



Unedited Event Transcript

Fintech, Disruption, and Financial Stability

Anders Borg (World Economic Forum), Daniel Heller (PIIE), Bertrand Badré (BlueOrange Capital) and Sarah Bloom Raskin (Former Deputy Secretary of the US Treasury)

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Karen Dynan: Welcome everybody. Glad everyone could come to our discussion of "Fintech, Disruption, and Financial Stability." I'm Karen Dynan, very recently having joined the Peterson Institute, and I'm going to be chairing today's session.

So we have a really interesting program set up for today. Anders Borg, chair of the Global Financial System Initiative of the World Economic Forum, will be giving the lead-off presentation on a new project they're doing reviewing transformation in the financial system, what some people are calling the Fourth Industrial Revolution, with the aim of finding balance between financial stability, innovation, and economic growth.

As people here at Peterson, of course, know, Anders was minister for finance for Sweden from 2006 through 2014 and chief economist and administrative director of the Swedish Moderate Party over that period as well. Among his many current roles in addition to this role at the World Economic Forum, Anders is deputy chairman of Kinnevik and advisor to Citi.

Our second speaker is going to be my colleague, Daniel Heller, from Peterson who today released a brief on how policymakers and central bankers should be thinking about bitcoin and digital currency as more broadly. Daniel has been at PIIE since the start of this year. And before that, he was head of financial stability at the Swiss National Bank.

Prior to that, he was the Secretariat of the Committee on Payment and Settlement Systems at the Bank for International Settlements and executive director for Switzerland, Poland, Serbia, Azerbaijan, and four central Asian republics at the IMF.

Then two discussants are going to offer comments on the presentations as well as their own views on the issue, first that will be my former Treasury colleague, Sarah Bloom Raskin. Sarah served as deputy secretary of the Treasury between March 2014 and January 2017. I relied with her for that entire period and it was a pleasure working with her. Previously, Sarah served as governor at the Federal Reserve Board for several years. And before that, she was commissioner for financial regulations for the state of Maryland.

And then Bertrand Badré will wrap up. He is CEO of BlueOrange Sustainable Capital which he founded in September 2016. Prior to that, he was a visiting fellow at Peterson for six months so another member of the Peterson family. And before that, he was managing director for finance and chief financial officer for the World Bank Group.

So that's introductions for you. And with that, we are going to just launch right into Anders' presentation.

Anders Borg:

Thank you very much. I will basically present the work that we have been doing in the World Economic Forum and the task force that we have set up on the future of the Global Financial System.

My own background is I've been head of the ministry of finances in Sweden for eight years. I've done a period at the Central Bank. And I've also been a banker. So I've actually also done more than a decade as an investment banker. So I've been in all of these sectors being a regulator and also in the private sector.

So the group that we have done the work with is quite heavily oriented towards the policymakers. We have Mark Carney. We have Min Zhu. We have Raghuram and [inaudible 0:03:48], people out of the IMF and different jurisdictions from the emerging markets from Europe and from obviously also at the US. On the private side, we have Larry Fink, Dan Schulman of PayPal, Douglas Fink from HSBC, Axel Weber from UBS, and Eric Jing from Ant, the big Chinese Alipay, owner of Alipay, and Ellen Richey of Visa.

So it's a combined group of private sector tech companies and also policymakers. And we have done a number of working seminars together with probably all of the major central banks ranging from ECB to Fed to Bank of Canada, Bank of England, and so forth. So that is the kind of starting point and where we are.

So for us, this is basically a part of a broader work that the Forum is doing on the Fourth Industrial Revolution. So we have 10 different initiatives working on the new industrial sector on food security on a number of items that are intermingled in how the digitalization is changing. We are now focusing purely on banks, insurance companies, and also on the impact on the whole financial sector.

So what are, our conclusions? Well, first and I think everybody understands this today. We are going to see a tremendous amount of change in the financial sector. Already, we have surveyed some 10,000 different tech companies that are active in this space. Many of them have growth numbers that means that they will have a transformative rate impact on the economy going forward.

We think that one of the main conclusions is that there are major benefits of this transition. The costs of the formal financial system will be reduced substantially. A number of people that are served will increase. And the quality of the services will improve.

To reap those benefits, it's important to have an enabling perspective. That's maybe one of our most important perspectives. Some of the central banks that we have worked with particularly some of the Europeans have been very much in the space of how can we regulate? How can we prevent? And how can we stop this development? And I think to reap the benefits, it's very important to have an enabling perspective.

Our third conclusion is that there are some major risks here to financial stability. We spent quite a lot of time on this issue. And it's pretty clear that going forward in the next financial crisis the fintech dimension will be important.

I think the major impact would probably come on the traditional banking sector. Profitability will be reduced substantially. Competition will be increased. Barriers of entry will be reduced. And that will push the traditional banks into behaviors that could create risks not the least in terms of credit bubbles and reduced liquidity.

Our fourth conclusion is that there are a number of steps that central banks and regulators can take to both enable facilitate and to control this. So enabling and controlling, I think, are the two keywords that has come out of our work.

If you look at the number of companies that are now active in this space, you could basically say that everything is disrupted. The client relationship; new actors like Amazon or Google or for that matter, Alipay, are trying to own the banks' clients. In terms of products and services, we are basically seeing new actors in all of the different spaces. And also, we see that some of the traditional financial resource management are changing very rapidly.

So one of the insights, I think, is that banking is basically a digital industry. And almost everything in this industry can be disrupted and changed over the years to come.

We have had a lot of discussions on what is driving these changes. And I think the first conclusion was basically that there is a lot of dissatisfaction among the clients. The Bertelsmann Foundation did a survey for our World Economic Forum meeting in Davos last year where the millennials were saying that they were preferring to go to the dentist to go into their bank. So there is a lot of dissatisfied clients out there.

And at the same time, there are enormous costs for society of formal financial system. And most of these challenges have a cost differences that is in the neighborhood of maybe 70, 80, or 90 percent if you look at asset management, money transfer, or some of the others. It's a huge cost difference. And the ability for society to save resources here is very big.

This is also a very profitable industry. So at one of the meetings, we had asked the traditional banks to summarize their view. And they were saying, well, you know these guys they are going after our most dissatisfied customers in the areas where our profitability is the highest. How can they do this to us? And that's actually how disruption works. If you have dissatisfied clients that you make a lot of money out, well, they will not be your clients in the future. And that I think is what is driving this change. But the banking sector has excessive profits in many areas and excessive costs and that can be changed.

