over the years, and it works.

2 MR. GORFINE: Mr. Gorelick?

3 MR. GORELICK: Thank you. Thank you, Bryan, for
4 your presentation. Again, I always enjoy hearing all
5 of the detail of the -- you know, how the industry has
6 really raced ahead of some of these challenges and is
7 continuing to work to keep up with sort of the latest
8 thinking in the area.

9 I think one area that's particularly interesting
10 in light of Steve's question as well is linkages
11 between different markets when they have failures of
12 some kind that take them offline through a circuit
13 breaker or extreme volatility of some kind. I thought
14 it was good that the IOSCO suggestions talk about
15 communication between the exchanges. I think that's
16 essential, and communication with the regulators also
17 very important.

18 I think it's also important to think through hard-
19 coded linkages between the exchanges because I think
20 that's when we can start getting into challenges about
21 fragility of a system. I think when you look at the
22 equity markets in particular, there are hard-coded

1 linkages between those many markets in Reg NMS in
2 particular that do raise concerns about fragility. I
3 think we're fortunate in the futures market that it's
4 more of a communication layer rather than a hard-coded
5 linkage that we rely upon to prevent the spread of any
6 technology problems that occur in one venue.

7 MR. GORFINE: Please.

8 MR. HEHMEYER: I agree with Richard completely,
9 and to sort of emphasize my point, from our shop, when
10 we deal with the CME, the tools are robust. They're
11 granular. They are -- the technology is incredibly
12 dependable. It's been thoroughly tested.

13 When we trade on one of these crypto exchanges,
14 it's like you call -- you call and the phone rings and
15 rings, and you don't know where your money is, it's off
16 to some wallet, you've got no idea. And so this is --
17 and I don't want to jinx them because they do a great
18 job every day, but -- and if there's a -- right
19 exactly. But it's -- it's -- the technology and the
20 tools are robust and developed, and that principle-
21 based approach has worked well. And so when we go over
22 into the crypto land, there's no principles, there's

1 sort of no nothing out there.

2 So I just -- I'll leave you with that. Thank you.

3 MR. GORFINE: Okay. So my next question is more
4 of a process or output tied to next steps question.
5 And, you know, maybe for Mr. Durkin or Ms. VedBrat or
6 the full members, what might the next step look like
7 for this subcommittee? Is it some type of a report
8 kind of based on the outline that Mr. Durkin presented
9 today around the IOSCO principles and some of the
10 additional areas that have been flagged by members
11 during discussion? Does it help to kind of summarize
12 what the current state of play is for automated trading
13 markets today? Any -- any thoughts or reactions there
14 that can help kind of to guide the work of the
15 subcommittee I think would be appreciated.

16 MR. DURKIN: Just from this discussion, I walked
17 away with a few to-do's that I think could keep our
18 subcommittee busy in terms of reporting on some of the
19 mechanisms that have been outlined today, taking a
20 relook at them, making sure that they're providing the
21 functionality and impact that has served us well in the
22 past. Is it serving us well today? Are there some

1 adjustments that maybe need to be considered? There
2 are a few of those components that have been brought to
3 my attention that I think we could take up with the
4 committee. And I think also just to more directly tie
5 what's been achieved to date through your good work as
6 part of the Commission and linking that up with the
7 IOSCO report might be beneficial.

8 MR. GORFINE: And I know that was a risky question
9 to ask right before our lunch break, but Mr. Gorelick
10 and then Mr. Chattaway.

11 MR. GORELICK: Sure. I think it was helpful to
12 see the survey results from the FIA in terms of which
13 other exchanges are broadly complying with these --
14 these best practices. It might be helpful to the
15 subcommittee and the committee and the Commission to
16 have similar reports from other exchanges and SEFs,
17 DCMs and SEFs, about the extent to which exactly the
18 details of their implementations and maybe some of the
19 challenges and questions that they're running into.

20 MR. CHATTAWAY: Yeah. My comment is along a
21 similar vein in that I think some more specificity
22 would be -- would be warranted here. So, you know, we

1 talk about the principles. Let's list out what the
2 principles are. Are they different from the IOSCO
3 principles? Are they the same ones? Let's be a little
4 more specific.

5 And then with respect to, Which venues do these
6 principles apply to? like let's list them out. Which
7 market participants do these principles apply to?
8 Let's list them out. And that level of sort of
9 specificity will I think help guide -- guide this
10 subcommittee.

11 MR. GORFINE: Ms. VedBrat?

12 MS. VEDBRAT: You know, the Flash Crash was
13 brought up again, and I don't know if it's beneficial
14 to perhaps give a very short update of what caused the
15 Flash Crash, and also like, you know, what changes have
16 been made because, you know, while it was related to
17 technology, and I go back to what I had said earlier,
18 that there are advancements in technology over the
19 years, and then there are enhancements that have to be
20 made in order to, you know, keep evolving those
21 markets. So we could actually provide an update on
22 that.

1 And, you know, if you'd like, more recently the
2 work that was done in order for us to be able to trade
3 swaps, we could potentially provide, you know, some
4 update on, you know, things that we should be looking
5 at, given, you know, it's been multiple years since,
6 you know, that evolution has taken place. So that
7 gives a little bit -- you know, some concrete things to
8 demonstrate.

9 MR. GORFINE: Thank you.

10 Okay. Well, with that, I'd like to thank our
11 panelist, Mr. Durkin.

12 And then we are remarkably on time. So we will
13 break for lunch and return back at 1:30 for our RegTech
14 and Robo-Rulebook discussion, which will draw everybody
15 back to their seats. So thank you.

16 (Lunch.)

17 Panel III: RegTech and Robo-Rulebooks

18 MR. GORFINE: I would like to call the TAC meeting
19 back to order and begin our next session with a
20 discussion of RegTech and how it is opening up the
21 possibility of machine-readable and machine-executable
22 rulebooks. At its core, RegTech appears to offer the

1 potential of more effective and efficient compliance by
2 market participants as well as oversight by regulators.
3 Today, we will hear about a broad range of efforts,
4 including overseas, and then consider how these efforts
5 may impact the CFTC and our markets.

6 Presenters today include Jo Ann Barefoot, Pierre
7 Lamy, Brijesh Solanki, and Brian Trackman, from our
8 very own LabCFTC, where we have been actively exploring
9 developments within and applications of RegTech.

10 So with that, I'd like to kick it off with Ms.
11 Barefoot.

12 MS. BAREFOOT: Thank you, Daniel.

13 It's a delight to be here today. I was able to
14 watch the morning sessions and thought they were
15 absolutely fascinating. And I'm happy to be able to
16 come here and widen the lens a little bit on some of
17 these issues, to put them in the context of what's
18 happening with RegTech.

19 I work in the RegTech field all the time. I
20 wanted to start by sharing a quote with you: "The
21 biggest challenge facing virtually every regulator is:
22 How do we take a 20th century analog rulebook and apply

1 it in a 21st century digital world?" That was said by
2 the Chairman, Mr. Giancarlo, at my podcast interview
3 with him last year, and I've been quoting it ever
4 since. I think it's the pithiest statement of what
5 this challenge is about from any agency head that I've
6 had the opportunity to see.

7 So we're going to try to convey some of what's
8 going on globally in RegTech -- more of it is outside
9 the United States than in -- and, again, kind of convey
10 some of the energy that's in this space.

11 So I'm going to start by telling you a story that
12 occurred last year, December 1st, in London, at the
13 Financial Conduct Authority where a little noticed
14 event occurred that I think we might look back on as
15 the equivalent for the regulatory world of Alexander
16 Graham Bell making the first telephone call or Edison
17 lighting a light bulb. The FCA ran an experiment on
18 whether it was possible to issue a regulation in the
19 form of code rather than words. They called it model-
20 driven machine-executable regulation, and they
21 organized what they call a TechSprint, which is a
22 hackathon. They'll tell you we're regulators, so we

1 don't like the word "hack," so they call it a "sprint."

2 And they have done a series of these. They bring
3 a group together, financial companies, I'm pretty sure
4 Credit Suisse was at it, the tech people, some
5 academics, and regulatory experts, and try to pick a
6 problem. It's an innovation in regulatory process
7 itself, which is really interesting to me. At each of
8 these sprints, they'll try to pick a regulatory problem
9 to try to solve, and then they'll work together across
10 these diverse teams and try to actually write code to
11 begin to solve it.

12 The one that happened last November and ended on
13 December 1st lasted for two weeks, and culminated on
14 the Friday afternoon. There was a lot of fear that it
15 was going to fail. People were tired. But in the end,
16 they pressed a computer keyboard, and they succeeded in
17 executing an experimental regulatory change in ten
18 seconds. They had taken one line of regulatory
19 guidance, which was about requirements for retail
20 lending reporting, and they had sat down what they call
21 their tech group and their text group of regulatory
22 experts. And they had worked on translating the syntax

1 of the words of the regulatory guidance into the syntax
2 of the computer code, and ran it against a pool of
3 dummy data, and were able to get first a correct
4 report, and then they tweaked the regulatory
5 requirement, ran it again, and got a correct adjusted
6 report back.

7 It -- for the people who were there, it felt like
8 a breakthrough. I'm going to show you a little video
9 at the end of my talk. The room erupted in cheers over
10 it. And, you know, I think it's ushering in a new era.

11 I'm a former bank regulator. We all know
12 regulation changes slowly and with great difficulty,
13 but there is a breakthrough occurring today, and it has
14 to do with shifting the whole ecosystem from an analog
15 to a digital design, as you said, Mr. Chairman. All
16 our financial products pretty much were designed on
17 paper originally, and over the years we have automated
18 them and had ways of speeding them up and gaining some
19 efficiency.

