Back to Basics

Tokens Are Finance's Newest and Oldest Innovation

Money has taken many forms over millennia; digital tokens are the latest

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THOUSANDS OF YEARS AGO, long before coins, paper money, credit cards, and banking apps, our ancestors bought and sold goods using cowries, a type of seashell. These shiny physical *tokens* were humankind's first financial innovation. What made them especially useful was that they were easy to verify: When someone handed you a cowrie shell, you could see it, feel it, and trust that it had value. You didn't need a middleman to verify the transaction.

Cash still works this way today. When you pay someone with a banknote, the deal is done—no delays. But when it comes to digital transactions, payments only seem instant. Behind the scenes, banks and credit card networks take over as *intermediaries*, approving and settling the transaction later. They take on the *settlement risk*—the danger that one party will renege on its end of the bargain. Intermediaries ensure that both parties keep their promises.

It takes time to manage settlement risk through intermediaries. This matters in cases where settlement delays are costly, especially when trading stocks, bonds, or other securities in financial markets. A *clearinghouse* collects the seller's asset and the buyer's payment and exchanges them one or two days later. In places like Wall Street, time is money. J.P. Morgan estimates that asset management costs could be cut by about a fifth if the settlement of trades and the reinvestment of sale proceeds were immediate.

Financial innovators aim to cut intermediation costs by bringing the immediacy of exchanging physical tokens to the digital world. The challenge is that when transacting parties don't meet face-to-face, they cannot see the assets they are trading before completing an exchange. *Programmability* provides a solution—a piece of code that ensures the buyer's money and the seller's asset are locked in and then exchanged at the same moment. The funds received can be reinvested automatically, saving valuable time and money.

Digital intermediaries

Tokenization creates assets on a programmable ledger, a recordkeeping system for financial transactions that market participants can trust and share access to. Assets such as a stock or bond can be issued directly on the ledger, or they might be a representation of an asset that exists outside the ledger, such as stock on the New York Stock Exchange. In the latter case, an intermediary still needs to hold the represented asset safely in the background.

Tokenization can spur competition between intermediaries. To trade in financial markets, investors are often required by regulation to use brokers. Switching assets from one broker to another is a hassle that requires the services of a specialized clearinghouse. Alternatively, an investor can sell all assets owned through one broker and repurchase them through another, but that comes with a trading cost. Tokenization, however, allows data to be transferred among brokers with the click of a button. It makes it simpler for investors to shop around and switch between brokers for the best price.

Tokenization does not cut out all middlemen, but it is reshaping the financial industry and reducing the need for certain roles. *Registrars* are intermediaries that manage asset ownership records and transmit payments

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such as dividends or interest from a firm to the asset owners. On a token ledger such payments are made directly to the token holders, automating the role of registrars and putting them out of a job.

Tokenization works best when money and assets flow smoothly. If different companies build their own token ledgers that don't work together, the financial system could fragment into silos. It is possible to design ledgers so that they can talk to each other, but this *interoperability* requires planning and coordination. This is why policymakers want to make sure that tokenized systems stay open, connected, and stable.

Flash crashes

Tokenization's greater efficiency does not come without risk. Faster driving can save time, but it also makes crashes more likely to occur and more serious when they do. The same is true for financial markets. Faster, automated trading has already led to sudden crashes, known as "flash crashes," such as the 2010 Wall Street flash crash, when an estimated $1 trillion was briefly wiped off the value of stocks listed on the exchange. By making it easier to program and instantly execute automated trading rules, tokenized markets can be riskier and more volatile.

Financial crises often unfold like falling dominoes, with one failure setting off the next, as occurred during the 2008–09 crisis, when global giants Bear Stearns, Lehman Brothers, and AIG all collapsed within the space of six months. On a token ledger, chains of programs can be written on top of each other, acting like a programmed set of falling dominoes during a crisis.

Tokenization and programmability also make it easier to create complex financial products, with risks regulators may not understand fully until it's too late. This was true of the nonprogrammable assets that soured during the 2008–09 crisis and led the Financial Crisis Inquiry Report to conclude that a "complexity bubble" burst at the same time as the real estate bubble. "The securities almost no one understood, backed by mortgages no lender would have signed 20 years earlier, were the first dominoes to fall in the financial sector," it says. Programmability adds to an already complex financial landscape and makes it harder for regulators to keep tabs on potential risks.

How much debt participants in a financial market owe each other has often made the difference between a financial ripple and a tsunami. Debt amplifies shocks because it implies a promise to repay—and nothing rocks confidence like broken repayment promises. Tokenization can make it easier to build up debt, because investors or institutions can use tokens as collateral to borrow and then invest that money elsewhere. If one part fails—if a token loses value, say—it could trigger losses across the system.

Hybrid technology

Financial assets started off as paper records and evolved into digital ledgers and programmable tokens. This trend is now expanding to nonfinancial assets such as real estate and potentially even agricultural collateral like farmland and livestock. But physical assets cannot be fully digitalized—they still require physical care to maintain their value, as a farmer tends to a herd of cattle or the pasture where they graze. The tokenization of nonfinancial assets is best seen as a hybrid between physical and financial technology.

From the ancient world's cowrie shells to today's digital tokens, human society has come to accept different mediums of exchange. The latest innovations offer clear rewards by speeding transactions and making trading cheaper. But there are risks, too. Speed, complexity, and risky debt have all contributed to previous financial crises—and tokenization adds to all of them. As with any innovation, digital tokens should be handled with care. F&D

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