

Tokenization of Real-World Assets (RWA)

Opportunities, Design Choices and
Challenges



01

Introduction to RWA tokenization



What is it ? How does it work ? What are the advantages ?

What is RWA tokenization ? How does it work ?

The basic idea = to divide a real-world asset into small digital pieces (tokens), so that many people can invest in it



Step 1

Define what the tokens represent: a right to receive part of the rent, part of the profit if the building is sold, ...



Step 2

Fractionalization: the rights are split into many small units (tokens)



Step 3

Blockchain registration: tokens are registered on the blockchain



Step 4

Investment and returns: Investors can buy tokens and automatically receive incomes

What are the advantages of RWA tokenization ?



From the investors' point of view

Accessibility

- Fractionalization make it easier to invest smaller amounts

Increased liquidity

- It is easier to buy or sell a small fraction of an asset than to trade the entire asset

Simplified exchanges

- No heavy administration

From the asset owners' point of view

Flexibility

- The asset owner decides what the tokens represent

02

Tokenizing a Real World Asset



Technical design decisions
Business design decisions

Technical Design Decisions

01

Choice of blockchain infrastructure

Public permissionless blockchains
OR

Permissioned / consortium blockchains

⇒ Trade-off: openness and liquidity vs regulatory control and privacy

02

Token standard selection

ERC-20: simple, highly compatible, liquid but not designed for regulated securities.

ERC-3643: particularly suitable for regulated assets like real estate.

⇒ Trade-off: simplicity vs built-in compliance

03

Smart contract architecture

Smart contracts define how the asset operates on-chain.

Typical components include:

- Issuance contract
- Transfer control logic
- Corporate actions automation

⇒ Tradeoff: efficiency through automation vs operational risk

Business Design Decisions

01

Legal wrappers

In most jurisdictions, you do not tokenize the building itself but a legal entity owns the property & tokens represent shares or claims on that entity.

According to the OECD, tokenization does not eliminate the need for legal structures, investor protection, and accountability mechanisms.

02

Investor eligibility

Real estate securities are usually regulated & projects must decide:

- Retail investors vs accredited investors.

- KYC & AML requirements are regulatory procedures that financial institutions use to verify client identities and prevent illegal financial activity.

03

Liquidity constraints

Tokenization promises improved liquidity but real estate remains inherently illiquid.

Possible mechanisms:

- Lock-up periods
- Transfer restrictions
- Whitelisted marketplaces

03

Key challenge:
Identity management
through Zero-
Knowledge proofs



What are ZK proofs ? How does it work ? What are the limitations ?

ZK proof - what is it ? how does it work ?

A **Zero-Knowledge proof** allows someone to prove that a statement is true without revealing the underlying information.

Example: proving that you are over 18 without showing your entire ID/private information

01

Identity verification = off-chain

A third party performs KYC and issues a cryptographic proof that says things like:
"KYC passed"
"Resident of EU"

⇒ The **proof is stored in the investor's wallet**

02

The **investor's wallet creates a ZK proof** that confirms only what is needed:

"I passed KYC"
"I'm allowed in this jurisdiction"

03

The investor **submits the ZK proof to the smart contract** = it verifies compliance without accessing personal data

ZK proofs - Limitations

Need for intermediaries

For identity checks, audits, and regulatory supervision



Computing power

ZK proofs require significant computing power



Complexity

If underlying cryptographic rules are badly designed or incomplete

⇒ Attackers may be able to generate fake proofs



04

Institutional
Perspective: Role of
third parties and
limits of RWA
tokenization



View of International Organizations
Role of trusted third parties
Structural Limits of RWA Tokenization

View of International Organizations



OECD perspective

The OECD considers tokenization as an evolution of financial market infrastructure rather than a complete disruption. It highlights several potential benefits such as:

- Improved market efficiency
- Reduced administrative and operational costs
- Greater transparency
- Facilitation of fractional ownership
- Broader investor access



BIS perspective

The Bank for International Settlements adopts a cautious but optimistic stance toward tokenization. The potential improvements identified are:

- Modernization of settlement systems
- Reduction of reconciliation processes
- Programmability of financial instruments
- Faster collateral mobility
- Operational efficiencies across market infrastructure

Role of trusted third parties



Custodians

- Ensuring the property is properly held by the SPV
- Protecting investors against fraud or misappropriation
- Maintaining asset security



Legal authorities

Property ownership is defined by national land registries rather than blockchains.

Implications:

- Blockchain records cannot override state law.
- Courts resolve disputes.
- Property transfers must comply with national legal procedures.



Property managers

Operational performance, which directly impacts investor returns, depends on traditional real estate professionals.



Auditors and data providers

Because real-world assets exist off-chain, third parties are necessary to verify key financial and operational information such as:

- Property valuation
- Financial statements
- Rental income
- Debt exposure

Structural Limits of RWA Tokenization

➤ Legal fragmentation

- How do regulatory differences affect tokenized assets?
- Do tax rules and investor restrictions limit cross-border investment?
- Can tokenization scale globally despite regulatory fragmentation?

➤ Technological and operational risks

- Do smart contracts create new technological risks for investors?
- How does the irreversibility of blockchain transactions amplify these risks?
- Does greater automation require stronger safeguards to ensure financial stability?

➤ Liquidity may be overestimated

- Does fractional ownership truly improve liquidity, or does it still depend on market demand?
- How do real estate cycles and macroeconomic conditions affect tokenized assets?
- Can tokenization deliver real liquidity, or does it risk creating the illusion of it?

➤ Persistence of intermediation

- Does tokenization eliminate intermediaries, or simply transform their roles?
- Why do financial systems still rely on trusted institutions despite technological automation?
- Is tokenization truly disintermediating finance, or modernizing existing infrastructure?



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