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In Conversation: What keeps you awake at night? Emerging challenges for central bank governors in a digital world

A conversation about emerging challenges for central banks in the face of rapid technological change. What implications do these challenges have for central bank mandates and for the way in which they engage with other stakeholders on issues such as competition, privacy, and climate change?



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(Transcription non-officielle)

Agustin Carstens (moderator)

We are living through an era of unprecedented change in the financial sector. A great attention is devoted to such emerging trends as the role of big tech in finance, decentralized finance (DeFi) and new forms of private digital money like cryptocurrencies and stablecoins. These changes raise challenges for central banks. Central bankers are working hard to understand these changes and to decide how to respond. They are looking at the implications of these changes for central bank mandates, regulation and the role of central bank money in the financial system of the future.

Amongst the important trends that are reshaping the financial system, I mentioned the growing power of big tech, the rapid rates rise of DeFi and expansion of cryptocurrency markets. Hence, my first question for all of our panelists: which developments do you believe offer the greatest opportunities for the financial sector, and which of these may be the greatest potential sources of risk? Jerome, let me start a with you.

Jerome Powell

You pointed out that we are in a time of rapid technological change in the financial sector, especially in payments. As it is often the case, there is a mixture of innovations that will have lasting and perhaps salutatory effects, and those that will turn out to be mostly hype. It is never possible in real time to be sure of which is more fundamentally innovation, the key to driving productivity in the economy. The FED has long supported responsible innovation. Novel technologies like distributed ledger and decentralized finance have the potential to increase the efficiency of the payment system and encourage a more competitive financial landscape.

The future we can imagine is one featuring ubiquitous real-time payments delivered at extremely low cost. However, it is also easy to see the risks. Our existing regulatory frameworks were not built with a digital world in mind. Stablecoins, CBDC, and digital finance more generally, will require changes to existing laws and regulation or even entirely new rules and frameworks under the principle of “same activity, same regulation”.

From a consumer protection standpoint, users may not fully understand the extent of their potential losses or the fact that these investments generally lack the government protections that accompany many of the traditional financial instruments and services.

There also are potential financial stability concerns for some products. In particular, we do not know how some digital products will behave in times of market stress that could lead to large destabilizing flows, nor do we know how stresses in crypto markets could potentially spillover into the traditional financial system. Moreover, crypto assets have been used in some cases to facilitate illicit activity and we need to prevent this, so that the innovations that survive and attract broad adoption are those that provide value over time and for legal use cases.

All of these innovations have made central bankers think critically about the intersection of money, payments and technology, and about the role of central banks in the economy. That

is why the FED recently issued a discussion paper on the future of money and payments. The paper is intended to be a first step in fostering a broad and transparent public dialogue about the future of money and we look forward to receiving ideas and comments from a wide array of stakeholders about what the future of the financial system should look like.

As the paper notes, we are actively examining potential use cases, benefits, costs and risks of a CBDC and while we have not made any decisions on whether we will eventually issue a dollar CBDC or what would be the underlying technological design of it. We did outline **four key principles** that are currently guiding our thinking:

- **First**, a CBDC will need to ensure **users privacy**. We are researching technological and policy options for a robust privacy framework.
- **Second**, a CBDC would need to be **identity verifiable** in order to prevent money laundering, terrorism financing and other illicit activity, just as banks and other financial institutions currently comply with such rules.
- **Third**, we also foresee a CBDC in the US being **intermediated**, so that it can leverage the private sector's ability to innovate as well as the private sector's existing privacy, identity management and AML frameworks. An intermediated CBDC would also lessen financial stability risks that could arise from disintermediation of private sector providers where financial services also provided by the government
- **Fourth**, a CBDC would need to be able to serve as a **widely accessible** means of payment for all transactions, meaning that it would need to be seamlessly transferable and between customers of different intermediates.

In any case, digital innovation in the financial sector is here to stay and we are only at the beginning of this journey.

Agustin Carstens

Thanks Jerome, you have raised very important and interesting issues some related to how fit for purpose is regulation to the developments of the digital world. At the same time, this is due to the fact that regulation was not drafted to having in mind this digital world, issues related to consumer protection and is very interesting the key principles that are contemplated in the in the CBDC document that was just raised on privacy, identity, intermediation and transferability of these CBDCs. Now, let me turn to Joachim.

