

## Digital Dollar Live II

An online discussion between private and public sector thought leaders about the opportunities for Central Bank Digital Currencies (CBDCs).

October 30, 2020

### Speakers:

- [Josh Lipsky](#), Director, **Atlantic Council GeoEconomics Center**
- [John Whelan](#), Managing Director, Digital Investment Banking & Innovation, **Banco Santander**
- [Tom Mutton](#), Director of FinTech, **Bank of England**
- [Chris Giancarlo](#), **Chairman Emeritus, US Commodity Futures Trading Commission**, Senior Counsel, Willkie Farr & Gallagher LLP
- [Robert Palatnick](#), Managing Director, Global Head of Technology Research & Innovation, **DTCC**
- [Kabir Kumar](#), Director, **Flourish Ventures**
- [Daniel Gorfine](#), Founder & CEO, **Gattaca Horizons LLC**; former Director, LabCFTC and Chief Innovation Officer at U.S. Commodity Futures Trading Commission
- [Sopendu Mohanty](#), Chief FinTech Officer, **Monetary Authority of Singapore**
- [Erin McCourt](#), Managing Director, Operations, **Morgan Stanley**
- [Usman Ahmed](#), Head of Global Public Policy, **PayPal**
- [Shelley Swanback](#), President, Product & Platform, **Western Union**
- [David Treat](#), Senior Managing Director, Global Blockchain & Multiparty Systems Lead & Global Technology Lead for Capital Markets, **Accenture**
- [Dr. Ousmène Jacques Mandeng](#), Senior Advisor Economics & Finance, **Accenture**
- [Danielle Martell](#), Managing Director, Banking & Capital Markets Strategy, **Accenture**

**DANIELLE MARTELL:** Hi everyone. Good morning, afternoon and evening, depending on where you're joining us from today. My name is Danielle Martell. I'm the Managing Director at Accenture focused on Strategy and Innovation. I'm pleased to be kicking off today's Digital Dollar Live 2 Event, hosted by the Digital Dollar Project. The partnership between Accenture and the Digital Dollar Foundation to support exploration and advancement of a U.S. Central Bank Digital Currency.

Many of you may have joined us for our first live event in July. At that point, we had recently published our first white paper and Chris Giancarlo, DDP Principle, had testified in multiple Congressional Hearings on the topic. During the summer session with the Senate Banking, Housing and Urban Affairs Committee, Chairman Crapo asked for proposed pilots, which we have since provided, in addition to publishing on the DDP's website.

In summary, there have also continued to be exciting advances in the market in both domestically and abroad. A few points worthy of note. China recently distributed 10 million Yen to 50,000 citizens, via a lottery system, to test effectiveness of a production CBDC. The ECB also recently

released a report on a digital Euro. While no concrete next steps were outlined, still yet another signal that CBDC is being seriously considered versus just a research endeavor.

Also, in the U.S., the Attorney General published a cryptocurrency enforcement framework and the White House also released a report on the national strategy for critical and emerging technologies in which distributed ledger technology was highlighted.

The DDP continues to take the position that a successful CBDC requires partnership and collaboration from both the public and private sector. This was, in fact, in line with Federal Reserve, Chairman Powell's remarks in a recent panel discussion on cross-broader payments hosted by the IMF.

Aligned with the DDP's positioning, Chairman Powell also stated that he thinks it's more important for the United States to get it right than it is to be first, citing key areas where tradeoffs need to be thoughtfully assessed. Recognizing that privacy is one of these key focus areas. In early September, the DDP stood up a privacy subgroup which includes members from our advisory group, in addition to other industry legal and privacy experts, with the objective of establishing a set of principles on how a Digital Dollar could approach this complex and very important topic.

These principles will be reviewed by our advisory group and subsequently shared with the broader public for input, much like our white paper was earlier this year.

We continue to be very excited about the prospect of a U.S. CBDC and are advocating for the next phase of work to focus on pilot programs. Testing key foundational elements through a series of thoughtful pilots will enable the U.S. to continue on the path toward future CBDC.

With that, we have an exciting agenda for the next 90 minutes. First, we'll talk more about the partnership and the project and then we'll have three esteemed panels. First, a global update on CBDC progress with some of our international stakeholders, followed by two panels focused on use cases. First, institutional and wholesale, followed by retail, before we close with final remarks. Thanks again for joining us today and I look forward to the lively discussion ahead. and with that, I'll hand it over to Daniel Gorfine.

**DANIEL GORFINE:** Great, thank you so much, Danielle. So I'm Daniel Gorfine, a Co-Founder and Director of the Digital Dollar Project. It's great to welcome everyone to our second Digital Dollar live event. A lot has occurred in the last couple of months, so we're excited for today's session.

I do think one of the key takeaways from Danielle's update is how we seem to truly be at an inflection point in terms of interest in and activity around CBDC. We seem to be moving from the if to the how or what a CBDC might actually look like in the wild or in real world application.

In the U.S., we are seeing increased attention to this topic, including, as Danielle noted from the Federal Reserve, and I want to underscore that we're starting to see substantial activity amongst regional Fed Banks. For example, the Boston Fed is doing important work in this space and I suspect we're going to talk more about that during today's event.

We view this as great news and we have consistently messaged that we think it is crucially important that policymakers and the private sector alike help to support and advance these efforts. Ultimately, a CBDC project is going to require a big tent approach that incorporates many different views and perspectives, something that we've attempted to do in the buildout of our advisory group, which represents many different stakeholders and perspectives.

This is why we also believe in conducting real world pilots and trials. As Danielle noted, this will give us the empirical data on outcomes that can help us demonstrate the benefits and remaining challenges that exist around CBDC.

So, today, we do have a great lineup of panels that can discuss the state of global efforts, institutional and wholesale use cases for the Digital Dollar and domestic and retail applications. I'll be back towards the end to try to wrap-up what I think we heard today, along with Chris Giancarlo.

But with that, let me turn it over to our colleague, Usman.

**USMAN AHMED:** Thank you very much, Daniel. And hello to all the conference participants and this is an exciting project. I have worked on issues related to the International Monetary System for years and the topic of this discussion is very close to my heart.

I would like to reiterate, the debate about CBDC has changed significantly. During the past few weeks, CBDC has been elevated from the fringes to the core of the International Economic Policy Agenda. Two CBDC issues now seem to dominate. CBDC as an instrument to strengthen payments and CBDC as a vehicle to advance the international role of national currencies.

The former was revealed during the IMF meetings, the previous week when IMF Managing Director, Kristalina Georgieva, stressed that CBDC could be instrumental in addressing key deficiencies in international payments.

The latter was highlighted with the ECB Report on the digital Euro, echoing similar ambitions by the People's Bank of China. This sort of publications by the Financial Stability Board that now offers a timeline for CBDC development milestones through end of 2022 and the BIS call for international considerations to be integral to any CBDC design. The ECB report on a digital Euro made radically propose it that a future digital Euro would have to be had by non-residents, offering an entirely new revenue to international payments, the G20 and of the upcoming Italian presidency will now continue work on international payments, which is said to include CBDC, thus raising the policy momentum.

CBDC will come. It lends confidence to token-based financial market infrastructures and issuers of token-based assets. It has become part of a wider end towards supporting greater diversification in finance by actors, mediums and geography.

We have a fantastic panel to discuss CBDC, covering topics such as global CBDC initiatives, the market for tokenized assets and how CBDC would interact with legacy systems.

Tom Mutton is Director of FinTech at the Bank of England, who very recently in his speech, highlighted that CBDC is a key priority for the bank's work on Fintech.

Josh Lipsky is Director of Programs and Policy at the Atlantic Council, where he recently co-authored the paper on a global strategy for shaping the post-COVID-19 work with a focus on digitalization.

Sopnendu Mohanty is Chief Fintech Officer at the Monetary Authority of Singapore and one of the key pioneers of CBDC at one of the most advanced central banks on CBDC.

We have 20 minutes until lockdown. This is a moderated discussion. To start, Tom and Sopnendu, could you offer your views about recent CBDC related events and what are key CBDC related projects you have been conducting at the Bank of England and the MAS? Tom, why don't you start please?

**TOM MUTTON:** So, thank you, (inaudible) at Digital Dollar. It's a huge privilege to be here with you. I recognize we only have 20 minutes, so I'll try and be super brief and I really mean it. I know that's famous last words.

We've put out the discussion paper back in March about our sort of traditional model of Central Bank Digital Currency in the UK. That was focused on domestic use, particularly in the context of payments. We recognize there's a big prize for international use as well, but really this has to start at home. We have to get things right domestically and make sure we're addressing the payments needs of people in our home country.

