
citi
Services
Digital Collateral:
a practical reality
THE ValueExchange

Contents

Citi Foreword

Mike Roberts
Head of
Digital Asset
Commercialization,
Citi Investor
Services

Collateral has always been the quiet plumbing of capital markets: essential, rarely glamorous, and until recently, remarkably resistant to change. That is now shifting fast.

Over the past year, we have watched the tokenization of collateral move from concept to practical reality. Institutions across the world are no longer asking whether digital collateral works, but how quickly they can put it to use. At Citi, we see this shift daily: clients moving from monitoring risk to genuinely managing it, in real time, across every time zone.

The case studies in this report tell that story concretely. From clearing houses' moves to real-time margining, to the mobilization of US Treasuries across a 24-hour cycle, to new eligibility pathways for tokenized money market funds, cryptocurrencies and even pre-IPO private securities, each example shows the same underlying pattern: legacy market infrastructure was built for daylight hours, but risk does not sleep. Tokenization closes that gap.

What excites us most is not the technology itself, but what it unlocks. Firms today over-collateralize and pre-fund simply to guard against operational uncertainty, locking up capital that could otherwise be put to work. Digital collateral removes much of that uncertainty, freeing firms to hold and deploy the assets that make economic sense for their balance sheets, not just the ones that happen to be mobile during local business hours.

None of this is without its challenges. Legacy technology, established processes and understandable caution around new risk all remain real barriers to adoption. But as the examples in this report demonstrate, the industry now has a clear, proven path through them.

We are grateful to the institutions who shared their experiences for this report, and to the ValueExchange for bringing these insights together. We hope it provides a clear and practical view of where digital collateral stands today, and where it is heading next.

Overview

In 2027, 27%[1] of institutional brokers, banks and asset managers plan to use on-chain securities to pledge a range of tokenized bonds and cash as collateral.

This is not surprising as over the last year, the tokenization of collateral has risen to become the leading use case for DLT development across institutional capital markets. Having passed a number of critical milestones, the industry now sees the tokenization of collateral as a practical reality – as counterparties and market infrastructures increase their acceptance of all forms of digital assets for funding and financing.

Today's collateral opportunity

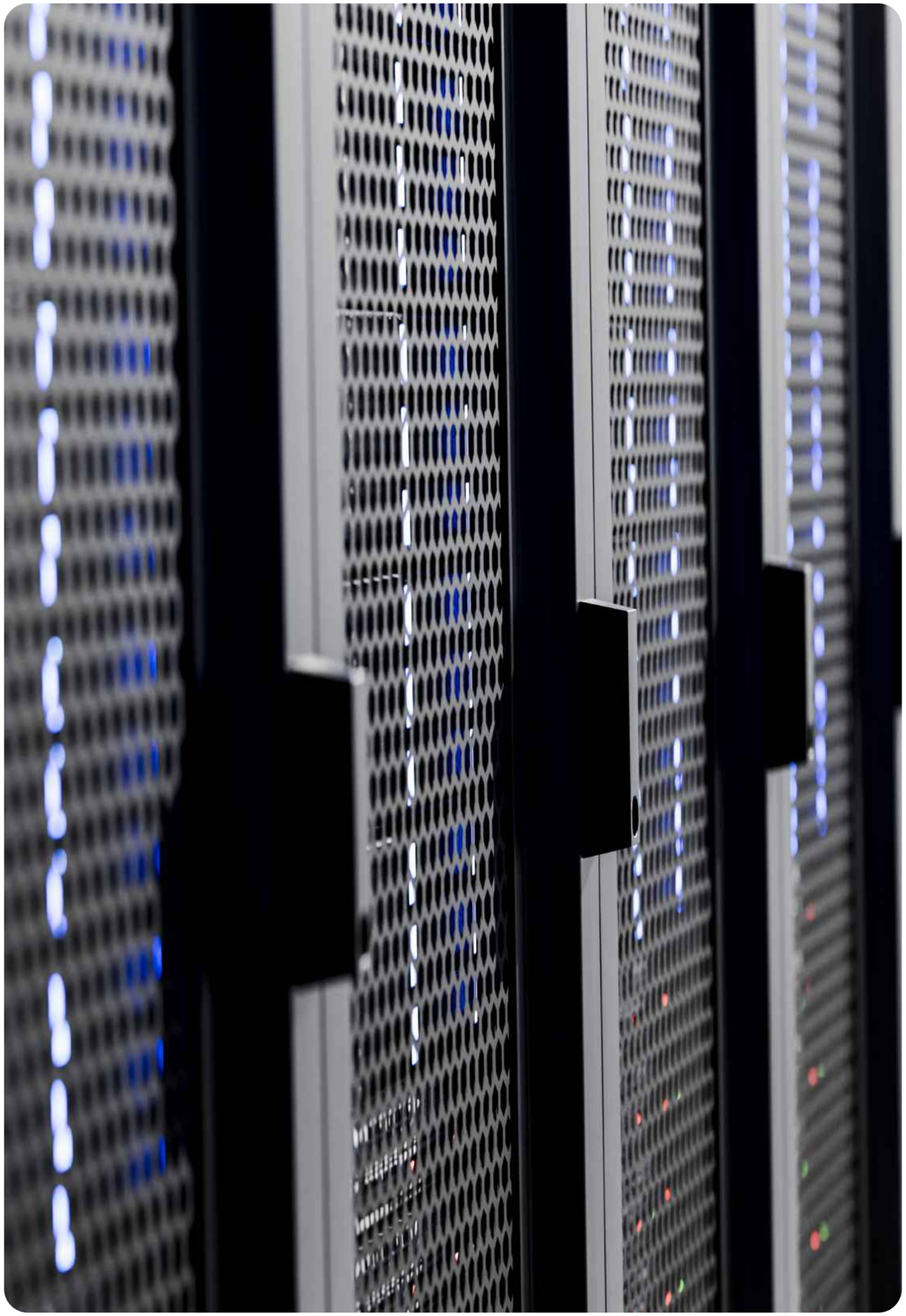
But what exactly does tokenized collateral look like today?

Drawing on a number of core use cases across the world, this report has been prepared by Citi and the ValueExchange to help market practitioners to understand how and why the tokenization of cash, securities and cryptocurrencies can help to increase collateral efficiency and deliver transformative benefits to issuers, intermediaries and investors across the capital chain.

This report centers on a series of in-depth case studies around leading institutions, including:

- **Tokenizing margin:** Making collateral fit for a 24x7 world
- **Taking collateral global:** How Asian CCPs are making the most of the 24 hour clock
- **The tokenization of money market funds:** How Franklin Templeton is building the ideal collateral asset
- **Bringing cryptocurrencies into the funding chain:** Citi Wealth's one step at a time
- **Bringing new forms of tokenized collateral to the market:** SIX's pre-IPO securities issuance

We also share the practical perspectives of Qube Research and Technologies' (QRT's) leadership, one of the firms that is leading the industry in bringing all of these digital activities onto the trading desk.



Tokenized collateral today: a snapshot

"As digital asset markets mature, collateral remains a leading institutional use case, particularly in the near to medium term. Tokenization has the potential to enhance asset mobility, operational efficiency, liquidity management and transparency – potentially unlocking not only cost savings but also risk mitigation, growth potential and improved client experience."

Chelsea Lo, Senior Vice President, Markets Digital Assets NAM Lead, Citi

What needs fixing?

The world's institutional, collateral markets are beset by two core issues:

69% of firms are experiencing significant issues in the settlement of collateral[4]

Around the world, more than two thirds of financial institutions cite challenges in settlement matching and delivery of collateral as the number one issue that they face in their daily operations.

These issues create a high degree of uncertainty across the industry – and trigger a range of expensive, corrective behaviors to avoid the cost and risk of default.

Legacy market infrastructure processes make "guess-timation" unavoidable

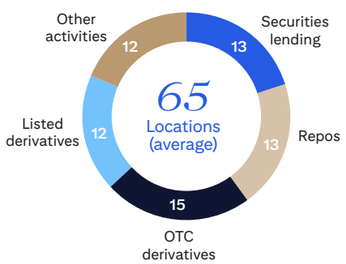
In a globalized world, local operating hours still matter. ICSDs and core payment infrastructures still cease processing in their local evenings and overnight. They are also all closed on weekends.

These closures and cut-offs create significant friction for organizations with cross-border or 7-day trading activities – resulting in pre-funding and in other, expensive solutions that carry significant performance drag.

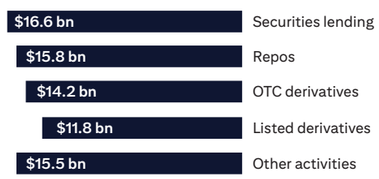
How much are these issues costing?