20 But the thing that's happening today is that we're
21 moving them toward -- we're moving finance, and then
22 behind that, financial regulation, from an analog to a

1 digital design. And when you digitize things, you make
2 them faster and cheaper and better and don't -- you're
3 not just -- it's like the difference between -- it's
4 like Uber. You can start with a -- you can say Uber
5 solved problems like being able to find a taxi, but we
6 didn't know it was a problem that you have had to pay
7 for the taxi ride at the end of the ride until the
8 whole process got redesigned.

9 So this is underway worldwide. There are -- I
10 believe the FCA is the leading agency in the world, but
11 many countries are really aggressively undertaking
12 RegTech at the government level, and also thousands of
13 companies are cropping up to reform compliance. The
14 RegTech for regulators is sometimes called SupTech, for
15 Supervisory Tech, a word I disapprove of. I see people
16 smiling. It sounds like "chicken noodle soup." But
17 the two are converging using the same technologies.

18 So globally, the leading use cases that are
19 emerging include the -- converting the rulebook to
20 being machine-readable is a top case. Both regulators
21 and private sector companies are working on this. And
22 the idea is to put an electronic tag on the sections of

1 regulations and rules and be able to say -- enable a
2 machine to be able to understand who and what is
3 covered by it, and then to implement changes. The
4 machine-executable scenario that I described at the
5 beginning is also the subject of a great deal of work.
6 It's a more ambitious vision, but people are working on
7 it.

8 There's a great deal of work underway on market
9 monitoring through RegTech using artificial
10 intelligence to detect patterns of conduct that could
11 indicate misbehavior or noncompliance or regulatory
12 risk. Some regulators in the world are working on
13 putting chatbots on telephones, on the cell phone, so
14 that people can complain directly to the regulator if
15 they are detecting -- if they think they might be the
16 subject of a scam or something like that.

17 There's a huge amount of work underway in anti-
18 money laundering. It's really a leading use case. The
19 United Nations says that there is about \$2 trillion a
20 year laundered in the United States -- in the world
21 globally, and that we're catching less than one percent
22 of it with the current approach. And we are spending

1 tens of billions of dollars to do that. It's not lack
2 of resources; it's old technology that's really holding
3 us back.

4 So digital identity is another area where RegTech
5 is being used. There's a proliferation of kinds of use
6 cases trying to bring this digital thinking into it.
7 And I might say that one of the driving forces behind a
8 lot of it is the global push to financial inclusion
9 through the mobile phone that has really caused NGOs,
10 like the Gates Foundation and the Omidyar Network or
11 the World Bank to prioritize RegTech as one of the most
12 important goals for building a healthy financial system
13 for people because regulators throughout the world
14 can't keep up with the changes that are underway.

15 So I want to quickly walk through the key concepts
16 that I think we should have in mind on RegTech. The
17 first is I think that we should be aiming for actual
18 transformation of the regulatory space. Again, I'm a
19 former bank regulator. I work with regulators all over
20 the world. I know how difficult this is. But there's
21 an opportunity here to deeply redesign how we do
22 regulation and actually make it work better, cheaper,

1 and faster at the same time.

2 Secondly, we have the technology already to do
3 most of this. The problem we have is with
4 institutional readiness and capacity. It's hard for
5 both the agencies and the industry to make these kinds
6 of adjustments. And it's going to be necessary to do
7 that, to move to a digitally native design.

8 Third, we are going to have to learn to move
9 faster. That doesn't come naturally to regulators
10 either. People worry about getting it wrong, but if
11 you think about the difference between the linear pace
12 of change and regulation and the exponential pace of
13 change in technology, the delta between the two is
14 growing fast, and there is so much risk in it that --
15 and it's going to widen unless somehow we can enable
16 the regulatory process to speed up. To do that, we're
17 going to need new models, new architecture. We have an
18 entrenched complicated system in both the regulatory
19 apparatus and the industry, and we're not going to
20 change most of that, so we have to enable it to connect
21 up differently, work differently together, and move
22 more quickly.

1 Another secret to success in this, including
2 acceleration, is we need a lot more collaboration. We
3 need a lot more ability to talk freely and work
4 together. The FCA's TechSprint is a great model of
5 that.

6 I like to say I'm in a good meeting these days if
7 I have to declare an acronym-free zone because you know
8 you've got people in the room who are coming from
9 different worlds. If you get people who can write code
10 and people who can't, put them in the same room, then
11 they have no idea what each other is talking about.

12 Another key is regulators have to have the
13 capacity for experimentation. LabCFTC and also the
14 Science Prize Challenge are such amazing innovations.
15 The CFTC, in my opinion, is the leading agency in the
16 United States in really embracing an agenda of
17 innovation. And part of the key to this is there has
18 to be a place for regulators to work hands-on with both
19 FinTech and RegTech and try things out rather than just
20 learn by regulating them.

21 Another is we need to be working to
22 interoperability, and the regulators have a huge role

1 to play in beginning to set standards that can enable
2 everybody to get onto the same frameworks and connect
3 up.

4 The other key is to move toward open source design
5 in regulation, to be moving from our sort of rigid,
6 centralized processes and beginning to move the whole
7 regulatory space onto a platform where we can have
8 continuous innovation, not have dominance by a rigid
9 single vendor or single firm, but, rather, enable
10 people to have people who are starting to talk about
11 having a GitHub for regulation, a place where we can
12 gather the best innovation together.

13 And last, I think it's a way to think about how to
14 get from here to there, is to begin to introduce some
15 of these changes in an alternative regulatory track on
16 the side, plant it on the side of the current system,
17 don't try to reform the whole system at once. But
18 think big, but start small with some alternatives,
19 especially in new areas, and learn from that experience
20 and let it grow.

21 So I want to just show you this very short video,
22 if we can queue the video. This is from the Financial

1 Conduct Authority.

2 (Showing video.)

3 Text on video screen: The autumn 2017 TechSprint
4 examined the potential to deliver model-driven,
5 machine-executable regulatory reporting

6 MR. OLIVER BURROWS (Chief Data Officer & Head of
7 Data & Statistics Division, Bank of England): This is
8 about communication between regulators and firms. The
9 challenge here was, Can you make this a straight-
10 through process? Can you make it machine-readable,
11 model-driven, machine-executable? What we've got here
12 now is a rule that's being ingested and made machine-
13 readable. You change the rule, it flows all the way
14 through. And we saw it happen. It took seconds, 10,
15 12 seconds. To me it works really really well.

16 Text on video screen: Participants worked to map
17 an FCA regulatory requirement directly to a financial
18 institution's data

19 (cheering)

20 Text on video screen: Laying the groundwork to
21 automate regulatory reporting, which could reduce the
22 need for costly interpretation within banks

1 MR. CHRISTOPHER WOOLARD (Executive Director of
2 Strategy and Competition, FCA): This is not the first
3 TechSprint we've done of this kind. But it certainly
4 is the longest, it certainly is the most complex. Huge
5 amounts of the costs is sunk into the current process
6 of regulatory compliance. There are real costs in
7 terms of time, management effort, distractions, that go
8 around these systems at the moment. And actually, if
9 they can be channeled elsewhere, they can be channeled
10 to the issues that create public value, that really go
11 to the heart of why we regulate in the first place.
12 Then that's a huge prize on the table.

13 MR. IAN SMART (Partner, Grant Thornton): It's
14 actually worked beyond our wildest imagination, to be
15 truthful.

16 (Video ends)

17 MS. BAREFOOT: So I'll leave you with that, beyond
18 their wildest imaginations. And I'll ask you the
19 question, When was the last time you ever saw bankers
20 and regulators cheering together? Something different
21 is happening, so it's exciting.

22 MR. GORFINE: Okay. Thank you, Jo Ann.

1 We're actually going to go to Pierre, who should
2 be on the line.

3 So, Pierre, if you can --

4 MR. LAMY: Yes, I am on the line. Thank you.

5 MR. GORFINE: Excellent. Thank you. Go ahead.

6 MR. LAMY: Okay. Good afternoon. Thank you to
7 the CFTC Technology Advisory Committee for giving me
8 the opportunity to share our experience at REGnosys as
9 it relates to machine-executable regulation. As Jo Ann
10 just said, this is an important field to make
11 regulation easy to adopt and to comply with.

12 Before going further into my presentation, can you
13 please confirm that you have the cover page of my
14 supporting slides on the screen?

15 MR. GORFINE: Yes, we have your first slide up,
16 Pierre.

17 MR. LAMY: Perfect. Thank you.

18 So let me start with a brief background about
19 REGnosys. REGnosys is a FinTech company which was
20 created two years ago with a vision to radically
21 transform the financial industry's approach to
22 regulatory compliance by providing a digital repository

1 of data, workflow, market practices, and regulatory
2 provision that is accessible to all market
3 participants. The digital repository is called
4 "Rosetta." We expect Rosetta to result in a more
5 transparent and efficient marketplace while also
6 facilitate the development of a rich ecosystem of new
7 technology solution providers. We will get back to
8 Rosetta later on in this presentation.

9 Let me shift for now to what has been our
10 experience with regulators here in London as it relates
11 to machine-executable regulation. REGnosys was given
12 the opportunity by the FCA to get involved in the two-
13 week TechSprint that Jo Ann just -- was just referring
14 to early on. This TechSprint made use of natural
15 language processing technology, which ends at turning
16 human language into executable code.

