Alessandro Cocco: Welcome to Lasalle Street: Financial Markets Insights, the podcast of the Financial Markets Group at the Federal Reserve Bank of Chicago. I’m Alessandro Cocco, and I lead the group. Today we are featuring a panel on climate change risk in financial markets, Advancing the Conversation 2021. This quarter, we plan to release a few new podcasts. We plan to cover climate change, clearinghouse risk management, and fintech. Look out for our podcasts on our website, ChicagoFed.org, and everywhere you get your podcasts from. And don’t forget to check our episodes from last quarter, where we talk with global thought leaders about fintech, CCP risk management, and U.S. Treasury market structure. This panel discussion was first released as a webinar on January 14, 2021. The views expressed in this podcast are the speakers’ own, and not those of the Federal Reserve Bank of Chicago or the Federal Reserve system. And with that, I hand it over to the host of this episode, Nahiomy Alvarez. Nahiomy is a senior financial markets analyst at the Financial Markets Group at the Federal Reserve Bank of Chicago. Nahiomy, over to you.

Nahiomy Alvarez: Thank you, Alessandro. I appreciate the great introduction of our group, and welcome everyone to our first webinar of the year. As Alessandro said, I am the senior markets analyst in the group, and I’ll be serving as the host and moderator of this discussion today. With me virtually today is a panel that I am thrilled to discuss this topic with. We have Anita Herrera, the general counsel and chief regulatory officer of Nodal Exchange. We have Christopher Palazzolo, the Head of Responsible Investment, AQR Capital. We also have Steven Kennedy, the Global Head of Public Policy at ISDA, and Steven Rothstein, the managing director at Ceres. Steven R., can you kick us off with your thoughts on how climate change risk has impacted global financial markets to date?

Steven Rothstein: Sure, thank you again for the question, thanks again for hosting this. So, climate has affected us in a number of ways. First is that the risks are growing exponentially. And there’s different kinds of risks. There are physical risks, fires, floods, hurricanes, and we all know those numbers are growing dramatically. You know, this year we had ten times the number of acres burn than we did a year ago. We also had 29 named storms, and things like that, so physical risks. Second are transition risks, transition risks caused by dramatic change, i.e., a pandemic or a change in regulations, carbon pricing Alessandro mentioned as a possibility. If carbon pricing, for example, is put in place in the next four years, that would have a dramatic impact on those. So there’s physical risk, there’s transition risk, there’s legal risk. The second big area we can talk more about is regulatory response, there is dramatic regulatory response, some in the U.S., and all over the world. And third, there’s new opportunities in green financing. So we can talk more about all of those, but I’ll turn it back to you now.

Nahiomy Alvarez: Thanks Steven. Chris can I ask you to share your thoughts on how climate change risk has impacted global financial markets to date?

Christopher Palazzolo: Thanks, Nahiomy, so what I would like to comment on is the demand side, what I see from investors. I speak to many of the leading investors worldwide and I can see there’s been a discernable shift in focus on to climate change and how they can help in that regard. So we have been seeing new things, like climate pledges to reduce carbon emissions by certain dates, there’s a few
different organizations leading those types of pledges, and we’re seeing more questions about how that
can be implemented. And it’s quite a complicated topic, we don’t, I think, have time to delve into every
little aspect. I will note though that we just published a paper on this topic called Carbon Voyage, which
is available on our website if you are interested in the details. I’ll try to touch on some of the aspects
later in this call, but I think the implementation side of climate reduction, climate improvement, and
carbon reduction targets is the big shift that we’re seeing. Especially led by Europe and parts of Asia.

Nahiomy Alvarez: Thanks Chris. Anita, let me turn to you.

Anita Herrera: Thank you Nahiomy. Ah yes, to follow up on Chris’s comments, it is true, we are the
supply side with the exchange. So where Chris mentioned too, that much of this movement has started
in Europe, in fact, we got into environmental products as a result of EEX acquiring us, which is in
Germany where they have been focusing on environmental products for a while now. And so we are
responding to the demands of the investment community and the actual industry itself as they are
looking for ways to hedge their climate change risks in order to continue to be viable institutions. We
are also responding to the investment community as a whole, those that are, as Chris is mentioning, are
responding to the investment community as a whole, looking for more responsible investments in this
space. Thank you.