With the average global, systemically important bank (G-SIB) posting **USD74 billion** in collateral every day across **65 different (custody) locations,**[5] the scale and magnitude of these issues are entirely global.

Average number of collateral locations per firm (custody locations)



Average collateral pledged today per activity (USD)



USD74 bn in total

Question: How many collateral locations do you currently hold margin in? How much margin do you hold for each activity?

Source: the ValueExchange, The case for tokenized collateral (October 2025)

The problem today is that, across this global collateral network, limited operating hours and high uncertainty combine to necessitate two expensive, corrective measures:

"Better too much than too little"

In order to counter the very high risk of a failed collateral transfer (triggered by the above manual risks), the average firm today is posting **6-7% more collateral**[6] than they need to.

"Better early than late"

In the face of multiple cut-offs around the world, firms are often compelled to **post up to 63% of their margins overnight** – essentially pre-funding their collateral ahead of a margin call the next morning.

Given the limited interest treatment that these (additional) collateral holdings receive, these corrective behaviors mean that today **25% of all collateral holdings are idle** and generating little to no return.

For an average firm, these idle assets in today's system can mean approximately **USD15 billion in un-remunerated cash or non-performing securities,**[7] triggering a cost (of lost income) of around **USD346m per year**[8] for the average tier 1 firm.

Sizing the tokenization opportunity

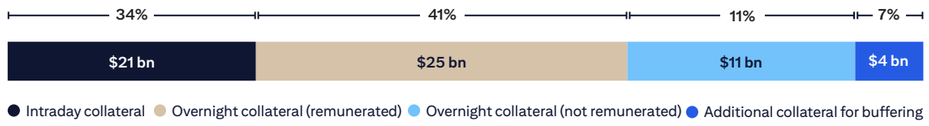
As sizeable as these additional potential earnings are, interest income represents only one portion of the potential tokenized collateral opportunity. As **Lo** notes, while outcomes will vary across firms and use cases, tokenization could yield other economic benefits. Greater visibility into asset movements and payments could help firms better align funding requirements with actual needs, potentially reducing borrowing costs and enabling more efficient deployment of capital. Improvements in settlement efficiency could help reduce operational risk and settlement fails, potentially contributing to lower capital consumption and more efficient use of balance sheet resources. In some cases, firms may reduce their liquidity risk due to shorter funding and settlement cycles.

"Every basis point we save 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. For our clients, that means treating tokenized and traditional collateral not as two parallel programs, but as a single, continuously optimized inventory," points out **Eric Ilardi, Global Head of Collateral Management, Citi Investor Services.**

There may also be opportunities to enhance client financing services. Improved certainty around asset movements and collateral availability could help firms provide financing more efficiently and make better use of available capacity. Similarly, more timely risk and collateral management processes could enable firms to manage counterparty exposures more dynamically throughout the day.

Beyond the potential economic benefits, the broader opportunity may lie in the operational efficiencies that more mobile and programmable collateral could enable across financial institutions. Streamlined operations and enhanced capabilities, for example when moving collateral across multiple depositories and counterparties or past traditional cut-offs, could in turn create cascading benefits for risk management and client experience.

Average collateral treatment today



Question: On average, how much of your collateral and margin is posted, based on its treatment?

Source: the ValueExchange, The case for tokenized collateral (October 2025)

Tokenized collateral: what has happened so far?

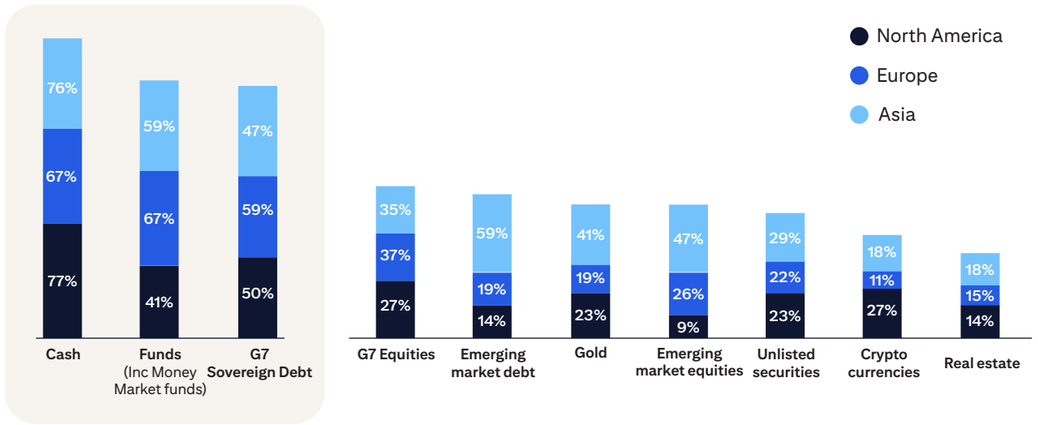
Since 2024, industry interest and activity around tokenized collateral has been growing at a rapid pace, with the key developments as follows:

2019 – 2022 Early pilots	HQLAx,[9] JPMorgan[10] and Broadridge DLR[11] lead initial industry work to tokenize collateral and repos.
2022 Proven collateral model	Copper launches an exchange collateral solution (Clearloop) as the foundational blueprint of collateral mobilization on a real-time basis (focused on crypto and Defi markets).[12]
2023 Digital issuance	Citi and World Bank collaborate to issue EUR100m in native, digital issuance, increasing the global supply of digitally native bonds.[13] In parallel, the European Investment Bank, KFW, Hong Kong Monetary Authority and other sovereigns all issue over USD30 billion[14] in natively digital bonds, providing critical supply of high-quality, on-chain securities.
2024 ECB trials	64 organizations conduct over 200 live trades (including collateral margining) using tokenized cash and on-chain, central bank cash.[15]
2025 DTCC weekend repo trades	DTCC and 18 institutions conduct live repo trades using tokenized US Treasuries over multiple weekends.[16]
2026 Live volumes	A total of 5% of repo turnover is now traded every month in tokenized form. In addition, US Treasuries will be available (via the DTCC) in tokenized form in October 2026 – creating significant new supply for firms to leverage in their daily processing.

Building on the momentum generated by these core milestones, up to 77%[17] of firms now expect to be working with some form of tokenized collateral in 2026 – primarily using cash, money market funds and government bonds.

What collateral to tokenize?

Cash, funds and HQLA are the core targets for 50% of respondents in every region



% of respondents in each region expecting to tokenize each asset class for use as collateral

Question: Which asset do you expect to tokenize (for use as collateral) and where?

Source: the ValueExchange, The case for tokenized collateral (October 2025)

Tokenizing collateral: avoiding the legacy drag

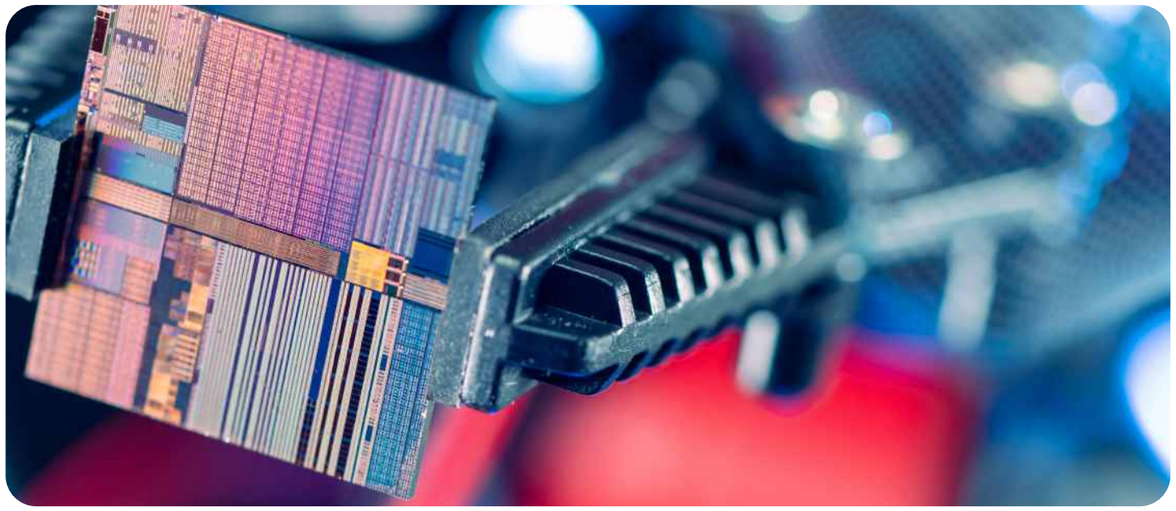
As compelling as the case for tokenizing collateral may be, industry participants face one common blockage in their adoption of blockchain – their legacy technology and processes.

