

# Real-World Assets: State of the Market

July 2023



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# 1

## Key Takeaways

- ◆ The tokenization of real-world assets (“RWAs”) has continued to gain traction with increasing user adoption and the entrance of large institutional players.
- ◆ Coupled with relatively low decentralized finance (“DeFi”) yields, rising interest rates have contributed to an uptake in RWAs, specifically in tokenized treasuries.
- ◆ Investors are effectively lending over US\$600M to the U.S. government today via the tokenized treasury market and receiving around a 4.2% annualized yield in return.
- ◆ Tokenized assets are estimated to be a US\$16 trillion market by 2030, representing significant headroom for growth and a notable increase from US\$310B in 2022.
- ◆ Numerous protocols have integrated RWAs or are participating in their growth. We briefly cover MakerDAO, Maple Finance, and Ondo Finance in this report.

## 2 Overview

More than four months have passed since the publication of our [first report on real-world assets](#). How has the market landscape changed since then, and what are some of the latest developments? We explore all that and more in this report.

### 2.1 A Primer to Real-World Assets

Before diving into the charts and latest market data, we summarize a few key points about real-world assets (“RWAs”) in this section. This covers the basics of RWAs and serves as a quick introduction to the sector.

#### What Are Real-World Assets?

As the term suggests, **real-world assets represent tangible and intangible assets in the physical world** (e.g., real estate, bonds, commodities, etc.). The tokenization of RWAs allows us to bring these off-chain assets onto the blockchain, thereby opening a new realm of possibilities regarding composability and potential use cases.

**Figure 1: Examples of RWAs**

Tangible Assets	Intangible Assets
Real Estate	Bonds
Commodities	Equities
Collectibles	Carbon Credits

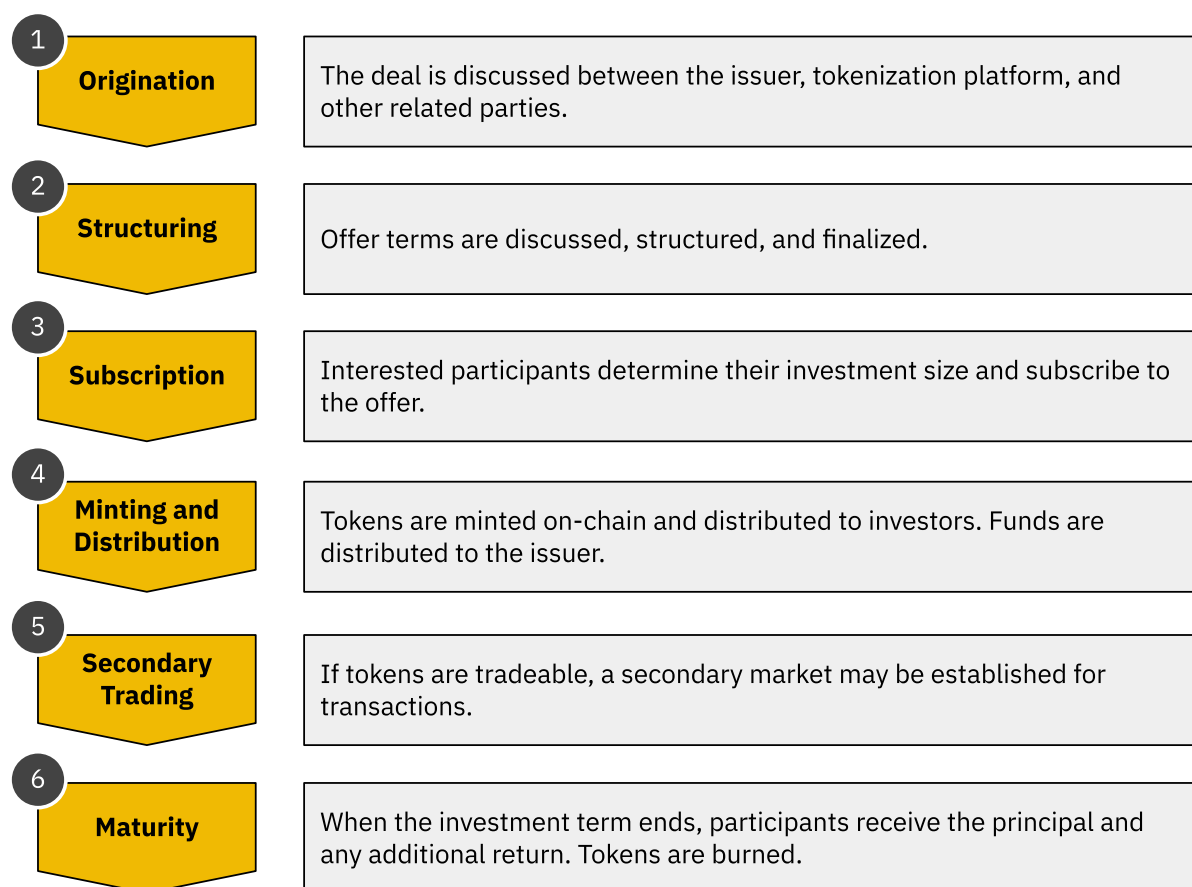
Source: Binance Research

By tokenizing RWAs, market participants can enjoy **increased efficiency, higher transparency, and reduced human errors** as these assets can be stored and tracked on-chain.

## How Does the Tokenization Process Work?

For RWAs to exist on-chain, their ownership and representation must be accounted for on the blockchain. While the exact mechanics may vary, the generic process involves ironing out the deal terms before minting tokenized representations of the asset on-chain.

