Transcript of Payments Innovation Conference:
Tokenized products
October 21, 2025

SUSAN FOLEY. And we are going to be talking about tokenized products. Leading us through this discussion will be Colleen Sullivan. Colleen is the Co-Head of Ventures at Breven Howard Digital, a global alternative investment management platform specializing in macro and digital assets. Thank you. Take it away.

COLLEEN SULLIVAN. Thank you. Good afternoon, everyone. I'm Colleen Sullivan. I co-head the venture team at Breven Howard Digital. I'd like to thank Governor Waller, Sunayna, Ria, Alex, and the other folks at the Fed for hosting us. It's really been an incredible day. I'll start by saying this panel I think is the perfect example of saving the best for last. So, each of these panelists really before it was fashionable or safe to do so recognized the benefits of blockchain technology that they outweighed the regulatory and reputational risk of being early to the space.

As moderators, we were asked to set the stage for the panel, so I'll do that very briefly. Recently, SEC Chair Paul Atkins announced Project Crypto, saying, "We're at the threshold of a new era in the history of markets," and that the SEC will seek to modernize the securities rules and regulations to enable America's financial markets to move on-chain. So, during this panel, we're going to talk about how we get to this on-chain future state through tokenization.

Now, before all assets are tokenized and move on-chain, which I do believe will happen over time, we're likely to see a gradual merger of traditional finance and crypto. Digital assets like stablecoins, tokenized commercial bank deposits, tokenized U.S. treasury money market funds, and all forms of crypto like Bitcoin, Ethereum, and Solana will trade and be used as good collateral in our traditional markets. At the same time, we'll see the reverse. Assets like public equities and commodities, which have historically traded only in traditional markets, are being

tokenized and traded and used as good collateral in DeFi as you heard during the first panel of the day. So, it's very much a two-way street.

Some of you may have watched the SEC's excellent panel on tokenization, and one of the interesting takeaways for me was that the panelists used similar, but slightly different definitions of the word "tokenization," and we had the same realization during our prep call. Tokenization means different things to different people. And I'll give one quick example. Let's take tokenization of public equities. Some tokenized public equities are synthetic instruments like IOUs or derivatives. They provide price exposure to the underlying, but they lack full legal ownership and governance rights. Other tokenized equities are issued natively on-chain where the token itself is the security recorded on the blockchain. Are synthetic and natively issued tokenized shares of Tesla fungible both with each other and with traditional non-tokenized shares of Tesla stock? If they're not, what does that imply for liquidity and potential market fragmentation? Would a venue like the Chicago Board Options Exchange and its clearing firm, the Options Clearing Corporation, treat synthetic and natively issued tokenized public equities the same for purposes of writing covered calls and callers?

These distinctions matter. We're now in a place where traditional finance brings scale, capital, regulation and the world's deepest markets and crypto brings transparency, programmability, composability and efficiency. Together, I think they form a financial system that's stronger and more resilient than either would be alone. However, as this convergence happens and as we now move into markets operating 24/7/365, we need to ensure that the foundation of this new joint market infrastructure is stable, secure and interoperable and that it doesn't lead to fragmented liquidity, lack of fungibility, fragile collateral, and loss of privacy.

So, my hope today is to go a layer deeper in tokenization, and we certainly have the right panelists here to do that. So, I'd like to begin by asking each of you to introduce yourselves and if you could also share examples of what your firms have done in tokenization and the benefits that have accrued to your firms or your clients as well as some of the challenges you see ahead. Jenny, you're in the hot seat first.

JENNY JOHNSON. Great. Well, thanks, Colleen. So, I'm the CEO at Franklin Templeton and we have built an infrastructure with a shareholder recordkeeping system on-chain, a wallet infrastructure that enables us to launch products on it. We in 2020 launched a tokenized money market fund that's actually natively on-chain, and that allows us to do things like intraday yield. So, if a hedge fund owns it for 4 hours 22 minutes and 36 seconds, you will actually get the yield for that amount of time. And I used to run our technology group and we used to have recordkeeping systems and none of them because they're all batch process allowed it. So, it just creates so much flexibility. We also run validators on 30 nodes on I think 11 layer 1 platforms and we have an asset management business within our asset management business that does model portfolios with tokenized crypto products and we have a venture capital fund.

DON WILSON. I'm Don Wilson. I'm the founder and CEO of DRW, which is a proprietary trading and markets innovation firm. We also founded Cumberland, which is our crypto trading arm in 2014. So, we were very early to the space. I think of crypto as kind of a warm-up for on-chain TradFi trading, and we spend a lot of time thinking about that convergence and how we can leverage blockchain rails to make traditional finance more efficient. An example of that was this past weekend. We just did another set of on-chain U.S. Treasury repo transactions. And these were unique for a few different reasons. One, there was no intermediary risk on the treasury. So, it was DTCC that actually put them on top of a blockchain. All the

transactions were atomic. So, USDC and some other stablecoins were used as the cash legs. In this case, there was also rehypothecation. Because it was done on the Canton blockchain, privacy was preserved. So, only the participants who needed to see the transactions saw the transactions. They weren't open to the whole world, which I think is very important. In addition to DTCC, Circle and some other stablecoin providers, DRW, Virtu, Citadel, B of A, and SocGen all participated in these. So, that's an example of stuff that's happening now that we're involved with that we're super excited about.