So we put forward a discussion paper with a platform model that had a strong role for private players, but also a clear role for public Central Bank provided infrastructure. We're considering the responses to that paper now. We've had a huge response with the right typical level of engagement we've had from right across the range of stakeholders who are relevant to us.

Basically, where it goes from here is two types of questions, policy economic analytical questions, monetary stability, financial stability, all the stuff you would expect, but also, technology issues.

We're going to lay out a roadmap for how we're going to think about those. But one thing that will be absolutely essential in that is collaborating both domestically and internationally, both with other Central Banks, but also, with a very wide range of stakeholders, both official sector and private sector and civil society. Central Banks can't go it alone. We don't have all the answers. Daniel referred to a big tent approach. I couldn't think of a better word to describe it, but is exactly spot on.

So in the UK, really excited about this. I think it's very positive and really looking forward to the discussion today.

**SOPNENDU MOHANTY:** Hi, from Singapore. It's late evening. Let me start saying that I will do no more experiment on CBDC because I've spent three years experimenting this damn thing and I have come to a conclusion that it works. So no more experiments from Singapore on CBDC. We have made a clear paper out there and we have called out that the wholesale currency needs to get a production life and we're quite committed to get it out there. And by chance, if you're not caught up of this news, for a brief second, the BBS Bank told the whole world they're actually putting in an exchange for tokens and they took it down in less than a minute because they just promoted by mistake that whole website of launching that digital exchange. So it created a lot of

noise in the system, but it clearly shows that Singapore is pushing hard and they will push hard strong because we strongly believe the wholesale currency has a clear efficacy objective and especially when it come to cross-border payments, the settlement part needs an answer. The existing framework in technology is not working and we believe also said that this is the answer to the solution. So we got to get that.

In terms of other use cases, the market has responded strongly during the COVID-19. As an example, Singapore launched one of our start-up, launched a (inaudible) of the bond, called E Bond Value. They're taking a bond and made it small bite size using the blockchain network. In Asia, Sir Philip has issued their Treasury showed bonds or I think bonds in a blockchain register. So Asia is marching ahead on the whole production lesson of blockchain. And as somebody said, that China is already out there experimenting with the currencies.

But I'd like to say one thing fundamental, which I think all of us forget. There's one country in Asia, who has actually done a production grade retail CBDC in its true form and that's called Cambodia. I strongly urge to not get lost in what's single person has done, what China has done, all of us should actually go and examine what Cambodia has done. It's the only country in the world which has assured production grade retail CBDC and the beauty of that whole launch is when you go to the web page, it doesn't talk about CBDC. It's a retail payment system innovation. What it says, that retail CBDC is not about a replacement of cash, it is a fabulous RTGS system, cheap, better and far efficient than what we have today.

**USMAN AHMED:** Very good. Josh, I mean we've heard now as some focus on international payments, some more on domestic payments, you have been tracking CBDC developments around the world. What do you see sort of as emerging trends? Where do you see CBDC is likely to have its biggest impact going forward?

**JOSH LIPSKY:** Well, thanks and thanks for having me today and thanks to everyone at the Digital Dollar Project for all the fantastic work you do to move this conversation forward. So at the Atlantic Council and in collaboration with Harvard, we started a Central Bank Digital Currency Tracking Project. And we have now mapped what about 70 countries in the world are doing and just to give you a sense of the acceleration. When we started this 8 months ago, we had about 40 countries on the map. So it just shows you what COVID-19 has done to move things from research to development to pilot so quickly and I encourage every to check it out. We can share it later. And to my colleague from MAS, completely agree what you said from what Singapore is doing and what Cambodia is doing.

So Southeast Asia in general, is a leader in the field that we can look at South Korea and what they're doing. We can look at Thailand and what they're doing. And so, what's so interesting about the trends right now is that COVID-19 and stimulus and fiscal spending have really accelerated the thinking and changed the way people think. And so, one thing we see happening is that central banks are now having to be a little bit more creative about how money is delivered. They need to get money to the unbanked quicker in this crisis situation and they're experimenting and even countries like Russia had previously were sort of saying, well, we don't need to do CBDCs as the governor had said. Even in the last three months, we see the tone changing a little bit.

And one other region I would point out for everyone is Latin America. Not discussed as much as Southeast Asia, but very important. So Uruguay, we know they had a very successful pilot project and they're doing more development. And this has been a little off the radar, but Argentina, just this week, the Central Bank said that the Yuan can now be used in international trade. And that was a big thing for the Central Bank of Argentina to say. Now, obviously, they're just talking about hard currency. They're not talking about digital currency and a digital Yuan. But when the discussions happen in Argentina at the Central Bank, one of the things that made it more attractive for the central bank to agree to usage of the Yuan was the potential for instantaneous settlements of transactions.

And so, you can see the roadmaps being laid out all over the world for the path forward on CBDC and how that's changing the conversation, especially in emerging markets and developing markets and it's the advanced economies as Tom knows and others know that are actually a little behind the game.

**USMAN AHMED:** Thank you. Thank you very much. I mean one has to say that in Europe, as well, I mean we have with the Riksbank, obviously, a key project on the possibility test CBDC with the Central Bank of France as well, very advanced in terms of wholesale applications in particular in an international setting. But I think the point, Josh, you made about how CBDC can equip currency with properties that will make them more attractive, in particular, international transactions is certainly a key issue.

I'd like to switch to the tokenized assets. A topic that we wanted to touch upon. We have seen virtually little in terms of pickup of tokenized assets. And do you think that CBDC could be catalyst to accelerating development of token-based financial marketing infrastructures? Sopnendu, why don't you start please?

**SOPNENDU MOHANTY:** I have told earlier that one of the beauty of CBDC is not only a payment innovation, it's also interesting way to look at how we think about trade. To that, trade has two process. There's a process to pay each other and a process to exchange goods. Imagine a situation where you merge this into a single transaction, both the goods and the payment are merged into one contract and that becomes your catalyst for a tokenized asset. Because the moment that process kicks in, the value of the asset in a tokenized form truly makes it meaningful and a real change in the way we look at assets. So that's one significant shift will make the tokenized asset as a very interesting way of looking at the new edge of asset creation.

The second part is, which I think going to be part of the big shift, especially in the Asian market is that that post-COVID-19, of course, during COVID-19, there's a huge disruption to the supply chain, especially when the supply chain is going through some kind of a decoupling. And now, the supply serving distributed with different places where the infrastructure which required to find the strength are not necessarily available. So there's a transparency issue in the data before we can finance the (inaudible). Here comes an opportunity to start implementing blockchain best platform, tokenized form of to build this of documentation, which increase a better way to do a supply chain financing, not only solving the – which I said before, COVID-19 productivity and the consistency was the big game. After COVID-19, it would be the efficiency and resiliency to get to that state, you need a wider distribution of data provenance, a smarter integration of payment to assets and all this requires us to go through that whole space of tokenized assets.

**USMAN AHMED:** Excellent. Thank you very much. And if you think about that, Tom, London is obviously one of the – next to Singapore, it's one of the largest financial centers. How do you see the role CBDC could play to sort of bring broader diversification and enable token-based financial assets to emerge which could be of particular interest to the city? How do you see that?

**TOM MUTTON:** So I think, well, the mission of the Bank of England is rightly good in the people of the UK. And, first of all, as I think about (inaudible) actually, I think about merchants, I think about businesses up and down the UK and that's why I'm interested in the retail use case. In no way is that to dispute or contradict the importance of the wholesale cases that stuff is laid out and I think there's huge promise there and the huge enthusiastic. But I think the real debate is about retail CBDC and we should remember that this is about improving the lot of our citizens and people in our countries. And I think the Cambodian example given is a really powerful example of that.

I think there is huge gains to be made in wholesale markets, but really our focus at the moment, is on retail. The wholesale financial markets is definitely space to improve back office. We've had our program in the Bank of England to think about post-trade processing and also, CBDC does have a lot of opportunities, but as do other opportunities in whole sale markets. Retail is really where I think it is.

In terms of this discussion, I really want to strongly agree with something that both Sopnendu and Josh has said, which is in advanced economies, we should really look to emerging economies who are leading the way in this debate on Central Bank Digital Currency. We can be humble enough to say that. Actually, we can learn a lot from emerging economies.

We need to be a bit careful about mixing together different types of concepts. So fundamentally, there are two different types of money, there's commercial bank money or privately provided money and the central bank money. Central bank money to retail users, at least in the UK, is only available in the form of physical paper bank notes.

