



The Digital Frontier: Collateral in a Tokenized World

How programmable, round-the-clock infrastructure
is reshaping every collateral relationship

Introduction

In our first article, “Back to Basics,” we argued that collateral management succeeds only with a solid foundation: scalable straight-through processing, real-time inventory, disciplined counterparty oversight, and robust settlement infrastructure. In the second, “The Next Frontier,” we showed what that foundation enables. Collateral evolves from a cost center to an alpha generator, as lending, collateral management, and cash reinvestment converge into a single optimization engine. In the previous article, we suggested tokenization would become the next frontier for collateral management. The question is no longer whether digital collateral will emerge, but how institutions will integrate it into existing optimization frameworks.

Both articles were preparation. This one is about what they were preparing the industry for: a collateral infrastructure that is programmable, round-the-clock, and native to digital markets, not bolted onto them.

Why Now?

Tokenization has moved past the pilot stage. Banks, custodians, and market infrastructure providers are building digital-asset capabilities directly into their core operating environments, establishing the institutional rails required to issue, hold, transfer and service tokenized assets.

This shift matters because collateral cannot operate in isolation. A digital asset is only useful if it can be valued, securely held, transferred, and plugged directly into everyday margin and settlement workflows. As these capabilities mature, tokenization moves from an isolated tech experiment to an essential settlement and mobilization rail within the broader financial system.

On-chain settlement money has arrived

A tokenized security cannot deliver its full value if the cash side of the transaction still depends on conventional operating hours and settlement cycles. For atomic settlement to work, both the asset and the corresponding payment must be able to move on compatible infrastructure.

The emergence of regulated forms of on-chain money, including tokenized deposits and digital settlement assets, begins to close that gap. By enabling collateral and cash to exchange simultaneously, it reduces principal risk and strips out the timing mismatches inherent in multi-day settlement.

In Brief

- Tokenization is moving from pilot to production, driven by three converging forces: systemic infrastructure adoption, regulated on-chain settlement money, and improving regulatory clarity.
- For collateral specifically, tokenization changes three things: settlement speed, the breadth of the eligible asset universe, and genuine cross-border mobility.
- The near-term operating model is hybrid, not transitional. Traditional and tokenized collateral should function as a single, continuously optimized inventory, not two parallel programs.

For collateral managers, this is a critical development. Margin obligations, asset substitutions and recalls can now happen 24/7 without creating cash-settlement bottlenecks.

Regulatory and legal clarity is catching up

Technology alone cannot build an institutional market. Participants also need confidence that a tokenized asset represents an enforceable legal claim, that its transfer constitutes settlement, and that ownership and security interests will be recognized across relevant jurisdictions.

“By connecting digital securities with regulated on-chain settlement cash via institutional-grade custody, we can enable continuous, atomic settlement that operates seamlessly and reliably within clients’ existing operating workflows.”

Ryan Marsh,
Head of Digital Asset Product, Citi Investor Services

Regulation is moving decisively from broad observation toward defined frameworks for digital issuance, custody, settlement, and market participation. Uncertainty has not disappeared entirely, but the direction of travel is no longer in question.

For globally active firms, jurisdictional differences will continue to matter. A tokenized collateral movement may be technically instantaneous, but its value still depends on legal certainty, robust governance and confidence in the institutions operating the network. This is why the most credible models will combine digital capabilities with the standards of oversight, custody and resilience already expected in traditional markets.

Taken together, these developments mark an important change. The industry is moving beyond the question of whether assets can be tokenized and towards the more consequential question of how tokenized assets can function within everyday institutional workflows.

Collateral is the connective tissue of every derivatives, financing and clearing relationship. As the underlying infrastructure becomes programmable and continuously available, operating models must evolve as well.

Three forces are converging, and each closes a gap that stalled earlier attempts at scale.

1

**Systemic
Infrastructure
Moves to
Production**

2

**On-Chain
Money Has
Arrived**

3

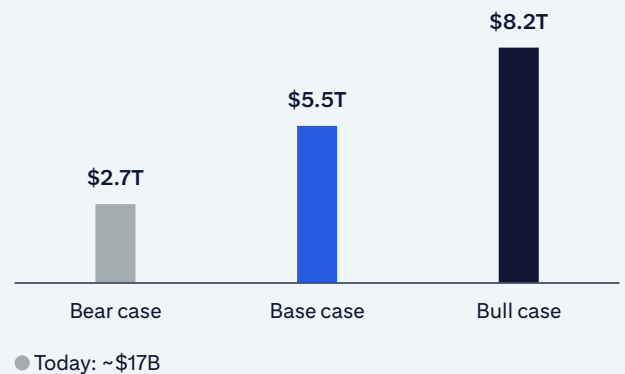
**Regulatory
Clarity Is
Catching Up**

A Market on the Cusp of Transformation

According to research from the Citi Institute, the tokenized asset market is poised for exponential growth. The base case projection suggests a market of \$5.5 trillion by 2030, a nearly 300 fold increase from today's approximately \$17 billion market.