ROB GOLDSTEIN. Great. I'm Rob Goldstein, BlackRock's Chief Operating Officer. Interestingly enough, in 2014, my contribution on this topic was being the person in BlackRock saying, "I don't know if I believe in this, but it seems big enough that we should create a small group of people who do nothing but obsess about this to figure out the right moment." And broadly, I would say the strategy that we've been employing at BlackRock is a strategy about bridging. You basically have the traditional capital markets and then you have this alternative universe, this digital asset universe that has been evolving and obviously has tremendous momentum. And what we've been doing as a company is trying to lead how you bridge the two together.

So, for example, the IBIT ETF, which has approximately $90 billion of assets, would be a great example where there's a tremendous demand among traditional capital markets investors to have access to these exposures, but to have access to these exposures in the same old way that they could have access to IBM stock and it shows up on that same brokerage account that they're accustomed to getting. Another example would be going the other direction where we actually manage one of the largest tokenized money market funds, BUIDL, where it provides the ability

to have access to a BlackRock money market fund, but to have it as a token that lives in this alternative universe.

So, when you look at that strategy, we believe very strongly that a lot of what's happening is this, Colleen, you had said the gradual merging of these two worlds and we've been trying as a strategy to be that bridge to help bring them together in every way possible.

KARA KENNEDY. I'm Kara Kennedy, I'm Co-Head of Kinexys. Kinexys is JP Morgan's blockchain business unit. So, we are in a unique position of sitting within obviously a significant bank like JP Morgan but actively working to develop blockchain-based solutions for our clients and we do that across assets, payments and information predominantly on networks that we operate today. And our focus is really on developing solutions leveraging tokenization that will solve real-world problems for the bank's clients today and help to develop those interoperability points between the legacy infrastructure that we clearly use for the vast majority of our business and the new opportunities that is afforded through the use of blockchain technology.

So, some examples of the products that we offer today which leverage tokenization capabilities would be our digital financing product, which is a product that our markets business operates, which enables the tokenization of collateral such as U.S. treasuries to be deployed in intraday repo transactions, which can be timed down to the minute allowing repo sellers to much more precisely meet their liquidity requirements without having to have the kind of overnight exposures that would be required in the legacy infrastructure. And so, we enable tokenization of traditional assets onto our network. They can then be moved against our digital payment solutions. We operate 24/7/365 blockchain-based payments infrastructure, enabling clients to leverage that. And then, as you may have seen this year, we also moved beyond into launching a proof of concept on deposit tokens, our JPMD product, which is initially launched on base. And

that really is looking to then meet the need that we see next, which is to have a bank grade digital cash product that can then be leveraged in the public blockchain ecosystem as well.

COLLEEN SULLIVAN. Thank you. Great. And the way that I've structured these questions, they're really open for everyone. So, I don't plan on calling on any of you, so please just jump in. So, the first one, when we think about tokenized money, so stablecoins backed by different reserve compositions, tokenized commercial bank deposits issued by banks with varying credit and regulatory profiles, maybe even eventually tokenized treasuries direct, how should we think about fungibility? And do you envision a future where we'll need to build new clearing mechanisms or special markets to price these assets?

KARA KENNEDY. I'm happy to jump in on that first. So, I think from our perspective, the products that you listed there are very different products in and of themselves. And so, I think we should recognize that there won't be fungibility between those different types and maybe there shouldn't be fungibility between those different types.

Tokenized deposits and stablecoins share a lot of characteristics in terms of programmability and peer-to-peer transactions, but they also differ in very significant ways. A tokenized deposit has the quality of a bank deposit and so largely if structured correctly should essentially be treated in the same way and have the singleness of money that you have with any bank deposit that is held in a traditional form. And so, we would see that those would be fungible ultimately potentially across institutions, but with that stable value of a dollar that you see same as a bank deposit, but that is different than a stablecoin. They're structured in a different way and they are likely to be used in different use cases, perhaps different client segments that will leverage those products and they will serve a purpose as well, so we would expect to see those coexist.

And then obviously when we get into more of the tokenized security products, whether that's treasuries or money market fund units or otherwise, again those are meeting distinct needs and just as in the traditional environment should be considered different distinct product types.

JENNY JOHNSON. I'm just going to add a couple. We're just talking about a programming language. We have these conferences and we're talking about it. It's a programming language. And it does some really cool things that make it better than some of the traditional rails, so that's great, but there's a lot of conversation about what should a stablecoin -- should they all be a dollar? Money market funds way back when had one break the buck, and it brought a reign of regulation down that have been really good things that control it that it's pretty close to staying as a dollar. Well, why?