17 One of the key takeaways from this TechSprint has
18 been that for such efforts to succeed, the source
19 document needs to be expressed in unambiguous terms and
20 syntax so that it can be converted into a sequence of
21 subject-object predicates that can be executed by
22 machines. So the subject and objects need themselves

1 to be unambiguous. Let me just give you an example.
2 As Jo Ann mentioned the (inaudible) data that we
3 basically seized upon applied to retail clients. It
4 progressively emerged through this two-week TechSprint
5 that the banks involved in it had quite different
6 interpretation of what a retail client is. As a
7 result, both of the exercises consisted -- as
8 consistent into qualifying at an actionable level what
9 the retail client is for the purpose of this role.

10 Natural language processing is certainly a very
11 interesting technology. Its usage in the regulatory
12 space, however, requires that rules be written with
13 specific syntax and be actionable. In that respect, I
14 do not see this technology as applicable to principle-
15 based regulation. We then believe that the recent
16 opportunity to complement such parties with solutions
17 that are compatible with the regulatory framework that
18 currently exists. Rosetta can provide such answer.

19 Today's topic, being machine-executable
20 regulation, I would like to present Rosetta as the
21 machine-executable workflow. If you could please turn
22 to the second page of my supporting presentation, at

1 the core of Rosetta is the syntax that provides the
2 ability to express data presentation, data validation,
3 data mapping, and workflow logic in an intuitive and
4 legible manner for non-technologists. This syntax is
5 then automatically translated into executable code.

6 Rosetta is currently used by ISDA and market
7 participants to develop the Common Domain Model, which
8 is a digital representation of the derivatives products
9 and workflows. The expectation is that this ISDA
10 Common Domain Model will bring efficiency and
11 transparency to the marketplace and will facilitate
12 interoperability across platforms, such as blockchain
13 providers.

14 The first version of the ISDA Common Domain Model
15 was released in May of this year. Its initial scope
16 include the features that is particularly relevant for
17 this discussion, as it corresponds to an initial state
18 into providing machine-executable ISDA definitions.

19 If you could please turn to page three of this
20 presentation, the approach that we have taken as part
21 of Rosetta is to position the ISDA definition text
22 alongside the machine-executable expression of it.

1 This provides an explicit and auditable relationship
2 between the original text and its Rosetta syntax
3 expression. Whereas the ISDA Common Domain Model focus
4 has so far been on derivatives, data, and workflows, we
5 have undertaken work in terms of technologies to
6 confirm that this approach can also be applied to
7 regulatory positions.

8 I would like to explain this work through two
9 examples. If you could please turn to page four of the
10 presentation, the ESMA MiFIR rule that went into
11 compliance earlier this year specified that all
12 instruments need to be reported with a buyer-seller
13 indicator. It also specifies how the various types of
14 swaps, which are transacted through a payer-receiver
15 indicator, should be reported with such a buyer-seller
16 indicator. The specification was published via
17 spreadsheet, the translation into code by the
18 respective market participants.

19 Using the same approach as illustrated before in
20 the case of the ISDA Day Count Fraction, you can see
21 here that we have extended the data representation for
22 swaps, which is part of the ISDA Common Domain Model to

1 provide a mapping into this ESMA reporting
2 specifications for the buyer-seller indicator. This
3 is, I believe, a good illustration of the close synergy
4 potential that exists between Rosetta as a machine-
5 executable workflow and the quest for machine-
6 executable regulation.

7 If you could please turn to page five of the
8 presentation, the second example that I would like to
9 share with the TAC members relates to the CFTC Part 43
10 rule, which specifies that the price of which swaps are
11 transacted need to be reported through two distinct
12 fields called "price notation" and "additional price
13 notation."

14 As part of the rule implementation, market
15 participants did agree on the common market practice to
16 specify all of the instruments should be reported,
17 depending upon the type of swap and whether the
18 transaction was a fixed or flow thread, spread, an
19 initial fee, et cetera. This market practice was then
20 published by ISDA as a spreadsheet to be transacted
21 into code by the respective market participants.

22 The second example is interesting in the terms

1 that this provision for the Part 43 rule cannot be
2 translated into executable code as such. In this
3 respect, this is quite similar to the retail client
4 example that I was referring to earlier as part of the
5 discussion. In this case, Rosetta provides the
6 flexibility to reference both the Part 43 rule and the
7 ISDA market practice and express those into a legible
8 syntax that can then be turned into machine-executable
9 code.

10 To conclude, I would like to suggest that there
11 would be value for both market participants and
12 regulators to further explore how we could leverage
13 Rosetta to make regulation easier to adopt and to
14 comply with. The technical infrastructure already
15 exists. Its usage is currently being tested by a
16 number of actors in the marketplace. The timing seems
17 right to further its applicability in the regulatory
18 space through joint involvement of regulator and market
19 participants.

20 Thank you.

21 MR. GORFINE: Thank you, Pierre.

22 I'll turn next to Brijesh, please.

1 MR. SOLANKI: Thank you. So we are part of the
2 FCA pilot, and we are still working with them.

3 (Microphone problem.)

4 MR. SOLANKI: Better now? Yep?

5 So I agree with the comments and the approach
6 recommended by both speakers before me, so I won't
7 repeat some of that, but just to step back and to
8 explain the approach and the objectives we had when we
9 started some of this work internally within Credit
10 Suisse as well as with FCA, our observations are that
11 the regulatory environment is complex and continues to
12 become complex, and the cost of implementation and the
13 time to market continues to increase.

14 With an organization like Credit Suisse, we also
15 deal with a very large group of regulators here in the
16 U.S. as well as abroad, and in many cases, what we are
17 seeing is that we have same or similar regulations with
18 different interpretations, and Basel III being a
19 perfect example where we have different interpretations
20 across regulations, which we have to comply to.

21 What we started doing is looking at machine-
22 executable and machine-readable regulations sometime

1 last year in order to understand the potential of
2 technologies. So we are playing with AI, machine
3 learning, NLP, and a few other technologies. We have
4 started participating in a couple of sprints, as
5 mentioned, with FCA. We are also working here in the
6 U.S. with a university to execute some research
7 projects to understand how some of this technology can
8 be extended, and we could push the boundaries.

9 Now, just from our point of view, the way we are
10 approaching this, just conceptually, we think of it as
11 three big broad buckets of activities. So there are
12 inputs, and I'll explain some of it; there is the
13 processing part of how to read, how to understand; and
14 there are the outputs.

15 When it comes to inputs, I think one of the
16 primary and the most important aspect, which was
17 mentioned, is having a common language, common
18 terminology, which we do not have. And when we look at
19 the global perspective, we definitely have an issue
20 with not having a common language we can speak.

21 The rulebooks historically have been plain English
22 text, and then we need to understand how we could

1 leverage, if any, of that to build machine-executable
2 regulations. We definitely need common terminology and
3 a mechanism to have common interpretation of some of
4 the rules, which is an issue and which consistently
5 takes a lot of time to bed down.

6 And we, I think, need collaboration amongst
7 regulators globally to work together to find common
8 approaches on some of the regulatory requirements. So
9 that we think those are our observations as to the
10 things we need to be successful with these
11 technologies. Yeah?

12 In terms of the processing, the second big bucket
13 of activities, the way we are approaching this is,
14 building algorithms is hard, but the technology and
15 understanding of these algorithms is evolving, and at
16 some point, we will be at a place where these
17 algorithms will be relatively easier to build and
18 execute.

19 I think the real challenge is around understanding
20 how to structure the process steps involved as well as
21 how to organize the execution of these rules.

22 And, finally, when it comes to these processes,

1 understanding the data quality expectations on the
2 regulatory side as well as on our side internally is
3 quite important. What we have also observed is
4 different regulators seem to have different perceptions
5 and expectations on data quality, which I think needs
6 some level of harmonization.

7 And, lastly, the last bucket around the outputs.
8 So we are looking at the outputs in terms of what do we
9 actually produce and what do we actually submit to the
10 regulators and how that can be part of situation. How
11 do we use some of this to generate internal MI, so
12 analytics, so we can understand and leverage the data
13 internally and not just for regulatory purposes?

14 So conceptually, that is how we are approaching.
15 And then all the buckets, we have some sort of activity
16 ongoing right now. And I can -- I'll talk to a couple
17 of examples of those activities.

18 Key dependencies, common language across the
19 industry is a very big dependency, and we need a
20 mechanism in which I think it is better to run with as
21 a joint collaboration between the industry as well as
22 the regulators to define that common language, so we

1 can all work towards that.

2 We need consistency in terms of expectations
3 across regulators globally. We need a relatively
4 flexible data model to be able to do this because it's
5 all about data, and if we don't have flexibility and a
6 consistent common data model, it's a challenge. We
7 need consistency in data quality and timing
8 expectations, and we need consistency in terms of the
9 frequency of how frequently we've done certain things
10 when we execute them.

11 So just to talk about one of the examples and one
12 of the projects we are running here in the U.S. with a
13 university, in order to understand how to approach
14 this, we are playing with some of the technologies and
15 the sprints we -- we -- that was discussed with FCA,
16 but we are also trying to approach this from the other
17 side.

18 What we're doing is we took some of the Basel III
19 documents and we said, well, can we build models and LP
20 algorithms, so on and so forth, that could read these
21 documents and translate them into machine-executable
22 regulations? What we have learned is converting plain

1 English text into executable regulations is quite hard,
2 and the technology needs quite a bit of evolution, and
3 there is a lot of learning involved in it. But the
4 things we have managed to do is we are able to read
5 plain English text, find out the meanings of the words
6 in the right contexts of those paragraphs, so we're not
7 just reading words and doing the comparison to
8 understand what is the meaning of a word, we are trying
9 to read the words in the context of the paragraphs so
10 we can understand what does that word mean in a
11 paragraph in the right context. And we are also trying
12 to now build decision algorithms once we learn that to
13 build relationships.

