

Tokenization of Real-World Assets

Unlocking a New Era of
Ownership, Trading, and
Investment



Tokenization will revolutionize the way we fund, trade, and manage assets. It is expected to disrupt nearly every industry and sector of our modern society – from investing and asset management, through manufacturing to real estate or even art. We conservatively estimate that the total market value of tokenized assets will significantly exceed USD 10 trillion by 2030. In this article, we lay out the basics of tokenization, share our view on the main use cases, as well as discuss what you need to consider for your business.

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What is tokenization?

Tokenization promises to redefine asset ownership and investment and we might just be on the cusp of a major breakthrough in its global adoption. The technology may radically overhaul traditional frameworks of investment and ownership, significantly lowering transaction costs, bringing transparency and greater liquidity into the equation. In broadening access to investments, we are not merely changing how we view property, commodities, and value, but how we interact with these crucial elements of our economic systems. The tokenization of real-world assets isn't a thing of the future; it's happening now. And it's setting the stage for a financial ecosystem where digital tokens stand for real-world assets, making them more accessible than ever before - not only to the privileged or institutional investors, but to the public at large. ▶ **A**

A Asset universe eligible for tokenization is not limited to equity shares or bonds only

 Financial Assets	 Real Estate	 Infrastructure	 Collectibles & Art	 Entertainment & Gaming	 Data
<ul style="list-style-type: none"> • Public Equity • Private Equity • Debt • Investment Funds • Commodities 	<ul style="list-style-type: none"> • Commercial • Residential • Real estate funds • Real estate debt • Land • Real estate development projects 	<ul style="list-style-type: none"> • Energy infrastructure & renewables • Transportation infrastructure (e.g. airports) • Oil & gas fields • Water and wastewater infrastructure • Communication infrastructure 	<ul style="list-style-type: none"> • Fine Art • Rare Books, Coins or Stamps • Cars • Watches • Jewelry • Handbags 	<ul style="list-style-type: none"> • In-game assets and virtual goods • Intellectual property and royalties • Gaming platforms and infrastructure • Esports and event-based tokens • Digital art and non-fungible tokens (NFTs) 	<ul style="list-style-type: none"> • Personal • Financial goods • Energy • IoT • Weather

Real Life Examples					
Major US PE firm...	Well-known hotel brand...	Innovative renewable energy marketplace...	Germany-based platform...	NFT marketplace...	Decentralized data exchange platform...
...tokenized its Health Care-orientated fund	...tokenized a well-known hotel resort in Aspen	...has been used to fund multiple tokenized renewable projects	...democratized luxury goods investment via	...helped broker digital art and IPs related to gaming or eSports	...enabled secure and transparent exchange of data

Source: Roland Berger

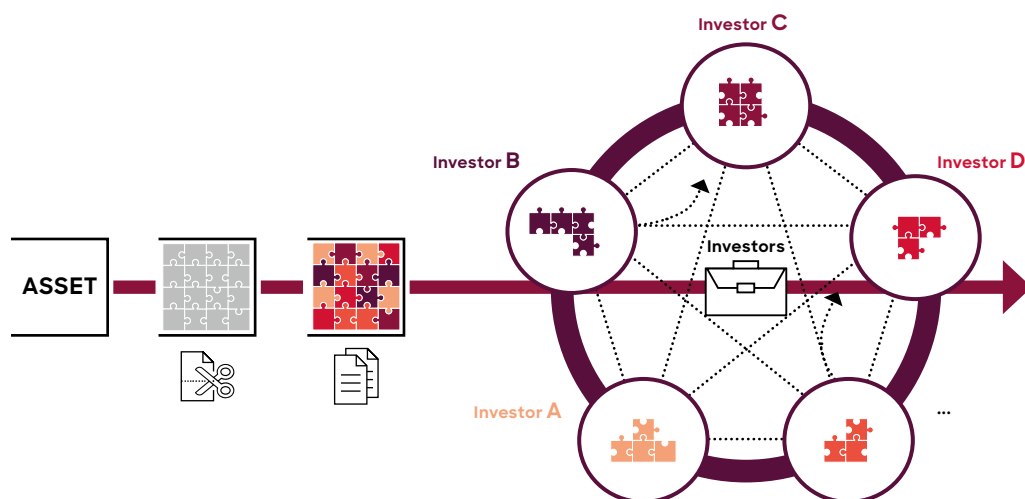
What, then, is the best way to define tokenization? The term 'token' has a long history (predating digital technology) with varying connotations and definitions, which sometimes make it difficult to pin down the exact meaning. In the context of this report, a token represents an asset in digital form, combined with information and assignable digital rights, all of which are connected in a programmable and automated manner. Tokens can represent either tangible physical assets or intangible assets—they can represent a share or the entire asset. It could be anything, from real estate, company shares, bonds, or even a work of art. The token, existing on the blockchain, represents ownership of this asset. This way, assets that were previously hard to divide or trade can now be easily managed and transacted.

