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Considerations at the Intersection of Payments and Tokenized Markets

Remarks by

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at

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Thank you for inviting me to return and speak today.[1] I am delighted to be here during a transformational time in payments. Two years ago, I spoke at The Clearing House's annual conference, where I discussed the roles that the private sector and the Federal Reserve play in payments.[2] I argued that the public and private sectors have distinct but complementary roles. In particular, I emphasized that the private sector, through competition, is best positioned to develop solutions that benefit businesses and consumers and to fulfill a clear market need.

The Federal Reserve can support these solutions by providing core payment and settlement infrastructure upon which the private sector can innovate, assessing potential risks to financial stability, and regularly engaging with the industry to better understand market challenges. Related to this last role, it's important to note that my remarks today are informed by rich, ongoing discussions I conduct with industry participants across a variety of forums, including a recent payments innovation roundtable I hosted at the Federal Reserve with participants from across traditional and decentralized finance, or DeFi.[3]

Turning to the timely themes of the conference, many of the sessions focused on the evolving payments landscape, including the state of competition, technological advancements, and readiness for the future. With this backdrop in mind, today I will discuss some considerations for tokenization in the payment system with an eye toward

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[1] Thank you to Aaron Compton, Micah Gertzog, and Priyanka Slattery of the Federal Reserve Board for their assistance in preparing this text. The views expressed here are my own and not necessarily those of my colleagues on the Federal Reserve Board or the Federal Open Market Committee.

[2] See Christopher J. Waller (2024), "What Roles Should the Private Sector and the Federal Reserve Play in Payments?" speech delivered at The Clearing House Annual Conference 2024, New York, New York, November 12, https://www.federalreserve.gov/newsevents/speech/waller20241112a.htm.

[3] Additional information on the September 18, 2026, roundtable is available on the Board's website at https://www.federalreserve.gov/paymentsystems/files/payments-innovation-roundtable-meeting-20260918.pdf.

the future and, in particular, the intersection of this technological advancement with existing systems and markets. To be clear, in this context, my focus is on the concept that a financial instrument can be represented digitally in "token" form and transacted on a new platform or technology, such as a distributed ledger technology like blockchain.[4]

Although the terms "blockchain," "tokenization," and "smart contract" are widely used, to ensure we are on the same page, I want to give a simple explanation of each of these concepts. A blockchain is simply a database that can have a variety of management properties, such as who can hold a copy of the database, who can read the database, who can change the database, and how the database can be updated. The word block means data are added to the existing database in "blocks"—much like adding a new sheet of data to an existing Excel file.[5]

Tokenization refers to the process of altering the properties of one form of an asset so that it can be transferred and used on a different platform than its current one. For example, if you go to a casino, you cannot use physical currency at the tables or machines. But you can take your cash and buy poker chips to use on the tables. In this world, poker chips are a tokenized version of physical cash that can be used instead of cash.

Finally, a smart contract is simply a piece of code that is embedded in the database and can be triggered to execute an action at a given point of time or under a particular set of conditions. The key aspect of a smart contract is that all conditions of

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[4] See Bank for International Settlements and Committee on Payments and Market Infrastructures (2024), Tokenisation in the Context of Money and Other Assets: Concepts and Implications for Central Banks (Basel: BIS and CPMI, October), https://www.bis.org/publications/tokenisation-context-money-and-other-assets-concepts-and-implications-central-banks.pdf.

[5] For a more careful discussion of blockchains, see David Andolfatto (2018), "Blockchain: What It Is, What It Does, and Why You Probably Don't Need One," Federal Reserve Bank of St. Louis, *Review,* vol. 100 (2), pp. 87–95, https://doi.org/10.20955/r.2018.87-95.

the code must be met simultaneously for the action to occur and be recorded on the blockchain. Smart contracts allow financial trades to be programmable, which is appealing for automating trades.

In any financial trades on a blockchain, there is an object being bought (say, a tokenized share of stock) and there is a tokenized payment instrument being used to settle the trade. For example, stablecoins are starting to be used behind the scenes to settle obligations among participants in card networks. And The Clearing House is one of several groups building a network for clearing and settling tokenized deposits, which are digital transformations of the digits in your checking account that can then be used as a payment instrument to execute a blockchain trade.

Now, let's look a bit closer at how payment innovation has progressed since I was here last. After a sustained period of industry investment and activity, a convergence between blockchain technologies and established markets is clearly under way, and deepening connections between these systems are taking root. Just a few years ago, blockchains were primarily used for crypto-asset trading activities. Today, all kinds of assets—from stocks to bonds to commodities—are being tokenized for use on blockchain networks to take advantage of new capabilities like programmability. And established payment providers, financial institutions, and market infrastructures are leveraging these capabilities. Firms are using these technologies to improve existing services—both customer facing and back office—and introduce new ones.