If you look at the different sectors where we are going to see change, I would like to point to a couple of areas where we already see very large shifts. One is if you start out with retail and small business, on payments the shift has already happened. If you are out in the rural areas in Tanzania and talk to women that previously have to keep their money in a coffee jar and walk miles and miles to be able to buy some fish to bring to the market under tremendous risk are taking out just a mobile phone and transfer via MPSS system or Tigo Money or some other system.

So it's already clear that on the payment side this is happening. Alipay is now serving 450 million clients in China. The work that we have been doing at the Forum with the Indian government has introduced some 252 million people into the financial system in India. And I think over the last five years, it's almost half a billion people that has come out of the

informal sector and into the formal banking system.

So in terms of payments, we are seeing a huge change. And let's remember that Alipay is a QR code mobile-based system. There is no bank involved and there is no credit card involved. So obviously the change here can be different in the US and Europe and in the emerging countries. But on payments, the traditional banking system is going to be disrupted over the next 5 to 10 years. And whether we will have a global system called Alipay or whether we will have some other system, it's an open question. But there we can see the transformation going on big time.

A second area, which is transformed very rapidly—and let me say just to remind that the cost level for Alipay is 1 to 2 basis points per transfer when the US bank is closed to almost \$1 in terms of equivalent cost. So it's an enormous cost difference between the two systems and when you have those kinds of enormous cost difference that you will have a lot of change.

A second area is actually asset management and wealth management. Here you have small robo-advisors growing. The big shift will not be that BlackRock and Bank of America will be turned out of business. It's not likely that you will have the alternative robo-advisors getting more than maybe 5-10 percent of the market.

But if you look at the announcement from BlackRock the other day where they were saying that they were now cutting back a fifth of their managers and cutting their fees rapidly, I think that is the first and strongest response that we've seen in this sector that the incumbents want to change early because change is coming.

If you look at the Betterment and Wealthfront and the rest of them, their fees are around 10 to 15 points to have close coverage. They have large margins at 25 basis points in fees. So we are going to see asset management costs being reduced very, very rapidly. And also it's quite likely that we are going to see an improved service for people with savings in the neighborhood of \$10,000 to \$20,000 dollars. So, ordinary people are going to get much better service for a substantially lower cost. And that obviously is going to reduce the returns in that sector.

Also if you look at deposits and SME lending, there is a huge number of challengers that are moving into this area. It's very traditional banking. It's taking care of depositors and turning that into short-term credit, very little leverage, and therefore in the short term at least not big risk. But it's pretty clear that change is coming there. Also when it comes to cross-border particularly, I think, when it comes to corresponding bank, remittances, and [inaudible 0:13:48] payments, we are going to see a lot of change coming.

So if you then look at the benefits of this system, what is it that we can really achieve? Well, first of all, it's pretty obvious that the fact that we are now including half a billion people into the formal financial system is a benefit. The pace here is still very, very rapid. I think we are including something between 50 and 75 million people a year going forward. So the change is really, really fast. And we are seeing new technology setting a new standard. In terms of services and asset management, I think we've for decades seen the banks overcharge for services that are much more passive management than active management. And that I think is going to change in the period going forward and also in credit.

One of the biggest advantages here is that we are going to see a lot of cost reduction in the traditional banking system. If I look at the Nordic banks, all of them now set the target of reducing the headcount with around 5 percent per year. We saw the Norwegian bank, DNB, cutting half of their offices over the last two years. And I think if you look at Europe, the last two years we've lost around 100,000 jobs in the banking sector.

So if you have a sector which is reducing its headcount between 1 and 3 percent a year, well in a decade or so this is going to be a huge shift in the financial sector and also obviously in benefitting society because these are very qualified people that will get back into the labor market. And these resources will be more efficiently used in other spaces.

So we have better access. We have lower costs. It's also likely that we are going to see better risk management coming out of this because the more digital their financial system becomes if it's smartly regulated that will also mean that we know much better where the risk ultimately is in the system. So the complicated process of disentangling Lehman Brothers and many other banks during the crisis is probably going to be much faster and much easier if we do this in the next financial crisis. We're also going to see quite a new number of companies growing and becoming very important players.

So one of our main conclusions that we've pushed to the central banks and I would underline particularly the European central banks is that this has to be an enabling perspective. The central banks and the FSAs and the treasuries of the world will have to think through how can they reap the benefits and get the fast transformation in their country because there are benefits here. And there is no societal value in safeguarding the incumbents. So, one of our main policy conclusions is enable this. Find ways to understand and to cooperate with the sector.

So let's then focus on the risk carrier. We've spent quite a lot of time here, and we've done quite a lot of surveys together with a number of different central banks. And there are risks here. One should be very clear about this.

If you start out with maybe the most tradition one, the risk of a credit risk: bubble. I think the mechanism here could be we are not seeing that at the present. If we look at the consumer lending or corporate lending at this time, it is a very old style of banking with very little leverage. But if the competition is increasing, this could be a transformation where the pricing power of the banks are being lost. And that could imply something very similar to what we've seen in other sectors being disrupted.

The newspapers are one example. There's no proofreading anymore. You just set on the web exactly what you've seen as a news. And in banking, this would imply that the risk function or risk control functions will come under pressure when profitability goes down. And basically in our studies, we are saying something like 20 to 30 of profitability going to be wiped out by increased competition. And in that environment, it will be a strong pressure to increase lending.

There's also a risk on financial market volatility here. If we have more and more automated trading in [inaudible 0:18:29], it is quite likely that volatility could increase in crisis situation particularly given that we also have a liquidity problem in the overall markets when a lot of the proprietary traders and interbank markets are functioning less well than

they did.

We also think that there is a risk going forward when it comes to maturity transformation. If the banking system becomes much, much disentangled and you basically have kind of almost old style of banking that could create a liquidity risk because when credibility goes there can be a lot of pressure on the system.

A fact that I would like to mention here which has come out very strongly from the bank CEOs is that they perceive cyber risk as an increasing factor in this area. If most of the banking system becomes digital, the cyber risk can increase substantially and that should be underlined.

Given that we have now been looking in different jurisdictions and the message so far is that we have kind of a green light but some long-term orange light. I think that is kind of where the regulators should start their perspective.

In the next 5 to 10 years, it's pretty clear that this sector will grow and that that will also be an important part of the next crisis. Let's remember that the subprime sector in the US was only 10 to 15 percent of the mortgage market and still it created a huge problem. So even if the sector is not going to be bigger than that, it can potentially be a factor.

So what can be done to mitigate this? Well, we think that in the short run having said that enabling is a necessary starting point for central banks, there has to be a close control. There has to be increased cooperation between private and public sector. Almost in all countries, there is a need for some type of industry council where banks, tech companies, central bankers, and regulators can talk to each other.