Some of the projects we've talked about today are similar to CBDC, but in my view are not CBDC. They are about commercial bank money being transmitted in new digital infrastructure. And actually, I think that's quite a fundamental question because, ultimately, it is a question of is your money provided by the state or is it provided by a private actor and that's a really important distinction to hold.

But the question which it presents us with is how do we make the most of digitalization, whether that's provided by private players or public players? And my very firm view is when regulated properly, when subjects through appropriate safeguards, private money has a strong role to play, just as much as public money does.

And then my very final question really is, I think the debate we need to have, assuming there's a role for both private and public money, just as we have a role at the moment for commercial bank deposits transmitted via payment infrastructure and we also have a role for bank notes is what's the optimal mix of public and private collaboration. And I think that's why what the Digital Dollar Program is working on is so important.

So, sorry, I didn't really answer your question about tokenization in wholesale, partly because I think there's a bigger prize in the retail sector to go for.

**SOPNENDU MOHANTY:** And just to piggyback to that, I just think we need a strong, very well-established regulated exchange to make it real. So that's the other factor behind to make it work.

**USMAN AHMED:** Very good. And I think it's fair to say, CBDC, of course, is the about central bank money and where central bank money plays a special role is where CBDC will have its largest impact. I have to say, I would tend to believe this is rather in wholesale as we have many, many alternatives in retail. But I see where you're coming from. Now, CBDC would obviously have to co-exist with existing legacy systems and this seamless integration of CBDC with existing banking and payment system will obviously be key. Josh, if you think about that, how could this work? I mean is this CBDC to substitute or more to complement existing payment processes?

**JOSH LIPSKY:** So I strongly believe and I agree with what Tom said. This is about complementing and basically building right now upon parallel tracks, but tracks that we know are going to intersect in the near future. So if CBDCs have to get built, we have to understand how we're going to design them and that has different privacy concerns, depending on the country where they're getting built. There have been design choices. We know they're going to grow with other digital currencies with Lipper, for example. And we have to have our eye on the prize, one year, two year, three years down the road of how these can be interchangeable and how these can work together. So that's how I see this parallel tracks that need to intersect.

But I want to go back one thing you asked at the beginning, Usman, about sort of adoption and the trends we're seeing. The biggest trend I see right now in the CBDC space is that the CBDC conversation has moved outside of central banks solely and it's moved into finance ministries and foreign ministries. I mean I'm briefing the State Department now on CBDC. Something I thought I would never do a year ago. We had a first conversation with them. Their eyes glaze over, but the second conversation they get it because it's a China conversation in the U.S.

And so, this is kind of the C-change that I see in the Western world about CBDCs. And there are risks to that and we have to be careful about that conversation and not make this into some geopolitical power play. But it is the reason there is more attention to this issue than ever before and I think we can use that as people who want to see CBDC adoption to elevate that conversation beyond the central banking community because that's how widespread adoption will actually happen.

**USMAN AHMED:** Absolutely. And I can see that. I mean one of the big challenges for the international economy is the gradual and orderly integration of the emerging market currencies and I think the challenge that we're all facing. CBDC is likely to play a role to be a vehicle for facilitating that integration.

And I'd like to go back to Asia. Sopnendu, you mentioned there's a lot of activity in Asia and ASEAN is looking also at greater financial market integration, in particular, using local currencies. Could you expand a little bit? How could this work? We have in Europe similar initiatives in the Nordic countries with the P27, for example. What role do you think CBDC could play to facilitate financial integration at the regional level?

**SOPNENDU MOHANTY:** That's a very difficult question and the answer to that can be highly misunderstood. So I think there is this desire to create a sovereign digital currency backed by the central bank, perspective central bank. Now, the question is, do you need to build an interoperable foreign exchange system, which would allow different currencies to be exchanged in the most efficient way. Well, there are implications, there are implications because we're to operate in a certain centralized system in many sense and how far countries will go and do a domestic currency settlement is to be watched and observed. I think that's still something to be watched for.

But I think the bigger question, and you asked a second question that what does the Digital Consulate do? And you asked the question of the lens of payment. Today, there are two kind of payment systems. There's a domestic payment system, there's a cross-border payment system. And thankfully or not thankfully, both are not connected. So this actually gives an opportunity for CBDC to not necessarily worry about interoperability. It can actually be a two different system working for different purpose.

On a domestic payment system, the country who doesn't have a good RTGS system or a faster payment system, they can just leapfrog by putting CBDC which I believe all of you go after this, go to Cambodia, look at the lovely payment system. It tells you how to build up RTGS at a fraction of the cost.

If you're doing a cross-border payment, that's a broader question. Less in Asia, there are 10 countries trying to come together to make efficient calls about their payment system. Even if not doing an exchange of local currency, but minimally, minimally, if we're going to use a wholesale currency structure to solve out of the three problem cross-border payment system has. One is end user experience, second is the AMFC of the checking and third is the central bank.

The fourth can be solved by existing technology construct. But the third piece, which is settlement, perhaps works better with a decentralized ledger run by different central bank and they can settle among themselves, the future of corresponding bank can be little more less pronounced.

So this is why I think the RCM relation market will move in the future, it comes to an integration of payment systems.

**USMAN AHMED:** Fantastic. Look, unfortunately, we are almost on the hour and we have a few minutes left. Please offer you sort of final thought. What are, do you think, next steps? Where do you see priorities for the institutions you're working with? What are the trends that you see that we should expect in the very short term? Tom, why don't you start and then, Josh, and then Sopnendu for final words?

**TOM MUTTON:** So, thank you. Well, what do I see as being the future? The future I see is that we have to take this incredibly seriously, make rapid progress. But again, to come at the point that Daniel made, the big tent point, there is no way that central banks can do this on their own, nor should they do it on their own. We can't answer all the questions ourselves. The questions around what do retailers, the merchants, what does it mean for competition, what's it mean for future payment needs, what does it mean for privacy? Those are things which need, as Daniel said, a really big tent. And that is going to be our focus in the UK. It's moving forward with

momentum, but also, with very carefully considered analysis to make sure that we thoroughly explore this and collaborate very purposely and deeply with a whole range of stakeholders to make sure we really understand the issues here.

**JOSH LIPSKY:** Yeah, picking on what Tom said. What I see as a trend and what I hope and what we're pushing for at the Atlantic Council over the next year, if that's some of the world's largest central banks, the Fed, Bank of England, ECB, the Bank of Japan, really move to the next level here and move beyond the research phase into some pilots and collaborate on that and talk about their collaboration, talk about their transparency, talk about their design choices together because those four central banks alone could influence the rest of the world by having this conversation in a more public and accelerated way. So that's something we're pushing for and we hope we see in the next year.

And then what I think overall is going to happen in this CBDC space is that people are going to start adopting it, talking about it and using it in a different way over the next year or two years. And that's because of the extraordinary amount of money that has been pumped into the global economy over the last six months in COVID-19. And so, that has really changed the dynamic. There's just more money in the system than ever before and so, it's the actual perfect time to be thinking about the future of money, when there's more money being generated by central banks than have ever been generated in history. So it's the right conversation at the right time.

**SOPNENDU MOHANTY:** Yeah, just a quick one because they were already spoken everything I need to speak. The two areas which will actually shift CBDC to production grade in my mind is direct finance and the capital market elevation, especially on the fixed income side and the new kind of assets getting part of the capital market, sweeter product. They will change the game. It does make it happen. I think that's the big bet, I have in my mind.

**USMAN AHMED:** Fantastic. Look, I would like to thank you very much, I think, on the last point, indeed. I think CBDC can be a catalyst precisely for this. It is the safest settlement medium and it would lend confidence that token-based financial market infrastructures can offer the same quality or sentiment that the legacy infrastructures can and that should give a huge boost. I can see certain industries benefitting disproportionately. Foreign exchange, I think, is one of them. I hope the city will look at this.

Look, I would like to thank you very much. Our time is up. Thank you to Tom, to Josh, and to Sopnendu for your great remarks.

Next is, David Treat. David is, of course, one of the leaders in blockchain. He is the head of the Blockchain and Multiparty Systems Unit at Accenture and he's also my boss. David, the floor is yours.

**DAVID TREAT:** Thanks, Usman. And just, Sopnendu, Tom, Josh, what a fantastic tour through everything that's happening globally in this space. I think you've left zero room for doubt that this is not an if and when question, it's a now and how. And just incredibly impressive tour through all of the constructs and progress that's being made on a global basis.

I'm incredibly thrilled to be joined now by three friends and colleagues and compatriots in this push to this innovation frontier. And we'll add some additional perspectives on this push to the future of financial systems.