According to the World Bank, as many as 1.7 billion people do not currently have access to financial services. This means that they do not have a bank account, credit card, or other financial products that allow them to save, borrow, or invest money. This lack of access to financial services can have several negative consequences, leading to overall increased vulnerability to poverty and financial hardship.

Tokenization can be one of the solutions for this problem, as it enables access to investments for many people who are currently unbanked by reducing barriers to entry. Previously illiquid assets, as well as assets that historically had high investing thresholds (e.g., private equity funds) are becoming more accessible through: ► **B**

1. breaking them into pieces (fractionalization); and
2. making them accessible beyond borders (where they are located or traded).

B Fractionalization of assets that would have normally been illiquid will promote trading and improved price discovery



Source: Roland Berger

Tokenization not only expands opportunities that were once limited by geographical or financial constraints but also enhances the accuracy and timeliness of asset pricing. Assets that were previously illiquid now experience increased trading activity. Moreover, institutions explore tokenization primarily for the following reasons:

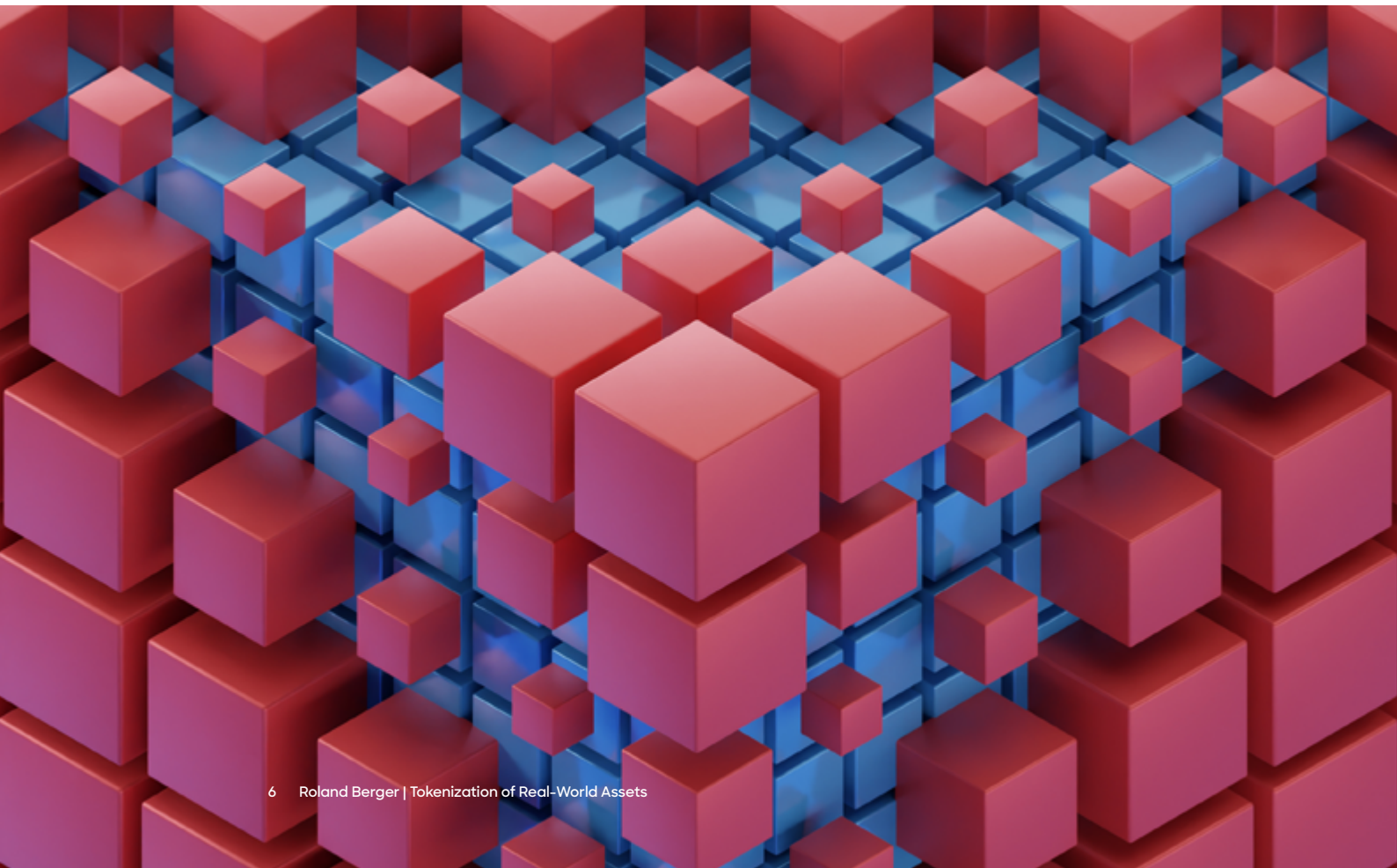
1. Significantly boosting liquidity, accessibility, and transaction speed, resulting in reduced ownership and transaction costs.
2. Enabling fractional ownership by allowing more people to participate in investment opportunities that were previously inaccessible.
3. Enhancing security through increased transparency, as tokenized assets are recorded on a blockchain, which provides a transparent and immutable record of ownership.

B A 10+ trillion-dollar market opportunity

We firmly believe that asset tokenization will grow to become a market worth at least USD 10 trillion by 2030, representing a 40-fold increase in the value of tokenized assets from 2022 to 2030. This would mark a significant rise from the current value of around USD 300 billion. Our estimate of the market size is based on our proprietary analysis:

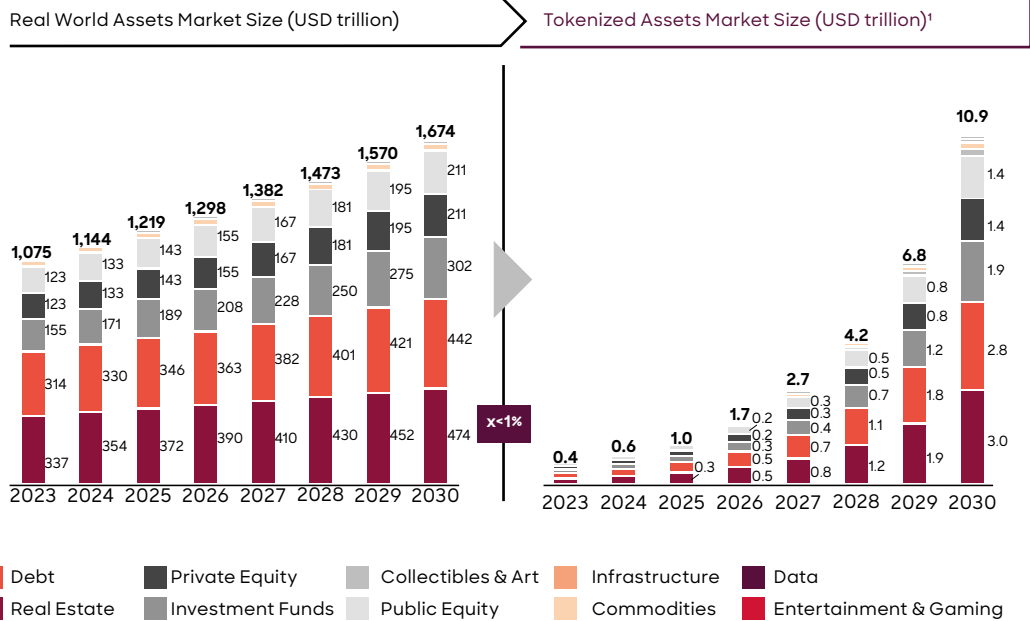
1. we collected **current data on market values** across public and **private equity, debt, real estate**, and other asset categories relevant for tokenization; and
2. we have applied **conservative growth rates** going forward (**from 2% to 8%**) for asset values and multiplying these by a **share (%) likely to be tokenized (up to 1%)**

Real estate and financial assets (including equities, bonds, investment funds) are likely to dominate the tokenized market due to the sheer size of the underlying markets and the high prevalence of use cases. ▶ **C**



C We estimate that the value of tokenized assets will reach at least ~\$10.9 trillion by 2030, with Real Estate, Debt and Investment Funds being the Top 3 tokenized assets

What is the future market potential?



¹) Roland Berger Conservative Forecast - Assumes <math>< 1\%</math> of RWA will be tokenized.
Source: Roland Berger

REAL ESTATE AND FINANCIAL ASSETS:

- debt (digital bonds)
- investment funds
- private equity
- public equity
- and commodities

...will dominate the tokenized market given the size of the underlying markets and high use case prevalence



Will tokenization disrupt your sector?

Whether you are an executive at an industrial conglomerate or a chief investment officer at an asset management firm, you may be missing out if you haven't yet developed your firm's tokenization strategy.

Asset tokenization is not merely confined to real estate or securities. The universe of eligible assets also includes infrastructure, collectibles & art, entertainment & gaming, and data. This broad range of assets means that virtually any form of value can be digitally represented and easily transferred.

Hence, tokenization offers opportunities and potential benefits to virtually everyone, **from individual retail investors** who previously couldn't access certain investments **to corporations across various sectors** that can now easily access the debt markets by issuing digital bonds on-chain.

Major institutions, including leading fund groups, have already embraced the potential of tokenization and tokenized some of the funds under their management.

Several real-life use cases highlight the vast potential of tokenization. For instance, in September 2022 a **major US PE firm** opened a portion of its **USD 4 billion healthcare-orientated fund for tokenization on the Avalanche blockchain**. This allowed investors with a fraction of wealth typically required to participate in the fund to access its returns – **bringing about more financial equality**.

Another prominent example included **a leading German industrial player issuing a €60 million digital bond on the Polygon blockchain in February 2023**, selling it directly to three institutional investors, bypassing intermediaries (typically banks). A recent development involved the international hotel chains, who took a similar approach, raising funds for their newest hotel in Georgia (the country) by tokenizing their project. ▶ **D**

KEY REASONS FOR TOKENIZATION (COMPANY STAKEHOLDER PERSPECTIVE):

- **No intermediaries**
- **Faster settlements**
- **Access to more non-institutional investors**
- **Opportunity for SMEs to raise capital without debt financing**
- **Lower issuance costs**
- **Paperless, public registry**
- **Benefit from efficiency gains of tokenization**

D It is expected that the tokenization of real estate investments and digital bonds will be the dominant use-cases going forward

What are some of the key tokenization use-cases?