If you think about what is risk-free, a risk-free investment is a U.S. dollar. Everybody's kind of agreed that that's the best safest investment you can be. Anytime you add, just like in a chain, it's only as strong as its weakest link. You add other risk to it, it shouldn't be considered risk-free and it will start to float away of which the market will determine it in many ways from the dollar. So, what types of risk do we have? Silicon Valley Bank was not a credit risk. It was a duration risk. So, if suddenly you're holding a bunch of dollars, but you've taken duration, you've just added a bunch of risk to that. The most recent fraud case is Tricolor and First Trust or First Brand, I can't remember, whatever it's called. That's operational risk. They resold the same loans, and somebody should have checked in and made sure that the loans were tagged in a system.

The good news is with blockchain, it actually probably reduces operational risk. So, when we talk about the stablecoins, first of all, not all stablecoins are made the same as far as what the collateral is behind them. And that will determine a lot of what their capability is depending on whether people apply a discount because they think that in that there's additional risk to it.

ROB GOLDSTEIN. And if I could -- it feels a bit like Jeopardy here. I'm sorry. But if I could just echo, we couldn't agree more this is just a technology. And I think where people often get confused and one of the things that we get a lot of pitches at BlackRock from various ecosystem participants, what problem would fungibility actually solve? And is it a problem that's high on anyone's to-do list? And I think sometimes within this space, there's so much excitement that sometimes those steps are skipped. And I think importantly going back to Jenny's comments about money market funds, there are differences between a bank deposit, a money market fund, cash, which is really a stablecoin in its purest form is meant to be digital cash, and other types of investments including short duration. So, when you look at something like short duration treasuries, if you were in the traditional capital markets, it would never be fungible with cash at a price that's guaranteed. The price moves all the time. And I think that some of these concepts, there's a lot to learn again bridging the two universes.

DON WILSON. So, let's see, I will partially disagree. I think that –

JENNY JOHNSON. Good. That makes a panel much more interesting.

DON WILSON. I think that this statement that, "Hey, this is just a programming language," misses what happens when you take a so-called real-world asset and you put it on-chain, and there are different ways of doing that. And if JP Morgan takes a JP Morgan deposit and puts it on-chain, the character of that hasn't changed that much. It becomes a more useful instrument, but there's no incremental credit risk that's introduced into the system.

Now, let's say that there's a Treasury security that matures the next day or something. It's a one-day treasury. And let's say that some intermediary tokenizes that and puts it on-chain. Well, that has different credit characteristics than the original treasury. And so, that goes beyond just

the programming language. There's additional risk that's introduced into the system because of the activity this intermediary took. Now, that's not the only way of getting it on-chain. I mean, somebody could deposit that treasury at the DTCC and DTCC could put it on-chain and I would argue now no incremental intermediary risk has been introduced. And so, the devil's in the details on –

JENNY JOHNSON. Okay, I'm going to respond. It's still a programming language. It just happens to have the application of the programming that introduces those additional intermediaries. And if you think about what this programming language does really well, it does three things really well. It has one source of truth. Guess what? A huge amount of all -- I know BlackRock, Franklin Templeton, JP Morgan, our operational cost, the number of people we have that reconcile data between systems is huge. And then, we've got to do a transaction and go reconcile it with the counterparty. Another expense. This completely eliminates the reconciliation. That's just the application of this programming language.

Number two, it has the ability to execute smart contracts. We do a foreign exchange contract with somebody in Indonesia, we'd probably go to JP Morgan and say, "Could you please be our counterparty because we don't know who they are." Guess what? Atomic settlement, we don't need that anymore. So, it's just effective at how it executes on something that exists today. And third, it has a payment mechanism. And you can argue on the smart contracts how they're valued -- I mean, the stablecoins, the value, but it has a payment mechanism. Again, those are the applications of the programming language that create opportunity.

DON WILSON. Yes, they create tremendous opportunity. One of the questions that Colleen asked is, "Should there be some kind of a central mechanism to make sure that all these things are fungible?" And my answer is, "No, absolutely not." These things are different. They

have different characteristics, and it's important for the market to recognize that. And there are two different questions. One is, "At what price do these things trade?" And the other is, "What is the appropriate haircut to apply to them if they are used as collateral?" Those are two different questions. You could have a bunch of things that all are trading at a dollar because the sun's shining and nothing's breaking, but a clearinghouse and perhaps with the encouragement of the Fed and other regulators could apply different haircuts to them to recognize the different types of risks inherent in these different items.

