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Tobias Adrian

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Tokenization—the representation of financial assets and liabilities on programmable digital ledgers—is increasingly shaping financial system developments. The most consequential transformation occurs within the regulated financial system, including banks, asset managers, and financial market infrastructures, where tokenization can enable atomic settlement, continuous liquidity management, and embedded compliance. This Note argues that tokenization constitutes a structural shift in financial architecture, rather than an improvement of marginal efficiency. It describes how permissioned shared ledgers, programmable financial assets, and smart contract-based risk management alter the nature of settlement, liquidity, and systemic risk. The Note also emphasizes that the long-term success of tokenization depends on anchoring digital finance in public trust through clear policy frameworks, safe settlement assets, robust governance of code, legal certainty, and international coordination. Absent such anchors, tokenization risks amplifying financial instability through speed, concentration, and fragmentation, as the contract-based risk management alters the nature of settlement, liquidity, and systemic risk.

Introduction

The global financial system is undergoing a transition that is often described as technological but is fundamentally institutional. Tokenization enables financial claims—including money, securities, and derivatives—to be represented as programmable digital tokens recorded on shared ledgers. This capability allows for real-time atomic settlement, collapsing multiple stages of the traditional financial value chain into a synchronized process (Aldasoro and others 2023; Committee on Payments and Market Infrastructures 2024). Previous waves of digitization improved efficiency within existing institutional boundaries. Instead, tokenization reconfigures the architecture through which trust, settlement, and risk management are organized. Unlike previous waves of digitization, which preserved existing institutional boundaries while improving efficiency, tokenization reconfigures the architecture itself (Bank for International Settlements 2025a).

This Note argues that tokenization constitutes a structural reallocation of trust within the financial system. In traditional architectures, trust is embedded in regulated intermediaries, layered institutional processes, and the sequencing of settlement over time. In tokenized systems, execution, settlement, and aspects of risk management migrate toward shared infrastructures and programmable logic (see Adrian and others 2023). The efficiency gains from this shift could be significant but also entail risks. In addition, implications for liquidity dynamics, governance, and the preservation of the singleness of money are core policy challenges. Ensuring that this reallocation preserves public trust requires clear governance frameworks, legal certainty, and appropriate anchoring in safe settlement assets.

From a policy perspective, the distinction between the governance frameworks of tokenized and traditional systems is critical. Financial sector policy frameworks have evolved around institutions, balance sheets, and markets that operate with temporal frictions: end-of-day settlement, batch processing, and delayed reconciliation. These frictions are not only costly to end-investors, but they also provide temporal buffers that allow exposures to be netted, liquidity to be mobilized, and authorities to intervene before settlement becomes final. Tokenized systems reduce or eliminate many of these buffers. Settlement becomes continuous, margining becomes automated, and liquidity demands materialize instantaneously (CPMI 2024; Financial Stability Board 2024).

Tokenization challenges crisis management and resolution frameworks that are built around nationally domiciled institutions, territorially bounded infrastructures, and jurisdiction-specific legal authority. In tokenized systems, transactions are executed on shared ledgers spanning multiple jurisdictions, allowing assets, liabilities, and collateral to move across borders at machine speed and without a clear geographic anchor. This creates a fundamental mismatch between the global, continuous operation of tokenized finance and resolution regimes that rely on jurisdictional control over institutions and locally situated assets, as the key levers of control may instead lie in governance keys, consensus mechanisms, or smart contract logic operating across borders.

Therefore, the relevance of tokenization extends beyond innovation policy or market development. It raises core questions for central banking and prudential regulation, and requires international coordination given the substantive cross-border transactions. Who provides the ultimate settlement asset? How are risks governed when financial logic is embedded in code? How can legal finality be ensured in a system that operates across jurisdictions at machine speed? This Note addresses these questions by situating tokenization within the broader evolution of the financial and monetary system.

From Digitization to Tokenization

Digitization has long been a feature of modern finance. Payments, securities, and derivatives have been recorded electronically for decades. However, these systems define ownership by entries in centralized databases maintained by trusted intermediaries. Transactions involve a sequence of messages, reconciliations, and legal confirmations, often across multiple institutions.

Tokenization departs from this model by embedding ownership and transfer directly into the asset itself. A tokenized security is not merely a reference to an off-chain legal claim, but it is a digital object whose transfer can be executed and validated on a ledger (CPMI 2024).[1] Smart contracts allow this object to interact automatically with other tokens, enabling conditional execution of delivery versus payment, margin calls, or coupon payments.[2] Three features distinguish tokenization from conventional digitization:

- First, programmability allows financial contracts to be executed automatically without human intervention.
- Second, shared ledgers replace bilateral reconciliation with a single, synchronized source of truth.
- Third, settlement finality can be achieved in near real time.