There is a huge cultural divide between the tech guys and the traditional banks and the regulators. And all of these three needs to talk to each other and to understand the cultural differences. We would think that it would be worthwhile for the FSB to set up something on a global scale to set standards and to understand the issue. But on a national level, this is also something that should be done.

It's also very important to understand that we need better data here. This is an area where people are talking a lot and you do surveys. But the hard data is often lacking. So I think it's very important to set standards and demands for data collection so that we can actually know how the system is changing. And we basically think that a lot of this could be done by traditional actors. But it's very, very important to have systems where we open up for the new partners.

So to try to wrap up and not go through all the details in this presentation, I would say three main conclusions. There are large benefits in a global financial system for reducing costs, improving access, and improving function of the system.

But having said that you should have an enabling perspective, the risks going forward on a 5- to 10-year perspective are there. And therefore, control is equally important. And part of that in the short-term is that when you're enabling it you also have to have better systems to collect data and to understand how the interaction between traditional actors and the fintech disruptors will go on.

So green light enable; yellow light in the sense that this is going to be difficult in the long run and that has to be the regulatory starting point. So thank you very much.

Daniel Heller:

Good afternoon. It's great to be here. I will talk about digital currencies and the implication for central banks. I think Anders' presentation set the stage really well. Fintech is a huge topic. There is an infinite number of startups. There is a lot of money pouring into the field. There's a lot of talk about disruption. But in a way, no one really knows where the journey will go and where it will end. But it's clear that financial intermediation as we have known it will not be the same a few years from now.

Anders also mentioned that mobile payments huge developments there that also lead to more financial inclusion. And while it developed the area of payments a little bit more in all direction, mobile payment is one area. But the area of digital currencies is another one that potentially may change the way we do payments. And some people even think that digital currencies will replace sovereign currencies like the US dollar, the Yen, the Euro.

In my talk, I will mostly focus on bitcoin because bitcoin is the largest digital currency that we know. And also once you understand bitcoin, it's pretty easy to understand similar schemes. Having said that, we should also know that there's really a lot of digital currencies out there. Some sources say 600. Some sources say 900. But it's a huge number. Before we go into digital currencies, I would like to—hold on a second.

So let's talk quickly about how we make payments today. For instance, we all have to pay DC Water once a month. So the way we do it, the payer on the left sends an instruction to his or her bank, bank 1. Bank 1 collects all of these payments and then on the two-way format the payments through a retail payment system that is typically called an automated clearinghouse. The automated clearinghouse again collects all payments it receives from participating banks.

Nets them out and sends settlement instruction to the central bank where the amounts, the funds, are transferred between the accounts of the banks. Then the central bank sends back an instruction, a message to the clearinghouse, saying all transactions have been settled. The clearinghouse sends a message to bank 2 which then informs DC Water that I have paid the water bill. So you see this is reasonably complex. There's a lot of intermediation. There are banks. There are clearinghouses. There are central banks. And the process takes one day, maybe a little bit more. So it's reasonably complex. If we have a look at a credit transaction, it's even more complex.

So, here come digital currencies. Let's start with a definition. I took the definition from the Committee on Payments and Market Infrastructures at the BIS. The definition is digital currencies are assets that are not a liability of any individual or institution, nor are they backed by any authorities. So it's not like a deposit with a bank where you have a claim on the bank. It also not like a bank note maybe claimed on the central bank.

So, digital currencies are assets. They are not a liability. They're not on any balance sheet. In that sense, it's very similar to an ounce of gold. An ounce of gold is not a liability of anyone. You own it. It's your assets, but it's not a claim on anyone. But in contrast to commodities, digital currencies have zero intrinsic value. So it's just a file, a digital coin, that represents the value. But there's no other value than that. In that sense, it's very similar to a bank note.

So now let's turn to how payments work in the digital currency world. Here, this is the description of the bitcoin system is represented by the blue cloud here. In this system, you have participants, again, payer and payee people who own bitcoin. And then you have a number of what is called miners in the rectangles below.

These miners, they have two functions. The first function is that they validate the payments pretty similar to what my bank is doing. But also they keep a record of all transactions very similar to what the automated clearinghouse does. So all these miners they keep records. As you can see, it's many, many miners. That's why it's often referred to the distributed ledger technology.

The market to mining is open, meaning everyone in this room can become a miner if he or she wants to become one. All you have to do is buy a piece of hardware, a processor, and also download the software which is open source and is for free. And I will talk a little bit about how mining works later.

Now in a nutshell, how does payment processing in bitcoin work? I've said there are two stages. One is the record keeping and the other one is the validation. So in bitcoin, all transactions are collected for 10 minutes. And then are sealed off in a block, in a file where all transactions are part of. The system gives its right to create an official block to one of the many miners. And there are clear rules of how this is done. This is done in a way that the system poses a cryptographic puzzle to all the miners that they have to solve.

And in these 10 minutes, the miners compete in solving this cryptographic problem. They can influence the chances of winning this race by devoting more computing power to solving the problem by providing by more computers and using faster computers. So one of them wins the right to create the block and gets rewarded in terms of newly issued bitcoins. So every 10 minutes there's a race to create a block. The miner that wins gets bitcoins. And then it goes on to the next block. And the miners that lose, they have the job of validating the block that the winning miner has created.

So how much do the winning miners get? It's currently 12.5 bitcoins. So every 10 minutes, 12.5 newly issued bitcoins go through the minor. This is called the block reward which is going down over time every four years. This block reward is cut in half. When bitcoin was created, the block reward was 50 bitcoins. And then it went down to 25. Now, it's 12.5. So newly issued bitcoins only go to miners based on this fixed rule.

Let's derive the amount, the number, of bitcoins that are in circulation. You can see this here in the blue line so it goes up every 10 minutes. More bitcoins are issued. If you look closely, there are two kinks; in 2012 when the block reward went down and another one in 2016 when it down to 12.5. But this also means that due to this halving that there's an upper limit that is [inaudible 0:32:50] approached over time. And this upper limit is at \$21 billion bitcoin. So today we are at somewhat above 15 million bitcoin which means about roughly 70 to 75 percent of all bitcoins that will ever be created or issued already.

This chart shows the price of bitcoin. It's striking how volatile the price is. If you look on the left-hand side 2009 when bitcoin was created, the price was below \$1 basically 0. Then it went up in 2013. It went up to \$1100 per bitcoin. This is usually described as the time when Silicon Valley got interested in bitcoin when Silicon Valley put a lot of money into

bitcoin-related applications wallet services and so on.

