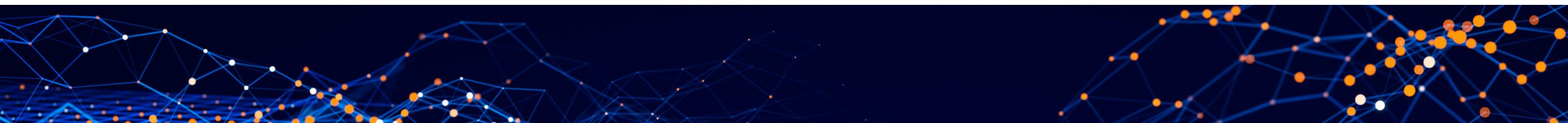


Tokenization of Financial Markets: Mapping the Plausible Future through Scenario Analysis



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Tokenization of Financial Markets: Mapping the Plausible Future Through Scenario Analysis

Tokenization — the process of digitally representing assets on a blockchain — is often described as the next financial revolution. What are the key factors that the industry should prioritize over a staggered time frame for tokenized markets to achieve the liquidity and accessibility needed for systemic relevance and broad adoption?



Are we witnessing a great tokenization takeover or stumbling into a silent tokenization trap?

While interests and momentum grow, tokenization's future trajectory remains malleable.

Tokenization has successfully gained traction in primary issuances, but its long-term impacts and potential to create a digital financial industry hinges on its abilities to have deep, liquid secondary markets which requires broader adoption by clients and industry players, more use cases, favorable and transparent regulatory environment, and cost-effectiveness. This future does not depend on technology alone, but also on private-public sector collaboration, the ability to resolve non-technology barriers, and to build sustainable operating models.

At today's crossroads, will tokenization progress to redefine existing capital markets, create an alternative digital ecosystem, or become a niche segment within traditional financial structures?

This paper does not aim to provide definitive answers, but to contribute to public-private sector dialogues on critical challenges and opportunities at this juncture of market development, and to help focus collective efforts that will facilitate the realization of tokenization's benefits. The aggregated effects of stand-alone action can drive systemic change to steer progress towards desired outcomes.

To frame this discussion, we have adopted a loosely based scenario analysis approach to briefly describe the form of tokenized markets in a future of two contrasting plausible scenarios: the transformative **Great Tokenization Takeover** and the stagnant **Silent Tokenization Trap**.

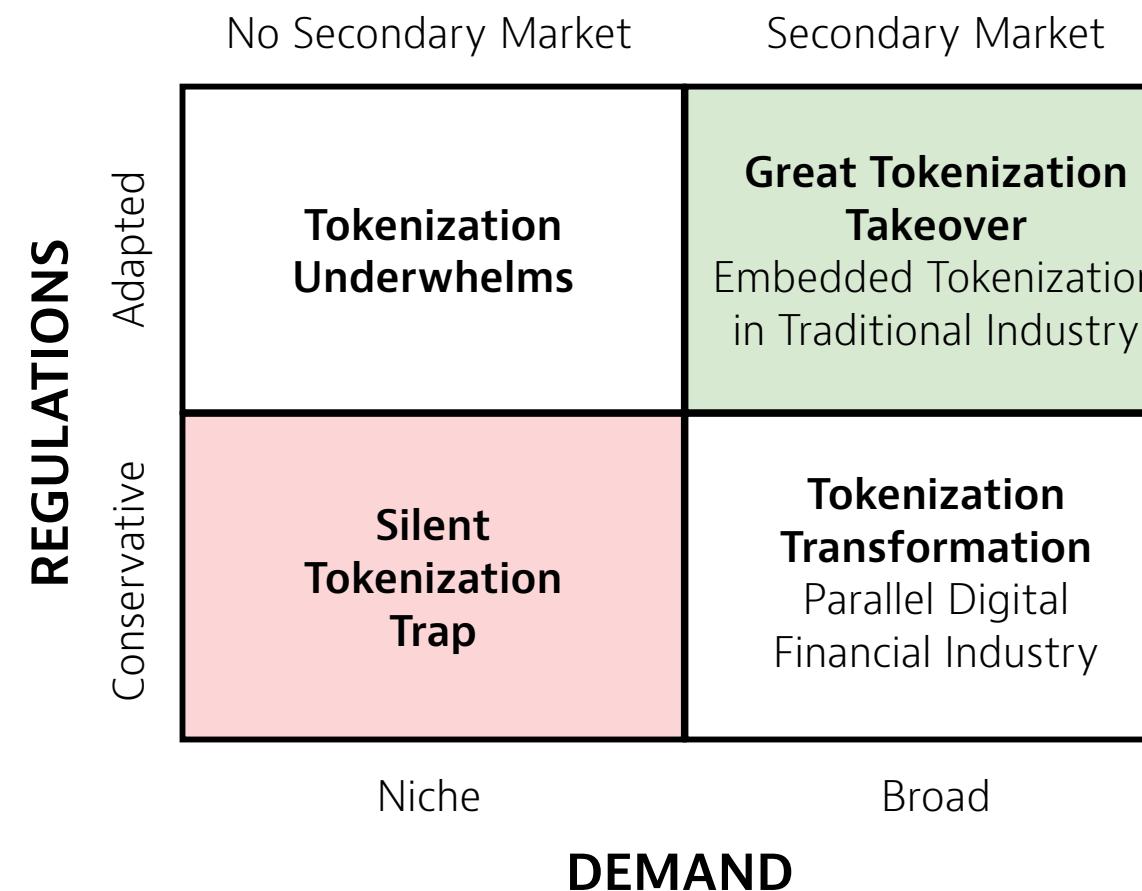


Contrasting Scenarios: Takeover or Trap

01

Source: Deutsche Bank

Tokenization of Financial Markets: Mapping Plausible Futures Through Four Drivers



The Great Tokenization Takeover

In this optimistic scenario, tokenization becomes a cornerstone of global finance, driven by the following:

- **Ease of access and broad adoption:** Technological complexity is simplified into intuitive everyday experiences, unlocking new financial applications and benefits.
- **Conducive policy environment:** Regulators prioritize clarity, enabling cross-border interoperability and fostering institutional participation. Frameworks balance innovation with risk management, creating trust in digital assets.
- **Thriving digital financial system:** Tokenized markets achieve scale, liquidity and resilience. Secondary markets flourish as institutional liquidity providers, and decentralized finance protocols integrate tokenized assets, enabling seamless trading, lending and collateralization. The digital financial system actively complements real economy activities and velocity.
- **Open and interoperable networks:** Public and private blockchains converge together with traditional and digital asset exchanges, ensuring fair access for all participants. Functionalities like fractional ownership and 24/7 trading help democratize access to traditionally less accessible high-value assets (e.g., real estate, private equity).
- **Risk-Adjusted Returns for All:** New digital assets (e.g., tokenized bonds, composable funds) attract retail and institutional investors with transparent pricing, lower fees, round-the-clock trading and higher yields. New asset managers emerge, aided by a more cost-efficient tokenization operating model, creating competitive choice for investors. Emerging markets leverage tokenization to bypass legacy infrastructure, accelerating financial inclusion.

Outcome: Tokenization redefines capital markets by merging traditional and digital systems into a hybrid model where efficiency, accessibility, and innovation thrive supporting real world economic activities.

02

The Silent Tokenization Trap

In this pessimistic scenario, progress into the formation of a liquid thriving secondary market stalls due to unresolved key challenges.

- **Technological sophistication** becomes a barrier to wider adoption and accessibility.
- **Competing standards and siloed ecosystems** (i.e. public vs. private chains) limit interoperability, further hindered by prolonged industry debates on standardization.
- **Retail investors face high suitability, regulatory and technical barriers to entry**, while institutions rely on closed-loop membership-based systems accessible only to select participants.
- **Tokenization stagnates in the primary market and does not reach escape velocity**, remaining limited to niche buy-and-hold issuances. Deeper liquidity fails to materialize as markets and products fragment across different blockchains, deterring secondary trading, new use cases and cost-effective ease of accessibility.
- **Regulatory paralysis**, driven by fragmented rules and compliance burdens, deters institutional adoption. Jurisdictional conflicts and unclear ownership laws heighten legal risks and costs, stifling investments and cross-border issuance amid growing doubts about investor and asset protection.
- **Without proof of superior risk-adjusted returns**, investors revert to traditional assets. Crypto-native enthusiasm wanes as macroeconomic conditions stabilize, reducing urgency for alternatives.

Outcome: Tokenization becomes a peripheral novelty, confined to niche use cases and absorbed into existing structures without transformative impact.

The Drivers Influencing the Future of Tokenization

To explore how tokenization may evolve, we have identified four core interdependent factors:

1. **Demand for Digital Assets:** Who will buy, hold and trade tokenized assets, and why?
2. **Supply Side:** What assets will be tokenized, and who will issue them?
3. **Market Structure & Adoption:** How can markets evolve to support deep liquidity and broad accessibility?
4. **Regulations:** Will jurisdiction-specific regulatory frameworks enable or limit growth?

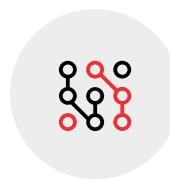
The interplay of demand, supply, market structure, and regulation can determine tokenization's path.



The Four Forces

**Demand Driver
for Digital Assets:
A Generational and
Geopolitical Shift**





1. Demand driver for digital assets: a generational and geopolitical shift

1.1 The great wealth transfer: Millennials & GenZ driving demand

A massive USD 84 trillion wealth transfer from baby boomers to millennials and Gen X by 2045 is underway.¹ Unlike previous generations, the following now applies:

- **Millennials** are five times more likely than baby boomers to own crypto and digital assets²
- **The next generation** is digitally native, with a strong affinity for blockchain-based financial products, creating a conducive environment for a shift from traditional assets classes to non-traditional asset classes, including crypto and digital assets.
- **Emerging markets with young populations** are already adopting crypto at scale — India has 90 million crypto users and Vietnam has 20 million,³ creating a huge base for tokenized asset adoption.

1.2 Macroeconomic conditions drive alternative asset allocations

Investors are under financial pressure from high inflation, low interest rates, and the rising living costs. This is further compounded by the expanding “sandwich class” — working adults caught between supporting the older and the younger generations exacerbates the situation — amid a declining employment to population ratio. Tokenized assets may be attractive given that:

- **Safe bank deposit rates** remain below inflation in many economies, pushing investors toward higher yield and alternative investments.
- **With longer lifespans**, the greying population requires higher returns, but safer investments are unlikely to meet inflation-adjusted growth needs.
- **Institutional investors** such as insurers and pension funds continue to increase their allocations in alternative assets.
- **Three-quarters of surveyed millennials and members of Gen Z** in the US believe traditional stocks and bonds cannot deliver above-average returns, making tokenized assets an attractive option.

- **Investors are increasingly exploring tokenization** for asset diversification and the ability to increase liquidity in real world assets. Previously untapped retail demand for a tokenization wrapper around private assets is gradually being met, enabling easier inclusion in portfolios and facilitating secondary trading for liquidity.
- **Decentralized finance (DeFi) concepts**, including staking and automating market makers, are being brought into the traditional finance (TradFi) ecosystem. There is a growing desire to collateralize crypto and other digital assets to free up liquidity to invest into income generating investments with capital appreciation potential.

1.3 Geopolitical and national interests in crypto and digital reserves

Nations are beginning to actively acquire digital assets, not just as investments but as strategic financial reserves.

- **Thirteen countries currently own Bitcoin** through different means. While El Salvador made direct purchases, others countries like Norway, Switzerland and Bhutan have acquired Bitcoin through sovereign wealth fund investments, state-funded mining operations or seizures.⁴
- **The United States has also passed an executive law** to create a Strategic Bitcoin Reserve⁵. Law makers and other interested parties in countries like Germany, Hong Kong, Russia, Brazil and Poland are reported to have proposed to explore Bitcoin as a strategic asset, each driven by unique economic and political motivations⁶
- **Stablecoins on public blockchains for regulated use** are increasingly possible, for example in Hong Kong, Singapore, European Union and United States.
- **Central banks and regulator-driven tokenization initiatives** could reshape global finance, increasing demand for sovereign-backed digital assets.