Joachim Nagel

Generally, I think that most of the developments are for the benefit of customers as well as the providers of financial services. I take for example fintech and big tech companies that introduced new financial services. The established financial institutions had to adapt their product portfolio accordingly. Now, most of them provide comprehensive mobile banking services that allow customers to conduct financial transaction using for example mobile devices such as smartphones or tablets, wherever they are.

Likewise, the emergence of crypto tokens and the introduction of distributed ledger technology (DLT) have opened up many opportunities. In particular, DLT allows for innovative applications at the interface between the financial and the real economies. And with programmable payments, completely new business models with fully integrated supply chains become possible.

Digitalization can also help us to tackle climate change and climate policies. In order to determine the right measures, we need a solid database of climate financial data. Digital technologies such as artificial intelligence or, for example, process optimization, enable us to gather and analyze the relevant data in a cost-efficient way.

Finally, the digital transformation also allows us to improve the way in which we work. Central bankers are making increasing use of these new digital tools to free-up time. This is just some of the potential offered by digitalization.

However, the aforementioned developments also create risks. The effects of the progressive expansion of crypto assets are not yet clear, in particular, the substitution of traditional banking services by non-banks could affect the stability of financial institutions and possibly the banking system as a whole. It could also influence the transmission of monetary policy, our main task.

Moreover, we have observed that digitalization can change competition because platform markets established by big techs tend towards market concentration. This increases barriers for new market entrance and can lead to de facto monopolies. In effect, firms would be able to dictate higher prices and increase profit margins at the expense of consumers. Policy makers and antitrust authorities are required to adjust their competition policies to these mechanisms and preserve competition in the digital age.

In that context, regulatory policy should also ensure the protection of personal data, and ultimately strengthen consumer sovereignty. Central banks need to share their expertise in this discussion.

Finally, financial ecosystems and operational networks are becoming increasingly complex and interconnected. This comes with a higher risk of cyber-attacks, for example, which can disrupt financial market infrastructures or systemically important institutions. Such events could lead to operational outages or excessive volatility on the financial markets. As a result, this could also undermine confidence and trust in the financial system, which would put financial stability at risk. Therefore, central banks and supervisory authorities need to address cyber risks in order to ensure financial stability and I guess we will continue to engage in this discussions about how we deal with this situation in the regulatory framework and how does this influence the financial industry of tomorrow.

Agustin Carstens

Thank you Joachim, let me now give the floor to Andrew.

Andrew Bailey

Let me start from a very firm principle: it is not for us, as public authorities, to stand in the way of technological change and its impact. There is a famous story in British history, going back a thousand years, which we all learned at school. A King had his throne put on the beach and he sat on it to prove that he could stop the tide, which of course he could not. The modern interpretation is that he did it to prove to his followers that he did not have the power to stop the tide and that his power was limited. We all have to remember the limits of our authority.

We are here to understand what innovation is, and to extract from it where the public interest lies and what it means for our public interest objectives as central banks (monetary and financial stability). How do these things affect that? Just to pick two examples.

Jerome was talking about **CBDC**. We have developed a system that combines the various purposes of money (medium of exchange and a store of value). We can all do that through our bank accounts and these institutions are performing another important public function, which is lending to support the real economy.

This innovation poses a threat to that system and could start to break it up. We have to understand what are the consequences of that for our objectives, both in terms of technology and of economics. If we start to break up the functions of money and have institutions that are more dedicated to money as a medium of exchange than as store of value, what does that imply? If we shift the mix of central bank money and commercial bank money (or, to use the old Milton Friedman's terms, inside/outside money) what does that mean for the financial system?

At the Bank of England, we are devoting a lot of time to understanding the consequences of those, not because we reject them but because we need to understand what they mean for our public policy objectives.

Final point on decentralized finance (DeFi). One critical thing in DeFi is that it appears to be saying "*Let us take all the innovation in artificial intelligence and apply it into the world of financial contracts*". What does this shift towards using artificial intelligence mean for our ability to pursue our public policy objectives? The first thing we are well engaged on, but it is a constant challenge, is to understand all the implications of this for our public interest objectives.

Agustin Carstens

Let me give the floor to Shamsiah

Shamsiah Mohd Yunus

We are in a very transformative period for the financial sector, powered by technology and innovation, but there are **two developments** that, in my mind, offer the greatest opportunities, especially for emerging economies

First: the accelerated creation of **new digital business models**. While this trend is not entirely new, momentum has picked up tremendously, driven by the entry of non-traditional players including fintechs and bigtechs, and the digitalization of incumbents. With more digital first players comes a host of benefits, like what the other speakers have said, accessibility, efficiency, convenience, customizability and security.