14 So one of the things we're trying to do is build
15 relationships between historic documents and current
16 documents by reading to understand how regulations have
17 evolved. So if you look at something like Basel III or
18 Basel, over the last ten years, it has consistently
19 evolved. So what we want to do is go from Basel I to
20 Basel III or maybe now Basel IV and start building
21 those relationships to understand how these regulations
22 are evolving, and that allows us to do impact analysis.

1 So when new regulations come, the amount of time and
2 energy it takes to understand, what does it mean? What
3 is the interpretation? What does it mean to us? and how
4 to go implement -- how to go about implementing this,
5 we are trying to see if we can carve that cycle down by
6 having this historic lineage and traceability on
7 regulations.

8 We are definitely not there, and I think we need
9 to do a lot more work. We are absolutely not there.
10 But it is an exciting space. Obviously, there are many
11 challenges, but we definitely see a lot of
12 opportunities in playing with these technologies. So
13 we are coming at this from both sides, look at the
14 executable side of things, but also try to see how some
15 of the existing stuff can be converted. It is a good
16 learning experience for us as organization because it's
17 helping us understand how to think through the future.

18 A couple of other things I would mention is any --
19 any development in this space will have to factor in
20 the historic portability as to how we ensure that the
21 future technology-based solutions are going to be
22 portable with what we already have up and running

1 because changing all that is going to be a massive cost
2 and quite complex. And we also think that this is a
3 great opportunity in terms of public-private
4 partnership and working together with the regulators
5 under their guidance and under their leadership.

6 Thank you.

7 MR. GORFINE: Thank you very much.

8 And last but not least, Mr. Brian Trackman, from
9 LabCFTC.

10 MR. TRACKMAN: Thank you, Daniel.

11 Mr. Chairman, Commissioners, members of TAC, it's
12 my pleasure and privilege to present to you today. I
13 want to thank my LabCFTC colleagues for also helping to
14 prepare this presentation. Many of the themes that we
15 just heard about -- complexity in our marketplace,
16 digital transformation of the financial markets,
17 opportunities in RegTech for collaboration,
18 particularly between ourselves and other regulators and
19 members of the market, market participants -- are
20 definitely things that we here at the CFTC have been
21 thinking about. And as a member of LabCFTC, I'm part
22 of the group that really has the mission to take the

1 lead in engaging in this area and looking for
2 opportunities to facilitate market-enhancing
3 innovation.

4 So I will note I am the attorney lead, not the
5 tech lead, so hopefully they'll -- all right, there we
6 go.

7 So, you know, overall, we have a broad objective.
8 A lot of what we do is around engagement. We meet
9 innovators both here and, of course, we do office hours
10 across the country, but also we are looking for
11 opportunities to proactively facilitate that, that new
12 -- those new steps, and I think this is the basic idea
13 to spur innovative thinking and activity around
14 applications of new technology.

15 So last spring, we initiated a request for input
16 on potential prize competitions that we here at the
17 CFTC would sponsor. We solicited and received feedback
18 on both substantive topic areas and how we might
19 administer such a competition. We had a 90-day comment
20 period, which is now concluded, and my goal today is
21 both to, you know, summarize what we have done and
22 provide you with some of the key takeaways that we have

1 going forward.

2 Just by way of background, the science prize
3 competition provides authority to all Federal agencies,
4 including ours, to set up and structure essentially a
5 competition that would have a defined topic area and
6 would then solicit potential solutions. In terms of
7 administration, we have broad flexibility. The SPCA
8 includes certain limited requirements, but gives broad
9 discretion to the agency head to structure it in a way
10 that makes sense both for the subject matter and for
11 the specific industry. There's a very useful website,
12 I'll just pause to note, challenge.gov. If anyone is
13 interested, they can take a look there to see -- they
14 can take a look to see competitions that have been done
15 already. But as far as I know, we would be the first
16 financial regulator to do such a competition.

17 So in the RFI, we proposed a number of ideas. We
18 meant these really to grease the wheels in terms of
19 what commenters might provide feedback on. We didn't
20 mean these to be an exclusive list by any means, but
21 the five are listed here. We did receive meaningful
22 feedback on all five, and you will note that the

1 Robo-Rulebook, which is essentially a layman's term for
2 machine-executable, machine-readable code, was one of
3 the proposals that -- that we put forward.

4 I will get this right before the end of the
5 presentation I promise, I promise.

6 We had a goal to stimulate thinking around RegTech
7 in doing our RFI, and in that respect, it was, from our
8 perspective, a very big success. We got strong
9 feedback, as I noted, particularly around the machine-
10 readable and machine-executable regulation. The topic
11 areas we proposed are overlapping. And so automated
12 regulatory reporting, leveraging new sources of market
13 data for such things as better market surveillance,
14 standards development, really form an orbit that could
15 help us select a competition topic going forward.

16 We got some comment, too, on administrative
17 elements. There was some divergence of thinking with
18 respect to the best way to structure a competition. I
19 think Jo Ann mentioned that in the UK, the structure
20 has been these shorter framework competitions. Others
21 suggested that perhaps a longer program might work
22 better to generate solutions that are more meaningful.

1 There was some question about IP rights.

2 Again, there's a lot of flexibility here. And I
3 should also note that in terms of the prizes, there's a
4 lot of flexibility. The SPCA provides for both non-
5 cash awards as well as cash awards. So we have a lot
6 of flexibility in how we go about doing this.

7 So in terms of key takeaways, certainly, the Robo-
8 Rulebook concept has global interest. As was already
9 mentioned, other jurisdictions are exploring this. A
10 number of entities are also involved working on
11 potential ways in which we can make regulation more
12 accessible to machines, which has the great potential
13 of reducing costs.

14 A few other takeaways, which I think are relevant
15 in thinking here, when it comes to automated regulatory
16 reporting, which has been a challenge, there seems to
17 be a lot of potential there. A competition, some
18 commenters suggested, might be a -- that might be a
19 useful focus.

20 The other broad feedback we got was that if we do
21 a competition, we should focus on practical steps,
22 which I personally thought was quite useful to hear.

1 Keep it specific, keep it practical.

2 And then the other piece that's rather broad and
3 cuts across different specific topics is the importance
4 of standards. I think we heard mention of that, too,
5 in the earlier presentations, the need for a strong
6 base layer to really support further innovation, and
7 that might be an area, some commenters suggested, where
8 a Commission-sponsored competition could be helpful.

9 So going forward, our evaluation rubric, this I
10 took right from our RFI. An ideal competition would
11 both highlight how new technology can benefit the CFTC
12 as well as the derivatives markets we oversee, and also
13 lead to actionable next steps, which could include
14 further use case development, additional research or
15 investment, proofs of concept, and implementation.

16 So that's kind of what we've done so far. And
17 where we are right now is that we are continuing to
18 evaluate the comments we received. They are available
19 publicly right from our website if you hit the links
20 over to public comments. And we are intending to
21 maintain a public dialogue on which topic we should
22 choose. So if folks have ideas or further thoughts, we

1 would be welcome -- very welcoming of those.

2 Directionally, I think we're hoping to move
3 forward with the competition sometime early next year.

4 Thank you.

5 MR. GORFINE: Great. Thank you, Brian, and thanks
6 to all of our panelists.

7 So I'd like to open the floor to our members to
8 ask questions or make some observations.

9 Mr. Randich, we can begin with you.

10 MR. RANDICH: Okay. Thanks. I think, you know,
11 having worked as a consultant, an exchange bank broker-
12 dealer, now regulator, I think this idea would be great
13 because one of the biggest issues that you hear from
14 firms, the participants, is the fact that they've got
15 to deal with dozens, if not hundreds, of regulators and
16 the interfaces with all of them, and the language is
17 all different. But then the reality of it, from an
18 implementation and execution standpoint is that, you
19 know, because of the politics, the history, and the
20 jurisdiction overlaps and competition, and then you've
21 got, you know, the States and the Federal and you've
22 got foreign and local, historically the regulators

1 don't really want to work together. So how are you
2 going to get to -- and without getting them to work
3 together, this isn't really going to break through.

4 So have you seen or heard or gotten any sense for
5 movement in this regard?

6 MS. BAREFOOT: So I think you put your finger on
7 the problem. And I have a lot of sympathy for the
8 regulators, challenges with it. There is a lot of
9 movement toward more collaboration. Even the U.S.
10 regulators now all have innovation groups. And,
11 Daniel, I know you're all in regular conversation with
12 each other, connections are starting to form. And
13 globally the FCA spearheaded the creation of GFIN, the
14 Global Financial Innovation Network, which was
15 originally conceived of to be a global sandbox and will
16 still include a sandbox, but will be broader than that.
17 One U.S. agency has signed up for that, CFPB, the
18 FBCFP, whichever name they're using today, and there
19 are 12 countries in it, and they're going to do just,
20 as was said, to try to pick something very small and
21 practical and doable and build the relationships and
22 build from there.

1 The FCA did a bigger TechSprint in May. Daniel
2 and I were both there. We had six U.S. agencies --
3 FINRA participated in it as well. Six U.S. agencies
4 went to London to observe or participate in that event,
5 and regulators came from all over the world just to
6 watch it. And now there's going to be a bigger one in
7 Abu Dhabi next year with a bunch of countries doing
8 multicountry AML problem solving. So there are seeds
9 of change.