Together, these features shift the locus of risk from institutions to infrastructure. Where traditional systems rely on institutional buffers and legal processes to manage failure, tokenized systems rely on the correctness, resilience, and governance of code. This shift necessitates a corresponding evolution in regulatory approaches. Supervisory frameworks focused solely on capital adequacy or conduct risk are insufficient when failures can originate in algorithms or data feeds. The policy challenge is to regulate not only who participates in the financial system but how transactions are executed at the most fundamental level, that is, in the code itself.

During the transition phase in which traditional, account-based assets and infrastructures coexist with tokenized ones, differences in settlement speed, liquidity management, and governance arrangements may give rise to interactions with potential financial stability implications (FSB 2024). Policymakers should be particularly attuned to those challenges.

Tokenized Money

The settlement asset is the cornerstone of any financial system. In traditional markets, central bank money serves as the ultimate settlement asset for transactions, anchoring convertibility and preserving the singleness of money across institutions and markets. Tokenization reopens this question by enabling a broader range of digital moneys to circulate on shared ledgers, potentially expanding the set of assets used to discharge obligations with finality (BIS 2025a).

Three broad categories of tokenized money are emerging. Tokenized commercial bank deposits represent a digital extension of existing liabilities, retaining the two-tier monetary system while enhancing programmability. Regulated stablecoins are privately issued digital tokens backed by safe assets, often designed for global circulation.[3] Stablecoins are payment assets and share similarities with various forms of digital “money”.[4] Wholesale central bank digital currency (wCBDC) represents a direct digital claim on the central bank, designed for interbank and financial market infrastructure (FMI) settlement (see Kunaratskul and others 2025).

[1] A security token is defined as any token that meets the definition of a security in a given jurisdiction (subject to respective securities laws).

[2] Many jurisdictions have, however, limitations in their legal frameworks, implying that tokenization is representing a claim against the issuer and is not a claim against the property right of the underlying asset. Hence the underlying asset may be commingled with other assets in practice, and may be treated as unsecured claims in bankruptcy. Having said that, many jurisdictions have drafted, or are considering drafting legislation for tokenization.

[3] See Adrian and others (2025) for a more extensive description of stablecoins.

[4] At the time of writing, the vast majority of stablecoins are denoted in U.S. dollars.

Each of these three types of settlement asset embodies a different allocation of risk between the public and private sectors. Tokenized deposits rely mainly on the existing prudential regulation and deposit insurance, but they remain exposed to bank credit risk to the extent that they are uninsured. Stablecoins can achieve global reach and are deployed on innovative technology, but their ability to maintain par convertibility depends not only on the credit quality of the reserve assets but also on the operational capacity of issuers to meet redemptions and on the liquidity of underlying funding and government securities markets.[5] Although a wCBDC eliminates the settlement asset credit risk, it requires central banks to operate a new infrastructure.

From the policy perspective, the "synthetic CBDC" (sCBDC) model—where regulated private issuers fully back their tokens with central bank reserves—represents one possible institutional arrangement within the two-tier monetary system. It leverages private sector innovation while anchoring digital money in public trust (Adrian and Mancini-Griffoli 2021). However, implementing this model requires carefully calibrated access to central bank balance sheets, robust oversight of issuers, and simultaneously ensuring that private providers' business models are sustainable without undermining public trust.

Tokenization in Banking

Tokenization has significant implications for banking, where money creation, credit intermediation, and payments intersect. As these functions migrate onto programmable shared ledgers, tokenization reshapes banks' internal organization, their interaction with FMIs, and their role within the monetary system. The core effect is not disintermediation, but it is a reconfiguration of the ways banks manage trust, liquidity, and risk.

Tokenized deposits represent digital forms of commercial bank liabilities recorded on permissioned ledgers. Unlike stablecoins, they remain claims on regulated banks and are embedded within the existing monetary system. Their defining feature is programmability: deposits can be transferred, escrowed, or conditioned on contractual states through smart contracts. Operationally, tokenized deposits allow payments, settlement, and liquidity management to be unified on a single infrastructure, enabling atomic execution and reducing reconciliation costs. At the same time, continuous settlement and 24/7 availability reduce banks' ability to smooth liquidity through end-of-day cycles, thus increasing the importance of real-time liquidity management and effective central bank backstops.

Tokenization also affects the asset side of bank balance sheets. In tokenized lending frameworks, loan claims can be represented as programmable tokens that embed interest accrual, collateral triggers, and covenant enforcement directly into code. This can streamline origination, servicing, and collateral management while improving real-time risk monitoring. However, automated enforcement mechanisms may amplify procyclicality if margin calls or collateral triggers respond mechanically to market prices. Therefore, governance frameworks must allow for override and discretion under predefined conditions to ensure compatibility with prudential objectives. In addition, consumer protection has to be properly incorporated in prudential and legal frameworks.