More and more digital banks and digital insurance have also proven to be effective at furthering financial inclusion and filling long-standing protection gaps which are often more prevalent in developing markets.

Regulators are also proactive in adapting regulations to harness the upside of this innovation while managing the downsides. I am hopeful that this will continue

Second: open data, where we have the potential to create a more open and collaborative financial ecosystem. With the appropriate building blocks, including consent and protection mechanisms, open data has the potential to become a source of continuous innovation and this will also lead to a financial system where collaboration is in it and consumer interest is at its core. Consumers will thus understand to gain immensely from the development of competitive offerings tailored to their specific needs without compromising their rights as owners of their data.

As an added advantage, open data would also enable the financial sector to be more adaptive towards emerging priorities such as pursuing the sustainability agenda. For example, innovations that utilize climate-related data to provide greater transparency across the supply chain will enable more effective transition by businesses and climate positive actions by financial institutions.

Together, these developments when harnessed correctly, can address many painpoints that we face as an emerging economy. But innovation also brings with it risk and at times, this risk can be very material.

Among the top worries are cyber security risks. These risks have only heightened as the financial sector adopts new technologies and becomes a “digital first”. For example, financial institutions processes have now become more interlinked with their technology providers who typically operate outside the financial sector, and a chain is only as strong as its weakest link. So, the need for financial institutions to ensure cyber resilience across its entire process chain is thus a pressing one. Of course, this also means that as supervisors we must build our capacity in this area.

Another concern is on blind spots that may undermine our mandates. This is particularly relevant for developments that take place outside our view but may affect monetary and financial stability. While currently DeFi’s adoption is confined to nation segments, it has the potential to give rise to material risk, as Jerome said, and this will include loss of monetary policy sovereignty, build-up of financial instability, and erosion of market integrity.

The challenges in managing risks associated with DeFi can also be complex, in particular due to two elements:

- What I call a critical lack of data, which makes it difficult to identify risk transmission channels and to seize up exposures of the traditional financial system,
- The risk of regulatory arbitrage arising from the uneven regulatory landscape globally and the borderless nature of DeFi.

So, my hope is for a closer coordination at the international level to formulate a cohesive approach towards managing risks and filling persistent data gaps.

Agustin Carstens

Thank you Shamsiah. For our second round, let me give the floor first to Andrew. The DeFi ecosystem is growing at an exponential rate. With an apparent elimination of intermediaries and promotion of peer-to-peer transactions, DeFi could present unique challenges for regulatory authorities. Traditional regulatory model say that impose obligations and standards upon regulated financial institutions are not well suited for the DeFi world.

So, the regulatory challenge is big and it is compounded by the borderless nature of the DeFi ecosystem. Andrew, how should central banks respond to these challenges? Do central banks need to rethink regulation and design new regulatory models to address the specific features of DeFi?

Andrew Bailey

DeFi is a very fast evolving area. We have a lot to do to get grip with what it is, where it is going, and what we are going to end up dealing with. But we have to do it very quickly. The crypto world is closely linked to DeFi (at the moment at least). In some parts of the crypto world, DeFi is a separate world where the normal rules do not apply, where libertarian principles apply.

I am not at all making a political point here: we operate in one system, and the real challenge you pointed to is that our regulation is rooted in a principle of identifying a “controlling mind”, using a regulatory hook into that mind, and saying “*here are the public interest principle ; here is how we turn those principles into rules and regulations; here is how we supervise*”.

The challenge of DeFi is that it is saying “*let us use artificial intelligence to change that concept of the controlling mind*”, and the question I am trying to answer is: “*is there a world in which DeFi leads to a situation where there is not a controlling human mind?*”

My instinct is that the answer to that question is NO, but it is making our lives a lot more complicated to get to that answer. I do not think you can have AI that operates entirely independently of the human mind, but it is going to make much more difficult the art of designing regulations that achieve what we want to do in the public interest.

Agustin Carstens

*Thank you Andrew. I fully share your point about “controlling minds”. Let me move to Shamsiah. CBDC has been in our minds for quite some time. It is a key aspect because it goes to the core of central banking. So, let me ask you **two questions** on this. **First**, to what extent could CBDC serve as a new foundation of sound and stable public money for the financial system of the future? **Second**, what essential features should the CBDC have to serve as an effective alternative to new forms of private money and assure that CBDC would seat at the center of the financial system?*

Shamsiah Mohd Yunus.