1.4 Emergence and demand for tokenized use cases

Tokenized assets are proving their **commercial viability**, offering **greater accessibility, efficiency, and cost savings** across multiple asset classes. Investors — particularly in **wealth management and family offices** — are increasingly exploring tokenization to **fractionalize traditionally illiquid assets like real estate and other real-world assets**, unlocking liquidity and asset portability that was previously unavailable.

As adoption grows, the tangible benefits of tokenization are becoming clearer.

- **Freedom of token ownership:** Tokenizing assets creates opportunities for investors to hold their own assets within their own non-custodial wallets, enabling freedom for the investor to use for trading and as collateral for financing
- **Unlocking private market liquidity:** Tokenization can fractionalize ownership of traditionally illiquid assets, such as real estate, venture capital, and private credit, allowing investors the option to exit investments via secondary trading. Long lock-up periods are no longer a hindrance to investing.
- **Bridging on-chain & off-chain finance:** The ability to use tokenized high quality assets as collateral for cross-institution lending and financing will integrate decentralized finance mechanisms with traditional banking and prime brokerage services.
- **24/7 market access:** Unlike traditional financial markets, tokenized assets can trade around the clock, enabling real-time portfolio rebalancing. In this regard, it is entirely possible for collateralised real-world assets to be traded instantly (or with a significantly shorter settlement delay compared to traditional financial products). Their links with underlying real-world assets that operate during market hours are also gradually being solved, for example, with collateralization and as key public securities market open for longer hours.

The fuel to achieve potential liftoff for mainstream adoption of tokenized assets may already be in place and only requires aligning the right supply with the existing demand to spark the liftoff for mainstream adoption.

Key Demand-Side Question: Will these demand forces be strong enough to propel tokenization into mainstream financial markets, or will they lack the force for tokenized assets to scale beyond niche adoption?

The Four Forces

Supply Side Driver:

What Will Be Tokenized,
and Who Will Issue It?





2. Supply Side Driver: What Will Be Tokenized, and Who Will Issue It?

For tokenization to thrive, supply must meet demand, meaning a broad range of suitable high-quality, tradable assets must be tokenized.

Beyond early pilot projects, we are now seeing increased institutional and sovereign issuance, as well as innovative financial products that expand the scope of tokenized investments. From government bonds and corporate debt to alternative assets and structured funds, tokenization is reshaping financial markets by enhancing liquidity, accessibility, and efficiency.

Below are the key areas where tokenization is making an impact.

2.1 Institutional and sovereign issuances

- **Government bonds and sovereign debt:** Countries exploring tokenized bonds include supranationals, Thailand, the Philippines and the EU member states.
- **Corporate debt and equities:** Traditional financial institutions are testing tokenized shares and corporate bonds, through private placements.
- **Alternative assets:** Real estate, commodities, fine art and intellectual property are being tokenized, offering new investment opportunities.
- **Private markets:** Venture capital and private asset funds are exploring fractional ownership via tokenization, making previously illiquid assets more accessible.

2.2 Expanding the universe of tokenized products

Product innovations extend the range of investable assets.

- **Tokenized money market funds:** Offering higher yields with liquidity comparable to bank deposits, making them attractive alternatives to traditional cash holdings.
- **Crypto ETFs:** Providing familiar, regulated investment vehicles for crypto exposure without requiring investors to manage crypto wallets, private keys, or complex technical setups.

- **Fractionalized private market assets:** Companies are staying private longer, limiting access to growth-stage opportunities. Tokenized private equity, venture capital, and real estate now offer fractional ownership, expanding investor access.

- **Tokenized composable funds and structured notes:** New financial products combine different risk-return profiles, allowing investors to customize payout structures for short-term liquidity and long-term capital appreciation.

2.3 Crypto as a differentiated asset class

Cryptocurrencies serve as:

- A **global sentiment tracker**, reflecting shifts in macroeconomic confidence.
- An **anti-inflationary asset** with portability to protect wealth against uncertain political environments.

2.4 24/7 market access and direct cross-border distribution

Tokenization eliminates traditional trading hour constraints:

- **24/7 trading or variations that transcend market hours** create an always-on financial system, allowing for real-time settlements and greater market efficiency. Catalysts to realise this feature includes timely counterparty risks management, the availability of collateral, the participation of market makers and cost efficiency.
- **Direct cross-border distribution of tokenized assets** that is "intermediary-lite", allowing up-and-coming talented asset managers to reduce costs and together, contribute to improving capital flow efficiency across global markets.

Key Supply-Side Question: Will issuers fully embrace tokenization? Can tokenized products meet or exceed the needs of investors, or will mismatches or a tokenization crisis keep traditional finance dominant?

The Four Forces

**Market Structure &
Adoption Driver:
Building Liquidity &
Ecosystem Depth**





3. Market Structure & Adoption

Driver: Building Liquidity & Ecosystem Depth

3.1 Market fragmentation Risks: Importance of Interoperability

Today's tokenized markets operate across multiple blockchain networks, and assets created on each blockchain tend to not be natively **interoperable between different chains**. This fragmented access and liquidity reduces market efficiency and limits the ability of tokenized assets to function as seamlessly as new digital securities.

First, technical interoperability is required and there are already battle-tested solutions like Axelar network (initially developed by Interop Labs) and its peers. These are yet to be fully adopted by the broader financial industry and regulators as available and trusted utility infrastructure (just like internet border gateway routers that routes internet banking messages across different networks) to facilitate regulated financial transactions moving across different chains. Further, legal clarity of financial tokens immobilized on one chain for minting on another via bridges, or the efficacy of message calls by autonomous smart contracts and between bridges is a developing topic.

However, technical interoperability alone is not sufficient. Effective interoperability between different liquidity pools will also require a similar set of operating and fungibility rules.

