



RedStone



CHAOS LABS

# RWA Report:

The Deep Dive into  
**2023** Market



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# 1 Key Takeaways

-  Real World Assets (RWA) protocols bridge traditional financial markets with DeFi, creating new use cases and opportunities. Asset tokenization enhances efficiency, transparency, and accessibility in the financial sector.
-  Institutions such as JP Morgan, Goldman Sachs, and Hamilton Lane are exploring real world asset tokenization. MakerDAO incorporates RWA in DAI collateral, Centrifuge leads in RWA lending, while Ondo Finance and Matrixdock play the first fiddle in tokenizing exposure to short-term U.S. Treasuries.
-  Gold is the second most tokenized asset regarding market capitalization in crypto, following USD, which is the leader. The debt market takes the third place.
-  Tokenization technology has the capability to transfer tangible and intangible assets on-chain. Apart from established classes such as real estate, precious metals, and financial products, RWA tokenization extends to intangible assets like intellectual property, expanding the possibilities for creators and innovators.
-  Oracles are important cogs in the RWA tokenization mechanism. They provide data feeds, which are utilized to price RWA backed tokens on various platforms and dApps. Secondly, they ensure accurate collateral valuation for CDPs and internal redemption mechanisms of RWA protocols, which ensures fair trading.
-  Collaboration between traditional finance and decentralized projects is at levels never seen before. Further adoption faces challenges, including regulatory uncertainty, however, their cooperation can address emerging issues.

## Featured RWA Projects

RedStone and Chaos, as authors of the report, would like to express a true gratitude to all the contributors, projects and key opinion leaders that helped us create such a comprehensive piece on the RWAs market. The depth and breadth of this report would not be possible without these individuals - thank you Bhaji and Asad from Centrifuge, Sid from Maple, Ryan from TrueFi, Po from Goldfinch, Sebastian from Steakhouse Financial, Adrian from Senken, Pablo from Angle, Suss from Ondo Finance, Kit from Backed Finance, Bernhard from Aktionariat, Adam from RWA.xyz, Wenni from MatrixDock, Donnie from KlimaDAO, Ela from Toucan, Jason from TProtocol, Anton from Pendle, Nader from Frax and many others!

Lending	Commodities	ESG	RWA-backed stablecoins	Debt Securities & Equity	Other
<a href="#">Centrifuge</a> (CFG)	<a href="#">PAX Gold</a> (PAXG)	<a href="#">Toucan Protocol</a> (TCO2)	<a href="#">MakerDAO</a> (DAI)	<a href="#">Ondo Finance</a> (ONDO)	<a href="#">RealT</a>
<a href="#">Maple Finance</a> (MPL)	<a href="#">Tether Gold</a> (XAUT)	<a href="#">KlimaDAO</a> (KLIMA)	<a href="#">Frax Finance</a> (FRAX)	<a href="#">Matrixdock</a> (STBT)	<a href="#">RWA.xyz</a>
<a href="#">Goldfinch</a> (GFI)	<a href="#">CACHE Gold</a> (CGT)	<a href="#">Senken</a>	<a href="#">Angle Protocol</a> (agEUR)	<a href="#">Backed Finance</a> (bTokens)	<a href="#">SteakFi</a>
<a href="#">Credix</a>			<a href="#">Flux Finance</a> (fUSD)	<a href="#">Aktionariat</a> (DAKS)	<a href="#">Avalanche Spruce</a> (AVAX)
<a href="#">TProtocol</a>			<a href="#">Tangible</a> (USDR)	<a href="#">Hashnote</a> (SDYC)	<a href="#">Canto</a> (CANTO)
<a href="#">TrueFi</a> (TRU)				<a href="#">OpenEden</a> (TBILL)	<a href="#">Kinto</a>
					<a href="#">Pendle</a> (PENDLE)
					<a href="#">FortunaFi</a>

## ② What are Real World Assets (RWA) in Web3?

In 2023, RWAs bring a lot of attention in the DeFi and Web3 space so let us first break it down:

1. The term real world assets describes all of the tangible assets which are represented in the physical world. Examples include real estate and commodities.
2. In crypto, the term RWA considers tokenization and bringing physical and financial assets on-chain utilizing blockchain technology and smart contracts.
3. Real world asset protocols serve as bridges connecting traditional financial markets (TradFi) and physical assets with crypto creating more use cases and opportunities.
4. Tokenized RWA offer increased liquidity, transparency, security, and availability.

Traditionally the real world asset class does not even include financial assets. It originally encompasses anything physical that has a practical utility such as real estate, commodities (natural and agricultural resources), infrastructure, machinery, and equipment. Financial instruments have a more abstract representation. However, when RWA are discussed in crypto, they are various tokenizable assets from real estate and precious metals to stocks, bonds, and financial derivatives. In traditional finance, real world assets function as a valuable collateral source for loans. Similarly, crypto protocols want to bring the same advantages and functionality to DeFi.

Let's look at a comparison example. Trading companies - any establishment paying bills by buying and selling various assets - must comply with diverse regulations like AML, report on illegal practices (e.g., wash trading), etc. Each party, exchange, and trader, is obligated to monitor their activity and report trading history daily. Next, systems verify if no rule has been broken. However, in case of an error or inaccuracy, some businesses have to examine trades manually using screenshots and Excel sheets. It is an inefficient and untrustworthy strategy because it is subject to human error.

Blockchain technology and tokenized RWA can help resolve such issues. With blockchain, each party can run its node and validator and have its ledger. Any inconsistencies will fall to a minimum and special events will be automatically detected and raised. The most important thing is that every participant will act as an independent validator and the whole network of financial institutions and companies will create a decentralized system. It is a goal many RWA protocols strive for. As a result, there would not be TradFi and DeFi divisions, rather the entire market would be interconnected and transparent. Though, at the time of writing, we are still miles away. A few hurdles need to be crossed to have an international system like this. Nevertheless, it shapes as an ultimate objective for tokenized real world assets.

To combine unique properties and characteristics for non-fungible real world assets, protocols incorporate non-fungible tokens (NFTs). They include the most important information about specific assets. By tokenizing these assets, their ownership and transaction history can be recorded securely on the blockchain. Familiar examples can be tokenized art, commodities, and real estate. Smart contracts manage NFT issuance and transfers ensuring that any real world asset representations are transparent and automatically enforced on the blockchain.



# The Types of RWA: Deep Dive

The variation of tokenized RWA in crypto is already diversified. Total value locked (TVL) of real world asset categories amounts to over \$880 Million at the time of writing (according to [DeFiLlama](#)). It is both a little and a lot, depending on the perspective. The TVL in DeFi amassed \$70.9 Billion. From this perspective, \$880M is relatively small, only 1.2% of the decentralized finance market. On the other hand, since Q4 2021 we have witnessed the growth and steady performance of the RWA class. Moreover, looking at the total value of digitalized real world assets in traditional finance, there is a massive upside potential for tokenized RWAs.



RWA category TVL chart from Q4 2021 until August 2023. (Source: [DeFiLlama](#))

## Tokenized Debt

Each RWA protocol offers some unique use cases and integrations with different Layer 1 and Layer 2 networks. Importantly, RWA may gain much more utility thanks to blockchain and smart contracts. As mentioned earlier, real world assets in DeFi refer to diversified tokenized instruments or physical goods. Hence, the first distinction of RWA protocols can highlight financial and tangible assets. DeFi protocols already offer equity exposure. Projects like Ondo Finance and MatixDock provide institutional-grade solutions. They grant access to US Treasury Bills, which is the largest and most liquid government bond market globally. In addition, Ondo services include US money markets as the most-liquid investment options available and corporate bonds exposure. Together both protocols bridge substantial TradFi markets with DeFi. Protocols explore the bond markets widely in comparison to stocks or other securities. The debt market is larger than the equity market, posing as a factor in prioritizing tokenized bonds. TrueFi is also making the credit market more accessible and transparent. Their protocol brings debt infrastructure on-chain. TrueFi offers tokenized US Treasury Bills. Provided the fund carries out a calculated strategy to preserve capital, stable yield, and high liquidity. Investment offering has all the details familiar to every fund investor, including fees, terms, and required capital. Adapt3r Digital, a US-based asset manager, is managing the US treasuries portfolio on TrueFi. This example shows how DeFi and TradFi can cooperate to provide excellent investing services.

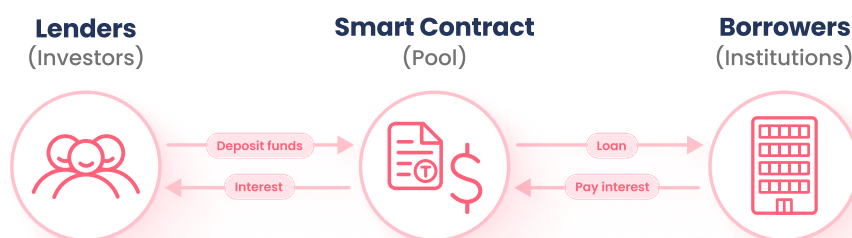
## Tokenized Equity

As a natural sequence, securities like stocks are next to bonds on the radar. To date, multiple attempts were made to bring equities on-chain. However, the results have not been as successful as debt tokenization. The hype for synthetic, tokenized assets peaked in 2021 when Mirror protocol on Terra hit almost \$1 Billion TVL offering synthetic stocks and Binance listed a token tracking Tesla stock price. For the clarity sake we may mention that synthetic assets are not the true example of RWA as they are not backed by the real world collateral but function more like a financial derivative. However, the experiment and popularity did not last long, and after four months, the exchange ceased stock tokens trading citing regulation uncertainty that predominantly influenced the decision. Nowadays, buying and selling tokenized stocks is limited, and it is not an anonymous option anymore. Users are obligated to perform Know-Your-Customer (KYC) verification or at least provide basic credentials. The Swiss-based Aktionariat is one of the few protocols providing a platform for legal security tokens. They offer digital stocks for 40 companies from the Swiss market. Aktionariat's solution can improve liquidity and bring new investors to thousands of businesses by creating a market for tokenized shares directly on an issuer's website. All their users need is a Web3 wallet e.g., MetaMask, to start investing.