**Figure 2: Example of on-chain tokenization process**

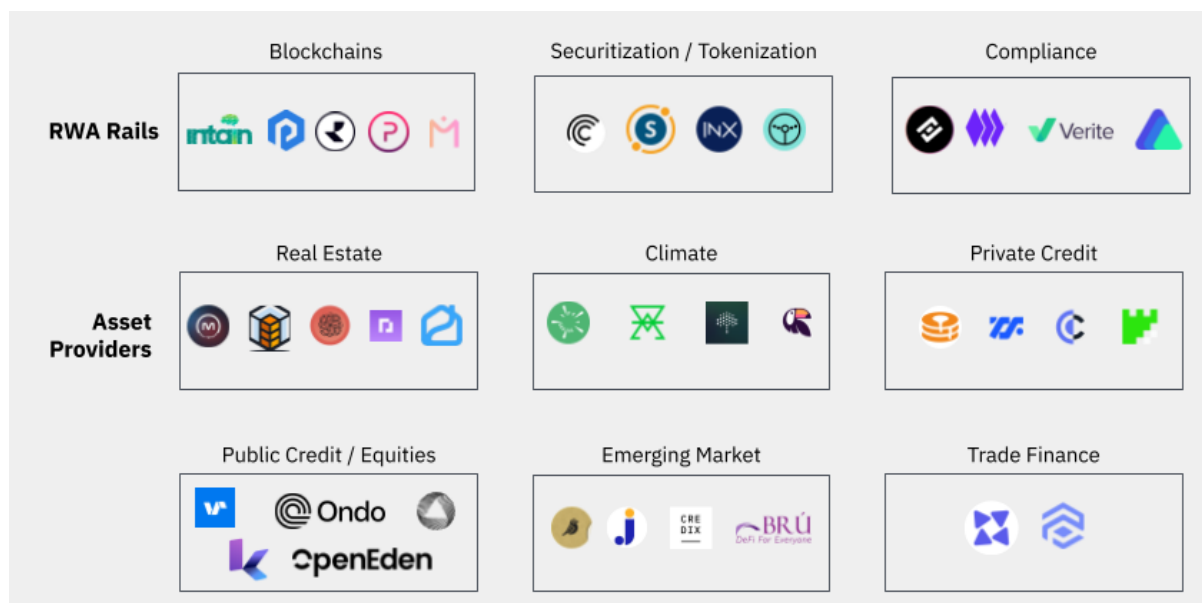


Source: Boston Consulting Group, Binance Research

## 2.2 RWA Ecosystem

The RWA ecosystem is diverse and steadily expanding as more projects enter the market. Some projects provide the regulatory, technical, and operational rails upon which RWAs are brought into crypto. We refer to these broadly as “RWA rails.” Additionally, there are “asset providers” that focus on originating and creating demand for RWAs across various asset classes. These include real estate, fixed income, equities, and others.

**Figure 3: RWA ecosystem map**



Source: Binance Research

- ◆ **Blockchains:** Permissioned and permissionless blockchains tailored specifically for RWAs.
- ◆ **Securitization / Tokenization:** Bringing RWAs onto the blockchain.
- ◆ **Compliance:** Services to ensure investor and issuer compliance.
- ◆ **Real Estate:** Originate and create demand for real estate-backed RWAs.
- ◆ **Climate:** Originate and create demand for climate asset-backed RWAs.
- ◆ **Private Credit:** Originate and create demand for private fixed-income-backed RWAs.
- ◆ **Public Credit / Equities:** Originate and create demand for public fixed-income and equity-backed RWAs.
- ◆ **Emerging Market:** Originate and create demand for RWAs coming from emerging markets.
- ◆ **Trade Finance:** Originate and create demand for trade financially-backed RWAs.

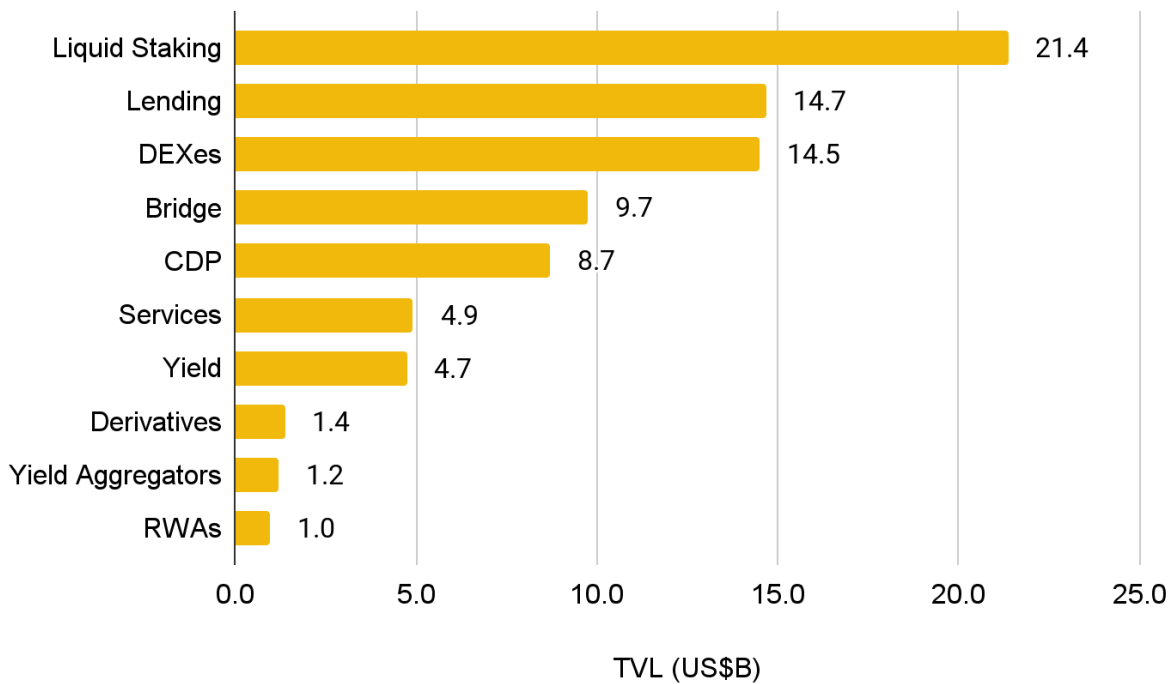
For more details, check out our prior [industry map](#).

### 3

## RWA Growth and Outlook

The RWA market is in its early innings of development but has seen signs of increasing adoption and growing total value locked (“TVL”). Today, **RWAs are the 10th largest sector in DeFi based on protocols tracked by DeFi Llama**, having risen from 13th place just a couple of weeks ago as of end-June. A large contributor has been the launch of stUSDT in July, a protocol that allows stakers of USDT to receive yield based on RWAs.

