

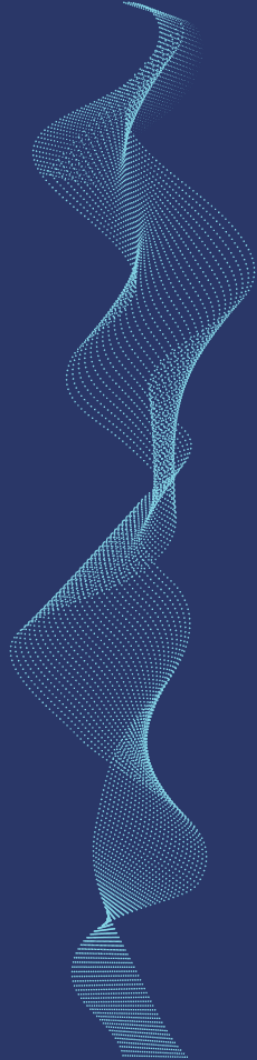
From assets to autonomous capital

What tokenisation has in store for the global financial industry

A primer of a research series on the impact of technology on investment by the Thinking Ahead Institute

March 2026

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Executive summary

Tokenisation may be more accurately understood as a **financial infrastructural shift** – one that is likely to alter the underlying “plumbing” through which financial value is represented, governed, and mobilised across the entire financial system.

Rather than manifesting as a discrete technological innovation or a new asset class, we believe it is fairer to think of tokenisation as a potential reconfiguration of the foundational arrangements that support financial capital accessibility, mobility, and management.

As such, it is likely to significantly impact the baseline operating model under which banking, capital markets, asset management, payments have all functioned so far. It represents what we might call an **erga omnes breakthrough** – it affects all players, at all levels, in any possible direction, with

inevitable cascading effects. In other words, tokenisation is a **multi-asset, multi-participant, multi-function technology**.

Historically, the most far-reaching transformations in finance have stemmed from changes in market infrastructure. One above all, the transition from paper-based certificates to electronic bookkeeping. This primer report aims to identify and position tokenisation as possibly the largest of these financial infrastructure rollouts in history. To the extent of pushing the boundaries even **beyond tokenisation, into autonomous capital**. This naturally implies a deeper consideration of the unprecedented set of both advantages and challenges.

Tokenisation preserves core economic exchange functions while adding liquidity, fractionalisation, programmability, and many other benefits. Yet high costs, fragmented

infrastructure, ownership complexities and systemic, legal, and governance uncertainties pose significant challenges.

Weighing up more speculative assertions, tokenisation may be conceived as a **(r)evolutionary product of its time**. Today, any resistance to greater awareness and understanding of it should be found within the conceptual hurdles of the Era of Dematerialisation. Tokenisation represents indeed the ultimate advancement of the digitisation of (financial) assets, and, by extension, of everything real and capable of being arranged as an asset. More bluntly speaking, an intangible/digital representation or symbol of real-world assets – a token – is about to become more real than reality itself (hyperreality). Tokenisation is the ultimate gateway to hyper-financialisation.

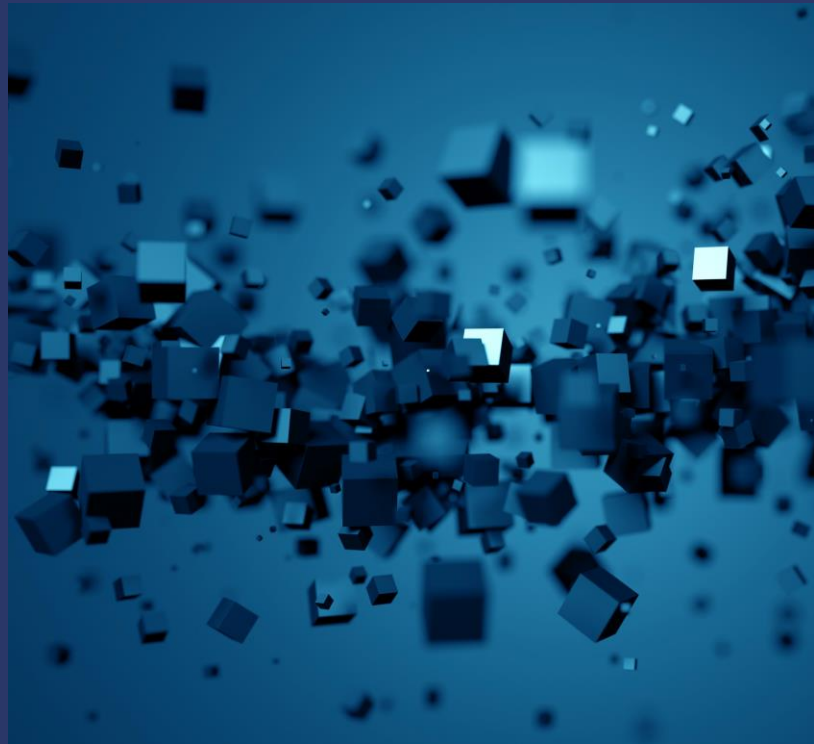
1. The token economy and on-chain economy