So I have with me, Erin McCourt from Morgan Stanley, who's the Global Head of Cash Management, Cash Settlement and Payments Control. John Whelan from Banco Santander, who's the Investment Bank Head of Digital and Innovation. John, I may have screwed that up. You can fix it. And Rob Palatnick from the DTCC, who's the Global Head of Technology, Research and Innovation. All three of you are pushing this innovation frontier and incredibly engaged, thoughtful and have great experience.

I think in the next 20 minutes or so, what I want to do is explore, again, picking up with the last panel, the value and use case. Let's just start there, just ground ourselves in the value from the perspectives of each of what you're working on. And then get into a little bit of this is not a panacea and it's not all rosy. Let's have that hard discussion around the risks, the challenges, what do we really need to be thinking about as we're pressing these pilot use cases ahead and we'll see where it goes from there. So maybe, just to kick it off, John, let me start with you, John. Besides fixing your title, talk from a Banco Santander perspective and actually, some of your roles outside of industry, just speak for a second around the value cases that you're focused on and your observation of those value pulls and the use cases?

**JOHN WHELAN:** Sure, David, thanks. And regarding the fancy job title, I'm really just an engineer who works for a bank and gets to do cool things with new technologies. So I've been focused on blockchain and DLT going back now to the early days, 2012 for more recently than a bank here at Santander since 2016. What I find incredibly interesting and really transformational is this idea of programmable digital money. That's what's different. The idea that you can attach, potentially attach behavior to money. And whether that money is issued by a central bank or whether that money is issued by a commercial bank in an appropriately regulated form. I think that what this new technology potentially allows is a complete rethink from an architectural standpoint of what the plumbing of the financial system looks like from a wholesale point of view and long before it gets through to retail users.

And it's incredibly interesting from a retail side as well, but those of us who work in investment banks and we're kind of tasked with examining these things. I come at or Santander has been involved in exploring the Central Bank Digital Currency world really since 2016, when we got involved with a version of CBDC that's not quite CBDC, but it's in a related space. It was originally called Utility Settlement Coin. The idea that you could build a fully tokenized blockchain based, multi-currency clearing and settling system for cash obligations that runs 24/7, 365 and offers similar characteristics to central bank money, zero credit risk, zero counterparty risk, settlement finality, with programmability built in and that was a research project. Crazy idea.

I remember myself and a colleague from UVS having this discussion in February of 2016. And we've come a long way since there and here we are talking about Central Bank Digital Currencies with name brand, top tier banks, number one. And also, of course, the central banks themselves. So it's been a long journey.

**DAVID TREAT:** Thanks, John. Erin, maybe let me turn to you next and just talk about your mission at Morgan Stanley around the future of your architecture?

**ERIN MCCOURT:** Sure. So, I think for us, there's – or for me personally at least. I think there are a couple of things that are really interesting, the domestic Atomic Settlement. So as we've seen, lots of our different exchanges, Deutsche Borse, ASX, utilize distributive ledger technology for trading and settlement. The tokenized CBDC could be used for that instantaneous settlement. And I think that's an evolution which is very attractive, particularly in operations. The idea of evolving rather than the revolution.

And then the other one that I think is really interesting is the non-Fedwire settlement idea and I think this is actually really interesting around operational resilience. So could CBDC actually provide a resilience opportunity, particularly for high value payments during a system outage and our regulators are very focused on operational resilience and I think that's rightly so.

But also, we have seen some longer and more difficult operational outages in the payment system. Last week was one. So I do think that this is becoming something that's actually in some rather less glamorous ways attractive in the wholesale space.

**DAVID TREAT:** Thanks, Erin. And, Rob, the DTCC has been on a very public journey for the past several years in this space. Maybe just summarize it and your views on the most important value cases to be considered?

**ROB PALATNICK:** Certainly. And I guess first, listening to Erin, I'm knocking wood, because anytime you're talking about an answer to resiliency, you're challenging the gods. So on DTCC remit is really to provide clearing settlement, asset servicing and information services for our clients around the world, across a variety of asset classes. So we're not a payment service, but we've been exploring the opportunities a new payment infrastructure could provide across the entire range of our services.

So an example is our trade information warehouse, the credit default derivative, which will be moving to a digital platform. It processes a variety of trade lifecycle cash flows. Those with a payment infrastructure could be optimized for netting and settlement.

On the equity processing side, we're currently building an application we call Project Ion, which is going to be a fully functional prototype on a digital platform. The prototype is being built on DLT that's going to provide optional accelerated settlement and it's going to operate in parallel with our production equities, clearing and settlement system.

There's obviously a cash leg to every trade, so the settlement process is going to require that exchange and we had already planned to create an Ion cash token. But it certainly can integrate with a Central Bank Digital Currency token.

A couple of other areas where digitizing assets can make it more efficient to move those assets across trading venues or post as collateral. And we're a wholesales CBDC can streamline the process. But I can really summarize it by saying that we provide a range of services to our clients across those classes and each of them having their own settlement workflow and margin models. So everything is kind of separated into different silos. So it feels obvious that adopting a more efficient payment rail would allow our clients to better manage the liquidity need.

**DAVID TREAT:** Awesome. Thanks, Rod. And actually, I want to bridge something that Sopnendu referenced in conversations, and I know you, Erin, you and I have had. Sopnendu those countries that may have maybe leapfrog their infrastructure and be able to jump straight to a CBDC for RTGS and other core infrastructures capabilities. I know, Erin, you're very focused on how do you future proof your infrastructure? Just talk for a second about your thoughts on that space and how does one approach that and why is that critical as we think about a new technology like tokenized assets in CBDC?

**ERIN MCCOURT:** Yeah, I mean, David, you and I've talked about this. It's one of the things that keeps me up at night and there are a lot right now that are keeping all of us up at night. But we're a bank, we're modernizing some of our legacy infrastructure. And so, personally, this is something that I'm thinking about. I do think we need to all be part of the dialogue. We need to be thinking about the pilots that are out there, how they can affect what we're doing and start thinking about some of those use cases and how we maintain flexibility as we're building in the future.

On the other hand, I also think that a key tenant of the CBDCs need to be interoperability and complementing existing systems, so that there is the free flow of funds between the systems. So when the previous panel was talking, is it a replacement or is it a complement. I'm definitely in the complement camp on that.

**DAVID TREAT:** Yeah, that makes good sense. And actually, maybe just pulling on that tread a little bit. John, just talk a little bit about your observations around how that notion of standards and the key topic of interoperability is developing?

**JOHN WHELAN:** Right. So the last thing the world needs is another liquidity silo. So we're automatically thinking it needs to be complementary to existing systems and to our existing payment systems, but also not just domestic, but ultimately, cross-borders, the systems will need to interoperate.

And one of the things we don't have today, for instance, if you think of RTGS system, whether it's Fedwire, CHAPS, TARGET2, they're really just payments APIs. They're not quite as elegant, let's say as the stripe API might be, but they're just payments APIs. And wouldn't it be great if all those APIs were the same or at least had a similar way to connect? It'll make let's say, banks live's a lot easier from an operation standpoint, from an IT standpoint.

And with regards to standards, I'll give you an example. I'm actually the Chairman of the Board of the Enterprise Ethereum Alliance. David, you and I have talked about standards as being necessary for a myriad of different reasons, whether it's related to payments, financial services or technology standards. Without standards, interoperability will not be achievable. So we need standards and that means sometimes herding the cats, getting everybody in the room together and hashing out some difficult discussions and questions around what are the right standards for these things. But it's been done before.

Swift has a bunch of standards, ELS has standards. There's a lot of standards out there in the financial services industry and this is something we can do.

**DAVID TREAT:** Yeah, and I'll pull on the thread even further. Rob, I know standards and when we throw in open source. You know, just talking about the dynamics of the importance of how the technology develops in this particular space and I know you've got strong views?

**ROB PALATNICK:** I mean the biggest thing with both standards and open source is just doing it and trying things out. Interoperability was given for a good number of years as the reason for the slow adoption of DLT, but it's kind of a chicken and egg thing. You can't have interoperability until you have production systems that are actually doing something that require a reason to interoperate with something else.

So trying things out, letting different interoperability models get exercised in production, finding out to Erin's point, what is resilient, what can survive different types of disruptions and what can't and what usually emerges is the best simplest solution.

**DAVID TREAT:** Erin, let me turn to you then in a slightly different direction. As the operator, the runner, you run a business that can take advantage of this technology. How do you think about the value and potentially the potential to cannibalize your business and how fast you move towards a new model versus sweating the equity investments you've made over time? How do you think about that?