Due to the pseudonymity of blockchain, crypto asset lenders have limited information and data on the credit worthiness of the counterparties and tend to rely on overcollateralization for credit risk mitigation. As a result of this challenge, tokenized lending has not grown meaningfully to date. In addition, borrowers are oftentimes averse to the types of automations that tokenized lending allows. Borrowers tend to prefer flexibility and an ability to negotiate with lenders in case of borrower challenges of paying interests on time.

Beyond deposits and lending, banks may one day use internal tokenization to integrate treasury management, collateral optimization, compliance, and reporting on shared ledgers. This could reduce operational risk and enhance supervisory visibility through real-time data. At the same time, failures in code, data feeds, or governance arrangements may propagate across multiple banking functions simultaneously, requiring a shift

[5] Aronoff and others (2026) highlight the dependence of par convertibility on market liquidity and intermediation capacity in Treasury and repo markets.

from periodic reporting toward continuous oversight focused on infrastructure resilience and algorithmic risk. The extent to which internal tokenization will be adopted by banks remains uncertain.

Tokenization in Capital Markets

Tokenization is reshaping capital markets by altering how securities are issued, traded, settled, and managed throughout their lifecycle. Its significance extends beyond the creation of new instruments to a reorganization of market infrastructure and asset management processes. By embedding ownership, transfer, and compliance directly into programmable tokens on shared ledgers, tokenization compresses trading, settlement, custody, and portfolio management into integrated workflows, with important implications for liquidity, risk allocation, and financial stability.

In capital markets, tokenized securities—such as equities, bonds, and fund shares—exist as tokenized and digital representations of real-world assets on shared ledgers. Delivery versus payment can be executed atomically, reducing counterparty risk and operational frictions while increasing transparency over ownership and transaction histories. However, the elimination of settlement lags and end-of-day netting shifts liquidity demands from discrete points to continuous real time. Credit exposures decline, but intraday liquidity needs increase, redistributing risk from intermediaries toward infrastructure and code.

For asset managers, tokenization affects both asset representation and portfolio operations. Tokenized fund shares and underlying assets allow valuation, compliance checks, corporate actions, and cash flows to be automated through smart contracts, thereby reducing operational complexity and errors. Tokenization also enables finer granularity of ownership, potentially broadening investor access through fractionalization. At the same time, programmability can amplify procyclicality. Automated redemption or margin mechanisms, if poorly designed, may accelerate outflows during stress, particularly for open-ended funds holding less liquid assets.

Custody and collateral management are among the most immediate areas of impact. Tokenized securities can be mobilized as collateral in near real time, improving the efficiency of high-quality liquid asset usage across trading, clearing, and funding markets. Although this can ease collateral constraints in normal conditions, it can also accelerate collateral withdrawals and margin calls in stress scenarios, transmitting shocks more rapidly across institutions. As post-trade functions concentrate on shared ledgers, the systemic importance of infrastructure governance increases.

Tokenized asset markets challenge regulatory frameworks built around intermediated, sequential processes. When trading, settlement, custody, and compliance are embedded in code, supervision must extend beyond market participants to the design, governance, and resilience of market infrastructures themselves. Failures can originate in smart contracts, data feeds, or consensus mechanisms, rather than firm balance sheets. See Bains (2025) for a primer of blockchain for supervisors.

From the financial stability perspective, tokenization presents a familiar trade-off in a new form. Atomic settlement and enhanced transparency reduce some traditional risks, but speed and automation introduce new vulnerabilities. Stress events are likely to unfold faster, leaving less time for discretionary intervention. Therefore, ensuring stability requires that tokenized asset management remains anchored in safe settlement assets, legally recognized finality, and robust governance arrangements.

Tokenization in Financial Market Infrastructures

The tokenization in FMIs has systemic implications. Central counterparties, central securities depositories, payment systems, and cross-border settlement platforms are increasingly experimenting with distributed ledger technology and other forms of tokenization to achieve atomic settlement and continuous processing (see Cabedo and others 2026).

This trend reflects a deliberate shift away from permissionless crypto networks toward permissioned, institutionally governed shared ledgers (CPMI 2024; FSB 2024). For permissionless crypto, open access and

immutable code are foundational. Regulated finance necessitates identifiable participants and clearly defined governance structures for compliance with anti–money laundering/combating the financing of terrorism requirements, operational resilience, and legal accountability.