Tokenisation is not a modern invention

Tokenisation is not a modern invention. It is an ancient cognitive technology. Archaeological research demonstrates that token systems were used as early as 7500 BC as accounting or recording devices in early redistribution economies, long before the invention of writing. Clay tokens represented quantities of goods – grain, livestock, even labour – and for millennia they enabled economic coordination and lubrication at scales exceeding individual, more limited, memory.

So at its core, **a token is a symbolic abstraction**: a representation of value that is meaningful within a shared system, and meaningless outside. Modern financial instruments – banknotes, securities, derivatives – are direct descendants of this abstraction. Today, a **digital token** is the

quintessential form of this abstraction – pure **digital representation of traditional assets**.



“

Tokenisation is not a modern invention. [...] at its core, a token is a symbolic abstraction”

“Today a digital token is the quintessential form of abstraction – a pure digital representation of traditional assets

1. The token economy and on-chain economy

Distributed ledger technology (DLT)

There is a fundamental missing piece within the previous definition – what distinguishes contemporary digital tokens is architecture/infrastructure. Tokens today exist, and only exist, inside programmable platforms (or ledgers, or chains). For example, in the context of financial transactions, these systems are called **distributed ledger technology (DLT)**. Think of this as a global spreadsheet that updates itself and cannot be secretly altered. Tokens are embedded within technical and legal frameworks that define not only what they represent, but **what can be done with them**. Without this ‘software enforcing and encoding’ – ie execution tech environments with rules and logic governing who owns what, what transfers are valid, etc. – tokens simply could not exist.

Definition: A **DLT** is a general class of systems made of decentralised databases, distributed across several computers or nodes. Within this system, every node will maintain the ledger, and if any data changes happen, the ledger will get updated (independently at each node).

The **Blockchain** is a specific and most widely used type of DLT with cryptographic chaining and consensus embedded in the data structured as a chain of blocks (ordered in a particular sequence). Think DLT as the parent technology of the blockchain. In this paper, interchangeably ‘chain’ or ‘blockchain’.

1. The token economy and on-chain economy

Off-chain vs On-chain

Now, if tokenisation is the process of representing and converting assets (real estate, commodities, stocks, bonds, etc.) into digital tokens represented on a chain, a new type of economy emerges – what lives **on-chain** (tokenised assets) and what lives and remains **off-chain** (eg stocks listed on a regulated exchange, the flat I own, etc.).