ROB GOLDSTEIN. And Don, I think in what you just said, one very important component -- and again, I believe there's a lot to learn from traditional capital markets here. A lot of what people are calling tokens are wrapped in such a way that they're really more like a structured product. And fundamentally, I think we know through many decades that not fully understanding structured products is very dangerous. And I think that to create pure tokenized assets that don't have that structural component to it is going to require a catalyst. It may not be the only way of doing it, but it certainly in my opinion would be a catalyst and catalytic towards having some centralized trusted intermediary who could help be the tokenization agent to take your asset from -- I hate the term "real world," but from the real world to this alternative universe. I hate the term "real world" because who wants to take something of value from the real world and put it anywhere else? But at the same time, I think there will have to be utilities that people trust that assist with that at least in the early days because these structured products that are being created are ultimately going to become a challenge.

KARA KENNEDY. I think I completely agree with the points here about the absolute criticality of the structuring of these tokenized products. And in the applications that that we have today, we have embedded the holding of the underlying position within a custodial framework,

which clearly ensures that there is beneficial ownership of the underlying asset to whoever's holding the token at any given time. Now, obviously, that works within our applications for our clients. When we're looking at this perhaps on a wider ecosystem basis, then it is important that we think through who that custodial entity is. And I was interested, Don, that you kind of identified that there is a clear risk difference of having a regulated clearing agency holding that underlying asset and being the tokenization agent versus another providing that wrapper, and I think that is really important when we think about how the regulatory frameworks evolve is ensuring that as far as possible, the token product needs to have the same legal rights and entitlements as the holder would have in the underlying traditional position. Obviously, if it's a native issuance, if it's something that the issuer is putting on-chain, that's much easier to achieve. But if there is an intermediary there, that needs to be in a framework which has the appropriate custodial responsibilities and the oversight to ensure that the holder of that token knows that they have all those legal entitlements that they would have in the underlying product. Otherwise, we definitely will be in a difficult position of having to navigate on a case-by-case basis what the kind of risk profile is and what the legal terms and entitlements are, which is simply not something that's going to achieve that institutional adoption or scale.

DON WILSON. So, I'm going to ask a question that I don't know the answer to. So, Rob, if somebody buys BUIDL on-chain, do they have the same rights as somebody who goes directly to BlackRock and invests in your money market funds?

ROB GOLDSTEIN. It's structured that there's basically equivalence, yes.

DON WILSON. No, as I said, I didn't know the answer.

ROB GOLDSTEIN. But part of the reason why I say is because -- and this is where I think it again goes back to like technology and what problems are being solved in that fundamentally at some point notwithstanding the success of the digital asset universe, people may want cash or they may want cash at JP Morgan or something like that. And obviously, you need to go off-chain to do that. So, you need to convert from a stablecoin -- the token is designed to be converted to stablecoins. And then, the stablecoin again needs to be converted to dollars, so there's another hop. But in theory, it happens much faster than it would if you were buying a traditional money market fund.

JENNY JOHNSON. So, I'm just going to make one -- again, I say it's a programming language, but I love this programming language. I mean, it's very cool. It does some great things. So, Franklin's money market fund is natively on-chain. So, what it can do, I mean, we literally calculate every second a yield and we pay it every day in the account, so you actually see it. That's unlike our traditional money market fund where it was too expensive to do it. You needed $500 to open an account. Our on-chain money market fund, you only need $20 to open an account. And honestly, you're going to be able to trade it 24/7/365. So, that is what this is going to bring. And the cost differential because you don't have all that reconciliation and everything is dramatic and is important. And so, when I say that a hedge fund who can own it for 4 hours 32 minutes and 22 seconds gets paid, that's a really cool thing.

The question is to Rob's point I'm not seeing a bunch of them jumping in and saying, "We need that." But maybe they do. But more importantly, what happens with technology is the first thing we all imagine is only to be more efficient at what you do today. This is going to enable some really interesting, cool, innovative -- and a lot of stuff is happening there. So, I don't want to dismiss those things because it will, and there needs to be an element of catch-up, but it does

some pretty amazing things. And just in our money market, I can see the difference of what this technology brings.

ROB GOLDSTEIN. And Jenny, if I could just echo that, I think one thing that this panel may not have done the clearest job on, this is not even like the first inning. Maybe it's the first. This hasn't started yet. So, global equity market cap is $120 trillion, something like that. If you just really think about this is still so early, so as we're talking about use cases, I would argue that many of the use cases with regard to tokenization today are either pilot-ish kind of projects or they're production projects that in reality have been engineered to be in production or they're very limited applications with certain like digital asset companies doing things with their treasury. There are very limited case studies today. This hasn't even started.

JENNY JOHNSON. And yet, Bitcoin has had more transactions in 2024, I think, than Visa and Mastercard combined. So, I mean, it's massive.

ROB GOLDSTEIN. Yeah.

COLLEEN SULLIVAN. First, I have the easiest job in the world because you guys just ask each other questions, so this is awesome, and I just get to sit and learn.