Permissioned shared ledgers offer significant efficiency gains. By synchronizing cash and asset transfers on a single platform, they reduce settlement risk and collateral requirements. By embedding compliance rules into the infrastructure, they lower operational costs and enhance transparency. However, these benefits come at the cost of increased concentration. A single shared ledger can not only replace dozens of bilateral links, but it also becomes a critical node whose failure could disrupt the entire market.

Still, varied permissioned ledgers may coexist, as different business cases require distinct technological features and business models generate competing pipelines. Bilateral bridges connecting these would likely be highly complex, thus compounding risks. New tokenized FMIs may provide a more centralized hub-and-spoke interoperability across ledgers, thus better managing the operational risks of bilateral connections and creating stronger network economies (CPMI 2024; Agur and Copestake 2025). However, although this Note takes a high-level perspective, not all FMIs have the same configuration and purpose, and architecture designs will vary (see Cabedo and others 2026).

From the policy standpoint, the migration of FMIs onto shared ledgers raises a classic trade-off between efficiency and resilience. Consolidation improves liquidity and reduces duplication, and it also amplifies the systemic importance of infrastructure governance. Regulators must require FMIs to comply with high standards for operational resilience and crisis management.

Settlement Finality and the Acceleration of Finance

One of the most transformative aspects of tokenization is the move toward instantaneous gross settlement. In traditional markets, settlement lags not only create counterparty exposure but also provide flexibility in liquidity management. Institutions can net various claims and obligations, mobilize funding, and respond to shocks before the final settlement occurs.

Tokenized systems eliminate these lags by design. Delivery versus payment can be executed atomically, ensuring that cash and assets change hands simultaneously. This reduces credit risk and the need for intraday credit. However, it also requires to maintain liquidity continuously. Obligations that once materialized at discrete points now arise in real time. New liquidity savings mechanisms can be designed based on the deferred settlement of tokenized assets, but without sound risk absorption mechanisms, settlement failures can propagate very quickly.

The implications for financial stability are ambiguous. On the one hand, faster settlement reduces exposures and improves transparency. On the other hand, it increases the speed at which liquidity stress propagates. Automated margin calls triggered by price movements can force rapid asset sales, reinforcing procyclical dynamics. In stressed conditions, these mechanisms can amplify volatility, rather than dampen it.

This shift challenges traditional liquidity frameworks of central banks. Moreover, it demands an appropriate design and oversight of tokenized FMIs and their risk management frameworks. Standing facilities designed around business-day cycles are insufficient in a 24/7 tokenized environment. Therefore, effective backstops need to directly operate on tokenized systems, including distributed ledgers, to provide liquidity at machine speed. Designing such facilities raises complex questions about access, collateral, and moral hazard.

Governance of Code and Legal Foundations

As financial logic migrates into smart contracts, governance must extend beyond institutions to algorithms. In tokenized financial institutions, smart contracts calculate margin requirements, execute collateral transfers, and initiate default procedures. These functions are central to systemic stability, yet they are increasingly encoded in

software. Therefore, the governance challenges concern not only code quality but also the processes that design, validate, modify, and, if necessary, override code.

Algorithmic risk differs from traditional operational risk in important aspects. Errors can propagate instantaneously and autonomously, without human intervention (FSB 2024). A faulty price feed or coding error can rapidly trigger cascading liquidations before authorities respond. The very features that make smart contracts efficient—speed, determinism, and automation—can also amplify the consequences of design flaws or data errors.

Therefore, effective governance requires multiple layers of control. Formal verification and independent audits should be mandatory for systemically important contracts. Change management processes must be transparent and subject to regulatory approval. Crucially, tokenized systems should incorporate clearly defined ex-ante intervention mechanisms in governance frameworks that allow contract execution to be paused or adjusted under predefined emergency conditions.

Tokenization embeds governance in code, which could be referred to as “code is law.” In important financial entities, legal mandates for stability must ultimately prevail over automated execution. Embedding this principle into technical design is one of the central policy challenges of tokenization (see Garrido 2023). When assets exist as tokens on a distributed ledger, questions arise regarding the applicable law, the location of the asset, and the enforceability of claims in insolvency.

Legal uncertainty is a major barrier to scaling tokenized systems beyond pilot projects. Market participants require clarity on whether tokenized records constitute a definitive proof of ownership and whether the settlement finality achieved on a ledger is legally recognized. Without such clarity, tokenized markets risk remaining fragmented and peripheral. A dual-layer legal approach is likely to emerge as best practice. Smart contracts define operational rules, whereas traditional legal agreements establish rights, obligations, and dispute resolution mechanisms. Legislators and courts must clarify the relationship between these layers, ensuring that legal certainty is preserved even as execution becomes automated.