The potential for CBDC to serve as a foundation for sound and stable public money is at the center of a well-functioning financial system. However, the growth of the crypto ecosystem over the past decade does reflect on some gaps in the financial system and these gaps include the failure to adequately support financial inclusion and meet evolving user needs. To remain relevant, public money needs to keep up with innovation, otherwise it risks being displaced by crypto assets as the main medium of exchange.

CBDC can be a tool to maintain confidence in public money and its role at the center of the financial system. If designed appropriately CBDC can be a public good that provides fast, safe and affordable payments.

However, it is also important to bear in mind that CBDC is not the silver bullet. It has to be supported by some macroeconomic policies and a fit-for-purpose financial system. This would ensure that the regulated financial system (and not the shadow financial system) remains the preferred and trusted avenue for the public.

The key design features for CBDC to fulfill its potential must be: open by design, and the three foundational principles that have been recommended by the BIS and a group of central bank, which we all agree with: (1) “do no harm”; (2) interoperability; (3) promote innovation and efficiency.

The “do no harm” principle means that CBDC issuance must not threaten monetary and financial stability and as much as we talked about the threat of “cryptoization”, foreign CBDCs denominated in major reserve currencies may pose greater challenges to smaller economies, specifically if used across borders. Foreign CBDCs may heighten currency substitution and financial disintermediation risk, and this is where international collaboration is critical. Developing a set of principles to govern CBDC usage across borders would reduce negative spillovers and support international macroeconomic and financial stability.

The other point I would like to address is that retail payment systems are also an equally compelling alternative. CBDC is not the only tool to preserve public money at the core of the financial system. Retail fast payment systems can be equally effective. Today, about 60 countries have implemented such systems whereas only three countries have launched their

retail CBDC. So, the benefits of instant and round-the-clock payment in the domestic domain can be extended to the cross-border space, and this can be achieved for example via interlinkages of retail payment systems across countries.

The project Nexus, led by the BIS Innovation Hub, immediately comes to mind, and we are happy to participate in this project, which aims to test the viability of connecting retail fast payment systems on a multilateral basis. There is this opportunity to reap the best of both worlds and it is worth for us to explore the idea of converging project Nexus with other multi-CBDC projects such as project Dunbar. A multi-CBDC network could complement a global network of retail fast payment system through efficient back-end settlement in central bank money.

Aside from enhancing “hard infrastructure”, it is also important for regulators to enhance what I call the “soft infrastructure”, and some of this could be to look at the feasibility to simplify and streamline regulatory processes such as KYC or sanctions screening, or to solve frictions in cross-border pavements.

Agustin Carstens

Thank you Shamsiah. What you mentioned is key : the foundational principles (“do no harm” and interoperability) are of tremendous importance, but it was also important to remind us that many developments are taking place in the non-CBDC world, like fast payment systems which are extremely important.

Let me now turn to Joachim. You mentioned digitalization is reshaping the financial landscape in ways that are both far-reaching and profound. It will be interesting to see how this is playing out in Europe. How is the Eurosystem addressing the different aspects of digitalization ?

Joachim Nagel

First, let me say re that I believe the central banks’ world will change tremendously over the next years. Central banks need to keep up with the pace of digitalization and I guess we have to speed up, not just keeping the pace. We need to exploit technological opportunities and rethink many of our processes.

To answer your questions, let me highlight some examples of how we, in the Eurosystem and particularly at the Bundesbank, are doing this.

First, together with our colleagues from the Banque de France (and with the BIS), we are going to open an innovation center with locations in Paris and also Frankfurt. This will help us to develop target-oriented innovative solutions with a keen sense of curiosity and a great deal of creative energy.

Second, in conjunction with other Eurosystem central banks, we are conducting a so-called “proof of concept entitled distributed system”. This project aims to establish a new collaboration model for an integrated system for reporting ESCB statistics based on a network approach. We are also setting up a state-of-the-art multi-cloud network that will allow for a

distributed data storage architecture and this cloud ensures symmetric data access, and also interoperability within the heterogeneous landscape of IT systems.

Third, the Bundesbank is also working on the efficiency of its own databases; we are improving our data handling with the high performance integrated data. Within the Bundesbank, we have formed an interdisciplinary committee that supports ideas from an early stage to ensure that we make constant progress on our digital agenda.