## RWA Lending

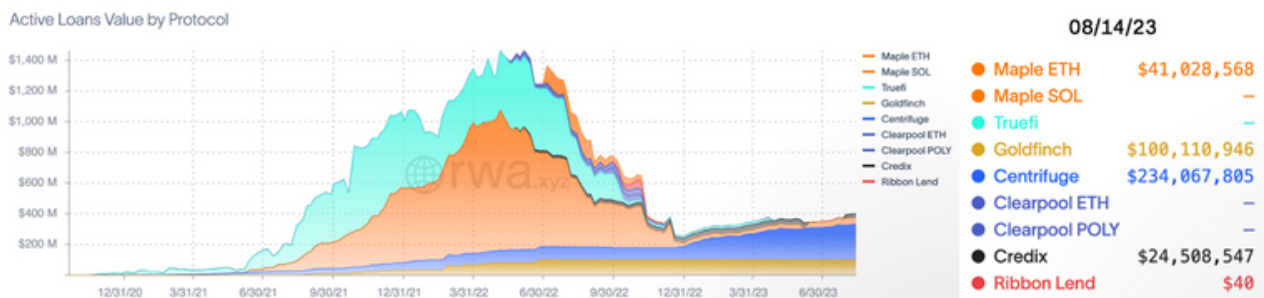
The lending process in DeFi is uncomplicated, and the procedure is straightforward in theory (Illustrated in the graphic below). The mechanism consists of lenders (investors), borrowers (institutions), and lending pools (smart contracts). Depending on the protocols' architecture, borrowers provide RWA as collateral or not. In the latter case, protocols conduct due diligence to ensure lenders' security. Lenders are on the opposite side, where they supply institutions and companies with capital. Interest incentivizes investors to enter the pool and deposit funds, which are next distributed to loanees. Both parties meet in the lending pool. It acts like an escrow based on smart contracts. A team of credit professionals or advanced financial algorithms manage funds. Every action, deposits, withdrawals, and interest are easily trackable on the blockchain. The ledger is publicly available, presenting a high level of transparency unheard of in traditional finance.

### Simplified RWA Lending and Borrowing Flow



RWA in the crypto space has the potential and power to enhance DeFi lending market efficiency. Enterprises could benefit from unlimited funding capabilities, and borrowers have additional investment opportunities. Centrifuge, the trailblazing project in RWA lending, provides pools associated with real world assets. Their platform unites businesses and investors via smart contracts and NFTs. Companies tokenize their financial assets and use them as collateral. One of the RWA space pioneers, Maple Finance, offers quality lending opportunities to sophisticated capital allocators as well. Their platform operates as credit pools operated by credit professionals which underwrite loans to businesses after passing KYC and credit assessments. Maple’s marketplace provides a range of yield options for DeFi users which suit risk and liquidity requirements. Loan details such as terms, status, and borrowers’ information are visibly exhibited for lenders to make informed decisions. Lending prospects do not end there. Another player, Goldfinch, is an onchain private credit platform, connecting borrowers and lenders around the world where loans are backed by off-chain assets and the borrower’s income. Investors access global debt opportunities through Goldfinch and earn returns that are not tied to crypto market fluctuations. Embracing "trust through consensus", Goldfinch offers borrowers a chance to prove their creditworthiness via a collective third-party evaluation. Importantly, a distinct feature of Goldfinch is the mandatory soulbound NFT that every protocol participant needs to hold before interacting (e.g., deposit or claim). Users undergo a KYC process with third-party agencies; those who clear the procedure are allowed to obtain an NFT. These verifications are updated daily, underscoring Goldfinch’s commitment to a compliance-centric platform management. In addition, RWA lending is not only based on the Ethereum network. Credix is the first protocol connecting institutional investors with global credit opportunities on the Solana blockchain. Credix focuses on organizations such as hedge funds, family offices, and alternative asset managers rather than individual investors. DeFi adoption must introduce more B2B relationships, which traditionally power the world’s economy. Another RWA Lending project, TProtocol, focuses on specialized pools that allow for different risk profile creation, based on the underlying asset. Such design allows users to curate their profile to their own risk desire and their note token USTP gives holders exposure to T-Bills yield.

On the other hand, Goldfinch offers a decentralized RWA credit protocol with loans fully collateralized off-chain. Their system consists of members (investors), borrowers (institutions), and auditors. Goldfinch introduces auditors to vote on approving borrowers, granting boosted decentralization.



Cumulative value of active loans by RWA protocols historically. (Source: <https://app.rwa.xyz/>)



## Property Tokenization

Switching to physical real world assets, we first enter the real estate market. Property tokenization is ranked second in regards to TVL, just after bonds. The advantage of digital real estate representation is the possible fractionalization of the property. Not everyone can afford to invest in the whole building. Hence, split ownership allows more investors to start their real estate market exposure. The principle is that a specific property is assigned a determined number of tokens, which afterward are available on the market. RealT is one of the platforms providing yield strategies based on real estate RWA. In their protocol, lenders deposit capital and provide liquidity. In exchange, smart contracts issue tokens that yield interest. These tokens offer freedom and flexibility for lenders, permitting them to seamlessly transfer, securely store, and proficiently trade these assets.

## Digital Commodities

Commodities play as a prospective asset class susceptible to tokenization. Digital gold is especially a popular category. Its market capitalization reaches \$1B, according to Coingecko. The biggest stablecoin issuers, such as Paxos and Tether, are involved. Gold tokenization creates digital tokens on a blockchain, representing physical gold ownership in a vault. This technology has the power to rival gold ETFs, futures contracts, and bars. Importantly, there are many advantages associated with transferring precious metals on-chain. For example, storage fees are a thing of the past in comparison with physical gold purchases. Moreover, transactions are settled instantly (depending on the blockchain), unlike traditional finance's lengthy standards. On top of that, tokenization introduces fractionalization to the commodity market. If investors cannot afford a single bar, they can buy lower amounts making an investment more accessible. In addition, tokenized gold can be redeemable for actual gold at any time. Fractional ownership democratizes access, while blockchain ensures transparency and efficiency.

Institutions responsible for minting digital gold must ensure security and that each token is collateralized by real commodities. Paxos, for example, backs its token Pax Gold (PAXG) with gold stored in LBMA vaults in London. The largest institutions are centralized entities, luckily, DeFi projects also issue tokenized gold. It is important to have decentralized alternatives on the market e.g., CACHE Gold (CGT), although their market cap is tiny compared with PAXG or Tether Gold (XAUT). As the next era of financial infrastructure for global markets takes shape, blockchain technology is stepping forward. With growing attention on gold due to inflationary concerns, tokenized gold is in a good position to take an important role in the transition to on-chain finance.

Other assets from this category, such as silver or different hard and soft commodities, are still untapped in terms of tokenization. Gold outclasses them all. It is not surprising to see silver in second place. However, it has not caught much traction yet. The rest of the assets, like oil and gas or agricultural commodities, are uncharted. Market analysts looking at the value of these assets in the centralized world estimate that with blockchain technology maturing, tokenized popular commodities also have significant market potential in the long run.

## Carbon Tokenization and ESG

Another type of RWA taps into ESG investments, especially carbon neutrality. The topic is often discussed in Europe, where the strictest environmental regulations, standards and consumer expectations exist. Some companies are obligated to meet CO2 emissions standards, and many others prioritize viable sustainability strategies to demonstrate their environmental credentials. To achieve this, organizations often buy and “offset” carbon credits to compensate for their carbon footprint. The surge in demand for carbon credits creates new challenges and markets which address mankind’s environmental impact. Decentralized projects and blockchain applications offer viable solutions to the carbon markets to help improve their efficiency and increase their scale.

Toucan Protocol is addressing climate change with tokenized carbon credits by exposing the carbon market to the benefits of public blockchain technologies. Toucan provides a bridge to bring carbon credits on-chain from an approved registry into a tokenized form. Each aspect of RWA information is recorded on a blockchain. Anyone can verify a given credit’s details, transaction history, and price data.

Blockchain architecture can serve as a foundation for specific applications and products that help scale the carbon market. Toucan works closely with Voluntary Carbon Market (VCM) stakeholders to educate on the advantages of alternative climate finance solutions. As Industry 4.0 and Web3 expand and evolve, the need and demand for liquid, accessible carbon markets will grow.