From this view, tokenization's promise of seamless financial markets is challenged by fragmentation at multiple levels:

- **The Mix of Today's Inherently Non-Interoperable Public and Private Chains** – Asset managers and stablecoins operate on public blockchains while banks, financial market infrastructures, CBDCs, and tokenized deposits operate on private chains. This creates liquidity fragmentation, and complicates accessibility and risk management.
- **Cash, foreign exchange (FX), and traditional assets** that underpin tokenized assets remain on traditional financial rails, limiting the full integration of tokenized financial markets.

- **Traditional Financial Rails Still Matter** – While digital assets are growing, cash, foreign exchange (FX), and traditional underlying assets that support digital tokens remain tied to traditional infrastructure. Will the need to operate and maintain two different systems (traditional and blockchain), prove to be too complex and costly to the industry and raise costs, risks and dilute interests over time?



Source: Deutsche Bank

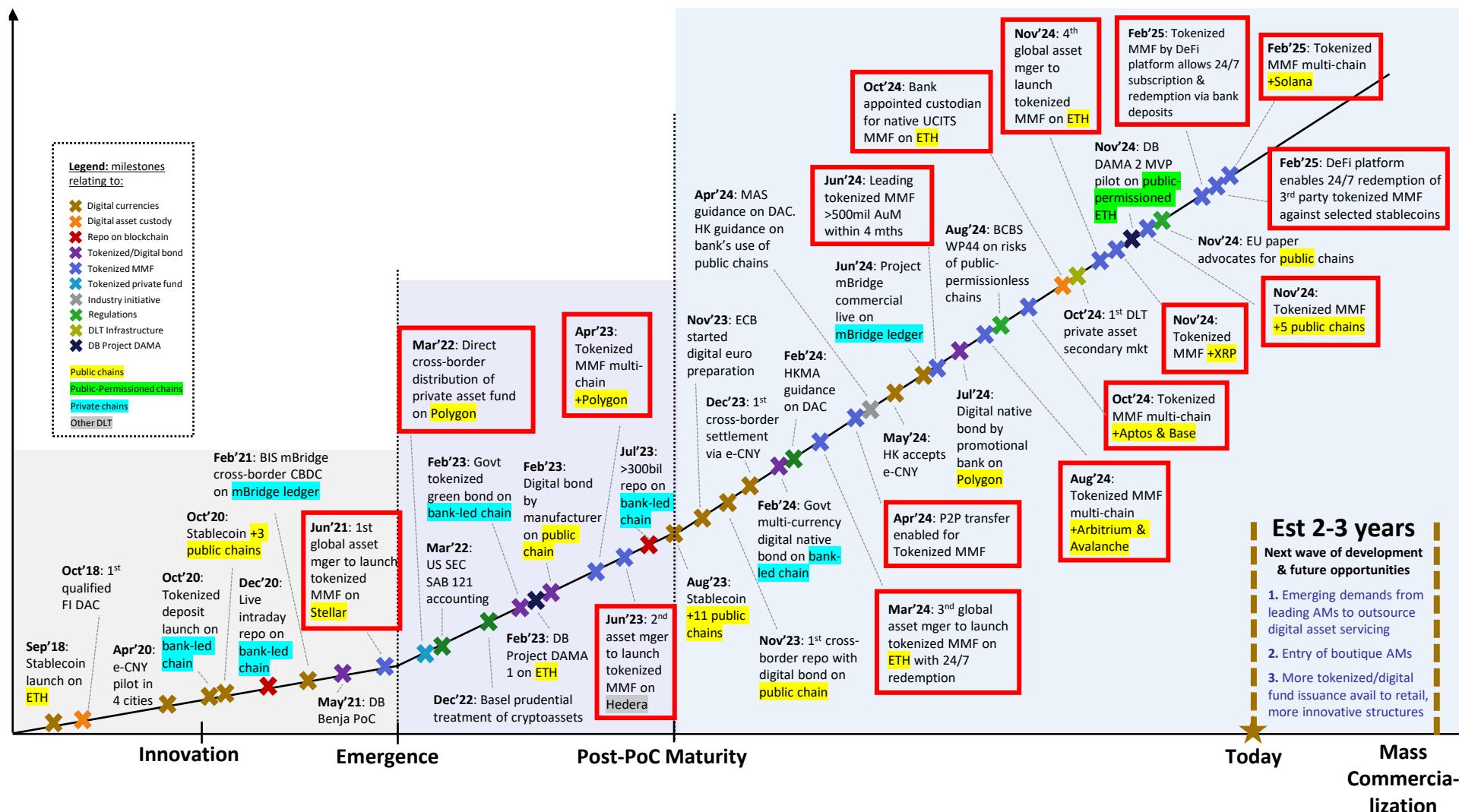


Figure 1: Tokenization adoption curve and key events from Sep 2018 – Feb 2025

3.2 Market risks being stuck in the primary market stage

High interest in tokenization does not guarantee that it can successfully transit the primary issuance phase into deep secondary markets. Without a global industry roadmap towards interoperability, cost-effective systems and active trades, the risk remains that tokenized finance will remain stuck in the primary market phase for longer than anticipated, potentially losing momentum before being able to achieve broader mainstream adoption.

Some jurisdictions have recognized these issues:

- Singapore's Global Layer 1 initiative**⁷ attempts to explore the development of a multipurpose, shared ledger infrastructure based on distributed ledger technology that can provide a shared infrastructure and technology for regulated financial institutions across jurisdictions to deploy tokenized assets.
- In a similar vein, the **EU is spearheading the European Blockchain Services Infrastructure (EBSI)**,⁸ with 29 supporting countries to create a cross-border unified blockchain infrastructure that can be used across different sectors within the EU.
- The US President has issued an Executive Order**⁹ that supports the use of public blockchains, paving the way for greater access to more financial applications on public chains. Likewise, the GENIUS Act cleared the Senate Banking Committee (at time of writing (superscript 10 here) which progresses regulations on payment stablecoins. This can potentially provide US-based issuers with a competitive edge as well as deepen the moat around US dollar dominance in global payments. The GENIUS Act allows the tokenised version of a US eligible reserve asset to continue to be treated as a reserve asset. This would significantly increase the acceptability of tokenised collateral of such assets that are prospects for re-hypothecation.