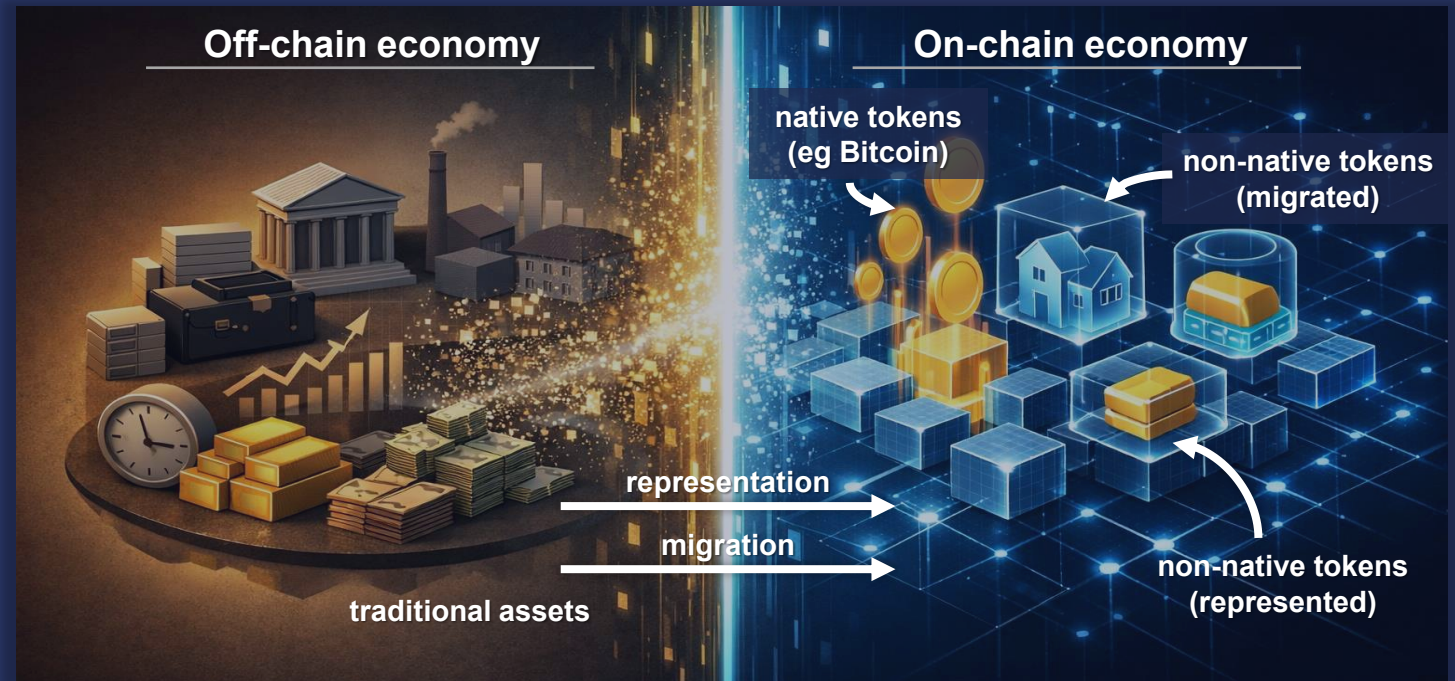
Traditional assets in the off-chain economy can be either virtually **represented** on-chain (non-native represented tokens) or destroyed and reissued on-chain via a process of **migration** (non-native migrated tokens).

Crypto-assets (eg Bitcoin) are **native tokens** newly originated and issued directly on-chain.

In theory, thinking the on-chain economy as a growing economy implies more and more real tradable assets getting tokenised, ie

converted into digital assets on the chain. Potentially, and tendentially, we could be observing a gradual **tokenisation of everything**, from real estate to art.

We will explore the implications of this process in a dedicated section later in this report.



2. What Tokenisation unlocks – value proposition and benefits

The core features of an exchange economy are preserved

It is worth discussing now the plethora of benefits derivable from this colossal digital migration. We have learned that we can digitise assets into tokens on programmable ledgers. This is the **representation dimension**. But what are the **operational implications**? And what **benefits** come along?

Essentially, the conventional features of an exchange-based economy are preserved – digital tokens can be:

Issued

evidence or verification of an asset value can be provided (*proof of value*)

Stored

ownership, agency, rights of an asset can be established (*proof of ownership*)

digital tokens
can be







Traded

records of transaction history and settlement can be produced (*proof of transaction*)

2. What Tokenisation unlocks – value proposition and benefits

Economic and financial advantages

The on-chain economy fully keeps alive the possibility of exchange of information and value. This is the operational dimension which is at the core of the tokenisation's unique value proposition and its economic and financial benefits across the board:

| | | |
|---|---|--|
|  | Decentralisation and disintermediation | Ledgers enable direct transfers of digital value or tokens between eligible participants with decentralised record-keeping, removing the need for an intermediary or central authority that controls the ledger |
|  | Transparency | On-chain tokens embed ownership, rights, and obligations directly in code, alongside an immutable transaction history. This enables verifiable counterparties, traceable provenance, and full visibility into who owned an asset, when, and under what conditions – reducing information asymmetry |
|  | Security | Tokenised assets rely on chain immutability and cryptographic verification. Ownership records and transaction histories cannot be altered retroactively, reducing fraud risk and ensuring enforceable ownership and transfer |
|  | Fractionalisation | Tokenisation enables assets to be divided into smaller, tradable ownership units. This lowers minimum investment thresholds, improves operational efficiency compared to traditional fractional structures, reduces costs, and allows broader investor access and portfolio diversification, including for high-value assets previously inaccessible |
|  | Accessibility | By lowering minimum investment sizes through fractionalisation, tokenisation opens access to a broader set of investors. Reduced capital requirements and simpler participation mechanics democratise, in theory, exposure to assets previously limited to high-net-worth or institutional players |
|  | Composability | Tokenisation enables digital assets and system components to interoperate across platforms, supporting multi-chain and multi-asset operations. This improves collateral mobility and liquidity |

2. What Tokenisation unlocks – value proposition and benefits

Two extra special advantages

There are two key additional advantages that deserve ad hoc considerations because of their significant implications for the investment industry more at large: liquidity and programmability.

