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NOTES

The Rise of Tokenization

Deciphering New Trends in Payments and Asset Tokenization

Tobias Adrian, Yaiza Cabedo, and Tommaso Mancini-Griffoli

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Tobias Adrian, Yaiza Cabedo, and Tommaso Mancini-Griffoli[1]

ABSTRACT: Tokenization—the process of issuing and transferring assets on blockchain-based infrastructures—is gaining momentum in financial markets and will have significant implications for market structure, risk management, and financial stability. This Note identifies emerging trends in tokenized finance and examines the policy questions they raise. It analyzes developments in blockchain infrastructure design, architectural configurations allowing for interoperability, and the evolving role of the public sector. The Note also assesses tokenized deposits and stablecoins as alternative forms of monetary liabilities, highlighting trade-offs related to distribution models, governance, and loss absorption. The analysis highlights and clarifies policy-relevant questions to guide discussions in a rapidly evolving field.

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[1] This work was finalized while Tommaso was a staff member at the International Monetary Fund.

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The Rise of Tokenization

Tobias Adrian, Yaiza Cabedo, and Tommaso Mancini-Griffoli[2]

July 2026

Tokenization—the process of issuing and transferring assets on blockchain-based infrastructures—is gaining momentum in financial markets and will have significant implications for market structure, risk management, and financial stability. This Note identifies emerging trends in tokenized finance and examines the policy questions they raise. It analyzes developments in blockchain infrastructure design, architectural configurations allowing for interoperability, and the evolving role of the public sector. The Note also assesses tokenized deposits and stablecoins as alternative forms of monetary liabilities, highlighting trade-offs related to distribution models, governance, and loss absorption. The analysis highlights and clarifies policy-relevant questions to guide discussions in a rapidly evolving field.

Introduction

Tokenization has become a prominent concept and an area of active exploration in financial services.[3] At its most basic level, it involves issuing assets, recording ownership, and transacting on a blockchain.[4] Although the concept appears straightforward, its implications for market structure, risk management, inclusion, and public policy can be more complex and far-reaching. In an environment characterized by rapid technological change, broad experimentation, and frequent announcements of new products and services, it can be difficult for policymakers to identify which developments are durable and where policy attention should focus.

This Note extracts and explains the emerging trends that appear most relevant for policymakers. It does not take a normative stance on policy choices. Instead, it highlights implications and trade-offs to inform and guide policy dialogue and decision making. In a rapidly evolving landscape, definitive answers are often premature. The Note is divided into three parts. The first surveys recent developments in infrastructure with an emphasis on governance models, interoperability, and the role of the public sector. The second surveys innovations in financial assets, namely tokenized deposits, stablecoins, and tokenized central bank reserves. The last part considers the possible evolution of financial market infrastructures in particular, drawing on the discussions and concepts introduced in the first two parts of this note. The focus remains on frontier developments and novel questions affecting policy.

The landscape relevant to tokenization is broad. A wide range of assets can be tokenized, from commodities and real estate to financial instruments (Agur and others 2025; Aldasoro and others 2023). This Note focuses primarily on money and other financial assets, including securities and derivatives. Money is typically the instrument used to acquire financial assets such as equities or bonds, whereas securities and derivatives also serve as backing for new forms of quasi money, most notably stablecoins.

[2] The authors would like to thank Carlos Brandt for his comments and insights on an earlier draft, and Erica Sandoval and Camila Rios for editing support.

[3] Tokenization can be defined as the process of creating a digital token on a blockchain that represents an asset—either natively (the asset exists only on-chain) or as a representation of an off-chain asset. Tokenization can streamline settlement, enable programmable asset management, and facilitate atomic cross-asset transactions, but it also introduces new risks related to the legal link between the token and its underlying asset. See Cabedo and others (2026); BIS-CPMI (2024); and Aldasoro and others (2023).

[4] A blockchain is an example of a public permissionless distributed ledger technology (DLT). This is where many of the relevant use cases developed by the market are taking place. However, in this Note, we incorporate messages that can also pertain to non-blockchain DLT, that is, private permissioned networks. We refer to these in more depth in the Tokenized deposit liabilities subsection.

To structure the analysis, the Note relies on a simple three-layer framework applicable to both traditional and tokenized financial architectures[5]. At the bottom of the stack lies the **infrastructure layer**, where transactions are settled. This layer encompasses the rails and rules governing finance, including databases, platforms, systems, operators, and third-party service providers behind the scenes. In traditional finance, this layer includes messaging providers such as Swift and settlement infrastructures such as TARGET2 operated by the European Central Bank (ECB). In a tokenized environment, the infrastructure layer is formed by the blockchain and the rules governing how ownership and transactions are validated.

Above the infrastructure layer sits the **asset layer**, which represents the value held by end users—money and other financial assets associated with issuers and their balance sheets. In a tokenized environment, the asset layer includes stablecoins, tokenized deposits, central bank digital currency (CBDC), tokenized securities, and tokenized money market funds, for instance.

At the top of the stack is the **services layer**, comprising functions such as asset management, fraud detection, customer due diligence, and transaction monitoring. In a tokenized environment, the services layer consists of applications such as wallets and exchanges.

Traditionally, money issuance and wholesale payments have been provided through vertically integrated models over the layers of the technology stack. Money was issued by commercial banks by way of deposits, and the same banks offered services and ran much of the settlement infrastructure (central banks underpinned the system with their own infrastructure ensuring final settlement). More recently, initiatives such as Banking-as-a-Service, including open banking, have introduced greater flexibility primarily at the services layer.[6] Figure 1 compares the models of traditional commercial banks and the tokenized stack.

Figure 1. Today's Commercial Bank Money Model and the Tokenization Stack

	Commercial bank money	Stablecoins
Services ⇨	Bank applications, card networks, exchanges, QR codes	Third parties, for example blockchain wallets, exchanges, QR codes
Assets ⇨	Bank liabilities *(stability including through deposit insurance, liquidity backstops)*	Stablecoin issuer liabilities *(no backstops, stability if tightly regulated)*
Infrastructure ⇨	Bank books, ACH, RTGS/ FPS	DLT

Source: Authors' elaboration.
Note: ACH = automated clearing house; DLT = distributed ledger technology; FPS = fast payments system; RTGS = real-time gross settlement system; QR = quick response.

Tokenization enables new configurations. Issuers of liabilities no longer need to build and operate proprietary infrastructures, and service providers can develop applications independently on shared infrastructure. For example, stablecoins are accessed through third-party wallets at the services layer, issued by entities responsible for backing at the asset layer, and settled on public permissionless infrastructures operated by a multitude of participants. Decoupling asset issuance from infrastructure operation can reduce the costs of

[5] For a somewhat more detailed discussion of the decentralized finance (DeFi) stack, with five layers, see Schär (2021).

[6] An example can be found in Brazil, with Pix, the Brazilian fast payment system that connects with open finance activities. Pix allows instant transactions, and through the link of open finance, users can pay bills, schedule transactions, and withdraw money. See Duarte et al (2022), BCB (2025) and Eroglu et al (2026).

building and maintaining proprietary systems and allows each layer of the stack to evolve more flexibly than in traditional vertically integrated models.