10 MR. GORFINE: Brian, did you have a --

11 MR. TRACKMAN: Sorry, I was --

12 MR. GORFINE: Sorry, Jo Ann.

13 MR. TRACKMAN: I was just going -- I was just
14 going to say that in our case, we would welcome
15 specific ideas on how better to coordinate, but it's
16 not -- also, it's important to point out I think that
17 from our perspective it's not necessarily the case that
18 we need to wait for coordination before proceeding.
19 There could be some value, we think, in proceeding and
20 then being a model for others. And we've noticed that
21 from the perspective of LabCFTC. So --

22 CHAIRMAN GIANCARLO: If I could jump in on that

1 one, at least this agency is highly committed to
2 coordinating with our fellow regulatory agencies, not
3 just here in Washington but around the globe. The last
4 two days, we had, in addition to ourselves, 18
5 regulatory agencies here at the CFTC plus SROs,
6 including FINRA, working with our FinTech Forward 2-day
7 conference. So we've made great strides. And, in
8 fact, yesterday we signed a cooperation agreement with
9 the Australian regulator right here, and that's our
10 third one. We already have one in place with the FCA
11 and with the MAS out of Singapore. So we've made a --
12 put a real emphasis on coordination, I think. And for
13 all of the reasons that have been expressed here,
14 coordination is vitally important.

15 MR. GORFINE: Okay, great. I'll go to Mr. Tabb,
16 Mr. McHenry, and then Mr. Levy.

17 MR. TABB: Hi. This sounds -- you know, being on,
18 you know, historically been and, you know, bank and
19 bank tech areas a long time ago, this opens up a
20 tremendous amount of efficiency. I guess the two
21 questions I have are, first, you know, if you start
22 thinking about framing the regulations in, you know,

1 kind of more structured language, does that, you know
2 -- are the Commission -- you know, you guys -- it would
3 seem to me mostly the folks writing rules are lawyers,
4 not technology folks. Does that -- you know, how does
5 that start, you know, getting into the fact?

6 And then the other side, on the implementation
7 side, the banks have different technologies and
8 infrastructures, and how to convert that and put it
9 into your own technology, that would seem to be -- you
10 know, it's certainly probably easier than having to do
11 everything by hand by coding, but it would seem to me
12 every implementation of that would be pretty
13 significantly different, depending upon your systems
14 and your database infrastructures.

15 MR. GORFINE: Larry, actually, I'll jump in for a
16 second on your question, and, you know, it's a very
17 good point, and that's part of the effort of LabCFTC,
18 is obviously around introducing more technologists to
19 the agency. But one area where there is really low-
20 hanging fruit, and even resonates with folks like us
21 that are lawyers, is that we publish no-action letters,
22 for example, in PDF format, which are not readily

1 consumable by these types of platforms. So there are
2 areas where it seems like there is low-hanging fruit
3 that we're beginning to explore. But I will defer to
4 the experts there.

5 Yeah, Brijesh, please.

6 MR. SOLANKI: So I think it's a great point, what
7 you raise. I think the first thing which would help
8 the most is to establish that common language and a
9 common data model because I think that is where it's
10 going to start. And I think the regulators have an
11 opportunity to take a lead in establishing a common
12 language and data model because once we have that, it,
13 I think, makes the communication easy, machine to
14 machine. Yeah?

15 In my personal view, I think at some point in the
16 future, we will have the plain English text documents
17 with regulations, and there will be an accompanying
18 document which will be the machine-readable format
19 because I think the need for plain English will not go
20 away, but we will have machine-readable formats that
21 come with that. Yeah? So I think that's the first
22 part. Obviously, we're very far from there, and I

1 think the first step is getting the common language,
2 common terminology, and some level of agreement on some
3 of the interpretation-related issues we face globally.
4 Yeah?

5 To answer your second question, I think it's a
6 very good question, as to if we achieve that, how does
7 that fit into the existing infrastructure in the
8 industry? Yeah?

9 I think the infrastructure will have to change to
10 some extent. I don't think it needs a full rebuild or
11 full redo. It is the interfacing because the way we
12 think of it is if we have the common data model, common
13 language, internally we have to map our systems to
14 that, and once we receive the external regulations in a
15 machine-readable format, we just need a mechanism to
16 then execute those internally.

17 So, again, easier said than done, but at least --
18 at least there are design patterns we can look to that
19 might help us.

20 MS. BAREFOOT: I would just add that part of the
21 secret to making this doable in the real world is going
22 to be to phase it in, and as we have both the paper

1 document or the Word document in the machine-readable
2 form there, I think an -- it wouldn't work for
3 everything, but to start to give the industry the
4 option, you can report the way you always have. You
5 know, you may not like it, but you know how to do it.
6 Or you can come into this new RegTech track, and it
7 will be more efficient, and you can -- you'll -- we'll
8 see you more fully, so you have to be -- think about
9 that tradeoff, but not force the change on the whole
10 system any more than we have to.

11 MR. GORFINE: So we have to be mindful of time,
12 but I'll move to these final three questions or
13 comments.

14 MR. LAMY: Can I -- this is Pierre. Can I just
15 add something in response to the point that Larry made?

16 MR. GORFINE: Please. Go ahead, Pierre.

17 MR. LAMY: Yes, thank you. Yes. I -- I
18 completely agree with the two points made by Larry Tabb
19 in the sense that we should not develop a solution that
20 is based on the assumption that we will revise the
21 rules into a way that is more friendly to machine
22 execution because it would just -- I do not see that

1 happening, and putting that precedence would delay
2 everything, which is exactly what we have -- the
3 formation of what we have been doing with Rosetta,
4 which is assuming that we take the rules as they exist,
5 and then what we do beside them is to develop an
6 implementation that is very legible as part of the
7 syntax that we have developed that provide the ability
8 to express an interpretation of those rules into
9 something which is directly machine-executable.

10 I also completely agree with the fact that we have
11 a very diverse environment within the banks, and I do
12 not see any time soon when the banks would say, okay,
13 let's completely change all data models and the way we
14 do things to addressing something else because that
15 will not happen.

16 So what we have also built within Rosetta is an
17 explicit mapping between the canonical model, which is
18 this normalized model that we're developing with ISDA
19 and other market participants with all the -- and
20 explicit mapping with all the relationships that exist
21 within the bank. So a bank can, without trying to be
22 told the internal data representation, plug itself into

1 Rosetta. So this is exactly the product we have.

2 Thank you.

3 MR. GORFINE: Thank you.

4 Okay, Mr. McHenry.

5 MR. McHENRY: Yeah, I'll just say from an NFA
6 perspective that for a while now we've been storing all
7 of our rules and all of our interpretive notices in a
8 database, so -- and that's been very beneficial
9 internally in terms of facilitating searches and things
10 like that, and also displaying the rules on our
11 website. So I would think that if we could come up
12 with a common language and common structure, that that
13 would have a lot of potential.

14 MR. GORFINE: Okay. Mr. Levy and then Mr. Stein.

15 MR. LEVY: Yes. Jo Ann, you mentioned open
16 source. Have there been any particular initiatives or
17 platforms, venues, open source foundations that that
18 conversation has been had? Because there is an
19 existing FinTech Open Source Foundation that might be a
20 worthy conversation.

21 MS. BAREFOOT: That would be a worthy
22 conversation. It's very early -- very early dialogue,

1 that ones that I'm in, which -- but there are a lot of
2 them all over the place. But if you've got suggestions
3 on where to start, I think that a lot of people believe
4 that's one of the foundational pillars.

5 MR. LEVY: Okay. Well, there's a foundation
6 called FINOS, FinTech Open Source Foundation, that many
7 of the banks and the vendors that are in the
8 derivatives space and beyond, I happen to be chairman.
9 I don't get paid, so it's not a paid advertisement, but
10 it might be an interesting discussion to have, and it's
11 been much -- it's been broadened out greatly this year,
12 and this could be an interesting home for it, or at
13 least a conversation.

14 MS. BAREFOOT: That's great. My colleagues might
15 have connected with them, but I'll make sure.

16 MR. GORFINE: Okay. Mr. Stein.

17 MR. STEIN: Thank you. That was very good. When
18 you consider the code as regulation, have you thought
19 about whether that becomes more or less susceptible to
20 end runs, systematic end runs? And how do you address
21 that?

22 MR. SOLANKI: It's a good question. I think the

1 trick is in the execution cycle, so -- and we have
2 thought about it, not enough, but we have some thoughts
3 on it. If we have the common language, and if we have
4 the execution part of those rules, there can be
5 validation mechanisms to ensure that the rules have
6 been executed correctly. And we have not spent time
7 experimenting with that, but we have some thought
8 process around it.

9 But I think the risk is real, and it could happen.
10 We also feel that understanding the output across the
11 industry from a regulatory point of view will help us
12 prevent these issues. So to give an example, if
13 multiple participants are submitting the output, often
14 executable regulation, the historic and current
15 variances between participants and within themselves
16 could help understand if things are going wrong, but
17 more to come on it.

18 MS. BAREFOOT: That problem is why we need to have
19 artificial intelligence in this, to catch the end run.

20 MR. GORFINE: Okay. All right. Well, thank you
21 all very much. I want to thank our panelists for a
22 great discussion.

