Tokenized Assets

Tokenization refers to a form of digitized finance in which real-world assets (RWAs)—financial assets such as securities, bank deposits, and real estate—are recorded and traded on a programmable platform, such as a blockchain. The term has become a byword for how discussions about blockchains have shifted from cryptocurrency—one of their primary uses—to other applications. While crypto has been characterized by volatility and scandal, some members of decentralized and traditional (centralized) finance, including former skeptics of crypto, perceive tokenization as the next step in the evolution of finance. One consulting firm estimates that as much as $16 trillion in assets could be available for tokenization by 2030.

What Is Tokenization?

Transacting with RWAs usually entails a few key functions: a repository and ledger to store and record ownership of the asset and a process and infrastructure for transacting with the assets. Different entities may perform these functions depending on the type of asset. Banks store and record customer deposits, but various card networks, wire services, and, ultimately, master accounts at the central bank facilitate movements of deposits. With securities, brokerages maintain client-facing ledgers, but a clearinghouse finalizes transactions by updating its central ledger. Proponents claim that tokenization may combine all of these functions—storing, recording, and transacting—on the blockchain.

Despite using similar technologies, cryptocurrencies and tokenization are distinct products. Cryptocurrencies—such as bitcoin and ether—are natively digital assets that were originally created solely on their associated blockchains. Tokenization, in contrast, uses blockchains' network capability to write programs that create, store, track, and transact RWAs. For example, developers can follow ether's network and coin standards to record preexisting assets into fungible (interchangeable) or non-fungible (unique) tokens, which can then be traded on that blockchain. These tokenized assets are also compliant with *smart contracts*—blockchain programs that self-execute transactions when predetermined conditions are met.

Why Tokenize?

Suggested—although largely unproven—benefits of tokenization are similar to those of other forms of cryptocurrency and digital assets, including potentially faster transaction times, cost savings, improved efficiency, and greater access. Transactions on public blockchains are *real-time* and final, which is an improvement over traditional payment and transaction settlement times that can take a couple of days. Also, smart contracts allow various legs of multipart transactions to be preprogrammed to execute at the same time. Smart contracts may also help

reduce the number of intermediaries required for some transactions. *Fractionalization*—the ability to divide whole assets into smaller shares—may be another benefit of tokenization. In the realm of traditional securities, token fractionalization allows the creation of fractions smaller than a share. For other physical asset classes, such as art or collectibles, fractionalization offers opportunities to disaggregate ownership of an indivisible object. Proponents believe that, combined, these benefits may also help reduce costs, making certain services more accessible and liquid.

Tokenized RWAs

Various types of RWAs could potentially be tokenized:

Stablecoins: Stablecoins are financial instruments that aim to tie their value at one-to-one to a fiat (i.e., government-issued) currency, such as the dollar. To do this, stablecoin issuers hold reserves—currency, bank deposits, government securities, etc.—that back the value of tokens *minted* on public blockchains. When consumers redeem stablecoins, issuers return the fiat. Hence, stablecoins are essentially tokenized reserves, and they have a market capitalization of roughly $160 billion as of May 2024.

Commodities: Some issuers have established set-ups similar to stablecoins for commodities, such as gold.

Non-fungible tokens (NFTs): NFTs are blockchain-based representations of digital or physical objects, such as pieces of art. The tokenization standards used in the NFT process differ from those used for fungible assets, such as stablecoins, allowing each token to account for the uniqueness of the underlying (nonfinancial) asset. In most applications, NFTs record ownership and trade of unique digital assets on the blockchain, while the asset is stored elsewhere. Some believe NFTs can be used to tokenize physical assets or music royalties.

Tokenized securities: Tokens may also reference traditional securities such as stocks and government bonds, among others. In tokenization, a security is converted from conventional forms to one in which the security has an on-chain token, and ownership and trading are conveyed on the blockchain. In an early example from 2016, the furniture company Overstock.com registered digital shares of its company and traded them on an affiliated blockchain. Additionally, certain exchanges and other platforms have offered tokenized stocks for trade (though these have been closed to U.S. investors). Various companies also tokenize U.S. Treasuries for different purposes, including allowing clients to earn interest. According to one May 2023 report, the market capitalization of tokenized securities was $225 billion. As of May 2024, there were reportedly $1.3 billion

of tokenized Treasuries, still a small fraction of the $27 trillion market.

