

Randal K Quarles: Thoughts on prudent innovation in the payment system

Speech by Mr Randal K Quarles, Vice Chairman for Supervision of the Board of Governors of the Federal Reserve System, at the 2017 Financial Stability and Fintech Conference, sponsored by the Federal Reserve Bank of Cleveland, the Office of Financial Research, and the University of Maryland's Robert H Smith School of Business, Washington DC, 30 November 2017.

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It is a pleasure to be with you today to talk about financial stability and fintech. Being in the Treasury's beautifully restored Cash Room calls to mind the themes of both history and finance. History, because the room was constructed just after the Civil War. Finance, because it was designed to be the Treasury's bank and was originally used to conduct daily banking and payment transactions with other banks and the general public. Of course the functionality of this room has changed over the decades as the financial system landscape has evolved, and today we are holding a conference here to discuss financial innovation.

Before I begin, I will note that my colleague, Jay Powell, was supposed to be your speaker today. However, as you can likely surmise, he had to attend to other matters and asked me to speak in his place. So to carry through the theme of today's topic, one might call Jay the innovator on payments issues at the Federal Reserve, as he has spoken extensively on the subject for many years. And one might think of me as tech support on these issues for the day.

New technologies have brought tremendous, positive change to our lives, raising productivity and living standards and contributing to economic growth. In the past few years, innovation has profoundly transformed industries such as retail shopping, the media, and even transportation by providing greater speed, convenience, and competition. Not surprisingly, both the banking industry and technology firms have also been seeking innovations in financial services that mirror and complement changes that have been made in other industries. Innovation is coming to finance with changes to consumer lending, financial advice, and retail payments, to name a few. The Federal Reserve, itself, is engaged in a multiyear effort to address challenges and opportunities in the current payment system.

During my experience in the realm of private equity, I had a chance to interact with many new firms in these areas. The pace of innovation was often dizzying. In my new role as Vice Chairman for Supervision at the Federal Reserve, I see innovation as something that can and should be fostered, but of course I must also scrutinize these innovations from a different perspective. That is to say, it is appropriate not only to evaluate the potential of innovations to improve on existing services, but also to judge their ramifications for the safety and soundness of the institutions we supervise and for financial stability—the topic of this conference. Although many of these technologies are still nascent, it is important to have an eye on the potential financial stability implications both in the short- and long-run. Payment systems need to be resilient during adversity. Without that resilience, we could face a sudden loss of public confidence and the seizing up of systems and critical activities.

With the Cash Room's perspective on history and daily financial operations in mind, I would like to concentrate my remarks on the U.S. payment system, which is a critical foundation on which financial transactions and the conduct of business take place. New technologies are being proposed that could alter the design of our payment system. Today, I will talk about the necessary trust and confidence that the system requires, the tension between the need for financial stability and the need to innovate, and the challenges that digital currencies, in particular, present relative to the current system. These considerations highlight the need for a prudent approach to innovation in payment systems.

Payment Systems, Networks, and Trust

Payment systems are both financial networks and technical networks. In simple terms, there is an asset that functions as money that can be transferred by households and businesses to buy goods and services, which, along with their financial institutions, make up the bulk of the financial network. Today, the predominant forms of money used in payment systems are Federal Reserve notes and reserve balances as well as transaction balances at depository institutions.

Payment systems also require a technical network to hold and transfer money. In earlier times, the network was less technical in nature and almost exclusively designed for the logistical storage and transfer of physical forms of money. Today, the main payments networks use centralized technology to process and safeguard the public's electronic funds transfers. Regulated banking institutions provide deposit money to the public and are a main source of trust for these systems. Transfers of balances on the books of these institutions are at the center of the public's transactions, with the Federal Reserve Banks playing a central, supporting role in interbank clearing and settlement for the most critical systems.

A great amount of resources and effort goes into the networks that make the overall payment system safe, efficient, and resilient. It is fair to say that the general public places a great deal of trust in the components of the overall system to safeguard their money and operate as planned every day, and that trust is necessary for the system to work. From the perspective of financial stability, if the safety and integrity of the institutions and assets at the heart of a system erode or the transfer operations are not dependable, then the necessary trust and confidence that the system requires to work may quickly cease to function as needed.

Payment System Innovation

With a steady diet of news about the effect of electronic networks, personal devices, apps, and more on U.S. industries, many question the effect of these technologies on the payment system. I think we should recognize that there can be a tension between the need for financial stability in the overall payment system and the need to innovate to keep up with the demands of modern technology and lifestyles. However, we should also recognize that this tension is not necessarily troubling. By definition innovation means doing something new, which usually involves taking risk in furtherance of some gain. But at the same time, we should be vigilant in balancing the benefits of innovation with the safe and reliable operation of systems and critical activities.