**Figure 4: RWAs are the 10th largest DeFi sector on DeFi Llama**

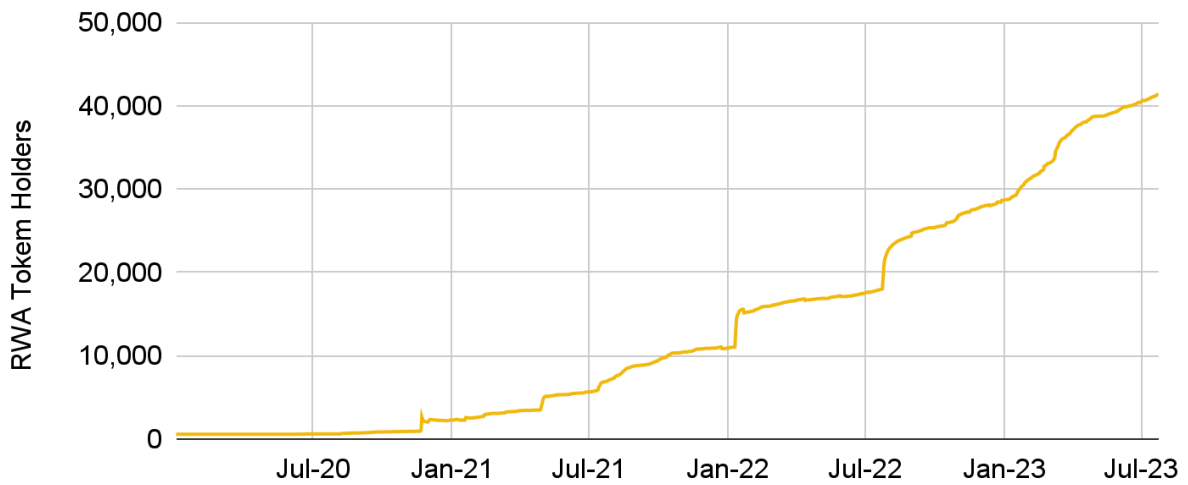


Source: DeFi Llama, as of Jul 25, 2023

Note that the data above is likely understated as not all protocols have been captured and data in certain instances may not be readily available when tokenization happens on private blockchains. Nonetheless, the rise in the ranks of RWAs as a sector is a testament to the increasing adoption of RWA protocols.

Referring to the number of RWA token holders in Figure 5 as a proxy for RWA adoption, we have also observed a steady increase in this data point. There are currently over 41.3K RWA token holders on the Ethereum blockchain. While this may not seem like much, the number of token holders has grown significantly from a year ago, more than doubling from 17.9K.

**Figure 5: The number of RWA token holders has increased steadily**



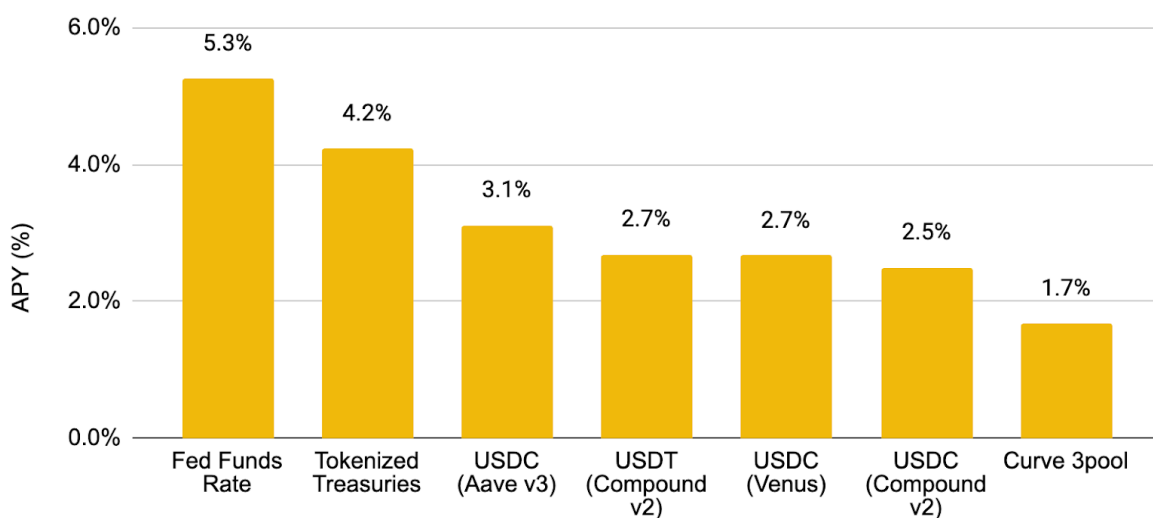
Source: Dune Analytics (@j1002), as of Jul 24, 2023

RWA Tokens Tracked: wCFG, MPL, GFI, FACTR, ONDO, RIO, TRADE, TRU, BST

## 3.1 The Rise of Treasuries

A bright spot within the RWA space in recent months has been tokenized U.S. Treasuries. U.S. Treasury refers to sovereign debt issued by the U.S. government and has been widely considered a benchmark for risk-free assets in traditional financial markets. Against the backdrop of rising interest rates, treasury yields have steadily inched higher and now comfortably exceed DeFi yields today.

**Figure 6: Treasury yields exceed DeFi stablecoin yields**



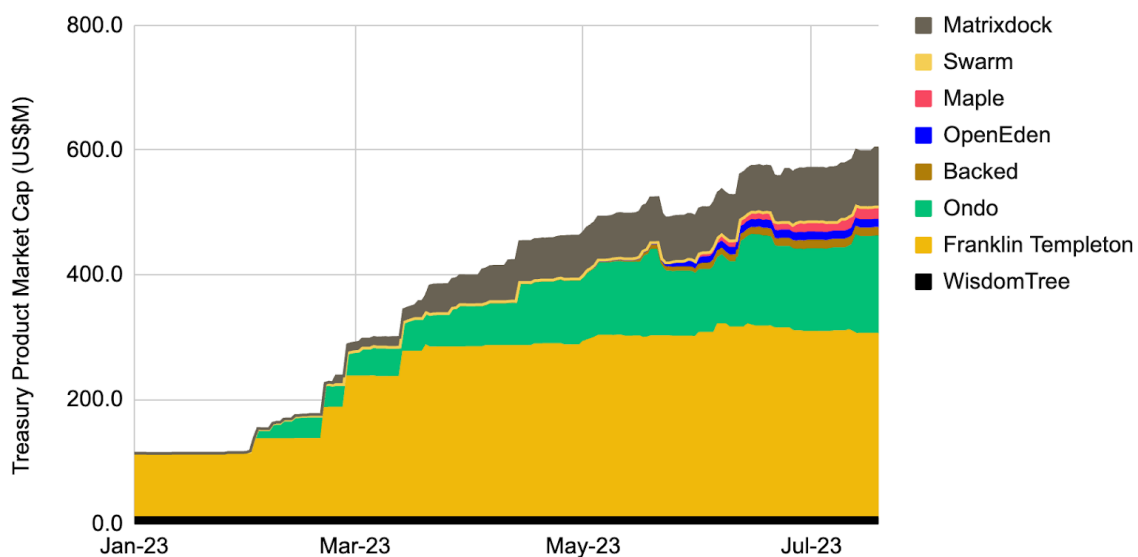
Source: rwa.xyz, Aave, Compound, Venus, Curve, Binance Research, as of Jul 18, 2023



Intuitively, assuming all else is equal, capital goes where yields are the most competitive – U.S. Treasuries stand out here. Demonstrating the utility of RWAs, investors today can take advantage of real-world yields by investing in tokenized treasuries without leaving the blockchain.

In fact, the tokenized treasury market is worth roughly US\$603M today, meaning that investors are effectively lending that amount to the U.S. government at around 4.2% APY.