Fourth, cyber-security is one of the major challenges that we are facing and therefore has a high priority for the Bundesbank. Being part of the Eurosystem, the Bundesbank supports also banks, insurance companies, financial market infrastructures and key service providers in putting their cyber defense capabilities to the test with hacking simulations in what we call TIBER tests. This is a specialized IT provider attacks, companies that attacks critical functionalities just as their criminal counterparts would do. A successful TIBER test provides these companies with information on how attackers could successfully breach their defenses, enabling them to close any gaps and enhance their cyber resilience accordingly.

Finally, I would like to mention our digital currency project. The Eurosystem is currently conducting an investigation phase for a CBDC. A digital euro would be issued by the Eurosystem itself and could be used by individuals and companies. As a supplement to cash, it would allow access to safe central bank money in digital form, thereby increasing the choice of means of payment. What I would like to emphasize in this regard is that a digital euro could also help to solve some of the problems discussed earlier. For example, a digital euro would combine digital usability with a high degree of data privacy as the Eurosystem has no commercial interest in the use of the data or maybe the behavior behind this. Also a digital euro would interconnect different networks and avoid bold gardens. I am convinced that the digital euro will be a major opportunity to help shape Europe's digital future.

Agustin Carstens

*Thank you Joachim. Let me move to the final question. Today, we have mentioned many different aspects of the relationship with innovation. Sometimes it is difficult to get a picture of how the future of the financial system would look like. **Jerome**, may I ask you what do you believe the financial system will look like in five to ten years and what role will central banks play within it?*

Jerome Powell

I will mention three directions.

Improvements in the payment system

We are well on our way to a world of instant, low-cost, available 24/7/365, domestic payments, with increased transparency and easier access for more people. Here in the US, the FED Now service is set to go live in 2023, and there are others around the world. On that path, there is work to do to achieve the same for cross-border payments.

Regulation

Digital financial activities that are currently outside the regulatory perimeter will be brought within it, which is necessary to level the playing field, keep the trust of users and protect consumers.

Here in the US, President Biden this month signed an executive order to ensure responsible development of digital assets to protect consumers, financial stability and national security. This order calls for a coordinated government-wide approach to address regulatory gaps related to digital assets and will complement the FED's ongoing work on CBDC. It does not focus on any particular aspect, but tries to take a holistic look at the digital finance landscape and is it is very welcome. So, we are looking at addressing regulatory gaps around digital assets and how they will work in the banking system.

In addition, the so-called "President's Working Group" (a body under Secretary Yellen's leadership issued last November a report on a regulatory framework for stablecoins used for payments, making several recommendations in the US context:

- stablecoins that are used in payments should be issued by insured depository institutions;
- custodial wallet providers should be subject to appropriate federal oversight (in addition to what currently happens at state level);
- stablecoin issuers should comply with limits on their affiliation with commercial entities.

Central banks will need to continue to play a key role, fostering a safe, efficient and widely accessible payment system with a trusted form of money at its core has really been a crucial aspect of all of our missions since our founding. But we will need to evolve with the rest of the financial system by staying at the forefront of technological changes. To do this, we are engaged in research and experimentation on our own and with partners related to payment technologies and digital currencies. We are hiring people with that kind of expertise, and it is something in which we will be investing time and money in the coming years

International cooperation

A lot of the progress that we make will depend on high levels of international collaboration if we are really going to unlock the potential of digital assets and services while avoiding the pitfalls.

We are actively engaged, with other central banks and international partners, in moving the G20 cross-border roadmap forward, which carries the potential to address the well-known and unfortunate frictions in international payments. We are collaborating with six other central banks and the BIS on CBDC, to share our analysis and finding consensus on some foundational principles.

Our collaborations will extend beyond these areas to cover the whole digital landscape, including stablecoins, unbacked crypto assets and other areas of financial innovation. We are dedicated to working with our domestic and international colleagues on making sure that the payment and monetary systems evolve in a responsible way that brings about improvements while maintaining safety, soundness and financial stability.

Agustin Carstens

Thank you Jerome. This is a perfect way to end this panel. As closing remarks, I would say that from what I heard from our panelists, central bankers are all for innovation, but always having the guide of the public interest in mind. That is easy to say but not so easy to implement, and our challenge is to find the path into a much better future.