This Note first examines trends in the infrastructure layer, before turning to developments at the asset layer. It does not analyze the services layer in detail, though it reflects how services are evolving as a result of changes at lower layers of the technology stack. As background, Box 1 provides a concise overview of tokenization and its core features, summarizing the key technological and governance characteristics that underpin tokenized systems.

Box 1. Features of Tokenization

- Tokenization involves issuing assets, or representations of assets, on a blockchain.
- Tokenization benefits derive from the core features of **blockchain technology** and **smart contracts**.
- A **blockchain** functions as a shared ledger that applies standardized transaction rules and can provide a transparent and consistent record compared with conventional databases. By synchronizing multiple copies of the ledger to maintain a single state of transactions, it can reduce reconciliation and reporting costs.
- **Smart contracts** consist of code-based instructions stored on the blockchain that execute predefined rules automatically when a transaction triggers them by calling the smart contract function.
- **Composability** refers to the ability of smart contracts to interact with and call functions of other smart contracts, so that a single transaction can trigger a chain of sequential contract executions.
- **Atomicity** ensures that when a transaction triggers multiple smart contract calls, the protocol treats them as a single indivisible unit. The system records all resulting state changes only if every step executes successfully; if any step fails, it reverts the entire sequence, leaving no partial execution.
- **Blockchain governance** defines how participants validate transactions, upgrade protocols, and adjust system parameters. In tokenized markets, clear and pre-agreed governance rules strengthen trust through transparency, while distributed validation and oversight enhance operational resilience by reducing single points of failure.

[1] There have been discussions about non–distributed ledger technology tokenization, but it is commonly agreed that the tokenization in financial markets involves distributed ledger technology. See BIS-CPMI (2024) and Cabedo and others (2026).

Trends in the Infrastructure Layer

The infrastructure layer raises three essential questions. The first is about the operation and governance of infrastructure. Will it be open to the public, with anyone able to validate transactions, or will permissions be closely managed? The second is about the resulting architecture and specifically the arrangements that would allow interoperability of assets across chains. Third, what could be the role for the public sector?[7]

Technology, Governance, and Infrastructure

Market participants, including banks, fintechs, and traditional service providers, seem to have gone back and forth between permissionless and permissioned infrastructure architectures. On the one hand, relatively new entrants such as Circle, Coinbase, and Stripe began by favoring permissionless and decentralized ledgers such as Ethereum and Solana. These firms have touted the benefits of a global, always-available, stable, standardized, and relatively cheap infrastructure with distributed and transparent governance. Recent developments suggest that a more nuanced or hybrid view is emerging. These companies are now building their

[7] For the purpose of this Note, private versus public chains refer to who can access the blockchain, whereas permissioned versus permissionless refers to who can participate in validating transactions.

own proprietary ledgers or centralizing elements in their architecture to optimize costs, speed, and privacy—in a race to control infrastructure and related services.

On the other hand, banks have traditionally favored and explored permissioned ledgers operated by themselves or by a consortium of known entities for their own purposes and clients. They have emphasized privacy, scalability, accountability, and predictable costs. However, several institutions have recently announced at least a partial shift to permissionless ledgers for issuance and transactions, such as JP Morgan (2026), UBS (FintechNewsCH 2025), and Societe Generale (SG Forge 2026). For instance, JP Morgan Coin represents bank deposits and is now deployed on Coinbase's permissionless chain, Base. UBS, alongside other financial institutions, has joined Tempo's testnet, an infrastructure that aspires to validate payments and explore settlement and reconciliation capabilities on a permissionless chain. Regulated financial institutions are leveraging the flexibility of permissionless networks, which allow them to incorporate permission controls such as whitelisting to govern who can hold and transact tokens, creating what could be called hybrid governance models. In addition, some banks appear interested in issuing stablecoins on permissionless blockchains, such as Société Générale's EUR denominated stablecoin CoinVertible issued on Ethereum, Solana, Stellar, and the XRP Ledger.

Another notable development, pointing instead toward permissioned ledgers, is the entry of Swift in the market for blockchain-based infrastructure. Swift is a global provider of messaging services with links to a large share of the world's financial institutions, and it already operates the network that token-native firms are seeking to build. Swift is now exploring an open-source, blockchain-based and Ethereum Virtual Machine (EVM)–compatible infrastructure.[8] Swift will operate the ledger, providing orchestration of transaction workflows, validation of funding commitments, and coordination of interbank processes. Banks will operate their own environments and retain full authority over keys, assets, funding, and settlement through real-time gross settlement system (RTGS) systems, correspondent banking relationships, and other agreed mechanisms between participants. This new infrastructure will support programmable corporate payment flows, foreign exchange Payment versus Payment (PvP), and cash movements for securities transactions (Swift 2026). Given Swift's size and network, this infrastructure has the potential to offer a truly global infrastructure.

Another significant development is the announcement by a group of large US banks including JPMorgan Chase, Bank of America, Citigroup, and Wells Fargo of a new network to clear tokenized deposits (Heeb and Huang 2026). It will be operated by The Clearing House (TCH), the payments network owned by the same banks that today clears nearly $2 trillion dollars per day. From early 2027, the new network will help banks clear their tokenized deposits, with settlement taking place in central bank reserves.

Which arrangement will eventually dominate is an open question that will depend on various factors including whether the technology supporting public permissionless blockchains will overcome hurdles such as scalability and privacy.[9, 10] For identity and compliance, techniques like zero-knowledge proofs (such as zk-SNARKs) allow users to check if they meet certain requirements, for instance verifying they are not on a sanctions list, without revealing personal data.[11] These systems are now in early production use. To protect sensitive financial information such as account balances and transaction amounts, many different projects are developing encryption methods that allow computations on encrypted data, meaning that transactions can be validated without exposing details, while benefiting from improved performance supported by recent upgrades to Ethereum (for example, through Layer 2s). Finally, institutional-grade security is being strengthened through

[8] According to Ethereum.org, an EVM is a decentralized virtual environment that executes code consistently and securely across all Ethereum nodes.

[9] The concept of the "blockchain trilemma" refers to the trade-off among decentralization, security, and scalability in distributed ledger systems, whereby blockchain architectures have historically been able to optimize only two of these three properties simultaneously. For example, improvements in scalability and security may come at the expense of decentralization.

[10] It is also fair to say that permissioned systems do not really solve privacy-related questions. They are often designed such that one entity can observe everything, and users must trust that this entity neither exploits its privileged position nor becomes compromised by a malicious third party.

[11] A zero-knowledge proof is a cryptographic method that allows multiple parties to verify a statement's truth without revealing information beyond the statement itself. See Chainalysis (2024); Buterin, (2021a, 2021 b); and Auer and others (2025).

shared control mechanisms like multi-signature governance and threshold cryptography that require multiple parties to approve a transaction.