KlimaDAO is a decentralized autonomous organization driving climate finance within the carbon markets via \$KLIMA token and the blockchain-based carbon market infrastructure it develops.

Carbon credits come in many different varieties, and companies use brokers and intermediaries to access carbon credits, which can lead to a fractured and illiquid market. In addition, trades often occur behind closed doors which reduces the availability of clear market data and pricing signals to inform market decisions. With friction and barriers across the carbon markets, KlimaDAO aims to solve key market challenges by using DeFi tools and public blockchain technologies to reduce opacity, illiquidity and fragmentation in the VCM.

KlimaDAO uses carbon credits to back its native token \$KLIMA, which is also distributed as an incentive to encourage more engagement with the protocol from its users. The \$KLIMA token also plays a key role in facilitating the Digital Carbon Market (DCM), as it provides a liquidity pair for tokenized carbon (such as that created by Toucan or C3), and as a governance token to vote on key DAO decisions. In addition, the DAO itself has organized and executed on the development of infrastructure that can increase accessibility and adoption of the Digital Carbon Markets, and the tokenized carbon credits contained within it. The infrastructure deployed to-date includes its carbon dashboard – which gives users full access to market data, carbonmark.com – a marketplace for acquiring digital carbon credits transparently and instantly, and its retirement aggregator – which allows users to “offset” or consume the environmental benefit represented by carbon credits.

Senken is a further example of an innovative combination of blockchain technology and ESG investing. Their business revolves around the carbon credit marketplace. Senken

connects institutions, asset managers, and investors with verified climate projects. Tokenized RWA are tracked on a blockchain available to the public. Distributed ledger technology plays a crucial role in security and transparency.



#### FLORESTAL SANTA MARIA PROJECT

235,349.3 credits available



Brazil

BeZero Carbon Rating B

2013



Agriculture Forestry and Other Land Use

#### Buy and Retire Carbon Credits

Get started today! Buy carbon credits and get a retirement certificate.

Buy from

1.75 \$ / tCO<sub>2</sub>

Request credits

Carbon credits market related to a project in Brazil (Source: <https://senken.io/>)

Digital Carbon Market protocols such as Toucan Protocol, KlimaDAO, and Senken are very interesting projects that bring something new to the crypto space. ESG investing gains worldwide traction, especially in Europe. More and more companies will have to buy carbon credits or produce carbon offsets to reduce their impact on the environment and to be within the limits of respective maximum emissions.

## Permissioned Protocols and Regulatory Compliance

The expansion of RWA protocols is noteworthy. However, a key distinction sets them apart from the majority of DeFi projects. This distinction lies in the fact that real world assets often operate within a permissioned framework. This means that access and participation are controlled by certain entities or governed by specific rules. These institutions provide admission to conventional financial instruments that are explicitly classified as securities under legal frameworks. Consequently, they are obliged to adhere to the regulations and laws that govern securities trading and issuance.

Opinions diverge on the significance of this approach. On the one hand, proponents could argue that incorporating securities into the blockchain realm signifies progress toward extending the influence of blockchain technology within the economy. Conversely, critics might assert that these protocols simply leverage blockchain to enhance the efficiency of traditional financial practices.

Reflecting on the situation four years ago, the concept of tokenizing securities held considerable potential. It has however, unfortunately, fallen short of delivering substantial outcomes.

Conversely, the protocols that have since emerged show encouraging signs of growth and development. Determining how these protocols integrate with the established DeFi landscape is a complex challenge, given the regulatory obstacles. Nonetheless, there is a possibility that the evolution of RWA tokenization could contribute to greater regulatory clarity within the DeFi sector over time.



# RWA Protocols by Category

Summing up, the below table gives a simplified categorisation of RWA protocols.

Lending	Commodities	ESG	RWA-backed stablecoins	Debt Securities & Equity	Other
<a href="#"><u>Centrifuge</u></a> (CFG)	<a href="#"><u>PAX Gold</u></a> (PAXG)	<a href="#"><u>Toucan Protocol</u></a> (TCO2)	<a href="#"><u>MakerDAO</u></a> (DAI)	<a href="#"><u>Ondo Finance</u></a> (ONDO)	<a href="#"><u>RealT</u></a>
<a href="#"><u>Maple Finance</u></a> (MPL)	<a href="#"><u>Tether Gold</u></a> (XAUT)	<a href="#"><u>KlimaDAO</u></a> (KLIMA)	<a href="#"><u>Frax Finance</u></a> (FRAX)	<a href="#"><u>Matrixdock</u></a> (STBT)	<a href="#"><u>RWA.xyz</u></a>
<a href="#"><u>Goldfinch</u></a> (GFI)	<a href="#"><u>CACHE Gold</u></a> (CGT)	<a href="#"><u>Senken</u></a>	<a href="#"><u>Angle Protocol</u></a> (agEUR)	<a href="#"><u>Backed Finance</u></a> (bTokens)	<a href="#"><u>SteakFi</u></a>
<a href="#"><u>Credix</u></a>			<a href="#"><u>Flux Finance</u></a> (fUSD)	<a href="#"><u>Aktionariat</u></a> (DAKS)	<a href="#"><u>Avalanche Spruce</u></a> (AVAX)
<a href="#"><u>TProtocol</u></a>			<a href="#"><u>Tangible</u></a> (USDR)	<a href="#"><u>Hashnote</u></a> (SDYC)	<a href="#"><u>Canto</u></a> (CANTO)
<a href="#"><u>TrueFi</u></a> (TRU)				<a href="#"><u>OpenEden</u></a> (TBILL)	<a href="#"><u>Kinto</u></a>
					<a href="#"><u>Pendle</u></a> (PENDLE)
					<a href="#"><u>FortunaFi</u></a>

### 3 The Market Overview of RWAs

RWA and blockchain use cases might shape the future of the global economy. The advantages of distributed ledger technology can induce a new age in personal finance and institutional investments. Nowadays, crypto in many eyes could be associated with scams, overpriced JPEGs, and incalculable token projects, or still unknown territory. Real world asset tokenization can change that, making blockchain truly widespread in society. The financial revolution and innovation that comes with it have already opened up a range of new possibilities that were previously inaccessible through traditional platforms. The annual extra capital that asset tokenization can generate is significant. According to the [Boston Consulting Group](#), just global clearing and settlement cost savings can bring \$20 Billion. The benefits do not end there. Crypto RWA can unlock the potential in illiquid assets, reduce operation costs, improve the lending market, and in practice make countless financial intermediaries obsolete.

Transforming assets into digital token securities introduces a whole new range of applications. Because blockchain and smart contracts impose programmatic rules, procedures, and restrictions, it allows for unparalleled and innovative use cases. For instance, fractionalization enables illiquid assets to hit the market and attract new investors. Decentralized networks provide a ground for unlimited transactions, security, and transparent transfers. Together it could create a global and open marketplace that connects the prawns and whales of the financial market. And when RWAs go on-chain, they can be smoothly integrated with DeFi protocols, empowering the next stage of blockchain utilization.

The expected advantages of RWA digitalization extend across various categories, encompassing private capital markets, asset-backed securities, money market funds, ETFs, intellectual property, and fixed income. The Total Addressable Market (TAM) for tokenization is staggering and ever-growing. In particular, private capital markets, which include company equity, debt, and real estate, confront issues such as illiquidity, outdated asset pricing data, and the presence of multiple intermediaries that influence price discovery and updates. These challenges render this sector notably receptive to alternative financial solutions.

Renowned financial institutions understand the RWA tokenization potential as well. JP Morgan considers the digitalization of traditional assets such as US Treasuries and money market funds. JPM is well acquainted with alternative finance methods. Their Onyx division works on digital infrastructure and networks and the bank is taking it further with JPM Coin, a blockchain representation of the US Dollar. Goldman Sachs has its own digital asset platform too. Their main focus is to simplify financial markets and get rid of unnecessary intricacies. Initially, GS DAP takes care of bond tokenization, which is experiencing the highest demand right now. However, in the future, the platform plans expansion to other assets such as real estate, private equity funds, and structured finance. Furthermore, enormous investment-management firms like Hamilton Lane are testing tokenized market waters. They even recently introduced a fund on the Polygon blockchain. Last but not least, Franklin Templeton, a leading asset management firm, run a mutual fund leveraging a public blockchain for both processing transactions and recording ownership of shares. Many institutions utilize Daml, a private blockchain

language designed to create tokenization platforms. It is the product of Digital Asset and it is used by Goldman Sachs and Broadridge platform.

As one can see, institutional RWA tokenization engagement is substantial. Financial behemoths are developing technologies and platforms to create digital asset representations and have realised there is a future in this approach. However, most of their ventures are centralized. Although it is a massive step forward from the current financial market standards, the power, and control are still in the hands of a few. To challenge that, decentralized projects create innovative solutions accessible to anyone. RWA protocols began to emerge fairly recently (2021). Slowly but steadily, they have grown and gained publicity. DeFi regulars are accustomed to tokenization platforms on Ethereum or other networks, but for crypto beginners or occasional investors, RWAs on-chain are unexplored.