	Real Estate	Digital Bonds	Investment Funds	Public Equity
Company	Leading hotel chain	German industrial player	Major US PE firm	Swiss private bank
Addressable Market¹ Size (2023)	USD 337 trn	USD 314 trn	USD 155 trn	USD 123 trn
Key Examples	Leading hotel chain seeks to implement a technological program that will allow it to innovate in the sector, expand its operations and boost the fragmentation model of real estate investments through Blockchain technology	A German industrial player issued a EUR 60 mn digital bond on the Polygon blockchain, selling the bond directly to three institutional investors without requiring an intermediary bank	Major US PE firm opened up part of its USD 4 bn Health Care-orientated fund to be tokenized on the Avalanche blockchain, granting access of the asset class to investors with a fraction of the wealth normally required	Swiss private bank tokenized its own shares, becoming the first bank to issue shares as ledger-backed securities and doing so in accordance with standards set by Swiss regulatory bodies
Key Benefits	Increased accessibility and transparency Trading through registered system Blueprint for future real estate tokenization	Removed intermediaries Paperless Lower transaction costs Faster settlement speed	Access to more investors Way for individual investors to diversify their investments Lower costs	Liquidity for SMEs Increased access to investors for SMEs Exposure for investors to traditionally inaccessible markets Removal of middlemen
Quotes	Our tokenization platforms' smart certificates can be fragmented without prejudice to the property's real value. Once fragmented, they grant each owner a digital copy and a unique key, ensuring that each owner receives their dividends automatically	By moving away from paper and toward public blockchains for issuing securities, we can execute transactions significantly faster and more efficiently than when issuing bonds in the past	With its ability to digitize operational inefficiencies and increase ease of use for individual investors, blockchain technology has the potential to play an important role in the future of private markets	Our vision is to make it possible for our clients to take full advantage of [the] rationalization and efficiency gains that the distributed ledger technology offers in this field
	Founder, US Tokenization Platform	Corporate Treasurer, German industrial player	Managing Dir. & Co-Head, Major US PE firm	Deputy CEO, Swiss private bank

Source: Roland Berger

We believe that the following five segments of the economy stand to benefit the most from implementing tokenization in their daily operations and, as a result, should develop their tokenization propositions in the near future.

Five segments of real economy most apt for tokenization:

1

Financial Services

There seem to be endless tokenization use cases within the Financial Services industry, including services related to investing in tokenized assets such as custody, training, and advisory. Among these, blockchain-based payment methods, including stablecoins and tokenized deposits, appear to be the most disruptive.

2

Industrials (incl. Manufacturing, Construction, and Waste Management & Recycling)

In the industrial sector, tokenization enables the tracking of the entire product lifecycle, including the recording of vital data such as origin and ownership, thereby optimizing inventory management and response to recalls. Moreover, it contributes to supply chain transparency and supports the development of a circular economy by providing essential data for efficient recycling and waste disposal.

3

Energy & Utilities

Tokenization in the Energy & Utilities sector streamlines financing and sustainability tracking. For renewable energy projects, it democratizes investment opportunities,

enhancing liquidity and transparency. Small investors can directly fund projects, while secondary market trades boost liquidity. For sustainability, blockchain offers an immutable ledger for carbon offset certificates, ensuring uniqueness and preventing double counting. These tokenized certificates can be traded in decentralized marketplaces, facilitated by smart contracts that automate validation and issuance based on predefined criteria.

4

Public Sector

Creating secure digital identities for citizens and streamlining access to government services may be one of the fundamental applications of tokenization. This would enhance the transparency and traceability of government assets, ensuring responsible usage. Furthermore, the technology could be broadly utilized to facilitate the secure and transparent distribution of benefits and subsidies. Voting system integrity could further be enhanced through the issuance of unique tokens to eligible voters.