**Figure 7: The tokenized U.S. Treasury market is worth US\$603M**



Source: rwa.xyz, as of Jul 19, 2023

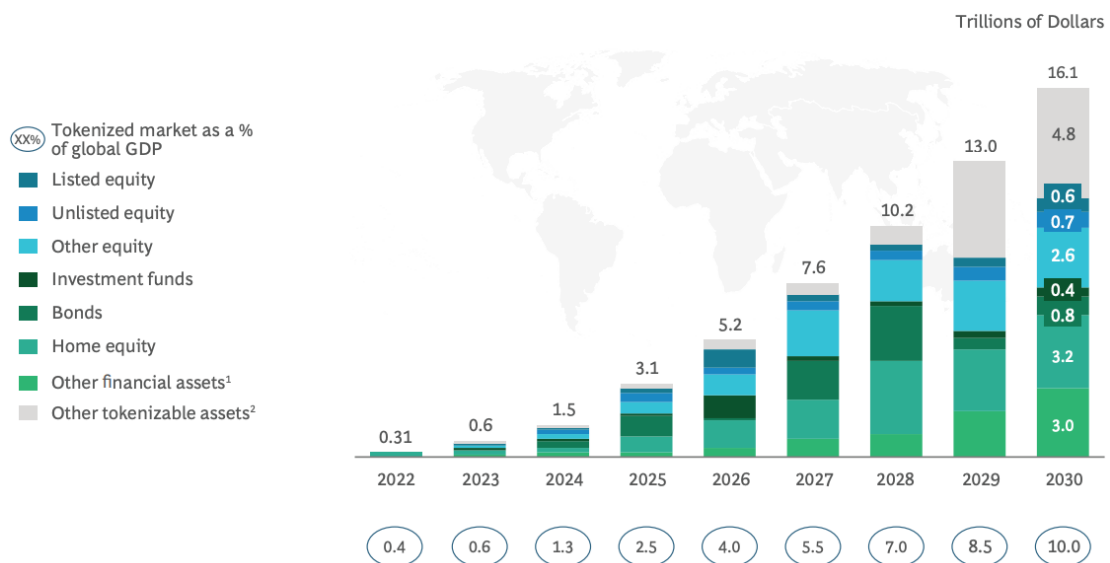
Protocols and firms in the treasury market include Franklin Templeton, Ondo Finance, Matrixdock, and others. Compound’s founder, Robert Leshner, has also recently announced the launch of his new venture called “Superstate” and has submitted filings to the U.S. Securities and Exchange Commission to create a short-term government bond fund using the Ethereum blockchain as a secondary record-keeping tool<sup>(1)</sup>.

Importantly, investors in tokenized treasuries need to note that investing in the asset class is not without risks. For example, exposure to treasuries subjects investors to the duration risks associated with such investments, where changes in interest rates may result in price fluctuations (although short-term bills have lower duration risks). Other key considerations include tokenization structure, fees, and Know Your Customer (“KYC”) processes.

## 3.2 Outlook of RWAs

Based on a report by the Boston Consulting Group, **tokenized assets are estimated to be a US\$16 trillion market by 2030**<sup>(2)</sup>. This would make up 10% of global GDP by the decade's end, a significant increase from US\$310B in 2022. This estimate includes on-chain asset tokenization (more relevant to the blockchain industry) and traditional asset fractionalization (e.g., exchange-traded funds (“ETFs”), real estate investment trusts). Considering the potential market size, even capturing a small percentage of the market would be a boon for the blockchain industry.

**Figure 8: The tokenization of illiquid assets is estimated to be a US\$16T business opportunity by 2030**

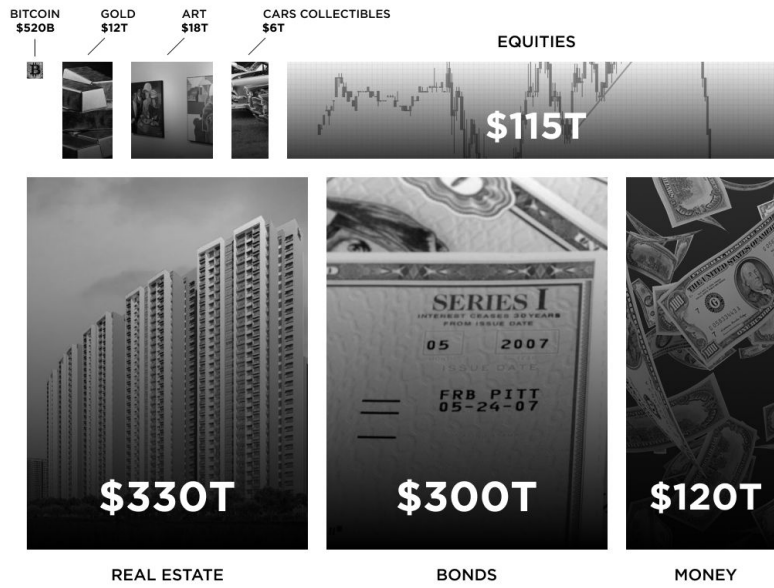


Source: Boston Consulting Group

Even at US\$16T, tokenized assets will still be a small fraction of the current total global asset value, estimated to be worth US\$900T (less than 1.8%, to be exact, and not factoring in future global asset value growth). One may even argue that the true addressable market is the entire global asset market, given that anything tokenizable could be represented as RWAs on-chain.

Figure 9: RWAs have huge headroom for growth

# TOTAL GLOBAL ASSET VALUE: \$900T



Source: Vlad Svitanko<sup>(3)</sup>

## Protocols in Action

To demonstrate how some protocols have integrated RWAs, we highlight a few market participants in this section. Besides the following protocols, we have also covered Centrifuge and Goldfinch in our [previous report](#).

Note that the mention of specific projects does not constitute an endorsement or recommendation by Binance. Instead, the projects cited are merely used for the purposes of illustrating the adoption of RWAs. Additional due diligence should be taken to better understand the projects and associated risks.