The limitations of the industry's "technology debt" are well known – the industry is running a large volume of decades old systems that are unable to house or process digital assets. As a result, firms are unable to successfully mobilize their collateral without having to invest in duplicative technology stacks and processes. "How can we avoid making things worse before they get better?" is a common question posed today across many financial institutions – as the current cost barriers to digital adoption are very high.

But it is more than just legacy technology. Adoption is equally being hampered by legacy processes. Over 50% of the cost of any DLT project today is driven by the (human) costs of risk, compliance and product approvals.[18] As established procedures are reviewed in light of DLT adoption ambitions, firms are faced with an inevitable inertia (derived from growing resilience pressures) that makes established risks and oversight processes preferable to new ones, no matter what the benefits.

In both cases, firms are looking for partners who can insulate them from the technology and risk costs of digital adoption. While the potential income and revenue benefits of tokenization are evident, the adoption costs faced by many firms can be even higher – locking firms in their current state.

The case studies included in this report illustrate how global banks are positioned to support firms in navigating digital asset adoption. By integrating new digital platforms and capabilities with existing infrastructure, banks can reduce cost and complexities associated with adoption and change.



Tokenizing margin: Making collateral fit for a 24x7 world

What needs fixing today?

"One of the primary use cases for tokenization is the modernization of the post-trade movement of collateral that backstops trading activity. Tokenization has the potential to make this process much faster and more efficient, removing the systemic risk associated with 24/7 trading by making it possible to move collateral when traditional banking systems are closed. More continuous risk management has the potential to unlock trapped capital, accelerate the velocity of collateral, increase the capacity for risk transfer and reduce the cost associated with traditional settlement processes."

Michael Blaugrund, VP, Strategic Initiatives, Intercontinental Exchange (ICE)

Today's derivative markets are reaching a unique juncture: they are moving into a round-the-clock cycle for trading, yet the margin processes that support them are not. Challenged by cash and securities market infrastructures, firms are today compelled to be "monitoring risk, not managing risk" as they move into an always-on environment.

This gap is manifest in several key areas:

Derivatives and digital asset margining is 23x5
The world's derivatives and commodities markets are already running on a near-round-the-clock basis. Exposures are being accumulated day and night....

Cash settlement systems are not 23x5
...the challenge is that cash (and securities) cannot be moved across today's traditional market infrastructures around the clock. Cut-offs and overnight processing windows create periods in the day when cash cannot be moved to support margin.

No intraday financing
In the absence of 24x7 cash processing, market participants are unable to finance their margin obligations (i.e. borrowing cash against securities) in order to post margin outside of daylight operating hours. As a result, they face an artificial cost of carry in their margin management overnight and on weekends.

Over-provision and pre-funding
To bridge critical downtime periods in wholesale payment and settlement systems, firms are forced to over-collateralize as a pre-funding buffer, trapping liquidity that could otherwise be deployed productively (see above) – most notably on weekends.

As overseas participants try to move funds across multiple time zones and settlement systems, these cut-offs multiply and further narrow the window for firms to fund their margins.

Continuous markets are not continuous
With the launch of crypto futures, gold contracts and other derivatives, the volume of contracts whose underlying spot markets are trading on a continuous, 24x7 basis is growing. If margin processes are unable to keep up, the market faces a dislocation risk.

Entities vary in liquidity
Across major financial institutions, margin calls can also hit entities at times when their liquidity is elsewhere. Firms are dependent on the above infrastructures to move funds from one entity to another in order to meet a margin call - subject to all of the limitations in operating hours.

Put together, the gap in processing and technology between derivative exchanges and the infrastructures that support them is not only growing, but also becoming more expensive to manage

What is the answer?

To address these increasingly pressing challenges, the world's leading CCPs are turning to tokenization in order to enable 24/7 liquidity and margining for their clearing participants over the next 12 to 24 months.

In contrast to today's frictional margin transfer processes (dependent on intermediary banks and infrastructures), tokenization can allow clients to move their funding within minutes of a margin call, from any wallet on the relevant blockchain, 24-hours a day.

In practical terms, this means that the following process could soon become an operational reality:

Clearing and margining in a tokenized world: potential trade flows

Saturday

22:59 Client accumulates trading risk.

23:00 CCP calls Variation Margin.

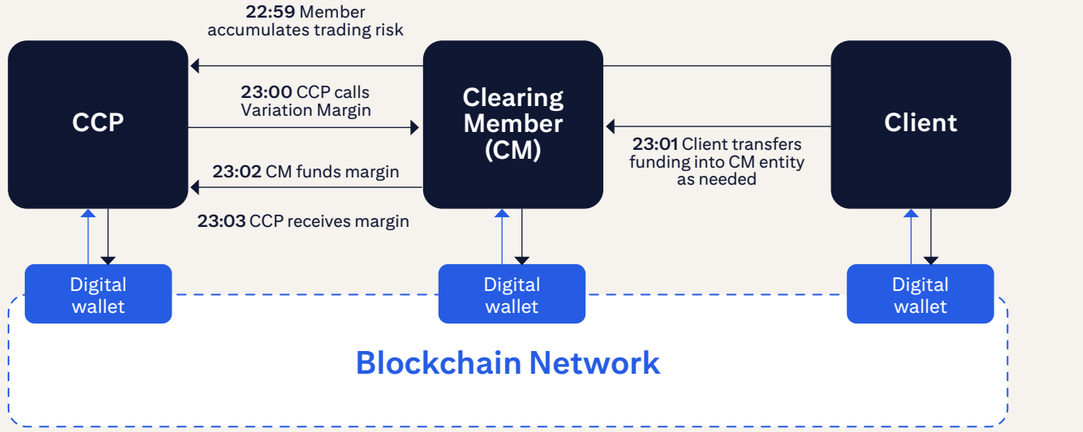
23:01 Client transfers securities (e.g. US Treasuries) or cash funding into their clearing member, wherever they are in the world. This may even involve a multi-entity transfer, if the funding is in the wrong entity at the specific time.

23:02 Having sighted the cash funding, the clearing member funds the CCP margin instantly.

23:03 CCP receives margin and clears account for continued trading.

23:05 CCP calls Variation Margin (based on real time price movements, potentially linked to a major market development).

23:08 Through the same steps as above, client margin can be provided in real-time.



What does this mean?

The successful implementation of real-time cash and securities margining is set to be a landmark development for all market participants. As **Roberts of Citi** highlights, concepts are now moving into execution: an Asian bank has just recently collateralized a precious metal margin call - using tokenized dollars in minutes.

- **Just-in-time funding**
  Instant payments as and when they are needed. No provisioning and complete flexibility in the event of a funding shortfall.
- **Eliminates weekend and overnight pre-funding**
  Improved funding efficiency through the mobilization of up to 25% of collateral (see above).
- **Real-time margining**
  By enabling real-time transfers, CCPs can benefit from improved margin efficiency – and potentially return significant value to their participants.
  For clearing members, real-time margining can not only mean fewer spikes in round-the-clock funding needs (especially on Friday evenings); it can also mean faster redeployment of funding during periods of reduced volatility.
- **Instant liquidity across global entities / accounts**
  Instant funding coverage from any digital wallet on the relevant blockchain.

"Using digital assets, firms can collateralize their margin obligations 8-10 times a day – versus once or twice today"

Mike Roberts, Head of Digital Asset Commercialization, Citi Investor Services

Key considerations

Importantly, this new mechanism triggers a range of critical considerations and requirements, which underpin the successful implementation of this innovation across the industry:

"Our collateral policy doesn't change with tokens"

For a CCP participant, the use of tokens as collateral does not change the financial risk. The financial risks of the assets representing collateral remain unchanged, whatever their format. Critically however, the operational risks (notably the effectiveness of the pledging or transfer mechanism, the cyber risk and the privacy risks) must be managed appropriately so that they present no additional risk to the parties in the collateral chain.

Backstop liquidity is a critical enabler

Today, CCPs have access to backstop funding facilities provided by a number of leading global banks. If the market were to come under significant stress, the CCP can reverse-repo several billions of dollars in securities (held as margin) in order to receive cash funding.

This ability to access funding is foundational to any CCP – and must continue in a tokenized world. In practice, this means that the funding banks and dealing desks must also be comfortable in receiving tokenized (or digital) securities and in offering financing against them. Their acceptance of tokens is a critical enabler for a CCP's own processes.