1

Liquidity: Derives from the possibility to convert traditionally illiquid assets into tradable fractioned digital units. This may expand the investor base, increase trading activity, and allow investors to capture liquidity premiums previously unavailable in private illiquid markets

2

Programmability: The ledgers enable programming pre-agreed conditions that are automatically executed once certain conditions hold. This is referred to as “**smart contracts**”. Operational efficiency via smart contracts enables automation of complex financial transactions, embedding logic directly into processes. In our opinion, this is by far **the most radically innovative feature of the tokenisation ecosystem**.

Programmability is what gives this report the title of “**autonomous capital**”. The operational efficiency of financial plumbing could develop its best potential as soon as it becomes able to encode transaction logic and rules **directly into self-enforcing codes** (ie smart contracts)*. This is the central object of attention of this report and therefore requires further analysis, alongside a quick glance at the historical evolution of financial asset digitisation.

*The radical innovation of ‘token-ledger programmability’ differs from traditional programmability because the code runs inside the ledger itself rather than being executed externally. By integrating code directly with the transaction ledger, tokenisation ensures coherence between logic and records, enabling more efficient and reliable smart contracts that bundle or condition transactions on one another.

3. A brief history of capital digitisation

From paper capital to programmable capital

Tokenisation is best understood as the latest phase in a longer process of (capital) digitisation. This process can be broadly divided into three eras of capital.

1. Paper capital

Human-centric

For much of modern financial history, assets were issued, transferred, and settled through physical certificates and manually maintained registries. Capital moved slowly, depended heavily on human intervention, constrained by geography and the limits of manual coordination and processing capacity

2. Platform capital

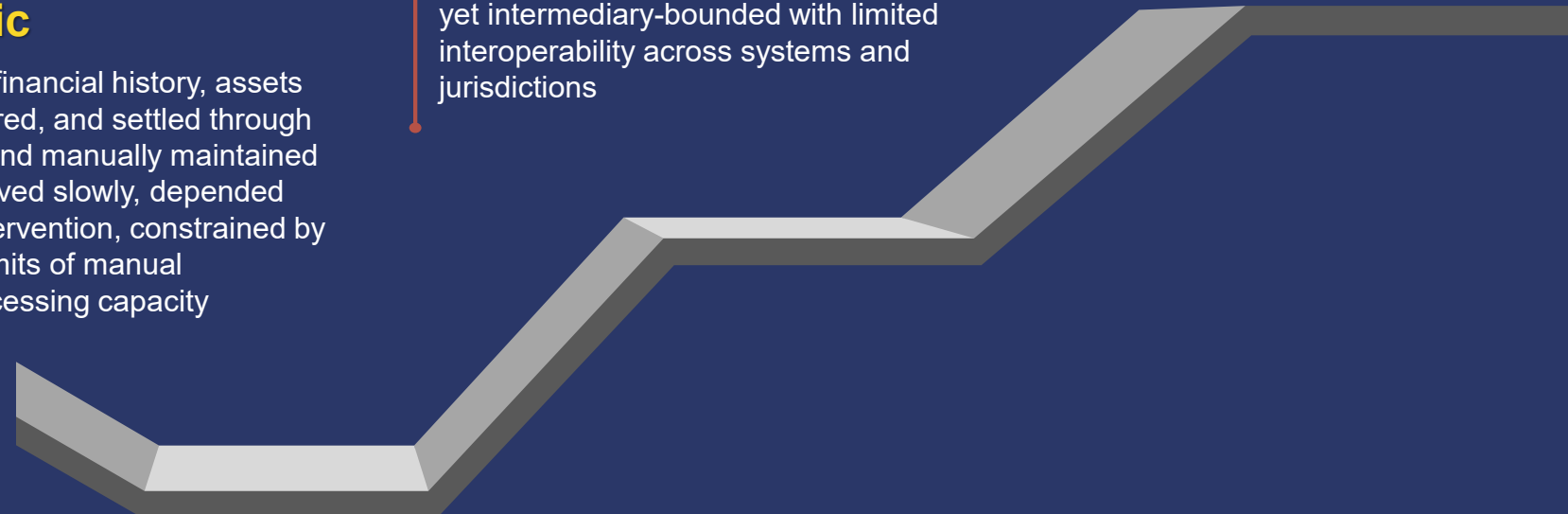
Intermediary-centric

The dematerialisation of paper certificates digitised and centralised securities within clearing houses and custodians. Capital moved faster due to improved operational efficiency, yet intermediary-bounded with limited interoperability across systems and jurisdictions

3. Programmable capital

Self-centric

In an on-chain token economy, assets become 'executable objects' that are maintained on programmable platforms. As we have seen, programmability removes the need for an account manager. It changes the role of the intermediary, minimising and rewiring their previous centrality into a distributed, shared system of record and rules directly embedded into the asset itself, along with all the other features and benefits discussed before.