1 Panel IV: Distributed Ledger Technology and
2 Market Infrastructure Subcommittee Presentation

3 MR. GORFINE: With that, I would now like to turn
4 to the final topic on our agenda, in which members of
5 our DLT and Market Infrastructure Subcommittee will
6 share the framework they've been developing within
7 their subcommittee work stream.

8 So our panelists are Mr. Erik Barry and Mr. Brad
9 Levy. And I believe this time around, Mr. Levy, we are
10 going to begin with you when you get situated.

11 MR. LEVY: Okay. Thank you. We'll try to call
12 back some time. I don't want to steal from our
13 important Commission.

14 So thank you very much for today and for the
15 subcommittee efforts specifically, just a few points on
16 that. Very broad diverse group. I want to
17 particularly call out Yesha Yadav on our subcommittee,
18 who did quite a bit of the lifting on this one and
19 wasn't able to participate today directly, but just
20 calling her out specifically; Erik, my co-presenter and
21 producer of the materials; the staff behind it -- Dan,
22 Jorge, and Bianca -- I want to call out Bianca

1 specifically, who has done real work with us; and
2 Chairman Giancarlo, for his support of this generally
3 over the years and before being on the Commission; and
4 Commissioner Quintenz for his support of this and us.

5 A few qualifiers. This is a broad representation
6 of the group's views. It does balance, I would say,
7 the diversity of the group, the breath of this space,
8 DLT, from a technology perspective, and maybe most
9 importantly, the newness of it. The group did ramp
10 through this process for the last few months, so people
11 came on a little bit toward the end, but I do think
12 that today's presentation is a good synopsis of what we
13 -- what we believe today.

14 If you were confused by the Virtual Currency
15 panel, you will either walk away from this more or less
16 confused, we'll see, but it is -- it is a big topic, a
17 relatively complex topic, but we hope to take it from a
18 high level, go from the Moon to Mars and maybe back
19 into the depths of the oceans as we get into the FCM
20 world.

21 So, you know, people talk about the Internet, and
22 it's actually come up a number of times today, and if

1 you think about the technology, Internet 2.0, in the
2 1990s, it was about mail. We've talked about the
3 downsides of email and the challenges there, the
4 browser, and buying books. So that was really that
5 core first use in the '90s.

6 Clearly, we are doing a lot more with that today.
7 And the question is, Is that a good thing? We're
8 certainly doing it, but is it safe? And one of the
9 questions is, Can DLT free us from some of the
10 challenges of this open digital world while we lock it
11 down, which is a little bit at odds with each other?

12 It's also not industry-specific technology. This
13 is a broad technology space that will apply to many
14 different industries, whether it's health care or
15 finance, and all supply chains. You think of finance
16 as a supply chain. This is just one of those
17 conversations, and this conversation could go from the
18 most virtual, banking, to the most physical, oil.

19 It's a massive game changer for many, as people
20 and industries, where the data and the applications can
21 be distributed and used more safely, and think of those
22 assets moving around much more freely and the smart

1 contracts or automation being accessed and doing
2 exactly what you think it says on the tin.

3 Most importantly, there will be unintended
4 consequences, especially in these areas where it's very
5 new and it's technology-led, and those consequences
6 will be good and bad, and we'll have to work through
7 those.

8 The word "trust" has come up quite a bit today,
9 especially in the virtual currency panel. There is
10 likely to be a blend of how we develop trust with these
11 new technologies. It could either be based on
12 somebody's character as a person or their authority and
13 their right to do something, or they're convincing you,
14 or just the logic and the power of technology and the
15 binary nature of code, it's either zero or one.

16 There's an element in this conversation that the
17 purists would say that it's only about technology, and
18 if you just trust the technology and remove the people
19 or the systems that have existed, that's the way
20 forward; and there are others that would say we should
21 do none of this. The right answer is most likely in
22 the middle, and today I think is us trying to balance

1 the trust. Does it create value? Does it blow us up?
2 And does it disintermediate us? So the balancing act
3 of all of those will be an important dynamic in the
4 coming years.

5 Whoops. Okay, so down a level.

6 We started with some of the concerns or the issues
7 that we talk about when we talk about new technologies,
8 and I'll just fire through this relatively quickly.
9 And to each of these, in operations and technologies,
10 which I consider one, and the regulatory and legal.
11 Just think of these as blockers. And if you think
12 about what is a potential blocker and is more adoption
13 of the cloud generally, which is starting to really get
14 adoption in our industry, is that a dependency? Is
15 figuring out custody a dependency?

16 Number two, resiliency. We talk about systems and
17 exchanges. Bryan went through a lot on the CME and how
18 -- how resilient it is. This is new technology. In a
19 highly automated world, how resilient is this
20 technology? How scalable is it? Should we be using it
21 for very fast markets or things that are a bit slower
22 and heavier today? Competitively, will larger firms

1 dominate the space and adopt this technology or will
2 new firms come in and take them out? And then
3 ultimately the viability. Sometimes the technology we
4 talk about just isn't fit for purpose, but it may
5 become in the future as we evolve.

6 On the regulatory and legal side, you have ---
7 Can it happen compliantly within a new regulatory
8 framework? Are there rules that allow for this
9 technology to be utilized in scale? How will we deal
10 with the international nature of our markets and these
11 technologies? And we've come -- we've talked a little
12 bit about today the east and the west, from a
13 conspiracy theory all the way through globalization and
14 commerce.

15 The legal frictions, contract law, something very
16 specific. You can't just say it happens in technology,
17 and that's fine. Think about how long we worked on
18 e-signatures in ISDAs, where for a decade or two we
19 still had to send them around by paper and do AutoSig,
20 and only ten or 15 years ago did we actually get a
21 legal framework where we could put it in the API.

22 And then the last, riskily. If we're going to put

1 exchanges in clearinghouses into this business which
2 are very sensitive, and platforms that I look after,
3 like MarkitSERV, how risky is it to take central
4 resilient entities and introduce this new modern
5 technology?

6 So talking about the bigness, this is big, it's
7 complicated, and there are many applications to drive a
8 value prop. I tried to come up with a construct for
9 thinking about this. And if you look up the left and
10 right, or the X and Y axis, those are value or
11 complexity and tangibility, or lack of complexity. And
12 if you go from the bottom left to the top right, maybe
13 that's where the value is. I talked about the physical
14 world and the financial, more virtual, world applying
15 here. You hear a lot about marine and shipping and
16 transport utilizing these technologies, or the oil
17 industry. You hear about crypto and trading firms like
18 Cumberland setting up to do these.

19 We'll try to focus in a bit today on the idea of
20 ags and treasuries and metals and swaps and futures,
21 but all are leveraging a lot of these same technologies
22 and converge as we know. There are times where the

1 IoT, the physical world of sensors and "Where is my
2 oil?" will meet the physical delivery of a futures
3 contract, whether it's grain or sugar or Treasuries
4 security that needs to be delivered on the back of a
5 futures contract.

6 So at the bottom of this page, we rattle off trade
7 matching and execution, user identity, reconciliation,
8 settlement, custody, risk management, regulatory
9 reporting, and oversight. To unpack any one of these
10 today will be extremely challenging, and we're not
11 intending to do that, but the reality is these
12 technologies will be used in all of these areas in some
13 form, in some time, and it's only a question of, How
14 soon and how big of impact will it be? And at that
15 time, it may not even be that big a deal at all.

16 So we spent a lot of time as a subcommittee
17 attempting to frame this somehow to come up with a way
18 to look at this and drill down. As a very quanty data
19 scientist in my firm, he says, "Can you double-click on
20 that?" meaning, "Can you drill down easily, and then
21 can you double-click again, and then can you come up?"
22 You know, data scientists, they go right down to the

1 golden record and then right back up to some
2 statistical analysis. So how do we frame this entire
3 discussion?

4 So we chose to frame all of this in a technical
5 perspective. We will not talk about regulations today.

6 Sorry, Gary, we just won't go there.

7 So this is really a technology-focused discussion.
8 And we thought about it as there are instruments and
9 assets, there's identity and roles in the market, there
10 are processes and functions that people perform, and
11 then there's the authority or regulation generally to
12 perform something.

13 So in the instruments and assets, think about a
14 futures contract that's created or exists on an
15 exchange, an identity or role as an FCM that plays a
16 role in that market with an identity to perform certain
17 tasks; from a functional role, they help entities enter
18 clearinghouses. And then there's an entire regulatory
19 framework around that that's about the CFTC and what
20 their role is, the FCMs, introducing brokers, et
21 cetera.

22 One thing we intend to do today is ignore the "D"

1 in the "DLT," meaning the "distributed" part. Part of
2 the reason is the theory of our subcommittee is a lot
3 of the distributed nature of where the world will be in
4 the next five to ten years will more likely be driven
5 by the move to the cloud than the evolution of DLT
6 specifically, and the evolution of DLT will leverage
7 the move to the cloud. And the quote on the first
8 page, it's easier to move the compute to the data; it's
9 counterintuitive, it's cheaper, than to move the data
10 to the compute. Data has become so big and complex,
11 and the commoditization of technology itself at the
12 hardware level, that what you really want to do is move
13 that compute to where your big data is, and especially
14 from a compliance and a sensitivity perspective.

15 So what we'll do today is try to drill down on a
16 few different areas. These are definitely words that
17 you've heard, which move beyond the distributed nature
18 and really into the cryptography, which is about the
19 data protection and the information security, again,
20 that we all heard today is really challenging in an
21 email-riddled world. And then the potential for more
22 automation, largely around the concept of smart

1 contracts, which again is a little bit of an abused,
2 overused term, but it really does mean encoding an
3 action into a process more directly, and never having
4 to look back at whether the action happened or not.
5 Think about a corporate action. So linking the data
6 and the action with authority and/or creating that
7 authority by linking the data and the action.