It's about the entire collateral ecosystem

The smooth management of daily margin obligations today relies on a closely integrated ecosystem that includes liquidity providers, global clearing members, triparty collateral management providers, custodian banks and software vendors. Each of these parties in the chain must be fully comfortable in operationalizing the use of tokenized margin if it is to become widely acceptable.

Interest will be different by asset class and by firm

Not all firms and trading desks will see the benefits of tokenization equally. Those trading crypto-futures will consider the need for real-time margining to be more compelling and urgent than those trading stock options today. Equally, market makers will see a greater and more immediate financial upside than 40 Act fund managers today. Given these differences, the speed of adoption will inevitably vary across the industry.

This is a 12-24 month journey

The adoption of tokenized collateral is not a distant prospect. With 24% of firms actively progressing their digital margining strategies for 2027,[19] the journey towards widespread use of digital and tokenized assets as margin is a short-term priority. Firms need to be preparing and scoping their own plans today if they are to make the most of the opportunities that are now available.

Citi Token Services

Citi Token Services (CTS) is Citi's blockchain-based platform for institutional cash management. Live since April 2024, CTS has processed billions of dollars in transaction value since launch, supporting transactions in the US, UK, Singapore and Hong Kong.

The core proposition is 24/7, near-instant, cross-border liquidity across the Citi payments and custody network, addressing the gap left by traditional cut-off times and pre-funding requirements. Importantly, CTS clients do not need to open new accounts, hold tokens or manage wallets. Instead CTS runs on existing account structures and leverages existing connectivity, ensuring that all Citi clients can derive the benefits of instant liquidity with minimal deployment effort.

Citi has described this as "making money smart": tokenized deposits and custody assets paired with programmable, smart-contract logic that can execute predefined actions (for example, releasing payment once a threshold condition is met) without manual intervention. In September 2025, Citi extended CTS by integrating it with its 24/7 USD Clearing solution, giving institutional clients in the UK and US near-instant multibank cross-border payments — an industry-first.

The Clearing House

The central problem with tokenized deposits has always been interoperability. A single bank's tokenized deposit is useful; an interchangeable one across all major institutions is transformational. In June 2026, The Clearing House announced a landmark initiative to bring together several of the world's largest financial institutions to create a new market of interchangeable tokenized deposits.

Leveraging the existing capabilities of The Clearing House's infrastructure (which clears over USD2 trillion daily today), Citi, JPMorgan, Bank of America, BNY, BMO, HSBC, Citizens and Fifth Third banks will cooperate to build an infrastructure in which tokenized deposits issued by different banks can move seamlessly across institutions in real time, 24 hours a day, seven days a week.

Importantly, this initiative will build on existing RTGS and CHIPS infrastructures, rather than looking to replace them. Executing within an existing regulated environment minimizes barriers to entry and enable quick scale for firms looking to move their USD funding and margining in real-time.

What does this mean in practice? All of the benefits of on-chain mobility, across several of the world's largest financial institutions.

Taking collateral global: How Asian CCPs are making the most of the 24-hour clock

"Today exchanges and banks are just warehousing risk until market opens up. Tokenization makes risk management a real-time activity"

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

What needs fixing today?

Collateral markets are not ring-fenced within any one market. Firms in Asia hold trillions of dollars in US dollar liquidity, while those in the US hold Japanese yen assets on their balance sheets. For any global financial institution today, the successful optimization of these assets across the 24-hour cycle is a vital driver of profitability.

Today, however, firms face a number of core limitations:

Global collateral schedules use USD
Across the world, 14 of the world's largest CCPs accept USD bonds and cash as eligible collateral, including 5 in Asia-Pacific. This means that firms across every time zone are holding and managing USD exposures.

Trapped securities
Owing to time zone differences, Asian firms (in particular) are unable to mobilize their holdings of US Treasuries (UST) to meet their obligations during Asian hours. With the Federal Reserve closed during the Asian day, any UST holdings are effectively trapped during the US overnight / Asian working day – creating a high cost of carry for USTs. Despite large volumes of USD holdings, Asian firms are unable to mobilize them without pre-funding up to 12 hours in advance.

Batches and latency
FMI settlements are batch-processed, which introduces latency even when markets are open. Before a market closes and collateral becomes fully immobile, firms can find their collateral trapped (and in the wrong account) due to a missed cut off at several points throughout the day. To compensate for the risk of missing any of these cut offs, firms are obliged to pre-fund, further increasing the cost of carry for collateral assets.

Lost income
Collateral immobility may result in Asia based firms holding lower quality assets in place of USD and offshore assets, simply because they are mobile and accessible during the Asian day.

Holding pricier Asian bonds means reduced treasury efficiency performance and lost earnings for many Asian firms. While they may prefer to hold more USD, operational limitations remain a challenge.

Operating costs
With the average firm managing a complex network of 65 different collateral accounts, every margin posting can be made up of multiple settlement legs across multiple counterparties. Given the above operational challenges, the risk of any one of these legs failing (and hence triggering a collateral shortfall) is significant.

To counter this, every movement of Eurobonds or offshore assets needs to be supported and tracked by significant manual resources – ensuring that every movement is a success. Automation is limited and fragile, with very high error rates in multi-party transactions.

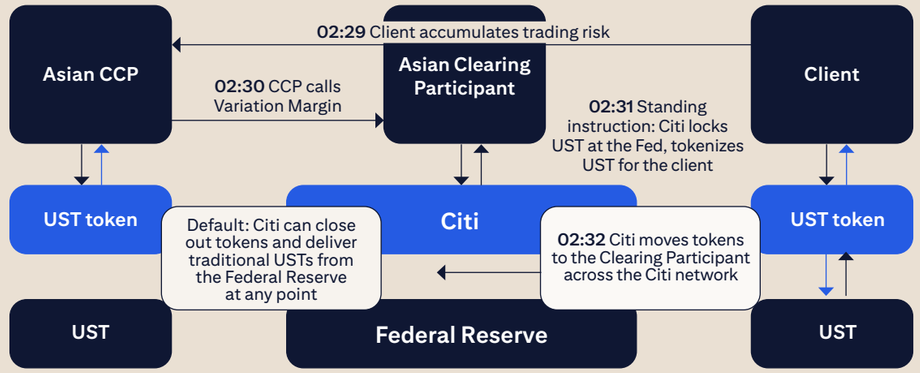
What is the answer?

By representing US Treasuries as tokens on a distributed ledger, USD collateral could potentially be mobilized across the entire 24-hour cycle, without increasing the risk to the safe-keeping of the underlying asset. Just as CTS made the benefits of tokenized cash available to account holders, in the future, Citi clients could elect to tokenize securities in their traditional custody accounts – and have them delivered to any other participant within the Citi payments or custody network within seconds.
Building on the growing volume of established precedent across the financial markets (including Broadridge DLR and HQLAx),[20] Citi is investing in the technical capability to "lock" certain existing securities in a custody account and issue tokens against them, enabling value transfer on a shared ledger. Importantly, this process means that the underlying asset never moves and, in the case of US Treasuries, the bond always remains safely in the Federal Reserve. In the event of a counterparty default, Citi can deliver the (dematerialized or traditional) US Treasuries as needed.

Building on the foundations put in place in 2025 by CTS,[21] the planned changes to include securities can enable the following collateral cycle:

SGT / HKT	EST	
14:29	02:29	Client accumulates trading risk.
14:30	02:30	CCP in Asia calls Variation Margin.
14:31	02:31	(Using a standing instruction) A client elects to "lock" a quantity of US Treasuries which it holds in its Citi custody account – wherever they are in the world. Despite the Federal Reserve being closed, the client then transfers the tokens reflecting the US Treasuries to the global clearing member (who also has a Citi account). The tokenized US Treasuries then arrive in seconds. This may even involve a multi-entity transfer, across multiple entities all receiving and delivering tokenized treasuries at the specific time.
14:32	02:32	Having sighted the tokenized treasuries in their Citi account, the clearing member funds the CCP margin instantly.
14:33	02:33	CCP receives margin and clears account for continued trading.

Asian clearing and margining in a tokenized world: Unlocking USTs



What does this mean?

24x7 mobility for USTs...and all assets	Using this tokenization model, all forms of assets (including USTs) can become equally mobile, subject to any regulatory restrictions. This can empower firms in Asia and across the world to hold and to mobilize the assets that offer the best economic value for their balance sheets. Operational concerns are minimized from a balance sheet management perspective.
Reduced cost of carry	Compared to today, this new parity would mean a significant economic impact for banking treasuries, whose cost of carry could be significantly improved using more efficient assets.
Fewer fails, less provisioning	Once tokenized, securities could be moved programmatically and with complete certainty, drastically reducing the risk of missed cut-offs during the day – and minimizing the risk of failed collateral moves across multi-party transactions. This will reduce the need to over-provision or pre-fund – meaning further economic improvement for financial resource managers.