3.3 Market makers and regulations for a secondary market



While tokenization has successfully reached the primary issuance phase, with innovations such as fractionalization for lower minimum investments, cross-border distribution, multichain issuances, and new use cases like tokenized money market funds serving as on-chain collateral, the transition to active secondary market trading requires further advancements and new financial products and models that can introduce sustainable liquidity.

Market makers who play a critical role in ensuring liquidity, will only enter markets when there is sufficient volume and predictable regulations. Regulatory clarity on capital treatment, settlement rules and reporting requirements could encourage market makers to participate in tokenized asset markets.

- **Some jurisdictions have taken proactive steps. Switzerland, for example, is exploring integrating tokenized assets into its traditional financial system** through the Swiss stock exchange, which could create sufficient volume by offering a secure and regulated environment for investors, thereby attracting liquidity providers to enter and provide liquidity.
- **Hong Kong has also set out initiatives, as part of its ASPIRE Roadmap**,¹¹ to pave the ecosystem buildout for secondary trading. This includes establishing a licensing framework for virtual asset OTC block trades to incentivize the establishment of liquidity provision and institutional participation, a regulatory framework for new token listings, and integration of global virtual asset platforms to unlock deeper liquidity.
- **However, certain challenges, such as the potentially higher capital charges under Basel III, may discourage banks from holding digital assets**, which would reduce the volume or number of trades. If so, can more Web3 or nonbank financial institutions (NBFIs) step into this important role?

A whole of market strategy is required to integrate tokenized assets into traditional financial systems. Without this, tokenized markets will struggle to achieve the deep liquidity needed to attract institutional market makers.

To scale beyond primary issuance, there are several factors to watch, including:

- **Institutional Liquidity Support:** Will market makers and liquidity providers emerge to facilitate active trading and ensure continuous price discovery? Greater chain accessibility may unlock new liquidity sources – like retail investors evolving into

individual financial advisors and portfolio managers to add velocity and volume of trades, mirroring the rise of new content creators following the advent of YouTube and TikTok.

- **Regulatory Clarity:** Clear rules on tax, multi-platform listings across traditional and digital exchanges, and clarity of the accounting classification of tokenized assets and stablecoins are essential.
- **Efficient Price Discovery Across Venues:** Reliable secondary market pricing requires robust order books blending traditional market models with on-chain data aggregation for transparency.
- **Expanded Collateral Utility:** High quality tokenized securities and bonds should be recognized as high-quality collateral, enabling their use in intraday margin, repo transactions, and collateral postings in the financial markets.
- **Financial Advisory Capabilities:** Upgraded investment banking and advisory services are needed to guide institutional and retail investors on how to structure, allocate, and manage tokenized financial products.

Deep secondary markets need efficient and cost-effective cross-chain interoperability, liquidity depth, and broader access to trusted trading and settlement digital infrastructure.

3.4 Is there enough demand?

Another key consideration is **whether there is enough demand to justify building this infrastructure**, including hiring experts and implementing new processes.

For tokenized markets to succeed, **they must attract liquidity providers** by identifying **asset classes and projects that offer compelling trading opportunities**. The ability to **scale liquidity solutions** will determine whether **tokenized products can rival traditional financial markets** in efficiency, depth and investor participation.

Source: Deutsche Bank

	Tokenization/ Issuing platform	Digital transfer agent/on-chain register	Distributor/placement agent	Fund Admin	Digital Asset Custodian	Others
Digital bonds						
Digital bond by a promotional bank (Jul'24)	FinTech specializing in tokenization and crypto securities registrar	Commercial bank		Digital asset arm of a private bank		
Govt multi-currency digital bond (Feb'24)	Bank digital asset platform	Traditional financial market infrastructures		Not disclosed		
Tokenized MMF						
Tokenized MMF on 7 public chains	FinTech for one-stop tokenization solutions			Global bank	For end investors: Web3 digital asset custodians	<u>24/7 redemption:</u> stablecoin issuer and DeFi platform <u>As on-chain collateral:</u> Prime brokerages
Tokenized MMF on 8 public chains	In-house					<u>24/7 redemption:</u> DeFi platform
Tokenized MMF on 1 public chain & multiple venues	In-house	Possibly in-house	Decentralized exchange and a digital marketplace	Global bank	For end investors: Web3 digital asset custodians	
Tokenized MMF on 6 public chains	In-house	In-house	In-house	Not disclosed	In-house	
Tokenized private fund						
Tokenized credit fund by a global alternative asset manager – 6 public chains	FinTech for one-stop tokenization solutions				Not disclosed	<u>Interoperability:</u> cross-chain protocol
DLT share class of a private asset fund global alternative asset manager – 1 public chain, multiple venues	Private asset digital marketplace	Global financial service provider and digital asset bank	Digital asset bank	Global financial service provider	Not disclosed	
Crypto ETFs						
Bitcoin ETFs (12 spots)					10 by CEX, 1 by Web3 digital asset custodian, 1 in-house	
Ether ETFs (9 spots)					8 by CEX, 1 in-house	

Figure 1: An abstract of the current tokenization ecosystem

Purple: FinTechs

Green: TradFi & FMI

Orange: In-house

3.5 Two competing models: a parallel digital financial industry vs. an embedded tokenization market structure

As the tokenized financial industry evolves, a critical question is: who will drive and shape its future?

Today, non-bank financial institutions (NBFI), fintechs, and Web3 firms are the most active players, leading the development and deployment of tokenized financial infrastructure.

In contrast, banks remain largely on the sidelines, such as those in the digital funds and bond space. This is largely due to their conservative approach and strict adherence to regulatory frameworks.

Global regulators' concerns about DLT risks in the financial sector are also contributing to banks' hesitance, making them less likely to engage meaningfully in the market development of tokenization.

