

# The role of — securitization in tokenized ● ———— assets

Crypto  
- Adoption .  
Curve

## Executive Summary

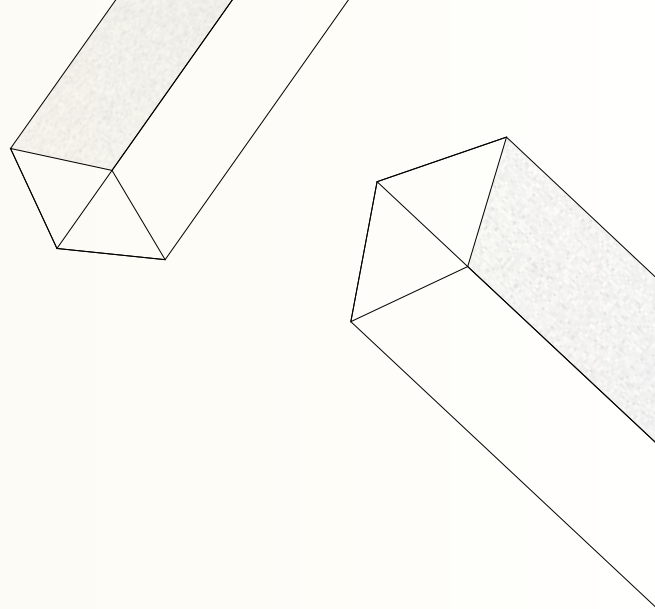
From automating time-consuming and error-prone manual reconciliations to instantly enforcing financial logic across geographies and timezones, tokenization is bringing a tidal wave of transformational changes to financial markets and operational processes.

That opportunity potential is attracting an increasing number of asset issuers to use tokenization to bring assets onchain. Hundreds of millions of assets, including trade finance, SME receivable financing and US property bridge loans, have already been tokenized or securitized onchain.

As the available set of assets expand, more and more institutional sized participants, from both traditional and crypto worlds, are deploying capital onchain to capture tokenization's various benefits.

Benefits of tokenization include spelling settlement, auditable transparency, programmability and composability and not only allow hundreds of billions of operational structural gains a year, they also enable new products and more efficient markets to form.

Utilizing data from institutional studies and tokenization transactions on blockchains, this report lays out a framework for readers to leverage to understand tokenization's problem-solution space, market disruption potential as well as immediate and longer-term growth drivers.



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# #1

## What is ● tokenization?

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Tokenization is the process of representing claims digitally on a programmable platform. For example, as opposed to having your house's title deed registered at the land office registry and in its database, you can have it represented on a blockchain.

Why a blockchain? In contrast to traditional database systems, tokenized ledger systems (i.e. blockchains) are far more efficient in their speed and cost while allowing for far greater innovation and ingenuity.

## Traditional Databases vs Programmable Blockchains

In traditional database systems, intermediaries, such as account managers and bank databases, are entrusted with maintaining and updating an accurate record of ownership according to a set of legal, operational and financial rules.

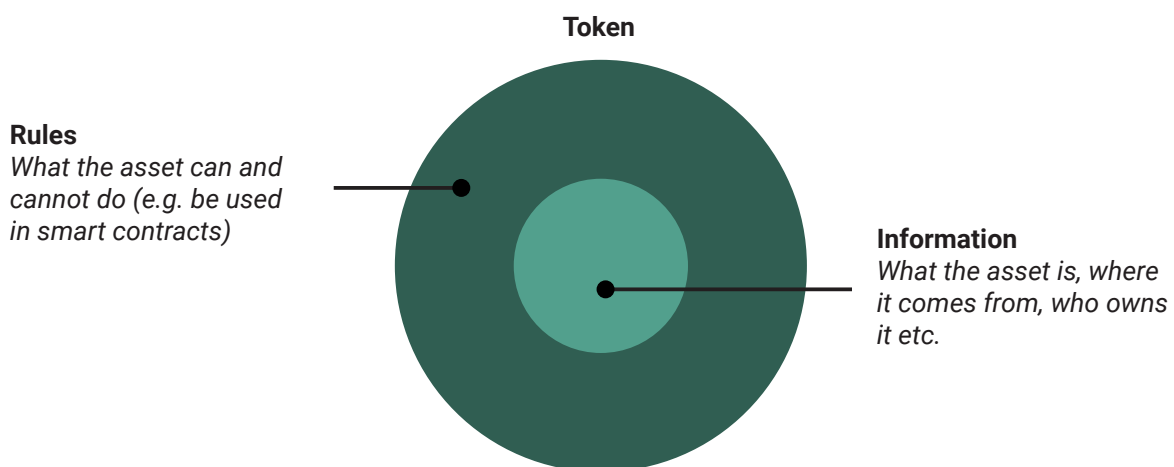
For example, when you make a trade through your brokerage account app, the broker needs to update its database of what stock you own, the bank or a trading house needs to update their records and the clearing house needs to update their record for the trade to "settle", i.e. all financial records at relevant parties showing the change of ownership of the stocks from the previous owner to you. The magic happens when we realize that these rules are simply "if, then" statements in computer programming.

Using blockchains to execute these "if, then" statements vastly collapses the human and financial cost involved in recordkeeping while drastically improving efficiency.

In a blockchain system, money or assets become digital objects called tokens that have financial logic built into them. Tokens can be transferred through the execution of programming instructions issued by system participants without the intervention of an account manager or intermediary.

This capability of having financial, legal and operational logic built into what tokenized assets can or cannot do is the fundamental difference between the tokenized system and a traditional ledger system.

### Tokens both define assets and specify what can be done with them



Source: [Bank of International Settlements](#)

# #2

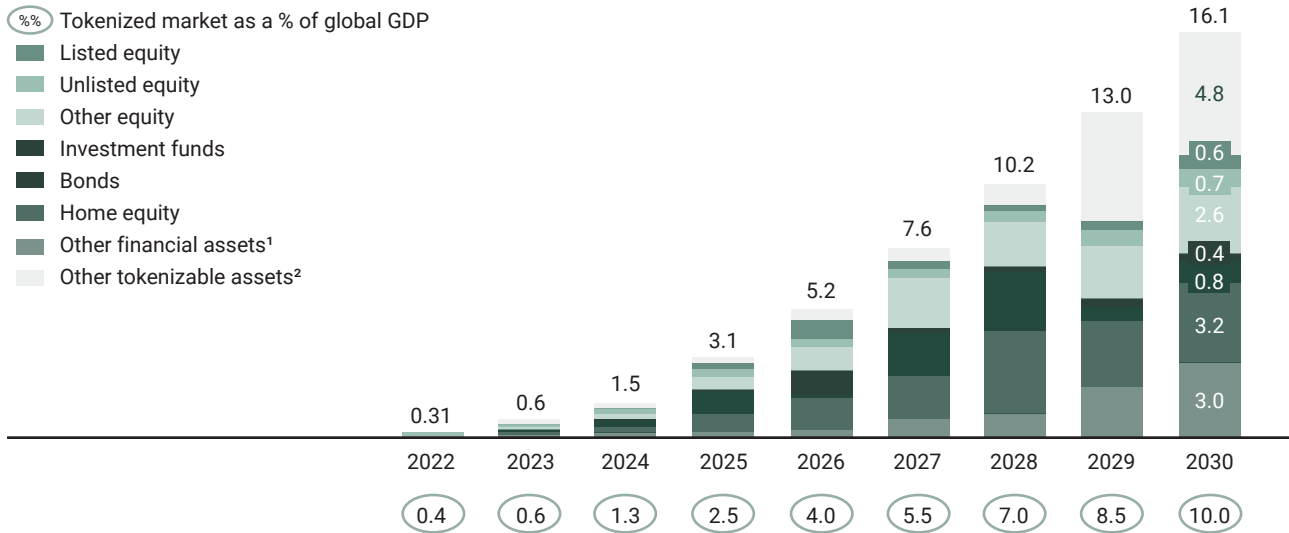
## Tokenization market size —

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Tokenization of real-world assets (RWA) has been heralded as a key driver for institutional adoption of crypto and blockchain. From asset managers, such as KKR and Franklin Templeton to banks, such as Standard Chartered and J.P. Morgan, institutional players around the world are looking at the ways to capture this transformational opportunity. Just how big is this opportunity?