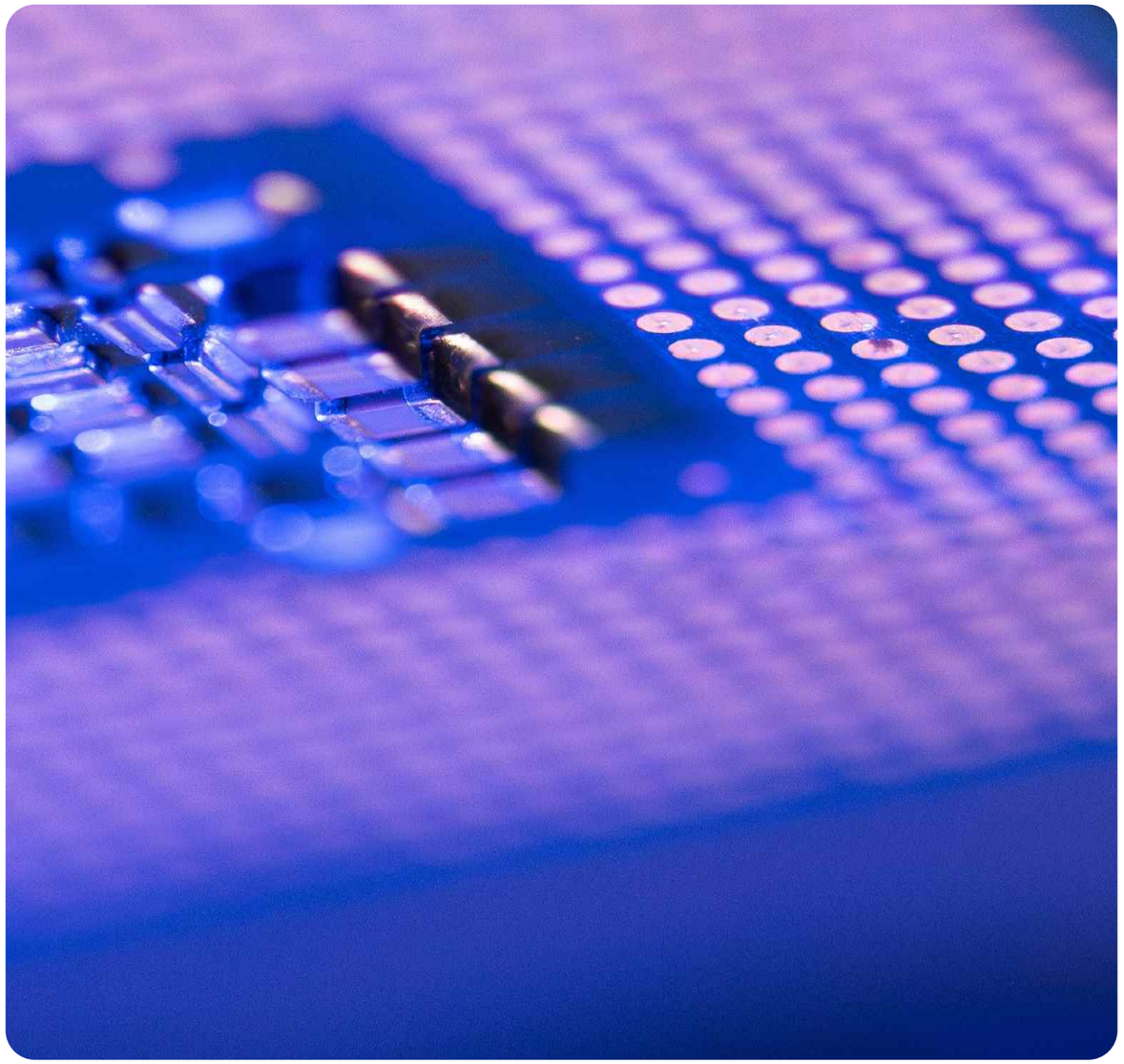
When combined, this increased mobility of US Treasuries (and USD cash) across the Asian working day can be transformational for banks. **Marsh** underlines that "discussions with some clients indicate that desks could release hundreds of millions of dollars in provisions back to the business" by leveraging tokenization in this way.

A highly scalable model

The same infrastructure that is used to facilitate US Treasury tokenization as exchange collateral can then be extended to all other collateral types and venues. European and Asian government bonds, and even equities could all be mobilized in the same way – with the only requirement being access to the securities in a custody account. This is where the next generation of collateral mobilization lies.

In this way, all securities could become instantly mobile, on a 24-hour basis, thereby enabling:

- **Multi-asset margin pools:** Inclusion of a wider range of assets into eligibility schedules, taking collateral from government bonds to equities, tokenized money market funds, and eventually crypto assets as eligible collateral at exchanges and CCPs.
- **Atomic DvP margin settlement:** Combining the securities token movement with a tokenized cash leg could create true simultaneous delivery-versus-payment (DvP) — eliminating counterparty risk on the margin call settlement itself.
- **Smart contract automation:** Pre-authorized threshold-based contracts could automatically top up margin when exposure moves beyond agreed bands, with zero manual intervention.
- **Record date orchestration:** Automating the substitution of collateral ahead of corporate action record dates — eliminating the current manual unwind process.



Tokenized MMFs– How Franklin Templeton is building the ideal collateral asset

"For the first time in history, industry technology is able to keep pace with the natural state of markets. Tokenized assets (including money market funds) allow you to create a new form of collateral asset that could unlock trillions of dollars in trapped margin today while simultaneously reducing risk due to faster settlement. Tokenized money market funds can pay yield by the minute to the holder. No traditional asset can do this. It is the ideal collateral asset."

Chris Perkins, Head of Cryptocurrencies, Franklin Templeton

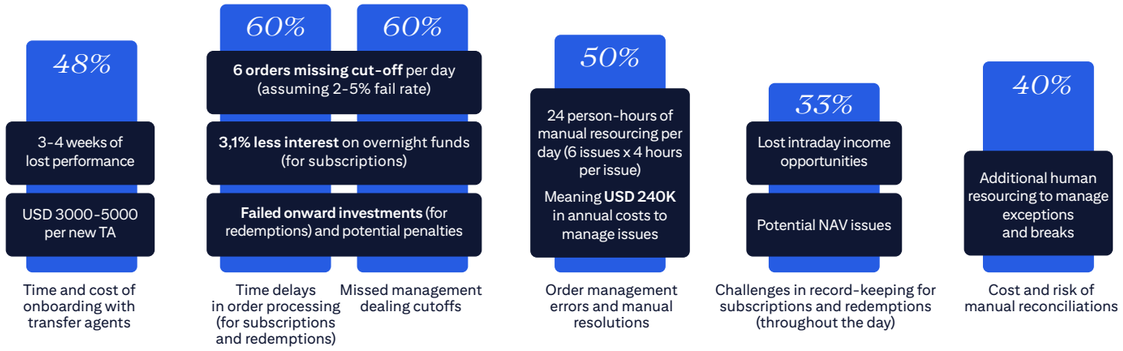
In 2027, around 35% of firms expect to use tokenized money market funds (TMMF) as collateral.[22] Tokenization is about more than simply making today's collateral more mobile – it is about leveraging the benefits of blockchain to create a new form of collateral asset that is mobile, interest-bearing and highly resilient as collateral.

What needs fixing today?

Today only a small fraction of money market funds are eligible as collateral at the world's leading clearing houses – due to a number of structural challenges.

Trillions of dollars are locked in margin accounts	Today, margin requirements are calculated based on 7-10 days of risk. This means that vast amounts of capital are tied up in support of cleared and uncleared derivatives, all because clearing houses are unable to manage risk cycles in real-time.
Around 60% of collateral is in cash	The majority of this margin is in cash. Easy to move and highly fungible, cash margin is prevalent but unfortunately not yield bearing. Very little of cash margin today is remunerated to the same degree as commercial cash deposits. This means that the majority of global margin is sitting idle.
Money Markets are overnight vehicles	The opportunity for money markets to offer an interest-bearing alternative to cash margin is not new, and a number of Rule 2a-7 funds in the US are being used daily to replace long cash balances. However, the challenge with traditional money market funds is that they are slow and expensive to transact. Over 85% of money market funds (MMF) subscriptions are for overnight purposes today.[23] 60% of firms today are experiencing significant issues in their daily MMF management[24] – most notably in missed dealing cut-offs and reconciliation errors. The high amounts of friction in the traditional MMF subscription and redemption cycle mean that most firms are today redeeming MMF units into cash up to 24 hours before they expect to need the funding – all because they have no choice. This means not only daily transaction fees but also one day of forsaken interest for every MMF fund investment – and approximately 1.5 – 2 basis points per night in lost interest.
Stablecoins are not yield-bearing	While new forms of digital money are emerging that can facilitate a transition to real-time margining (and hence a vast capital "unlock"), current stablecoin models do not solve the "idle cash" problem. By not giving the holder interest, stablecoins have a negative cost of carry – making them unsuitable for use as an alternative to cash margin in the long run.
Today's TMMFs are still evolving	A first generation of TMMF launches (since 2024)[25] has begun to evidence the power of tokenized money market funds as collateral on DeFi exchanges. However, concerns remain around "gap risks" (i.e. differences in liquidity between real-time fund shares and T+1 or T+2 delivery cycles for the underlying holdings in the fund), which has contributed to the slow adoption of existing TMMFs by institutional banks and investors.