Risks to Global Finance

Interoperability and Risk of Fragmentation

The tokenized ecosystem is likely to remain pluralistic, with multiple platforms operated by different consortia, infrastructures, and jurisdictions. In such an environment, interoperability becomes not only a technical concern but also a monetary and financial stability issue. If settlement assets, liquidity pools, or collateral frameworks differ across platforms, fragmentation could impair par convertibility, reduce netting efficiency, and complicate crisis management.

Without common standards, liquidity could fragment across platforms, undermining efficiency and increasing risk. Cross-ledger bridges may introduce new vulnerabilities, particularly if they rely on complex trust assumptions or weak governance. From the systemic perspective, fragmentation can be as dangerous as concentration.

Public authorities have a key role to play in setting interoperability standards and promoting common protocols. International coordination is essential to ensure that cross-border transactions achieve atomic settlement and legally recognized finality. Absent such coordination, tokenization may exacerbate existing inefficiencies in cross-border finance, rather than resolve them.

Financial Stability Implications

The net effect of tokenization on financial stability is uncertain. Atomic settlement and enhanced transparency reduce some traditional risks, but speed and automation introduce new ones. Stress events in tokenized markets are likely to unfold faster than in traditional systems, leaving less time for discretionary intervention. From a macroeconomic stability perspective, size, concentration, interconnectedness, correlation, and lack of substitutability are the key challenges.

The cross-border, infrastructure based nature of tokenized finance complicates supervisory reach, regulatory perimeter, and crisis management capacity, with EMDEs potentially most exposed in the absence of adequate safeguards. The ease with which tokenized assets and money can move across borders heightens the risk of volatile capital flows, rapid currency substitution, and erosion of monetary sovereignty, particularly if privately issued global stablecoins gain traction in economies with weaker currencies or less developed financial systems. These risks are amplified by the macrofinancial dynamics of tokenization: capital flows may respond more rapidly to shifts in global financial conditions, while automated execution and continuous settlement could accelerate outflows during stress episodes, undermining the effectiveness of traditional capital flow management measures (IMF 2024).

Therefore, financial sector policy frameworks must adapt as tokenization grows and challenges financial stability (see IMF 2023, IMF-FSB 2023, FSB 2024). Existing indicators may not capture the dynamics of automated margining, continuous settlement, lack of interoperability, fragmentation of the liquidity pools, or algorithmic feedback loops. Supervisors will need new tools to monitor liquidity and leverage in real time and to assess the resilience of shared ledgers. Jurisdictions will need to define carefully which entity would be responsible for this monitoring and risk assessment and ensure these entities will have the tools needed for such responsibilities.

Central banks, in turn, must reconsider their role as lenders of the last resort in a digital environment. Providing liquidity at machine speed, potentially through tokenized facilities, raises profound questions about access, governance, and accountability.

Tokenization does not diminish the role of the public sector, but it reshapes it. Central banks and regulators must decide whether to act primarily as rule setters, infrastructure providers, or direct participants. In practice, all three roles are likely to coexist.

Public authorities may operate core settlement assets, such as wCBDC, while relying on private actors to innovate at the application layer. At the same time, regulators must ensure that private infrastructures align with public policy objectives. The credibility of public backstops remains central: tokenization reallocates trust, but it does not eliminate the need for it.

Cross-Border Resolution and Crisis Management

Tokenization fundamentally challenges the traditional architecture of crisis management and resolution, which has evolved around nationally domiciled institutions, legally bounded infrastructures, and discretionary intervention exercised through courts and supervisors. In a tokenized environment, financial transactions are executed across shared ledgers that may span multiple jurisdictions simultaneously. Assets, liabilities, and collaterals can be mobilized across borders at machine speed, often without a clear geographic locus.

This creates a mismatch between the global operational footprint of tokenized finance and the nationally anchored nature of legal authority. In traditional systems, resolution powers rely on control over institutions and assets located within a jurisdiction. In tokenized systems, the critical control points may reside in governance keys, consensus mechanisms, or the smart contract logic that operates continuously across borders.

Therefore, the central policy question is how authorities can exercise effective resolution and have crisis management powers within shared digital infrastructures. The failure of a systemically important tokenized institutions could result in jurisdictional conflict, delayed intervention, or paralysis at the moments when a timely and decisive action is required.

International coordination on cross-border resolution crisis management is already challenging. Absent enhanced coordination, tokenization risks fragmenting the global financial system into jurisdictionally bounded digital silos. Although fragmentation could reduce some cross-border risks, it would also undermine the efficiency gains that motivate tokenization in the first place. Therefore, policymakers face a trade-off between preserving sovereign control and enabling global integration. Managing this trade-off will be one of the defining challenges of the tokenized era.