So, Rob, definitely we are early. Part of the reason I wanted to raise these questions though is it's also moving very fast. We saw NASDAQ file to have tokenized public equities trade on the platform. They're working with DTCC. They think this is going to be ready Q3 of '26. We see the CFTC has an initiative for tokenized collateral and stablecoin being used as good collateral on DCOs, DCMs, and that's why I wanted to raise these questions.

And then, there is nuance within the products. Tokenized public equities, you can have derivatives effectively or issued natively on-chain. And I think it's really important that we think

about what is good collateral, like what do we want coming into our traditional markets and how do we haircut that? Like, how do we think about those things?

And one thing I wondered, I mean, given that we're here at the Fed, with the Federal Reserve having joint oversight of our primary clearing agencies, ICME, Options Clearing Corporation, is there a role for the Federal Reserve to play and helping sort out like what kind of collateral comes back into our traditional markets?

DON WILSON. Yeah. So, I think absolutely. I think that this is a great opportunity for the Fed to lead on this, to be a thought leader. And when it comes to just focusing a little bit more on stablecoins, I don't think that it should necessarily be a binary question. It should be, "What are the criteria for thinking about the haircuts?" And I don't think the Fed should be the one determining the haircuts. The clearinghouses should. But the Fed can talk about the principles that should be used to determine the haircuts.

And so, I think that those should be what is the credit quality and that's both the underlying assets as well as any intermediate risk introduced in the wrapper. What is the liquidity profile of those underlying instruments? And what is their convertibility or the ability to transform them into cash almost instantaneously? And then, what is the transparency? And this is an opportunity for stablecoin issuers and money market funds to compete. Eventually, I envision a world where all of the assets whether it's a stablecoin issuer or a money market fund, that all of their underlying assets are on-chain. And we shouldn't have to wait for the monthly audit to see where the stablecoin reserves are invested. We should be able to see in real-time where those are.

And that, hopefully we see competition towards that transparency. And then, you can look at it and you can say, "Well, this stablecoin issuer decided to put their reserves primarily in

bank deposits. That's probably less safe than a different stablecoin issuer that has it all in very short-dated treasuries." And there can be a discussion about what the haircut implications are for that. They're probably all going to trade a dollar, but the haircut implications are going to be very different.

ROB GOLDSTEIN. So, Don, I agree with that. I think we're quite some time away from that. I agree with that. I also think we need to take a step back. I think there's a tremendous role for the Fed to play. I think it has to start with education. So, as a starting point, some of us -- I know Jenny's definitely in this camp -- we spend a tremendous amount of time traveling the world and meeting with asset owners all over the world. And many of them are among the most sophisticated asset owners on the globe in the capital markets. Not only do they not understand a lot of what we're talking about, but to them it has to actually solve a problem. So, if you're going to start having a little bit of the portfolio over here on this sort of alternate universe, but everything else is over here at JP Morgan, that actually doesn't solve a problem. It creates a problem.

So, there has to be a value proposition, and I think there are still a fair number of people who need to be educated and just some fundamental frictions that need to be resolved to make it easy for asset owners to continue to see their whole portfolio. And I think a lot of times we have these discussions and it becomes very binary between like everything's on-chain or everything's not. We're going to have to be building technologies and building an ecosystem that is thinking of a hybrid solution because that's the realistic outcome for many decades.

KARA KENNEDY. Yeah, I think that's a really valid point around the readiness for adoption and what that really means because I think we've talked about some of the transformational potential of this from an asset perspective, but also that that means moving

away from daily cycles for funding settlement or would mean differences in terms of how data is consumed if you want that real-time visibility. And I completely agree with you that that is something that from a service provider perspective there's going to need to be the ability to move at the speed of the client in terms of for those that want to make more significant changes to their operating models to allow them to really engage with these types of assets, great. But also, there's going to be plenty who are only interested in the investment case. They want to access that asset and they don't want any additional complexity or pain, and there's going to be a need to take that away as well. So, it's definitely going to take a bit of time to adapt. But if we don't find a way to do both of those things, it's going to be very difficult to kind of jump into that end state.

DON WILSON. Yeah. I mean, to the, "Why would somebody do that, why is it worth the trouble?" I think that it's pretty clear that a lot of traditional markets are going to go to either 24/5 or 24/7. And as soon as that happens, guess what? You need to be able to move collateral 24/5 or 24/7. And so, I think whether people want to or not, they're going to find that this is an essential part of how they manage their assets. And I agree there is a world where that kind of hybrid system is more complicated and I think the goal is to make it the least more complicated that it needs to be.

ROB GOLDSTEIN. Yeah. And I think importantly, just trading 24/7 is more complicated. So, it is, "What is the optimal way of creating an infrastructure to manage in that world?"

COLLEEN SULLIVAN. Well, that leads me perfectly into the next question in terms of 24/7/365 trading in the crypto markets. So, so far, we've focused on crypto assets moving into our traditional markets, but I think we also need to spend some time on the reverse. So, as traditional assets like public equities and commodities are tokenized and traded and used as collateral in DeFi, what are some of the issues we should be thinking about?