Name	1d Change ↕	7d Change ↕	1m Change ↕	TVL ↕	Mcap/TVL ↕
1  stUSDT 2 chains	+0.01%	+38.94%	+68.55%	Ⓢ \$704.81m	
2  Ondo Finance 2 chains	-0.80%	-2.12%	+7.47%	Ⓢ \$161.03m	
3  MatrixDock 1 chain	+0.04%	+0.24%	+25.26%	Ⓢ \$123.82m	
4  RealT Tokens 1 chain	-0.07%	+0.21%	+0.87%	Ⓢ \$83.02m	
5  Maple RWA 1 chain	+1.07%	+3.09%	+7.51%	Ⓢ \$33.37m	
6  Tangible 3 chains	-0.91%	-14.30%	-47.94%	Ⓢ \$32.79m	
7  Solv Protocol 4 chains	-3.76%	-4.33%	+12.44%	Ⓢ \$31.32m	
8  Lofty 1 chain	-0.01%	-0.11%	-8.68%	Ⓢ \$24.1m	
9  Aktionariat 2 chains	-0.00%	+25.82%	+19.51%	Ⓢ \$19.19m	
10  Toucan Protocol 3 chains	-5.82%	-4.93%	-2.73%	Ⓢ \$15.17m	

Top 10 RWA protocols by TVL on 19th August 2023. (Source: [DeFillama](#))

When assessing the influence of RWA on the DeFi sector and the broader cryptocurrency economy, it is important to pay special attention to the market capitalization of these assets. When looking at new and innovative RWA protocols that are being introduced, the Total Value Locked in these protocols is observed to be under \$1 billion. Simultaneously, tokens backed by real world assets, such as PAX Gold, have substantial amounts of value tied up. For instance, PAXG is a token that represents ownership of physical gold, and its market capitalization is approximately \$500 million. The largest representation of real world assets backing any cryptocurrency or protocol is prominently demonstrated by Tether’s stablecoin. USDT is primarily backed by RWAs. These assets include more than \$3 billion worth of precious metals (like gold) and a significant amount of \$53 billion in Treasury Bills (T-Bills).

In summary, it is paramount to consider the market capitalization of real world assets in the context of DeFi and the broader cryptocurrency economy. While new RWA protocols might have a TVL below \$1 billion, tokens like PAX Gold possess significant value due to their backing by real-world assets. Furthermore, the dominance of USDT as the largest



RWA-backed cryptocurrency, with substantial holdings in both precious metals and T-Bills, showcases the impact of real world assets on the crypto landscape. Lastly, one should remember that stablecoins and tokenized gold are freely tradeable (like other crypto assets), whereas tokenized securities and credit are not. Moreover, stablecoins and gold are fully fungible whereas credit is much less fungible (more like NFTs).

## RWA 2023 Leaders

Ondo Finance is a captivating protocol at the forefront of tokenizing real world tangible assets. This innovative platform pioneers institutional-grade finance within the DeFi space, offering a selection of quality security assets. Ondo Finance specializes in the tokenization of esteemed US asset classes, including the US Money Market (OMMF), US Treasuries (OUSG), Short Term Bonds (OSTB), and High Yield Corporate Bonds (OHYG), all of which are well-known to traditional investors. By facilitating the tokenization of these real world assets, Ondo Finance enhances liquidity and accessibility for investment vehicles. Each tokenized product assumes the structure of a fund, imbuing investors with a sense of familiarity regarding management, fees, and risk exposure.

Beyond the tokenization of RWAs, Ondo Finance expands its ecosystem by establishing decentralized protocols, harnessing the capabilities of premium security tokens. One such innovative protocol is Flux Finance, a lending platform that leverages OUSG as loan collateral, presenting a compelling use case for real world asset tokenization. Flux Protocol supports lending and borrowing through the issuance of derivative stable fTokens, which represent loan positions. The synergy between Ondo Finance and Flux Protocol paves the way for RWA-backed stablecoins, and merges the excellence of Traditional Finance (TradFi) securities with the efficiency and transparency of blockchain technology. As TradFi and DeFi continue to converge, the collaborative efforts of Ondo Finance and Flux Protocol are expected to play a pivotal role in shaping the future landscape of the financial industry.

As the landscape of on-chain RWA continues to expand, so too will the demand for effective on-chain yield management. Recognizing this trend, protocols such as Pendle have a unique approach to RWA adoption via money market protocols that support tokenized T-Bills as collateral instead. Therefore, Pendle [has recently listed](#) Flux Finance's fUSDC as its first RWA pool. This enables users to provide liquidity, secure fixed yields and/or to directionally trade yield fluctuations in fUSDC's APY. Following the expanding RWA narrative, Pendle considers already listing other similar RWA-related pools in future. Interest-rate derivatives is one of the largest markets in traditional finance, and have historically been the backbone of institutional hedging. In a similar vein, these RWA pools on Pendle represent essential tools for institutions and sophisticated investors to manage on-chain exposure, as well as meaningfully participate in the digital asset space.

Last but not least, Ondo offers USDY (US Dollar Yield Token), which is the first retail accessible product from Ondo. Like stablecoins, USDY operates as a bearer asset that can be transferred to investors without their need to be onboarded with the issuer. However, onboarding is necessary for minting or redeeming. Importantly, USDY holders earn almost the entire yield from the assets that back USDY, a comparison between USDY and stablecoins is available [here](#).

The debt market is what most centralized and decentralized projects battle with. It is a space with institutional interest. Hence, protocols such as Matrixdock provide access to tokenized real world assets. Their digital asset platform offers Short-term US Treasury Bills tokens (STBT). Matrixdock emphasizes transparency and security. They share daily asset statements as well as all historical transaction records relating to the minting, burning, and rebase of STBT.

Tokenized RWA presents a great opportunity for stablecoin holders who wish not to exit the crypto market. Matrixdock supports all major stables such as USDC, USDT, and DAI. Investors can directly transfer cryptocurrencies in exchange for US Treasury Bills. Although the US government bond market is the biggest and most liquid one, having an immediate possibility to jump between crypto and debt securities is convenient. T-Bill ownership has never been easier even with compulsory KYC requirements.

Creating a slightly different flow, OpenEden has built the smart-contract Tokenized Vault that allows users to mint and redeem TBLILL token, around the clock, in an on-chain manner, with a regulatory compliant foundation in a bankruptcy-remote SPV structure. The improved settlement time is a result of smart contracts implementation that convert deposited assets to TBILLS automatically. Additionally, OpenEden offers a 60+ pages prospectus for investors that ascribe their rights and risks, plus manages the funds by investing in treasury bills, reducing potential risks coming from investing into its ETFs. Notably, the issued TBILL token accrue in value daily, by the underlying T-Bills interest.

DeFi giant MakerDAO and RWA are another profound example of digital asset symbiosis. In 2022 MakerDAO introduced a proposal accepting new forms of DAI collateral. Tokenized real world assets became viable options. As of June 2023, MakerDAO's total RWA portfolio reached a value of **2.34 billion DAI**. It consists of vaults representing different deals and funds allocated to specific vaults have distinct purposes. Lend capital drives investment in various sectors, including real estate, renewable energy projects, construction, invoices, US Treasuries, and corporate bonds. The majority of vaults are powered by Centrifuge, a protocol that specializes in tokenized real world assets. RWA helped Maker to scale its operations and diversify collateral options. The protocol issues loans in the form of DAI to financial institutions, which pay interest contributing to revenues.

RWA is an important part of Maker's livelihood. They generate over **half of the revenue**, which can be surprising for the second-largest DeFi protocol in TVL. Fees collected from real world asset exposure contribute significantly to Maker's financial result. Right now they are more than just a DAI stablecoin issuer. Their next 10-year roadmap called The Endgame Plan incorporates RWA involvement. Depending on the phase, the real world asset exposure can be unlimited or restricted to 25%. The structure will highly rely on DAI 1:1 peg to the US Dollar, but plans include situations of global economic and geopolitical instability.

The impressive part of Maker's operation is that all relevant metrics can be tracked using Dune Analytics dashboards. People can verify the protocol's balance sheet, revenues, asset type exposure, DAI utilization, and more. All of which show the advantages of blockchain technology and the levels of transparency it presents.

# The Growing Case of RWAs: Centrifuge & Backed Finance

Centrifuge is a pioneering credit protocol focused on bringing RWAs on-chain. It is one of the first protocols linking real world assets and blockchain technology that started back in 2017. Their cooperation with MakerDAO, minting the first RWA and bringing the first credit fund operations on-chain and Aave, building the RWA market is a hands-on example and a statement of Centrifuge's mission. Centrifuge's approach to driving the RWA industry showcases its commitment to pushing the boundaries of blockchain technology integration and sets new directions in the space. The team aims to connect borrowers and lenders without any unnecessary intermediaries with the help of tokenized fully-collateralized asset pools.

With a vision that extends beyond traditional boundaries, Centrifuge expands the reach of blockchain applications to encompass a diverse range of financial instruments. By bringing mortgages, invoices, microlending, consumer finance, and even more traditional securities on-chain, Centrifuge opens up new avenues for accessing and leveraging real world assets within DeFi. This innovative integration of tangible assets into the blockchain realm holds the potential to revolutionize the financial landscape, providing greater accessibility and efficiency to the credit market, and creating a more robust and stable on-chain ecosystem.