According to a study done by the Boston Consulting Group, the total value of tokenized assets is projected to reach \$16.1 trillion by 2030.

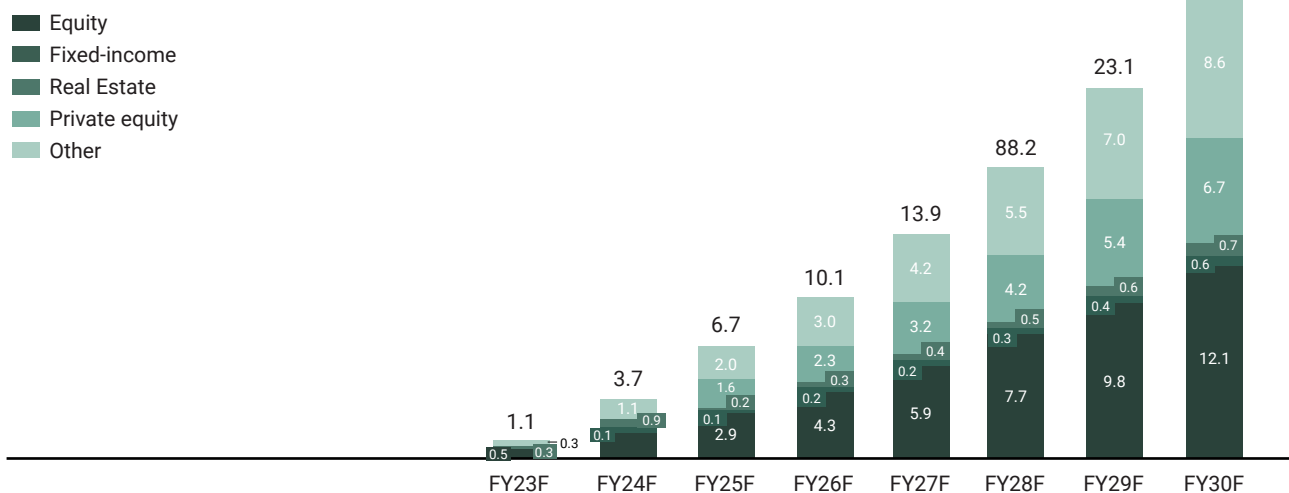
### Total projected value of tokenized assets, in \$tr



Source: [Boston Consulting Group](#)

Another study from EY-Parthenon estimates institutional investors are projected to allocate 7.2% of their portfolios to tokenized assets by 2027. This translates into \$13.9 trillion in total tokenized asset value by 2027.

### Asset tokenization market forecast (FY23B-FY30F), in \$tr



Source: EY-Parthenon

According to RWA.xyz, the value of all tokenized real-world assets, including public and private credit, stands at \$4.3 billion.

**This is but a mere 0.04% of BCG's \$10.2 trillion projected value by 2027 or 0.03% of the EY-Parthenon's \$13.9 trillion projection figure. Of course there is no guarantee that we will reach the projected numbers. However, the opportunity set is large and asymmetric.**

# #3

## What benefits does tokenization bring? —

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There are four core benefits deriving from a blockchain system:

1. Near instant settlement speed
2. Transparent auditability
3. Programmability
4. Composability

### **Near instant settlement speed**

Because blockchain transactions settle every few seconds or faster depending on the specific blockchain, transactions based on blockchain settle much faster than they do in traditional processes that rely on intermediaries consisting of people, processes and databases.

With further technological advances, such as sharding and layer 2 blockchains, transaction speed is only set to improve further in the future.

### **Transparent auditability**

Instead of time-consumingly resolving reconciliation errors and bad data in days or weeks, blockchain's immutability allows relevant stakeholders to have instant access to a single source of truth as data recorded on the blockchain. This allows a complete auditable trail of transactions.

With privacy enabled access, regulators as well as service providers such as rating agencies and loan servicers can have full confidence in the data they have at hand.

### **Programmability**

Due to blockchain's programmability, all the tasks of the intermediaries are automated by embedding financial, legal and operational "if, then" rules programmatically in a token.

The whole transaction and settlement process is now measured in seconds instead of hours or days or weeks. Blockchains make transactions of tokenized assets much faster and efficient.

### **Composability**

Composability on a global programmable blockchain such as Ethereum or Polkadot affords the ability for different assets to interact with each other in an automated fashion and in accordance with their predefined financial, legal and operational rules instantaneously.

This would enable new financial products and markets and provide services more seamlessly to clients.

#### **EXAMPLE**

Imagine a \$500 million loan is issued to a middle market corporate borrower through a syndicated loan market with 10 participants on a blockchain. The transaction is finalized and settled onchain in a few seconds by paying a \$5 fee. The ownership of the loan is recorded onchain in the process through the use of tokens representing participants' share in the loan asset.

Then, the tokenized loan asset can be programmed to be able to interact with the rest of the decentralized financial ecosystem by adding logic such as "this token can be pledged as collateral on Aave Arc, an institutional lending market with a KYC/AML process, at a LTV of 45% to access instant USD liquidity" or "this token representing ownership can be deposited into a real-world asset tokenization platform such as Centrifuge and the cash flow of the loan is further tranching and structured and sold to KYC'ed investors with a minimum investment of \$50,000"

Of course, it is also possible to borrow against these loan positions in the real world, but can that be done at the speed of a blockchain transaction? In traditional finance, liquidity needs to be sourced for this specific loan from a hedge fund or trading desk. Onboarding processes need to be done with legal and compliance persons.

The whole process will take days if not weeks. Whereas in a tokenized world, the whole process can be done in seconds.

## Potential benefits from tokenization, by stakeholder type, nonexhaustive

	Asset owners		Service providers		Investors	
	Revenue type	Cost efficiency	Revenue opportunity	Cost efficiency	Revenue opportunity	Cost efficiency
<b>Improved capital efficiency</b> Lower cost of capital and free up capital in transit					✓	✓
<b>Democratization of access</b> Access to new secondary markets: greater liquidity					✓	
Access to new pools of capital with lower minimum investment required	✓					
<b>Operational cost savings</b> Opportunities to embed manual and error-prone product-structuring and asset-servicing tasks into the token smart contract and eventually across a portfolio		✓		✓		✓
<b>Enhanced compliance, auditability, and transparency</b> Embedding of rules and credentials into the token smart contract (eg, investor qualification, carbon credit verification)		✓		✓		✓
<b>Cheaper and more nimble infrastructure</b> Open-source technology driven by thousands of Web3 developers and billions of investment dollars		✓		✓		✓

Source: [McKinsey](#)

Operational cost saving, enhanced compliance, auditability and transparency and access to new pools of capital are some of the key structural efficiency gains McKinsey has identified for asset owners, service providers and investors.

# #4

## The role of tokenization in securitization —

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Securitization has emerged as the clearest adoption trends so far. Both traditional and crypto-native institutions have been exploring the best setups for adoption.

