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Digital currency's potential and democratization of the financial system

- Interview with Robleh Ali by Tetsuya Inoue -

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Executive Summary

Digital currencies have emerged as a hot research topic amid growing interest in digital currency issuance among central banks. We spoke with Robleh Ali, head of a digital fiat currency project at the MIT Media Lab's Digital Currency Initiative (DCI), about how to best design central bank digital currencies (CBDC) and how their issuance would affect the financial system.

Robleh Ali

Research Scientist
Digital Currency Initiative, MIT Media Lab

His main focus is on how national currencies can be issued digitally outside the existing banking system and the role of central banks in such a system. The overall aim of the work is fundamentally reforming the financial system by changing the way money is issued. He previously led the research into central bank issued digital currency at the Bank of England.

Tetsuya Inoue

Chief Researcher
Financial Market & Innovation Research Department, NRI

His major area of research is monetary and financial policy by central banks in advanced economies and their implications for economic and financial system. With this respect, he is launching a new research project of central bank digital currency. He was previously Deputy Director-General in charge of international financial markets at the Bank of Japan.

Involvement with digital currency

Tetsuya Inoue: Why are central banks around the world so interested in digital currency issuance?

Robleh Ali: It all started with Bitcoin. Policymakers started to take notice of Bitcoin around 2012-13 because it was so different from how money is created through private bank lending in the conventional financial system. While by no means perfect, Bitcoin showed that you could have a functioning currency system without banks.

Money is so fundamental to the whole financial system that I think it's incumbent upon central banks to seriously think about new currency systems. Most central banks' mandates include both monetary policy and financial stability elements. Digital currencies touch on both.

Inoue: How are central banks researching digital currencies?

Ali: Central banks' fundamental concern is what role they should play and how they should respond if there's some kind of big transition catalyzed by cryptocurrency and associated technologies. The research they're doing is about preparing for an uncertain future, like an insurance policy. Central bankers need to be well prepared by learning about cryptocurrencies' underlying technology and how blockchain settlement systems work.

It's super important for central banks to have people on staff who understand the technology. Cryptocurrency issuers and software vendors' goal is to increase usage of their cryptocurrency or software, so they may gloss over its shortcomings or trade-offs. If central banks rely on outside experts' explanations without understanding the technology themselves, they would be at risk of making policy errors.

Inoue: Developing countries in particular seem very interested in digital currency issuance by their central banks.

Ali: As a strategy, I think it makes sense. If your financial markets are not yet mature, you have more freedom in terms of what you can do. As an analogy, look at telecom in Africa. Africa bypassed the fixed-line telecom stage in favor of mobile phones,

which are now ubiquitous in Africa. We may see a similar phenomenon with digital currencies. They may gain widespread acceptance first in developing countries with more leeway to innovate.

Central banks in developed countries are cautious about digital currency issuance because of uncertainties about how their highly developed banking systems would be affected. Developed countries are waiting for some other country to go first. If it succeeds, they will follow suit.

Digital currency experiments

Inoue: Tell me about the MIT Media Lab's DCI, where you're researching digital currencies.

Ali: The DCI started in 2015. Media Lab Director Joi Ito wanted to create a space where the Bitcoin core developers could work in a neutral environment free of commercial pressures.

We're doing a bunch of different projects, including the Lightning Network project, which is developing an innovative blockchain settlement protocol; and the Cryptokernel project, which is a blockchain toolkit. My focus within the DCI is the financial system. I'm leading a project on CBDCs.

We're particularly interested in how to move value around on the Internet. That's one of the big promises of blockchain technology. At the DCI, we do fundamental research necessary to help the technology fulfill its promise and take root globally.

Blockchain technology's most common use at the moment is trading different cryptocurrencies. There's a lot of speculation, which has its downsides. But I think such a phase is sort of inevitable, like the Web boom of 20 years ago. Over the long run, I think we'll see the technology mature and become capable of performing many more functions.

Inoue: Where are you at now with your project?

Ali: In phase one, I published a paper, Cellular structure for digital fiat currency, with input from a group of central banks. In it, I proposed a cellular structure model where a single fiat currency would have multiple digital currency issuers, each with its own separate cell [i.e., ledger].