### Maple Finance

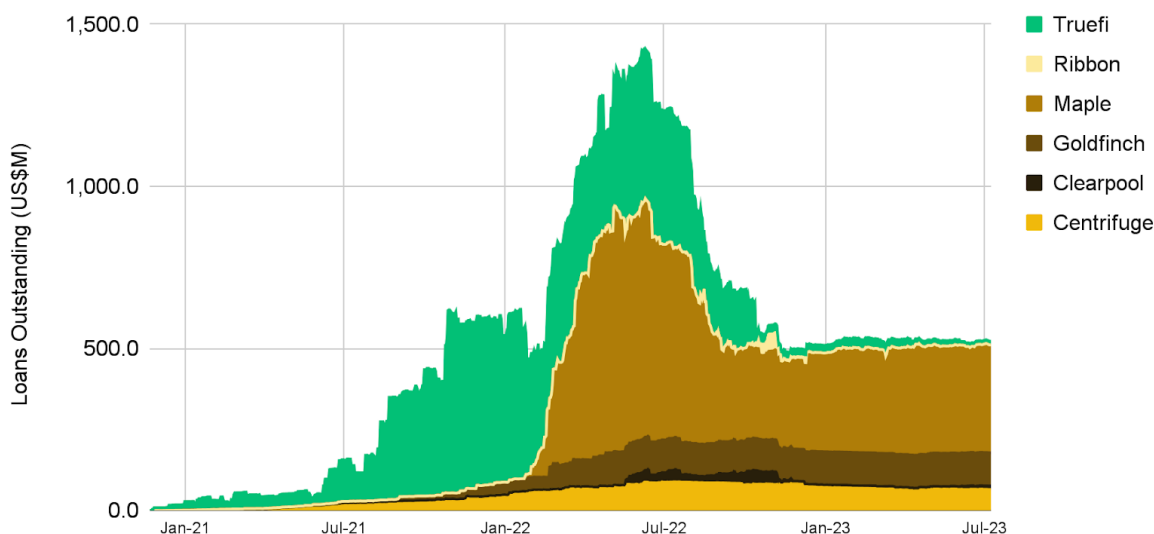
Maple Finance is an institutional capital network that provides the infrastructure for credit experts to run on-chain lending businesses and connects institutional lenders and borrowers<sup>(4)</sup>. Maple Finance has three key stakeholders: borrowers, lenders, and pool delegates.

- ◆ Institutional borrowers can access financing options on Maple Finance.
- ◆ Lenders are able to obtain a yield on their assets by lending to borrowers.
- ◆ Pool delegates are credit professionals who assess, manage, and underwrite loans.

While Maple Protocol previously focused on uncollateralized lending, it has increasingly ventured into RWA-based loans. Previously, uncollateralized crypto lending left Maple with over US\$50M in bad debt<sup>(5)</sup>. These losses came after last year's centralized contagion spread to Maple's crypto-native borrowers.

Today, Maple Finance is one of the market leaders in the private credit space, with more than US\$332M in outstanding loans.

**Figure 10: Outstanding loans of private credit players**

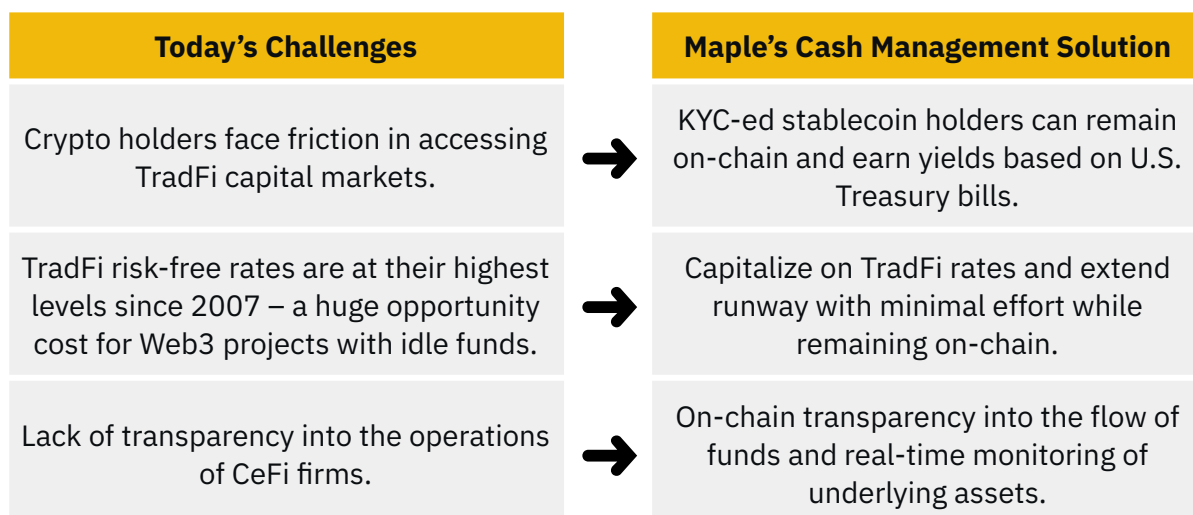


Source: Dune Analytics (@octavionotpunk), data as of Jul 17, 2023

Capitalizing on the increased demand for treasuries, Maple rolled out a U.S. Treasury pool in April, allowing non-U.S.-accredited investors and entities to access U.S. Treasury bills directly. The pool is backed by U.S. Treasury bills and reverse repurchase agreements, targeting a net APY of the current one-month U.S. Treasury bill rate minus fees and expenses of 1.0% annualized. This essentially serves as a cash management solution for stablecoin holders to earn yield.

Overall, RWA offerings such as those provided by Maple Finance demonstrate the potential to resolve some of the challenges faced today while allowing crypto users another avenue to earn a yield on their holdings.

**Figure 11: Maple’s cash management solution addresses several of today’s challenges**



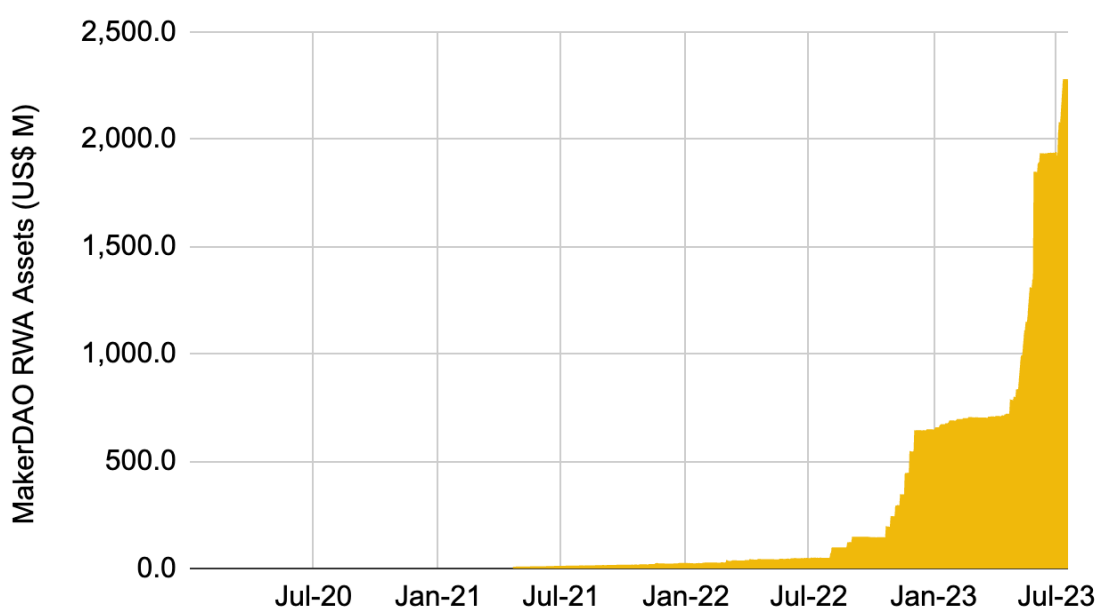
Source: Maple Finance, Binance Research

## MakerDAO

As the protocol behind the DAI stablecoin and the third-largest DeFi protocol by TVL, MakerDAO is undoubtedly a familiar name for many within the crypto space. Borrowers deposit collateral into MakerDAO's vaults and, in turn, can take out a DAI-denominated debt.