Emerging and Developing Economies: Risks and Opportunities

For emerging and developing economies (EMDEs), tokenization presents both significant opportunities and material risks. On the opportunity side, tokenized financial systems could reduce the cost and increase the speed of cross-border payments, improve access to capital markets, and enhance financial inclusion through more efficient settlement and custody services (CPMI 2024; IMF 2024). By innovating correspondent banking networks, tokenization could alleviate long-standing frictions that disproportionately affect smaller economies.

At the same time, the cross-border and infrastructure-based nature of tokenized finance raises questions about supervisory reach, regulatory perimeter, and effective crisis management capacity. EMDEs may be particularly exposed to the destabilizing effects of tokenized finance if appropriate safeguards are not in place. The ease with which tokenized assets and money can cross borders raises the risk of volatile capital flows, rapid currency substitution, and erosion of monetary sovereignty.[6] Privately issued global stablecoins, in particular, could gain traction in economies with less-developed financial systems or weaker domestic currencies. Currently, the overwhelming share of stablecoins is denominated in U.S. dollars, creating currency mismatches in many EMDEs.

The macrofinancial implications of such developments are significant. Tokenized capital flows may respond more rapidly to changes in global financial conditions, acting as an amplification mechanism (IMF 2024; Reuter

[6] Adrian and others (2025) highlight these specific risks for emerging and developing economy and present policy recommendations on how to mitigate them. Reuter (2025) provides data and a methodology mapping international stablecoin flows, including large flows relative to GDP to regions.

and others 2025). Automated execution and continuous settlement could accelerate outflows during periods of stress, limiting the effectiveness of traditional capital flow management measures.

For EMDE policymakers, robust macroeconomic policies and credible institutional frameworks are the first line of defense to protect monetary sovereignty and stability. In addition, authorities have to clarify the regulatory status of tokenized assets and liabilities, ensure that domestic institutions remain central to settlement and liquidity provision, and strengthen cross-border supervisory cooperation. International institutions have a critical role in supporting this process. By providing policy guidance, technical assistance, and platforms for coordination, they can help EMDEs harness the benefits of tokenization while mitigating its risks. Failure to do so could exacerbate existing global financial asymmetries.

Scenarios and Policies

Scenarios for the Future Financial Architecture

The trajectory of tokenization is not predetermined. Policy choices made over the coming years will shape the structure of the future financial system. Three broad scenarios illustrate the range of possible outcomes:

1. Coordinated public-anchored scenario: Tokenized infrastructures are built around safe settlement assets, such as wCBDC or tightly regulated sCBDC arrangements. Permissioned shared ledgers operate under clear governance frameworks, with robust interoperability standards and internationally coordinated oversight. In this scenario, efficiency gains are realized without compromising financial stability, and the public sector retains its role as the ultimate trust anchor.

2. Fragmented scenario: Jurisdictions pursue divergent regulatory approaches, leading to a proliferation of incompatible platforms and settlement assets. Liquidity becomes trapped in digital silos, and cross-ledger bridges introduce new vulnerabilities. Although some efficiency gains are achieved domestically, cross-border finance remains costly and fragile. Financial stability risks increase as oversight becomes uneven and crisis management more complex.

3. Private money–dominated scenario: Innovation outpaces regulation, and privately issued stablecoins and proprietary platforms become the primary settlement assets for tokenized markets. Efficiency and global reach increase rapidly, but the system becomes more dependent on private governance and market confidence. Absent strong public backstops, the risk of runs, contagion, and disorderly adjustment rises.

These scenarios are not mutually exclusive, and elements of each may coexist. The way in which these scenarios may materialize will be highly dependent on the take-up pace of tokenization in different markets and financial infrastructures and the degree of cross-border cooperation among authorities. Nonetheless, the scenarios highlight the central role of policy in shaping outcomes. Tokenization is a technological enabler, not a determinant of institutional design.

Policy Roadmap

A coherent policy roadmap for tokenization should rest on five pillars, each responding to the structural reallocation of trust and risk that tokenized infrastructures entail:

- First, anchor settlement in safe money. Systemically important tokenized transactions should ultimately settle in assets that minimize credit and liquidity risk. Whether through tokenized interbank money (wCBDC) or through tightly regulated private alternatives such as tokenized deposits, the objective is to preserve the singleness of money and maintain confidence in convertibility at par across platforms and institutions.

- Second, implement global standards and recommendations on crypto markets in line with the approach taken by the standard setting bodies: same activity, same risk, same regulatory outcome (see IMF 2023, FSB-IMF 2023).

- Third, ensure legal certainty. Legislators and courts must clarify the legal status of tokenized assets and liabilities, ownership records, and settlement finality. Legal frameworks should evolve in parallel with technological adoption.