Centrifuge seeks to connect on-chain capital with off-chain economic opportunities. The ultimate goal of the protocol is to resolve the financing problem of small and medium-sized enterprises (SMEs) by providing more efficient infrastructure for credit. It is harder for SMEs to access capital money markets, although they are the building stones of the global economy representing over **90%** of businesses worldwide. Centrifuge tackles SME trading limitations by coding the financing process into a blockchain.

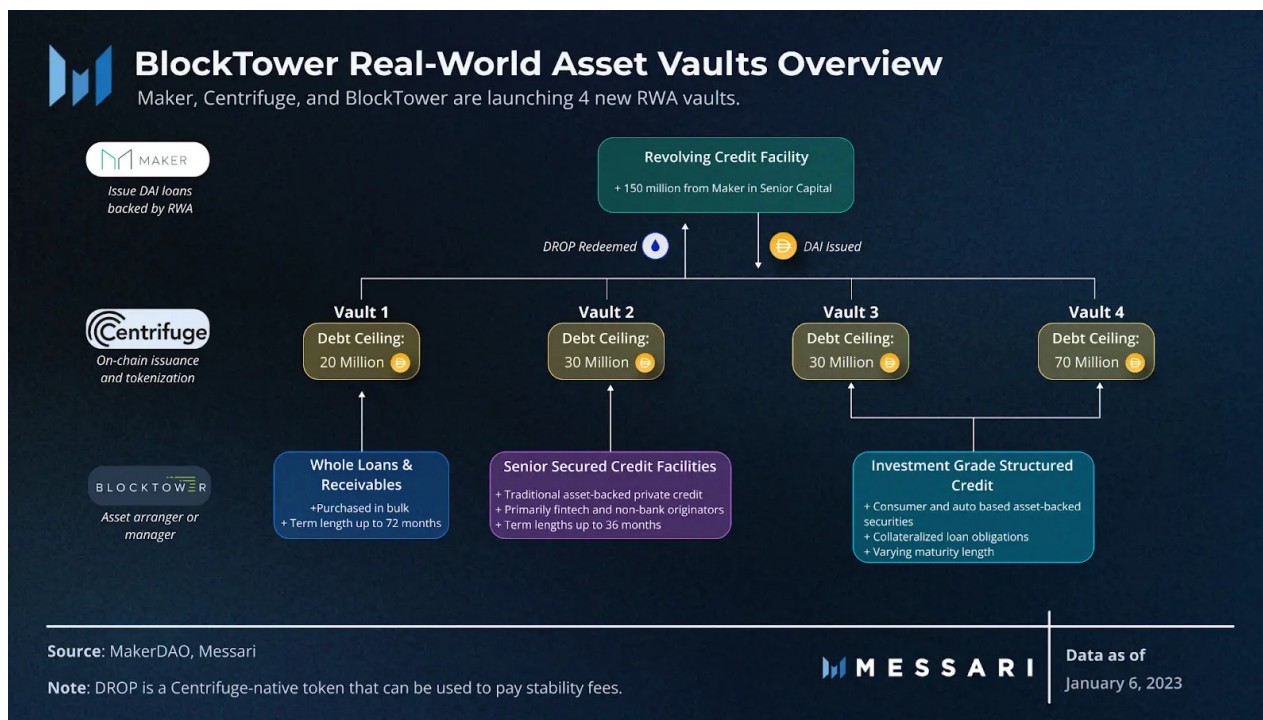
*"The next generation of protocols will succeed by taking the best elements of DeFi - automation, transparency, decentralization - and using this to solve problems in traditional markets. We've been learning and building towards this dream for years now and believe our deep integrations with on-chain capital markets, our commitment to automation and transparency, and the continually growing quality of our ecosystem are ready to lead the next bull cycle"* said **Lucas Vogelsang, Centrifuge CEO & Cofounder**.

Backed Finance emerged as a groundbreaking venture that exemplifies the potential of real world asset tokenization within the dynamic realm of DeFi. Backed Finance introduces an innovative protocol that revolves around the issuance of bTokens - fully-backed representations of tangible financial assets. At its core, Backed Finance's mission is to democratize access to financial instruments by seamlessly converging traditional equities with the DeFi ecosystem. Backed Finance delivers tokens that mirror the intrinsic value of renowned equities. These tokens hold the potential to soak through the DeFi landscape, providing users with the ability to integrate into diverse leveraging strategies.

Backed Finance represents a fresh shift in asset digitization, envisioning a future where conventional publicly traded assets transition fluidly into adaptable crypto tokens. The project addresses the obstacles confronted by tokenized securities and synthetic trackers in terms of platform limitations, regulations, and user confidence. Rooted in a



foundation of compliance and interoperability, Backed Finance serves as a conduit to tokenized stocks and equities on the blockchain. This tokenization is executed meticulously, ensuring each token corresponds precisely to its real world asset counterpart, fortifying security measures through engagement with licensed custodians. They harness Ethereum's versatility to unlock the full potential of its tokens across the expansive DeFi landscape, embracing cross-chain functionality through established bridges. SteakFi prepared an extensive [risk assessment for Backed Finance](#) in August 2023 that gives a good overview of the dynamics.

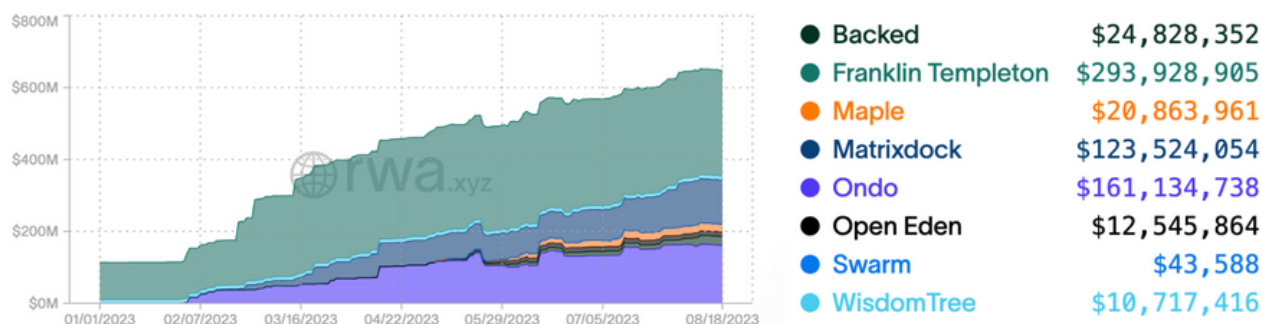


Overview of Centrifuge, BlockTower, and MakerDAO vaults. (Source: <https://messari.io/>)

## RWA Analytics

Tokenized real world assets are bridging traditional and decentralized finance. This technology continues to fascinate start-ups and protocols as well as renowned institutions. With the power of blockchain and some data analytics trickery, new possibilities to monitor and present information are beginning to appear in the sector. Anyone can access clean and relevant data online. One of the platforms strictly focused on providing RWA information is RWA.xyz from Castle Labs. It is an incredible tool for tracking and comparing tokenized asset data. Users can check charts and tables for tokenized treasuries, bonds, and cash equivalents. Furthermore, they can verify details for credit protocols. RWA.xyz is a must-have application for investors actively participating in DeFi or tokenized tangible assets. Beginners starting their journey and wanting to learn will find helpful material too.





The market capitalization of treasury products by protocol. (Source: <https://app.rwa.xyz/>)

What’s remarkable about RWA.xyz dashboards is that they let you verify data provided by different protocols which can act as an additional inspecting point. Their team plans to expand panels to other RWA classes, such as real estate and stablecoins. They are vital links in the tokenization process. As a result, users will receive a valuable RWA analytics tool aggregating all the relevant information.

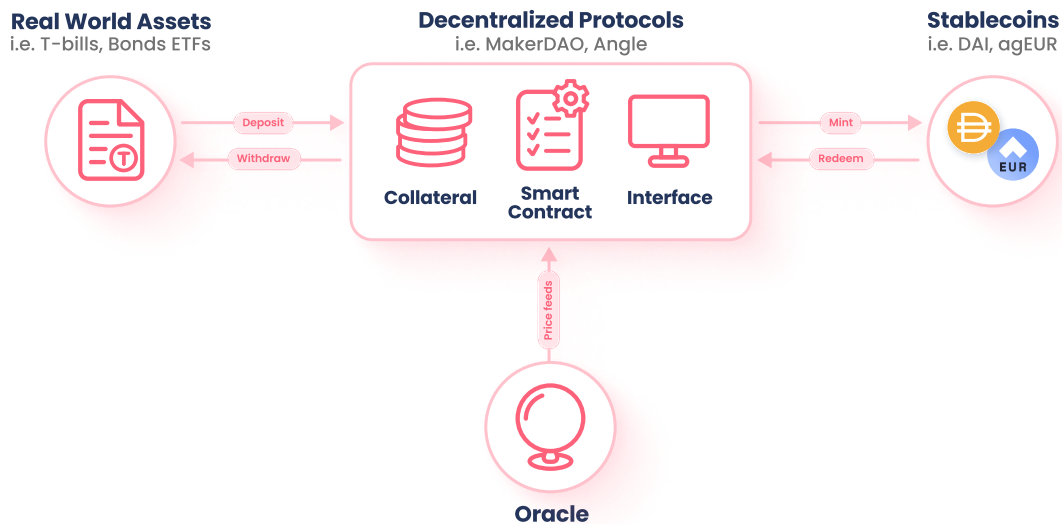
The following platform is probably familiar to all DeFi participants. DefiLlama provides tidy and transparent data about decentralized protocols. It allows users to browse global statistics for the entire ecosystem. Moreover, it separates information into specific categories. DefiLlama can source data for RWA and RWA Lending classes, focusing on decentralized solutions. The application can easily rank each category based on the combined TVL or the number of associated protocols. Real world asset group is in the top 10 regarding total value locked in the 9th place.