4. The new Era of Programmable Capital (beyond Tokenisation?)

Programmable capital reallocates continuously on its own

From above, it follows that tokenisation works as a mere wrapper, being able to migrate existing assets on-chain. However, the deeper transformation emerges precisely from the programmability feature of the ledgers, enabling autonomous, continuous capital. Let's dig deeper into this concept.

Capital flowing on-chain loses, by construct, those static characteristics of traditional assets and starts responding to data, conditions, events, rather than periodic human review and decisions. Now decisions are triggered by thresholds, behaviours, and state changes so that programmable capital **reallocates continuously on its own**.

Some hypothetical but **practical examples** may help here:

- ◆ Bonds that automatically pay coupons and withhold taxes based on jurisdiction
- ◆ Real estate tokens that route rental income instantly to holders
- ◆ Collateral that self-liquidates when loan-to-value thresholds are breached
- ◆ Funds that rebalance exposure without a fund manager executing trades
- ◆ Equity tokens that cannot be transferred to non-accredited wallets
- ◆ Assets that only trade during regulated windows
- ◆ Yield that only accrues if compliance conditions remain true

The advent of cryptocurrencies, their skyrocketing price increase, as well as volatility distracted from this other parallel macro trend that's been building under the surface. **(Non-native) tokenised** digital assets, in fact, act as a link between the blockchain and the real world, allowing the token to be tradable and transferable; but it's only their ultimate programmability within that ecosystem that elevates the whole technology.

The next section focuses on this new major trend and provides facts and figures to back up its recent surge into the spotlight.

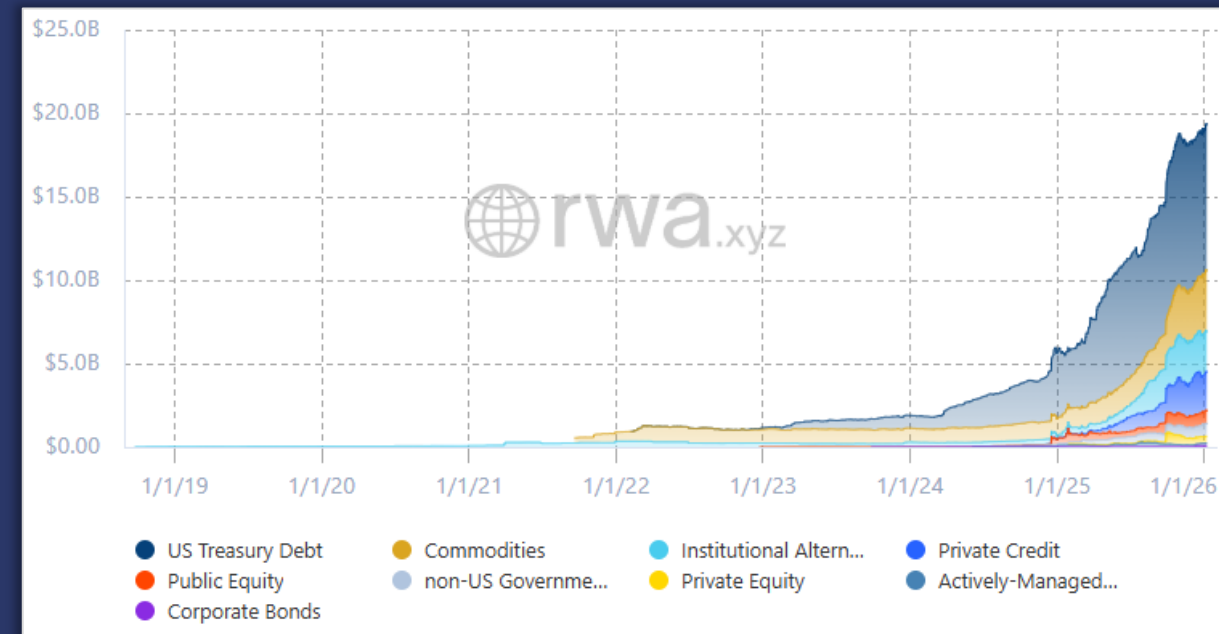
5. From Real-World Assets to Digitised Asset Markets

The most consequential development in tokenisation is not just the proliferation of native digital assets (eg Bitcoin), but the migration of real-world assets (RWAs) into digital form. Tokenised bonds, funds, private credit, and real estate represent an emerging phenomenon that has grown rapidly. Data from RWA.xyz indicates that tokenised RWAs have expanded by over 1,600% in just the past three years, reaching approximately USD \$25.4 billion deployed on-chain as of February 2026. These are the **distributed** tokens on the ledgers, meaning those “RWA

tokens using the blockchain as a distribution ledger, enabling on-chain investors to subscribe, hold and manage assets directly through their own wallets or custodians.”