Nahiomy Alvarez: Thank you. So we’ve touched on this growing recognition of climate change risk on
the transition side, on the physical side, changing investing practices on the demand side, and then a
response on the supply side. Steven K. do you want to add anything else to these remarks?

Steven Kennedy: Yeah sure, I just want to sprinkle a couple data points out there. One, and I want to flip
your question around. The question was, how has climate change impacted financial markets, let’s talk
about how financial markets are impacting the climate change discussion. And I think that the big story
is that I think the financial markets are embracing their role in climate change and transition to
sustainable and greener economy. Whether that’s helping firms raise capital, or that’s developing new
risk mitigation strategies innovations, there’s a big role for the financial industry to play in this process.
There’s been a lot of talk about risk management and how to incorporate climate risk into risk models,
and I think we would agree that, at least at this point it is less about whether the asset is green or
brown, but about what the risk of the asset is, and if there is a correlation between greenness and
brownness and risk, then capital should be allocated appropriately. That discussion’s becoming
mainstream, we’ve seen the Fed join in, NGFS Network for Greening the Financial System, we saw two
reports, Voluntary Scaling of Carbon Markets, the CFTC report, so I think the financial markets are
embracing their role in climate change which I think is important. The other thing, real quick, product
innovation, we’ve seen a lot of that, we’ve seen sustainability with derivatives out there, we’ve seen
virtual power purchase agreements, which are basically commodity swaps, that enable green energy
producers to have a stable supply of revenue coming in, so there’s a lot of seeds that have been planted
from a financial innovation standpoint which I think will bear fruit in the future.

Nahiomy Alvarez: Absolutely, and thank you Steven. I’m glad that you touched on some of those things
because it does, I think, nicely capture some of the developments we saw in 2020. Of course, 2020 was
also the year of COVID and a pandemic unlike one we’ve seen before, or at least in recent years, so this
is a question maybe for Chris, Steven R, but then anyone else who would like to comment. Do you think
the COVID pandemic and the sort of the discussions that unfolded in markets as a result of it impacted
the climate change space at all, or do you think these sort of conversations are happening in their silos
and not directly impacting each other?
Christopher Palazzolo: Um it’s hard to say exactly. I will point out obviously that what we’re talking about here are long-term trends, so one year is not going to change the overall picture very much. However, it was an interesting experiment. It’s obviously not easy to have a complete downward shift in demand for travel and therefore an extreme reduction in pollution and carbon emissions, so we did see a discernable change in that, and I think it proves the point that there could be policy and political pressure to actually reduce the demand and the output from fossil fuels. So I think that’s an interesting data point and I think it’s worth studying that in greater detail this year. There’s other things that I think obviously came out of this crisis, there was a lot of examination on social issues and how the COVID crisis may have exacerbated some of those, including both health effects and socioeconomic breakdowns according to both race and status in work environments. So I think what we have to do is focus a little bit more on understanding what the actual changes might be from a travel and a usage standpoint and how we can change that. I think this is a good example where we’re meeting quite efficiently on a virtual platform, but also I think we have to look much more carefully at the social side of things on health and wellbeing and try to examine how socioeconomic factors are playing themselves out. And it seems they are doing so in unequal ways in many respects. So I think those two things are going to be quite a big focus in 2021.

Steven Rothstein: This is Steven, and I completely agree with everything that Chris said and the social inequities he highlighted, agreed. To the point, first is that I think this highlights that nature doesn’t wait for one crisis at a time, for instance, while we were facing COVID we also had the west that was literally burning, we had hurricanes, we had floods, so that you can’t go, I’m going to get to this when we have time, we have to deal with it when Mother Nature wants, number one. Number two, I think it highlights the importance of scenario analysis in planning because, you know, if someone had asked a banker two years ago, do you have plans for a pandemic, probably most of them at least wouldn’t have had plans for at least this level, and because we didn’t know this was happening. But we do know that climate change IS happening. There’s a lot of data about it, unfortunately, so we know the problem is happening, the question is, what are we doing to solve it? That the regulatory agencies and the banks overall do a great job looking at risk, but this is like risk like any other risk, so why not get into the details of climate risk just like currency risk, or market risk? My last point is, as challenging as the current situation is, and it is heartbreaking to all of us, and our lives and livelihoods, we now have a vaccine, and the coming months will get better. There is no vaccine for climate change, so unless we make systemic changes, we know it will get worse and worse. Back to you.