Category	Protocols	Combined TVL	Description
1 Liquid Staking	115	\$20.307b	Protocols that enable you to earn staking rewards on your tokens while also providing a tradeable and liquid rec
2 Lending	287	\$13.003b	Protocols that allow users to borrow and lend assets
3 Dexes	962	\$12.289b	Protocols where you can swap/trade cryptocurrency
4 Bridge	46	\$8.95b	Protocols that bridge tokens from one network to another
5 CDP	100	\$8.905b	Protocols that mint its own stablecoin using collateralized lending
6 Services	149	\$4.591b	Protocols that provide a service to the user
7 Yield	448	\$3.581b	Protocols that pay you a reward for your staking/LP on their platform
8 Derivatives	150	\$1.259b	Protocols for betting with leverage
9 RWA	23	\$1.253b	Protocols that involve Real World Assets, such as house tokenization
10 Yield Aggregator	109	\$1.073b	Protocols that aggregated yield from diverse protocols

Top 10 categories by TVL. (Source: <https://defillama.com/>)

## 4 RWA-backed Stablecoins: TradFi and DeFi Bridge?

### Simplified Flow of RWA-backed CDPs



The first partially RWA-backed collateral debt position stablecoin needs no introduction. It is DAI from MakerDAO. Originally, DAI was a single-collateral coin with ETH as its only option. However, the protocol has since expanded to a multi-collateral version taking other cryptocurrencies besides ETH to mint new DAI. Since 2022, Maker Protocol has allowed for alternative collateral sources for its stablecoin. The accepted proposal permits lending DAI stablecoins by financial institutions, which invest in real world assets. You can read more on Stablecoins and MakerDAO history [in the stablecoins report](#).

At MakerDAO, each loan is associated with a vault, which carries out a different strategy. The largest one is called Monetalis Clydesdale ([Dune dashboard](#)). It is an active vault onboarding RWA, which in this particular occasion are bonds - iShares Treasury Bonds 0-1yr and 1-3yr, and US Treasury Bills. The second largest transaction is BlockTower Andromeda. It is focused on purchasing Short-term US Treasury Bills. The third place on the podium currently goes to Coinbase Custody and its partnership with Maker. As mentioned earlier, Centrifuge helps run the majority of the vaults and are at the forefront of tokenizing real world assets.

The DAI collateral list is in the public domain. MakerDAO issues RWA reports monthly, providing details for each vault with commentary. It is astonishing how accessible the information is. Anyone can dive deep into reports, dashboards, and proposals to verify MakerDAO's real world asset exposure. Traditional finance could learn a lot from MakerDAO. DAI is the largest RWA-backed CDP stablecoin managed by a DAO. However, it is not the only one with RWA collateral. It is worth mentioning that centralized stablecoins such as USDC and USDT also diversify their collateral into various assets. Circle's reserve fund assets include US Treasury securities and repurchase agreements,

while Tether’s reserves contain US Treasury Bills, money market funds, gold, and repurchase agreements.

“The rise in interest rates and further development in the legal work since 2020 allowed our team to help MakerDAO launch Clydesdale and Andromeda, vaults with collectively close to \$2 billion of RWA. Furthermore, 2023 is the year of tokenized T-bills, as the Angle example further in the report shows. They simplify access but more importantly unlock on-chain Crypto Asset Liability Management. We are still very early, but the end goal is simple: to migrate finance onto crypto rails” said **Sébastien Derivaux, Steakhouse Financial Chef & Co-Founder**.

Collateral list					
search collaterals	<input type="radio"/> ALL <input type="radio"/> ETH <input type="radio"/> SC <input checked="" type="radio"/> RWA <input type="radio"/> ON-CHAIN				
COLLATERAL	TOTAL SUPPLY	CHANGE 24H	DEBT CEILING	LOCKED	ANNUAL FEES
Monetalis Clydesdale RWA007-A	1,139,950,318 of 1.25B	—	1,250,000,000 usage 91%	\$1.25B 110%	45,598,015 4%
BlockTower Andromeda RWA015-A	602,450,000 of 652M	—	1,280,000,000 usage 47%	\$1.28B 212%	27,110,252 4.5%
Coinbase Custody RWA014-A	497,000,000 of 500M	—	500,000,000 usage 99%	\$500M 101%	12,922,000 2.6%
H. V. Bank RWA009-A	100,000,000 of 100M Maxed	—	100,000,000 usage 100%	\$100M 100%	109,420 0.11%
BlockTower S4 RWA013-A	69,658,301 of 70M Maxed	—	70,000,000 usage 100%	\$85.2M 122%	2,786,332 4%
BlockTower S3 RWA012-A	49,637,075 of 80M	—	80,000,000 usage 62%	\$97.3M 196%	1,985,483 4%
6s Capital RWA001-A	14,348,036 of 15M	—	15,000,000 usage 96%	\$15.9M 111%	430,441 3%
Fortunafi RWA005-A	5,926,220 of 15M	—	15,000,000 usage 40%	\$17.2M 290%	266,680 4.5%
New Silver RWA002-A	3,741,246 of 20M	—	20,000,000 usage 19%	\$22.5M 601%	130,944 3.5%
ConsolFreight RWA003-A	1,795,936 of 2M	—	2,000,000 usage 90%	\$2.36M 131%	107,756 6%
<b>TOTAL</b>	<b>2,484,507,133</b> of 2.7B	<b>0</b> 0%	<b>3,332,000,000</b> usage 75%	<b>\$3.37B</b> 136%	<b>91,447,323</b>

RWA-type collateral backing DAI stablecoin (Source: <https://makerburn.com/#/rundown>)

## RWA-backed Algo-stable

FRAX stands out as the largest algorithmic stablecoin, boasting an \$800 million market capitalization. It operates entirely on-chain and functions as a fractional-algorithmic, open-source, and permissionless stablecoin within the DeFi ecosystems. Notably, it introduces a pioneering approach by partially backing its supply with collateral while implementing an algorithmic mechanism for price stability. The blend of collateral and algorithmic elements in the FRAX stablecoin varies according to market valuation. The Frax Protocol employs the Algorithmic Market Operations Controller (AMO), enabling automated execution of monetary policies.

Frax founder Sam Kazemian recently introduced a [proposal](#) to onboard FinresPBC as a reserve custody partner. This latest move is part of the FRAX v3 RWA asset strategy plan. The corporation's primary objective is to grant the Frax Protocol entry to secure cash-equivalent assets and yields near Federal Reserve rates. Furthermore, FinresPBC is committed to further enhancing its conventional infrastructure, including future efforts to meet the prerequisites for a Federal Reserve Master Account (FMA). All earnings derived from the assets managed on behalf of the Frax Protocol will be directed back to the protocol (after deducting operating expenses and fees associated with running the public benefit enterprise). Frax's goal is to benefit from off-chain RWA partner capabilities, including holding US Dollars in FDIC-insured savings accounts, minting, redeeming USDP and USDC, and holding and trading US Treasury Bills, all of which would be subjected to earning yield. For full transparency, FinresPBC will post reserve reports and asset breakdowns monthly. The community will be able to familiarize themselves with yield decomposition and maintenance costs. When introduced, FRAX v3 RWA strategy can result in a truly decentralized RWA-backed stablecoin.

## RWA-backed Euro Stablecoin

Innovation and upgrades do not only happen for stablecoins pegged to the US Dollar. Angle Protocol introduces tokenized tangible real world assets to agEUR reserves. In the first version of the protocol, Angle has approved various cryptocurrencies as collateral options, including USDC, LUSD, wBTC, and ETH in wrapped and LST forms. In addition, users can mint agEUR using derivative tokens obtained through liquidity provisioning or staking. Although alternative currencies like Euro are less favored and popular, Angle created a sustainable and thriving stablecoin architecture. Holder count and transactional volume are both on the rise.

However, the team wanted to make the protocol more robust and resistant to market conditions and the March 2023 USDC panic accelerated the development. With the Angle V2 launch, smart contracts received enhancing treatment, especially when it comes to value-sharing and collateral diversification with real world assets. Angle Protocol combined efforts with Backed Finance and RedStone Oracles to add tokenized RWA to agEUR reserves. For starters, short-term and risk-free Euro bonds ETF ([C3M](#)) have been introduced, where RedStone's C3M price feeds facilitate liquidations. Furthermore, users considering minting agEUR have additional options supplied by Backed Finance. They can borrow stablecoins using bHIGH and bIB01, Backed tokenized bond iShares ETFs, tracking the performance of corporate and treasury bond indexes, respectively.