Core challenges with money market funds today



% of firms citing significant issues with their MMF processing today

Question: Approximately how many fund subscriptions and redemptions do you process on a daily basis (in/out of MMFs, across all of the portfolios that you oversee)?

Source: the ValueExchange, The case for tokenized money market funds (2026)[26]

What is the answer?

The world's cryptocurrency exchanges have been demonstrating the opportunity for digital assets to transform the collateral landscape for several years already.

The new generation of TMMFs (by Franklin Templeton, BlackRock, Fidelity, WisdomTree and others[27]), is beginning to demonstrate how the TMMF structure can deliver a unique combination of three core characteristics:

- Real-time mobility
- Bespoke fractionalization
- (Intraday) interest yield

Put together, these three characteristics can not only help banks and investors to drive performance, they can help support execution of their core, fiduciary responsibilities.

Leveraging the power of a TMMF, trade flows such as this can become standard practice:

Clearing and margining in a tokenized world: Tokenized money market funds as collateral

Saturday

22:58	**22:59**	**23:00**	**23:01**	**23:02**	**23:02**
Client sweeps cash into a TMMF in order to maximize interest earnings on balances.	Client accumulates trading risk at CCP.	CCP or counterparty calls variation margin.	Client delivers fractional unit of TMMF holdings as title or pledge to the CCP/ counterparty in real-time. (No fund redemption is needed to release cash holdings in order to make the pledge. Pledge or title transfer is reflected in the share registry of the TMMF in real-time).	Client continues to receive interest for securities on pledge.	CCP or counterparty receives TMMF unit as margin and clears account for continued trading.

What does this mean?

In practice, this means a number of foundational benefits are available for firms using TMMFs to support their margins today:

Intraday earnings

In comparison with (fiat) cash or stablecoin holdings today, TMMFs can deliver more income to the holder through interest payments that are calculated around the clock – by the minute. No gaps, processing or down-times.

No more unnecessary redemptions

Central to the value of TMMFs is the ability to pledge a (fractionalized) unit of the TMMF to a collateral taker, in place of having to redeem the share for cash.

With no subscriptions and redemptions to manage, this reduces the extensive cost of supporting margining today (using traditional MMFs). No more transfer fees, no lost interest and no need for manual resources to support and manage the process.

Continued interest

With the collateral giver able to receive interest treatment even on pledged TMMF shares, holders and pledgers could see a daily delta of 1.5-2 basis points in daily earnings (versus cash margin).

Programmability

53% of firms cite the programmability and automation of TMMF fund transfers as a critical benefit of tokenization.[28] There is no reason why the management of MMFs and margin funding should need manual intervention (in theory).

Fiduciary empowerment

Critically, the real-time, 24x7 mobility of TMMF shares can also play a foundational role in helping institutions to fulfill their daily fiduciary responsibilities. With geo-political and economic events now happening around the 24x7 cycle, TMMF collateral tools can enable asset managers to act in their clients' best interests at all times. If a major news event strikes at 4:30 am, an asset manager can now be equipped to react to that event in real-time.

Reduced CCP time horizons

Finally, as the supply and transfer of margin becomes increasingly real-time, so too can the calculation processes by CCPs. As a generation of highly mobile cash margin substitutes matures, TMMFs can enable accelerated and more frequent margining, and hence reduce CCP risk horizons from 7-10 days downwards.

Critical dependencies

Even with over USD 6 billion in tokenized money market fund issuance today,[29] the current generation of TMMFs face three critical dependencies:

Transfer agents are the key: Over 70% of firms cite the operators and the owners of the share registry as the #1 point of dependency for the successful transition to collateral eligibility.[30] If they are to avoid being replaced by new, on-chain native providers, the world's leading transfer agents need to invest heavily in order to accommodate real-time transfers, pledge transactions and connectivity to leading collateral managers.

Dual registries are expensive: Given the limited supply of underlying bonds, commercial papers and cash in on-chain form, today's TMMFs are faced with a split model. Share registries and dealing are on-chain; yet securities and cash processing still occur off-chain. Based on early experience, this duality of operating models creates a significant cost base for TMMFs, and limits the financial viability of these vehicles in the short term. DTCC's launch of its tokenization service[31] (enabling widespread adoption of tokenized US Treasuries and equities) is expected to help address this challenge from October 2026 onwards.

Education: As **Perkins** notes "TMMFs are very different from traditional MMFs." Firms need to understand the core differences and characteristics that make TMMFs indispensable as collateral (versus the flaws that have limited the use of traditional MMFs) in order for TMMFs to be accepted into the world's eligibility schedules.

Importantly, regulation is no longer one of these blockages. Recent developments in the US (notably by the CFTC[32]) have begun to make the use of TMMFs a question of execution. The above obstacles are not insurmountable – and can be resolved quickly. As the ISDA / GDF working group on TMMF collateral eligibility has recently reported, the pathway to the mobilization of TMMFs as margin is increasingly clear.

Bringing cryptocurrencies into the funding chain: Citi Wealth's one step at a time

"Clients don't think about assets in isolation. They think about their overall balance sheet. Over time, cryptocurrencies will need to fit into the same financing, liquidity, portfolio construction, and wealth planning frameworks that support the rest of a client's financial life. The evolution from ownership to utility is one of the clearest indicators of a maturing asset class."

Deborah Querub, Global Head of Digital Assets, Citi Wealth

What needs fixing today?

Cryptocurrencies have emerged to become an increasingly accepted and resilient asset class in the world's investment markets. Yet holders of these assets face few options in mobilizing them – leaving them with an artificially high cost of carry today.

Crypto is an outperformer

Over the last decade, the world has amassed over USD 3 trillion in cryptocurrency holdings, many of which are now held in corporate and financial treasuries.

This is partly because despite their volatility, the prevailing forms of cryptocurrencies have presented significantly higher investment returns than traditional assets. Bitcoin has had a compound, annual growth rate (CAGR) of approximately 65% in the last five years – compared with around 3.4% for US Treasuries.

Over USD13 billion of cryptocurrencies held in corporate accounts

As a result of these returns, around USD13 billion in cryptocurrencies was held by wealth or corporate clients (notably those with wallet holdings of over USD50 million) at the end of 2025.[33]

While many are dismissive of these firms, some of whom engage in the retail and unregulated market, this community now includes many of the world's leading market maker firms. With Citadel, DRW and Virtu now live in trading and managing cryptocurrencies, these assets are now an increasingly core part of the world's capital markets.

Cryptocurrencies are not integrated into banking workflows

Despite their growing liquidity, the integration of cryptocurrencies into banks' foundational risk management, reporting and monitoring processes is still only just beginning. As a result, risk managers, treasurers and advisors are only slowly acquiring the tools and the knowledge to integrate cryptocurrencies into their daily operations.

Institutional firms aren't financing crypto

Partly due to these process limitations, most regulated, financial institutions are able only to hold cryptocurrencies for clients – as segregated, client assets.

Owing to regulatory obstacles and legacy technology limitations, regulated, institutional banks are not able to integrate cryptocurrencies into their balance sheets or to offer any degree of scalable funding for these assets.

While cryptocurrency ETFs provide banks and their clients with some ability to finance crypto-exposures, the majority of this highly mature collateral and funding ecosystem is closed off to holders of cryptocurrencies. Firms with crypto inventories are unable to pledge them or to mobilize them in return for liquidity – leaving them with effectively "dead" assets from a balance sheet perspective. While cryptocurrencies are offering significant growth returns, they are handicapped by their cost of carry.

Lost earnings

For as long as these issues prevent cryptocurrencies from being smoothly integrated into banking treasuries and dealing desks, firms are losing out on the significant growth opportunities that are presenting themselves from this new asset class.