This raises a fundamental question: Should the tokenized financial system develop as an alternative to traditional banking, inherently aligned to new chain-ways to achieve similar results, or should it be embedded within the traditional system and focus on aligning the tension between traditional design emphasis and blockchain functional outcomes?

This creates two competing sub-scenarios on how tokenization will integrate (or not) with traditional finance.



Two competing models: a parallel digital financial industry vs. embedded tokenization market structure

There are two competing futures for how tokenization will integrate (or not) with traditional finance.

Model 1: A parallel, non-bank-led digital financial industry

In this model, NBFIs and fintechs would provide full end-to-end tokenized financial services, including the following:

- **Tokenization of assets**
- **Listing and trading on digital exchanges**
- **Settlement and prime brokerage**
- **Custody of tokenized assets**

Banks, in this model, would continue operating on traditional financial rails, providing banking services like custody, deposits and loans, and perhaps be confined to private blockchain networks where they can manage cost structures without running both blockchain and legacy systems simultaneously.

Pros of a parallel digital financial industry:

1. **Faster innovation & efficiency** – Fintechs and NBFIs can move quickly without being constrained by banking regulations, allowing faster adoption of new financial models and products, to meet investors' demand.
2. **Lower compliance costs** – Without the heavy regulatory burden imposed on banks, operations can stay lean and costs of maintaining both blockchain and traditional systems are reduced. This in turn lowers access costs to market participants including investors.
3. **Greater specialization** – Fintechs and NBFIs can focus purely on digital financial services, while banks remain dedicated to traditional financial infrastructure, avoiding the complexity of system migration.

4. **Risk isolation and Growth Potential** - Parallel traditional and digital markets with some cross-overs can lead to lower chances of new systemic risks and greater market resilience in the traditional markets while allowing for a new level of growth.

Cons of a parallel digital financial industry:

1. **Fragmented oversight and risks:** If NBFIs and fintechs operate outside traditional banking regulations, systemic risks (such as stablecoin depegging or counterparty failures) could escalate **without proper safeguards, which can still invoke some systemic risks.**
2. **Liquidity fragmentation:** A separate digital financial system could lead to disjointed liquidity pools between tokenized assets and traditional financial instruments, making price discovery and collateralization more challenging.
3. **Regulatory equivalence:** Regulators can still step in to impose stricter licensing requirements on fintechs, forcing them to comply with bank-like regulations, negating the cost efficiency and innovation advantages they currently enjoy.
4. **Systemic risks** can still arise due to the connectivity with market participants including banks, underlying capital markets and investors.

Model 2: Embedded tokenization within traditional banking

An alternative scenario is that regulators enforce an integrated model, bringing NBFIs and fintechs under equivalent banking regulations, while relaxing restrictions on banks to allow them to operate in public- and public-permissioned blockchains.

This model would create a hybrid system where:

- **Tokenization is driven by NBFIs, fintechs and banks.**
- **Banks participate more actively in blockchain-based finance.**
- **Digital finance is embedded into the existing financial system.**

Pros of embedded tokenization in traditional finance:

1. **Regulatory clarity and trust:** Embedding tokenization into traditional finance ensures compliance and reduces counterparty risks, making digital assets more appealing to institutional investors.
2. **Stronger liquidity and collateral utility:** Tokenized assets could be seamlessly used as collateral in regulated banking systems, improving credit markets, intraday margins, and repo transactions.

3. **Consumer protection and risk management:** A regulated framework could mitigate risks of fraud, hacking, and systemic instability, increasing confidence in digital financial products.
4. **Larger room to grow for traditional participants,** with spillover benefits from faster innovation from collaborations with Web3 firms.

Cons of embedded tokenization in traditional finance:

1. **Higher compliance and operational costs:** Banks and fintechs would face higher compliance burdens, which could slow down tokenization adoption and innovation.
2. **Slower market transformation:** Banks are relatively more risk-averse, meaning they may delay or resist full tokenization, keeping innovation constrained to controlled pockets of activities.
3. **Potential overregulation:** If regulators impose stringent business segregation rules, fintechs may lose their ability to compete effectively, leading to less diversity in financial services and suboptimal growth.
4. **A traditional bank's expertise, controls and culture dominate collaboration, leading to idea plagiarism by** "build in-house" preferences, leading to a decrease in Web3 pollination possibilities.

3.6 Which model will prevail?

The future of tokenized finance depends on regulatory choices, cost structures and risk frameworks.

- **If banks remain restricted,** NBFIs and fintechs will likely continue driving tokenized finance as a parallel system with a crossover nexus with banks, underlying capital markets and investors.
- **If regulations evolve,** banks may become more involved, embedding tokenization within traditional finance.

The final answer is likely (and unsurprisingly) one that lies in a **balanced approach** — a future that envisions the teaming up of innovative fintech firms and well-established and deeply rooted traditional banks on the basis of mutual respect and equal partnership.

Hence, an optimal path is likely to involve a hybrid-collaboration model, where fintechs and NBFIs continue innovating, while banks gradually enter public blockchain finance under updated regulations working collaboratively with NBFIs and Web3 firms — ensuring

constantly increasing cost efficiency, liquidity, benefits and better risk management in the evolving tokenized financial ecosystem.

An analysis of recent industry trends reveals the continued rise of such hybrid collaboration, as we see established financial institutions increasingly partner with emerging fintech firms.

In particular, Deutsche Bank has been at the forefront of the developments of the tokenized market with its proof-of-concept multichain network initiative, **Project DAMA 2**.

- **Deutsche Bank collaborates with Memento Blockchain and Interop Labs** (the initial developer of Axelar Network) to develop Project DAMA 2¹², a public-permissioned Layer 1-Layer2 open architecture MVP for multi-network digital asset/fund servicing, as part of Deutsche Bank's contribution to the Monetary Authority of Singapore's Project Guardian. In this collaboration, Memento Blockchain developed a fully functional testnet, while Axelar assisted in delivering cross-chain interoperability with potentially >60+ EVM and non-EVM chains.