Tokenization 2030: A Base Case of \$5.5 Trillion

Projected global tokenized financial asset market by 2030, across public and private markets



Source: Citi Institute, Tokenization 2030 — Wall Street On-Chain (June 2026). Today's global tokenized asset market is estimated at approximately \$17 billion.

300x

"Citi Institute's base case implies the tokenized asset market could grow roughly 300-fold over the next four years—from today's \$17 BN to \$5.5 trillion by 2030."

A Scenario: Settling Across Time Zones

Consider an asset manager with a European derivatives book and an Asian custodian. A Friday evening variation margin call from a Tokyo counterparty presents a familiar challenge. Under a traditional model, the call sits open over the weekend because of closed markets. The manager must either post cash it would rather deploy elsewhere or accept the counterparty exposure until Monday.

With a tokenized collateral leg, the outcome is different. The eligible bond position is represented on-chain. The moment the call is agreed, the asset and a settlement token exchange simultaneously, with no dependency on market hours.





Traditional Path

Call sits open through the weekend. Cash is diverted from other uses, or counterparty exposure accumulates until Monday's overlapping settlement window opens.



Tokenized Path

Obligation met within minutes. No cash diverted. No counterparty exposure accumulates while both sides wait for the next session.

The underlying economics did not change. What changed was the operational cost of time itself, and in collateral management, time has always had a price.

What Tokenization Actually Changes for Collateral

Tokenization does not create liquidity or change asset's fundamental economics. What does change is how quickly, flexibly, and cheaply an eligible asset can be identified, mobilized, and delivered. For collateral, three changes stand out.

Traditional vs. Tokenized Collateral, At a Glance

Illustrative comparison across the four dimensions this article addresses

Dimension	Traditional	Tokenized
Settlement Timing	Constrained by market hours and T+1 conventions; movements wait for the next overlapping window	Atomic, simultaneous settlement – 24 hours a day, seven days a week
Eligible Collateral	Concentrated in cash and government securities; broader eligibility is operationally costly to administer	Wider asset universe becomes operationally realistic, including yield-bearing instruments
Cross-Border Movement	Routed through correspondent and custodial chains; speed and auditability vary by corridor	Moves across currencies and jurisdictions with consistent speed and a shared audit trail
Idle-Asset Yield	An asset typically stops earning the moment it is posted as collateral	Certain tokenized instruments can continue accruing yield while pledged

- 1. Settlement stops waiting for the clock.** Traditional collateral movements are constrained by market hours and T+1 conventions. A tokenized leg can be pledged, substituted, or recalled 24/7 because both sides of the exchange settle simultaneously. This removes an entire category of gap risk.
- 2. The eligible universe gets wider, not just faster.** The industry has long relied on a narrow band of assets like cash and government securities. Tokenization makes it operationally realistic to expand eligibility. A tokenized money market fund share, for example, can be pledged directly as collateral while continuing to accrue yield, something not possible in traditional form.
- 3. Collateral mobility becomes genuinely cross-border.** Programmable, tokenized assets can move across currencies and jurisdictions with a speed and auditability that today's correspondent chains cannot match. This directly reduces the amount of collateral that needs to sit idle as a buffer against operational friction.

“Every basis point saved by making an asset move faster or mobilize more broadly is a basis point of value that used to be trapped in operational friction. Tokenization is not a separate initiative from collateral optimization. It is the next stage of it.”

Eric Ilardi, Global Head of Collateral Management, Citi Investor Services

A Scenario: Substituting Collateral During Market Stress

Market volatility exposes another persistent friction: trapped collateral.



Imagine an asset manager that has pledged sovereign government securities against a live derivatives book. When sharp market turbulence strikes, those high-quality liquid assets (HQLA) suddenly become urgently needed elsewhere in the portfolio—either to meet an unexpected liquidity demand or to support a critical financing transaction.

Traditionally, substituting the posted collateral may require several sequential steps. The manager must identify an alternative eligible asset, agree the substitution with the counterparty, instruct the custodian and wait for the original securities to be released. A missed cutoff or cross-border mismatch pushes release to the next business day, leaving critical liquidity stranded.

In a tokenized environment, the optimization engine identifies an eligible replacement asset from the manager's wider inventory and initiates the substitution through programmable settlement instructions. The replacement collateral is delivered, and the government securities are released as linked components of the same transaction, reducing the risk that one movement completes without the other.