Tokenized deposits: Tokenized bank deposits of various forms are also being considered. One form of tokenized deposit would resemble a stablecoin issued by a bank. The tokenized deposit holder would hold a claim on the issuer. The holder would not require permission to transfer the claim to another owner, as there is no need for the issuer to record the transfer except when it is ultimately redeemed.

Other tokenized deposits could look similar to traditional account deposits issued by banks and other depository institutions. The tokenized deposits would be liabilities for issuing banks, and, unlike stablecoins, a transfer would require debiting one account and crediting another as in the traditional banking model. Such tokenized deposits would be another method—on par with checks, debit cards, and automated clearing house transfers—that bank clients could use to access their deposits.

Another version would be accessible and transferable only to customers of a financial institution or a consortium of participating financial institutions. J.P. Morgan is developing one such system for wholesale payments, named JPM Coin System. The system allows J.P. Morgan clients to transfer "[d]ollars held on deposit" at the bank within the system using a permissioned blockchain.

Real estate: Tokenized real estate—in which commercial or residential real estate properties are tokenized and traded on blockchains—is similar to other tokenized assets. In practice, there may be differences, in part because the underlying assets are less uniform and exist in physical form for use, unlike securities. One project offers tokenized real estate through a single-purpose company that owns the real estate, while tokens represent shares in the company.

Potential Challenges

Despite potential benefits, tokenization may face challenges to implement:

Adoption and scalability: Because tokenization depends to some extent on public crypto infrastructure, it may face some of the same challenges affecting crypto, including whether it can provide affordable services at scale. Regulated traditional financial applications performing similar services may also impede adoption.

Interoperability: Tokenization projects may be built on existing public blockchains, such as Ethereum, or they may choose to create new blockchains. Different blockchains are not usually interoperable, which means that assets created on one blockchain are not compatible with those on another. This may lead to fragmentation in the markets for tokenized RWAs, in which the same assets trade at different prices. For example, lack of interoperability among different banks offering tokenized deposits would prevent flow of payments. Similarly, while traditional securities trading markets have set hours, blockchains are intended to operate continuously. Simultaneous trading across platforms may create trading-platform-specific price differentials.

Blockchain versus offline: In some cases, intertwined legal and technical challenges may impede adoption. There are established practices and legal frameworks for ownership and trading of most assets. Therefore, the ability to record transactions of real estate (for example, on a ledger) does not necessarily confer legal rights. Moreover, while tokenization offers an avenue for "owning" or conveying real estate or art, such physical assets may still be traded offline (i.e., in real life). This would require a system that reconciles blockchain and physical realities so that a tokenized property that has been sold on the blockchain cannot also be sold via traditional methods and vice versa.

Policy Implications

Tokenization may also raise policy issues, including:

Systemic risk: Tokenization's ability to reduce frictions of, increase accessibility to, and speed up payments may align with common policy goals. However, in moments of uncertainty, faster transactions may exacerbate stresses. In the case of tokenized deposits, instantaneous transfers that would allow individuals or companies to pull funds from banks or stablecoin issuers could create or exacerbate runs. To the extent that other financial assets are also tokenized, such panic could spread around the financial system quickly. While certain safeguards (such as circuit breakers) that protect against this are used in traditional finance, it is unclear whether similar mechanisms are compatible with tokenization.

Operational risk: Tokenization built on public, decentralized infrastructure with no central authority poses operational risk. Financial institution infrastructure is often taken for granted until a failure or breach. Financial institutions or their customers may find public blockchains and associated miners and validators—where no individual can be held accountable for operational failures and who may lack credibility—to be too risky to consider. Financial institutions may create their own private blockchains to manage operational risk, reinforcing challenges for interoperability and adoption.

Regulatory and legislative frameworks: It is unclear if tokenization would necessitate changes to statutory or regulatory frameworks. Tokenization does not necessitate the creation of a new asset class, and regulators and/or Congress may decide that existing regulations are adequate. However, tokenization may implicitly change markets (for example, with 24/7 trading of securities) or require changes to accommodate on-chain acknowledgement of transactions (for example, in real estate) in ways that may require regulatory changes. There is also a question of whether Congress or regulators would require a security issuer (such as the U.S. government) to have a say in whether underlying securities may be tokenized.

If Congress were to decide that tokenization warranted changes to legislative or regulatory frameworks, it may choose to introduce standalone legislation or consider tokenization among the ongoing legislative efforts on digital assets and stablecoins.

Paul Tierno, Analyst in Financial Economics

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