In phase two, we'll work on building out such a model. I'm thinking about how to integrate stocks and bonds into a digital fiat currency model and how to do delivery-versus-payment. One of the insights from Bitcoin was that the financial system can be seen as a set of functions, not a set of institutions. Bitcoin demonstrated that certain financial functions can be done without financial institutions.

I think it's important to actually build a model and write software to show how the system would work. By doing so, we can learn specifically how a new currency system would function.

Inoue: In that sense, Bitcoin and a lot of other of cryptocurrencies are like experiments.

Ali: Yes. For example, Bitcoin has a policy of halving the coin reward for mining a new block every 210,000 blocks, but no one could predict what would happen when such "halvenings" occur.

We're not going to run a new currency system that actually moves value right from the start. We think the best approach is to initially run a mock system using real machines and real software before transitioning to a new system with real value at stake. But that's not the approach Bitcoin took.

One advantage Bitcoin had over other cryptocurrencies is that it had two or three years of relative obscurity where it was just a technical software project and the only people interested in it were software developers. There wasn't a bunch of people thinking, "This is going to make me rich."

Anything involving money will end up inviting speculation, so I think you should leave such elements out of the equation as much as you can. We try to replicate the early days of Bitcoin by focusing on the technology and the people who want to work on it. You need to make sure the technology works before allowing a cryptocurrency to be

used as money.

Inoue: Are you focusing more on wholesale or retail digital currencies?

Ali: At this stage, we do not want to draw a distinction between the two.

Inoue: Central banks' pilot programs have so far all been related to wholesale CBDCs.

Ali: Yes, many central banks are focusing on functions related to securities settlement and central securities depositories. We want to build a system that's capable of supporting both. We see no need for separate systems.

What would financial system look like under new currency system?

Inoue: What's most innovative aspect of digital currency?

Ali: The fact that it's money without banks. When you take financial institutions out of the picture, you can flatten the structure of the system, create a new system with a different structure.

Digital currencies' rules are basically all in their software [i.e., technology]. The rules' enforcement is likewise all in the software. Conventional payment systems are a combination of technology and rules. For example, if you want to join the Visa payment system, you have to agree to Visa's contractual rules.

But not even digital currency systems can be governed entirely by technology. Basic procedures for coin issuance and transaction authentication are defined by the protocol in the software, but differences of opinion on governance issues have arisen within cryptocurrency communities, leading to the emergence of new currencies.

The extent to which a system can be governed by software alone is an interesting question, one that calls into question the role of existing central securities depositories and clearinghouses.

Inoue: How will credit creation work under a centralized digital currency system?

Ali: The system I described in my cellular structure paper would basically coexist with the existing system, so it would essentially have no effect on credit creation by private banks.

If you get rid of fractional reserve banking upon switching to digital currency issuance, you'd be drastically changing the financial system. Such fundamental changes would require careful thought by not only the central bank but also the government. The public also must have a say in the matter.

Inoue: That reminds me of the Swiss Sovereign Money Initiative. Although it was voted down in a national referendum, it sparked a lively debate of full-reserve banking, with even international institutions chiming it.

Ali: Yes, that debate was partly about whether policymakers responded correctly to the global financial crisis. Their policy responses were supposed to fundamentally change the financial system over the next decade but I think they were merely patches.

That's one reason why cryptocurrencies have taken off. Cryptocurrencies speak to the public's need to really change the way the system works. The authorities have to be cognizant of the public wanting this fundamental change.

I see my role as how to make such change a reality. Even if cryptocurrencies are ultimately successful, they'd be pointless if the structure of the financial system remains unchanged and some big players have a lot of influence over the system like big banks do today. Even cryptocurrency mining is industrialized, with miners exercising a lot of influence over the system. Bitcoin may become even more concentrated.

Inoue: In other words, technological change alone is not enough. The financial system must change democratically.

Ali: Yes, the important point is that the system be run for the benefit of its users. The outcome that I'd like to see is a world in which individual users have much more influence over the system's operation.

Inoue: How can we create such a user-centric system?