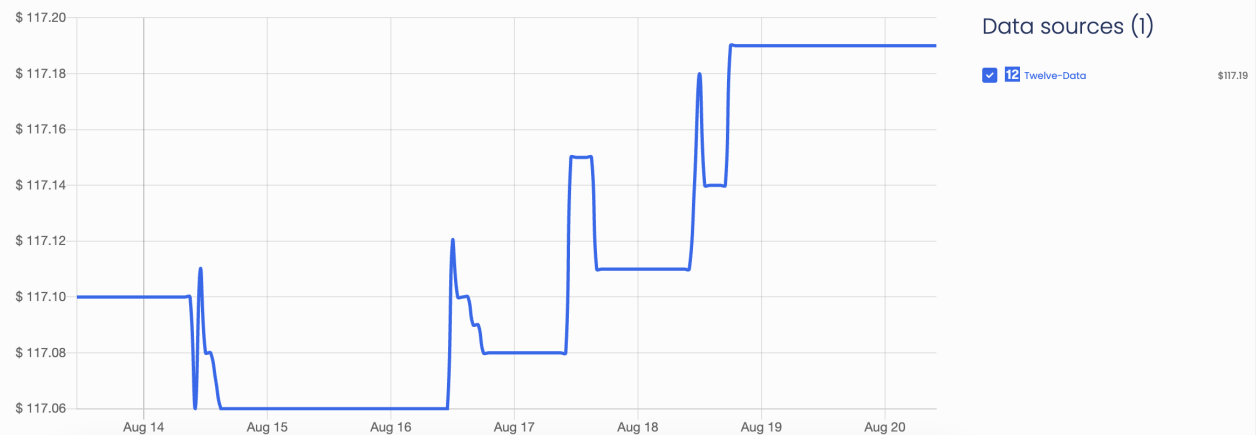


## Amundi ETF Govies 0-6 Months EuroMTS Investment Grade UCITS ETF DR (C3M):

**\$117.19** +\$0.09 (+0.08%)

Last hour 1 day 3 days **7 days** Min: \$117.06 Max: \$117.19 Average: \$117.11

Last updated **minutes ago**



Historical price chart for C3M (Source: <https://app.redstone.finance/>)

## Real Estate Collateral

Real world asset tokenization presents tremendous opportunities for creating a stable currency. Apart from all the examples mentioned before, there is another interesting solution. Tangible have introduced Real USD (USDR), a stablecoin backed by tokenized real estate. It is an alternative approach to the US Dollar pegged stable issuance. To mint new tokens, users supply DAI. Formally, USDR reserves consist of different asset buckets. The largest one, up to 65%, represents yield-producing tokenized real estate. In addition, rental profit provides yield for USDR. The second pool with 20% of USDR market capitalization is associated with protocol-owned liquidity. The next part of the reserve includes TNGBL – Tangible’s governance token. Another fraction is described as an insurance fund where around 5–10% of assets will be utilized in emergency situations to help maintain the peg and meet redemption requirements. Some DAI previously used to mint USDR are the last piece.

USDR is an overcollateralized stablecoin backed by real estate. To generate yield, properties are rented to tenants. This mechanism rewards holders in the form of a rebate. Another great strength of this solution is incorporating real estate price appreciation meaning the housing market can boast a history of continuing value increases. These features have never been implemented in stablecoin design before. USDR has the characteristics to become a store of value and a stable unit of account.

## 5 Oracles and RWA: Do they interact?

The short answer is, yes, they do. And they do more and more. The main responsibility of an Oracle is to deliver market data, usually price feeds, to dApps and on-chain use cases. The natural intersection of an RWA protocol and Oracles is the creation of a data feed for the price movements of the created token, i.e. RWA-backed stablecoin or token representing a basket of RWA assets. Then other DeFi protocols, such as lending and derivatives, can use the price feed to offer the RWA-backed asset pools for their users.

The second use case is delivering, to RWA protocol, price feeds needed to constantly calculate the floating value of assets against which tokens were minted. For example, if a protocol accepts any representation of T-Bills to create stablecoins, the cumulative value of T-Bills should never go below a certain threshold value of the minted stablecoins, i.e. 120%.

### RWA x Oracles: Flux Finance and Matrixdock Case Studies

Let's look at specific examples of the two situations presented above. Flux Finance is a decentralized lending protocol on Ethereum that leverages oracles. The protocol is a fork of Compound V2 with additional functionality to support both permissionless (e.g. USDC) and permissioned (e.g. OUSG from Ondo Finance) tokens. Firstly, the protocol is based on an Oracle that delivers price feed of stablecoins used to borrow assets (remember that stablecoins fluctuate too). Once users lend their stablecoins with Flux, they receive fStables that represent the right to reclaim stablecoins, plus accrued interest. They can then use the fStable, i.e. fUSDC or fDAI across DeFi. But the protocol that utilizes an fStable is usually limited unless there's a reliable price feed oracle for it. Hence oracle's support for such an asset is the catalyst for its market adoption and utilization across wide DeFi applications.

Matrixdock, a protocol offering tokenized RWA, has an interesting Oracle intersection regarding its Short-term Treasury Bill Token (STBT). In the price discovery process of STBT, an Oracle has to not only take the protocol's reserves but also enhance it with real-time data about the market price of the token. Specifically, STBT is available on Curve in an STBT/3CRV pool. Therefore, to ensure both a more accurate collateral value estimate for lending protocols and protection against arbitrage, an Oracle should mix the two sources of information to guarantee price information closer to the market value of reserves. As a result, the final data feed offers a robust mechanism for DeFi protocols to integrate STBT into their offering and for Matrixdock itself to utilize in internal monitoring and redemption flow.

# Stablecoins Report:

The Ultimate  
**2023** Market  
Overview



Delve deeper into the topic of stable assets by reading [the Stablecoins Report](#).

## 6 Threats and Risks of The RWA Solutions

RWA tokenization carries some infancy threats, as all new technologies do. First and foremost, digital assets utilize blockchains to provide transparent and publicly available data. For some time, regulators have tried in vain to keep up with innovative solutions such as distributed ledgers. Although we are still in the wild west regarding crypto space, governing entities are introducing more straightforward frameworks to answer the sector's needs. In addition, crypto with all of its networks and smart contracts has the ability to self-regulate. Blockchain data analytic capabilities help track malicious actors and rug schemes and code and smart contracts get more robust. The community is so strong and supportive that white-hat hacker numbers increase constantly. Hence, the regulatory landscape for tokenized real world assets is still evolving. However, different jurisdictions may have varying interpretations of how these assets should be classified and governed. This uncertainty can lead to legal challenges and potential disruptions. With the involvement from top-of-the-foodchain financial institutions, progress in this matter might accelerate. Let's hope that pressure from TradFi giants will not stifle the development of decentralized protocols because ultimately their success is what finally matters.

The tokenization of tangible assets inherit all the problems the blockchain technology currently faces. Hacks and rug pulls happen on a daily basis. This must be reduced to the minimum for RWA to catch mainstream adoption. Ownership of real estate, precious metals, and securities cannot be compromised due to smart contracts or network issues. Therefore, the longer blockchain such as Bitcoin or Ethereum exists, the greater the security will be. Crypto developers learn quickly from past mistakes.

Tokenization and digital assets can be vulnerable to cyberattacks. They can be at risk if inadequately protected, leading to financial losses and reputational damage.

One of the primary enhancements the tokenization of RWA will bring is increased liquidity and accessibility. These are only assumptions until market fragmentation happens. Tens or hundreds of protocols on different networks will not address this issue. There must be interoperability on the highest level. Although market competition is vital, popular and well-known leaders are needed (e.g., MakerDAO or Aave equivalent). RWA may face liquidity challenges, especially if the secondary market for these tokens is not sufficiently developed. Poor tradeability can affect the ease of buying or selling assets, impacting their value. Common ground for minting, redeeming, and exchanging is essential, whether it is a superior app or a platform built on an interconnected Layer 0 blockchain.

Just like any other financial market, tokenized asset markets could be susceptible to market manipulation, insider trading, and price manipulation, potentially leading to unfair advantages for certain participants. Unfortunately, it is inevitable. However, blockchain transaction history, which is impossible to overwrite (except for validator majority attacks), makes tracking and verification more manageable.

Tokenization will certainly require third-party custodians. Intermediaries who, on the one side, confirm ownership, certificates, and/or keep watch over the assets. On the other, they are responsible for bringing RWA on-chain. If custodians fail to secure assets properly or mismanage them, it could lead to loss of funds or possession. The failure or dishonesty of any of these parties can pose significant risks to the assets and investors.

RWA digitalization could involve sharing sensitive information on a blockchain. This might raise privacy concerns, especially in cases where personal or confidential data is linked to the tokenized asset. It is a code-related issue. Developers must put their work through rigorous tests and audits to ensure safety. In terms of privacy concerns, as TradFi institutions or regulators step in, investors might bid farewell to anonymity and freedom. Already a significant percentage of RWA DeFi protocols or centralized platforms require KYC. This may be unavoidable and necessary for full scale adoption.

Last but not least, proper RWA pricing is crucial. They must be valued correctly all the time. Determining the accurate cost of tokenized real world assets can be complex. If there is a lack of transparency or reliable valuation methods, it could lead to inaccurate pricing and disputes among investors. Therefore, at RedStone, we take the extra mile to ensure the highest monitoring and security standards.



