

Financial Stability and Monetary Policy Issues Associated with Digital Currencies

Remarks at Fintech – the Impact on Consumers, Banking, and Regulatory Policy

Bill Nelson

Chief Economist, The Clearing House

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Introduction

Thank you Julapa and the other concert organizers for this opportunity to speak at this interesting and timely conference. Let me start with a disclaimer, and not just the usual disclaimer. My work at The Clearing House and at the Fed before that has been focused on banking regulation, financial stability, and monetary policy. I am not an expert on digital currencies. So I thought today I would discuss digital currencies from the financial stability and monetary policy perspective. Given my non-expert status and for all the usual reasons, I'd like to emphasize that these are my views, not those of The Clearing House.

My talk will first address financial stability issues associated with digital currencies and then turn to monetary policy issues. By "digital currencies" I mostly mean private sector, digital, means of payment such as Bitcoin but I will also discuss some of the issues associated with central bank digital currencies. I make no pretense at this being independent work. I have drawn heavily on studies of this issue by the Bank of England, IMF, BIS, and FSB and benefited from discussions with a number of experts at central banks, academia, and The Clearing House.

Financial stability

Years ago, after the 9-11 terrorist attacks, I was involved in some of the planning for possible future terrorist incidents. When discussing with Roger Ferguson, the Vice Chairman of the Board at that time, the possibility of a problem with Fedwire, the large-value payment system operated by the Federal Reserve, my colleagues and I explained the extraordinary number of backups, hot, warm, and cold, that the Fed maintained. After discussing each one, Roger's response was "what if that one was destroyed too?" In the end, we had to build a spreadsheet-based additional version. While the principal lesson I drew from the experience is that it is impossible to satisfy people when it comes to contingency planning, it also illustrates the extraordinary importance of the payment system for financial stability and the risk posed by central points of failure. In that regard, digital currencies, at least those based on distributed ledger technologies are attractively resilient, at least in principle.

In practice, however, at least to date, distributed ledger technologies appear to be more, not less, subject to fraud and cyber risks than central bank payment systems. Indeed, the last annual report prepared by the U.S. Financial Stability Oversight Council lists technological problems with Bitcoin and the exposure of distributed ledger technologies to fraud as potential emerging threats to financial stability.

That said, with respect to financial stability, currently the issues seem to be concentrated in digital currencies as an asset, not as a currency. A number of studies, including a recent Fed working paper, report that the majority of Bitcoins, for example, are held by investors, not as a means of payment.

With Bitcoin value up 400 percent this year, there has been a lot of speculation about whether there is a bubble in Bitcoin prices. Usually a bubble is defined as a positive departure from the fundamental value of an asset, and it is a hard in this instance to determine what fundamental value means. But the question boils down to whether recent price gains have been driven by expectations of future price gains and are subject to a sudden reversal. In his book *Irrational Exuberance*, Yale professor and Nobel Laureate Bob Shiller has argued that asset price bubbles are frequently tied to technological change and the resulting promise of large but uncertain future returns. He points out that there were bubbles associated with the advent of rail travel in the early 1900s and mass production in the 1920s. Professor Shiller, and others, including recently Jamie Dimon, have indicated that they consider Bitcoins' current valuation to be a bubble.

The popping of asset price bubbles does not necessarily lead to financial stability problems. For example, the bursting of the dot-com bubble in 2000 had limited financial stability consequences. Several additional preconditions need to be met. Generally, for the bursting of a bubble to imperil financial stability, investments in the asset need to be funded with short-term debt, and exposures need to be material and connected to core providers of credit to the economy.

As far as I can determine, digital currencies have none of these characteristics currently. The asset class, at about \$130 billion, may be too small to be material. For comparison, there was \$800 billion in subprime and nonprime RMBS outstanding at the end of 2006. My view at the time was that that amount of nonprime RMBS was simply too small to constitute a systemic risk, which proved to be spectacularly wrong.

Also, I am told that there is little leverage supporting digital currency investments including in initial coin offerings, or ICOs, in which firms raise capital by selling digital tokens that can be turned in for a service by the firm.