Second, which model will offer more acceptable governance? Governance mostly concerns the rulebook regulating transactions. Questions addressed by rulebooks include the following: Who can access the infrastructure, under what conditions, which assets and transactions are permitted, what information is needed to validate a transaction and who validates it, how and when are transactions considered settled irrevocably, and how are disputes managed? Infrastructure provision goes beyond technology, as it fundamentally depends on legal frameworks and governance arrangements.

As noted earlier, permissionless base layers allow restrictions at higher layers, whereas permissioned base layers are built on purpose to enforce restrictions. The premise of public permissionless infrastructure is that few constraints exist at the outset. Nearly any user, asset, or transaction is potentially welcome, as long as it obeys the network's protocol rules. However, participants can create Layer 2 solutions or can hard-code constraints in the assets they create, leveraging smart contracts. Layer 2 blockchains are scaling solutions that operate off the main chain and rely on the base layer for security, settlement finality, data integrity, and dispute resolution.[12] Smart contracts can be used to impose regulatory requirements such that only clients or investment professionals can transact certain assets, also known as whitelisting participants after verifying whether they comply with predefined requirements. Mancini-Griffoli and others (2024) offer a more detailed discussion of governance models and their implications.

Instead, the premise of permissioned infrastructures is that users are parsed at the outset by the infrastructure operator, so only certain users and assets can access a given blockchain. The advantage is potentially more scalable settlement and trusted counterparties. For example, Circle has launched Arc, a permissioned Layer 1 blockchain designed for stablecoin-native applications and operated by approved validators that improve fee predictability and accountability. Arc incorporates features such as a built-in foreign exchange engine, mechanisms to protect sensitive payment data, and PvP settlement, with transaction fees paid in USDC (Rodriguez, 2025). Stripe's Tempo follows a comparable logic. Tempo is a Layer 1 blockchain designed to support payments at scale, emphasizing instant and deterministic settlement, predictably low fees, and a stablecoin-native architecture. It aspires to evolve toward a public permissionless model, with fees paid in US$-denominated stablecoins (Tempo Team 2025). Coinbase's Base pursues similar objectives through a different design using a layer 2 blockchain. Base is an Ethereum Layer 2 blockchain that remains public and permissionless at the base layer, while introducing centralized transaction sequencing and validation by Coinbase before transactions are settled in batches on Ethereum. All three solutions are compatible with the EVM.

Third, how will users value the trade-offs between tailored specialized infrastructures and the benefits of network effects? Specialized infrastructures can be designed to optimize particular functions, such as privacy, programmability, or compliance, and may better meet the needs of specific user groups. Instead, benefits from network effects come from a broad infrastructure supporting multiple assets and providing a large user base. Permissioned infrastructures tend to favor specialization, whereas permissionless infrastructure tends to favor network effects.

Relatedly, to which infrastructures will the developer community and assets migrate? Developers are essential to foster smart contract standards, build functionality and services, and render the infrastructure more productive. Developers will favor infrastructures with a large user base and coverage of assets, whereas issuers will prefer infrastructures supported by large and active communities of developers. This would tend to favor the network effects of public permissionless models, or at least convergence toward infrastructures with compatible technology such as the case of Arc, Tempo, and Base, all of which are EVM compatible.

[12] See more on Layer 2 solutions in Bains (2025).

Architecture Design

An important related question regarding infrastructure is what architecture will emerge—importantly, will owners of assets recorded on different chains be able to transact in an interoperable fashion? In practice, such transactions might involve paying money for a bond recorded on another ledger, or exchanging two currencies across ledgers.

According to Adrian and Mancini-Griffoli (2023) and Mancini-Griffoli and others (2024), three architectures are possible, and they are applicable to both traditional and tokenized assets. These architectures simply follow from the possible relationships between ledgers, assets, and owners (transacting parties), as illustrated in a matrix (Figure 2).

Figure 2. The Three Possible Relationships between Ledgers, Assets, and Owners

Do owners have access to the ledger(s) where assets are recorded?

Are assets recorded on the same ledger?	Yes	No
Yes	Single ledger	N/A
No	Compatible ledger	Common ledger

Source: Authors' elaboration, Cabedo and others (2026).

The rows represent whether the assets being transacted (such as money and bonds) are recorded on the same ledger. The columns represent whether the owners aiming to engage in a transaction have access to all the ledger(s) where the assets are recorded. The architecture models stem from the possible combinations captured by the matrix. The case of assets being on the same ledger but owners not having access to that ledger is not plausible and so is excluded from the analysis.

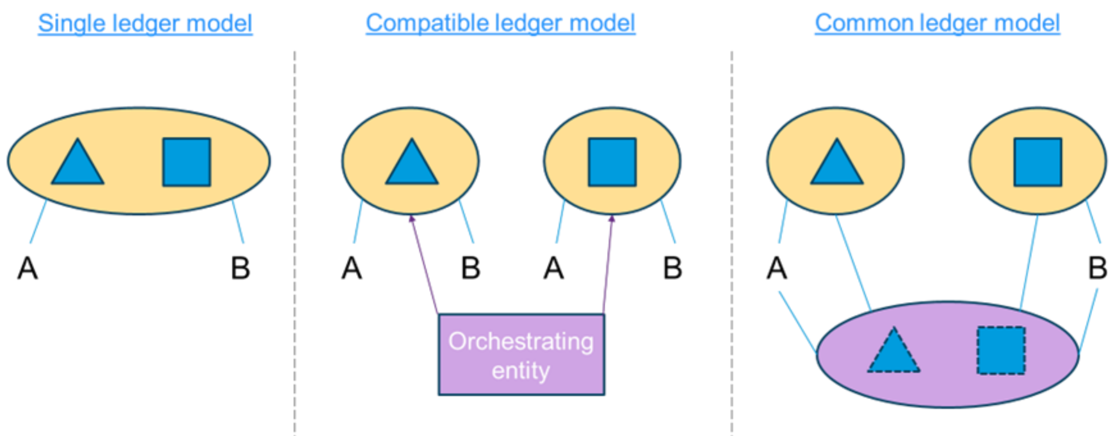
The first model, called the **single ledger** model, similar to the "unified ledger" (BIS Annual Economic Report 2023), entails all owners having access to the same ledger on which the assets being transacted are recorded (Figure 3). Two parties might, for instance, exchange a bond for money on the same ledger. The simplicity of the transaction is attractive, but in practice, examples of single ledgers covering a large set of assets do not yet exist. A central securities depository (CSD) may be the closest example of a single ledger, but only for the subset of securities recorded on the CSD. Circle's Arc blockchain has similar features.

The second is the **compatible ledger** model, relevant to assets being recorded on separate ledgers, with owners having access to both ledgers. For instance, money is on one ledger and bonds on another. An orchestrating entity can then pass transfer instructions to both ledgers concurrently, and so the bond is received only if the payment is made. One example is the ECB's T2S platform, which orchestrates payments in central bank money on the ECB's RTGS ledger with transfers of securities recorded on CSDs. The delivery of assets versus the payment of money is possible as CSDs have dedicated cash accounts in the common European RTGS. Another example is Swift's trial ledger to orchestrate settlement instructions, designed to integrate with multiple settlement venues, asset models, and policy frameworks. TCH's ledger is also a compatible ledger that coordinates transactions between ledgers on which deposits are tokenized and ultimately with the RTGS system.