If we want to consider a broader set of RWA, we must change the definition to **represented** tokens. The total Represented Asset Value of “RWA tokens using the blockchain as a recordkeeping layer, enhancing transparency, reconciliation, and operational efficiency without enabling on-chain investors transfer or distribution” is USD \$372.6 billion as of February 2026.

Total Distributed RWA Value



Source: [RWA.xyz](https://rwa.xyz)

5. From Real-World Assets to Digitised Asset Markets

Market projections

There is broad agreement that the market potential for tokenised assets is significant, although estimates vary widely. **Boston Consulting Group** projects that tokenisation of global illiquid assets could reach \$16 trillion by 2030. **McKinsey** estimates a more conservative \$2 trillion in total tokenised market capitalisation by 2030, excluding cryptocurrencies and stablecoins. **Roland Berger** places the potential market size at over \$10 trillion by the end of the decade.

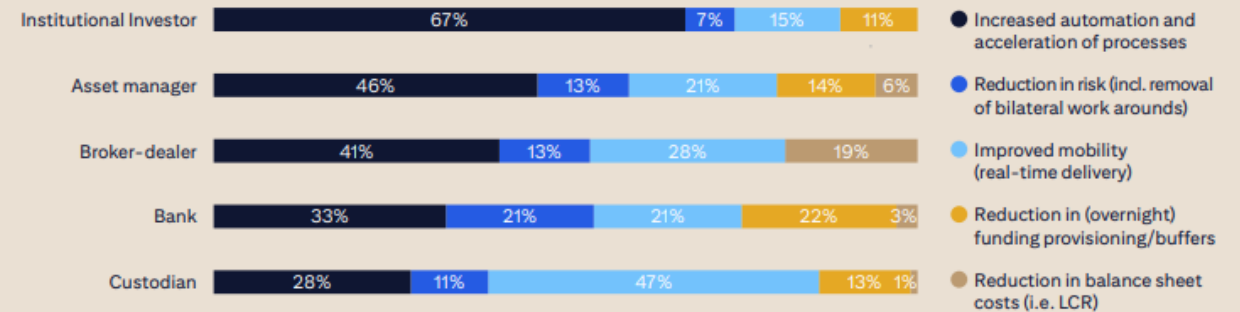
2030 roughly 10% of global market turnover is expected to be conducted using digital and tokenised securities, with tokenised funds forecast as the fastest-growing category in use cases through 2030.

The survey also highlights that digital money is increasingly used for operational automation and improved capital mobility.

Citi's 2025 Securities Services Evolution report finds that by

What is digital money being used for?

Figure 15: What is digital money being used for?
Automation vs balance sheet



Question: What is the #1 driver for your using these cash mechanisms (versus traditional forms of cash)?
Expressed as: % of respondents citing each driver, by segment.

Source: *Citi Securities Services Evolution 2025*

5. From Real-World Assets to Digitised Asset Markets

Infrastructure experimentation at scale

Two years ago, the **Eurosystem** successfully concluded a series of tests employing distributed ledger technology (DLT) for wholesale settlement in central bank money. Between May and November 2024, the Eurosystem processed over 200 transactions and a total value of €1.59 billion.

Operational experimentation by systemically important institutions further underlines the shift from theory to practice. The European Central Bank's DLT settlement experiments processed over €1.5 billion in value across 200+ transactions, involving more than 60 participants – a credible demonstration of market-function testing at scale.



5. From Real-World Assets to Digitised Asset Markets

Institutional product traction

Regulated financial products have begun to emerge. **Franklin Templeton**'s Franklin OnChain U.S. Government Money Fund, the first Luxembourg domiciled fully tokenised UCITS product launched on public blockchain, reported nearly \$766 million in assets under management by the end of 2025, illustrating tangible adoption within mainstream regulatory frameworks.

At the institutional end of the spectrum, **BlackRock** has followed with the launch of the USD Institutional Digital Liquidity Fund, now the world's largest tokenised fund. Structured as an institutional-grade vehicle backed by US Treasuries and cash equivalents, this fund enables eligible investors to hold yield-bearing fund shares directly on public blockchains with 24/7

settlement and transferability. Since launch, the fund has rapidly scaled, surpassing \$2.5 billion in assets under management as of November 2025.