8 There are many ways and many variants to apply
9 cryptography automation to create authority, whether
10 it's the blockchain method on Bitcoin or a different
11 version of that in Ether and Ethereum, or the 1,500
12 cryptos and tokens that exist with different methods
13 there of creating safety, security, and automation.
14 But ultimately, there's two questions. What is it that
15 I'm trying to get to: my cash, my security, et cetera?
16 And did it happen?

17 So double-clicking one more, maybe to bring this
18 down to something a bit more practical and tangible,
19 these are examples that exist in the real world. We
20 use these examples because it really does demonstrate
21 the breadth and depth of the applications and the
22 earliness and the early stage that we are in, in this

1 DLT space. There are also initiatives that are
2 familiar to our subcommittee members because we're
3 involved in them.

4 So we've broken these down into three major
5 buckets, and I think there's been a lot of discussions
6 around this today, including on our last panel
7 discussion about this idea that the new will never come
8 or that the new will wipe out the existing. Neither of
9 those are true, and it's very rare that you've ever
10 seen that happen. In all likelihood, it's combinations
11 of everything we're talking about and some incremental
12 evolution over a longer period of time, but it will
13 happen.

14 So just a couple of examples that maybe pull back
15 a little bit to what we talked about in the Virtual
16 Currency group this morning and maybe give you a bit of
17 an understanding of how broad this technology space is
18 and how varied the applications can be.

19 There's an initiative that we're involved in, in
20 IHS Markit called "Stax Payments for Loans." It
21 involves a syndicated loan market, which is a highly
22 sensitive private market that is relatively low to

1 settle, and cash is a relatively painful process in
2 that market, whether it's making an interest payment or
3 paying the agent back -- agent bank to represent your
4 interest to the lender or the borrower, or the borrower
5 drawing more down from its lenders. Cash is heavy,
6 it's inconvenient, it's low yielding, and it's
7 generally disconnected from the event that drove it, so
8 you spend a lot of time reconciling it.

9 So can you create a replica, not a token, not a
10 new currency, but a replica, of true money in a trusted
11 private system, connect that to the event that
12 generated that cash event, move away from the need to
13 use the legacy systems of wiring money, and then within
14 a 3-hour window every day, and then spend a lot of time
15 reconciling those movements to make sure that the cash
16 in your portfolio matches what you think it should and
17 that the assets or futures or whatever they are, are
18 also accurate?

19 The number two initiative on here is central banks
20 using the same type of a concept, which is what
21 inspired us to do it, a project called "Ubin." The
22 monetary authority of Singapore is a central bank, in

1 2016, create an exact replica of their paper fiat in
2 their systems. The Central Bank of Canada did the same
3 project, "Jasper." And if that central bank says this
4 is fiat money and moves it between central banks, and
5 then banks are allowed to use that, then that is an
6 exact replica of fiat in a lighter system that can
7 maybe modernize the way central banks work globally in
8 a central monetary system. So that's where we're
9 combining current technology with new technologies.

10 The number two bucket, taking existing technology
11 and replacing it with distributive ledger tech. So
12 credit derivatives right now is going through a
13 relatively large replatforming exercise across the
14 industry. It touches the DTCC, it touches ICE, it
15 touches LCH, and it touches MarkitSERV and other
16 platforms in the market that are involved in the credit
17 derivatives market.

18 DTC, in particular, is rebuilding the Trade
19 Information Warehouse as the golden record repository
20 for all credit derivative trades and building them on a
21 distributed ledger technology. Now, the reality is
22 that won't change our lives anytime soon, but we will

1 have a lot more optionality down the road to do more
2 with that data from an analytics perspective looking at
3 risks and flows in the market. And if you paid
4 attention to '08, it might be interesting to have an
5 understanding of what's going on in CDS beyond just a
6 few folks in the market that may have had an indication
7 of that.

8 No smiling, Mr. Chairman.

9 It's a real thing, and it could provide a real
10 value and de-risk a lot, or at least giving people a
11 bigger sense of where the risk is before it manifests.

12 There's been a very large initiative in Australia
13 to fully replatform the entire front, middle, and back
14 there from an exchange and clearing perspective.
15 Digital Assets is running that and is a member on our
16 committee. So that's a full-stack replacement that's
17 underway, and that's a big deal, and it's a closed
18 private trusted system that has the ability to do this.
19 And, again, it may not change much at the get-go, but
20 it will provide a lot of optionality for those markets
21 in the long run.

22 And then there are just slight tweaks, like the

1 CBOE creating a futures contract on Bitcoin. Now, that
2 doesn't sound like a big deal because the underlier is
3 just a thing, and it's a futures contract, and people
4 will trade it. But the reality is when you think about
5 risk, when you think about what underpins that
6 underlier, and from our Virtual Currency panel, that's
7 a tweak to a futures contract maybe, but the entire
8 ecosystem that needs to coexist around that new futures
9 product is meaningful when you think about EMS systems
10 and risk systems and collateral management behind that
11 and CCP risk. It's a much bigger deal than just
12 listing a futures contract on an exchange.

13 So now I'm going to turn to my partner, Erik, who
14 is going to take it down to the persona or the function
15 of an FCM in the market and make it a little bit
16 tangible from that perspective.

17 MR. BARRY: Yes. Thank you.

18 So Brad has done an excellent job detailing the
19 conversations. The very diverse thought processes
20 amongst our subcommittee have been engaged in as it
21 relates to the implications of DLT implementation
22 across not just futures and cleared swaps, but

1 financial services more broadly. So as I and others in
2 the FCM industry have tried to grasp the possibilities
3 that DLT provides, I take it from a perspective of
4 nearly 17 years in the FCM community, starting from
5 doing basic exchange reconciliations, speaking with
6 floor clerks to chase down trade breaks, to running a
7 client service team, to moving to client solutions, and
8 eventually on to running technology strategy across our
9 business.

10 So as we look at that process and the migration of
11 that, we're trying to navigate this tangled nest of
12 client workflows between our clients, their vendors,
13 and how we bring all that together. So we see the
14 promise of DLT as being a very wonderful opportunity to
15 solve all the issues that the FCMs come across on the
16 clearing side of the business.

17 So I'm hopeful that many of the concerns that our
18 side of the FCM business have tried solve for
19 independently can be addressed through this technology.
20 And the slide that you see up -- oh, there we go -- the
21 slide that's up there now, things as basic as an
22 initial clearing record of an executed trade.

1 Currently, identifiers don't carry through from
2 execution through to clearing in a normal manner across
3 the industry. This creates a very divergent workflow
4 in how we deal with -- with our clients, and, again,
5 the vendors that they have. They all have different
6 workflows, they all initiate different identifiers at
7 each step in their process.

8 So at the FCM level, when you try to take that
9 information, bring it back together, recreate orders,
10 recreate average prices, allocations, that have to get
11 down to the final clearing level, it's very difficult
12 to do. We all do it in different manners, and there's
13 no traceability that's consistent from one FCM to
14 another FCM or how you interact with different clients.
15 So common identifiers addressable by any permissioned
16 party is one of the goals that we seek to achieve
17 coming out of this.

18 That goes back to Brad's point about
19 permissioning, authority, different roles that
20 different parties would play on this central ledger,
21 and allowing clients to drive a bit more of the
22 decision making about who's the best provider of a

1 service to them. Do they go choose a vendor that goes
2 across multiple brokers? Do we unlock the stranglehold
3 that an FCM currently plays in providing a lot of these
4 services by opening up that -- that allocation, all
5 that post-trade servicing, to vendors that are
6 approved, perhaps that pull in machine-readable formats
7 around allocation rules? It opens up a whole new
8 possibility as to how this may happen.

9 So consistent APIs. Reduced messaging. Messages
10 right now go from OMSs to execution platforms to
11 clearinghouses to vendors to the FCM back out to the
12 clearinghouse for allocations going to another broker.
13 All along those paths, messages can fail, breaks can
14 happen, translations can drop off, and it makes the
15 entire process difficult. By moving to that central
16 ledger, the promise of DLT allows you to perform all
17 those functions at a central place and remove the need
18 for reconciliation to cross multiple aspects of that.

19 So I've highlighted just a few of these -- these
20 items on the slide. If we go to the critical
21 considerations, we realize that many of these benefits,
22 very important considerations to take into account.

1 Allowing these permission-certified vendors to interact
2 with the ledger increases the choice in competition.
3 Clients and FCMs can select vendors that best meet
4 their various business needs, whether it's for futures
5 or across their entire portfolio. And we look to move
6 to certified standards, perhaps guided, again, by the
7 machine-readable rules, which were on the previous
8 panel.

9 The key to this is that regulators can gain access
10 to this data on a central ledger, and we completely
11 rewrite how swap data repositories, how large
12 positioned trading reports need to be reported. This
13 will all be available to you in that permissioned role
14 with the authority that's granted to you to read that
15 -- that ledger. So instead of, like Brad said before,
16 instead of the data going out, you're coming to the
17 data, and we're all working off of that same -- that
18 same data.

19 So what we have seen as we talk about this within
20 the FCM community, certain challenges, and fracturing
21 of the process flows is probably key amongst that. So
22 what we're trying to avoid is having a separate

1 distributed ledger with different language and
2 different protocols across each of the CCPs or
3 institutions that we need to deal with. So if we can
4 move towards a common language, a common framework,
5 that allows us to connect all that and really bring the
6 efficiency that the industry needs to ease this part of
7 the workflow, we start to realize less of the benefits
8 of that efficiency if we start to fracture how that
9 communication works.