There is however a difference in their objectives. Institutional interest in tokenization of the securitization process is typically due to efficiency gains. Crypto-native interest in tokenization skews more towards capital access.

Let's look at how tokenization helps user groups solve their pain points.

## Tokenization of the securitization process

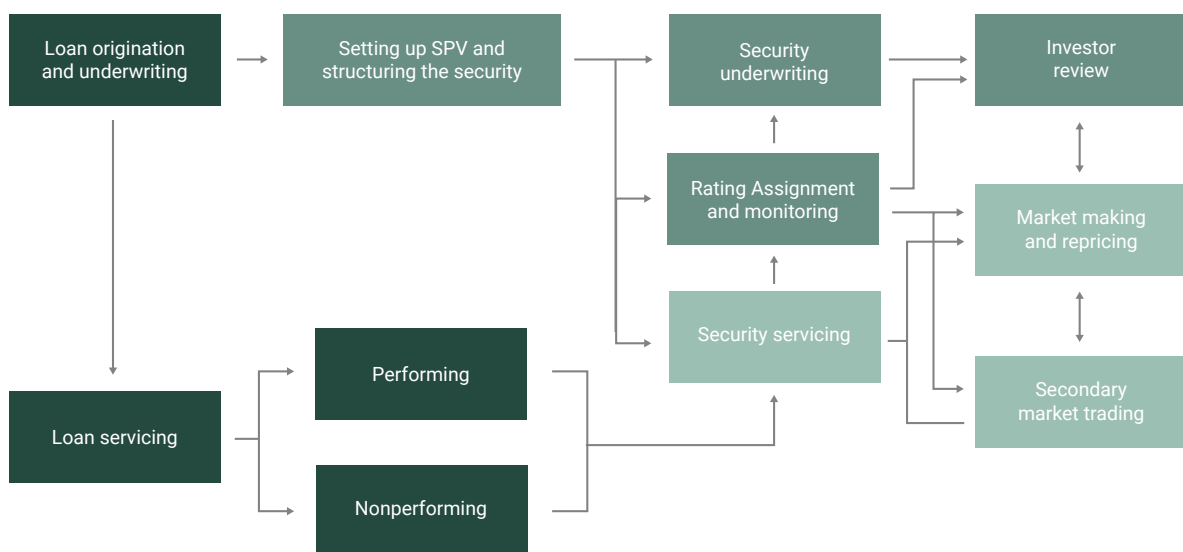
Among the \$51 trillion fixed income assets in the US, securitized products accounted for roughly 1/3. If you take out the treasuries, they will actually account for slightly more than half of the fixed income universe. Securitization technology provides about half of the funding for consumer credit and business credit in the US.

At more than \$15 trillion, securitization is a massive and integral part of the US financial system and economy. Any efficiency gain tokenization brings would prove hugely important for participants involved.

But where exactly in the securitization process are the inefficiencies? Let's take a look.

Below is a chart showing the various steps of a securitization transaction.

### Simplified securitization lifecycle

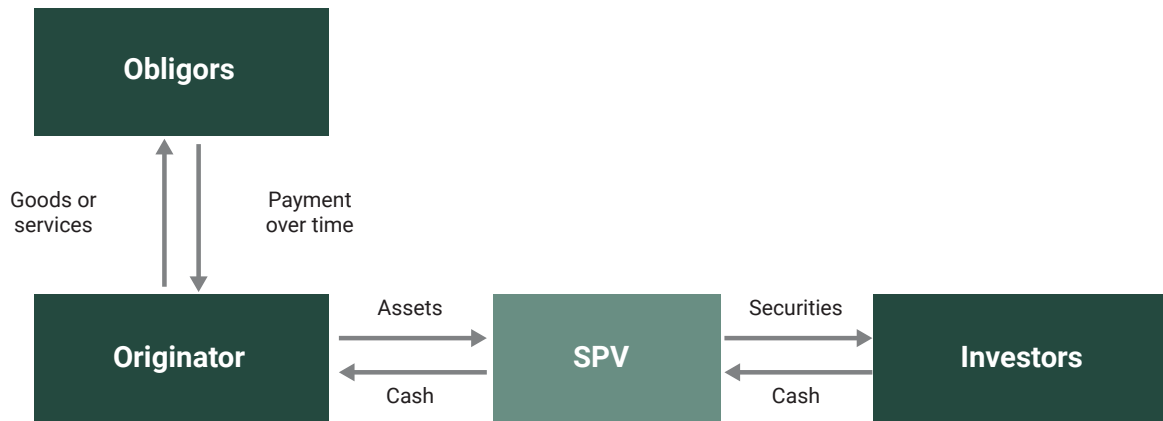


Source: [Deloitte](#)

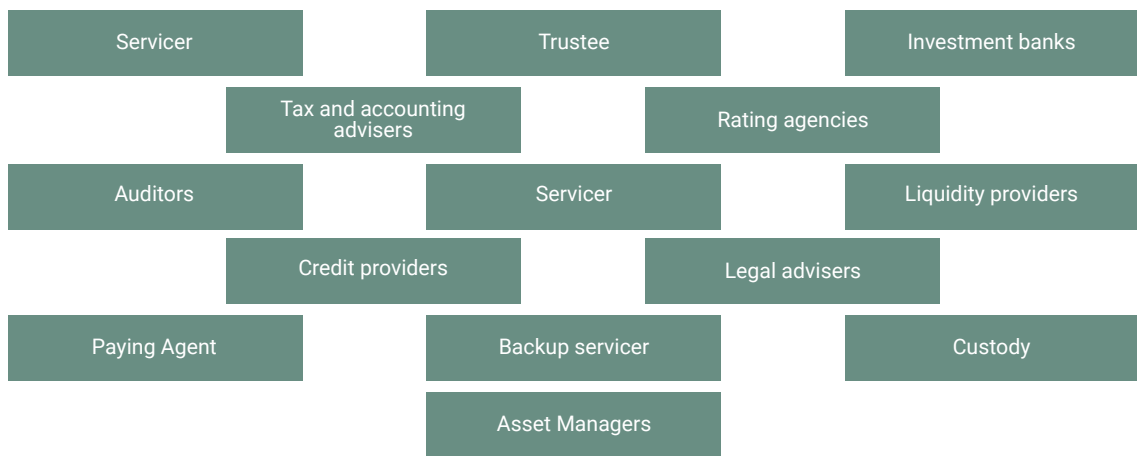
These individual steps in a securitization process can be broadly categorized into five stages:

1. Loan Origination
2. Pre-Issuance
3. Primary market issuance
4. Security custody & servicing
5. Secondary market trading

We can further unpack the stakeholders of this process using the following chart.



**The securitization service providers**



Source: PWC

Now that we have all the players and the production stages of this \$15 trillion industry, let's ask the most important question: how much structural efficiency gains can be generated through tokenization?

If we overlay the two charts together, we can begin to understand and visualize the inefficiencies and improvements made possible through tokenization.