So, some of the things I think about, fragmentation of liquidity on-chain and off-chain. Are there challenges to using oracles to price tokenized assets accurately? Do we need some form of circuit breakers in DeFi? I'm not sure how we would do that, but it's a question.

How do we ensure -- and Don, I'll definitely start with you, but how do we ensure that centralized and decentralized exchanges don't shut down and not accept deposits during times of market stress? And should we rethink how auto deleveraging systems work in DeFi? And the reason I'm going to start with Don is he published a great piece last week called "If DeFi is the future of TradFi, what did Friday teach us?" And that's referring to October 10th where we saw about 19 billion in liquidations across the crypto markets. So, I'm wondering what are some solutions here? Don, this one I will pick on you to start. And then, I would love for everyone else to join.

DON WILSON. Yeah. So, I was so perturbed by what happened and some of the failures that we saw in the market that I decided to send out my first ever thread on X. So, I don't know, maybe it will all go downhill from here. And so, some of the points that I made, I highlighted some things that happened on October 10th that I think that a lot of people in traditional finance aren't aware of that these things happened. And when you go to 24/7 trading, then you need to go to real-time collateral management, and it brings all sorts of challenges with it. And the time that this kind of flash crash happened was a late Friday afternoon Central time, probably one of the most illiquid points of the of the day and also a time when a lot of people's systems kind of take a break.

And so, some of the things that we saw were oracles became unreliable. So, an oracle is the mechanism that's used to record the price that you're using to measure whether somebody has

sufficient collateral or not. Obviously, that's a really critical thing. And so, I think it highlighted the importance of having really robust oracles. I think the oracles should be properly regulated.

The other thing that happened was some of the crypto platforms actually provided liquidity for the liquidations themselves. And this is kind of one of these practices that I think is just a horrible practice where an exchange has their own market maker on it. It just creates all sorts of conflicts of interest, definitely not best practice, but especially then when that liquidity provider kind of steps in to take the final bit of the liquidated order. And you can see it on-chain on some of the platforms where the first clip of liquidation was sold into the order book, the next clip was sold into the order book, and the final clip was internalized and then sold back into the market half an hour later for a big profit.

And you coupled that with the observation that some of the wallets were closed. In other words, people were unable to top up their wallets, presumably because there was so much activity. But you kind of ask the question of like, "Well, did that benefit the exchange or did that benefit the platform? Did they make more money in the liquidation because people weren't able to top up their collateral?" And all of a sudden, it just doesn't look good. I'm not at all suggesting that that's the case, but it just highlights the problems with these conflicts of interest. And so, that is definitely not what we want to replicate. And that was kind of the point that I was making.

JENNY JOHNSON. Look, the things that happened on that day are things that have happened in traditional finance in history. And it just takes time for the system. Like Binance's pricing system worked until it didn't work because they had one source of pricing and it was probably one that anybody who really looked at it would have said, "That's probably not going to work in times of stress." I mean, these things happen.

This stuff will all evolve as they get identified. In traditional asset management, everybody talks about private markets and the growth of private markets and we need to democratize them and blockchain is going to be the great way as we tokenize private markets. And I always say this potential exists today, but you don't get liquidity unless you have market makers who exist there to create liquidity, which means you have to have an inventory, which means you have to have a system that's in place. All these things evolve. I think inevitably we will go to 24/7. By the way, if you have a Schwab account, you can trade 24/7, and I think less than 4 percent of their trades actually happen after hours. So, it can happen. This is definitely going to be a more efficient way to do it. It's going to be cheaper to do it.

And you need to have the arbitrage between markets. I think Franklin stock is New York Stock Exchange and London Stock Exchange. Guess what? There's people who arbitrage pricing so that you ensure that it stays very narrow. And that infrastructure, the maturity of it hasn't been built today yet. I mean, it's happening. And as it happens, I genuinely believe it ultimately replaces the current rails in the system. It takes a little time to do it, but we all shouldn't forget that there are a lot of big companies that are toll-takers on the current system and are actually incented for this not to happen very quickly. And so, that's going to slow it down too. But again, I think the capability is in the evolution of the market. These kind of days that happen wake people up to issues that you then go and fix.

ROB GOLDSTEIN. But it's interesting because -- and maybe this goes back to the point earlier, the question earlier about the role of the Fed. I think importantly if you had this kind of issue in the public markets and it was about some arbitrage or something, it leads to someone looking at it and actually knowing that tomorrow will be better than yesterday in terms of having supervision of infrastructure, certain standards, market quality, just a variety of things that I think

for the capital markets to have widespread adoption here we have a gap between where we are today and where it ultimately needs to be.

JENNY JOHNSON. Yeah, the challenge is this infrastructure is going to make it a heck of a lot easier to move money across boundaries, and there's no global regulation around it. So, you're still going to have this mismatch than honestly you have a little bit today, but a lot of people follow the Fed. So, you end up in big developed markets having a little bit more standardization.