At any point of convergence, such as those I have described, key questions arise that must be addressed before progress can continue. Let me focus on three areas. First, I will share observations on how tokenization is increasing competition between new and

existing players, leading to a variety of solutions and choices for market participants to sort through. Second, I will discuss the importance of building trust in new tokenized services if they are to scale. Third, I will turn to how payments can support safe and efficient tokenized markets, where the same themes of competition, choice, and trust apply. Along the way, I will highlight open questions market participants should consider. I will close with some thoughts on ways the Federal Reserve can continue to support innovation in payments.

Observations and Key Questions

Competition Dynamics

Tokenization is changing the nature of competition in payments. I am a firm believer in the free market and consider it the best testing ground for new, more efficient ways to deliver products and services, including through the introduction of new technologies.[6] Blockchains in particular have some distinguishing features that make them ripe ground for competition in payments and financial markets. By operating 24/7/365, open blockchain networks offer a new paradigm for competition with traditional payment rails. In addition, smart contract code is often open source, or available to the general public. You or I could code and launch a smart contract today.

When a technology such as blockchain is introduced, it can often set off a race between new entrants and established firms. Each has relative advantages. The new entrants bring native familiarity with the new technology and its potential to improve efficiency or enable new ways of doing business. But established firms, too, have

[6] See Christopher J. Waller (2026), "The Next Frontier of Payments Innovation," speech delivered at Sibos 2025, Frankfurt, Germany, September 29, https://www.federalreserve.gov/newsevents/speech/waller20250929a.htm#fn1.

distinct advantages: They have amassed customer relationships and associated network effects, along with the power of market confidence. History is replete with examples of success from both ends of the field.

This competitive dynamic currently applies to the closely linked domains of payments and financial markets and could lead to more choices for consumers and businesses. Take, for example, DeFi firms, which first emerged to offer complex forms of lending and trading activity using crypto-assets, such as bitcoin and Ethereum. This activity was largely separated from regulated financial markets. As time has passed, there has been a better understanding of the potential for crypto technologies to improve existing payment systems and financial markets.

These new technologies are forcing established firms to compete in a number of ways. In some cases, firms are developing their own blockchains where they maintain final control over the ledger. In other cases, firms are pooling their resources to develop tokenized products and services or blockchains owned by a consortium. In still other cases, experienced institutions are developing new tokenized products and services in partnership with emerging blockchain firms.

Tokenization is still in the early innings of robust competition among new entrants, established firms, and combinations of each. Each model has its own benefits and tradeoffs among control and scale, and time will tell how these play out. Is it necessary for the market to coalesce around one model? I find it more likely that several different solutions will emerge to support different customers and use cases. But a market with many new options raises a further question: Which of them can be trusted?

The Trust Imperative

I now want to turn to what I'll call the *trust imperative* that is affecting the development of tokenization. For new tokenized services to succeed, they will need more than just technical prowess. They will also need to earn trust through how reliably they operate and how clearly they are governed. It is therefore encouraging to hear that the conversation about which aspects of tokenization need to scale is increasingly focused on trust and governance. Trust is built when transactions occur reliably and securely, both within and across platforms. It is hard to win and easy to lose. In payments, trust is measured not in months and quarters, but in years and even decades. From a public policy perspective, I am acutely aware of the importance of trust in payments.

As traditional financial assets move onto blockchains, tokenized services raise new questions about accountability. Who bears responsibility when fraudsters take advantage of the automatic execution of smart contracts? How will operators of new systems take responsibility for compromised or lost keys, erroneous transfers, and pricing errors? What happens to assets that are stranded on failed blockchains—the inevitable "zombie chains"?[7] The recent events around Binance have highlighted some of the issues that can arise from programmable blockchains.[8]

Answering these questions around trust is not merely a matter of finding the right solutions to purely technical problems. Industry debates are evolving to recognize that clear governance, sound legal frameworks, and common data and standards are just as important, if not more. Assets that move across networks must maintain legal identity,

[7] Zombie chains can be defined in a number of ways. Generally, the term is used to characterize blockchains with very low levels of developer activity and daily use, in contrast with a blockchain network that sees healthy developer activity and transaction volume.

[8] See Sam Kessler and Vicky Ge Huang (2026), "Binance Suspends Transactions After It Is Targeted in Biggest-Ever Cyber Heist," *Wall Street Journal,* October 30.

ownership rights, economic terms, compliance obligations, corporate-action treatment, and access to liquidity. Clear legal treatment of tokenized claims, settlement records, custody, insolvency, and resolution will be critical to mainstream institutional adoption—especially when assets are used in the most technically complex, smart contract–enabled arrangements.

Ultimately, the market will determine which solutions deserve broader business and consumer trust. These solutions must strike the right balance between controls and the creative potential of blockchains. As I mentioned earlier, this balance may be use-case specific. For example, systemically important financial transactions may call for the most conservative designs. These designs might trade some of the developer creativity found on purely permissionless, open networks in favor of greater privacy and control.