	<b>Lifecycle Stage</b>	<b>Parties Involved</b>	<b>Inefficiencies/ Bottlenecks</b>	<b>Tokenization Improvements</b>
<b>Loan Origination</b>	Securitization lifecycle begins with loan origination, underwriting and servicing	Originators Obligors Servicers	Non-standardized processes and siloed databases of originators and underwriters make reconciliation of data among borrowers, originators/underwriters and servicer <b>time consuming</b> and <b>error-prone</b> .	Loans originated and underwritten onchain have data including applicant credit scores, income statement, repayment schedule and cash flow embedded in their token representations.  For example, financial and operational logic such as issuing a default notice to a servicer can be programmatically embedded in a smart contract that monitors the loan repayment status constantly.  Permissioned ecosystem partners can leverage this information with <b>faster speed</b> and <b>better reliability</b> .
	Originators pool together loans/assets, place them in bankruptcy-remote trusts or special purpose vehicles (SPV) and structure the securities	Originators Banks/ Sponsors Legal Advisers Trustees	The structuring process involves <b>lengthy processes</b> of  • lawyers drafting offering documents • Stakeholders building models and calculating waterfall payments  Much time and resources are spent to reconcile and verify data validity. Any error in data validity would result in multiple emails and hours of video calls. Sometimes late discoveries of errors even lead to scandals.	While there is a large body of work that happens whether the assets get tokenized onchain or securitized through a traditional process, there are structural improvements to be gained if the loan origination and servicing was done on a blockchain.  • For example, once loans are tokenized, a securitization trust can have auditable and seamless access to loan data. Any loans that meet the qualifying criteria can be marked by a smart contract once it goes into the securitization trust.
<b>Pre-Issuance</b>	Auditors review the pool and provide pool audit letters to investors	Auditors Investors	For example, asset double pledging or pledging of non-existent assets is a big problem in the securitization process of trade finance assets.	This would ensure that the same loan cannot be assigned to another security, thus <b>solving the double-pledging issue</b> .
	Rating agencies may be asked to express an opinion on the securities' credit quality through a credit rating	Originators Rating agencies	A recent infamous example was Singapore's Hin Leong's multi-billion fraud where he pledged single assets multiple times with different lenders including Societe Generale, Rabobank and HSBC to obtain loans.	• Also, by being a unifying source of truth, all waterfall payment details can be embedded and coded in a smart contract that <b>saves time</b> and <b>reduces errors</b> for all ecosystem partners.
	Underwriters work with legal counsel and the transaction sponsor to prepare an offering document	Originators/ Underwriters Banks/Sponsors Legal Advisers		

**Primary Market Issuance**

Underwriters price and bring the securities to market, where investors make purchases based on their risk-reward preferences

Originators/Underwriters  
Banks/Sponsors  
Legal Advisers  
Investors  
Custodians

In traditional securitization, this stage usually involves an issuer paying a % fee based on the total issuance amount, usually measured in low to mid single digit, to a bank/place-ment agent tasked with distributing the investment to its network of investors.

As tokenization offers **automated execution** and **improved data quality**, the fees for the issuers are thus an order of magnitude **lower**.

See detailed examples in later sections.

Given the number of participants involved in the securitization process, the total cost is the sum of every single involved parties' fees. This number is very high when compared to the tokenization cost for the issuer/originator.

Also, given public blockchain's permissionless nature, tokenized issuance is able to instantly reach a global liquidity pool of capital.

Apart from this being unnecessarily high, a large swath of the borrower market cannot access this process as banks only work with the largest clients while private credit funds also have a minimum threshold that prevents many SMEs from being able to access financing.

**Security Custody And Servicing**

Servicers collect borrower repayments, pool them and forward them to a trustee.

Servicers  
Trustees

Custody and servicing stage is one of the most manual and inefficient steps in the whole securitization lifecycle.

Instead of having multiple ecosystem partner review, confirm and forward the correct payment amounts in duplicated efforts, tokenization enables speedier payments, eliminates reconciliation error and provides greater data reliability. Since the correct waterfall amount has already been calculated in pre-issuance and embedded in a smart contract, once the borrowers make their monthly payments, that money is automatically distributed to the investors.

Calculation and reporting agents calculate and report the waterfall amounts according to waterfall defined in the transaction documents.

Calculation and reporting agents

According to Kevin's, Head of Credit at BlockTower Credit, excellent article on why he moved from traditional finance to shave basis points of the cost of securitization process, this stage involves:

- Servicer sending loan repayments to securitization's bank account at a custodian

Trustees manage the trust entity and allocate distributions to security holders based on the calculations and employ a paying agent (bank) to wire funds accordingly

Trustees  
Paying Agents  
Prime Brokers

- Custodians employing paying agents to wire the principal and interest amount due, as determined by calculation agents, to DTCC

- DTCC then updates its record of security ownership data and forwards the payment to prime brokers who finally distributes the payments to investors.

The efficiency gains also mean securitized loan data can be kept up-to-date and constantly monitored by rating agencies, trustees and regulatory bodies, providing extra transparency and confidence in the security.

## Secondary Market Trading

In secondary markets, broker-dealers make markets among investors trading the securities and establish new prices.

Liquidity  
Providers  
Investors  
Custodians

Opaque relationship-based pricing deters deep liquidity formation in secondary markets

Since most of the non-agency backed securitized assets trade in over-the-counter (OTC) markets, information asymmetry and network advantages such as close relationships with broker-dealers/liquidity providers make price discovery and seamless trading difficult.

This in turn prevents securitized assets from gaining wider acceptance and limits the overall pool of investors.

The potential of blockchain for securities trading has been well recognized.

From NASDAQ to DTCC, exchanges and clearing houses are all developing a wide spectrum of secondary market use cases.

Unlike the relationship-based and non-transparent OTC trading that is prevalent in the current financial market for non-agency ABSs, tokenization enables easy market creation and price discovery that is transparent and instantaneous.



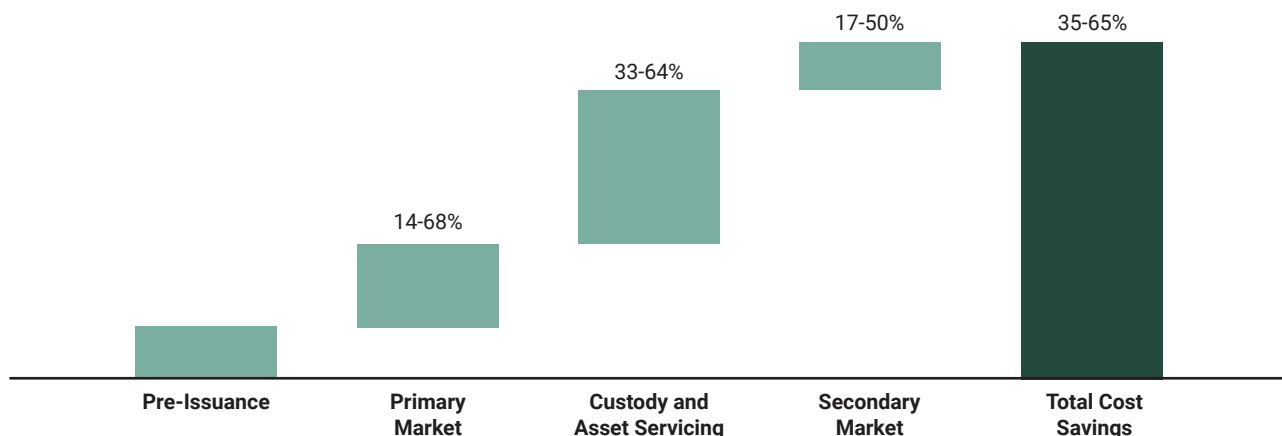
## Tokenization savings potential

The biggest savings occur in the steps where there are many operational and administrative tasks, primarily:

1. Primary market issuance
2. Custody and loan servicing
3. Secondary market trading

The chart below offers an estimate of the savings potential at each stage of the securitization process.