What is the answer?

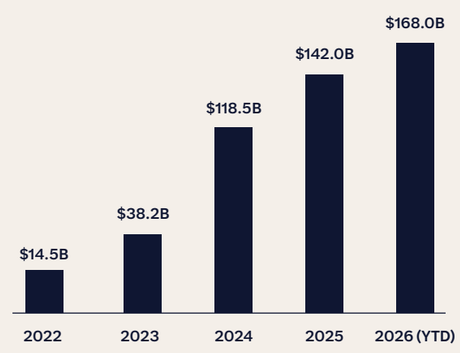
As **Querub** noted, digital assets have had a much broader impact than simply creating a new investment category. They have challenged many of our assumptions about how assets can be issued, transferred, settled, and ultimately managed. In many ways, crypto served as an early proof of concept for what a more digital and programmable financial system could look like. The long-term significance may extend well beyond the assets themselves.

But as demand for direct crypto-asset financing grows, clients are now starting to expect cryptocurrencies to be treated in the same way as any other asset within the portfolio. For financing banks, this growing demand is triggering a growing awareness of the steps that lie ahead for cryptocurrencies to become fully mobile and operational within the mainstream portfolio.

This means three core steps:

1. Wealth clients have so far been able to begin financing their cryptocurrency exposures by taking holdings of bitcoin or Ethereum ETFs. By using the traditional and well-established ETF framework, risk managers across the industry are able to take their first steps in managing the risks inherent in digital assets – as a safe first step.

Global cryptocurrency ETF Assets Under Management (AUM)



Source: the ValueExchang Research[34]

2. In order for financing to take hold on a direct cryptocurrency holding level, systems and data flows must be integrated, so that crypto exposures are manageable alongside those of traditional assets across the entire investment lifecycle. This is not just a portfolio reporting question; this stretches into funding, estate management and other critical areas.
3. This must reach the front line: those advising, trading for and supporting investors must be conversant in critical questions and dynamics - supported by the corporate resource ecosystem that spans investment research, suitability reporting and other areas, for example.

As **Querub** *explains, many advisors are already having thoughtful conversations about crypto with clients. What determines the pace of broader adoption is not client interest alone, but the availability of education, research, reporting, and institutional infrastructure that can support those conversations at scale.*

How Strategy is building Digital Credit around a Bitcoin treasury

"Strategy is building a capital-markets platform around our 845,000+ bitcoins worth over $65 billion. For MSTR shareholders, our objective is to increase Bitcoin Per Share and outperform bitcoin over time. For income investors, we are building Digital Credit. Stretch ("STRC"), our flagship Digital Credit instrument, is designed to deliver high yield, low volatility and high liquidity while trading near par. We have successfully scaled STRC to $10 billion, with more than $130 million of average daily trading volume. By combining our Bitcoin treasury with a dedicated USD Reserve and active capital management, we have built a fortified balance sheet designed to serve both Digital Equity and Digital Credit investors."

Phong Le, President & CEO, Strategy

Since 2025, Strategy has issued a series of perpetual preferred equity securities, offering investors a range of five options (STRK, STRF, STRD, STRE, and STRC) in how they wanted to invest in the company.

As we highlight above, institutional banks, brokers and investors today face a number of challenges pledging or mobilizing bitcoin holdings for use as collateral and financing. What is unique about Strategy's issuance is the fact that their corporate treasury is built on over 845,000 bitcoins. Building on these holdings, Strategy was able to effectively finance its crypto-assets by issuing securities of the company without pledging its bitcoin holdings as collateral.

For an organization holding significant inventory of cryptocurrencies, this type of issuance may present an opportunity to raise capital and to mobilize its digital asset holdings. And while securities issuance carries costs, it may offer an attractive alternative to secured financing, depending on the relative funding costs, collateral haircuts and other financing terms available.

As of 8 September 2026

How NYSE is breaking down the regulated cryptocurrency divide

In March 2026, Intercontinental Exchange (ICE), owner of the New York Stock Exchange (NYSE), took a strategic investment in OKX at a valuation of USD 25 billion, with the aim of connecting regulated and digital-asset markets.

This agreement is transformational in creating a two-way bridge between today's traditional finance markets and the cryptocurrency markets – enabling new investment flows and customer access.

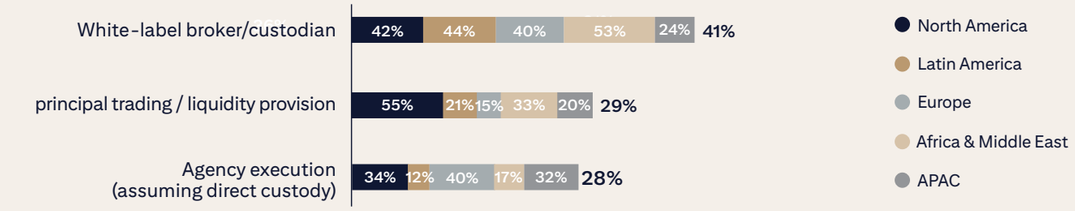
For regulated banks and brokers looking to take cryptocurrency exposures, OKX's spot crypto prices will be licensed to ICE to support US-regulated futures - giving institutions a compliant route to digital asset exposure without leaving a regulated venue. With these contracts then cleared through ICE infrastructure, broker dealers will face the same risk management and custody infrastructures that they face today.

At the same time, OKX's 120 million account holders will also gain regulated access to ICE's US futures and NYSE tokenized equities, extending institutional-grade market access into a distribution base that traditional exchanges have so far not been able to reach. Banks and issuers will have wider reach than ever before.

What next?

Based on recent research from Fireblocks, 53% of North American financial institutions plan to consider offering prime brokerage and financing against digital asset holdings in 2026.[35]

How is crypto becoming an institutional asset?



% of banking respondents to offer digital asset services in the coming months

Question: Do you plan to offer trading services for digital assets in the next 12-24 months? If so, what services do you plan to offer?

Source: The Financial Grid, Fireblocks

But as the industry evolves towards the financing of cryptocurrencies, firms are exploring countless opportunities for digital asset holders to improve their cost of carry and to make their cryptocurrency holdings perform.

The view from the trading desk: QRT's learning points so far

What do all these initiatives mean in practice for the trading desks that are making markets and generating liquidity today? **Thomas Uhm, Quant Research Director at Qube Research and Technologies (QRT)** cites several core considerations in the evolving path of digital assets in the collateral space:

1. **Tokenization use cases differ between asset classes:** Tokenization of equities allows for improved access for users across borders with reduced reliance on prime brokers and brokers, increased flexibility for holders and creates a more accurate real-time record of ownership for corporate issuers. However, the increasing fragmentation of tokenization issuers, product structures and venues does add some potential risk and complexity for users. Making tokenized markets work as well as the underlying markets will draw heavily on the experience and expertise of firms like QRT, who can help trading counterparties abstract some of the back-end complexity and source the liquidity they need to trade these products on an institutional scale.

2. **Opportunities in other asset classes:** Digital replications earn their keep in high-friction markets. The benefits of price discovery and risk management of all asset classes outside of normal business hours have become clear. There are significant opportunities in the world's repo markets, cargo and commodities mid-transit, money market funds and US Treasuries – where faster collateral movement can drive better capital efficiency, fewer capital lock-ups and the ability to pay intraday interest.

3. **The economics of settlement cycles:** Today's "spot" equities are in fact T+1 forwards, and so there is a funding cost included in today's equities settlements that needs to be included in the economics of tokenization and T+0 settlement. Essentially the T+0 version of an asset should trade at a discount equal to one day of funding cost. On the other hand, the T+0 market "looks fully funded unless someone is willing to manage the repo risk overnight." The pricing of T+0 means pros and cons – all of which need to be priced.

4. **Can we afford T+x?** Much is said about the potential for DLT to enable entirely customized settlement cycles, down to a bilateral or even trade level. But truly bespoke settlement cycles for every trade would fragment liquidity so severely that a default cycle would most likely re-emerge as a necessity. Netting longs against shorts and compressing settlement reduces the cost of capital sharply. Discarding those mechanisms is not a convenience; it is capital destructive. The plausible outcome is a T+0 or end-of-day model (i.e. a 4pm batch, allowing a CLS-style compression system to preserve capital efficiency), but balance sheet flexibility and willingness to deploy will be key.