Then the price collapsed down to \$200 in 2015. But then there was again a big surge to an all-time high this January of over \$1200. It came down again to below \$1000. Now it's up at \$1200. The second increase is usually attributed to the interest in China, the interest of Chinese investors in bitcoin.

You can also see this here which shows the volume of bitcoin trading against major currencies. The chart starts at 2014 goes up to—so before 2014, the bitcoin was mostly traded against US dollars. It's not shown on the graph. But then what you see from 2014 onwards there's a light green bar that's basically Chinese renminbi. And in 2015, you see a huge increase in renminbi bitcoin trading. In that period, about 95 of all bitcoin trading was done against renminbi.

Also have a look at the red circle there. At the very end, it's the latest data for this year. You see that trading basically has collapsed. It's down to a very low level. All the Chinese trading has stopped because the People's Bank of China put a tighter grip on bitcoin exchanges. They introduced a fee for bitcoin trading. And also much in trading was stopped. So this led basically to the evaporation of the bitcoin trading volumes. Interestingly, the price effect has not been very pronounced. And as you've seen in the previous chart, price has come down a little bit but not that much.

Now, here I show you quickly on the location of the miners. The slice of the pie is basically how much computation of resources you devote to mining. What is striking that there's about seven mining firms account for 75 percent of the mining activities. So there's a high degree of concentration. It's not an atomistic market where you have a big number of small miners around the world.

The second thing that is striking you see this with the red flags that four of the largest mining companies are located in China, so Chinese mining accounts depending on the day between 50- to 60-day of the mining activities. The other big mining firm is located in the Republic of Georgia in the Caucasus.

So now let me conclude by a few words on how bitcoin fails in terms as a currency and the economists typically say the currency are called into three dimensions as a medium of exchange, as a unit of account, and as a store of value.

So here bitcoin as a medium of exchange, you see overtime the number of transactions on whole bitcoin system has increased steadily to about 300,000 transactions per day. That's around 3 to 4 transactions per second. So this is a lot. In order to assess whether this is a lot, I put together some comparisons from randomly chosen countries for other payment transactions like non-bank credit transfers—this would be the payment to DC Water—and also card payments including credit card and debit card payments.

So these numbers are in millions. So before with 300,000 per day, these are millions per day. If you take Brazil, for instance, 33 million card payments per day so that's a factor of 100 times bigger than bitcoin. Let's take out of courtesy to Sweden, the country that uses very little cash and a lot of credit cards. We have 8 million transactions there also about 30 times bigger than bitcoin. In the US obviously, a lot of credit payments, 1000 times as many credit card payments as bitcoin payments globally. So this puts it into perspective

that there has been some progress in the use of bitcoin, but the traditional channels are still much bigger.

Now, bitcoin as a unit of account, a unit of account is as the name says. It's the unit in which we do accounting. It's numéraire of the system. It's the unit in which wages are denominated how we pay in restaurants in supermarkets. And clearly bitcoin is not used as a unit of account. Bitcoin may be used at certain website, say, for gambling and may be used for certain start-ups when they do their funding. But it's not used as a unit of account. It's not used widely in any economy. It's used sporadically for certain transactions.

And finally as store of value, we have seen that the bitcoin price is extremely volatile. It goes from 0 to 1100 down to 200 up to 1200 down to 900. So this means it's a high-risk asset. And typically, we will not say this as a good store of value. It's very risky but it's not a good store of value.

One question, of course, is why is bitcoin is so volatile? And I think one of the explanations is if you go back to how bitcoin is provided at this steady rate of a few bitcoins every 10 minutes. There's no mechanism to increase supply when demand goes up or vice versa. Then demand goes down. There's no mechanism to absorb bitcoin supply.

In a way that's exactly what central banks would typically do if the interest rates go up too much there will be more supply. If the exchange rate fluctuates too much, the central bank would adjust the supply of money. You don't have these in digital currency. And I think that's also one of the major weaknesses going ahead.

Let me now conclude. So what we have seen historically if you go back to China 1000 years ago, the Middle Ages in Italy, and also earlier last century and this century. There have been examples of private money that competed quite successfully with sovereign currencies. It's not that sovereign currencies always dominated private currency.

But we also see that private currencies have been successful and sovereign currency has been weak in the sense that there was debasement of coins. Coins were not of good quality in the Middle Ages or when there was high inflation. Then substitute currencies emerge.

But against this background, I think I would for now conclude that there's very little indication that digital currencies will be able to replace sovereign currencies for as long as sovereign currencies provide very good qualities as medium of exchange, unit of account, and store of value. Thank you.

Sarah Bloom Raskin:

Well, hello, I am very happy to be the first discussant of the two real excellent presentations that we just heard. And the way I want to set the context really for some reactions here really starts with this notion of what is fintech and what is driving it, right?

So when we talk about financial technology, what we are talking about is the mimicking of the functions of banking through technology and the way in which technology can take on some of the functions of banking and do it in a superior way; superior meaning lower costs possibly bringing about greater financial inclusion, doing things that haven't been done before, and also in a way that minimizes the current risks that the financial sector faces.

One risk in particular that both Anders and Daniel mentioned is the cyber risk. And I want to say something about that risk before posing some questions to these presentations.

Cyber risk is going to be with the fintech world, with the traditional financial world, as long as that's where money is. So we have seen that despite this transformation that is going on in the financial sector, cyber-attacks continue to threaten the security of payment transactions. Again, why is this? This is because the financial sector is where the money is. Money isn't intangible. It's based very much on trust. And the notion that confidence could somehow fail becomes then the transmission channel for a financial stability kind of risk and event.

The notion of a cyber-attack is one in which these are very low-cost disruptors. The vectors of attacks we see morph very frequently. And they're low cost. They're low cost to launch. And they're high cost to defend. And this turns out to be a formula that as you can imagine becomes one in which cyber-attacks are going to continuously unfold. And as soon as they get discovered, a new vector, a new configuration of how an attack is going to occur will emerge. And that is in essence what we've seen. We have seen tracking of different types of cyber-attacks move from the very early stages where they were denial of service attacks to things like phishing attacks, things now like ransomware. And we see different evolutions of these different devices.

How do you combat this? And this is something that we're going to have to do regardless of what happens in the fintech world. We obviously need to make sure that the financial sector overcomes its fear of talking about cyber-attacks.

So, one of the early challenges that we had at the Treasury Department when we started to deal with these problems is that the bankers just didn't speak the language of the IT professionals. As Anders points out, these are two very different cultures; the culture of sort of the IT geek and the culture of risk management which you obviously have as more of a foundation in the financial sector. And so many bank CEOs did not know how to deal with what was in essence a very live set of risks being presented to their financial institutions.