MakerDAO's foray into integrating RWAs goes back to as early as 2020, when MakerDAO [voted](#) to allow borrowers to post RWA-based collateral to vaults. Since then, MakerDAO's RWA vault has increased to US\$2.3B. Noticeably, the bulk of its RWA growth came in the past year or so, alongside the rise in real-world yields.

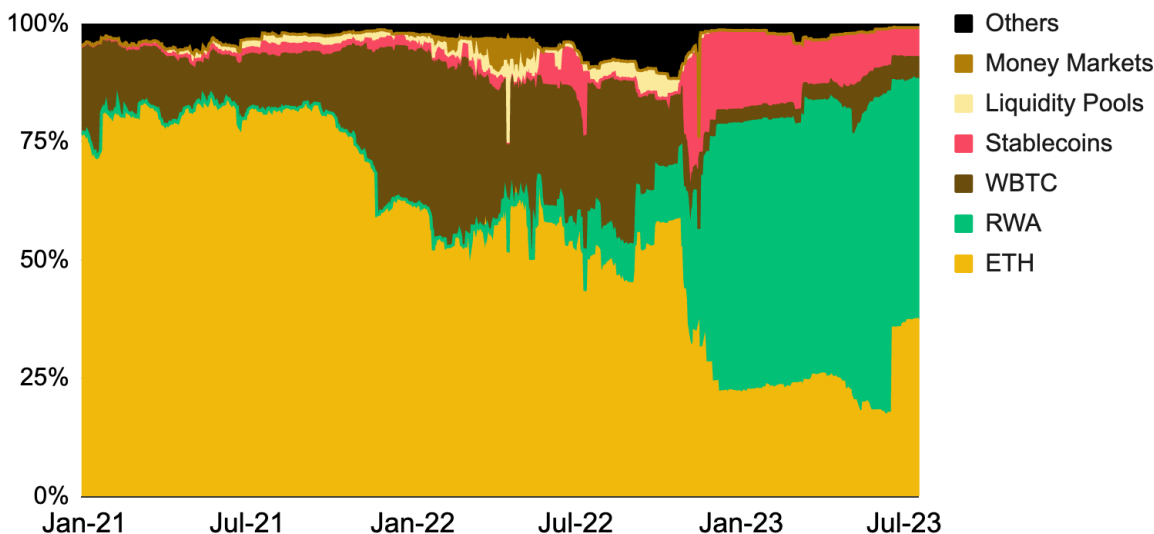
**Figure 12: MakerDAO currently holds over US\$2.3B in RWA exposure**



Source: Dune Analytics (@SebVentures), Binance Research, as of Jul 18, 2023

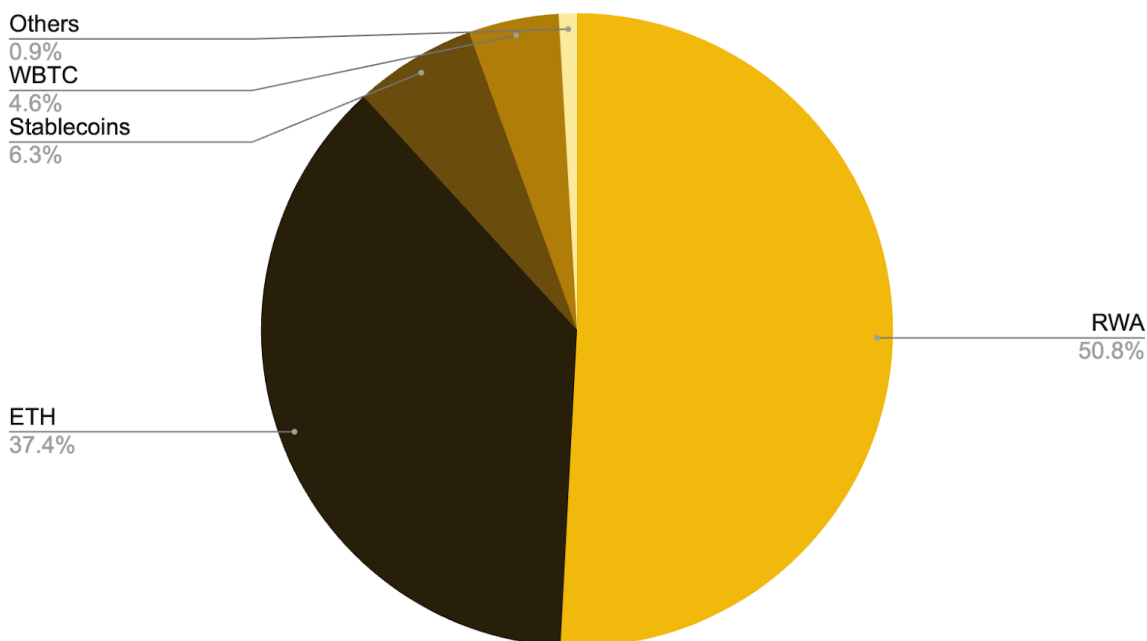
Considering that RWAs make up 49.2% of MakerDAO's total assets, it is also an equally significant contributor to the protocol's treasury. Specifically, RWAs' share of MakerDAO's revenue has grown significantly since late 2022 and currently accounts for **50.8% of the protocol's revenue**.

**Figure 13: RWAs' revenue contribution has increased significantly in the past year**



Source: Dune Analytics (@SebVentures), Binance Research, as of Jul 18, 2023

**Figure 14: RWAs account for more than half of MakerDAO's annualized revenue**



Source: Dune Analytics (@SebVentures), Binance Research, as of Jul 18, 2023

RWAs and, specifically, U.S. Treasuries will likely continue to play a significant role in MakerDAO's balance sheet, at least in the foreseeable future. MakerDAO had recently purchased US\$700M worth of treasury bonds in June, bringing their total treasury holdings to US\$1.2B. A diversified collateral base with exposure to RWAs enables MakerDAO to take advantage of the current yield environment while diversifying its risks.

## Ondo Finance

Ondo Finance provides institutional-grade, blockchain-enabled investment products and services. The firm is led by former Goldman Sachs staffer Nathan Allman and is backed by notable investors, including Peter Thiel’s Founders Fund, Coinbase Ventures, and Tiger Global<sup>(6)</sup>.