## 7 What Can We Expect Next in The RWA Space?

The real world asset category is an enormous investment market. In combination with financial instruments, it creates an infinite playground, battleground, and innovation space. This part of the economy may seem fully discovered, and no new solutions are required. However, dissecting finance piece by piece reveals the next inefficiencies and flaws. RWA tokenization brings a whole new dimension to the market. Although, in essence, it is the transference of assets on-chain, the process introduces entirely new possibilities and has the power to improve existing systems.

First and foremost, tokenized real world assets increase accessibility to a broader range of investors, including those previously excluded due to high entry barriers. Putting it together with decentralized applications provides a substantial financial space with freedom on flexibility levels never seen before. It will benefit companies and individuals. Together with greater access comes enhanced liquidity. Fractional ownership interest will skyrocket and offer possibilities previously unattainable. Investors may even find it easier to trade assets on secondary markets. From a psychological point of view, investing may become less feared and stressful for beginner investors. Starting small will help novices learn regardless of the asset category, securities, real estate, or commodities. As the general population's awareness and knowledge of finance increases, TradFi might face some long-overdue issues with transparency and efficiency.

Tokenization will extend beyond instruments known so far, encompassing a broader array of products like intangible assets. Such classes include patents, copyrights, brand recognition, trademarks, and intellectual property. People and companies will be able to capitalize on assets never considered before. What would be possible? Suppose you are a professor, engineer, writer, or musician, tokenization platforms will allow you to digitize your patents and rights. When on a blockchain, they could be utilized as loan collateral to start testing, fund further research, or launch an album. No one will have to rely on outsourced funding. Though such ideas sound straightforward, the market has to mature to bring them into practice.

The entire ecosystem needs a common ground for exchange to complete the tokenized RWA revolution. The key links include marketplaces and platforms where RWA are securely and easily traded. They should act as one-stop applications designed with a focus on user experience and transparency. As the RWA market grows, the demand for such solutions will increase too. One of the currently functioning platforms originates from Tangible. Their marketplace offers real estate, gold, wines, and watches. NFTs represent each asset. Tokens are redeemable, liquid, and tradable to provide investors with flexibility. Underlying physical assets require storage and custody. It is a fantastic opportunity for traditional businesses and DeFi protocols to form valuable partnerships and bring RWA on-chain. Collaboration like this is the foundation of digital asset accessibility. The more custodians open up to new market possibilities, the faster benefits for retail and institutional investors.

## RWA Applications on Dedicated Blockchain Ecosystems

Avalanche created an entire ecosystem for blockchain deployment utilizing subnet architecture. Subnets are separate blockchains and subsets of the Avalanche Primary Network and can be described as application-specific Layer 1 networks. Subnets offer customization with adjustable features and parameters to provide a high optimization level. Evergreen Subnets are a tooling and software environment with built-in functionalities created explicitly for financial institutions. Evergreen contains features such as EVM compatibility, user permission settings, a permissioned validator set, and other blockchain-related characteristics. It merges the benefits of public networks with enterprise blockchain requirements.

Avalanche Evergreen is a valuable addition to the financial landscape serving as an onboarding platform for traditional capital. It can open a wide door for real world asset tokenization, which has soaring institutional interest. Testing has already begun with the latest Avalanche Evergreen Subnet named Spruce. The testnet launched with an initial group of institutional partners, including T. Rowe Price Associates, WisdomTree, Wellington Management, and Cumberland. They can engage with public blockchain infrastructure without risk and try out DeFi applications on Spruce. The first phase focuses on foreign exchange (FX) and interest rate swaps, with more areas planned for the future. Gradually, institutions can explore additional features such as third-party applications, equity tokenization, credit issuance, trading, and fund management. It is fantastic to see such initiatives from blockchain-native companies like Avalanche. Currently, notable dApps like [Aave lending protocol](#) or Voltz interest rates AMM are operating on Spruce utilizing RWA data feeds from RedStone Oracles, like Secured Overnight Financing Rate (SOFR) data.



The spruce subnet permissioned to institutions (Source: <https://www.avax.network/evergreen>)

Another example of an ecosystem focusing extensively on RWA is the Canto blockchain which has multiple initiatives ongoing. Firstly, the veRWA voting-escrow incentivization primitive mimics the veCRV pattern from Curve, but focuses solely on RWA. Secondly, there is an ongoing process by Fortunafi of deploying native Treasury Bills on the chain. Lastly, a blockchain-enabled asset management platform Hashnote has agreed to deploy its daily liquidity private cash fund (SDYC) on Canto among its multichain deployment strategy.

Within the Ethereum ecosystem, Kinto is the first fully KYC'ed Ethereum Layer 2 protocol with built in insurance. Kinto focuses on reducing regulatory and financial risks, while maintaining access to capital from the largest DeFi ecosystem in the world. Notably, the chain is built with OP Stack as an Optimistic Rollup parallel to Optimism and Base.

## 8 Conclusions

In conclusion, the emergence of tokenized real world assets heralds a transformative era at the crossroads of traditional and decentralized finance. With the convergence of blockchain technology and financial markets, these digital representations offer an abundance of advantages that stand to reshape the investing landscape. Tokenization addresses historical entry barriers, unlocking opportunities for both retail and institutional investors by fractionalizing ownership and enabling global participation. The integration with the burgeoning realm of DeFi introduces novel avenues for collateralization, lending, and yield farming, propelling decentralized protocols toward improved maturity, sophistication, and adoption. As of 2023, RWAs are gaining substantial attention within DeFi and Web3. They serve as bridges connecting conventional financial markets and physical assets to the world of blockchain and smart contracts.

Moreover, RWA tokenization improves transparency, security, and efficiency within financial ecosystems. Immutable records on blockchains eliminate opacity, while smart contracts enforce transactional rules, mitigating the need for intermediaries. Nonetheless, a balanced perspective mandates acknowledgment of potential risks. These include regulatory uncertainty, security vulnerabilities, and asset marketplace management. However, it is essential to recognize that these challenges are integral to any nascent innovation and can be addressed collaboratively through evolving regulatory frameworks, enhanced cybersecurity measures, and the maturation of market practices.

The transformative potential of RWA tokenization spans across asset classes such as private capital markets, asset-backed securities, money market funds, ETFs, intellectual property, and fixed income. This suggests an expansive Total Addressable Market for tokenization that can bring unprecedented liquidity, transparency, and efficiency to various sectors. Traditional private capital market challenges, including illiquidity and outdated asset pricing, are poised to be overcome. As institutional players like JP Morgan, Goldman Sachs, and others explore RWA tokenization, the narrative extends beyond a mere technological trend. The power of blockchain-driven digitalization is evident in the potential to unlock otherwise illiquid assets, streamline operations, reduce

costs, and reshape financial intermediation. Centralized projects are paving the way, but decentralized initiatives like Centrifuge, Ondo Finance, Backed Finance, and others are equally pivotal in democratizing access to tokenized real world assets.

The emergence of RWA-backed stablecoins, i.e. DAI from MakerDAO, Frax's newest proposal, and Angle Protocol V2, demonstrates the potential to tokenize a diverse range of tangible and intangible assets, ranging from real estate and precious metals to intellectual property rights. The adoption of RWA-backed stablecoins brings with it a multitude of advantages, including improved safety mechanisms in times of market volatility, collateral diversification, and the potential to revolutionize financing and investment models across various industries. As demonstrated by the DAI lending vaults and the integration of real world assets as collateral, these stablecoins are enabling new avenues for financial institutions to invest in and leverage tangible assets within the DeFi ecosystem.

In this dynamic environment, it is clear that RWA tokenization is not a fleeting concept but a catalyst for the future of finance. As the blockchain ecosystem evolves, regulatory clarity is sought, and security measures refined. The journey toward a seamlessly interconnected global financial landscape, encompassing both traditional and decentralized realms, is well underway. In navigating this evolving landscape, people must balance innovation with prudence, seeking collaborative solutions that uphold investor protection, market integrity, and technological advancement. As tokenized real world assets traverse the path from promise to realization, the fusion of TradFi norms with blockchain-enabled efficiencies paves the way for a more inclusive, accessible, and interconnected global financial ecosystem. The future holds the prospect of witnessing the unity of both to forge a new paradigm in economic opportunities. Could RWA be a driving force and a major narrative in the upcoming bull market? We will see. Nonetheless, the greater adoption and utilization will definitely bear fruit for both traditional and decentralized finance.



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## About Authors

**RedStone** is a modular oracle delivering diverse, high-frequency, data feeds to all EVM L1 and L2 networks and beyond, i.e. Starknet, Fuel Network or TON. By responding to market trends and developer needs, RedStone is capable of supporting assets not available elsewhere. The modular design allows for **data consumption models** adjusted to specific use cases, i.e. CDP stablecoins and algorithmic stablecoins. RedStone raised almost \$8M from Lemniscap, Blockchain Capital, Maven11, Coinbase Ventures, Stani Kulechov, Sandeep Nailwal, Alex Gluchovski, Emin Gun Sirer and other top VCs & Angels.

**Chaos Labs** is a DeFi Risk Management company offering mechanism design services and a comprehensive risk management and optimization platform specifically tailored for DeFi protocols. Trusted by industry-leading partners like Aave, GMX, and dYdX, Chaos Labs offers full coverage to lending protocols, derivatives, stablecoins, and other novel protocols.

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## Resources

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