### Tokens Savings Potential in %



Source: [Cashlink](#)

To validate those numbers with a real-world example, BlockTower's Head of Credit, Kevin Miao, recently talked about how they were able to manage the whole securitization lifecycle for a \$170 million pool of ABS onchain through Centrifuge for about \$12,000 at current Ether price in contrast to the 20–30 basis points per annum or \$340,000–\$510,000 it costs to run the securitization process in the traditional legacy system. On the low end, this represents a 28x lower cost.

Furthermore, having analyzed approximately 5,000 asset-backed security products issued between 2015 and 2020, BIS shows that the adoption of blockchain technology indeed reduces the yield spread by approximately 25 basis points and that this benefit is heterogeneous across the different underlying asset classes and institutional arrangements.

*25–100 basis points of savings on \$15 trillion of assets translates into \$25–\$150 billion in saving a year. This translates into more yields for the investors or more savings for the borrowers and much less time and money spent on operations for service providers.*

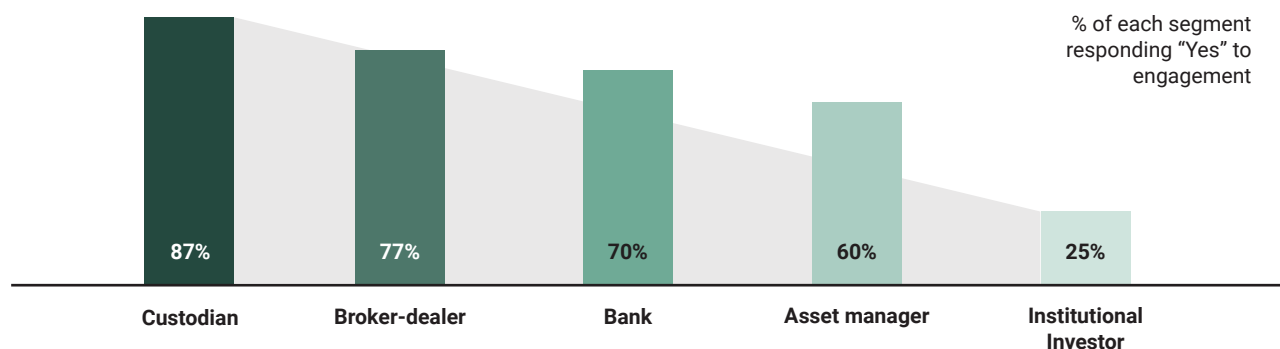
# #4

**Who are the —  
early adopters  
of tokenization?**

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Despite the adoption trend being at an early stage, many institutional players are already engaging and experimenting with blockchain technology, including 70% of the banks surveyed.

### Engagement with digital assets/DLT - by segment



Source: Citi Securities Services

Here are 3 examples:

**1. Standard Charter** used Ethereum to securitize, syndicate and distribute trade finance asset-backed securities (ABS) worth \$500 million. Ten institutional investors oversubscribed the two tranches. Singapore Exchange (SGX) listed the tokens.

As part of Project Guardian, an effort by the Monetary Authority of Singapore (MAS) and the Bank of International Settlements (BIS) to develop standards for financial applications onchain, it was the first time the bank has tokenized RWAs on a public chain.

"By transforming trade assets into transferable instruments, we aim to improve the accessibility to an asset class – which has largely been the domain of banks – with participation from a broader range of investors," said Kai Fehr, Global Head of Trade & Working Capital at Standard Chartered. "Not only can we potentially narrow the \$1.7 trillion global trade finance gap, this also offers investors the option to balance their portfolio with a digital token that has traceable intrinsic value," he added.

**2. Bank of China's** investment bank subsidiary, BOCI Hong Kong, announced the successful issuance of \$28 million worth of structured notes on 9th June 2023 on Ethereum with UBS as the originator.

Ying Wang, Deputy CEO at BOCI said, "Working together with UBS, we are driving the simplification of digital asset markets and products, for customers in Asia Pacific through the development of blockchain-based digital structured products, designed specifically for customers in Asia Pacific.

It was the first time a Chinese financial institution has issued tokenized securities in Hong Kong.

This was the second time UBS leveraged blockchain for tokenization. Previously in Dec 2022, UBS issued a \$50 million tokenized fixed note to a group of HNWI and institutional wealth investors across Hong Kong and Singapore.

**3. BlockTower Credit**, a crypto-native credit fund, has originated over \$190mil of securitized private credit on Ethereum through Centrifuge.

This includes a collaboration with one of the biggest DeFi projects, MakerDAO, which provided \$150 million in senior capital to take advantage of asset-backed opportunities in the US. This further helps Maker to diversify its collateral holdings across non-crypto correlated fixed-income producing assets.

Kevin Miao, Head of Credit at BlockTower, said on a recent Twitter space that by leveraging Centrifuge's tokenization technology, the cost of the securitization process was an order of magnitude cheaper than it would have been if they had gone through the traditional securitization process.

BlockTower's transaction represents the single biggest private credit onchain securitization deal to-date, outside of banks' in-house efforts.

# #5

**What does**

**• the current  
tokenization —  
landscape look  
like?**

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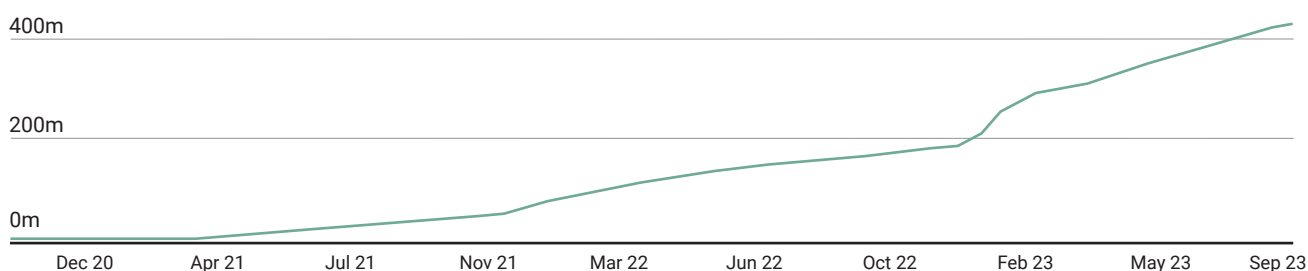
The top 3 onchain securitization platforms, defined by origination volume over \$50M, are Centrifuge, Goldfinch, and Maple.

## Centrifuge

Centrifuge, together with MakerDAO, pioneered the onchain securitization of offchain assets in the summer of 2020 to help Maker, one of the biggest capital allocators in crypto, diversify its holdings of yield generating assets.

From tokenized trade finance receivables to real estate bridge loans, Centrifuge has helped securitize over \$469 million for various originators. Below is a detailed breakdown of Centrifuge's cumulative origination number.

### Total Originations Grouped by Pool



<b>BlockTower</b>	\$201,699,213	<b>Flowcarbon</b>	\$1,689,999	<b>Branch Series</b>	\$7,441,813
<b>Alternative SPV</b>	\$7,120,000	<b>REIF</b>	\$9,325,000	<b>Bling</b>	\$18,928,498
<b>Databased.Finance</b>	\$6,061,774	<b>Paper Chain</b>	\$585,728	<b>ConsolFreight</b>	\$41,785,861
<b>Gig Economy Pool</b>	\$17,357,335	<b>FortunaFi</b>	\$13,575,199	<b>New Silver</b>	592,643,031
<b>Cauris</b>	\$7,503,242	<b>Harbor Trade</b>	\$19,152,813		

Source: [Dune Analytics](#) (accessed 29th Sept 2023)

The top 2 originators are:

- BlockTower's \$220 million structured credit fund (\$150 million from MakerDAO and \$70 million from BlockTower)
- New Silver's \$92 million in real estate bridge loan financing

Together they make up 70% of the total origination volume. In terms of transaction number, there have been 17 completed deals since the launch.