5. **Tokenized securities or perpetuals?** Tokenized equities struggle with dividends on-chain and the lack of rehypothecation pools. It's very difficult to construct a clean order book when tokens carry different entitlements, which can render them non-fungible, and the lack of borrows makes two sided markets tricky and expensive. Perpetuals can avoid this by design, by setting an ex-dividend funding window or delivering total return with no entitlement event. They are also cash-settled derivatives, which allows for efficient risk transfer in either direction. Run through a clearing house, they also remove the need for auto-liquidation, enabling proper margin calls instead, which would reduce risk across the system. But because perps are currently tied to the trading platform, they can't be used as collateral or deployed for capital efficiency elsewhere.

For the trading desk, the strategic question is no longer whether digital rails matter. TradFi and crypto rails are converging toward becoming inseparable, with real-world assets moving on-chain and on-chain assets moving off. The priority is no longer digital vs traditional - the ability to price liquidity, risk and friction across these two universes will be the core foundations of trading in 2026 and beyond.

Bringing new forms of tokenized collateral to the market: SIX's pre-IPO securities issuance

"In private markets you have a lot of friction - some is desirable, some is waste. On the downside, every time you issue a new share, it is for the first time. There is no scale."

Marco Kessler, Head Custody Business Development & Markets Ecosystem, SIX

Manual issues are keeping private assets off the collateral agenda

Alongside cryptocurrencies, private market assets are equally immobile today. Beset by a range of structural problems across the security lifecycle, private securities can take months to be transferred and so are rarely included in collateral eligibility schedules.

These structural problems include:

Manual capital table management
Shareholders in private securities are often recorded manually by law firms or service providers, with minimal automation or interfacing to external systems.

Restrictions of transfers
As part of the transfer or settlement process, firms undertake extensive checks on new shareholders to ensure their suitability, etc. (in addition to meeting regulatory requirements).

With these checks being conducted manually today, the transfer of title (or ownership rights) is impossible on an automated or accelerated basis – making these assets unsuitable for use as collateral.

No standardized structures for private assets
Private securities are also highly variable in structure and definition – to the extent that few private equities look alike, for example. In the absence of standardized security definitions, scalable rules for limit and risk management are impossible to apply.

Not recognized as securities (not in a CSD)
Despite a small number of exceptions, most private assets are issued on an over-the-counter (OTC) basis, and they are not held in regulated CSDs. As a result, they cannot be classified as securities (under critical regulations such as CSDR in Europe) and hence cannot often be included in eligibility schedules.

No secondary market
Few private market securities today even have provisions for secondary market activity or transfers of title. Shares are rarely transacted in the open market, meaning that there is almost no substantial price discovery or market liquidity. Absent these two core criteria, private markets are extremely difficult to manage in a collateral context.

Building liquid, private market securities on-chain

On 11 June 2026, Citi and SIX launched a unique range of Digital Depositary Receipts (DDRs) on private company shares. Built on the regulated blockchain infrastructure of SIX, these DDRs are the first tokenized securities to offer pre-IPO companies access to investors through a regulated Blockchain platform.

The product adapts the familiar depositary receipt structure (typically used to let investors hold foreign-listed stocks through bank-issued certificates) and applies it to private market equity. Private companies can broaden their investor reach without listing on a public exchange, while institutional and accredited or high-net worth investors receive a Citi-issued, regulated security rather than the opaque SPV or offshore structures common in secondary private markets.

While offering a significant range of benefits to corporate issuers and to investors, this structure also takes private markets one step closer to collateral eligibility by introducing a range of new benefits, including:

Digital Compliance
Leveraging smart contracts, restrictions on transfers can be automated to become simple, rule-based processes. If specific conditions are true, then ownership can be transferred automatically – radically shortening settlement processing times.

Standardization
In creating a new range of standardized depository receipts, this initiative has given a standardized shape and definition to the previously variable private markets. And with standardization comes an improved ability to manage risk.

CSD Securities
The DDRs are held in SIX today, meaning that all concerns around the place of safe-keeping have been resolved for institutional shareholders.

While a range of core issues continue to remain in the journey towards collateral eligibility for private assets (most notably the existence of a secondary market and the associated data and liquidity benefits that that entails), this issuance is early evidence of how tokenization is set to widen the collateral pool in the coming years.

Conclusion

The case studies in this report confirm that the world's collateral processes are being fundamentally rebuilt, not simply digitized.

Citi's ongoing development work with global clearing houses shows that tokenization turns margin management into a genuine 24x7 capability, letting clients meet a Saturday-night variation margin call in minutes instead of pre-funding it hours ahead.

Citi's work on tokenizing US Treasuries is beginning to evidence how collateral can be mobilized across Asian and European trading hours without ever leaving the Federal Reserve, unlocking truly global use of a single pool of assets.

Franklin Templeton's new generations of tokenized money market funds are providing a hitherto impossible combination of mobility, yield and programmability, as the foundation for the "ideal" collateral asset.

Strategy's bitcoin-backed issuance illustrates how digital assets are being drawn into mainstream funding chains that have historically excluded them.

SIX's Digital Depositary Receipts extend the same logic to pre-IPO private equity, converting one of the most illiquid asset classes on the balance sheet into usable collateral.

Underpinning all four is the same headline finding: firms are sitting on an average USD346 million a year in unrenumerated idle collateral, and each of these examples is reducing that number every day.

Looking ahead, a growing number of high-profile developments will define the next phase of this transformation. DTCC Tokenization Service due to launch in October 2026 will support US Treasuries which will also help create the deep, high-quality on-chain supply that multi-asset margin pools need to scale beyond pilot volumes. Alongside this, the emergence of interoperable, bank-issued tokenized deposits, exemplified by The Clearing House's initiative among Citi, JPMorgan, BNY and other major banks, will finally solve the fragmentation problem that has limited tokenized cash to single-bank silos.

Taken together, these two threads point to a 2027 runway in which tokenized Treasuries and interoperable bank deposits combine to give firms atomic delivery-versus-payment, smart contract-driven margin top-ups and genuinely global, 24x7 collateral mobility.

With 27% of firms already progressing digital margining strategies for 2027, the industry is not waiting for a distant future state. The infrastructure, regulatory precedent and institutional appetite are available now, and firms that scope their tokenization strategies today will be best placed to capture the efficiency gains this report has outlined.

Endnotes

1 ValueExchange research, DLT in the Real World 2026
2 rwa.xyz
3 ValueExchange research, DLT in the Real World 2026
4 ValueExchange research, The case for tokenized collateral (October 2025)
5 ValueExchange research, The case for tokenized collateral (October 2025)
6 ValueExchange research, The case for tokenized collateral (October 2025)
7 ValueExchange research, The case for tokenized collateral (October 2025)
8 ValueExchange research, The case for tokenized collateral (October 2025)
9 https://www.icmagroup.org/fintech-and-digitalisation/fintech-resources/tracker-of-new-fintech-applications-in-bond-markets/
10 https://thedefiant.io/news/defi/jpmorgan-executes-first-blockchain-settlement-in-blackrock-barclays-trad
11 https://www.broadridge.com/capability/middle-and-back-office-solutions/post-trade-processing/distributed-ledger-repo-solutions
12 https://copper.co/en-ch/insights/research/a-snapshot-of-copper-in-2022
13 https://www.citigroup.com/global/news/press-release/2023/citi-first-issuing-paying-agent-world-bank-euroclear-new-dfmi-dlt-platform
14 ValueExchange research
15 https://www.ecb.europa.eu/paym/dlt/exploratory/html/index.en.html
16 https://thevx.io/research-insights/report/treasuries-on-chain-an-industry-case-for-change-whitepaper
17 ValueExchange, The case for tokenized collateral (2025)
18 ValueExchange, DLT in the Real World 2026
19 ValueExchange, DLT in the Real World 2026
20 https://app.rwa.xyz/
21 https://www.citigroup.com/global/news/press-release/2025/citi-integrates-citi-token-services-with-24-7-usd-clearing-real-time-cross-border-payments-liquidity-management
22 The ValueExchange, The case for tokenized money market funds (2026)
23 The ValueExchange, The case for tokenized money market funds (2026)
24 The ValueExchange, The case for tokenized money market funds (2026)
25 https://finance.yahoo.com/markets/crypto/articles/blackrocks-buidl-nears-1-billion-140715821.html
26 The ValueExchange, The case for tokenized money market funds (2026)
27 https://app.rwa.xyz/treasuries
28 The ValueExchange, The case for tokenized money market funds (2026)
29 The ValueExchange, The case for tokenized money market funds (2026)
30 The ValueExchange, The case for tokenized money market funds (2026)
31 https://www.dtcc.com/digital-assets/tokenization/live-production-trades
32 https://www.ledgerinsights.com/cftc-collateral-rule-change-could-boost-tokenized-mmf/
33 ValueExchange research
34 ValueExchange research
35 https://www.fireblocks.com/report/financial-grid-global

26-C0EC3638 09/26