Nahiomy Alvarez: Anyone else want to jump in on this one? And I love that, there is no vaccine for climate change, that is a very important point to note. Anita and Steven K, let me turn to you. So this is a nice segue into what we might expect for 2021. A lot of these trends were of course impacted by the pandemic but it’s sort of hard to tell which ones will stick, and which ones were sort of transitory, so Anita, do you have any views on what we might expect for 2021?

Anita Herrera: Well you know, what’s interesting is that I’m seeing it mostly from the power side and because of the shutdowns, industry essentially also was, reduced its level of power usage for example. So that we’ve observed that there was more of a flattening in the need to hedge power products, at least for the, in the short term. This of course, we see that this is something that changes as we are looking more longer term, and this is part of the planning process. So that’s just where we’ve seen that impact from that, it really is something that on our environmental products, we’re just seeing more and more demand for it, because there is increased need, and just observing more that climate change is having a very dramatic impact and that to Steven’s point that there is no vaccine and so that it is merely trying to manage this risk going out long term.
**Nahiomy Alvarez:** Thank you. We’ll certainly talk more about how some of these products might be used from a risk management perspective briefly, but I want to allow anyone else maybe on this question of what might we expect in 2021 based on what we’ve seen so far?

**Steven Kennedy:** One of the biggest questions in 2021 is what is the Biden administration’s plan in the area of climate finance? We know that former senator, former secretary Kerry is his climate czar, so it will be interesting and important to see you know how the administration rolls out their strategy. And secondly, how does that align with what the Europeans are doing? They’ve been hard at this work for several years, I think we’ve responded either alone or jointly with other groups to 19 different ESG consultations over the last few years. I think we’re all looking for some kind of international coordination and alignment on how the different jurisdictions approach it. And which leads to my last point, is which I think it’s a question of standardization. I think standardization is required at these innovations to scale, and really to transform you know, the markets and the standardization would come in the form of both disclosures and in definitions of different types of products. So those are three areas that we see as being important.

**Christopher Palazzolo:** If I can just comment, I think I would bring it back to, from my perspective among investors, bring it back to implementation. So I think through 2020 there’s been a lot of analysis and thought. The 2020s is going to be a lot more about putting, you know, where the rubber meets the road. There’s going to be a lot more thought into how to translate pledges into action and how to deal with complexities. You know, derivatives is a good example, where that not at all a problem that I think has been completely solved, how to think about derivatives versus individual assets, so there’s a lot of thought, a lot of careful consideration that investors are going to be taking and I think that’s a good sign because it means it’s leading towards significant action. And I think there’s going to be 100s of billions of dollars moving around over the next couple of years in response to climate change specifically, if not over a trillion. So I think we’re going to see major moves in markets. It’s hard to predict in what ways, but I think the overall theme is going to be highly connected to sustainability and ESG.

**Steven Rothstein:** Right, and I would agree with my colleague, and just to go, to emphasize a little bit more. First is climate disclosure, and I think we’re going to see a lot of activities in ‘21, including driven by the SEC but there are many other federal agencies that are involved, from PCAOB, and Municipal Securities Rulemaking Board, and others. Clearly the new appointments, the announcement of Gary Gensler at the SEC, and what’s going to happen with the Fed, and the others, those will be critical benchmarks, but I also would highlight the state regulators, the state insurance commissioners, the state banking commissioners, they are playing an important role, some have already made some big pronouncements, and I think you’ll see a lot more in 21-22.

**Nahiomy Alvarez:** Thank you. I think this question of standardization is something that is of special interest to me at least. So, as Alessandro mentioned earlier, our group focuses on exchange traded markets and futures. This question is for Anita, who is representing the exchange perspective. Could you talk to us a little bit about how you think about climate change risk; is it like other catastrophic risks that clearinghouses and exchanges consider, or is there something sort of fundamentally different from your perspective?