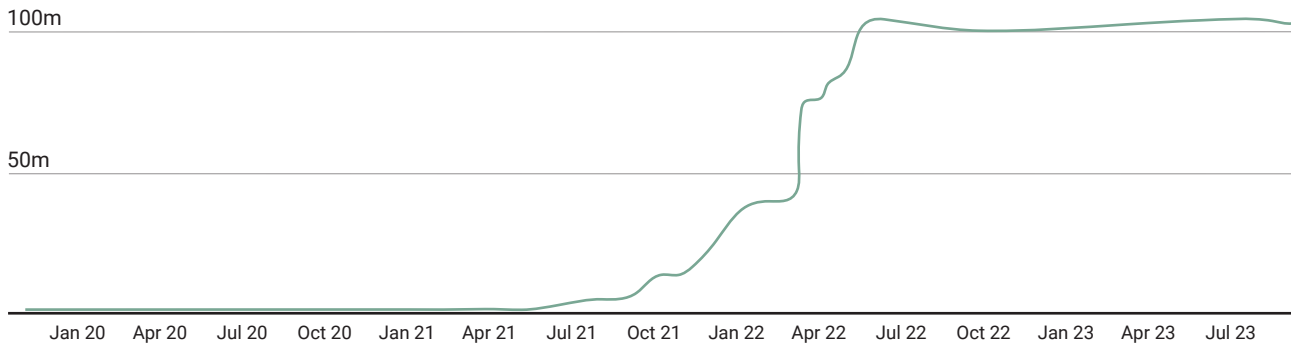
While New Silver grew their loan book steadily in the past 2.5 years, BlockTower exploded out of the gate with their 9 figure business and dominated the recent origination volume.

This is an important signal because BlockTower is the biggest and the first crypto-native institutional buy-side firm to leverage tokenization for a credit strategy of this size.

## Goldfinch

Goldfinch has been focusing on emerging markets (EM) credit products across Africa and S.E. Asia. It has issued around \$100 million tokenized ABS since launch.

### Active Loans



Source: [Dune Analytics](#) (Accessed 29th Sept 2023)

The top 5 deals are:

- Stratos' \$20 million US fintech venture debt asset
- Addem Capital's \$10 million LATAM ABS
- LendEast's \$10 million S.E.Asia fintech venture debt assets
- Almavest's \$10 million EM fintech & carbon reduction assets
- Almavest's \$10 million EM social impact lending assets

Together they make up 60% of Goldfinch's origination volume. In total, there have been 21 completed deals on the platform since the launch.

One thing to note is that since June 2022, Goldfinch's origination number has stagnated except for two recent deals by Fazz Financial and Cauris with each in the \$2 million range.

## Maple

Maple has an interesting history in the onchain credit space. Unlike the other projects, Maple originally launched as an onchain credit marketplace focused on matching investors with borrowers that were crypto proprietary trading firms.

It launched in 2020 and scaled to more than \$2 billion in loan origination by end of 2022. But unfortunately the FTX fallout impacted the crypto trading desks space and essentially shut the market on Maple except for two relatively small pools that are not accessible to the general public.

Since 2023 Maple has pivoted away from facilitating lending to crypto trading desks and focused more on traditional assets by including tokenized US treasuries and short term tax receivables in its product offerings.

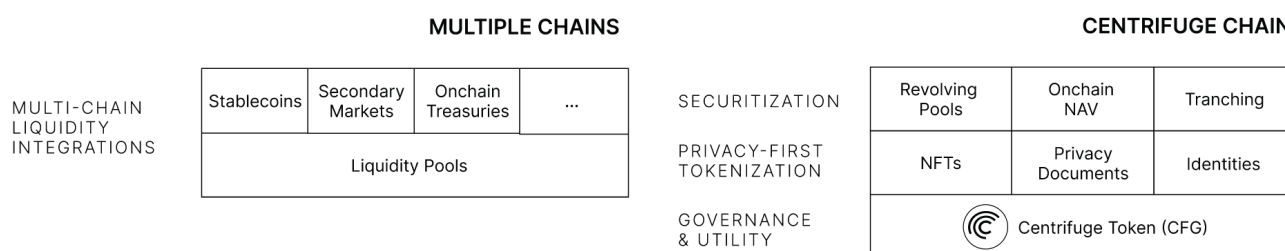
Currently AQRU's \$16 million US IRS tax receivables product is the sole representative of tokenized private credit assets on the platform and thus make up 100% of its volume.

## Centrifuge case study

To dive into the platform with the highest TVL, Centrifuge, is an onchain tokenization platform with \$469 million in origination volume.

The founders previously worked together at Taulia, a financial technology company specializing in supply chain finance and working capital solutions. The Centrifuge founding team was able to draw on their expertise in supply chain financing to pioneer onchain tokenization of asset-backed securities.

How exactly does Centrifuge facilitate the securitization lifecycle? Let's look at Centrifuge's technology stack.



Source: Centrifuge

**Liquidity Integrations** are the investors in a securitization transaction. For example, this could be MakerDAO's capital in the BlockTower Credit pool or Aave DAO's treasury allocation in the *Anemoy pool*. Centrifuge's multi-chain product, Liquidity Pools, allows capital sources from multiple blockchains to invest in Centrifuge's tokenized products.

**Centrifuge Chain** is the engine that drives the entire securitization process. It is a tokenization application specific blockchain that

1. Allows multiple tranches including having asset issuers to stake their capital as skin in the game in the most junior tranche
2. Automates onchain NAV calculations
3. Enforces cash flow transfers according to the waterfall payment schedule
4. Issues NFTs representing assets in SPV immutably
5. Offers identity-permissioned access to loan data through its Private Data Layer
6. Onboards investors through a KYC process for compliance

Amongst tokenization projects, Centrifuge stands out with these specific features:

1. Offers an entire blockchain optimized to accommodate the whole onchain securitization process
2. Provides a multi-tranching functionality that goes beyond a 2 tranches set up
3. Embeds privacy protection for asset issuers in its infrastructure design
4. Is home to a group of fixed-income veterans (The Credit Group) who synergistically pool their expertise in sourcing, diligence and work out stage of a transaction.
5. Has an out of box legal and technical solution for DAOs and crypto projects to build a customizable fixed-income portfolio through *Centrifuge Prime* that is integrated with the Credit Group for risk analysis and Steakhouse Financial for reporting.

# #6

**What are the challenges and  
● opportunities  
for broader —  
adoption?**

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## Challenge/Opportunity #1: Access to Capital

Except for BlockTower's \$220 million in transactions on Centrifuge and Stratos' \$20 million transaction on Goldfinch, all other onchain securitization transactions are fairly small in size at less than \$10 million. This points the difficulty of accessing sizable capital sources for tokenization projects.

For the onchain securitization space, the fact that most of the transactions are less than \$10 million means these deals are too small for securitization desks at banks. This suggests the issuer is not solving for an efficiency problem that they experienced at banks.

While the cheaper cost of using tokenization is nice to have for multi-billion transactions at GSIP banks, the immediate pain point at current deal size level is capital access.

This illustrates the difference in focus for financial institutions and crypto-native adopters. Whereas big financial institutions are laser-focused on using tokenization to solve their middle and back-office inefficiency problems in a regulatorily compliant manner, the early adopters of onchain securitization products built on public blockchains are leveraging the technology to solve their access to capital needs.