ROB GOLDSTEIN. Right. But even something, Jenny, going back to your point about whatever exchange, importantly if you think about the number of people who must do reviews of just the basic technology governance of the New York Stock Exchange, I don't know what the number is, but I'm assuming there's a lot of people who do a variety of like technical due diligence on them as part of their regulatory regime. There are certain basic things you could do if you want to transact here.

JENNY JOHNSON. Agreed. But again, I mentioned the two frauds that we see. I mean, I used to do securitizations and like I'm still trying to figure out how you sell the same loans. Like, somebody's got to go in and change the system. Usually, you tag them. So, it happens even in traditional. I think it's harder. I think it will be harder to do with this technology going forward. I think that's the good news about this technology. But the development in the infrastructure doesn't quite exist.

KARA KENNEDY. I think I completely agree with you, Jenny, that this will evolve. And the events of Friday was really -- that is something that is going to focus a lot of minds both in

the crypto space, but it is also going to be an education for any risk managers within any of the institutions that are looking to get into this. There'll be a lot of a lens on that.

I think, Colleen, you asked the question about thinking about that in the context of potentially public equities and securities going into this environment and I think that is really the key takeaway for me is to think about how careful we have to be about deploying securities into these sorts of ecosystems where perhaps those risks are not fully understood or assessed at this point. And so, ensuring we have the appropriate guardrails in place, ensuring that if there are actors who are operating whether that's kind of activity that would otherwise be regulated in the traditional world as broker dealer activity or exchange activity that they are required to meet the same standards and regulations as exists in the traditional space because the capital markets and protecting investors and confidence is paramount. And we know enough from the experiences of the traditional world that we don't need to make those mistakes in terms of experimenting in this space. We need to make sure we go in with the right approach from the start.

COLLEEN SULLIVAN So, I just saw the unfortunate news that we're down to like 13 minutes. I was worried that we had not enough questions and we're only through three of them, but let me switch to audience questions really quick.

So, Representative Foster from Illinois. Great. Two Chicago people here. It seems that most of the new initiatives we've heard about today use permission distributed ledgers, and Representative Foster is asking if that's a trend.

DON WILSON. Yeah. So, the Canton Ledger is has I guess configurable permissioning, if you will. It's has configurable privacy and also configurable permissioning. And so, that's a nice hybrid environment that enables regulated entities to configure whatever levels of

permissioning they need to operate in a regulatorily compliant manner. So, we think that that's kind of the best of both worlds.

JENNY JOHNSON. I was just going to say, look, I had this debate with somebody who today in the room is doing something on the permissionless side, and I said, "Look, we're a regulated entity across the globe. Our tokenized money market funds better not end up in a wallet that hasn't been approved on the whitelist and is AML/KYC or we're going to be in trouble." So, I don't know how you do that without having a certain -- whether it's programmed in the token to ensure that the wallet's clean, I just think that that's a reality.

KARA KENNEDY. Yeah, I mean, I was going to say the same thing. It's a reality of operating in the regulated space. It's something that there's different tools obviously for permissioning. I think there's been an evolution perhaps from private permission chains to looking at how you can enact permissioned environments within the public domain. But the AML/KYC requirements that we're rightly subject to, that's a non-negotiable particularly for institutional players. And so, having the ability to control that either through whitelists or hopefully in time through perhaps more on-chain technology solutions enabling that, I think that is a critical part of how we operate our businesses today.

ROB GOLDSTEIN. And not only -- like, there there's no disagreement, but I would almost take it a step further. This is a luxurious point in time in that going back to the initial point of this as a technology and this being nascent in the relative scheme of things, it's a unique time where you could build with no legacy in a way that should have a more rigorous AML/KYC framework because it's not about having people take a picture of their driver's license and fax it to you. So, I think so much of the narrative is on what could go wrong as opposed to the

principles of how do you build something new that is actually both more efficient and more controlled for the most important elements relative to what we have today.

JENNY JOHNSON. Did you say "fax" and "crypto" in the same conference? Wow.

COLLEEN SULLIVAN. Well, because we're running out of time, I do want to talk about what can go right. So, I would love to hear where each of you think the tokenization space in particular will be over the next five years. Jenny?

JENNY JOHNSON. Technology adoption is always slower -- what was the saying? It's much slower -- what is it? Yeah, but it's like look the first two years I can't really give a term. It's much, much slower. And then, it just takes off and you can't imagine 10 years. That's what's going to happen here. Like, this is going to be one -- first of all, going to these a digital asset or crypto conferences, I am stunned by the number of people who attend, the enthusiasm and the creativity that happens in these places. And I am also stunned to go in on the traditional side and how much they ignore it and say, "Another crypto winter. Not going to happen again. We don't need to pay attention to it."