From an analytical perspective, payment systems typically increase in value as more people use a system and the more attractive it becomes to others. In addition, there is an inverse relationship between the volume of users of a system and the cost of production—more users lower the cost of production. Until recently, these features may have hindered innovation by presenting high barriers to entry and may have also fostered greater concentration into a few key entities that could become systemically important.¹ Of course, technology may be able to reduce the effect of at least some of these hurdles by, for example, attracting high numbers of users quickly or reducing the costs of production. However, the effect of reducing technological barriers for financial stability is not clearly positive or negative. For example, on the one hand, new market participants attracted by lower barriers to entry may introduce new and unknown risks in the payment system. On the other hand, new market participants may relieve the concentration of activity in a limited number of players.

Thus, the potential tension between innovation and stability can be more difficult to manage in the case of payment systems as compared to other industries that are less affected by these hurdles. One sensible approach to risk management would emphasize “starting small” and taking small risks. But unless a payment system grows a fairly large network of users in a reasonable time, it is unlikely to achieve the scope and scale it needs to be successful. Conversely, if a system attempts to start on a large scale and is successful, there will surely be

questions about resilience in adversity, particularly if cutting-edge technologies and methods are used to handle people's money. The essential problem is how to achieve scale and manage financial and technical risk at the same time. Not surprisingly, because striking the right balance takes time, genuine innovation in payment systems over history has often been measured in decades, not years.

Private Digital Currencies

As part of the new technology associated with fintech, we are now seeing the emergence of privately developed digital currencies using new decentralized technologies. Fundamental to these digital currencies is the establishment of a new asset, the unit of the digital currency—for example, a bitcoin—and a new record-keeping and transfer mechanism that enables users to store and trade those units—for example, a blockchain—often without reliance on traditional financial institutions.

I believe the financial industry is increasingly recognizing that we should separate the concept of digital currencies from the innovative new technologies that they have employed to transfer assets. Those technologies, such as distributed ledgers, may offer useful new ways to store, transfer, and protect data and traditional financial assets. The industry is now moving cautiously from pilot projects in many of these areas to the use of these new technologies in limited production settings. This cautious approach to using new technology appears to reflect the weight of responsibility the financial industry bears for protecting both their customers and their reputations. Continued monitoring of developments is in order, and time will tell how these new technologies—and others—can contribute to a safe and secure payment system and broader financial system. The Federal Reserve has been actively monitoring these developments and will continue to do so.²

But when we examine the assets at the center of digital currency systems, I think we should begin to think clearly about the long-term properties we seek for large-scale payment networks and systems used by the general public. Today, the vast majority of our payments by volume and value are processed by regulated financial institutions. In the U.S. payment system, digital currencies are a niche product that sometimes garners large headlines. But from the standpoint of analysis, the “currency” or asset at the center of some of these systems is not backed by other secure assets, has no intrinsic value, is not the liability of a regulated banking institution, and in leading cases, is not the liability of any institution at all. Indeed, how to treat and define this new asset is complicated.³

While these digital currencies may not pose major concerns at their current levels of use, more serious financial stability issues may result if they achieve wide-scale usage. Risk management can act as a mitigant, but if the central asset in a payment system cannot be predictably redeemed for the U.S. dollar at a stable exchange rate in times of adversity, the resulting price risk and potential liquidity and credit risk pose a large challenge for the system. During times of crisis, the demand for liquidity can increase significantly, including the demand for the central asset used in settling payments. Even private-sector banks and certainly non-banks can have a hard time meeting large-scale demands for extra liquidity at the very time when their balance sheets may be in question. Moreover, this inability to meet the demand for extra liquidity can have spillover effects to other areas of the financial system.

Earlier in our history, the United States frequently witnessed bank runs that severely disrupted financial and economic activity, an example of what can happen when people lose faith in a payment system. In response, Congress ultimately introduced both a central bank and deposit insurance programs to help regulate fluctuations in the supply of liquidity in order to keep prices stable. Without the backing of a central bank asset and institutional support, it is not clear how a private digital currency at the center of a large-scale payment system would behave, or whether the payment system would be able to function, in times of stress.

Central-Bank-Issued Digital Currency

Given that privately developed digital currencies may raise important financial stability issues tied to the value of the asset, some have argued that central banks should begin to issue their own digital currency as a 21st century analogue to paper currency. I would urge caution, particularly for countries like the United States with highly developed banking systems and ongoing robust demand for physical cash.

As a practical matter, I believe that consideration of a central-bank-issued digital currency to the general public would require extensive reviews and consultations about legal issues, as well as a long list of risk issues, including the potential deployment of unproven technology, money laundering, cybersecurity, and privacy to name a few. I am particularly concerned that a central-bank-issued digital currency that's held widely around the globe could be the subject of serious cyberattacks and could be widely used in money laundering and terrorist financing. The effect of all this would significantly divert our focus from work to improve or establish new private-sector retail payment systems based on existing institutions. The prospect of a government-sponsored digital currency might even derail private-sector plans to enhance the payment services provided to their customers, thereby significantly disrupting the financial networks that exist today in ways that could create instability. For example, if payment activity radically shifted from using deposits at financial institutions to using central-bank-issued digital currency, deposits could significantly shrink and potentially disrupt financial institutions' ability to make loans that spur economic activity.