**Anita Herrera:** That’s an interesting question, as to whether we view any of this type of climate change risk as being any different, I think that from the exchange perspective, where there’s a risk that demands a product, we look for ways to solve it. And, but there are certain commodity risks I suppose, for example water—I believe that the CME has introduced a product in water futures that has received
some criticism because there’s fears of inviting the speculators—from an exchanges perspective you need the speculators in the market in order to provide liquidity. So this is, as an exchange, we look at the product and see, is there a potential appetite by the speculators, because that’s, it’s needed along with those who are looking to hedge their particular risks. From our perspective we view if, as long as you have those two parts, it plays a critical role in being able to provide the hedges that the industry may need in order to meet their climate change risks.

Nahiomy Alvarez: Thanks Anita. Does anyone feel especially motivated to respond to this question of not just water futures, but what specific products we might want to develop in response to this emerging crisis?

Steven Kennedy: If we look at just, derivatives right, you can’t raise five trillion dollars of capital and allocate it towards a sustainable economy without having risk management tools. You can hedge a green bond, but then it’s your straight swap, but that’s an interest rate swap and that can be cleared, so that’s not a problem. But when you start getting into more bespoke products, like what we call sustainability-linked derivatives, okay, and sustainability-linked derivatives is a derivate in which the floating rate payment is tée’d off to some KPI and the counterparty would pay more or less depending upon the performance against that KPI, like how much solar energy it uses, so to speak. And those transactions aren’t cleared, they can’t be cleared right now, and there are a bunch of them out there. We did a research paper in which we catalogued probably two dozen of them. But there’s no standardization in the KPI, so the metric that determines what the floating rate payment is keyed off of changes from contract to contract. It’s similar to doing an interest rate swap off, say LIBOR, or not having a standard metric against which the interest rate swap is measured. So I think at some point, for those types of things to scale there needs to be some kind of standardization and then perhaps they could be cleared. There are other things, like these virtual power purchase agreements, which are basically fixed floating commodities swaps, and they give say a wind farm, stable source of revenue, they give a corporation a renewable energy certificates, those are always going to be bespoke, and you can probably standardize terms to make it a little bit more legally efficient to transact them, but I don’t see those ever being cleared. So it really runs the spectrum.

Steven Rothstein: I’ll just add briefly on the question of the risks, that climate, unlike some other risks, is very much of a systemic risk. Meaning it doesn’t just affect a company that’s on a coastline or something else. There was an analysis done by SASB, the Sustainability Accounting Board, and they identified that 72 out of 79 sectors of the economy would be affected by this. We’re going to have tens of millions of climate migrants. People won’t be able to either live or work where they are now. So it will affect all of us. And that’s where I used to go into the risk analysis, the chief risk officer needs to be looking at this at every business, every bank, every insurance company.

Nahiomy Alvarez: Great. I want to hear your views on what role markets and the public sector can play in managing this risk in 2021 and onward, and then any sort of concluding remarks that you have for the folks that might be in attendance today.

Steven Rothstein: Net zero by 2050 or 2040 goals, which is great. Investors are starting to do that, but we work with a group of international investors that in December collectively had about 9 trillion dollars of assets under management, and they committed to going to net zero by 2050. So investors and companies need to have a critical role. But also the regulators do. That the United States is taking some great steps, with what the Feds set in November, joining the Network for Greening the Financial System, but we’re way behind. There are 85 members of the international consortium, and we need to do more
of both—all of our federal regulators, the SEC, FDIC, OCC, the Fed, but also the state regulators. I think there will be a lot of activity at the federal level. Who knows what Congress will do, there might be policy activities, that would be good as well, but then the private sector needs to continue to show leadership.

Nahiomy Alvarez: Thank you, Steven. Steven K?

Steven Kennedy: So I think, part of the question was, does the public sector have a role to play in this? So yeah, here’s the thing, I think if you ask our members, which we did, you just say “will incentives be required to raise the trillions of dollars in capital that will be needed to build a sustainable and greener economy?” And the answer is yes, incentives are going to be required. So then the next question is, what do those incentives look like? Okay, and we talked about one before, an incentive from a capital standpoint, but then you start getting into moral hazard issues, like you start incenting certain types of assets, and then you get a plethora of these assets, and that leads to some risks. But are there other types of incentives. There are other, and there’s a whole measure of fiscal policy tools that regulators could potentially use as incentives to help raise capital, and that’s what I said before, it will be interesting to see what the Biden administration comes up with in terms of their game plan, to catch up with Europe as Steven said. Which the U.S. has been, totally lagging behind.

