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How Tokenization and Programmable Assets Could Reshape Capital Markets

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INTRODUCTION

A trend with the potential to reshape capital markets is asset automation. By this, we mean the coding of operational and business rules and processes directly into financial assets.

Let's start with an example. Take a share of stock in a booming, private company. Board approval is required for the share to be transferred. And say someone attempts to transfer his or her share without approval. This occurs often,[1] and when it eventually needs to be unwound, it involves lawyers, transfer agents, financial advisors and, usually, an upset shareholder. But what if the share itself was encoded so that it couldn't be transferred in the first place?

This is becoming possible via tokenization. Tokenization allows for a financial asset to be programmed with computer code. In this article, we provide a brief overview of tokenization. We question the liquidity tokenization is said to unlock and suggest that the increase in asset "velocity," as explained below, may be worth a deeper look. We flag legal issues that can arise, particularly when a client's tokenization efforts change the fundamental nature of the asset. Finally, we discuss artificial intelligence, and how tokenizing can make assets AI compatible.

There are many questions on if, how or when this merging of code and asset may occur. But we would predict over time, given the time and cost efficiencies it can provide, as well as compliance improvements, that it will rewire capital markets.

TOKENIZATION OVERVIEW

Tokenization uses blockchain to enhance how things are tracked and traded. To stick with the stock example, a stock can for example be issued and tracked as a physical certificate. Or nowadays it can be recorded as a tiny digital entry in a database with trillions of other tiny

1 https://www.wsj.com/finance/investing/so-you-think-you-own-shares-in-a-hot-startup-anthropic-says-not-so-fast-7b60f938

entries. Those are extremely different ways of tracking a share of stock. But they are both accepted and common. Think of blockchain as a rather boring database innovation. Tokenization can enable a smarter, faster, and cheaper way of tracking how assets trade. Importantly, tokenization differs from what most people consider cryptocurrency, the tokens of which are generally all the same and freely tradable. In contrast, a token can behave, and be regulated, like the stock, bond, investment fund interest, real estate, commodity, etc. that it represents.

Tokenized asset adoption is largely institutional. The New York Stock Exchange is developing a tokenized securities trading platform.[2] The Depository Trust & Clearing Corporation, which processes trillions of transaction volume daily, is developing a tokenization service with household names in finance participating.[3] Without exaggeration, dozens more industry giants have committed to building tokenization into their core operating infrastructure. Some of this may be experimentation but some will likely stick.

LIQUIDITY VS. VELOCITY

Industry proponents believe tokenization will create liquidity in markets. On the blockchain superhighway, a tokenized asset can truly be transferred or traded nearly instantly, 24/7. Faster transfer and settlement times are a true technical innovation. If assets can be traded and settled step-functions faster (near instantly versus T+1 or more) and cheaper (down to fractions of a cent), they can be lent, posted as collateral or rehypothecated in ways that the existing system can't support. In other words, the same asset can be put back to work more quickly, lent and re-lent, posted and withdrawn. The asset's "velocity" can increase.4

Faster rails are not, unfortunately, a legal innovation. Putting something on a blockchain does not mean it can, for example, be distributed where it was prohibited before. The Securities and Exchange Commission staff has made clear that a security remains a security, even on a blockchain.[5] A question we often get from clients is, if they convert or reissue their product as a token, can they now sell it abroad or to retail? Unfortunately, the legal analysis for the tokenized version and the existing asset are often the same. A security can be distributed generally in the same ways, tokenized or not.

Ironically, tokenization could have the effect of decreasing liquidity. Tokenization opens the door for the asset to become "smart." KYC, accredited investor, and similar rules can be codified and as such code-enforced. Compliance automated into an asset can prevent assets from being traded illegally and as such can extinguish noncompliant market activity.

ASSET PROGRAMMABILITY

A traditional financial asset is passive — it sits on a database and gets shuffled around in a jungle of intermediaries, humans and legal documents. A programmable asset is different - instead of it being a cell on a table, it is now machine-readable computer code. Although that may sound futuristic, if our cars can drive themselves, one can imagine that big innovations may be coming in other industries and that includes finance.

The point is not that all assets should become "smart." Or that all rules for an asset should be encoded. Many and perhaps most rules and processes appropriately depend on human discretion, and ultimately human circuit breakers should (and hopefully will) remain part of the process.