So we had to overcome that fear. We did this through development of a common lexicon. So we can talk about cyber now in the way that bankers understand. And it is in essence a risk management kind of lexicon. We've engaged in information sharing hubs. We have coordinated among the sector, the US regulators. All are onboard. And we have moved this effort into the international realm. So the G7 has developed fundamental elements of cyber-security, which all have been adopted in at least the G7 countries.

Clearly, there is a lot left to do. The two big issues that haven't yet been addressed internationally are, of course, bringing the issue of cyber-security beyond the countries of the G7 as the Bank of Bangladesh incident points out. The cyber-attacks aren't just confined to institutions in the G7 countries.

We also have challenges regarding the entire security of the supply chain. As more and more banking functions become outsourced, there needs to be some kind of assurance that those outsourced functions are not presenting vulnerabilities that present a cyber or heightened cyber-risk.

Similarly, there are other critical infrastructures besides banking. There's the energy sector. There's the telecom sector. Those two critical infrastructures are themselves transmission mechanisms that become the means for heightened cyber security risk.

So with all of these as a backdrop, many technologists thought, well hey, let's forget having to deal with what is going on in the financial sector and let's create something completely new so that we can minimize this cyber-security threat and really provide a clean slate. And this clean slate idea had some backing to it because if you think about the major financial firms of our world they are built upon legacy systems.

So there is one set of systems that has been acquired from one set of mergers. And those systems are pretty much just put right on top of old systems. And there hasn't been too much of a rationalization of these systems. And these systems provide when they overlap contradictions and conflicts, which heighten the cyber-security risk. So this idea of providing a clean slate was one important driver of the fintech solutions.

So we now come then to Anders and Daniel and their presentations. And we take as given that the financial technology is going to change the landscape of the financial sector. I want to say that there are at least four questions here embedded in these presentations that will require significant work and here they are.

First of all, what is the correct regulatory structure? And I'm going to talk about each of these. Two, what is really the pace of change? Three, is the change sustainable? And finally, if blockchain is the ultimate in disruption, how is it going to be controlled?

Now, it's interesting. So Anders tells us, okay, we need to have a regulatory context that is both enabling and controlling. What does that mean? Enabling and controlling. In the US at least, this is a contradiction in many cases. You can't both enable and control. We have seen in the US the emergence of an OCC limited charter. There hasn't yet been any pickup to it. But this is I would argue the attempt to be both enabling and controlling. But there hasn't been any pickup of it.

The other thing I would point out is in the US at least there have been stumbles in the fintech world. We saw what happened with LendingClub. We see challenges in the bitcoin world. And Daniel pointed out some of these having to do with the lack of full convertibility, the volatility, the functionality. Sometimes the legal rights it's not clear when goods are delivered whether legal rights how they would operate. Time, how our transactions to be settled. It's not happening instantaneously.

In terms of consumer protections, it's not clear whether disclosures are required when you open a bitcoin account. Consumer funds could be lost if the exchange or the network becomes insolvent or loses funding. Bitcoin too subject to hacks just the way a traditional bank is. And at this point, there's no prudential regulator overseeing those hacks.

So the stumbles, the cultural points, and some of these challenges, I think, lead us to wonder what really the pace of change will be. The other thing to think about is, yes, we talked about these technologies as being disruptive. But how sustainable is this disruption particularly when there are a couple of things that I would argue are necessary for sustainability that you don't always see in the entire fintech world.

One, you have to have access to the payment system. That OCC limited charter it doesn't give you access to the payment system. Without access to the payment system, how exactly are transactions supposed to happen? Secondly, for fintech to be sustainable, there needs to be a solid form of funding, okay.

Now what we see in the banking world, of course, is you've got cheap deposits. And those deposits are sticky and they're insured and they don't walk away when times get tough. But in instances like LendingClub or places that have had some management stumbles, you see the funding dry up. When the funding dries up, you have to ask yourself. Is this going to be a sustainable firm? Is this going to be a sustainable activity?

And I would argue, by the way, that in the realm of the financial sector, trust is extremely important. So while in other tech sectors you can maybe have a stumble or two. In the financial sector because trust is so important if a consumer wakes up one morning and finds that his or her account is showing all zeros because something has happened, you can be pretty sure that the future of that firm is going to look pretty grim.

I would also note that there is a lot of transformation happening. But I'm not sure it's all happening in the US. We, for example, have seen huge access to mobile banking in places like Kenya, in places like India, where you can actually use your cellphone to do banking without having a bank account. That hasn't been figured out yet in the US. That is not happening in the US. And some would argue that is because of our relatively rigid regulatory structure that is keeping that sort of innovation from happening.

And then finally, I would argue that real disruption occurs when financial firms, banks, are disintermediated when they are completely taken out of the equation. And that is the potential of blockchain also called the distributed ledger and blockchain being the underlying technology that powers bitcoin as Daniel talked about.

But blockchain which essentially is the wedding of two powerful technologies, one having to do with a public ledger and the other having to do with an authentication tool, has the ability to get rid of government backstops. In other words, if blockchain works the way its founders intended to, it works without the need for any government intervention.

It also works without any financial intermediation, the idea, of course, being that you have a public ledger. That ledger consists of code. And it's really Daniel's presentation in the bitcoin context. But blockchain more generally, the code is subject to public look. Everybody can see what's going on. And it's the public, the participation by the public, that determines whether or not the transaction is in essence valid.

In that context arguably no need for government intervention. And this, by the way, is kind of the political driver too for the—it's really the impetus of the blockchain technology because it offers the promise of no government. And that, of course, is a debatable proposition.

But, anyway, with that I will turn to our second discussant, Bertrand, and I leave you with those questions. Thanks.

Bertrand Badré:

Well, thank you, Sarah. I'm supposed to be the voice of the private sector because before the World Bank I was in charge of the finance of two so-called—at that time, they were not

called Global SIFIs. Now it's a new name. So I was group chief for Société Générale and Crédit Agricole. And these are two large companies as rightly described by Anders. And I will basically use that experience to discuss what has been presented. There are many things that had been said by Sarah. So I'll try not to repeat in particular the focus on cyber security. I have three main points and I will come back in more details on them.

First of all, I think we have this conversation at the moment which is not any moment. We are still at global financial crisis. We're not out of the woods yet. And so, we cannot have this discussion in abstract. We have to take into consideration what has happened over the past 10 years. Was there a trust? Okay. You can argue trust is precious, but trust has been shaken a lot which actually gives an advantage to some fintech players. I mean how can we trust these banks? Would you be able like-- in the past few years that come to me? So that's an important factor.