It seems to me that the risks to financial stability from digital currencies currently or in the near future are likely to be concentrated in economies where the currencies are in greater use, either because there is less confidence in the domestic currency or the digital currency allows individuals to evade capital controls. Even in those cases, while large and rapid declines in the value of the currency could lead to widespread losses and even panic, it is hard to see how those losses would be conveyed to the core financial intermediaries in the economy unless those intermediaries had provided credit to support speculation.

The most serious financial stability risks from digital currencies seem to only be possibilities, not yet realities. If a digital currency came into widespread use as a currency, then we would be in a world where its value was relatively stable and it was seen as a low risk asset, otherwise it would not be used as a unit of account and store of value. As we saw in the financial crisis, financial stability risks are concentrated in assets that are considered to be safe, not assets that are considered to be risky.

If there were a sudden loss in confidence in the digital currency, savers and investors would switch rapidly to dollars (assuming this is in the United States). Financial institutions that were net long the currency would make losses, deposits denominated in the digital currency would be withdrawn, and financial institutions would be unable to roll over short-term borrowings denominated in the currency.

If there were multiple digital currencies in use, loss in confidence in one would likely lead to a loss in confidence in all. For this reason, the appropriate measure of the size of financial stability risks posed by digital currency is probably the total amount of such currency outstanding, not the amount of an individual currency.

The central bank would be able to operate as a lender of last resort, although only with difficulty. Consider a commercial bank that had illiquid assets denominated in the digital currency and was experiencing a run on its deposits denominated in that currency. At least in principle, the central bank could purchase the digital currency in the open market, lend the digital currency to the bank, and take the bank's digital currency assets as collateral.

But it would take time for the central bank to purchase the digital currency and effective lender of last resort intervention usually needs to be fast. The purchases in the necessary size might be especially difficult if, as seems likely, markets for the currency were disrupted at the time. On the other hand, in this situation, there might be many eager sellers of the digital currency.

Similar problems arise when a central bank needs to provide lender of last resort support in a foreign currency, and the major central banks have established standing currency swap arrangements to facilitate such operations. In the digital currency case, however, there is no counterparty with which to establish a swap line.

If the economy had converted entirely to the digital currency, I think there are two cases to consider. In the first case, all payments take place through the digital currency platform, and there is no central bank at all. In this case, it is unclear if there would be a public agency that could act as a lender of last resort. While a government agency or consortium of private banks could lend, the lending would not expand the total amount of liquidity available so it could not meet the generalized increased demand for liquidity that occurs during a financial crisis.

The second case is more complicated but perhaps more relevant. If an economy adopted a digital currency, banks would make loans denominated in that currency and take deposits denominated in that currency. The digital currency money supply would equal bank deposits denominated in the currency and digital currency held outside the banking system. If banks were required to back deposits with digital currency one-for-one, then the money supply would equal the quantity of digital currency. But if banks only had to back deposits with a fractional amount of digital currency, then the digital currency money supply would exceed the quantity of digital currency.

The situation would be analogous in some ways to pre-Civil War United States when the country was on the gold standard, but banks were able to issue notes that were convertible to gold. Over time, the ratio of notes to gold went up, however, and when things went badly there were runs on banks, the banks

folded or suspended the conversion of notes to gold, and the panic got worse, with substantial adverse effects on the economy.

In this second case, it is easier to see a role for a central bank, which would itself take deposits from the commercial banks. The central bank would be well positioned to act as a lender of last resort to the banks, although it would be limited by its need to maintain an adequate stock of the digital currency to back the commercial bank deposits it had received.

Monetary policy

Total conversion to a digital currency is a convenient, although admittedly implausible, point to begin a discussion of the monetary policy implications of the currency. The situation would in some ways be similar to instances where an economy had converted entirely to the dollar, or to the situation of an individual country in the Eurosystem. The central bank, if there were a central bank, would not be able to stabilize the macroeconomy. Moreover, because the supply of digital currency is fixed or exogenous to the demand for currency, economic and financial volatility would be amplified, although it may be that changes in the design of digital currency schemes could help limit the damage.

If the quantity of the digital currency is fixed, then as the economy grows, the real value of each unit of the currency would rise. Put another way, prices of goods in the currency would be falling; there would, on average, be deflation. Deflation is bad for an economy. Businesses and households tend to put off expenditures because items will cost less in the future than at present, holding back economic activity.