Key market structure question: Will tokenized markets develop the liquidity and adoption needed to become a core part of financial infrastructure, or will fragmentation slow progress, leaving tokenization stuck in primary market stages?

Geographically, should the industry expect one or two dominant crypto/tokenization hubs that can stand on their own, with a handful of satellite markets, while other markets play distant catch-up? If so, should global private-public sector efforts focus on nurturing growth in such dominant markets first to nurture winners and pathfinders, or risk having no mature tokenization market with secondary liquidity at all?

The Four Forces

Regulatory Driver:
Catalyst or Barrier?





4. Regulatory Driver: Catalyst or Barrier?

Regulations shape the operating environment and is a compass of how change can occur.

Regulators have largely adhered to the principle of "same activity, same risks, same regulations." This approach has been beneficial in enabling tokenized finance to gain a faster start, as it prevented the duplication of regulations and avoided imposing premature regulations that would quickly be made obsolete by technology advancements.

However, while this approach worked initially, gaps between existing regulations and digital financial instruments are becoming more evident.

Examples of emerging regulatory gaps in digital finance

On-chain records and legal recognition: Can on-chain transaction records be recognized as de facto evidence of asset ownership, or must off-chain documentation remain the legal standard?

Hybrid characters: A token can be transferred without a named owner, relying on wallet addresses instead of traditional identity records. Can a token be both a registered and bearer instrument?

Characteristics of bridged tokens: Can token characteristics change when they are being bridged, frozen/burnt and minted?

Tokenized assets and stablecoins as collateral: Can these assets legally serve as collateral in financial markets, and how should they be accounted for by accounting standards?

Tax and stamp duty implications: Will stamp duties apply when tokenized assets are traded across multiple digital asset exchanges and traditional platforms?

Multilisting challenges: Can a tokenized asset be listed on both digital-native exchanges and traditional stock exchanges, and how will regulatory oversight work across these platforms?

These unanswered questions highlight the need for regulatory modernization to ensure that tokenized finance can scale with clear interpretations for participants to operate with.

Key regulatory question: Will nonfinancial regulators collaborate in time to enable tokenization to thrive, or will outdated interdependent regulations prevent tokenization's full-scale adoption?

To understand whether regulation will accelerate or hinder the future of tokenization, it is essential to examine its effect on the two primary drivers of tokenized markets: demand and supply.

By evaluating the interaction of regulation with each of the two drivers, we can gain a better understanding of the key factors that are crucial for increased adoption of tokenized assets.

Below, we will examine the following questions:

- (1) **Unlocking demand: Will regulatory certainty unlock institutional adoption?**
- (2) **Unlocking and supply: Will harmonized frameworks drive issuer confidence?**

4.1 Unlocking demand: will regulatory certainty unlock institutional adoption?

One of the biggest hurdles for tokenized markets is whether **institutional investors and sovereign entities** will have sufficient comfort to **allocate capital to tokenized assets**.

The following key factors were discussed earlier in this paper:

- 4.1.1 Legal certainty on on-chain ownership records**
- 4.1.2 A clear cross-border regulatory and legal framework for tokenized collateral and asset classifications**

These factors address certain fundamental and practical aspects that drive the demand for and adoption of tokenized assets.

Legal certainty on on-chain ownership records

Legally binding on-chain ownership records would afford greater convenience and encourage the widespread adoption of tokenized products and structures.

How are jurisdictions around the world addressing this? There has been a dichotomy of views.

While some jurisdictions, such as certain states **in the US¹³** and **Switzerland¹⁴**, **Germany¹⁵** and **Luxembourg¹⁶** in Europe, have taken **progressive steps to recognize blockchain-based records** as valid forms of legal evidence, other jurisdictions remain silent on the matter or specifically legislate that off-chain records are the presumptive source of truth.

A clear cross-border regulatory and legal framework for tokenized collateral and asset classifications

Digital assets and digital exchanges allow easy access in markets across the globe — if stakeholders, including the regulators, create the right environment and balance to drive demand and encourage the adoption of digital assets while ensuring investor protection for market participants.

To create a conducive regulatory environment, there must be clarity on the **classification of assets and how the issuance and distribution of those assets are treated** in each jurisdiction.

Achieving clarity does not necessarily require uniformity of the rules. Rather, it is the **harmonization of the rules** on how they are applied to digital assets and stakeholders that will lend to greater legal certainty and confidence for tokenized markets.

The harmonization of rules will bring benefits and solve many practical issues when stakeholders are considering the adoption of tokenized assets, such as the following:

- (1) How tokenized assets are treated from an accounting perspective
- (2) How different data privacy laws may come into play globally

How tokenized assets are treated from an accounting perspective

For tokenized assets, like stablecoins or digital assets that form the engine and payment system of digital exchanges, **their treatment from an accounting perspective can be a key practical consideration**.

This is particularly needed for institutions such as banks, which will have practical concerns such as determining whether stablecoins would be merely considered a debt or whether they can be considered cash or cash equivalents.

Under international standards like the Basel III rules, banks, with the exception of custodians, are subjected to higher capital charges for holding tokenized assets backed by algorithms or baskets of riskier assets, among other Group 2-classified Crypto Assets.¹⁷ A global tax environment that acknowledges the ability to issue and trade digital assets, and supports this with clear and conducive tax treatments for the trading and distribution of such digital assets will greatly accelerate demand for and adoption of tokenized assets.

How different privacy laws may come into play globally

As tokenized markets attempt to scale and distribute across different jurisdictions, stakeholders will have to consider compliance with different privacy laws when it comes to investor information and data.

- For example, the **EU's General Data Protection Regulation (GDPR)¹⁸** offers extensive **rights to individuals** and mandates strict requirements, such as (1) the requirement to obtain explicit and informed consent from individuals before processing data, (2) the requirement to notify individuals of the processing of such data according to guidelines of "lawfulness, fairness, and transparency" and (3) the right of individuals to correct or erase their data.
- In comparison, **Singapore's Personal Data Protection Act (PDPA)¹⁹** does not grant individuals the right to request the erasure of data.