Collectively, these signals – from central banks, market utilities, and regulated products – explain why tokenisation has moved into the core infrastructure debate.



6. The problems that come with it

Micro/industry level – contingency on ecosystem readiness and reality on the ground

Cost

As seen before, tokenisation is commonly perceived as a cost-saving form of disintermediation. Shared ledgers, automated settlement, and reduced post-trade complexity are expected to materially lower operational expenses for issuers and investors. While this holds in theory, early implementations suggest a more nuanced reality.

In practice, many tokenisation structures rely on special purpose vehicles (SPVs) to acquire and hold the underlying assets. These SPVs typically require their own custody arrangements, fund administration, collateral management, legal structuring, and

back-office support. Rather than displacing intermediaries, **tokenisation may reproduce them at an additional layer**. The service providers that tokenisation is expected to remove remain essential to meet regulatory requirements and the operational standards demanded by institutional capital.

As a result, costs may not be eliminated but duplicated. Until tokenised structures can substitute, rather than sit alongside, existing legal and operational frameworks. Reaching that point would necessitate legislative change, regulatory updates, and a substantial reconfiguration of existing technology stacks across the industry (where legacy systems represent an incremental cost layer to maintain). While such a transition could remove portions of the

current cost structure, it represents a significant upfront investment and is unlikely to be realised in the near term. Even under favourable conditions, the ceiling for cost savings remains constrained.

6. The problems that come with it

Micro/industry level – contingency on ecosystem readiness and reality on the ground

Accessibility

As also seen before, tokenisation is associated with improved accessibility, particularly through lower minimum investment sizes and digital distribution. In practice, however, accessibility is shaped by the structure of the underlying market infrastructure. Today, in fact, tokenised assets are deployed across a **fragmented landscape** of public and private blockchains, each with distinct standards, governance models, and access requirements. This fragmentation introduces friction rather than seamless access, as investors and intermediaries must navigate multiple environments that are not fully interoperable.

Moreover, smart contracts operate primarily on on-chain data and require reliable links to off-chain processes such as valuation, corporate actions, compliance, and custody. These mirror the dependencies highlighted with cost, reintroducing intermediaries and operational constraints, limiting the extent to which tokenisation can simplify market participation. The proliferation of **bespoke, firm-specific blockchain infrastructures further compounds the issue**. Isolated platforms may be viable for experimentation, but at scale they risk trapping assets within closed ecosystems, reducing liquidity and undermining the very accessibility that tokenisation is expected to deliver.

As a result, broader access is unlikely to emerge from tokenisation alone. Meaningful improvements in accessibility will depend on

progress toward interoperability, common standards, and legally robust market infrastructures capable of supporting multiple asset types and participants. Without these conditions, tokenisation may redistribute access rather than expand it.

6. The problems that come with it

Micro/industry level – contingency on ecosystem readiness and reality on the ground

Ownership and fractionalisation

Fractional ownership is often framed as a democratising force, enabling broader participation in traditionally illiquid assets. In practice, however, secondary markets for fractionalised tokens remain limited, and prices often diverge from underlying fundamentals due to inconsistent valuation and limited trading. It's a classic old problem of liquidity – tokenisation does provide new market venues, but actual tradability is a serious potential structural barrier – but it's too early to say anyway.

Fragmented ownership structures can also dilute accountability and create challenges

around decision-making, dispute resolution, and fiduciary responsibility. In this sense, fractionalisation may democratise but without necessarily improving investor agency.

Other challenges revolve around compliance limitations, cybersecurity risks, and operational risks.

6. The problems that come with it

Macro/system level – the unknowns of a paradigm shift

Systemic risk lens

At the system level, the implications of tokenisation extend beyond questions of efficiency or market access. They touch on the resilience, governance, and power dynamics of the financial system itself. In this respect, tokenisation should be understood not as a discrete innovation, but as a force that interacts with – and potentially amplifies – existing structural fragilities.

While tokenisation promises greater transparency, automation, and capital mobility, the behaviour of tokenised assets **within the broader capital market infrastructure** remains only partially understood. In particular, it is unclear how

digital assets and their interconnections with traditional markets will transmit stress under conditions of increased uncertainty.

Hypothetically, yet bluntly, **tokenisation might involuntarily and unknowingly be a new source of systemic risk**. Essentially, by repackaging assets into tokenised forms, risks may become harder rather than easier to assess, particularly where liquidity assumptions are implicit rather than explicit.