The manager instantly regains access to scarce high-value assets during peak market stress without compromising counterparty protection or introducing delivery risk.

Evolution, Not Revolution

This transition will be gradual. The near-term reality is a hybrid one, where tokenized and traditional infrastructure operate side by side. This is because trust, liquidity, and legal certainty take time to migrate.

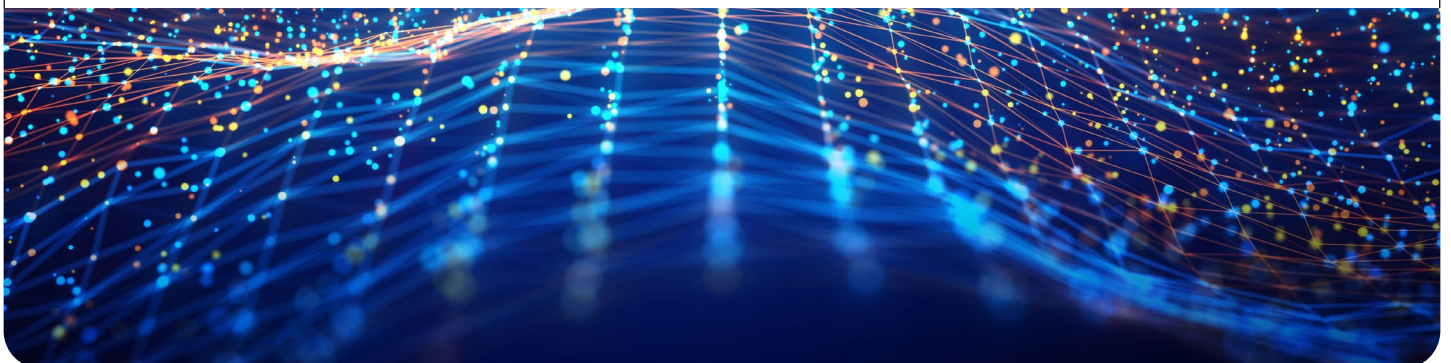
The winning model will not abandon existing rails but will treat tokenized and traditional collateral as a single, optimized inventory. An asset is tokenized on demand when it creates value and settled through existing rails when it does not, with the decision being invisible to the client.

“In a tokenized market, connectivity matters most. Institutions that create access for tokenized assets to the broadest set of counterparties, custodians, and settlement venues generates tangible value for market participants. Moat builders will be left behind.”

Patricia Hostin, Citi Investor Services

A maturity curve, not a cutover

How the hybrid model is expected to evolve.



Trust Is the Infrastructure

A programmable, atomically settling collateral movement is harder to reverse than a traditional one. This means the control around it must be stronger. In practice, this requires several things:



1

Independent review of programmable logic.



2

Institutional-grade custody of cryptographic keys.



3

Clear, jurisdiction-by-jurisdiction legal certainty.



4

A resilient fallback to traditional settlement rails.

What This Means in Practice

For Asset Managers, Pension Funds & Insurers: Demand infrastructure, not slogans. Ask if your provider's optimization logic treats tokenized and traditional inventory as a single pool and if eligible collateral schedules are expanding.



For Banks & Market Infrastructure: Combine, don't specialize. Value accrues to whoever can combine issuance, custody, optimization, and settlement within a single trusted framework.



For Every Market Participant: Architect for it now. The goal is not to adopt tokenization as a standalone project, but to demand that its value appears automatically as the ecosystem matures.



A collateral program that forces a choice between “the traditional way” and “the digital way” has misunderstood the assignment. The client should never have to know, or care, which rail a given movement travelled on.

Institutional adoption will depend less on technology than governance. Market participants will need assurance that programmable logic behaves as intended, digital assets remain under secure custody, and tokenized claims retain legal enforceability across jurisdictions. In this sense, trust is not separate from the infrastructure. It is part of the infrastructure itself.

The Frontier Continues

We began by getting the basics right, then moved to turning collateral into a source of alpha. This article closes the loop by describing the infrastructure that the engine will run on: one where settlement is instantaneous, eligibility is broader, and mobility is global.

The firms that treat tokenization as an experiment will run two collateral programs badly. The firms that treat it as a disciplined extension of the fundamentals will run one program exceptionally well.

“Collateral has moved from an operational function, to a strategic tool, to, now, a genuinely programmable asset. Each step has raised the bar on what good looks like. We intend to keep setting that bar.”

Eric Ilardi, Global Head of Collateral Management, Citi Investor Services

Further Reading:

Digital Collateral: A Practical Reality

Discover how tokenized digital collateral has transitioned from experimental pilots into live institutional production, offering practical strategies to eliminate billions in trapped liquidity.