Therefore, stakeholders will have to keep in mind the nuanced differences between the treatments of privacy laws across jurisdictions, as they consider how to design the rights and characteristics of tokenized assets. These will affect their tokenized products' ability to be distributed across borders and meet the market demand.

Unlocking Supply: Will Harmonized Frameworks Drive Issuer Confidence?



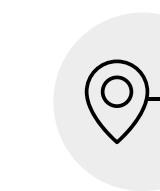


4.2 Unlocking Supply: Will Harmonized Frameworks Drive Issuer Confidence?

For tokenization to scale, issuers are looking for clear regulatory guidelines on issuance, compliance and taxation. Clear regulatory and tax rules that apply to digital assets will drive distribution and scaling of tokenized projects.

Today, there is regulatory fragmentation and jurisdiction specific rules relating to the legal and tax frameworks and digital assets. Would it be possible to create a harmonised framework with clear regulatory treatment and rules? If this is achievable, it could simplify compliance within the digital asset industry, thereby fostering greater confidence and driving adoption.





4.3 The Path Forward: Avoiding The Trap and Accelerating The Tokenization Takeover

The future of tokenized financial markets stands at a pivotal crossroad, where the forces shaping adoption and institutionalization will determine whether tokenization achieves mainstream success or remains a niche experiment.

The risk of the tokenization trap

Several barriers discussed in this paper could hinder the scalability and adoption of tokenized markets, leading to a silent stagnation rather than a financial revolution.

- **Regulatory paralysis and legal uncertainty:** If markets have unclear rules regarding the distribution around the product and investor protection, this uncertainty discourages adoption by both investors and issuers.
- **Lack of secondary market liquidity:** Tokenization cannot thrive without deep liquidity. We need a clear critical mass for markets to reach escape velocity. If market makers remain absent due to unclear capital treatment rules and margin requirements, tokenized markets will struggle to move beyond primary issuance and fail to offer efficient price discovery or active trading venues.
- **Interoperability & Market Fragmentation:** There is no clear frontrunner for the structure of a globally utilized blockchain and tokenized assets fail to reach critical mass across fragmented networks.
- **Investor demand erosion:** If tokenized assets fail to demonstrate superior risk-adjusted returns compared to traditional finance, investors will revert to established asset classes. Without a compelling advantage, tokenization will struggle to gain traction beyond crypto-native communities.

Without addressing these key challenges, tokenization risks being absorbed into traditional finance as a niche tool, rather than fulfilling its promise as a transformative force in capital markets.

The potential for a tokenization takeover

On the other hand, several tailwinds indicate that tokenization **could still take off and reshape financial markets**.

- **Conducive regulatory environments and cross-border collaboration:** If regulators harmonize rules on asset classification, distribution and collateral use, tokenized assets could be integrated into mainstream financial markets usage.
- **Institutional-grade market infrastructure, products and liquidity support:** In order for the tokenized market to scale liquidity and adoption, there is a need for financial institutions to shape a common, trusted tokenization operating model that facilitates asset portability and integration with global liquidity pools.
- **Integration with traditional finance and decentralized finance:** The ability to use tokenized assets as high-quality collateral in repo markets, prime brokerage and lending will drive institutional adoption. If financial institutions can bridge DeFi mechanisms with traditional financial services, tokenized markets will achieve higher capital efficiency and greater market depth.
- **Global demand shifts and new investor profiles:** A generational shift in wealth, combined with growing adoption in emerging markets, could drive sustained demand for tokenized assets. Younger investors are more comfortable with digital financial products, and markets with limited traditional banking infrastructure are more likely to leapfrog into tokenized finance.

If these trends accelerate, tokenization could fundamentally reshape capital markets, democratizing access to investment opportunities, enhancing efficiency and unlocking new asset classes for global investors.

The catalyst — a collaboration of decentralized finance and traditional finance

The transition to a **fully functional, liquid and institutionalized tokenized market** will not happen overnight, but the **building blocks are already in place**.

The success of tokenized markets hinges on collaboration between all stakeholders in the tokenized market in a hybrid-collaboration model that can ensure cost efficiency, liquidity and better risk management.

Fintech firms and NBFIs should leverage their specialization in digital markets, focusing on innovation and technical issues surrounding digital markets. Meanwhile, traditional banks can provide the established financial infrastructure, liquidity and access to demand that will be crucial for integrating digital markets with established financial systems.

Naturally, regulators must play a crucial role in fostering a secure and resilient tokenized market ecosystem that is able to support institutional adoption at scale. They must continue to develop and deliver harmonized compliance frameworks that can be applied seamlessly across jurisdictions. These frameworks should cover all aspects of tokenization products, platforms and services (i.e., financial compliance, tax and data privacy), enabling tokenization projects to integrate and scale effectively and consistently across different regions.

Whether tokenization becomes a core component of financial infrastructure or a fragmented, underutilized innovation will depend on **industry-wide collaboration to develop an interconnected ecosystem with common operating rules to preserve token fungibility, regulatory modernization and a commitment to solving fundamental liquidity and adoption challenges**.

By bridging the best of traditional finance and digital finance, the industry has a chance to reshape the financial landscape, making capital markets more accessible, efficient and meaningful to investors as well as dynamically future-proof.

The question now is will we be able to seize this opportunity to accelerate tokenization adoption or risk letting it fade into stagnation?

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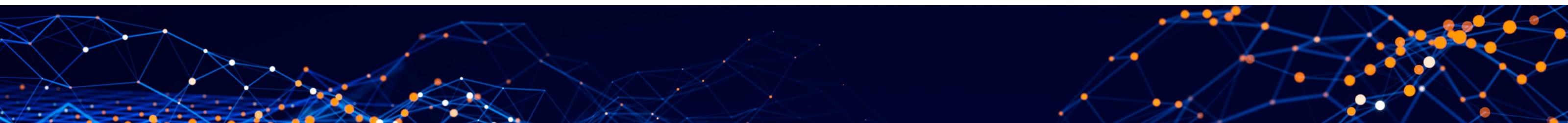


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