Ondo has four RWA offerings, providing investors access to a range of cash management products and bond funds. In terms of the process, an investor can deposit USDC, which is exchanged for USD, to purchase assets such as ETFs or funds. In return, new fund tokens are minted and deposited into the investor’s wallet. At the point of redemption, tokens are burned, and USDC is returned.

**Figure 15: Ondo Finance’s offerings**

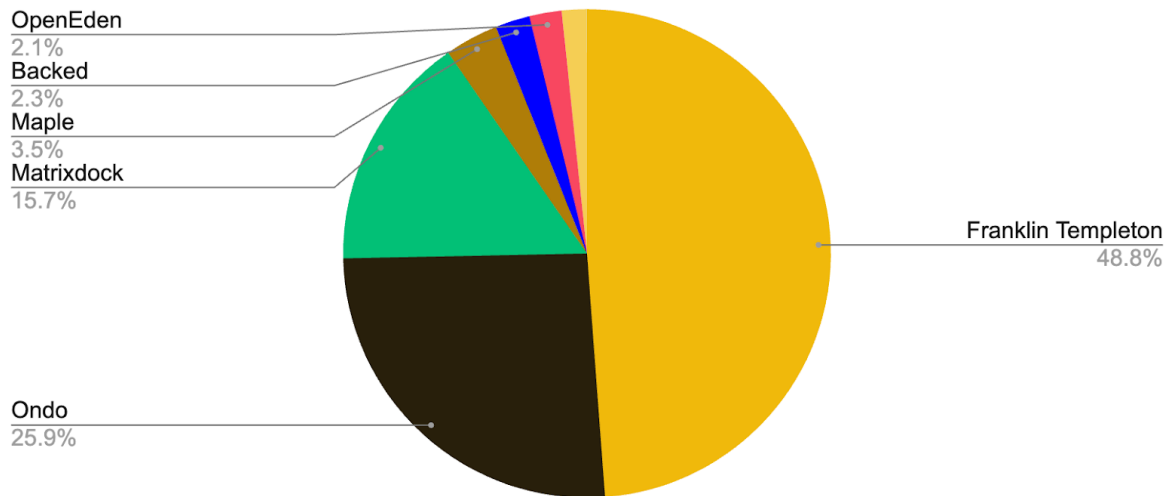
	<b>U.S. Money Markets (OMMF)</b>	<b>Ondo Short-Term U.S. Government Bond Fund (OUSG)</b>	<b>Ondo Short-Term Investment Grade Bond Fund (OSTB)</b>	<b>Ondo High Yield Corporate Bond Fund (OHYG)</b>
<b>ETF</b>	Undisclosed	iShares Short Treasury Bond ETF	PIMCO Short-Term Corporate Bonds ETF	iShares iBoxx \$ High Yield Corporate Bond ETF
<b>Underlying</b>	U.S. Money Market Funds	Short-Term U.S. Treasuries	Short-Term IG Bonds	High Yield Corporate Debt
<b>APY</b>	4.50%	5.13%	5.38%	7.76%
<b>Ondo’s Risk Rating</b>	AAA	AAA	BBB-	BB-

Source: Ondo Finance, Binance Research, as of Jul 19, 2023

Ondo Finance is currently one of the market leaders in the tokenized treasuries space with its OUSG offering, just behind TradFi asset manager Franklin Templeton.



**Figure 16: Ondo Finance has a 25.9% market share in the tokenized treasury market**



Source: rwa.xyz, Binance Research, as of Jul 19, 2023

Notably, Ondo Finance has recently expanded beyond Ethereum to Polygon. As part of a “strategic alliance,” it has issued its OUSG token, a tokenized version of Blackrock’s iShares Short Treasury Bond ETF, natively on Polygon<sup>(7)</sup>. As its first expansion beyond Ethereum, it will be interesting to watch how this will contribute to adoption.

# 5

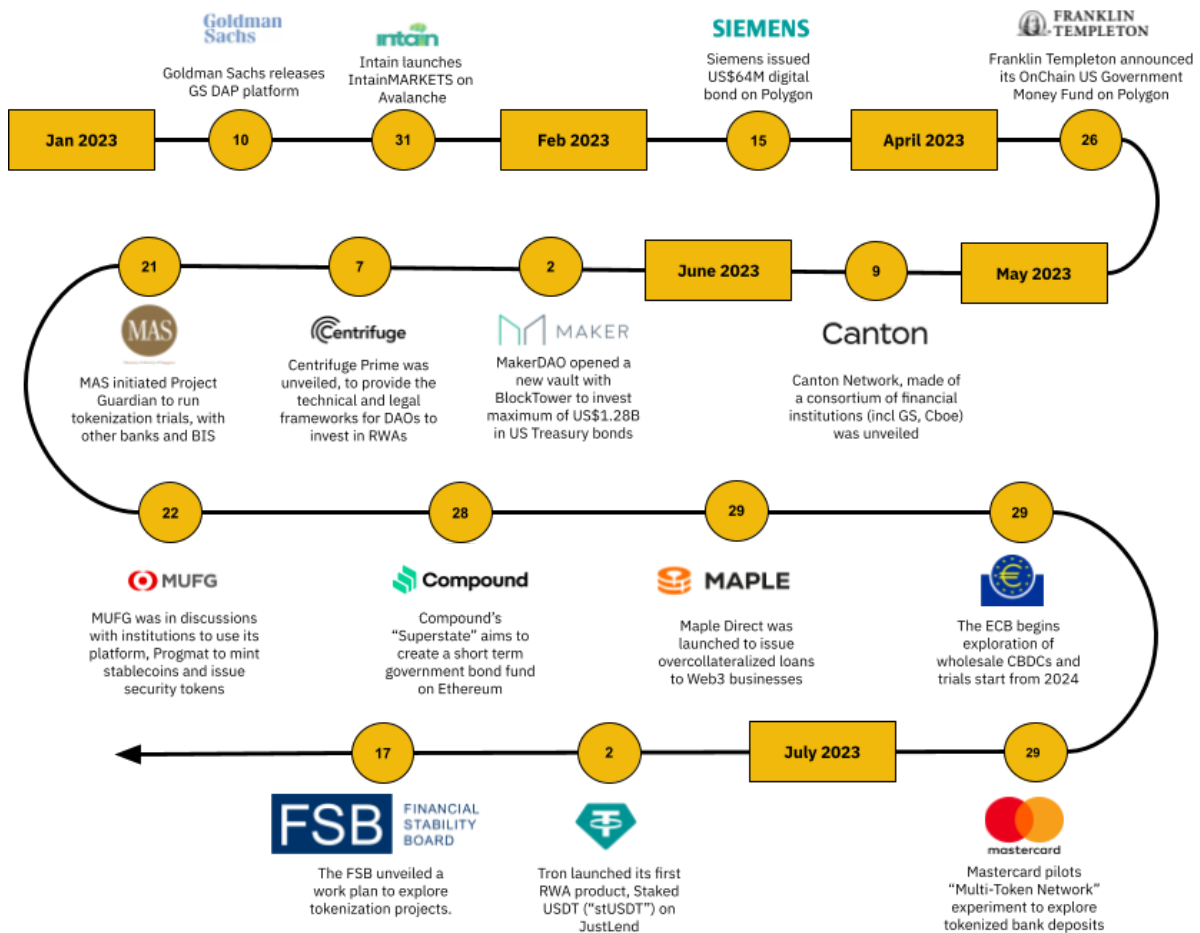
## Notable Developments

Dubbed the “[Killer App for TradFi](#)” by J.P. Morgan, tokenization emerged as a buzzword in 2023 and was cited as the “next generation for markets” by Blackrock’s CEO, Larry Fink<sup>(8)</sup>.