Nahiomy Alvarez: Thanks Steven. Chris?

Christopher Palazzolo: Yeah, I’ll just follow on both of those comments. I think, so first of all as a consumer of data on behalf of investors, we look at pretty much all liquid markets globally. I think the first and most obvious thing for us is availability of data, data transparency, and I think the role of government is to enhance both those things. So, from our standpoint, we very much believe in market forces, and markets will clear at efficient prices assuming information is accurate and available. One of the challenges in, for example, climate change is the lack of standardization and lack of availability of this data. Not only across global markets, but even within single markets like the U.S., it’s clearly not available among all public equities for example. So you know, we’re big sponsors of CDP, FTCFD, we want to make sure that the reporting and the standards that come out along with SASB all are moving in the direction of more transparency and availability. Our belief is that with that information, investors will make more accurate decisions, and allocate capital efficiently. I will again touch on something I said earlier, and Steven Rothstein mentioned climate pledges, you know getting to a net zero target is not going to be an easy feat. And that’s part of reason why we wrote that paper “Carbon Voyage,” so I encourage people who are interested in that topic to look at this. But getting to a net zero target without the right information is going to be extremely challenging. It’s even challenging WITH the right information. So I guess my perspective would be for policymakers is if that they could just focus on whether to outright require, or at least encourage that standardization, along with a public-private partnership in this area.

Nahiomy Alvarez: Thank you, Chris. And Anita?

Anita Herrera: Yes, to follow on these comments, standardization obviously is a very key tool for us in order to be able to provide the products that can be traded and cleared. And this has been our goal essentially, we want to be able to provide those products and we look for ways for standardization. When it comes to our relationship with our regulator, the Commodity Futures Trading Commission, the CFTC has a commissioner right now, commissioner Behnam, who has very strong feelings towards some environmental products being able to provide some mechanisms to hedge against climate
change, and now with the change in administration, we would expect to have more of this kind of an impact coming from a regulator which we welcome. I know it’s also been discussed about the green collateral, and that as a clearinghouse we collect collateral obviously to clear products, and when it comes down to green collateral, it really comes down to the basic risks in our regulations of credit, market and liquidity as to whether we could accept green collateral. And to that point, much of that could be driven by the types of incentives that could be provided from the public sector, from the government, on these types of products so that there could be more, or a greater sense of reduced risk on holding that type of collateral.

Nahiomy Alvarez: Thank you, Anita. So this is a question that ties into something that the Chicago Fed has been interested in exploring recently, which is the impact that low to moderate income communities face, and so sort of plug for Project Hometown, I encourage you guys to go out and check out the webinars that have been posted over the last twelve months or so. But to any of the panelists, what are your views on how the financial sector and some of the tools that we discussed today might be able to help some of the communities that traditionally might not have been able to benefit from some of the products we have out there today?

Steven Rothstein: Well I’m happy to jump in. First is the point that you made, that climate justice is racial justice, and racial justice is climate justice, that individuals in our community that are affected with discrimination on economic issues are also facing power plants in their neighborhoods, lack of parks, lack of public transportation, etc. But then there are a variety of ways from the currently noticed on the community investment map, and there are critical issues there. There is important work now being done on the increasing risk of floods, and both the Federal Reserve, the Federal Housing Finance Agency, FEMA, and at the state insurance level there is so much happening, we see those numbers grow dramatically, not just on the coast, but even from inland areas. So the risks are larger, and that we have to look at areas, and then on opportunities, because most low income folks don’t have the opportunity to own their own home, things like community solar, and how do you have solar if you don’t have your own home, or rent. So, there are great market tools out there, and we have to expand those tools and recognize the challenges.

Nahiomy Alvarez: Great. Question specific for Anita, could you please give an example of green collateral, and maybe this is a question for you as well, which products do you see as being the biggest accelerators of repricing green versus brown risk.

Anita Herrera: You know when I was referring earlier to green collateral, obviously those would be bonds that are used to provide the funds necessary to develop a green project. And so when I refer to that I mean that there are these projects that are getting bigger and bigger throughout the country, clearly more of them in Europe, and in order to ensure that there is an active investment community feeding those projects, that’s where the incentives would come in. Certain incentives that would ensure that the funds would always be available, and that those bonds would always be sustained throughout the life of that term.