There's also a factor of regulators. They're still not totally sure about the financial stability. We've patched up the system, but we don't really know what we want to do. So that's a first question. We are not discussing an abstract. There are benefits of a new technology.

The second thing and that's really what I've experienced first and actually I have to make that decision on IT investment. This costs a lot of money in institutions where you spend already a lot of money to kind of manage a legacy that you rightly described, Sarah. So the cultural issues are essential. And there are between actors and rising actors. And we cannot underestimate this.

And finally, this comes as a question. What is it that we want to emerge as a system, as a financing system for our economy taking to account the lessons of the crisis, taking to account the benefits of technology, et cetera? And if I may be very provocative, do we want to move from Wall Street to Silicon Valley to control the world? Because that's kind of underlying subtitle. I mean fintech is nice to look like new companies. But I'm not sure Alibaba qualifies or Amazon or all these guys. We have nice little companies at the beginning. Then they're not so innocent anymore today.

So we have to consider these questions. And in that context, I think that we're not seeing as a mutual regulation. The regulators have the capacity to inference where the markets would go. And we should not just fool ourselves. Yeah, we will just enable. Well, enable means something. What do you want exactly to enable? So that's really the main issues that I wanted to highlight.

And for full disclosure, I've just accepted to join the board of a fintech company, which is so-called a robot management, so a Canadian company which is starting its business in the US this morning. So that's in full disclosure.

So as I said, it's a very interesting moment. We are not totally yet out of the global financial crisis. We're still navigating. I mean it's not just the monetary policy questions. There's also business monetary questions for a number of banks, insurance, not only the banks actually, banks, insurance, asset managers, et cetera in our charter territories.

So we are really questioning the business models. Which are the things that we want to do or not do. And most people have not yet addressed this they have repaired their ratio, they have focused on recuity ratio, capital ratio, but they don't know what else that

would go in that business or that business. So it's still very much open.

And I was very happy to see that. It was the first time in 2016 the Financial Stability Board put fintech in its agenda. I'm very happy that it's still in the agenda this year. But I remember as a first conversation I was still representing the World Bank of [inaudible 1:03:23]. We don't really know whether it was good or bad. That was really fintech. We have to take care, but it's still uncertain. So it seems it's important that everybody moves fast in the learning curve. I think it's critical.

And again, we have to take into consideration the behaviors of actors which have their own experience in the past. I mean some people have near death experience. Some people have kind of surfed on the crisis et cetera. So it's really the discussion now is with all these actors between infinite opportunities and technically as you rightly said Sarah. If blockchain and everything which goes well and succeed, I mean you can envision the disappearance of banks in a way as a traditional banking world. So this is really what you can discuss.

So not too forget, the development of artificial intelligence and all these techniques which combined could really be a real total shakeup of the system and that's-- so you have anxiety of this. I mean the job loss. I mean hundred thousand jobs lost in the banking sector in Europe. I mean an association in Holland; 20 percent of the branch is closed. That's a big deal in a country like France and so on and so forth.

So it's not operating in a vacuum. I think it's important to maintain these kinds of infinite opportunities [inaudible 1:04:39] created by a new financial revolution after a financial crisis. Let me put it this way. After time [inaudible 1:04:49] years and where as a future as I see isn't clear, we still have not really defined the way we want our economy to be financed.

So I think we have to understand. We have to avoid overkill and underkill, which is easier than done as we all know. So we're going to reap the benefits without jeopardizing the fragile stability that we have regained 10 years after the beginning of the crisis. And we have to understand the actors. So let me focus mostly on the incumbents, which is where I'm coming from.

So you have to bear in mind that the focus of banks but it's true for most of these people is on profitability. These guys I mean before the crisis are anywhere from 15 to 20 percent. And people are very happy with that. Now, most people are even incapable of reaching 10 percent return on equity because these guys are struggling. They are struggling. And the fintech threat comes on top of the low rate environment.

So fintech risk comes on top of uncertain regulatory framework. So it's an additional question for these people. I mean their margins are under threat. And it's a very difficult moment to make rational decision for an incumbent. So this is really perceived as a threat in a moment where they are still struggling even if it's a little bit better in the US even the expectations of fast deregulation. We'll see how it turns out.

So, the cultural issues are important. In most financial sector, it's very hierarchical. It's very heavy, very bureaucratic. Compliance especially after there's a crisis especially after there's various sanctions imposed to a number of players. Compliance is everywhere. Cyber

security risk is everywhere. And the cost of legacy. You don't want to change your system when you spent 3 billion towards this brand new IT system five years ago. Why should I change all these? I have to say no to one. I know [inaudible 1:06:36]. You have to make trade-offs and something. It's difficult have this.

Then people are faced with a usual decision in business. Do you build something? And that's what [inaudible 1:06:47]. It was the first online bank. And one of their challenges [inaudible 1:06:52]. How do you so-called cross-fertilize? Very difficult because they're not the same people. Or do you buy? That was one of the French examples.

Last week BNP Paribas bought something called [inaudible 1:07:03] which was an online bank offered in tobacco shop where you just come, show your ID, and you can open an account. BNP Paribas is buying this. That's kind of shock of culture. Or you have the Sachs approach which now say with are an IT company which happened to do banking. I don't know.

So all this is kind of shaking the tree and these are big discussions for the players. And you don't know who's going to win at the end. It's like social media. So, online news that's great but the brand didn't matter. Nobody expected that people will check their news directly on Facebook bypassing traditional media. Some media had succeeded. So will BNP Paribas or Bank of America succeed or will they disappear? These are the types of discussions that are there. And the regulators cannot just be neutral in that space. What they allow will have a big importance.

And it has accelerated over the past few years so the pressure on margins is very, very important. Social cost is very important. So people are really focused on profitability where profitability is under swept as you see. The people are taking over dissatisfied clients in the fat margin areas because this is really the worst for a company.

So market share, of course. Security of the system when you have to open your system, I mean this is really an issue. Do you aggregate the account or do you spread the risk? And, of course, the volatility of clients because if you make their lives easier, the stickiness and trust are big assets of banks where you don't change your banks that would change. So, all this is threatening. And this is not again just for banks or for cash transfer. Look at MoneyGram. It's being taken over by Alibaba. Interesting This is also for asset management and for insurance.