6. The problems that come with it

Macro/system level – the unknowns of a paradigm shift

From “code is law” to “law is code”

Immediately related to these issues of governance, authority, and trust are further important considerations regarding **legal/regulatory implications**. The paradigm shift of digital technology we have all been experiencing for some time now has brought about a progressive acquisition of power by code in regulating virtual/digital behaviours. Effectively, ‘regulation through code’ has now become the new normal (code is law).

For example, on platforms like Facebook or PayPal, when we click “Like” or “Pay” the system automatically applies a coded rule – incrementing a counter or money balance – so the outcome is determined entirely by the

underlying software logic.

Now, the blockchain technology paradigm pushes all this even further by **embedding rules into code** (law is code), as we have seen before through the lenses of programmability, smart contract, decentralisation, self-sufficiency. The inner properties of blockchain tokenisation are radically shifting the role of coding from having influence and impact on the law, to the law being potentially defined as code, being code-ified – law **becomes** code. Code may now be able not just to enforce legal rules, but to autonomously elaborate and execute embedded instructions and events through its own technology, effectively turning law into code.

For example, Blockchain users now being able to establish **contractual/legal**

relationships with other users (or machines) simply through an on-chain transaction.

In a digital world where code is law, while law can be influenced and shaped by code, it remains a fundamental building block for operating. In contrast, in a digital world where law is code, law as we know it ceases to exist, because code is now totalising. Hold this thought when turning to the next page.

This is by far one of the most far-reaching, disruptive, and least understood implications of blockchain. Trust in autonomous, decentralised, predominantly private systems will require a completely different set of governance balances and weights that nobody has ever formalised, let alone deeply thought through yet.

6. The problems that come with it

Macro/system level – the unknowns of a paradigm shift

A-legality

When decentralised, autonomous systems' behaviours becomes fully determined by code and protocol rules, (human) legal norms or moral judgments (may) become... irrelevant or obsolete! Transactions execution and rules enforcement by these systems (may) simply occur **without any built-in notion of lawful or unlawful** (within any particular jurisdiction).

Unless designed to do so, blockchains and smart contracts **will not** adapt to or enforce legal judgment, hence a-legality.

Code is agnostic to legality.

Traditional services (banks, platforms, intermediaries) can be pressured or shut down by courts, regulators, or law enforcement because they are run by identifiable entities in specific jurisdictions. In contrast, a-legality in decentralised systems means there may be no single party who both controls the system and can be coerced to stop or change it, making certain behaviours effectively hard or impossible to stop.

It would also be interesting to further connect this idea to the recent regulatory shifts under the Trump administration, including the issuances of new cryptocurrencies.



6. The problems that come with it

Macro/system level – the unknowns of a paradigm shift

Hyper-financialisation

In parallel, tokenisation accelerates a tendency toward the financialisation of ever more domains. By making assets, rights, commodities, even the natural world and living things programmable and tradable, tokenisation operationalises the **extension of market logics** into areas previously governed through institutional social, or just natural arrangements. What can be tokenised can be priced, exchanged, and optimised – often before clear frameworks exist to determine whether it should ever be.

”

[...] The air we breathe, the water we drink, the soil, the oceans we need for the food we consume, the minerals we need as inputs to technology and infrastructure... [...]

[...] Nature is treated within the economy as though it's unlimited and predominantly as though it's free.

[...] And the risks and harms are simply not costed in financial terms.

*[...] If we're going to protect natural systems, one of the solutions is **to bring nature onto the balance sheet, to bring nature into the ways that decisions are made within business, to allocate a value to it and to bring it into accounting and financial mechanisms.***

Lindsay Hooper, WEF 2026 speech (emphasis added)
(CEO for the Cambridge Institute for Sustainability Leadership)

7. Some scattered business and investment implications

Advice shifts from products to architecture

Tokenisation may reduce the value of product selection advice and increase the *value of designing* portfolio structures, governance, and operating models across asset types

Portability becomes table stakes

Clients will expect assets to move easily across wrappers, platforms, and strategies, putting pressure on advisory, custody, and reporting frameworks. In other words, the correlation between *decentralisation* and (advisory) *trust* remains largely undetermined

Siloed advice stops making sense

Separating investment, operational, and technology advice becomes impractical as

tokenised portfolios may require integrated answers

Real-time exposes legacy

Tokenised assets may soon reveal the inadequacy of legacy services (reporting, governance, risk modelling, DD, manager selection) as they struggle to adapt to real-time

ETFs as a conduit

Traditional asset management is already equipped with a powerful bridging mechanism between real-world and tokenised assets. And what implications for the eternal active-passive battle?

"Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road"

Stewart Brand

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