In the cross-border payments space, the compatible ledger model is similar to the Nexus project which originated in the Bank for International Settlements Innovation Hub and is now a separate legal entity. Nexus coordinates transactions between correspondent banks in two or more countries' fast payment systems. Similarly, Liquid is a fintech company licensed by the Monetary Authority of Singapore for participating in cross-border fast payment linkages (for example, PayNow–Unified Payments Interface (UPI).[13]

The third is the **common ledger** model, used when each owner can only access the ledger on which the asset they want to sell is recorded. The most evident example is a cross-border transaction in which a domestic and a foreign bank wish to exchange currencies ultimately recorded in each of their country's RTGS. Another simpler example is the client of one domestic bank wanting to pay a client of another bank. In this case, assets are first moved to a ledger common to both transacting parties. In the aforementioned simple case, the intermediary is the central bank able to settle in central bank reserves on an RTGS ledger accessible to both banks. In the cross-border case, the intermediary is a correspondent bank. More recently, companies such as Thunes operating out of Singapore have started offering global services on the basis of receiving and paying in any country through local branches and settling on the firm's common ledger in the middle. They connect payments across more than 130 countries and in more than 80 currencies.

Figure 3. Three Architecture Models



Source: Authors' elaboration, Mancini-Griffoli and others (2024).
Note: Ellipses represent ledgers on which the assets (triangles and squares, representing, say, money and bonds) are recorded and can be transacted. Owners of assets are noted as A and B. The blue lines connecting them to a ledger mean that they have access to that ledger. The orchestrating entity in the compatible ledger model passes instructions (arrows) to be executed on the ledgers. In the last case, the purple (common) ledger operator can receive the triangle and square assets, hold them in escrow, and (re-)issue its own liabilities for settlement represented in dotted lines.

Architecture matters for the efficiency and risks of transactions. For instance, the single ledger model offers considerably more functionality. As all assets are recorded on the same ledger to which all owners have access, interoperability is natural and perfectly atomic transactions are possible. This allows for assets to be exchanged in an inseparable transaction, thereby eliminating settlement risk and reducing counterparty risk. However, this creates a single point of failure risk and increases concentration, undermining market contestability if an infrastructure becomes dominant. It also complicates governance as all participants must be willing to accept the same rules and transact under the same rulebook. From that standpoint, public permissionless single ledgers may be easier to implement because governance is embedded in protocol rules, which are standardized and not negotiated case by case.

The common ledger model also allows for interoperability and atomicity because all assets are reissued in the common ledger. However, it introduces settlement and counterparty risk to the extent that the common ledger operator manages a balance sheet and holds assets in their native ledgers in escrow. This system requires ensuring that assets on the common ledger are always backed by assets in escrow in their native ledgers, placing custody at the center of risk management. If the operator of the common ledger grows large, it can also undermine market contestability and extract significant rents. The compatible ledger model does not fully

[13] More information can be found in the Liquid group website (see Paynow-UPI).

support atomic settlement, as transactions take place in separate environments that must operate simultaneously, increasing operational risk when enabling Delivery versus Payment and PvP. However, this model is easier to implement as it imposes less centralization, to the extent that parties agree to an orchestrating entity and to some level of compatibility in technology and messaging.

The Role of the Public Sector

The third main question is regarding the role of public sector. We typically think of public sector intervention as limiting or countering market frictions. In this case, frictions can stem from multiple sources. Coordination failures may undermine progress as private parties find it difficult to converge on any given set of technologies, messaging standards, and legal treatment. This has slowed, and to some extent frustrated, the efforts of single banks and consortiums. Indeed, banks have expressed their concerns about each having its private chain, and interoperability becoming the biggest challenge facing financial institutions globally. Another potential friction stems from network effects that can lead to concentrated markets and path dependencies potentially around legacy technologies. Finally, negative externalities from systemic failures of infrastructure may not be priced in or fully taken into consideration by private parties or their clients.

The public sector can operate key infrastructures, particularly when they are systemic and involve strong network effects. Alternatively, the public sector can license private operation within strict limits. That is the case today for financial market infrastructures (FMIs). For instance, in advanced economies, CSDs and central counterparties (CCPs) are privately owned and operated, but are subject to licensing and intensive supervision.

Similarly, central banks provide safe settlement assets and would likely continue to operate infrastructure backbones for payment systems, thereby ensuring ultimate settlement in central bank money. These key services can be provided by synchronizing on-chain transactions with those on the RTGS system, or directly on blockchains on which central banks tokenize their reserves.[14] In the latter case, the provision of public infrastructure can also alleviate coordination and fragmentation problems. For example, the European Central Bank Pontes and Appia projects, currently in development, aim to provide interoperability between market DLT platforms and Eurosystem settlement infrastructure, enabling the settlement of tokenized asset transactions in central-bank money (European Central Bank 2026). Because all participants want to be compatible with central bank money and infrastructure, whatever technology and standards are provided by the central bank will be emulated to some extent by the private sector which will want to be compatible.

It may not be necessary, or possible, for the central bank to pick an optimal technology. An environment that converges on compatible technology is likely preferable to one that is fragmented and dispersed. Moreover, in any case, optimality is a theoretical concept that is difficult to identify in practice for any entity, public or private, and even if it existed, it would quickly be surpassed by further innovation. The central bank's key role may thus be to foster convergence and interoperability on a minimal common set of technologies and rules, while leaving room to the private sector to evolve and innovate on top.

[14] Tokenized central bank reserves are addressed later in this Note; a fuller stand-alone treatment is beyond the scope of this Note and is left to dedicated work, including Kunaratskul and others (2025).

Box 2. Key Policy Questions for Trends on the Infrastructure Layer

- Which infrastructure architectures (permissionless, permissioned, or hybrid) will predominate for different market uses, and how should oversight and regulation be tailored to the specific risks?
- Do existing legal frameworks recognize the infrastructure, smart contracts and their effects, or the nature of the tokens, and do they support settlement finality and enforceable outcomes across different architectures?
- How can governance and accountability be made clear when there is no single operator? How can anti-money laundering/combating the financing of terrorism, investor protection, and access eligibility rules be applied effectively on permissionless infrastructures?
- What technical capabilities (for example, scalability, privacy, predictable fees, deterministic settlement) are needed for tokenization's adoption at scale?
- What standards or governance arrangements are needed to ensure interoperability across ledgers and infrastructures?
- How should operators of common ledgers that intermediate transactions or hold assets in escrow be regulated?
- Should authorities actively promote convergence on common technologies, smart contract standards, or legal frameworks to ensure interoperability and avoid fragmentation across private blockchain infrastructures?
- Should central banks continue to operate settlement backbones in central bank money, including in tokenized environments? Should central banks participate in blockchains they do not operate?
- Under what conditions should private blockchain infrastructures performing systemic functions be licensed and subject to oversight, similar to financial market infrastructures today?
- How should authorities address concentration risks and network effects that may arise in blockchain infrastructures?