The contractionary consequences of deflation are largely a result of the fact that interest rates generally cannot be negative. But the zero bound on interest rates is tied to the fact that paper currency always provides a zero rate of return. In a digital currency world, that restriction on interest rates could possibly be lifted, a point I will return to in a moment.

In any case, the deflation problem seems partially fixable by allowing the outstanding quantity of the digital currency to grow with the economy. Even so, unless the quantity of the digital currency were able to move up and down with seasonal demand, at least, and respond to other outside shocks to the economy, at best, there would be excessive volatility of interest rates and a tendency toward financial crises, which often happened historically during seasonal tightness in demand for money. The Fed was created to provide just such an elastic currency.

If the economy operated partially in the digital currency, and the public currency and the digital currency had a floating exchange rate, the central bank would seem able to moderate the business cycle and control public currency inflation rate but with less precision because of volatility coming from the digital currency side of the economy.

Some of the most interesting recent discussions about these monetary policy issues concern central bank digital currencies. While a central bank digital currency can take the form of an anonymous token akin to digital cash, similar results, apart from anonymity, can be achieved by simply allowing universal access to central bank accounts.

If the economy were to convert entirely to such central bank digital currency, the zero lower bound on nominal interest rates could potentially be overcome entirely. The central bank could pay a negative interest rate on the accounts, driving its policy rate as low as necessary to achieve the needed economic stimulus, at least in principle. I suspect there may be insurmountable political hurdles, though, if the public were forced to hold digital cash and then forced to pay interest on it.

Conclusion

At this point, many of the financial stability and monetary policy problems associated with digital currencies seem remote. Regarding monetary policy, no digital currency seems likely to come into sufficiently widespread use to complicate the central bank's ability to moderate the business cycle and control inflation.

For those who are fans of policy rules or a gold standard, a digital-currency-based monetary system may seem attractive for the same reason: It provides a way to limit central bank discretion. However, usually such schemes are proposed as a means to overcome a perceived tendency for the central bank to generate too much inflation. In the current environment, where inflation has been low for decades and is, if anything, too low, there does not seem to be a need to boost central banks' credibility or rein in their inflationary tendencies.

And even in countries or situations where the public has lost faith in the central bank, it seems inconceivable that a private digital currency would be adopted instead of, say, dollars. A fundamental characteristic that the public demands in a currency is trustworthiness, and it does not seem credible that the public would want to convert to a currency subject to fraud or technical errors with no person, firm, or government standing behind it.

For the same reasons, some of the more extreme financial stability risks also seem highly unlikely. In particular, if a digital currency does not come into widespread adoption, then banks won't be subject to digital currency runs and the central bank won't have to struggle to be a digital currency lender of last resort.

Nevertheless, other financial stability risks seem more serious. It has been impossible to read about digital currencies and initial coin offerings without concluding that there is a mania going on. While it seems likely that the fallout from any popping bubble will be limited, you can never be sure until it happens.

References

Ali, Robleh, Barrdear, John, Clews, Roger, and Southgate, James, 2014, Innovation in payment technologies and the emergence of digital currencies, Quarterly Bulletin 2014:Q3, Bank of England.

Badev, Anton and Chen, Matthew, 2014, Bitcoin: Technical Background and Data Analysis, Finance and Economics Discussions Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board.

Bech, Morten and Garratt, Rodney, 2017, Central bank cyptocurrencies, BIS Quarterly Review

Bordo, Michael D. and Levin, Andrew T., 2017, Central Bank Digital Currency and the Future of Monetary Policy, Hoover Institution Economics Working Paper 17104

Committee on Payments and Market Infrastructures, 2015, Digital currencies, Bank of International Settlements

Financial Stability Oversight Council, 2016, Annual Report

He, Dong, Habermeier, Karl, Leckow, Ross, Haksar, Vikram, Almeida, Yasmin, Kashmia, Mikari, Kyriakos-Saad, Nadim, Oura, Hiroko, Saado Sedik, Tahsin, Stetsenki, Natalia, and Verdugo-Yepes, Concepcion, 2016, Virtual Currencies and Beyond: Initial Considerations, International Monetary Fund Staff Discussion Note 16-03

Shiller, R.J, 2000. *Irrational Exuberance*, Princeton University Press