2 https://www.wsj.com/finance/stocks/nyse-partners-with-securitize-to-develop-24-7-tokenized-securities-platform-871a4c7e

3 https://www.dtcc.com/news/2026/may/04/dtcc-advances-development-of-new-tokenization-service

4 If you use a $10 bill to buy lunch, and the restaurant owner uses that same bill to pay a supplier, who buys something else with it. That single $10 note has generated $30 in economic activity. Its velocity in this scenario is three. By the same logic, if a tokenized treasury can be posted as collateral, lent out and pledged again in the time it would have taken to settle a single trade currently, that one treasury has been put to work three times instead of once.

5 https://www.sec.gov/newsroom/press-releases/2026-30-sec-clarifies-application-federal-securities-laws-crypto-assets

Here are some of the key features being programmed into assets today:

FEATURE	EXPLANATION
Conditional action	Allows automatic execution of an action (e.g. payment) upon specified, predetermined conditions
Forced transfer	Allows for an issuer of a token to forcibly transfer a token (i.e. without the holder's consent)
Burn	Allows for a token to be deleted
Freezing	Allows a token to be frozen (i.e. can't move it)

A typical token on a blockchain does not come pre-loaded with these features. What makes bitcoin bitcoin is that there is no central party who can take it from you, move it from you, freeze it, or delete it. It is generally considered a bearer instrument. In contrast, the features above (as well as many others) need to be specifically chosen and engineered into the token.

Let's consider how these features could manifest in some actual products.

FEATURE	EXAMPLE
Conditional action	**Stock:** A dividend is automatically calculated and distributed to all token holders of record at the close of the dividend record date, without a paying agent calculating and instructing each payment. **Private credit fund:** A borrower makes an interest payment on an underlying loan, and the payment is automatically allocated across investors without the fund administrator separately calculating and instructing. **Commodity:** A tokenized warehouse receipt for a metal automatically releases the metal upon surrender of the token to the warehouse, without a separate written instruction to the warehouse operator.
Forced transfer	**Stock:** A shareholder dies and the shares need to be transferred to the estate or beneficiaries. Today this involves probate documentation, transfer agent processing, and often months of delay. A programmable share could, if desired, be transferred to a pre-designated estate immediately. **Private credit fund:** An investor is found to have provided false KYC information. The sponsor can transfer the tokens away from the holder without the holder's cooperation. **Commodity:** For a commodity tied to a dated contract (a futures-linked or delivery-dated structure), the issuer can force-transfer holders into the successor contract or structure at roll, without each holder manually rolling their position.

Burn	**Stock:** A buyback or redemption automatically deletes, or "burns," the repurchased shares, so the cap table and the outstanding share count update in real time rather than through a separate administration step. **Private credit fund:** A redeemed interest is automatically burned, so the fund's register of outstanding interests reconciles in real time rather than waiting on an administrator to update the books. **Commodity:** If or when the underlying physical asset is physically delivered (i.e. physical settlement) to the holder, the corresponding token is deleted to prevent the same physical asset from being claimed twice.
Freezing	**Stock:** A shareholder is subject to an SEC enforcement freeze order. The shares become non-transferable for the duration of the order without the transfer agent needing to manually block each transfer request. **Private credit fund:** A holder is subject to a regulatory hold, a court order, or an internal compliance investigation. The tokens become non-transferable as needed. **Commodity:** A tokenized commodity holder is the subject of an asset freezing order in connection with a regulatory investigation. The tokens are frozen for the duration of the investigation without needing to coordinate with the warehouse operator each time a transfer is attempted.

In each case, the feature is doing work that today requires the issuer or an intermediary to act. In terms of criticisms, a major one is that code is generally black and white, and can and will execute without any real world context. We would imagine that programmed assets would not eliminate human oversight.

COUNTERPARTY UPDATE

Programmability may alter the traditional slate of counterparties, such as for a private fund. In a traditional private fund structure, the fund and manager's counterparty relationships include administrators, accounting firms, law firms, valuation agents, and custodians. In a tokenized fund structure, the counterparty set may expand to include tokenization platforms, "smart contract" auditors, blockchain-compatible data providers, and digital asset custodians. These may be new, standalone businesses and thus new relationships to be cultivated. Or it may be existing incumbents who self-develop these services or acquire them via M&A.

Either way, operational due diligence and counterparty risk will need to be reevaluated. For example, a fund administrator failure typically results in reconciliation delays or errors that are corrected in short order. A tokenization platform failure, or a failure in the underlying blockchain, however, could simply render fund operations inert for an extended period of time. These are critical considerations for companies as well as for vendors considering how to navigate procurement, compliance, and risk departments of financial institutions.

AI INTERSECTION

As stated above, tokenized assets are machine-readable. That means that AI can read and act on them. And if the asset is programmed, that also means AI can analyze and execute on the asset's specific programs. This potential future state of capital markets is why we called this article "automated capital markets."