Trends in the Asset Layer

The asset layer sits on top of the infrastructure layer, allowing assets to be created, destroyed, and recorded in the form of tokens. The most common financial asset used today is money. Moreover, most of that money, certainly for retail purposes, is in the form of commercial bank deposits. Instead, wholesale transactions ultimately settle in central bank money (reserves) whenever possible. This section considers tokenized deposits, stablecoins, and tokenized reserves.

Tokenized Deposits

Commercial bank deposits are appreciated for their nominal stability, meaning that the annotation of ten euros (or any other currency) in a bank account is expected to be worth ten euros over time, and to be redeemable on demand for a ten-euro bill issued by the central bank. This stability is a result of banks being closely supervised and having access to public backstops such as deposit insurance and emergency liquidity. Banks settle payments between their own clients on their own books. Between clients of different banks, payments are ultimately settled through transfers of central bank reserves on the central bank's payment infrastructure to other banks, with client accounts being updated accordingly.

What happens when banks decide to tokenize deposits? First, according to the definition in this Note, tokenized deposits are nothing more than a bank liability held, recorded, and transacted on a blockchain or other DLT.

Technology should not necessarily change the relationship between a bank and its client. However, when a new technology is introduced, the status quo is questioned with the potential to evolve relationships and processes in a search for greater efficiency and lower risks.

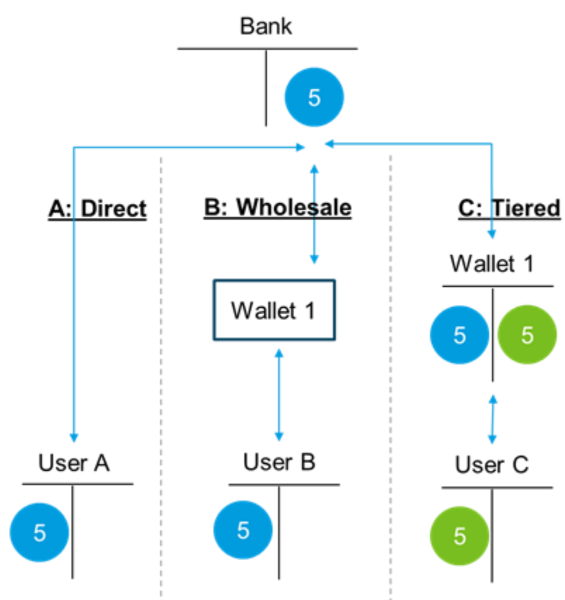
The starting question is what will tokenized deposits represent and how will they affect the relationship between banks and end users. At least three models are theoretically relevant (though not always possible in practice) as illustrated in Figure 4 with their respective intermediaries and balance sheets (represented by 'T-accounts').

The first **model (A)** replicates the traditional relationship between a bank and one of its retail clients, User A. In this case, User A holds a direct claim on the bank and trusts the bank to issue an asset it calls money. The bank has responsibility for the due diligence of its clients. The blue arrows capture the "trust relationships" between the bank and the user. The asset held by User A may be recorded on a blockchain and accessed through a wallet provided by the bank. However, nothing else changes in this model.

The second **model (B)** of wholesale distribution entails a wallet provider or exchange that distributes the deposit tokens issued by the bank. The wallet provider can warehouse deposit tokens and then sell them onward to end users. Alternatively, the wallet provider could also distribute deposit tokens just in time, without taking on warehousing risk (nor having a balance sheet). The other important point is that the bank does not necessarily have a direct relationship with User B. As shown in the diagram, it is the wallet provider that carries out due diligence on the end user and shares responsibility for monitoring transactions on an ongoing basis. Nevertheless, User B holds a claim on the bank.

The third **model (C)** of tiered distribution entails a wallet provider that acquires a claim on the bank's liabilities and issues its own token backed by that claim. Although the token is not itself a deposit, it is backed by deposits' liabilities and may be transferred to end users. The end user holds a claim only on the wallet provider, rather than on the bank. Therefore, the wallet provider bears full responsibility for customer due diligence and transaction monitoring, while remaining the bank's client.

Figure 4. Models for Tokenized Deposit's Liabilities



Source: Authors' elaboration.

Which model prevails will be dictated in great part by regulation. Specifically, much will depend on whether the issuer of a deposit—the bank in this case—is required to know its customers, those holding its liabilities. If so, Case A would be allowed as tokenized deposits would only be transferable among bank clients. Case B would probably be ruled out as the intermediary, not the bank, undertakes due diligence. Case C, instead, would be possible, again because tokens would circulate among known clients, and the token is not strictly a deposit. Case C could allow greater circulation of the tokens if the wallet provider had a much larger user base than the bank. However, if banks in Case A had access to the central bank's ledger through a bridge or a compatible infrastructure, or access to tokenized central bank reserves as a settlement asset, clients of two banks would be able to pay each other. The token of the sender's bank would be extinguished, whereas the token of the recipient's bank would be created, and both banks would settle their claims on central bank infrastructure.

Stablecoins

Stablecoins instead appear to follow either the wholesale distribution model (B) or the tiered distribution model (C). For instance, at the time of writing, around 25 percent of outstanding USDC stablecoins are distributed by Coinbase and held in wallets of the same firm.[15] A few market participants have access to the issuers, while the majority of end users buy stablecoins through exchanges in the secondary market. The question is then whether end users hold a direct claim on the issuer, as in Model B, or on the intermediary, as in Model C. That depends on regulation. In some jurisdictions, including the EU and the UK, all stablecoin holders are expressly granted a legal redemption claim against the issuer.[16] This strengthens investor protection and reduces dependence on the depth of secondary markets in stress periods. In both cases, however, it is the intermediary that ensures customer due diligence.

In many cases, stablecoins can be transferred among end users who are not direct clients of the issuer. This allows stablecoins to be held and transferred all over the world. The question is whether deposit tokens and stablecoins should be subject to the same distribution models or if there is something particular about one or the other that justifies different models of distribution. That must still be elucidated by policymakers and regulators.

Stablecoins seem to benefit from a distribution model more often used for securities, not money. For instance, the holder of a bond can sell the bond to another person who then inherits legal rights to coupon payments without the issuer of the bond knowing either holder. From the standpoint of transferability between end users, stablecoins are closer to a tokenized treasury than they are to money, which as discussed earlier requires issuers to know end users. A natural question emerges: why are treasury bills in most countries not traded on infrastructures that allow even more efficient peer-to-peer transferability? Part of the answer may relate to technology and part to legal and regulatory constraints, including taxation requirements. But then why are stablecoins exempt from these? Conversely, could the laxer requirements applied to the transfer of stablecoins also apply to treasury bills? The question is complex and remains open for now.