5

Real Estate

There is a significant potential in the real estate sector – tokenizing properties creates a new venue for trading real estate, dividing ownership into multiple shares that can be bought and sold with an immediate effect in a liquid market. This has the potential to democratize access to real estate investment, enabling more people to participate and trade properties (or their shares).

D

What is holding it back?

The development of tokenized real-world asset markets faces several key challenges. One major obstacle is that this technology has not **yet reached mainstream adoption** due to its novel and complex nature.

Further complicating matters is the **absence of clear and consistent regulations** governing tokenized assets, which discourages potential participants and slows the development of these markets. Nevertheless, on a global scale, jurisdictions have adopted distinct regulatory approaches, and we have noted similarities in these approaches – **distilling following key success factors:**

1. **Clear regulatory framework** – Clear definitions for different types of digital assets and avoidance of ambiguity and facilitation of regulation compliance.
2. **Stablecoin regulations** – One of the regulatory challenges presented by stablecoins arises from their primary objective of maintaining a stable value. To address this challenge, issuers must maintain adequate reserves to back the coins effectively.
3. **Market accessibility** – Ensuring that all participants have fair access to the market, in alignment between international rules and local standards for seamless cross-border transactions.
4. **Technology governance** – Incorporating standards for system performance, data quality, and data privacy, to ensure secure and reliable technology.
5. **Risk-based approach** – Ensuring that regulatory measures are proportionate to the risks arising from digital assets through targeted regulation focused on areas with the highest potential harm. ▶E

E Although globally jurisdictions have varied regulatory approaches, we note similarities in their approaches – distilling following key success factors

Key success factors for legislation

1 Clear regulatory framework	2 Stablecoin Regulations	3 Market accessibility	4 Licensing and compliance requirements
<ul style="list-style-type: none"> Clear definitions for different types of digital assets Avoidance of ambiguity and facilitation of regulation compliance 	<ul style="list-style-type: none"> Regulatory challenge posed by Stablecoins due to the goal of maintaining a stable value Ensure that issuers have sufficient reserves to back coins 	<ul style="list-style-type: none"> Ensure that all participants have fair access to the market Alignment between international rules and local standards to ensure seamless cross-border transactions 	<ul style="list-style-type: none"> Necessity to outline the licensing requirements Provision of clear guidelines for the acquisition of licenses, obligations and penalties
Digital Assets Legislation			
<ul style="list-style-type: none"> Inclusion of Anti-Money Laundering (AML), Counter-Terrorism Financing (CFT), Know Your Customer (KYC) measures and monitoring 	<ul style="list-style-type: none"> Protection of investors from unfair practices Implementation of measures to improve disclosure transparency, custody of digital assets, and recourse mechanism 	<ul style="list-style-type: none"> Inclusion of standards for system performance, data quality, data privacy, to ensure secure and reliable technology 	<ul style="list-style-type: none"> Ensure that regulatory measures are proportionate to the risks posed by digital assets through targeted regulation focused on areas with highest potential harm
5 AML/CFT controls	6 Consumer protection measures	7 Technology governance	8 Risk-based approach

Source: Roland Berger

Lastly, **the limited understanding of blockchain and tokenization**, among both the general public and professionals, has historically hindered trust and adoption. However, we believe this trend is gradually changing and evolving towards greater understanding and acceptance.



How can you start your tokenization journey?

Embarking on your tokenization journey is no different than taking the first step of any major endeavor. We propose initiating our collaboration by offering you a tokenization-readiness workshop, designed to assess and identify the initial tokenization potential within your organization. Following this assessment, Roland Berger can provide comprehensive support in the development of a robust tokenization strategy and the execution of relevant use cases.

We partner with leading tokenization technology providers across numerous jurisdictions, ensuring that the chosen technology aligns seamlessly with your unique use case roadmap. It's important to note that the tokenization journey is not a winner takes all situation, but rather an arena where the first mover often enjoys a substantial advantage.

Reach out to us today to start your journey and get ahead of the competition.

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