And at some point, whether you call it a bridge or whatever, you have these pools of projects that are going on. Central banks have been working for a couple years in Asia and Europe on kind of being able to move their currencies on blockchain. And what's going to happen is these things are going to start to connect over time and people are going to turn around and say, "How did that happen so fast?" And anybody who's been living in the ecosystem is going to say, "Are you kidding me? It's taken so much time." So, is it five years that we see the hockey stick? I think so. I can tell you that I have more conversations about this where people

are now inbound asking about it as opposed to us saying, "And by the way, I want to mention one other thing."

DON WILSON. Yeah. So, I have to preface this by saying that I'm usually wrong. I lived in London in the mid '90s and I watched the Bund Futures Pit completely disappear and be taken over by the DTB, which was now Deutsche Borse, the electronic platform. And then, I moved back to Chicago in '96 and I was on the trading floor at the Merc. And I said, "If this place is not completely electronic by the year 2000, they're going to be out of business." And I was so wrong. Of course, eventually, they became electronic. So, I was right in the long term, just my timing was wrong. So, with that preface, my expectation is that in five years from now that every instrument that is traded frequently will be traded on-chain. That is my prediction.

ROB GOLDSTEIN. And I'll take it a step further. I think that a lot of this stuff is not an "if," it's a "when." It's hard to predict if it's 2030 or 2032 or 2027, but I think it's quite clear that if there are $4.5 trillion in digital wallets today, that number is going up, not down, and that that wealth accumulation is going to have the ability to create the whole portfolio in that digital wallet. They'll have access to traditional capital markets instruments like stocks and bonds, and they'll have access to funds that companies like Franklin and BlackRock create. They'll have access to ETFs. They'll have access to model portfolios that will be on-chain, hit a button, automatically happens and automatically rebalances.

I believe these things are a question of when, not if. Someone had asked me the question. I wish I knew how to answer it. They said, "With all of the wealth that's being created in AI, when you look, a lot of the fundraising that's been happening, a lot of it's been primary capital, but a lot of it's provided liquidity to employees." And they said, "What percent of that liquidity do you think is going into a Schwab account relative to going into a wallet?" And I don't know

what the answer is, but I think we all know some material component of that wealth creation is going into wallets. So, it's just going to grow and grow and grow, and this will be another way for the capital markets to grow also.

KARA KENNEDY. Yeah, I think getting the timing estimates right here is always going to be very difficult, but I think just look at how far we've come in a year. We're in a very different position now, and I think we'll continue to see that acceleration particularly in the regulatory environment. To some extent, that was already advanced globally. And then obviously, that has moved at pace in the U.S. this year. I think next year, we'll see significant advancement in terms of commercial bank money on-chain. So, the cash side has really matured and will continue to do so, and I see that as a significant area in the shorter term. And then, I think we will take the next step in that evolution towards some of the things we've talked about today in terms of structuring around more of the securities and asset side, which we'll build. So, in five years, I think we'll have much clearer building blocks for sure that can then start to develop some of those model portfolios and the kind of programmable investment vehicles, which is really where it starts to get very interesting.

COLLEEN SULLIVAN. Great. Ria, should we wrap up or do we have -- four minutes? Okay, great. So, final question, and we've touched on this a little bit. But given that we're here at the Federal Reserve, what do you think the Federal Reserve could be doing to help tokenization grow? I'll close with that.

DON WILSON. Yeah. I mean, one thing I think the Federal Reserve could do is take the lead in putting together a cross-agency task force to help because obviously this cuts across CFTC, SEC, OCC to help think about tokenized collateral and best practices, etc. I think that that would go a long way.

JENNY JOHNSON. Transparency and clarity of regulatory environment is always what's so important for the market. People want to understand what the rules are of the road and then they can build within that. And consistency across regulatory agencies. To the extent that there isn't clarity around that, that makes people fear innovation.

KARA KENNEDY. I think just to add to that, probably the kind of level playing field piece is important. So, thinking about ensuring that we have the ability for regulated institutions and non-regulated institutions to participate on the same terms is critical.

ROB GOLDSTEIN. And I would just echo that I think that having more participation and more I would say embraced participation of highly regulated organizations particularly banks is going to be a dramatic catalyst towards unlocking innovation here. And I think the more that they're constrained or sort of on the sidelines, the harder it is for this to really get scale.

DON WILSON. Yeah, I'll mention two more things. One is thinking about longer real-time growth settlement windows and intraday liquidity for on-chain settlements, just kind of rules around that. And the other thing is there are now rules that at some point in time in the future repo is required to be cleared, and I think those rules were written in a time before on-chain activity was really taken seriously. And so, I think it's important for the regulators to go back, take a look at those things, and make sure that they're not doing anything to actually hamper on-chain repo transactions.

COLLEEN SULLIVAN. Great. And with that, I'd like to thank Kara, Rob, Don and Jenny. I really, really appreciate your time. Thank you. Thanks for coming.

SUSAN FOLEY. Thank you.

[Applause]