**ERIN MCCOURT:** I mean I think that's a tough question. But we're going to have to invest in some new infrastructure coming up. And so, really, it's a question of where do you think you're going to get the most value in these different use cases. And some of them are out there, right, like France. It's happening in the wholesale space. So I think the inevitable nature of some of that is going to show us where there is value and then, we're just going to have to make those prioritization decisions.

Where your – like we talked about before, where your modernizing now, I think that is a good opportunity. Leapfrogging would be fantastic. I just don't know if we're quite at the point where we can make those jumps. But I do think some of it will be experimental. And so, the more that we have out there where we can experiment and do it in small places and find out what's working, I think that's going to be really important for all of us.

**DAVID TREAT:** Yeah, that makes good sense. On the operational side of things, the operational risks, John, how do you contemplate as Santander's involved in a number of different pilots on different frontiers, how are you thinking about how to address the potential operational risks? What are you looking for in these pilots to create that safety, soundness, security that's required for core financial infrastructure?

**JOHN WHELAN:** Wow, that's a deep topic, David. Look, so I think operationally, for example, if CBDC is for wholesale payment systems rely extensively on the use of cryptographic keys, for instance, we're really going to have to understand fundamentally, perhaps beyond how we handle cryptography and cryptographically safekeeping already with very robust AFMs. There won't be – it's potentially systemic risk related to operational issues, particularly if there's some form of DLT involved, whether it's public, whether it's private, whether it's consortium, whether it's permissioned, etc. This is a new type of architecture that we're still learning a lot about how to keep up and running, what disaster recovery scenarios, etc., look like. I think it's entirely solvable. It's an engineering problem, but it's new. And anything that's new is going to have to take some

time in order to acquire additional scrutiny and maybe we run both in parallel for a while before switching over incrementally over time. That story is yet to be told.

**DAVID TREAT:** Rob, just continuing down the same path, the DTCC, obviously, arguably one of the world's most successful consortia ever or certainly rank in the top five. In terms of your relationship with the clearing participants and your obvious standard and brand around safety, soundness, security, same question, your observations, insights, wishes, for how we develop this in a way that meets the core requirements of the capital markets industry?

**ROB PALATNICK:** Thanks for that question, David, because DTCC really focuses on resiliency first. We're all about operations and execution every single day and making sure the integrity of the markets and the safety and soundness are maintained. We've built this on top of decades, close to half century of trying things out, engineering things, building this technology in a way that it's been battle tested, integrated into operations, dashboards, integrated into schedulers, into monitoring systems and learning systems, everyone knows what to do if something goes wrong at two in the morning, at three in the morning. And everyone has exactly what that playbook looks like and what our resiliency, which our regulators demand that we test on a regular basis looks like from a recovery.

So the starting point is that level of capability, that's been there for decades with that technology. Now we've got a brand new technology or anything to be able to be hardened, that needs to be able to be tried out, can handle the scale, the performance, security, resiliency needs in the market. That needs to be able to scale to hundreds of millions. Really, if you think globally, it needs to be able to handle billions of transactions a day.

A few years ago, we conducted a benchmark with partnering with Accenture to evaluate the performance capability of the technology and it took a lot of engineering, but we were pleasantly surprised at the ability of it to scale, but it was really a pretty simple test in the big scheme of a wholesale use of something like a new payment rail. A real CBDC and a real use of market scale requires a different use – a different set of validation, a different set of testing. So we know that at scale, everything fails. So testing this technology to its breaking point and then pushing it further is really that starting point.

**DAVID TREAT:** Yeah, thanks, Rob. We're in the dwindling minutes here. Just maybe, let me just turn to each of you in sequence. What comes next? What would you advise folks to look for? Obviously, we've got a range of audience here. Over the next period, in terms of either what you're working on or you're observing in the markets, how should people lean in, what should they look for, how to get engaged? And, John, let me start with you.

**JOHN WHELAN:** Well, I run the Digital Assets Program here at Santander and I think all of the banks now have people like myself who are focused on these topics. I think we're going to see continued incrementally more complex digital security issuances. I think we'll begin to see Central Bank Digital Currencies used in some of these real money pilots and experiments and it'll be an incremental set of steps. And there's a ton of work going on whether it's in startups or it's in financial services firms, whether it's in consulting firms. And the thing that's really exciting is that it's like one little community, where everybody is exploring the cutting-edge frontier.

**DAVID TREAT:** And, Erin, let me turn to you next and I'll layer onto the question. And John's referenced it and the prior panel referenced it a few times. The whole nature of public/private partnerships and just the nature of this technology, the same question. What to look for in the next period?

**ERIN MCCOURT:** Yeah, I mean similarly, we're starting to have much more dialogue internally about this. And I think the direction of the discourse is starting to kind of motivate some of this collaboration a little bit more. So keeping in mind these pilots, but also, there's a lot of research going on. And so, I think that's another really interesting place to get involved and some of these collaborative papers that are coming out like the ISDA R3 papers around DLT. So I think there's a lot of different places to get involved and to see, but most importantly, having that internal dialogue at the firm and making sure that people are talking about and aware of and keeping it in mind, even everyone from the business, through application developers, it has to be at the forefront of our minds.

**DAVID TREAT:** Excellent. And Rob, same question to you.

**ROB PALATNICK:** I guess just what I said about interoperability and hardening. We just got to try it out. We have to keep pushing forward. We're building our project, Ion prototype, really to allow ourselves and our clients to try out Atomic Settlement, different models of accelerating settlement to T1 to T0, maybe to real time gross and to see what happens. It's a prototype, so it's going to encourage experimentation and integration with a Central Bank Digital Currency would be a great way to try out some new models and experiment. But there are many challenges and as this thing becomes real, people are seeing those challenges.

We're talking to all of our clients about this project. And, today, there are 200 million settlements this year. It's been high volume and the 200 million trade sides and those turn into about a million settlements after netting. So if you now take away the netting part and say, alright, everyone has to settle everything atomically. That means 199 more settlements. Does that make sense and is that something worth paying for? Does it make sense to prefund everything. If you're settling real time gross atomic and you're buying equities, but you were selling a money market instrument to fund that purchase, how does that work if the timing is different across those different markets.

So creating a real time lab with real transaction copies that people, including our clients, can have real experiments working with the industry, working with our regulators, potentially working with the Central Bank Digital Currency, I think is a great way to learn about what the unintended consequences might be and figure out how to move forward.

**DAVID TREAT:** Excellent. Thanks, Rob. So I hope this was informative and instructive. I always enjoy talking about this topic and with these people. So if I were to just put a bit of a wrapper on it, again, just as the first panel established, I think if you think about how this innovation wave plays out, having the core infrastructure players, the leaders and the businesses that underpin these use cases, there should be no misconception that this is starting here. There have been multiple years' worth of work already underway in anticipation of what a CBDC could do to add to these use cases in these tokenized business flows and the whole notion of digital asset markets. The emergence of even that term of digital asset markets and the formation of those business groups and those roles is just a clear indication of where we're headed. And as I started, I think,

hopefully, everyone's seeing that from an innovation frontier perspective, we are squarely and soundly in the now and how and no longer the if, if and when.

So with that, Rob, Erin, John, thanks so much. I really appreciated your engagement and dialogue and it's always great to speak with you. And at this point, I've got the pleasure of turning it over to Chris Giancarlo and I can't help but to, again, link back to the first panel. Sopnendu, of course, Chris and I actually first started talking about this whole notion of the Digital Dollar Project at the Singapore Fintech Festival more than a year ago. And so, I think it was only fitting to have you here today. And, Chris, thinking about the progress we made over the past year is just incredible. So I'm going to turnover to Chris and a great discussion around the retail side of the pilot and use case frontier.

**CHRIS GIANCARLO:** Thanks very much, David. What a great panel that was. We began the program earlier with a great discussion and I enjoyed Tom Mutton's emphasis on the retail use of CBDC and then (inaudible) position against Sopnendu's discussion about both the wholesale and then the retail efforts that are going on in Southeast Asia. Well, this panel now is going to take the chance to drill down into the retail side of that and I'm delighted to be joined by Kabir Kumar, who's the Director at Flourish Ventures, which is an Evergreen Fund that makes impact oriented investments in personal finance and management tools, challenger banks, regulatory, innovations and other technologies that empower people to foster a fair and more inclusive economy.

Kabir's a graduate of the Maxwell School of Syracuse University. And in addition to Flourish, Kabir serves with me on the Advisory Board of the Alliance for Innovative Regulation.

And also, Shelly Swanback, President, Product and Platform at Western Union. In a role, Shelly advances Western Union's dynamic cross-border and cross-currency global platform to support the company's expansion to multiple customer segments. Previous, Shelly was Group Operating Officer for Accenture Digital, establishing it as a market leader in digital services. And Shelly holds a Bachelor of Science degree in Finance and Computer Information Systems from Colorado State University.