Integration Considerations

Finally, I want to focus on another area shaping the future of tokenization. How will payment solutions integrate within and across platforms for tokenized assets to support the development of safe and efficient markets? Will tokenized money be accepted and cleared efficiently at par? Here again, competition and trust will be key features of a successful payment system.

As with any market, tokenized finance will need choice in payment methods, with both tokenized and traditional payments having roles to play. Market participants increasingly expect payments to be automated and synchronized with the delivery of assets and services regardless of the time of day or day of the week. For example, imagine an investor buying a tokenized stock on a Saturday, when many traditional systems are closed. Using tokenized money, the payment and the stock could be

programmed to change hands simultaneously, reducing settlement delays and the risk that one side delivers and the other does not.

The private sector is quickly building a multi-instrument ecosystem of tokenized money to meet these needs of tokenized markets. In addition to stablecoins, tokenized deposits, tokenized money market funds, and other potential settlement assets are coming to market, each providing distinct benefits and tradeoffs. Stablecoins and tokenized deposits, for example, both enable programmable settlement but differ in issuer model, regulatory treatment, connectivity to traditional systems, and ecosystem reach. Given these choices, some forms of tokenized money may be well suited for certain use cases, like international business payments, while others may be best for high-value transactions in tokenized securities. As a result, corporate treasurers, banks, asset managers, and payment providers may use several tokenized instruments at once to serve different aspects of their business models, in the same way they use multiple rails today.

Choice also matters in settlement methods for tokenized markets. "Atomic" settlement is often cited as a benefit of programmable tokenized money. Broadly speaking, it means a transaction with more than one step that either completes all at once and in full or not at all. That can be useful for complex transactions with multiple parties. But in my conversations with market participants, they cautioned against viewing it as the only settlement model for tokenized markets. Other settlement models, such as net settlement and batch settlement, where only net amounts need to be funded, will remain useful when saving liquidity is a priority, as in high-volume capital market activity.

Given these diverse needs of tokenized markets, I believe traditional rails and the forms of money exchanged on them will continue to play an important role in

underpinning trust in the overall payment system. In particular, central bank money need not be used in every transaction or on every platform, but its presence at the foundation of the system is essential.[9] Traditional rails—such as those for large-value payments and, more recently, instant payments—support trust because they have proven resilient through market events, and many provide access to the safest forms of dollars through linkages to central bank money. That makes them a reliable backbone for final funds settlement on which innovative services, including tokenized markets, can develop. This is happening today, as traditional rails are used for on- and off-ramping stablecoins and for settlement of tokenized deposit transactions. I encourage further conversation on potential ways that tokenized markets and traditional rails can connect and complement one another.

Reflecting on this landscape, I see a range of payment solutions coexisting to meet the various payment needs of tokenized markets. The market will test different solutions, with the strongest approaches emerging through not only competition but also collaboration. An important question to resolve will be how participants can transition between various forms of money flexibly and safely. I expect continued dialogue between industry participants and the Fed will be helpful for thinking through considerations like cross-system connectivity and trust as the payment system evolves to support tokenized markets.

[9] A Committee on Payments and Market Infrastructures report published last month reaches a similar conclusion; it is available on the Bank for International Settlements' website at https://www.bis.org/publications/roles-central-banks-and-central-bank-money-evolving-payment-system.

Looking Ahead

I'll close by sharing some final thoughts on the intersection of tokenization and payments, with an eye toward the future, and then briefly discuss how the Fed can continue to support innovation in the payment system. First, the market is currently in an early period of experimentation and convergence between new and existing systems. The new systems may seem experimental now, but it is possible that market participants will look back on this period in the same way that we look back on the payment, clearing, and settlement technologies of the 19th and 20th centuries. We've come a long way from clearing payments via paper stacks of certificates and telegraph wires.

Second, while the considerations I've discussed today are actively being sorted through, the market is already considering how tokenization and blockchain-based systems will interact with artificial intelligence (AI), particularly AI agents in payments and commerce, a topic I spoke about a few months ago.[10] While agentic commerce is still in the early stages, tokenization and AI could be catalysts for one another. Both advancements are also grappling with similar questions on trust, standards, and the use of open or closed networks.

And, lastly, the Federal Reserve will continue to support responsible innovation by regularly engaging with and listening to industry, providing core payment and settlement infrastructure on which all market participants can build, and monitoring risks to financial stability. Where market forces alone cannot address a key challenge, and where it falls within our mandate, the Fed can act as a connector and convener. The goal

[10] See Christopher J. Waller (2026), "Payments in the Age of AI Agents," speech delivered at Sibos 2026, Miami, Florida, September 29, https://www.federalreserve.gov/newsevents/speech/waller20260928a.htm.

is to support a market that keeps innovating, remains safe and resilient, and delivers better services for the public.

With all of that in mind, I am keenly focused on how new technologies can affect the structure and functioning of payment systems globally. I look forward to continuing the conversation throughout the conference. Thank you.