- Fourth, promote interoperability and international coordination. Common standards (such as defining settlement expectations and finality) and cooperative oversight are essential to prevent fragmentation and manage cross-border risks (see IMF 2023, FSB-IMF 2023).

- Fifth, adapt liquidity and crisis management frameworks. Central banks must ensure that their tools remain effective in a 24/7, automated environment, potentially by operating directly within tokenized infrastructures.

Taken together, these pillars provide the foundation for a stable and efficient tokenized financial system. Implementation will require sustained engagement between the public and private sectors and close coordination across jurisdictions.

Conclusion

Tokenization represents a profound reconfiguration of the financial system's core infrastructure. By enabling programmable, real-time settlement on shared ledgers, it promises efficiency gains that extend across payments, securities, and derivatives markets. At the same time, it introduces new forms of risks associated with speed, automation, and concentration.

The central message of this Note is that technology alone will not determine the outcome. The future of tokenized finance will be shaped by policy choices regarding settlement assets, governance, legal frameworks, and international cooperation. Anchoring innovation in public trust is essential. Without such anchors, tokenization risks amplifying instability, rather than mitigating it.

If designed and governed appropriately, tokenization can reinforce the foundational principles of the financial system: safety, efficiency, and inclusiveness. Achieving this outcome requires policymakers to engage proactively with the structural implications of digital transformation, rather than respond reactively to its manifestations. The window for shaping the architecture of the tokenized financial system is open, but it will not remain so indefinitely.

Annex 1. Wholesale Central Bank Digital Currency Pilots and the Public Anchor of Tokenized Settlement

Recent wholesale central bank digital currency (wCBDC) pilots illustrate how central banks explore tokenization as a means of preserving safe settlement in increasingly automated and real-time financial markets. These experiments focus less on retail payments and more on interbank settlement, foreign exchange, and securities transactions—areas where settlement risk and liquidity efficiency are systemically relevant.

Projects such as Project Jura demonstrated that euro- and Swiss franc–denominated wCBDCs could be issued and exchanged on a shared distributed ledger operated by a third party while still complying with existing regulatory requirements (BIS 2021). The pilot successfully executed delivery-versus-payment and payment-versus-payment transactions between commercial banks, highlighting the feasibility of atomic settlement in central bank money across borders. Importantly, the project also surfaced key policy questions, including the conditions under which nonresident institutions may access central bank money and how central banks can retain control when settlement occurs on shared infrastructures.

More recent initiatives, such as Project Agorá, extend this logic by exploring a unified ledger that integrates tokenized commercial bank deposits with tokenized central bank reserves for wholesale cross-border payments (BIS 2025b). Agorá brings together multiple central banks and a large set of private institutions to test whether compliance checks, liquidity management, and settlement can be executed simultaneously through programmable money, rather than sequentially through correspondent banking chains.

Taken together, these pilots underscore that wCBDC is less a standalone product than a policy instrument. Its primary value lies in anchoring tokenized markets to the safest settlement asset, thereby reducing the need for complex risk mitigation layers elsewhere in the system. At the same time, they highlight that issuing wCBDC—particularly on shared or cross-border platforms—requires new governance arrangements that reconcile central bank control with operational interoperability.

Annex 2. Tokenized Central Counterparties and the Automation of Risk Management

Tokenization is increasingly being tested within central counterparty (CCP) workflows, particularly in collateral and margin management. These use cases are of high policy relevance, as CCPs are systemically important institutions whose risk management practices are central to financial stability.

A prominent example is the DTCC–Digital Asset collateral network pilot, which involved banks, custodians, central securities depositories, and central counterparties using tokenized US Treasuries as collateral (DTCC 2025). The pilot demonstrated that digital representations of high-quality liquid assets could be mobilized in real time to meet margin calls, with legally enforceable control maintained throughout the process. By synchronizing collateral movements across participants, the pilot reduced operational frictions and improved transparency relative to traditional, batch-based processes.

In Europe, Eurex Clearing's collaboration with HQLAˣ illustrates a related approach (HQLA 2025). Eurex received regulatory nonobjection to test distributed ledger technology–supported collateral mobilization, allowing clearing members to move securities collateral rapidly across custodians to meet CCP margin requirements. The initiative aims to enhance speed and flexibility while remaining embedded in the existing CCP risk framework.

These experiments show how tokenization can automate and accelerate core CCP functions. However, they also highlight new vulnerabilities. When margining and collateral substitution are governed by smart contracts, errors in code or data inputs could trigger automated, procyclical responses. As a result, tokenized CCPs require not only traditional safeguards—such as default funds and capital buffers—but also rigorous governance of algorithms, including auditability, stress testing, and override mechanisms.