However, from the economic standpoint, stablecoins are quite different from tokenized versions of treasury bills. For one, stablecoins introduce counterparty risk. If stablecoin issuers take on excessive risks, end users cannot recoup the full value of the treasury bills held in reserves. See the Bank for International Settlements' Annual Report of 2025 for a fuller discussion, and IMF (Adrian and others 2025; Li and others 2026). Second, stablecoins do not necessarily pay interest, unlike a treasury bill. Major jurisdictions seem to converge on banning interest accrual for stablecoin holders. That is the case for the EU under MiCA and the US under the GENIUS and CLARITY Acts,[17] though other jurisdictions remain silent, and the Financial Stability Board has not taken a formal position.[18] If stablecoins did pay interest, their prices would fluctuate with changes in demand and

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[15] As of March 31, 2025 and 2024, based on information provided to Circle by Coinbase, the percentage of USDC in circulation held on Coinbase's platform was approximately 25 percent and 17 percent, respectively. This information is extracted from Circle's FORM S-1 reported to the Securities Exchange Commission. S-1/A. https://www.sec.gov/Archives/edgar/data/1876042/000119312525126208/d737521ds1a.htm?utm_source=chatgpt.com

[16] Although the end user redemption claim is direct on the issuer, it can be exercised either directly or through exchanges.

[17] Although the CLARITY Act is still under discussion, signs point at a ban on interests and "rewards" may be allowed. Even where stablecoins do not pay interest, holders may still earn indirect rewards through arrangements at the services layer. In particular, exchanges and wallet providers that hold customer stablecoins can pass through a share of the yield earned on their consolidated balances, sometimes labeled as "rewards" or "incentives."

[18] The Monetary Authority of Singapore does not explicitly ban stablecoin interest (see, for example, BIS 2025, p. 7), and neither does Bermuda (see, for example, Bermuda Monetary Authority 2024).

interest rate conditions, just as treasury bills do. That would further distance stablecoins from the concept of money.

Note that although bank deposits pay interest, they are still perceived as money. That is because the interest rate is not tied to the asset but to the contractual relationship between a client and their bank. Just send ten euros to a friend whose bank pays a lower rate on deposits; the friend will still receive ten euros and can redeem their deposits for a ten-euro bill. The interest rate does not affect the principal of the deposit, as it is detached from deposits. So, could a stablecoin distributor offer a return to its clients without attaching that return to the stablecoin itself? That question is also complex and is still being debated.

The more important test of whether an asset is money is not so much whether the asset's distributor pays interest, but whether the asset is capable of retaining its nominal value in all states of the world (Gross and Senner 2026). In other words, can the asset be redeemed into the sovereign currency at face value, or, according to Holmstrom (2015), can the asset be broadly accepted "no questions asked"? Practically, that means a stablecoin would need significant loss-absorption capacity. When it comes to loss absorption and limiting potential moral hazard, we could draw inspiration from past experience, through the use of default funds and loss-mutualization funds.[19] This approach would require stablecoin issuers to allocate dedicated prefunded resources—in addition to the backing assets and to their equity capital—as a safeguard in case of the issuer's default.[20] In addition, policy discussion should also consider market-based mechanisms that can channel liquidity to stablecoin issuers without recourse to public backstops.

Other options for loss absorption could come from a form of government backstop, such as an investor compensation fund, access to safe central bank reserves, or access to emergency liquidity.[21] Related discussions are just beginning, and the need to prevent moral hazard should be taken into account. There are various possible models through which stablecoins could have some access to central bank reserves or to payment infrastructure. Models of central bank involvement are captured in Figure 5. Each has different trade-offs and objectives, and the option of not offering any access remains possible and perfectly defensible.

[19] For instance, after the 2008 crisis, standardized derivatives transactions are required to clear through central counterparties, which mutualize losses among non-defaulting participants in the event of a default.

[20] An additional layer to this approach is for loss mutualization among issuers, with issuers contributing to a collective default fund calibrated to the risk each issuer brings to the system. At the moment, however, the stablecoins market is very concentrated and whether such an arrangement could ever be made operational would depend on prior progress in regulation, supervision, and standardization across major issuers. The option is mentioned here as a conceptual benchmark rather than a near-term policy recommendation.

[21] Trade-offs need to be weighted carefully. A contingent, market-wide facility collateralized with short-term, high-quality government securities is generally less risky for the central bank and tends to minimize market distortions. By contrast, emergency liquidity arrangements involving longer-term collateral and instruments that perform greater maturity transformation would expose the central bank to greater duration risk.

Figure 5. Possible Models of Central Bank Involvement in Stablecoins

Possible models of stablecoins (models to the left are closest to CBDC)

Levels of access to CB reserves	Full service	Partial service	Light service	Self service
Overnight For backing	All assets held as CB reserves	Fraction of assets held as CB reserves	X	X
Intraday For payments	√	√	√	X
Emergency For liquidity	n/a	√	X	X
	"Synthetic CBDC"	Bank of England proposal	Fed "skinny account" concept	Current default model

Source: Authors' elaboration.
Note: The association of each model with announced central bank proposals and concepts is based on our own interpretation. CB = central bank; CBDC = central bank digital currency; Fed = Federal Reserve Board.

It is useful to consider levels of access to central bank reserves according to three dimensions (noted in the first column of the table): (1) access to overnight central bank reserves to back the issuance of stablecoins, (2) access to intraday central bank reserves to make payments on the central bank's payment infrastructure, and (3) access to emergency central bank reserves to obtain liquidity support in a crunch.

Four possible models of stablecoin design can be constructed according to how each addresses the three dimensions of access to central bank reserves.

- **Full service model**: Stablecoins are fully backed with central bank reserves. The issuer also has access to the central bank's payment system, enabling interoperability between different stablecoin issuers. This model is closest to narrow banking and what has been called "synthetic CBDC" (Adrian and Mancini-Griffoli 2019).
- **Partial service model**: Stablecoin issuers hold a fraction of their assets as central bank reserves, with access to the central bank's payment system and emergency liquidity. This model seems most similar to the Bank of England's recent proposal for stablecoin regulation (Bank of England 2025).
- **Light service model**: Stablecoin issuers only access the central bank's payment system, ensuring interoperability between stablecoins but not allowing stablecoins to hold safe and liquid central bank reserves overnight to back their issuance. This is similar to the concept of a skinny payment account explored by the Board of Governors of the Federal Reserve System (2025).
- **Self-service model**: Stablecoin issuers have no access to any form of central bank reserves, just as in most cases of stablecoins to date.

Each of the service models has different implications for the operational and reputational risk of the central bank. These models, except the partial model where the emergency liquidity is backstopped by the central bank, could be combined with the proposal to have a clearinghouse for stablecoin issuers, that would guarantee emergency liquidity where one of the issuers defaults on its obligations.

The full service model is closest to retail CBDC, a digital liability of central banks that households and firms can hold directly. In fact, the model could be taken one step further if the stablecoin issuer retained its technology, client relationships, and services, but distributed CBDC instead of its private liabilities. Users would no longer be exposed to the balance sheet risk of the private issuer, even if that were small. The stablecoin issuer would continue to offer value where it has a notable comparative advantage, that is in interfacing with end users, innovating at the wallet level, and cross-selling other financial services. This option is discussed by Mancini-Griffoli (2025).