## Capital Sourcing

Crypto native capital is the lowest hanging fruit because not only does this capital not need to be onboarded to crypto, it also currently suffers from a lack of access to traditional assets with non-correlated yield opportunities.

While there currently aren't pension funds onchain, we are seeing significant capital sources emerge. For example, MakerDAO has become the largest capital allocator towards tokenized real world assets (RWA) with over \$3.3 billion deployed.

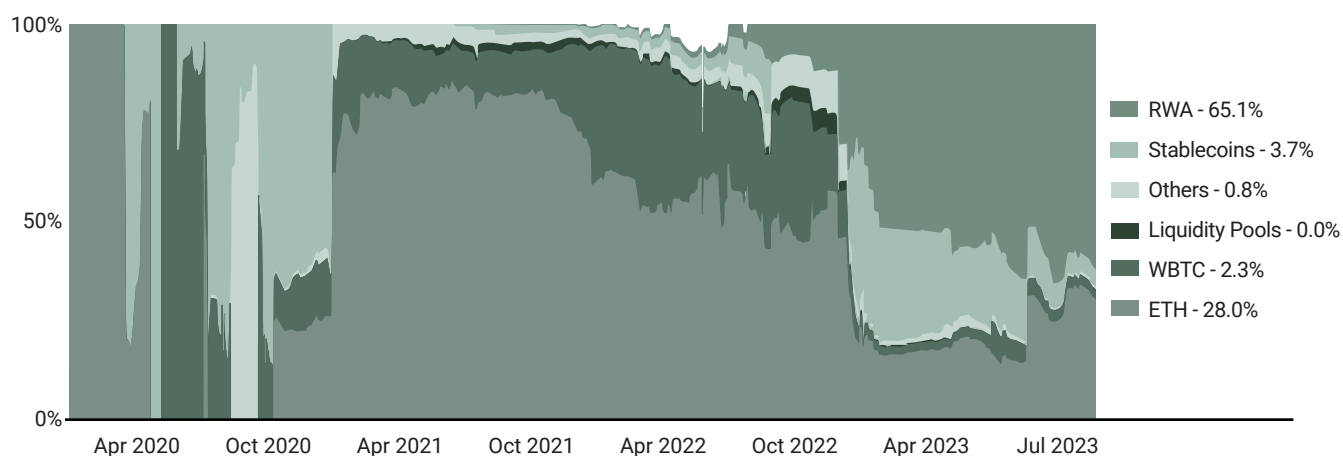
COLLATERAL	TOTAL SUPPLY	CHANGE 24H	DEBT CEILING	LOCKED	ANNUAL FEES
<b>Monetalis Clydesdale</b> RWA007-A	1,249,950,318 of 1.25B <b>Maxed</b>	↑ 38M 3.14%	1,250,000,000 usage 100%	\$1.25B 100%	49,998,015 4%
<b>BlockTower Andromeda</b> RWA015-A	1,202,450,000 of 1.25B	↑ 50M 4.34%	1,280,000,000 usage 94%	\$1.28B 106%	54,110,254 4.5%
<b>Coinbase Custody</b> RWA014-A	500,000,000 of 500M <b>Maxed</b>	—	500,000,000 usage 100%	\$500M 100%	15,000,002 3%
<b>H. V. Bank</b> RWA009-A	100,000,000 of 100M <b>Maxed</b>	—	100,000,000 usage 100%	\$100M 100%	109,420 0.11%
<b>BlockTower S4</b> RWA013-A	69,414,500 of 70M	↓ 419k 0.6%	70,000,000 usage 99%	\$85.2M 123%	2,776,580 4%
<b>BlockTower S3</b> RWA012-A	54,439,759 of 80M	↓ 347k 0.63%	80,000,000 usage 68%	\$97.3M 179%	2,177,590 4%
<b>6s Capital</b> RWA001-A	14,348,036 of 15M	—	15,000,000 usage 96%	\$15.9M 111%	430,441 3%
<b>New Silver</b> RWA002-A	5,493,752 of 50M	↓ 583k 9.59%	50,000,000 usage 11%	\$92.9M 1,691%	384,563 7%
<b>TOTAL</b>	<b>3,196,096,375</b> of 3.32B	<b>↑ 86.7M</b> 2.79%	<b>3,345,000,000</b> usage 96%	<b>\$3.42B</b> 107%	<b>124,986,865</b>

Source: [Makerburn](#)

*While most RWA securitization deals in the space are below \$10 million, Centrifuge has been able to help asset originators such as BlockTower and New Silver establish \$10 million+ credit lines with MakerDAO. Being the sole onchain securitization platform MakerDAO has worked with so far, Centrifuge is uniquely positioned to grow alongside Maker as they aim to scale to \$100 billion DAI in 3 years as part of its Endgame plan.*

Currently, tokenized real-world assets assets together contribute close to \$125 million in annual income for MakerDAO, making up 65% of its total income. Unlike crypto-native income, this tokenized fixed-income products have income streams that are fixed and predictable.

### Revenues per type (relative). MakerDAO - Assets per type



Source: [Dune Analytics](#) (Accessed 29th Sept 2023)

As MakerDAO scales its front end stablecoin product, DAI, through its Endgame plan, it will also need to deploy even more capital towards yield generating traditional assets.

As Maker proves out the power of real-world asset tokenization, more projects will look to allocate towards tokenized real-world assets such as US treasuries and private credits.

For instance, Aave, another DeFi heavyweights, has voted to allocate its own treasury funds towards a liquid US T-Bill fund run on Centrifuge. Similar to MakerDAO, Aave also has its own stablecoin ambitions. This partnership is a first step towards backing Aave's GHO stablecoin with liquid and stable real-world asset collaterals.

As these decentralized financial giants increasingly adopt tokenized RWA in their collateral management and yield generation strategies, other crypto-native projects and high net worth individuals (HNWIs) are likely to follow suit. For instance:

- There are 20 projects holding a DAO treasury of \$100 million+. In total, there are over \$18.7 billion worth of assets held by project DAOs, \$16.4 billion of which is [real-world asset](#).
- Additionally, out of the \$130 billion in fiat backed onchain stablecoins, there are around 900 wallets holding \$10 million or more.
- Furthermore, as the overall crypto market expands, there will be more crypto native buy side firms of significant size like BlockTower Credit that could benefit from a cost-effective onchain access to tokenized public and private market assets.

## Challenge/Opportunity #2: Access to deal flow

According to S&P Global's Structured Finance Outlook, the global securitization volume for 2022 was around \$1.09 trillion and is forecast to be the same for 2023.

### Approximate Global Structured Finance New Issue Volumes (i)

(Bil. \$ unless otherwise noted)	2017	2018	2019	2020	2021	2022	2023f
U.S.	510	540	582	452	783	595	507
Canada (C\$)	20	25	19	11	14	17	21
Europe (€)	82	107	102	69	114	81	80
China	220	292	334	432	485	299	310
Japan	48	56	61	60	61	45	45
Australia	36	23	31	22	38	32	31
Latin America	17	9	13	13	24	22	25
<b>Approximate global new issue total</b>	<b>930</b>	<b>1,050</b>	<b>1,150</b>	<b>1,070</b>	<b>1,530</b>	<b>1,092</b>	<b>1,019</b>

Source: S&P Global

At \$614 million, currently the total issuance of securitized private credit onchain is but a mere 6bps of the traditional securitization market size. And this is only accounting for transactions that come across institutional securitization desks. If we include various opportunities in trade finance, an area banks have been pulling away from, and SME lending, an area banks suffer from a lack of nimbleness, the overall opportunity set for tokenization is even larger.