That said, research into digital currency issues, including highly liquid and secure limited-purpose digital currencies for use as a settlement asset for wholesale payment systems, should continue. As technologies are developed and refined, old issues are resolved and new issues arise. Other countries may have different environments and experiences. We should always be open to learning and understanding from the experiences of others.

Prudent Innovation

For the United States, the alternative to privately issued digital currency is not necessarily a publicly issued digital currency. Instead, the near-term alternative is to build on the trusted foundations of the existing payment system and work to improve private-sector payment services. Importantly, this means looking to the banking system, which holds the bulk of the transaction deposits in this country, to improve services. This began a number of years ago with internet banking. Today, many banks offer around-the-clock internet-based access to accounts as well as mobile banking and payment capabilities. Many banks typically allow real-time or near real-time transfers of funds among their own customer base. What does not yet exist in the United States is the sort of ubiquitous, real-time payment system that would allow banks and their customers to make transfers and settlements of funds across the banking system instantly, conveniently, and securely all the time.

As my colleague at the Board, Jay Powell, recently discussed at a conference in New York, the Federal Reserve has been working with the banking industry and a wide range of other payment system stakeholders to better understand the consequences of this state of affairs and support efforts to expand the available options through our payment system improvement initiative.⁴ For example, based on recommendations from the industry, the Federal Reserve is currently studying potential improvements in its settlement services—a traditional core function of a central bank—that could address the future needs of a ubiquitous real-time retail payments environment.

Building on our existing banking system also makes sense from a financial stability perspective. Federally insured and supervised institutions are the core of our current payment system and largely address the potential financial stability problem of relying on payment systems with

unbacked and unregulated digital currencies at their heart. But leveraging our existing banking system does not suggest that there is no room for new or emerging institutions and technologies. Indeed, there are a number of promising avenues that would allow the innovations that appear to be of the greatest interest to households and business—attributes like instant payment capabilities and around-the-clock operations—to be offered using a variety of existing and new technologies without requiring significant tradeoffs in safety and resiliency.

Summary

To conclude, our financial stability requires that the payment system be reliable and dependable so that the public can trust it. As a result, there can be a tension between innovation and the need for financial stability in the overall payment system. Innovation must therefore account for the effects that it has on both the financial and technology networks that make up our payment system.

The innovation that is beginning to flow from the development of digital currencies—and other technologies—will likely have a long-run effect on the technical networks and the business processes used in the payment system and the wider financial system. Privately developed digital currencies as currently configured would raise concerns about the effect on financial stability if they take on more prominence in the payments and overall financial system. Central bank digital currencies are also not immune to a large range of risks and could even adversely affect financial stability. As such, central banks should tread cautiously as they contemplate issuing them. But this does not mean that we should avoid further innovation. Working cooperatively, private-sector participants and central banks can incorporate innovation that may be able to strike the right balance of improving the technical networks without adversely generating financial stability concerns. I am optimistic that the Federal Reserve’s work with the payments industry will facilitate a future with a safe and more efficient payment system.

¹ See Financial Stability Board, [Financial Stability Implications from FinTech: Supervisory and Regulatory Issues that Merit Authorities’ Attention \(PDF\)](#), June 27, 2017.

² See David Mills, Kathy Wang, Brendan Malone, Anjana Ravi, Jeff Marquardt, Clinton Chen, Anton Badev, Timothy Brezinski, Linda Fahy, Kimberley Liao, Vanessa Kargenian, Max Ellithorpe, Wendy Ng, and Maria Baird, [“Distributed Ledger Technology in Payments, Clearing, and Settlement \(PDF\)”](#), Finance and Economics Discussion Series 2016–095 (Washington: Board of Governors of the Federal Reserve System, 2016).

³ For example, the Commodity Futures Trading Commission published a statement on digital currencies making clear that many fall into the category of commodities under the Commodity Exchange Act (www.cftc.gov/PressRoom/PressReleases/pr7231-15). The Securities and Exchange Commission has published guidance on the treatment of digital currencies under the Securities Exchange Act (www.sec.gov/news/press-release/2017-131). The Internal Revenue Service has published guidance on the tax treatment of digital currencies (www.irs.gov/pub/irs-drop/n-14-21.pdf). And the Financial Crimes Enforcement Network has published guidance on the treatment of digital currencies under the Bank Secrecy Act (www.fincen.gov/resources/statutes-regulations/guidance/application-fincens-regulations-persons-administering).

⁴ See Jerome H. Powell, [“Financial Innovation: A World in Transition”](#) (speech delivered at the 41st Annual Central Banking Seminar, sponsored by the Federal Reserve Bank of New York, New York, October 18, 2017).