One approach to inject more competition into the payments landscape that does not involve creating new private money is the open banking model. This model has become increasingly prevalent in countries where fast payment systems have taken off alongside a growing offering of third-party wallets. These wallets can initiate payments through banks and non-bank e-money providers by linking through standardized application programming interfaces (APIs). In these cases, money and settlement infrastructure are provided by commercial banks and central banks, but wallet providers (which do not have a balance sheet) increase competition and quality at the level of services. In India, the entry of wallet providers combined with digital ID was a key element in drastically increasing financial inclusion and the use of digital payment services (Copestake and others 2025). The Indian fast payment system UPI increased financial inclusion from about 20 percent in 2016 to 75 percent in 2021 (Klapper and others 2025). In Brazil, in a little over a year since the Pix launch, 67 percent of adults in the country had signed up (Duarte and others 2022). In the Kyrgyz Republic, account ownership grew by 70 percent between 2011 and 2024, with 67 percent of the population making or receiving a digital payment in 2024, and 72 percent having a bank account (Klapper and others 2025).

However, open banking does not increase competition at the level of settlement or money issuance. If the banking sector is particularly uncompetitive, then the open banking model may not drive down costs to end users unless it addresses fees, since wallet providers would still face high fees to access money and settlement services. In such cases, models that involve e-money or well-regulated stablecoins and can ensure redemption in any state of the world are more attractive.[22]

Tokenized Central Bank Reserves

The earlier discussion of tokenized deposits and stablecoins leaves an important question open: who, ultimately, provides the on-chain settlement asset? The answer is unlikely to be neutral. To the extent that the public sector does not provide an on-chain settlement asset, private alternatives—such as tokenized deposits, stablecoins, or other emerging instruments—may expand to fill that role. These instruments, however, may carry varying degrees of credit, market, and operational risk. By contrast, central bank money remains the only settlement asset free of private credit risk, as it is a direct liability of the sovereign issuer of the currency.

Central banks' choices regarding tokenized reserves, including whether to issue them, for which use cases, and on what type of infrastructure, are likely to have significant implications for the architecture and resilience of the tokenized financial system. At the wholesale layer, central banks are exploring whether the reserves they already issue to eligible financial institutions can be made available on-chain to support atomic settlement of tokenized assets, programmability, and interoperability with private ledgers. Tokenized reserves may not change the perimeter of who has access to central bank money, but they would change the technology through which that money is held and transferred. They thereby preserve the role of central bank money as the ultimate settlement asset in a tokenized environment, while allowing the wholesale system to capture the efficiency gains of blockchain-based infrastructures.

[22] In fact, some jurisdictions have broadened access to central bank–operated payment infrastructure for nonbank payment service providers. Examples include the United Kingdom, where nonbank payment service providers have been eligible for Bank of England RTGS accounts since 2017; Brazil, where regulated payment institutions can participate directly in the Pix ecosystem and settle through the Central Bank of Brazil's Instant Payment System (SPI); and the euro area, where the Eurosystem has adopted a policy allowing eligible nonbank payment service providers access to TARGET services, including T2 and TIPS.

Box 3. Key Policy Questions for Trends on the Asset Layer

- Can tokenized deposits change the relationship between banks and end users, and how?
- To what extent do banks need to maintain a direct relationship with deposit token holders, versus allowing distribution through intermediaries?
- Can the same models of distribution apply to tokenized deposits and stablecoins?
- What safeguards could help ensure that stablecoin issuers can absorb losses, maintain a stable value of their liabilities, and limit moral hazard?
- To what extent, and under which models (full, partial, light, or none), might it be appropriate for stablecoin issuers to access central bank reserves or payment infrastructure?
- What role might central banks play in supporting interoperability and stability in systems where private stablecoins circulate widely?
- What are the implications of not providing tokenized reserves for the role of private settlement assets, including stablecoins and tokenized deposits, in wholesale markets?

Implications of Tokenized Architecture for Financial Market Infrastructures

Choices over blockchain architecture will shape how functions currently performed by FMIs evolve in tokenized environments. A central question is how much of the processes of issuance, clearing, settlement, and reporting can be automated through technology, and which functions will continue to require accountable legal entities capable of bearing responsibility, exercising discretion, and adapting to stress. A more detailed discussion is provided in a paper on the evolution of FMIs in a tokenized economy (Cabedo and others 2026).

Blockchain technology can replicate several functions that FMIs perform today and, in doing so, blur some of the distinctions between them. For example, a blockchain can maintain records of ownership, similar to the role of CSDs, it can also function as a repository of transaction data akin to trade repositories, or clear and net participants' exposures like a central counterparty. In principle, trading, clearing, settlement, and reporting could occur on a single shared infrastructure. However, full on-chain automation of some of these functions may not be the most desirable outcome. Key activities such as risk-model calibration or business continuity require human judgment and accountable institutions capable of intervening when conditions change or when systems fail. Existing standards typically require critical infrastructures to restore operations within a short time frame, often within two hours. Without a responsible entity overseeing the operation of a blockchain-based infrastructure, it would be difficult to ensure compliance with such business continuity requirements or to manage orderly recovery and wind-down processes.

Another key consideration is the trade-off between liquidity and instant settlement. Although shorter settlement cycles can reduce counterparty and settlement risks, instant settlement may not be optimal for all market participants. In many markets today, participants sell assets before they are available for delivery and rely on short settlement cycles to source the necessary assets or funding. This flexibility supports liquidity and market functioning. Instant and atomic settlement eliminates settlement and counterparty risk by ensuring that trading and settlement occur simultaneously. However, once any delay is introduced between trading and settlement, these risks re-emerge and must be mitigated through mechanisms such as prefunding. Prefunding, in turn, can impose liquidity costs and constrain trading activity.

Overall, the use of blockchain is likely to transform how markets operate today, but the functions performed today by FMIs will remain relevant. One area where innovation is already emerging is collateral management. New solutions allow market participants to allocate collateral more efficiently to meet margin calls and to move assets more rapidly across jurisdictions. For example, common ledgers connecting multiple custodians and

FMIs allow participants to interact seamlessly. This can facilitate the rapid reallocation of collateral across institutions and markets, reducing delays, reconciliation needs, and operational frictions, as all participants share visibility over transactions recorded on the common ledger.

In addition, FMIs are well placed to act as catalysts for change. Financial ecosystems continue to organize around core infrastructures—not only RTGS and payment systems, as discussed earlier, but also CSDs, which provide the authoritative records of securities ownership. CCPs play a similar anchoring role, bringing together virtually all major market participants and setting common risk-management and collateral standards for their participants. As a result, changes adopted by CCPs—such as accepting tokenized money (including stablecoins, tokenized deposits, and tokenized central bank reserves) or tokenized assets (for example, tokenized treasury bills) as eligible collateral—could materially accelerate and broaden the adoption of tokenization across markets, provided that regulatory frameworks evolve in tandem.