So facing that, the fintech is not as I said a simple universe. You have the traditional guy in his garage, then there is fintech. I mean there's a company I've just joined started like this. When I first met them, I'm the guy in green glasses and they looked at me with my tie and said are you Bertrand? That does exist. But you have at the same time the big guys from the Silicon Valley. And they're not part of the same club exactly. They don't exactly have the same intentions.

So we should not confuse all these. And we have this cultural shock including within incumbents. So we have the startups and then the big guys. And not everybody will make it. Facing that, you have investors and investors also because the investors are the incumbents which are putting pressure on a quarterly basis on banks and insurance. Oh what are you doing to adjust to the new digital age?

And now I've reviewed these past few weeks these investors of large banks. Everybody say oh we are digital. We are digital because the pressure of the market. And at the same time, investors are also pushing startups. They want to find a new PayPal as you rightly say, Anders. So the investors also place their walls and we push in certain directions.

And, of course, you have the regulators. They are getting organized. But even within regulators, you have cultural discussion. I mean the young guy and the old guy are not thinking the same. So it's difficult. So you kind of have a task force dedicated team sandbox approach. All these things does exist but it's complex. So we have these cultural issues just absolutely everywhere.

So my conclusion is really coming back to what Anders say. That is we have to enable this understanding the risk and not being naïve. Again, there is no neutrality. What is at stake is big. It's one of the largest industries in the world. It touches just everything. So we cannot ignore this. We need to discuss. We need to better understand what's going on. And vast majority of people should hear.

I mean people talk of blockchain because people that really understand what's behind it are very, very little. So we really have to discuss and make sure that the FSB people are really discussing the regulatory perspective. And we make sure we preserve some form of competition that will not just transfer from the Syrian Wall Street to Honshu or where Alibaba is or to Wall Street.

And not to forget also is the main benefit which for me given my world bank past [inaudible 1:11:02] impact on development as you mentioned Kenya and India. And so that technology and financial services will also make a big difference in this area. Thank you very much.

Karen Dynan:

So I want to start by just commending all of the panelists for giving this topic a bunch of thought and being kind of forward leaning because I do think there are risks on both sides of not doing enough to foster this sector but also letting the sector get ahead of us and then creating other sorts of risks for the financial system and also for businesses and households.

We have some time for a few questions. So if people want to—if they have questions, please stand up. I think there are other mics going around the room or mics going around the room. There's also a central mic. Please say your name. And also since we are running kind of short on time, please keep the question short. So start over there.

Male Speaker:

Yes, I'm Ted [inaudible 1:12:20] and I'm a freelance writer. A question for all the panel. When [inaudible 1:12:26] test and bitcoin I think have it. Is there any chance this is really going to become a day-to-day part of the financial system or most Americans are—? Is this destined to be a hobbyist thing?

Anders Borg:

I'm very much in agreement with Daniel. This is probably the worst point in human history to launch an alternative currency. We have almost no inflation anywhere. And it's high and volatile inflation that has actually shifted people out of the traditional fiat money. And with overall high degree of price stability I think it's very difficult to see that bitcoin is going to be successful.

And I don't think if you look at all of the other disruptions, there is some huge consumer benefits that it's a new service to a lower cost. And it's not clear that bitcoin is reducing the cost for the consumer. We are free to use the fiat money and the cost of using them will be reduced by the technological shift.

The only thing that is unique is that you're able to do it without revealing your identity. And I think with the exception of hobbyists and maybe people in the betting industry or some illegal sections of society, I don't see that as a major advantage. So with a high degree of price stability, reduced costs for the payment system, I don't see that bitcoin is going to be that big.

But the distributive ledger system is likely to be much, much more important going forward particularly if we can reduce the costs so that can be used as a way of dealing with all of different types of markets ranging from land to securities to whatever where you can have immediate settlements of the transactions.

Daniel Heller: Yeah not really a lot. I basically agree. I think bitcoin in the current version as I try to make clear I think will not become a currency. It may have a niche in the payment space. And possibly bitcoin 2.0 or 3.0, some improved version of the digital ledger technology combined with the digital edge that we can use to transfer money, I think, there I would see some potential.

Sarah Bloom Raskin: Yeah. I would just add that the early experiences with bitcoin were not positive. Bitcoin was used as a vehicle for laundering drug money for criminal activity. It was not attached to what it's possibly potential positive could be. But the technology again and this is to Anders' point that technology is, I believe, something that does have huge potential, its application being an alternative currency maybe not. But the application I think has much broader potential.

And I wouldn't discount the libertarian impulse. It is strong as we have seen. And I wouldn't discount the possibility that that impulse becomes an important drive to the uses of this technology.

Karen Dynan: Another question?

Lee Price: Hi, I'm Lee Price from the FDIC. In the last several months, the FDIC has had meetings around the country advising people how we're open for business and having denotable banks. And a large percentage of the people have been coming to think about opening banks are trying to address what Sarah's point was of the access to the payment system that they would like to be able to have banks their fintech companies that have been in fintech or have ambitions to be doing fintech.

So my question really is what you talked about wanting to control and regulate, I agree with Sarah's point. We don't have green light now and yellow light later. You have to think now as you grant charters about what kind of risk you want to regulate and how you would regulate. What are the risks that you would want to watch out for as you grant or don't grant charters for innovative fintech companies who are obviously going to pick out the slices of financial activity that are the most profitable?

Karen Dynan: Sarah, you want to start on that?

Sarah Bloom Raskin: Sure and thanks, Lee, for those observations of what the FDIC as any regulators is struggling with. And the idea here is in essence to encourage innovation. I mean we would love to see the power of a new technology deal with some of thorniest problems we have had. Particularly I would argue in the area of financial inclusion. So the potential for letting technology develop unfettered and the impulse to do that is very strong.

At the same time as others have pointed out, these firms are being run by technologists who don't have the same kind of sensitivity to the financial crisis to risk management that the traditional banker and bank regulator has. And so the cultural differences I think are really pretty profound here.

And one thing that I would urge new firms to do at the very least is to meld your skillsets to try to bring in both sets of consciousness and bring both of these kinds of thoughts to bear and be able to make a case to your regulator if you have a regulator that the risks that your product is going to present can be mitigated. And I think that's really the way we have to start in this.

Karen Dynan: So if I can just add a perspective. I mean we've been in conversation with basically, well, the major central banks maybe with the least degree in communication in the US. But when we talk about Russia, Switzerland, Sweden, Israel, or Canada, all of these central banks are asking the question. How can we enable and facilitate this?

And what they can do is a wide range of issues. Look at China. Alipay basically sat down with the Bank of China to construct the code and the complete system and had the go-ahead from the government to develop this because there was no consumer bank servicing to that respect the community when the system started to build out. The traditional Chinese bank had been working with industry, construction, financing, and much more of kind of building the business sector rather than serving consumers.