And finally, we're joined by Usman Ahmed, Head of Global Public Policy at PayPal. Usman covers a variety of global issues, including financial services regulation, innovation in international trade and entrepreneurship. And Ahmed is also an Adjunct Professor of Law at Georgetown University Law School, along with Daniel Gorfine, where Ahmed teaches courses on international law and public policy issues related to the internet. He earned his JD from the University of Michigan, his MA from Georgetown University School of Foreign Service and his BA from the University of Maryland.

So thank you everyone for joining us today. And let's start off with the value of domestic retail CBDC as to say from wholesale uses and other. What gets each of you excited about the potential value a CBDC can drive? And maybe, Shelly, maybe you would lead off.

**SHELLY SWANBACK:** Sure. Well, first of all, thanks for having me. You know, I think for me, if I had to pick one use case, if you will, it really is about being able to get public money straight into the hands of citizens. And I think as Josh said, we probably all understand that use case better than ever now given the Covid situation over the last many months and governments around the world trying to get money directly in the hands of citizens. Whether that's for stimulus funds or

let's say, normal benefits, if you will, maybe even disaster relief. You think about being able to get money directly into the hands of consumers in disaster relief scenario. I think that's super exciting.

And I guess the other thing that is exciting is just who knows where this will lead, right. And every innovation leads to another innovation. And so, I think there's a lot to be said about that and I think probably the idea of people talk about financial inclusion and maybe we can talk about that a little bit later. But I think perhaps this could yield better inclusion for some underserved communities.

**CHRIS GIANCARLO:** That's great. Usman?

**USMAN AHMED:** Yeah, let me put a final point on what Shelly is raising and what Josh highlighted when it comes to the stimulus payments, in particular. Twenty million Americans received checks of the 100 or so plus million that received payments from the government. Some of them took as long as 3 or 4 months to actually receive their check. And you can imagine living on the margins, living paycheck to paycheck and waiting 3 or 4 months to actually get the money that the government is saying is yours. That is a serious challenge and something that retail CBDC from our perspective could be really interesting to help fix.

I'd expand it beyond that. You know, Governor Powell has talked about grants for small businesses in the next wave of relief. I mean, again, that would be something that presumably could be done through a CBDC and then, tax refunds. There are tons and tons of bills and payments that government has with individual citizens and businesses. And so, improving that entire system is something that we are excited to understand and see if we can be helpful with.

**CHRIS GIANCARLO:** Thanks. A system that certainly can use some improvements. I saw a statistic that somewhere in those relief distribution, over a million separate deceased individuals received close to over a billion dollars in relief payments and that's certainly not going to stimulate any economic activity, but it's just an inefficiency in the system.

Kabir, from your point of view, what gets you excited about CBDC at the retail context?

**KABIR KUMAR:** Thanks, Chris, and thanks, it's great to be here. I think we also spoke on the sideline with the Singapore Fintech Festival over a year ago. I think Usman, Shelly and I seem to be singing from the same song, so I'm good here. We actually commissioned McKinsey to look at the relationship between government response and digital infrastructure components. They looked at 11 programs, 6 countries. The U.S. is at the bottom of the list. In part because the core public infrastructure, the public infrastructure failed. And so, I think that's what exciting us. The way I see CBDC, Chris, Usman and Shelly, is like the internet. I mean we need it. And it's going to unlock all this private innovation. We don't know what it's going to look like, but we need it and we need that infrastructure investment like we made in the internet many years ago.

There are four areas where I think it's going to make an immediate impact and it's already coming into view based on all the discussion we heard today, non-payments, the distribution of money right into people's wallets and identity as you alluded, Chris, on data sharing and also on the regulatory system, the regulatory reporting and AML system that complements that.

**CHRIS GIANCARLO:** That's terrific. It's funny you mentioned that we met on the sidelines at the Singapore Fintech Festival last year. Well, the festival is coming up again this year and it's remarkable how different it's going to be, what a difference that year has made in Covid. The festival is going to be much more of an online experience, but I'm delighted to be participating. So we'll have to find a way to meet on the sidelines of it once again.

But let's drill down a little bit more into financial inclusion because I think that from it's one of the things that's changed in the last year, in constituencies that hadn't spent a lot of time thinking about CBDC. I think because of the inexactitude of delivering relief during the crisis and the recognition of the 6% of at least the U.S. population that's unbanked and maybe 25% that's underbanked, a lot of folks that hadn't thought much about CBDC are suddenly thinking about it as perhaps a means of addressing that unbanked and underbanked population.

Shelly, can I can go back to you to give us some thoughts? I know with your work at Western Union, populations that perhaps are not considered to be fully banked or have long been a constituent for yours, how do you think about CBDC and how it may be utilized to address some of these populations?

**SHELLY SWANBACK:** Yeah, well, first, I guess the first point is access will be important, right. We talk about financial inclusion, but digital inclusion will be important too because some people that are underserved by current digital solutions, it's usually for a couple reasons. One, they may not have access on a regular basis to smart phone, the internet. They may live somewhere that the access isn't a basis for them. And, two, they don't trust the system.

So I think what's going to be very important for any implementation of CBDC is to create that trust and perhaps, some of these underserved citizens by getting money directly, stimulus money, benefit money, tax returns, etc., directly through a CBDC, that would begin to then establish trust or other sorts of bank or other digital solutions. And so, I think that could have a nice knock-on effect and help from an overall financial inclusion perspective.

**CHRIS GIANCARLO:** It's so interesting that you mention trust because trust is one of the notion of centralized providers of trust and perhaps replacing them with more of a decentralized consensus development of trust is so critical to this new technology. And so, maybe, Usman, I might ask you, as you think about it as PayPal has built networks, trusted networks that people can use to conduct commerce online and elsewhere, how do you think about underserved populations and how CBDC may perhaps provide the trust element that wasn't there for them not to engage in the financial systems to the extent that was the barrier for them?

**USMAN AHMED:** Yeah, look, before I jump in to trust, I'd just say, I appreciate you taking this broader lens of financial inclusion. So certainly, the FDIC survey that found that about 5% of Americans are on bank. The number one reason they're reported as to why they are on bank is they don't have the money to put into the bank. And so, to Shelly's point, if you're getting money directly put in, you're probably much more likely to want to use the system. So there's just an interesting kind of very obvious almost reason there.

But then when it comes to trust and ubiquity and usage, I think now you're talking not just about 5% of people. You mentioned 25% of people under bank, sorry, meaning they've used a non-

bank financial service. But 47% of Americans don't have \$400 in savings. So it's actually a lot broader of the population that needs a lot of help when it comes to financial services.

And so, I think trust is a big part of that. I think usage and ubiquity, the ability to buy stuff online, buy stuff what you need in person, send money to people you need, receive money, like get credit as Kabir was talking about, I think, and alluding to like the ability to add-on services in an efficient and clean way on top of the payments.

That's really where I think what we've been alluding to that the innovation that could be built on top of a baseline payment system is very, very exciting. And, again, that's something that I think we could be helpful with, but I think a lot of players in the financial services ecosystem can plug into this and benefit from it.

**CHRIS GIANCARLO:** Thank you. Kabir, would you want to jump in on the ability to reach underserved populations with this new innovation?

**KABIR KUMAR:** Yeah, we've been talking about the U.S., but they're an estimated 1.7 billion people globally who are outside the formal financial system. And they're outside the formal financial system, but as all of us know, they are using cell phones. And in some countries, they're leapfrogging from basic cell phones to smart phones. So there's a way to reach them. And over the last 10 years, it's actually been technology driven innovations that have brought hundreds of millions of people into the formal financial center. CBDC, I suspect, will play a big part in the next stance to bring people into the formal financial sector.

But I think there's something beyond inclusion and that's what I think Usman and Shelly we're getting at, which is once people are in the formal financial system, is it working for them? And we talk about payments. I think throughout today, we have been addressing sort of from the wholesale to the retail aspect of payments. And the ability to move and sell money instantly.

And this is a game changer to life changer for people who have less money. And (inaudible) has documented how low income Americans could retain over \$10 billion annually in their bank account if money moved faster. Because if money moved faster, they don't need to use check cashers, they don't need to use speedy lenders, they're not subjected to bank overdraft fees. So the power of systems that work better, that are efficient, that are instant, that are real time, with CBDC promises is not only inclusion, but it's fairness, the building of fair financial world that ultimately has the greatest impact and the most vulnerable.