Conclusions

The emergence of blockchain technology raises fundamental questions about the infrastructures underpinning finance, the nature of the assets held and transacted, and the role of the public sector in shaping this evolution. This Note has focused on each of these issues, identifying the novel trends as well as open and emerging questions for policymakers.

At the infrastructure layer, the contrast between public permissionless and private permissioned blockchains is increasingly giving way to hybrid solutions. Fintech firms that initially favored fully public systems are introducing centralized components to enhance speed, privacy, governance, and cost predictability. At the same time, banks that historically relied on private infrastructures are beginning to issue and transact assets on public blockchains. The emerging pattern points toward infrastructures in which public networks support connectivity and innovation, while governance, validation, and access controls provide the predictability required by institutional users. For tokenization to scale, infrastructures must also deliver operational reliability and predictable transaction costs.

Blockchain infrastructures raise important governance and legal questions.[23] In environments without a single operator, accountability is likely to shift away from the operators of infrastructure. Regulatory frameworks are already evolving in this direction, with greater focus on issuers, exchanges, and service providers operating on blockchain networks. Compliance requirements—including anti-money laundering/combating the financing of terrorism controls, investor protection, and eligibility restrictions—can increasingly be embedded through smart contracts or layered technical solutions, allowing open infrastructures to coexist with regulated financial activities. Moreover, tokenization is loosening the traditional link between issuing an asset and operating the infrastructure on which it circulates. Private assets may increasingly circulate on public infrastructures, whereas public money may interact more closely with private platforms.

Architectures exist to allow interoperability between ledgers and tokenized assets. However, models entail distinct trade-offs between functionality, governance, stability, and feasibility. *Single-ledger* architectures offer significant functionality, enabling atomic settlement and eliminating settlement risk. However, they also concentrate activity on a single infrastructure, raising concerns about governance, resilience, and market contestability. *Compatible-ledger* architectures, in which assets remain on separate ledgers, but transactions are coordinated across them, appear more practical in the near term, as they impose fewer governance constraints. *Common-ledger* models facilitate interoperability through an intermediary ledger but introduce counterparty and concentration risks that must be carefully managed. In this case, it is critical to ensure that assets issued on the intermediary ledger remain fully backed by assets held in their native systems.

[23] For a broader perspective on a legal perspective on tokens, see Garrido (2023).

These developments also sharpen questions about the role of the public sector. Public authorities will continue to play a central role in shaping the tokenized financial ecosystem. Central banks, in particular, are likely to continue operating settlement backbones in central bank money, providing safety, liquidity, and a trusted anchor for the system. Public institutions can help foster convergence toward compatible technologies, messaging standards, and legal frameworks, reducing fragmentation while preserving scope for private innovation. As private infrastructures take on systemic functions, they may increasingly resemble traditional FMIs and warrant licensing, supervision, and oversight comparable to that applied today to entities such as CSDs and CCPs.

At the asset layer, the emergence of tokenized deposits and stablecoins raises questions about how monetary liabilities issued by banks and public institutions may evolve in tokenized environments. Although multiple distribution and design models are possible, regulatory choices will be decisive in shaping their development. For tokenized deposits, direct issuance by banks to their clients remains closest to the existing institutional framework and is therefore likely to remain the default outcome if regulation remains broadly unchanged. Wholesale distribution through wallet providers could expand reach and innovation at the services layer, provided that intermediaries are allowed to take responsibility for customer due diligence and transaction monitoring. Tiered distribution models, in which intermediaries issue their own liabilities backed by bank deposits, may support further market development but introduce additional counterparty risks and would likely require stronger safeguards to protect end users and ensure full backing.

Stablecoins raise a distinct set of policy challenges, some of which remain unanswered. Although designed to maintain stable value and facilitate payments, stablecoins do not necessarily fully meet the traditional criteria of money, particularly when redemption cannot be guaranteed under all circumstances. Moreover, issuing stablecoins requires funding with existing money, whereas deposits can be created elastically by banks (the same is true of reserves for central banks; see Banerjee and others 2025). In this sense, stablecoins lack the elasticity that characterizes the traditional monetary system. Stablecoins can be transferred peer to peer between end users who do not necessarily have a direct contractual relationship with the issuer, nor are known to it. As such, stablecoins do not appear to be money. However, the question emerges: why are certain securities, like the treasury bills that back stablecoins, not themselves able to be transferred as seamlessly including across borders as stablecoins?

The question of whether stablecoins resemble money is mostly related to their ability to maintain a stable face value expressed in the unit of account in any state of the world. The debate about whether a distributor of stablecoins can offer a reward to end users seems less important. Maintaining stable value requires credible loss-absorption mechanisms. Current models rely mainly on reserve asset requirements and issuer capital buffers, but complementary arrangements may be considered. Mutualized risk-management mechanisms for stablecoin issuers, akin to clearinghouse arrangements in derivatives markets, could help distribute losses across participants while reinforcing market discipline.

Public backstops—such as access to central bank liquidity or insurance mechanisms—may also be considered to varying degrees, subject to careful calibration to limit moral hazard. A central policy question concerns the extent to which stablecoin issuers should have access to central bank reserves and payment infrastructures. Possible models range from full reserve backing with access to central bank settlement systems—approaching synthetic CBDC—to lighter arrangements that grant access to payment infrastructures without reserve backing. At present, most stablecoins operate under a self-service model with no direct central bank access. Emerging regulatory proposals are nevertheless exploring options.

As technology evolves, so too do the questions that policymakers face. Debating these early and extending current policy frameworks consistently and effectively will protect the financial system against novel risks while encouraging innovation at the infrastructure, asset, and services layer.

Acronyms and Glossary

CBDC..........central bank digital currency

CCP ....central counterparty

CSD ....central securities depository

ECB ....European Central Bank

EVM ....Ethereum virtual machine

FMI..............financial market infrastructure

Layer 1........base blockchain

Layer 2 ……A scaling solution built on top of a base blockchain (Layer 1) that processes transactions off the main chain and periodically submits aggregated results to it. The main purpose is to increase transaction throughput and reduce fees without modifying the base layer. Common variants include the following:

• Optimistic rollups: Assume that transactions are valid by default; anyone can challenge them during a dispute window.

• Zero-knowledge rollups: Use cryptographic proofs to attest validity before submission to Layer 1.

Layer 2 solutions can reduce composability and strict atomicity, since transactions are aggregated before being confirmed on the base chain. Detailed transaction data may reside only on Layer 2, requiring dedicated entities to collect and aggregate it for reporting purposes. However, within a given Layer 2, composability with strict atomicity are preserved.

PIX ....Payment program for instant payments created and managed by the Central Bank of Brazil

PvP..............Payment versus Payment

RTGS ....Real-Time Gross Settlement System

TARGET2... RTGS system for the euro area

USDC..........Stablecoin issued by Circle and pegged to the US dollar

XRP ....Cryptocurrency platform by Ripple Labs

zk-SNARK.. Zero-Knowledge Succinct Non-Interactive Argument of Knowledge

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