So there is a wide range of perspectives here. And I think the central banks and the regulators need to interact and to understand that interaction will be very different. These are not traditional banks. They are small and fast-moving companies that adapt very fast. If you don't invite them to understand why they are regulated, they would try to circumvent regulation. And it's much better to sit down at roundtables and talk to each other and try to understand each other's perspective.

And it's extremely important to have an open communication here because some of these new firms they don't understand why this is taking so long why they've been in retail e-trade or they've been in renting cars or whatever they've been doing in their previous business experience. And they have to understand what banking is and why the society is so sensitive about it. So I think all of the central banks are setting up—almost all are setting up councils creating sandboxes, accepting regulatory experiments, and so forth.

So I would say that almost all central banks are already doing this to a different degree. And I would argue that it's better that they (a) continue to do this and (b) also talk to each other to better understand what is best practice and how do you actually facilitate this change.

Bertrand Badré: If I may add, these are my practical experiences. I think it was most for incumbents and

fintechs and that's where the regulatory difference is to make sure the government mixes competencies. So I think again I'm very excited to join this board of this fintech. And I would try to bring this aspect to them. And I wish more people who come in from the technology can come to the incumbent side and really organize [inaudible 1:21:41] different cultures et cetera because if it remains two different worlds, it's very painful. So that's really one aspect to make sure that in the key functions like finance and risk as they evolve you organize this type of things. And the regulators have the capacity to shape this in a way.

Karen Dynan: We have time for one more question.

Male Speaker: My name is [inaudible 1:22:03]. I used to be at the World Bank a long time ago. And my question really it's a question of information.

The points you had been making—I'm talking mostly about fintech. The cultures, the regulators, and the legacies of the financial crisis are completely different in China. And I feel that China is a world that is going to lead in this field much more than any other players. And my information question is what is the best channel to keep informed about Chinese transitions?

Because the Chart 7 in Daniel's paper is very interesting, the Central Bank in China had decided that bitcoin is no longer acceptable and the market just evaporates. But if you look at the culture of the Chinese population, the very rapid diffusion of technology in payment systems, the regulatory structure, the lack of legacy, they have a different legacy. The legacy of the transition from planning to market has created a very different banking structure. But even in the scale, where do I go to keep in touch with these trends?

Karen Dynan: Okay. So anyone want to take on China?

Daniel Heller: I think China is really interesting in the sense that they can leapfrog to a new world without having developed banking system with a lot of bank accounts. And I think it would be really interesting to see. And I think you alluded to this too that the legacy systems that we have to overcome here China does not have that problem, but the risks remained the same in China or here. It's a risk of how you do financial intermediation? How do you cope with credit risk? How do you cope with liquidity risk? Fintech does not solve this. They may be a tool to manage it, but it does not get rid of these risks.

Anders Borg: So I don't want to sound like I'm here from the marketing department of Alipay. But we have Eric Jing, the sharer of Ant that owns Alipay on our task force. And we have very regular meetings and he gives new presentations of what they are doing. And it is extremely impressive.

I think they for the last two years have added something like a whole city bank to their number of customers. They are now entering the Indian market. They struck a deal with Sberbank to also go into Russia. It's very likely that they will go into Africa, I would say, in the next couple of years. They are already at 450 million customers. So everything that they do is going to be enormous. And to some extent, I think they are going to set the global standards when it comes to many of these services.

It started out as a payment service. And then they started to talk about becoming an

ecology. And today, they provide asset management. They provide savings account. They provide consumer credit. And they do it based on big data where they don't have privacy issues. Some of our European banks were a little bit shocked when they understood how they use the information.

But that also means that they have very low non-performing loans. And they have a way of providing banking services that is very similar in terms of risk that was happening in Europe and the US in the 1860s and 1870s where traditional savings banks had all of this information because everybody knew each other. And it might be that if you want to provide credit in a society without credit legacy, it's necessary to use more information and that they need to mature in this.

The way that they are dealing with asset management and all of the other issues are extremely impressive. They are leading in technology. They are way ahead of the European competitors. And it's a very, very systematic high quality management that they provide in the company.

So every time we get oh no we are heading in this and that direction and you sit and wonder what is really going on. And then a couple of weeks you start to understand what you really heard. And then two months later, you will see that this is actually implemented on the ground. So very, very impressive leadership from China here.

We talked about the big tech companies. There is constantly falling margin of costs over almost any kind of scale here where increasing return on scale is enormous. So this might become a global company that is basically setting the standard for the global financial system. So it will be very interesting to follow what that means not only in terms of bank identity and other things. It's a very, very fast developing company.

- Karen Dynan: Okay. I'm going to end you. I'm going to wrap up with a simple multiple choice question, only two choices. So this will be quick. So you all emphasized opportunities. But you also emphasized concerns by having the appropriate regulatory framework in place. So here's my question. Do you believe (a) that regulators are making good progress and should just continue pace or (b) do they need to step up the pace at this point? So Anders, A or B?
- Anders Borg: I will be completely inconsistent. They have done good progress because we see that in our interaction. They need to step up but both in terms of control and enabling. Particularly in Europe, we could make a lot of savings in a very fragmented banking system by letting fintech competition reduce the costs.
- Karen Dynan: Excellent. Daniel?
- Daniel Heller: I'm leaning towards B and would say that the regulators have to try to be ahead of the curve and really understand how is the system is evolving and where the risks are going.
- Karen Dynan: And Sarah, you've been in kind of the trenches on this one so I'm curious about your opinion.
- Sarah Bloom Raskin: Right. So I think that there has been great progress made. But I think that the current regulatory framework at least as it exists in the US is really not designed for the world of financial services tomorrow. And so I would argue that we need to adapt our financial

regulatory environment in such a way that it can become more responsive and understanding of what lies ahead.

Karen Dynan: Great. And Bertrand, you get the last word.

Bertrand Badré: I think there's been some progress but we're not there yet. There is a quantum leap ahead of us, which is also anchored in what we call the financial crisis. I think this is really how do we envision the next cycle financially and technologically speaking and our attention within each regulator? I mean you feel this when you discuss these people. And I think it's great because I don't know what is the truth actually.

So I really think that we are at the moment that these discussions are very useful. This should happen everywhere. And we should again not be ignoring this. Again, it's not innocent to choose if China will be the leader, chief, et cetera. Or can we organize some international discussion on that? That's a very valid question, I think.

Karen Dynan: Terrific. That's a great way to end. Thank you.