**CHRIS GIANCARLO:** So let's take it from sort of that high level view, down to real practicalities, Kabir, in your investment work at Flourish, you probably see a lot of opportunities, a lot of innovations of a very practical nature. What are some of the trends you're seeing? What are the, perhaps, some of the actual applications that maybe get you excited that you think hold promise for the longer term?

**KABIR KUMAR:** Chris, as I was saying earlier, I see CBDC, the sort of government official part, as well as the tokenized infrastructure, like the internet. I feel it's the next internet element for us. We build the internet, but we never believe in the money. So it's very hard to predict what business models are emerging. We didn't know eBay would emerge and would change the world, for example. But we are actively investing in the private financial infrastructure.

In fact, the private financial infrastructure is driving the frontend retail innovation is getting completely revamped right now. This is all areas, payments, identity, AML, fraud, we are actively making investments in all of those spaces.

And at the same time, finance is becoming as a lot of my venture capitalist colleagues like to say, embedded in all our digital experiences. The XE payments, for example. The ability to get payments, process payments, the ability to get access to credit is being embedded in all these digital apps and all these digital experiences. Again, infrastructure players are driving that.

My view is that entities that have a stable client component in that or have a tokenized component in that, they're going to arguably get turbocharged when CBDC comes into existence. So we are keeping an eye on that. We haven't made active investments in that space.

The other big trend is what Usman mentioned, right, 70% of Americans are still struggling. Actually, 70% of Americans that are financially unhealthy by some measure there, 8 dimensions the financial health network looks at. Disproportionately Black and Brown households. We just did a study that looked at Dig workers, they call it digital Hustle. It's a multi-country study focused on the U.S. Again, huge impact of the Covid crisis, as all of us know, again, disproportionately impacting Black and Brown household.

We are making these infrastructure investments because we believe it will unleash front end innovation. I have due diligence companies that have really interesting ideas to give people access to investment opportunities, give people to access to savings opportunity. As Usman mentioned, new credit products, but they struggle to build and configure those products on the existing infrastructure. They need a better infrastructure to bring those pieces together. Those are the trends that we are seeing to be excited about.

**CHRIS GIANCARLO:** That's very interesting. In our work at the Digital Dollar Project over the course of 2020, when we talk about retail usage, one issue that just seems to come up again and again and again, it's a very important one. It's the issue of privacy and it's the issue of what should be the expectations for retail use of CBDC of the individual for their privacy rights. How similar is it to the use of say the dollar in the cash markets and what's the balance, the legitimate balance of that between the needs of law enforcement and the official sector to monitor transactions for really bad things, money laundering, drug trafficking, human sex trafficking, the kind of things that I think society expects law enforcement to oversee. How do we get that balance right and, perhaps, where would you put the balance in that scale because we do have the ability to choose these balance points as design elements, as we design CBDC, where would you put it? Maybe, Usman, I might turn to that because I'm sure privacy is an important issue for PayPal and it's something you've spent a lot of time thinking about?

**USMAN AHMED:** Absolutely. Let me largely agree with you that it's just a very challenging policy choice because as you highlighted, certainly individual citizen privacy is an incredibly important value, as is making sure that our financial system is not being used for inappropriate terrorist financing or money laundering or criminal activity. And it's an issue that PayPal has dealt with since our inception and actually, this whole concept of tokenization that is so central to CBDC and the broader conversation, that's what we kind of architected 20 years ago to protect people's credit card information or bank information, right. It was setting up a token. It's the same concept

that we're talking about here. So I don't know if I can answer the policy choice. I think the good part is we actually have a policy choice to make, whereas, with other forms of payment you might not have that policy choice.

The last thing I'd just add though is the other dimension to this is as we mentioned, there will be layers built on top of this. And one could imagine a digital wallet provider offering a privacy or a security solution on top of the CBDC that might be tailored to a particular consumer's desire, whether that's to share a lot more information than others or to share a lot less. So I wouldn't look at it purely in the first layer of issuance as an issue. It's actually something that will build out towards the broader financial services ecosystem.

**CHRIS GIANCARLO:** Great. And, Shelly, I might ask you the same question because there too, I think that's something you probably spent a lot of time thinking about at Western Union as well?

**SHELLY SWANBACK:** Yeah, maybe just building on what you Usman had to say, I think there will be different options about how to implement this. I think, ultimately, this will be critical for a CBDC to flourish is to be able to do both. I suppose maybe just taking a bit of a different view, instead of thinking that it's a balance between one or the other, it really is a requirement to do both. I mean keeping the privacy and, obviously, protecting the data of all of the participants in the system is critical, but keeping the bad actors out is absolutely critical. And so, it is to me, it's a little bit less about the balance between the two and more about the implementation I suppose and how you do both at the same time.

**CHRIS GIANCARLO:** Indeed. And also, just before we wrap-up, I do want to talk a little bit about crypto because there's lessons to be learned, I think, from the crypto space that may apply to the CBDC space. And, Usman, I might come back to you on this one because I know PayPal is engaging in that area. Are there lessons, you think, that can be learned from the last few years' experience in crypto and it's growing maturation that might be applicable to the development of CBDC over the coming decade?

**USMAN AHMED:** Sure, certainly. We had some news, I guess, about 10 days ago on this front in terms of launching the ability to buy, sell and hold for specific cryptocurrencies in the PayPal digital law. I think the first lesson is we did it in compliance with existing laws. So having that, as Kabir keeps alluding to, having that regulatory infrastructure and the confidence to be able to offer a product that's going to be overseen is actually very important for the private sector. And so, this broader effort that, Chris, you're leading, is just so important, I think, as we're building this out.

The second piece is being able to have those digital wallets that offer security, connectivity into the individual users, this public/private partnership that's also at the center of what the DDP is doing, I think, is the other key learning that we are taking out of this is how do we build the ability for people to add new forms of payments, money, assets, into their wallet because that's what people want and they want to be able to use different – there are different tools. As we've said many times on this call, I don't think any of us see CBDC replacing all the other forms of payment, they're going to continue to exist because they have uses. So that's really, I think, one of the big learnings for us is how do we continue to add functionality for different users based upon what they need and what they want?

**CHRIS GIANCARLO:** Kabir, would you add to that?

**KABIR KUMAR:** You know, I wanted to quickly talk about the previous question, Chris. I strongly believe that the trade-off is a false trade-off, it's a false dichotomy. We do need to address privacy concerns and, in fact, the timing is perfect. As you know, as a country, we are heading into looking at a national data law of some sort and more importantly, and this is something that's often missed in the conversation, find our laws in the financial sector that govern data are severely outdated. They're a patchwork of 7, 8 laws. They are as one study, just observe the point solutions. They're not comprehensive. They're not cohesive. We need to upgrade those anyway. I mean the Financial Modernization Act of 1999, right, before the iPhone was in an era of the marketing mailers. It was addressing privacy concerns associated with that era.

So we have a huge upgrade we need to make anyway and I think the time is really perfect. I think in terms of the sort of lessons to be learned from the crypto space, the consensus conference, it's kind of interesting, as the years have gone on, it has become – gone from 100% non-regulators, no one was there, to largely policymakers and regulators over the years and that's a great sign. And that's a sign of how regulators are very ambitious about embracing innovation, increasingly and increasingly their ambitions about embracing innovation. And we've been very closely involved. Chris, you're aware of this with Jo Ann Barefoot and the Alliance for Regulation to bring regulators along, not only in the U.S., but globally.

So I'm very confident that the right minds around the table, we can address these challenges.

**CHRIS GIANCARLO:** Thank you. It actually gives me a chance to give a shoutout to my successor at the CFTC, Heath Tarbert, just yesterday announced a revamping of their whole data infrastructure, the appointment of chief data officer, a division of data. I think it's the first agency to do it and it is really the right move. Agencies need to become quantitative analysis regulators. Something I called QUANTREG during my time there and I think that's a really step forward.

But I do want to move back away from privacy and crypto for a second and before we close, it's just really important that we touch upon the issue of remittances. There is close to a trillion dollars in remittances moving around the world every year. A lot of that from the United States. And, Shelly, I want to turn to you because this is an area where Western Union has got a lot of experience. How do you see the impact of CBDC on remittances around the globe and here in the United States?

**SHELLY SWANBACK:** Yeah, well, I suppose first thing is it'll depend a lot about how it gets implemented, I guess, and what sort of demand that creates from consumer, small business and the like. I think maybe just picking up what Usman said a bit ago. I don't think any of us see it as replacing necessarily remittance solutions that are on the market today but, perhaps, creating some new innovations. There are lots of options on the market today, all digital by the way, whether it is transferring money to or from an account, a wallet, a card, even cash in the instance of like our business at Western Union, putting in cash, what are we doing with that. We're digitizing it, so somebody can deposit it in a bank, a wallet, or pick up cash on the other side.