Nahiomy Alvarez: I think you touched on sort of the foundational question there but let me let you off the hook here maybe with a larger question for everyone else as well. Do you think that rating agencies properly account for climate change risk across assets and communicate sufficiently clearly their climate related ratings?
Steven Rothstein: The short answer is no. I think the rating agencies are doing a lot more than they did five years ago, and I give them credit for the deep analysis, but no they’re not. And it’s also not in, um, there’s some sectors they are focusing more on this, like oil industries are spending a lot more time trying to understand it, but useful debt is just one example of it, it’s a four trillion dollar a year market that is very opaque. We think there are a number of actors that the accountants, the rating agencies, and the stock exchanges just as three, all have an important role to play in addition to the regulators.

Steven Kennedy: Yeah I know that our members want the rating agencies to, you know in a recent member survey we did they told us they want the rating agencies to focus more on climate risk in their credit ratings. It doesn’t particularly surprise me that they’re not that far along, cause I think we need to get further along in terms of the disclosures I think that companies are making in terms of climate risk. So I would expect that they would improve that in the future.

Nahiomy Alvarez: Great. So with the ongoing concerns about global warming and issues of water scarcity, do you have thoughts on the profitability of investing in water as a commodity? So Anita mentioned earlier, that some of the products are used for hedging and Steven mentioned the importance of having these tools to raise the capital we need to transition. I think this question is getting more to, you know, fundamentally we expect to have issues of water scarcity, is there a risk of having some of these scarce resources tied to potential use for speculation?

Anita Herrera: Well the one thing I would say about that is that, without these types of tools you have businesses, agricultural businesses, that cannot plan long term. And to the extent that you have a balance between those that need these types of tools and the speculators, I don’t see an issue. But this is where I would say the economists may have a better perspective, but from an exchange perspective, we’re looking for ways to assist the industry, any particular industry, in this case it would probably be the agricultural industry seeking to hedge their longer term risk in water. Particularly with climate change which has become so unpredictable, and that, I admit that the fact that it is so unpredictable on the one hand does demand a hedging tool, but it also does, could create an environment that could be damaging. But that’s, I’ll leave that to the economists to comment on.

Nahiomy Alvarez: And even though I work in economic research, I am by no means an economist, so I’ll have to kick that to my colleagues. I think most of you mentioned something about the work that is being done in other countries that is related to climate change risk and how the U.S. is behind, are particular policy changes, or things that stand out to you as things that the U.S. should do as well?

Christopher Palazzolo: I can just comment first. One of the markets where I see a big sea change in terms of regulatory requirements is in the UK, where there’s, starting this year, a major shift in what pension plans have to report as their climate exposure, so I think that’s one of the big things. It’s not a specific recommendation in terms of what any investor needs to invest in or do, but it is requiring that the information be reported. That obviously leads to renewed focus on that issue and probably on allocation resources. I think in the U.S. we haven’t seen anything like that so far, so that would be my first question to the regulatory community, is that, should there be any kind of increased requirements for transparency among certain investors about what their climate exposures even are.

Steven Rothstein: I agree with Chris, Ceres did a report on this last summer, it’s on the website, Ceres.org, with 50 recommendations of what financial regulators should think about doing, some that have already been done. But following up on Chris, there are many individual areas, but there’s two big buckets. The first is, as Chris said, is climate disclosure. And that is critical. There are lots of examples
across Europe and different areas, New Zealand has some, Canada, are a variety of examples, and what the SEC does. But then other federal agencies have a role. There’s potential legislation of this. What size of company would be affected, how quickly they get implemented, all those are critical issues. So climate disclosure is number one, and the second big area is credential supervision. For banks, and looking at stress testing, and scenario analysis, the training of bank examiners so that from the Fed or others, to look at climate areas. So credential supervision, and then monetary is the third area.