Today, AI in capital markets largely analyzes and recommends. An AI research tool surfaces a trade idea, and a portfolio manager decides whether to place the trade. An AI surveillance system flags a suspicious wallet and a human decides whether to act. Decisions are still routed through standard workflows and intermediaries. Programmable assets have the potential to close this gap. Because the rules and the asset are the same thing, AI can simply interact with the asset directly — initiating a transfer, executing a trade, freezing a position, burning a token — without a human.

This could mean that compliance can be enforced in seconds rather than over the days it takes to coordinate among compliance, counsel, administrators, and law enforcement. Costs can be dramatically reduced because actions that today require several people and handoffs can in theory require none.

The risks are also significant. If an AI system misreads a data feed or misinterprets a rule, it may take an undesired action. And depending on which assets are programmed in, an AI system could freeze or burn or move tokens it should not have, in seconds. On a blockchain, some actions are difficult or impossible to reverse once executed.

This is why AI in this context may best be understood and used as a capability to be governed rather than a goal to be maximized. The right design keeps humans where subjective judgment matters, and allows automation where the action is well-defined, the inputs are trustworthy, and most importantly that the cost of an error is bounded.

These are in many ways compliance and supervision questions, and the existing regulatory framework was not built for them. The existing frameworks assume a human actor. The duty to maintain reasonably designed policies and procedures, the duty to supervise the people and systems carrying out a firm's obligations, and the fiduciary duties an adviser owes its clients were all built around a person making the consequential, subjective decisions. When an AI system is the one deciding and executing, what supervision requires becomes a more muddled question.

A FEW LEGAL ISSUES

All of the above has real promise, however the tectonic shifts required and natural inertia against change likely means this will take years, if not generations, to be realized. Part of any process is working through related legal issues, and we flag a few below.

The 1:"whatever" Tokenization Temptation

Simply, if you encode features into an asset that weren't there before, you are not tokenizing the asset 1:1. You are tokenizing 1:whatever, with "whatever" being the infinite design space of financial engineering. As an example, let's consider private credit again, but as a direct asset not held in a fund structure.

A direct loan or a loan participation between sophisticated institutional parties can not be a security. Under the Reves family-resemblance analysis, the institutional and individually negotiated character of the participation, and the absence of a trading market, work to keep the instrument outside the securities laws. Using a token as the recording mechanism for the participation interest does not change any of this.

But if new encoded features pop up or if distribution expands, the regulatory weather can change quickly. Fractionalizing the participation into many small interests and distributing them broadly strips out the individually negotiated character that kept it outside the securities laws. Building programmatic resale into a secondary market introduces a trading feature that is itself a Reves factor. The underlying loan did not change, rather the product design did. The regulatory analysis that applies to the product is no longer the regulatory analysis that applied to the loan. If you tokenize a gold bar, but add yield, it may now be a security. If you tokenize an apartment, but add on programmatic rental distributions, you may be crossing into securities territory.

Although the private credit example is just one example of the 1:whatever problem, programmability can help keep a product in an unregulated state too. A sponsor can encode features designed to keep an instrument out of a regulatory category — limiting transferability, restricting holder eligibility, prohibiting secondary market activity — in ways that the underlying asset, untokenized, simply can't.

The "What is it We're Selling" Question

In some instances, the token is the security. An example of this is a company issuing its own stock in a token format. Many laws and other norms apply in their regular ways.

But take something else, such as a commodity like a barrel of oil. You can't "issue" a barrel of oil as a token. A barrel of oil is a physical thing - it has no shares that can be digitally reimagined as a token. Any such token must therefore be representative in nature. So a major question, which cuts to the heart of any product legally and commercially: what is actually being sold?

Unless it's directly issuer led (e.g. a company tokenizing its own stock), what is actually being sold has often ceased to resemble the underlying asset. For example, projects can sometimes head down the securitization or the trust path. Pool the assets in a fund or SPV and tokenize the interests in the vehicle. Or establish a trust and hold the asset for the benefit of the beneficiaries. In each case, the "token" is no longer the thing - such as the barrel of oil - it is a fund (or similar) interest that provides economic exposure to the thing.

A threshold question for any tokenization that is not directly issuer-led is therefore "what, legally, is the token." That answer drives everything downstream, from registration to disclosure to tax to who is liable if something goes wrong.

Conclusion

The largest financial institutions in the world, especially in the United States, are actively exploring embedding tokenization and programmability into their existing infrastructure or building out new businesses entirely. It is no longer a question of whether the technology will arrive, rather of how the legal and operational frameworks will keep up.