When we compare these two sets of numbers, the onchain tokenization volume suggests a bottleneck in deal sourcing or product availability.

In traditional finance, access to superior deal flow is often a USP used by GPs to attract LP capital. While smart contracts and blockchains can do wonders with automating middle and back office processes, origination is still a relationship driven business and it is an essential part of a well functioning securitization process.

Global banks spend a lot of money and effort on multiple touch points, such as sales, trading, structuring, financial coverage etc, throughout the organization to be close to clients, and in return, to be first in line to provide capital market services whether that is bond issuance, securitization deal or equity raising assignments.

On the buy-side, in a recent interview, Dan Pietrzak, Co-Head of Private Credit at KKR, said building out an origination funnel is essential to good deal selection. This speaks volumes about how institutional investors view the importance of deal flow. Amongst the 100+ people who are working on KKR's private credit business, Dan talked about how they rely on geographically focused teams with deep local expertise and connections to lead the origination process while leveraging close relationships with KKR private equity for direct lending deal opportunities.

*Solving specific problems for specific user groups in a nascent market is the key to successfully bootstrapping and kicking off the flywheel effect.*

Looking at the tokenization transaction data, the explosive growth in tokenized US treasuries since Jan 2023, from 0 to \$344mil, and the launch of various tokenized short duration products demonstrate a clear preference for short duration and higher yields on the part of capital allocators.

Consequently, there has been a clear shift of focus for tokenization platforms to offer more liquid products.

- A Goldfinch product from May 2023, Fazz Financial, was the first time the industry has seen a callable feature for investors being structured into a deal. Before this, most transactions were all term loans with 2 years+ maturities.
- A May 2023 deal on Maple, AQRU, issued an update to lower its withdrawal waiting period from 45 days to 7 days and increase its gross yield from 11.2% to 16.2%.
- A web3 native asset manager, Anemoy, launched in September 2023 with a liquid treasury pool on Centrifuge and was selected to manage a portion of Aave DAO's treasury funds

This preference for higher short-duration returns is likely to last as long as the Fed keeps the short term rate high. When the Fed cuts and the inverted yield curve normalizes, capital invested in tokenized short duration assets are likely to rotate. They will be looking for a home in longer duration assets offering higher yields.

Overtime, the full spectrum of traditional assets are going to be tokenized and made available onchain. The immediate question is whether protocols can offer investors sufficient access to products that they want access to. Differentiated superior deal origination is a USP for potential investors.

Once relationships with institutional DeFi capital allocators are established and solidified, crypto native tokenization platforms with provable track records and deep deal flow capabilities will reap the network effect benefits as other capital allocators look to emulate.

## Challenge/Opportunity #3: Between crypto native and institutional TradFi

The €60 million Fed 2023 bond issuance by German conglomerate Siemens through tokenization service provider Cashlink on the Polygon blockchain is a great example of tokenization as a service (TaaS) where the issuer brings its own distribution network. In this case, it consisted of DekaBank, DZ Bank, and Union Investment.

Even if the GISP banks such as UBS and Deutsche Bank have the resources to build and experiment everything in-house, it is unlikely that all banks can do the same. There are over 10,000 banks in the world but only 30 are G-SIBs (Globally Systemically Important Banks) according to the Financial Stability Board.

This means many smaller regional or neo banks are probably keen to learn more or even try their hands at tokenization but do not have the capabilities to build everything in-house. A partnership approach could be very effective in onboarding them.

This principle applies to corporations too. For example, the German investment platform WIWIN incorporated tokenization in its crowdfunding platform investment process to reduce bureaucratic steps faced by investors from classical securities.

ADDX, a Singapore based fintech investment platform, also incorporated tokenization in its back-end to more transparently and efficiently track the ownership and transaction details of its private market assets while maintaining a familiar web2 fintech front end.

Partnering with forward thinking investment platform businesses to help them operate more efficiently would be a great way to expand the addressable market and build more successful case studies for tokenization. Although this may require development of more regulatory capabilities, it will also open up more possibilities for additional revenue streams.

# Conclusion •

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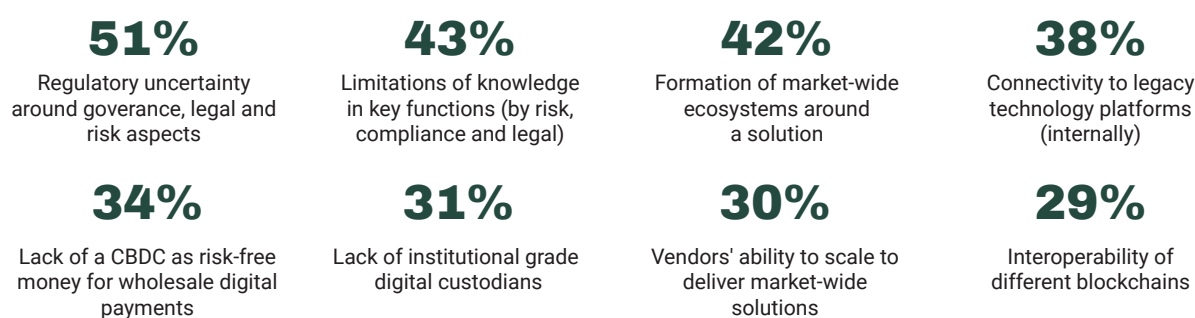
Tokenization unmistakably has been top of mind for many institutional firms, from asset managers to banks, for the structural efficiency gains it delivers.

From automating onchain NAV calculations to making the tokenized asset composable with the rest of the innovations on blockchain, there is no doubt tokenization is transforming global markets.

The existing adoption use cases are just the beginning of that transformation. As we build more track records of success by establishing new distribution channels and onboarding more product opportunities, tokenization is going to gain wider acceptance and adoption.

From an institutional perspective, the biggest hurdle to tokenization's immediate widespread adoption remains the lag in regulatory clarity that has yet to catch up with blockchain technological innovation.

### Top impediment to the widespread use of digital assets in the next three years



Source: Citi Securities Services

However, the demand from investors will ultimately overcome these challenges. Based on the EY Parthenon September survey, 57% percent of institutional investors indicated an interest in investing in tokenized assets, particularly tokenized private funds, equities, fixed income, and public funds.

Most of the pioneering work from institutional participants will likely come from asset managers that are looking for new distribution channels. KKR, Hamilton Lane and Franklin Templeton launching tokenized versions of their funds is a good first step.

For more immediate adoption growth, crypto-native market participants are likely to play a much more impactful role than traditional financial institutions. Established DeFi projects are likely to be spearheading the effort by allocating their financial resources towards tokenized fixed income opportunities that strengthen their products and ensure their long term viability through prudent treasury management.

The biggest DeFi projects are likely to be the immediate source of institutional capital. Maker, with its 2020 pioneering real-world asset tokenization partnership with Centrifuge and \$3.3 billion allocation, is continuing to set the standard for the rest of the industry. Other DeFi giants, such as Aave, are already looking to emulate through partnerships with tokenization projects.

As these DeFi giants deploy more capital towards tokenized real-world asset, more asset tokenization takes place onchain which, in turn, provides an increasing number of attractive destinations for capital to flow towards. The flywheel of positive feedback loops gets into action.

Throughout this process, much of the procedural framework and ecosystem infrastructure will be improved upon and become streamlined. This is likely to signal greater maturity and provide greater confidence to the giant financial institutions such as banks and pension funds.

Slowly but surely, as the total tokenized real-world asset market grows in size and maturity, more institutional capital and asset issuers will likely want to join the movement. The world of traditional assets and digital assets will eventually merge. Ultimately, real-world assets will become just assets.

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