**Nahiomy Alvarez:** Any final comments on this question?

**Steven Kennedy:** Let me just add, I think I would agree with everything that Chris and Steven just said, but I’ll note a couple other things. One, the EU has been engaged in this effort, developing taxonomy, a green taxonomy, and you know disclosure statements for non-financials and what not. And you know, it doesn’t need to be perfect, the U.S. doesn’t need to perfectly align the initiatives, right. But at least there should be some realization that, let’s be aligned where we can be okay? As opposed to having totally separate, a separate stream of issues. And maybe the close coordination between the U.S. and the EU will improve what the EU does and what the U.S. does. But especially with regards to credential supervision, we saw governor Brainard at the end of the year note, in the last Fed Financial Stability Report, their expectation that risk models would be more climate focused. And I think that there is a serious attempt by financial institutions and others to start to do that. But I don’t think we want to start imposing incentives or penalties until we are able to really have a true understanding of the data and the risks. You know, somebody mentioned before, brown risk green risk. Okay, you know, the risk of an asset is the risk of an asset independent of whether it’s brown or green, right? There could be brown assets that are less risky than green assets. And I’m not saying from a public standpoint, you know the policymakers might decide to create incentives based on whether something’s green or brown. But I just think we need to become careful when it comes to credential supervision, disclosure yes, standardize it, make sure it’s out there, whether it’s the SEC or it’s the bank supervisors. A better appreciation of how data correlates with risk before we start changing credentials and capital stance.

**Nahiomy Alvarez:** Thank you. So I just have a couple of questions, and I think that will conclude the session for today. These are a little bit more specific. So, one question is, how can we develop derivatives to transfer long dated risks like transition risk? You know, this is a question that I thought about at some point, especially in the context of climate change being perceived as sort of a long-term risk. I think some of those views have changed over time, but welcome to disagree with folks. To reframe that question, can we develop products that can transfer more longer dated risks associated with climate change, or should we focus on the near term?

**Steven:** I think the World Bank has already started doing some of that, I think they worked with the Philippines and Maldives and whatnot to figure out how climate risk might affect specific geographic areas and develop some hedging programs to mitigate the impact of climate change. So and I think some of that is ongoing you know, and I think there’s different types of structures and different types of vehicles for how that might get done. The question is whether it can be done at scale. I don’t think we know yet, but I think people are interested in trying to find out.

**Steven Rothstein:** I agree with what Steven said, but I also think the answer is that we have to, what used to be considered a long-term risk, the pace of change is happening so much faster. It’s happening so much faster on the technology side, it’s happening so much faster on the product side. And, again we go back to the question you asked earlier about the pandemic. We’ve learned things that we thought a year ago were impossible could happen, and we’ve seen that. So, how many on this call would bet that
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in the next four years there would be some kind of carbon crisis? And if there is, that would have a dramatic impact on our markets overnight and even if it’s a timeline to build it in, so yes I think we have to deal with not just the short term risks, but plan for the long term, because we know that they’re coming. And the one thing we know about Mother Nature is that we can’t stop it. We can plan for it, by mitigation, by that planning.

Christopher Palazzolo: I would add that, the availability of more products that would allow hedging and investing in, for example, carbon and climate change, would facilitate the greater use of them. So for, you know, example, if climate futures become much more prevalent, more liquid, and more widely used, those would be tools that would be of greater importance to asset managers like us. Often times with these types of strategies there are some futures that we’ll use but they can often be of limited use due to liquidity issues or just market size. So, the greater the market size, the greater the liquidity, and information transparency, the more they will be used and the more we can implement longer term hedges, as you asked.

Anita Herrera: And I would say, I just have to say that I agree with everything that everyone has said. And coming from the exchange perspective, that’s exactly what the function of our exchange is, to try to develop products that can gain the liquidity necessary to sustain them, to accumulate the data on such products, and related products, to be able to develop that type of hedging mechanism on a longer term basis. We see this as an ongoing process that we have to engage in, and it’s, well it’s good for our business anyway.

Nahiomy Alvarez: All right, with that I would like to just thank our wonderful panel of experts. We hope that you guys continue to produce some of the great work that you’ve referenced. If any of the audience members are interested in the links to those pieces, reach out to us on our website, or LinkedIn, we are happy to pass that along. And yeah, we hope that this conversation continues in a productive manner this year, and we’ll be continuing to do research in this space. So thanks again, everyone for joining, and we hope you have a great rest of your day. Bye everyone.

Anita Herrera: Thank you very much.