Annex 3. Cross-Border Payments and Multi-Central Bank Digital Currency Platforms

Cross-border payments are a leading use case for tokenization, reflecting long-standing inefficiencies in correspondent banking, including fragmented liquidity, sequential compliance checks, and delayed settlement. Multi-central bank digital currency (multi-CBDC) platforms and related interoperability frameworks seek to address these frictions by enabling more direct settlement between jurisdictions on shared ledgers, which could be distributed, thereby potentially achieving payment-versus-payment execution in central bank money.

The XC platform concept of Adrian and others (2022) provides a policy-oriented blueprint for enhancing cross-border interoperability without creating a single supranational ledger. XC envisions a common interface layer that links domestic financial institutions and tokenized infrastructures, allowing jurisdictions to retain control over currency issuance, compliance standards, and monetary policy while facilitating standardized messaging, foreign exchange conversion, and settlement coordination across borders.

In parallel, initiatives such as Project Agorá, coordinated by the BIS Innovation Hub together with multiple central banks and private financial institutions, are practical explorations on wholesale settlement architectures (BIS 2025b). Agorá examines whether tokenized commercial bank deposits and tokenized central bank reserves can operate on a shared programmable infrastructure for cross-border payments. The objective is to test whether compliance checks, liquidity management, and settlement can occur simultaneously through programmable money, rather than sequentially through correspondent banking chains.

Taken together, these efforts illustrate the range of institutional models under consideration—from interoperable national systems connected through standardized interfaces to more unified wholesale ledgers. In all cases, the core policy questions concern legal finality, access criteria, liquidity backstops, and the allocation of governance authority across jurisdictions. Cross-border tokenization may reduce traditional settlement frictions, but without clear ex-ante arrangements, it can also heighten coordination challenges and sovereign risk.

Annex 4. Stablecoins versus Synthetic Central Bank Digital Currency: Private Money, Public Backstops, and the Singleness of Money

As tokenized finance scales, a central policy question concerns the appropriate role of privately issued stablecoins relative to publicly anchored digital money. Although both stablecoins and so-called “synthetic central bank digital currency” (sCBDC) arrangements rely on tokenized representations of value, they differ in their risk allocation, governance, and implications for the monetary system (Adrian and Mancini-Griffoli 2021).

Regulated stablecoins are privately issued digital tokens typically backed by high-quality liquid assets, such as government securities or cash equivalents. Their appeal lies in programmability, global reach, and continuous availability. However, even when fully backed by these high-quality liquid assets, the maintenance of par convertibility depends not only on reserve quality but also on the operational capacity of issuers to meet redemptions and on the liquidity of underlying funding and government securities markets. As a result, today’s stablecoins resemble money market funds more than central bank money, and they could be vulnerable to confidence-driven runs in adverse conditions. Therefore, regulatory frameworks focus on reserve quality, segregation, disclosure, and redemption rights, but they do not completely eliminate the need for market discipline.

By contrast, an sCBDC arrangement refers to privately issued digital money that is fully backed by central bank reserves and issued by regulated entities with direct access to central bank liabilities. In this model, private institutions retain the responsibility for customer-facing services, innovation, and compliance, while the settlement asset itself remains anchored in central bank money. The central bank does not issue digital currency directly to end users, but instead, it provides the ultimate backing that ensures par convertibility and preserves the singleness of money. In this model, the ultimate settlement backstop resides on the public sector balance sheet, rather than on private reserve portfolios.

From the policy perspective, the distinction is not merely semantic. Stablecoins without access to central bank reserves require additional safeguards at the infrastructure level, including higher liquidity buffers and conservative margining, to compensate for settlement asset risk. By contrast, sCBDC arrangements shift the burden of stability toward the public sector, reducing the need for private risk mitigation but increasing the importance of access criteria, supervision, and governance.

In tokenized financial market infrastructures, this distinction has systemic implications. Using stablecoins as settlement assets can increase efficiency in normal times but may amplify stress if confidence deteriorates. sCBDC arrangements offer a closer functional equivalent to wholesale central bank digital currency, supporting atomic settlement while maintaining the traditional two-tier monetary system. However, they also blur the boundary between public and private moneys, requiring a careful design to avoid undue expansion of central bank balance sheets or competitive distortions.

Ultimately, the policy choice between stablecoins and sCBDC concerns the institutional setup for the ultimate backstop and the conditions under which par convertibility is assured. Stablecoins emphasize private initiative and market discipline, whereas sCBDC emphasizes monetary integrity and systemic safety. As tokenization advances, jurisdictions may adopt hybrid approaches, but preserving clarity about the nature of the settlement asset—and the location of the ultimate backstop—will be essential for financial stability.

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