Ali: Through competition. At the moment, if you want to hold money digitally, you're pretty much forced to deposit your money in a private bank, which essentially means you're lending money to the bank. The banking system consequently has to be backstopped with deposit insurance and the government has to bail banks out if they go bust.

I think we need an alternative to this system of implicit and explicit subsidies. Then we'd have competition not only between the new system and the banking system but also within the new system. When thinking about a cellular structure for digital fiat currency, I placed priority on preserving competition within the new system over the long term.

You need to be aware of the forces that will eventually centralize the system and think about how to structure the regulatory system to counteract those forces. To me, competition is an important public policy consideration in the context of financial stability as well.

Potential for digital currency use in Japan

Inoue: Lastly, I'd like to hear your views on digital currencies' implications for Japan. Japanese banks have long been plagued by stagnant lending activity and declining profits. Given such an environment, I think banks may be receptive to digital currency. If Japan transitions to a digital currency system, banks may be able to reduce the burden of balance-sheet-related regulations to some extent.

Ali: I'm no expert on the Japanese banking system but any transition of this nature would create the opportunity to change the way institutions in the system work. For example, banks may have both profitable and unprofitable businesses. Big banks, however, may not have a clear picture of differences in profitability between their business units. Transition to a digital currency system could potentially make such disparities more visible.

Inoue: In other words, the transition would shed light on problems concealed by the banks' large scale. I'm not sure whether the Japanese are prepared to accept drastic changes in the currency system.

Ali: Like it or not, they may have no choice at some point. There are two routes to digital currency issuance by a central bank.

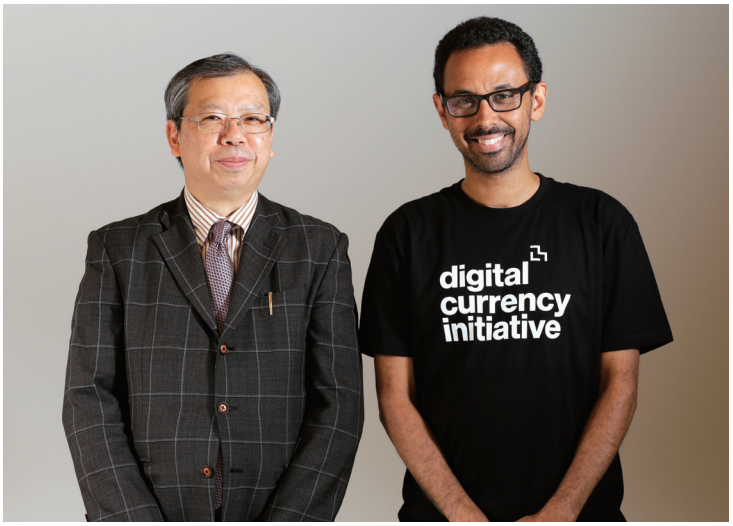
The first is where the central bank follows the private sector's lead. If one of the various digital currencies coming into existence ends up taking off and its usability gets better, central banks would have to look at it. It's analogous to private bank notes, which in the UK started as a private sector initiative that was later co-opted by the state. Now we have state-issued money.

The second way it could happen is in response to international changes. There's a bunch of digital currency projects going on in different countries. If one country, particularly if it's a big one, decides to issue a digital currency, many other countries may do likewise.

Inoue: In the latter case, one reason a country may issue a digital currency is to raise its own currency's international stature.

Ali: China has pretty much said that its central bank will issue a digital currency. It's just a question of when. I can understand why China would do so: if your currency achieves reserve currency status, you gain a huge number of benefits.

Inoue: How would the US respond in such an event?



Ali: For the bigger economies, I think that strategic considerations that go beyond pure economics come into play. Aside from China and the US, other developed economies would have to decide what to do if a country bigger than themselves adopts a digital currency. Once a neighboring country has a digital currency, there's always a risk of it bleeding across the border and circulating in your country because it's convenient to use.

Inoue: That would be the digital equivalent of dollarization. Japan needs to be fully prepared in case its big neighbor, China, moves forward with digital currency issuance. Thank you for an insightful conversation.

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