Interestingly, we note that beyond DeFi protocols, traditional financial institutions have also shown increasing receptiveness to the tokenization of RWAs. For one, global asset manager Franklin Templeton has launched its own fund on a public blockchain. Additionally, institutions have also begun exploring building their own private blockchains to tokenize assets.

Looking ahead, it is not unthinkable to see traditional exchanges facilitate secondary trading of tokenized RWAs, especially as adoption rises. In this aspect, the Australian Securities Exchange could reportedly consider listing tokenized RWAs in the future<sup>(9)</sup>. As the sector continues to mature, regulatory developments in this space will be the driving force behind mainstream adoption.

**Figure 17: Timeline of institutional adoption and market developments**



Source: Binance Research, as of Jul 19, 2023. This is not an exhaustive list of all ongoing RWA projects.

- ◆ **January 10, 2023:** Goldman Sachs unveiled its new digital asset platform, GS DAP, developed on the Daml smart contract language and its privacy-enabled blockchain, Canton<sup>(10)</sup>. It aims to make digital representations of assets and automate the workflow within the ecosystem. Examples include “tokenized assets, digital currencies, and other financial instruments.”
- ◆ **January 31, 2023:** Intain has launched its IntainMARKETS solution on Avalanche to provide a tokenized marketplace for structured finance products<sup>(11)</sup>.
- ◆ **February 15, 2023:** The largest industrial manufacturer in Europe, Siemens, issued a one-year US\$64M digital bond on Polygon, with investors including DZ Bank and Union Investment<sup>(12)</sup>. This aimed to streamline the process and remove the need for a central clearing house.
- ◆ **April 26, 2023:** Franklin Templeton announced that it brought its OnChain U.S. Government Money Fund onto the Polygon blockchain<sup>(13)</sup>. The US\$272M fund mainly invests in government securities, cash, and repo agreements.
- ◆ **May 9, 2023:** Canton Network, “a network of networks,” has unveiled a consortium of financial institutions on its blockchain, including BNP Paribas, Cboe Goldman Sachs, and Microsoft<sup>(14)</sup>. It will provide a decentralized infrastructure for tokenization and blockchain interoperability.
- ◆ **June 2, 2023:** MakerDAO has embarked on several approved proposals to open RWA vaults to generate yield for their assets, USDC and DAI. In April, the protocol opened a vault for Coinbase Custody and approved the transfer of up to US\$500M in USDC stablecoins for a 2.6% yield. Subsequently, on June 2, the community once again voted to open a new vault with BlockTower to invest a maximum of US\$1.28B in short-dated U.S. Treasury bonds<sup>(15)</sup>.
- ◆ **June 7, 2023:** Centrifuge unveiled its new product, Centrifuge Prime, which provides the technical and legal frameworks for DAOs to invest in RWAs<sup>(16)</sup>. Previous partnerships included Aave and MakerDAO using the Centrifuge platform.
- ◆ **June 21, 2023:** In collaboration with the Bank for International Settlements, the Monetary Authority of Singapore has presented a framework to propose ways to design open and interoperable networks for tokenized digital assets<sup>(17)</sup>. Known as “Project Guardian,” tokenization trials were run across wealth management, fixed income, and foreign exchange with banks such as Standard Chartered, HSBC, DBS, and Citi.
- ◆ **June 23, 2023:** Japan’s largest bank, MUFG, was in discussions with institutions to use its blockchain platform, Progmatic, to mint stablecoins, which are tied to foreign currencies, including USD, for global use<sup>(18)</sup>. The bank also aims to use the platform to issue security tokens for third parties.
- ◆ **June 28, 2023:** Compound’s founder has filed to launch “Superstate,” which will create a short-term government bond fund on the Ethereum blockchain<sup>(19)</sup>. It will invest in “ultra-short-duration government securities,” including U.S. Treasury bonds and government agency securities.

- ◆ **June 29, 2023:** Maple Direct, the new lending arm operated by Maple Finance, will issue overcollateralized loans to Web3 businesses<sup>(20)</sup>. These will be secured using the following eligible collateral: BTC, ETH, and staked ETH.
- ◆ **June 29, 2023:** The European Central Bank has outlined its direction to explore wholesale CBDCs alongside other options that enable the settlement of DLT transactions<sup>(21)</sup>. This will include trials using central bank money starting in 2024.
- ◆ **June 29, 2023:** Mastercard is piloting an experiment, the “Multi-Token Network,” which will begin by exploring tokenized bank deposits<sup>(22)</sup>. It aims to move on to CBDCs and regulated stablecoins in the future.
- ◆ **July 2, 2023:** Staked USDT (stUSDT), Tron’s first RWA product, will be officially introduced on JustLend<sup>(23)</sup>. Users who stake USDT on the platform will receive stUSDT. Staked assets are invested in RWAs to generate rewards.
- ◆ **July 17, 2023:** The Financial Stability Board unveiled a work plan to explore asset tokenization projects and assess their vulnerabilities and policy implications for the financial system<sup>(24)</sup>. This development comes as the Committee for Payments and Market Infrastructure explores “the benefits, risks, and challenges to central banks of a tokenized financial ecosystem.”

## 6 Closing Thoughts

The tokenization of real-world assets presents a strong use case for blockchain technology, potentially enabling the onboarding of the next wave of users into crypto. By providing greater transparency and increased efficiency, tokenization can be an attractive alternative to existing mechanisms. We have witnessed early signs of institutional adoption as traditional firms explore a technology that could resolve inefficiencies in today's solutions.

The proliferation of RWAs has also been a positive development for crypto investors, who now have access to increased opportunities outside of the crypto ecosystem. Apart from being able to take advantage of heightened treasury yields, the integration of RWAs has introduced more stable assets into DeFi and increased the diversity of collaterals in the space.

As we look ahead, we are hopeful that continued innovation and development in the RWA space will bring about more use cases and help drive crypto adoption.

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A crypto-centric review of the first half of 2023



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