10 Another concern that's been brought up was around
11 jurisdictional concerns, where you hold data. A
12 distributed ledger, by nature, the ledger can sit on
13 any of those nodes. If -- if there are certain rules
14 and certain countries where an exchange may -- may be
15 local to, are there concerns about how you access that?
16 Is it allowed to leave that country? Or does
17 everything have to happen within that country? Do you
18 have to have a node local to that exchange? So these
19 are just some of the concerns that the community has
20 brought up as well.

21 MR. LEVY: Thank you. So just to conclude
22 formally with what we have here and then a bit on what

1 we believe are our next steps as a committee, so
2 hopefully you took away that the reach of this space,
3 from a technology perspective, is potentially quite
4 expansive. It really does hold out the promise of
5 introducing deeply transformative changes to any --
6 into any process. I personally believe that, and I
7 believe my subcommittee members believe that it's more
8 a matter of where we go, how we go, and when we go.

9 Cryptography is critical to DLT's success. Smart
10 contracts will facilitate greater automation, but that
11 will only happen when we get comfortable with the
12 ability to protect both the data, the identities, and
13 the processes or applications that are performing
14 tasks. We've talked a lot about today, How much will
15 we trust this technology? Well, we'll trust it if it
16 works, but, more importantly, we'll probably trust it
17 over time.

18 Also, the existing players that are in the market
19 today as trusted entities, whether they're fully
20 regulated large exchanges that have been around for
21 decades or longer or newer technology, all of these
22 will come together, and these large players that exist

1 today are likely to play a very large role bringing
2 this technology forward.

3 That said, the technology of virtual currency,
4 which is really the genesis, I guess, of this whole
5 conversation, even though many of these technologies
6 have been around much longer than Bitcoin, can be
7 adopted in traditional finance, and the regulation and
8 the authority of the financial markets can be applied
9 to this space of distributed ledger tech and the more
10 virtual world.

11 But the reality is new networks take time, do
12 require incentives to ramp up, and the existing
13 networks may also need some changes, both
14 technologically and beyond to adapt to this new world.

15 The reality is existing tech -- existing players
16 will evolve incrementally to develop this trust with
17 this new technology. This new technology will mature
18 incrementally to develop more trust, and then the
19 outcome is likely to be both will combine to the
20 benefit of all.

21 So that's the end of our formal remarks just to
22 give you a bit on what we believe are our next steps,

1 because we did stay at a relatively high level and then
2 again tried to refine it down to markets that you
3 understand, like swaps or futures, more importantly, a
4 very important roleplayer in the market, the futures
5 commission merchant.

6 What we plan to do, number one, is refine our
7 focus on the functional areas and drill down into
8 those, whether they are the instruments that they deal
9 with, swaps and derivatives broadly, the entities in
10 the market, like clearinghouses. What does a
11 clearinghouse look like in a more decentralized
12 distributed world, and what do they do, both from a
13 futures perspective, but then also how do they adopt
14 these new technologies to make their markets bigger and
15 safer? And then how will the swap markets in
16 particular evolve, which are fairly heavy?

17 And, again, I think a lot of what we heard on the
18 RegTech panel was around the automation and the
19 evolution of swaps. We've been through a lot from
20 Dodd-Frank and beyond. We landed, but we can likely do
21 much better from a technology perspective.

22 We'll go -- number two, we will push deeper into

1 specific technology areas and the differences and the
2 risks and benefits, whether it's blockchains or
3 cryptography and the nuances of different networks and
4 protocols, different levels of smart contract
5 automation and the blend of legal authority, regulatory
6 authority, and automation more generally through
7 software, and the relationship to the broader
8 technology landscape. You heard natural language
9 processing in a significant way in the last panel. NLP
10 will play a very big role in this space, as cloud will,
11 as we talked about the distributed side.

12 And then specific industry efforts, number three,
13 that are adopting this technology today. We glanced
14 through a few of them. We will stay close to home in
15 terms of futures and swaps and clearinghouses, et
16 cetera, maybe spending more time in execution in our
17 next sessions than we what we do, from a reporting
18 perspective, back to the community; looking at post-
19 trade life cycle more detailed; and then ultimately
20 looking at risk more deeply, whether it's the
21 technology risk introduced or the technology's ability
22 to manifest risk or understand risk in a more

1 meaningful way.

2 Most importantly for this Commission and all of
3 us, these technologies can be used by the regulators to
4 enhance their ability to surveil and do what they need
5 to do as regulators. There is no doubt that these
6 technologies will both aid the markets that these --
7 that this regulatory body oversees as well as aid the
8 regulator themselves in overseeing these markets. So
9 through those three areas we expect to come back in the
10 future with more drilldowns, double-clicks on these
11 areas, and hopefully over the next months and years,
12 where this technology is less new and more real, we'll
13 be able to talk a bit more deeply and practically and
14 about business models that are evolving behind this DLT
15 space.

16 MR. GORFINE: Great. Well, thank you very much
17 for the comprehensive presentation. So I want to open
18 the floor, and I'll just, for the sake of time, I'll
19 throw a few questions out there that may help stimulate
20 discussion.

21 You know, first you mentioned particular areas of
22 application, but where are we seeing any proofs of

1 out, and you can definitely see standards that are
2 created just by listening to what everybody is doing
3 because the standard is generally a version of what
4 everybody is already doing, they just haven't written
5 it down in a document and programmed it.

6 MR. GORFINE: Okay. Well, thank you very much to
7 our panel and our presenters. And I want to thank all
8 of our panelists today. I think we've heard some
9 excellent presentations from our subcommittees as well
10 as our RegTech panel. And so based on this, we look
11 forward to the ongoing work of our subcommittees and
12 the broader efforts of the TAC.

13 I am now going to turn it back over to
14 Commissioner Quintenz to facilitate closing remarks.

15 Closing Remarks

16 COMMISSIONER QUINTENZ: Thank you, Dan. Before I
17 give my closing remarks and thank all of our great
18 presenters and our members, let me turn it over to my
19 fellow Commissioners for any closing thoughts.

20 Commissioner Behnam?

21 COMMISSIONER BEHNAM: First off, thanks to the
22 entire committee, the subcommittees, the speakers,

1 excellent discussion today and look forward to future
2 discussions and ideas and conclusions that obviously,
3 as we've discussed many times on this side of the
4 table, are really helpful to us to think about these
5 issues today, next week, next month, and in the many,
6 many years ahead. And with that, a special thanks to
7 Dan, as DFO, and, of course, Commissioner Quintenz.

8 COMMISSIONER QUINTENZ: Thanks.

9 And Commissioner Stump.

10 COMMISSIONER STUMP: I have very little. It was
11 fascinating. I'm excited to attend the next meeting
12 with -- with many of the things that were laid on the
13 table for future discussions. Really interesting. And
14 thank you all for being here. Thanks to Commissioner
15 Quintenz and Daniel for putting this together. It's
16 been a busy week, and you all -- I hope you have a
17 great weekend. You deserve that.

18 COMMISSIONER QUINTENZ: Thank you.

19 And, Commissioner Berkovitz.

20 COMMISSIONER BERKOVITZ: Thank you, Commissioner
21 Quintenz. I will just echo the remarks of Commissioner
22 Behnam and Commissioner Stump. And it's very, very

1 informative. And thank you all very much. I look
2 forward to future meetings and speaking and hearing
3 from you again. Thank you.

4 COMMISSIONER QUINTENZ: Well, let me thank all of
5 you, my fellow Commissioners, for spending the whole
6 day with us, and that's a great tradition that we have
7 here with all of our advisory committees. In that
8 vein, the Chairman wanted me to express his gratitude
9 to all of you for all of your work, all of your hard
10 thinking. He had a prior commitment that, to his
11 credit, ended or began after our time was supposed to
12 end, so he met his obligation but wanted me to
13 personally thank all of you for what he thought and
14 what I thought was a very impressive discussion.

15 The quality of the work that went into these
16 presentations was superb. I -- as I think my fellow
17 Commissioners just expressed, I am very excited to see
18 where this thinking goes. I'm very excited to see all
19 of you answer the very tough questions that you posed.
20 I think you are the people to do it. I think we're
21 going to rely on you to provide some guidance, some
22 answers, maybe some suggestions as to practices or

1 standards. That's why we have this advisory committee.
2 And while it takes a lot of thought and work to ask
3 tough questions, it's going to take some more to try to
4 provide some concrete responses.

5 So I learned a great deal. I have a lot here that
6 I could go through. I don't think I will since these
7 topics have been so thoroughly fleshed out, but I will
8 say that in all future conversations, I'm going to
9 reference this meeting and its webcast to point to for
10 anyone to get a good basis of understanding on these
11 topics, and I think that will hopefully encourage a
12 continual increase in the amount of attention that gets
13 paid to your thinking and the CFTC's work in technology
14 in this area and in furthering our relationship with
15 innovators.

16 So thank you. Thank you all very much for being
17 here, for participating, for your efforts.

18 Let me turn it back over to Dan and thank him for
19 his work as well as, again, Jorge Herrada, John
20 Coughlin, and all of the support staff that have turned
21 this event into something very meaningful.

22 MR. GORFINE: Great. Thank you, Commissioner.

1 I have two more important lines, and it is, first,
2 thank you for joining us today; and, second, we are now
3 adjourned. Thank you.

4 (Whereupon, at 3:22 p.m., the meeting was
5 adjourned.)

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