And more and more of these solutions are – they're faster, there's more transparency. So I think ultimately it's going to depend how does the CBDC get implemented and can it augment or improve the remittance products that consumers have access to today?

Now, we've talked a lot about already in this panel, there are many people that don't participate in the more digital products because they don't trust the system or they just don't naturally – they're not naturally part of that financial system. So I think with the CBDC and getting those folks into the system, if you will, could have an impact and a positive impact from a remittance perspective.

So I guess we'll see. Certainly, we're excited about what this could be from a financial inclusion perspective. Obviously, we're also looking at it just in terms of how can it make the remittance process everything from things we've talked about today, the user experience, all the AML, KYC stuff, settlement. If it can make that whole system more efficient, ultimately, that will benefit consumers and businesses.

**CHRIS GIANCARLO:** Yeah, you make a very good point. Those percentages about unbanked and underbanked populations, they're not a monolith. It's a very diverse community in those categories and there are issues in terms of access to financial services, have everything to do with – or have things to do from rural issues where there's not a lot of bank activity or not a lot of broadband access to inner-city communities, to immigrant communities. It's a very, very diverse and, therefore, it's about giving them giving them access points, it's not necessarily – there's no silver bullet to addressing those issues.

And, Usman, is there something that you would add to the discussion of remittances because I'm sure it's something you've also thought about at PayPal?

**USMAN AHMED:** Yeah, look, again, it's really about the speed, the trust, the ubiquity, right. If there's an ability to get money into the system faster, cleaner, simpler than cash, I think people are going to turn to it and I think it will – that's where I see CBDC playing the biggest role is as a cash substitute rather than all the other electronic payments that already exist.

The last thing I'll just leave with to wrap-up from my end. We talked about the 20 million stimulus checks, Chris, and you were alluding to this, 13 million people also received interest tax refunds from the government this is, as small as \$5 as a check. Can you imagine sending a check for \$5? It costs more in the mail and to send than the actual value of the thing and sometimes remittances have that kind of cost structure as well. And so, to replace that with something that actually gets money from point A to point B to the person who needs it, that's what we're really excited about.

**CHRIS GIANCARLO:** Alright, I'm going to do a quick lightning round, folks. So as quick as you can, tell me if we could launch one public/private partnership pilot program say on January 10, 2021, to test out use of CBDC, what would you suggest we do? And I'll start with you Kabir. What should we test?

**KABIR KUMAR:** Government money into people's wallets and complete the chain of transaction with them, moving into a savings account or making a purchase on Amazon or another platform. So we demonstrate the full chain within a period of time. And ideally building on all the technological knowledge already captured at Singapore and London and elsewhere.

**CHRIS GIANCARLO:** Terrific. Usman.

**USMAN AHMED:** I mean certainly Kabir's idea is great. I'd say small businesses are a key part of the payments ecosystem. And so, if we can figure out a way to get them into the system early, particularly minority entrepreneurs who've traditionally struggled with the existing financial system. If there's some way to tie them in through a pilot, maybe in a small rural area or something like that, you could really have a very powerful early pilot for this.

**CHRIS GIANCARLO:** Great. Shelly, what pilot should we do first?

**SHELLY SWANBACK:** Well, I like both of those ideas. I guess, I'll vote for Kabir's idea to start with, going from the government and getting the money directly in the hands of citizens 'cause I think that's just critical need there.

**CHRIS GIANCARLO:** Thank you very, very much, Kabir, Usman and Shelly. It's great. And, Daniel, we're going to hand it off to you. We're ready to go with pilot programs January 10, 2021. Let's get going.

**DANIEL GORFINE:** Excellent, excellent. Well, I want to thank everybody for joining us today. I personally think these have been some of the most insightful and interesting discussions on CBDC that I've heard yet. So I really want to thank all of our panelists and excellent moderators.

So what I'm going to try to do is summarize quickly what I think I heard and I'm going to go back to the theme I set out at the beginning, the moving from if to how and even when. And I think that these discussions really underscore exactly that transition that we're seeing in discussions around CBDC and the potential for real world implementation.

So in the first panel, I think my favorite line of the day was when Sopnendu said that Singapore is no longer testing CBDC because it works. So that was great. He talked about it largely in the wholesale context, but then we heard from Tom from a Bank of England perspective, there's a real focus on the retail side of CBDC. He also appreciated my statement at the beginning that this is all going to require a big tent because of the number of different implications and the ways that a CBDC will trickle through a global economy and all different stakeholders that it hits.

We heard from Josh no global activity, really underscoring actually activity in South Asia.

On our second panel, awesome conversation about wholesale application and markets. Erin talked about instantaneous settlement and the potential of that with CBDC. John really emphasized infrastructure and plumbing and I happen to very much agree with that. I think that a lot of what this is all standing for is the upgrade of our systems, the way we transact, the way we send information about value. Rob talked about real world implementation of DLT systems within the markets and within that plumbing and infrastructure.

And finally, we just heard, so I won't spend too much time because it's fresh in your minds, but we just heard an awesome discussion on retail application and the potential for enhanced access, inclusion, the potential for government and relief being distributed through these systems. And what was interesting is it also highlighted the importance of public/private partnerships and

implementation. We talked about privacy and, obviously, privacy is a major theme. Danielle flagged at the outset that we've created a privacy sub-group to focus on these issues. We also talked about identity because digital identity is a core component or element, especially when you talk about retail application of CBDC.

So overall, found it to be a fascinating day. Really thank everybody for participation. And again, because this requires a big tent, we encourage public participation in something that's truly transformational and has the potential to have a very positive impact on society.

Chris, I think I may turn it back to you, if you have a final word and then we will try to stay true to our time here at 10:30 Eastern time.

**CHRIS GIANCARLO:** Great. So, Daniel, when you and I pegged our Op-Ed in the Wall Street Journal a year ago, this month, entitled, We Could Land a Man on the Moon, We Can Certainly Send a Dollar into Cyberspace. I think we never anticipate the amount of momentum that would occur over the course of that year. And David Treat, when you and I were at Davos last January and announced the launch of the Digital Dollar Project, I think we never really anticipated how much of a catalyst would come about. But the catalyst perhaps wasn't so much all those conversations. The catalyst was Covid. Covid has really sped things up and Covid has brought an important constituency to bear in this conversation. The constituency perhaps wouldn't normally think about things like digital money and distributed ledger technology because this constituency is a constituency that's concerned with social issues. And I think that the inability to get relief to people in a crisis, the inexactitude of using paper money and account space money has really gotten a much broader group of folks - Daniel refereed to a big tent - brought a big tent to bear. And Covid has done a lot of things, but it's really sped up time of trends that might have taken 5 to 7 years are really now accelerating in the course of a year.

And I want to end today's discussion with a prediction. Next Tuesday, we're going to have a major election in the United States and it's going to result undoubtedly, no matter who wins, in a lot of change in public policy, whatever is the outcome. Well, here's my prediction. A year from now, whatever the outcome of next Tuesday, there will be still more development, still more enormous activity around the world on CBDC. I predict there will be no slowing down whatever the outcome of this election, both in the United States and around the world. And right now, there's a number of, you might call them, Pelotons moving at the central bank level and we discussed some of them today, certainly the Bank of England, the Banque de France, certainly Singapore, Japan, South Korea and others are in that first Peloton. I would say the United States probably is in the middle Peloton at this stage, not out in the first one, certainly not in the last one and somewhere in the middle Peloton.

But the thing about Pelotons, if you ever watch racing, they still need to keep up with that first pace Peloton. There's a lot of work to be done here in the United States to keep pace with that front Peloton. And it can't be done by the official sector alone. The right approach is a big tent approach. The right approach is public and private sector partnerships. That's the way the United States has always done big projects and that's what the Digital Dollar Project is here to do to bring that private sector involvement, energy, enthusiasm, the ability to do big projects fast on time and finance them and bring the energy and enthusiasm of the private sector to bear. So we look forward to continue our work with the public sector, to explore a central bank digital currency and stay tuned to the Digital Dollar Project has a number of projects underway. One in particular,

our work on privacy by a new privacy sub-group of the Digital Dollar Project will be presenting early in the New Year on their work in the field of looking at privacy issues related to a U.S. digital dollar. And there's other work underway that we'll be announcing in the coming months.

So thank you very much for today. It's been really a great program. We thank our participants and we thank our audience for joining us and we look forward to speaking to you again soon. Thank you everyone.