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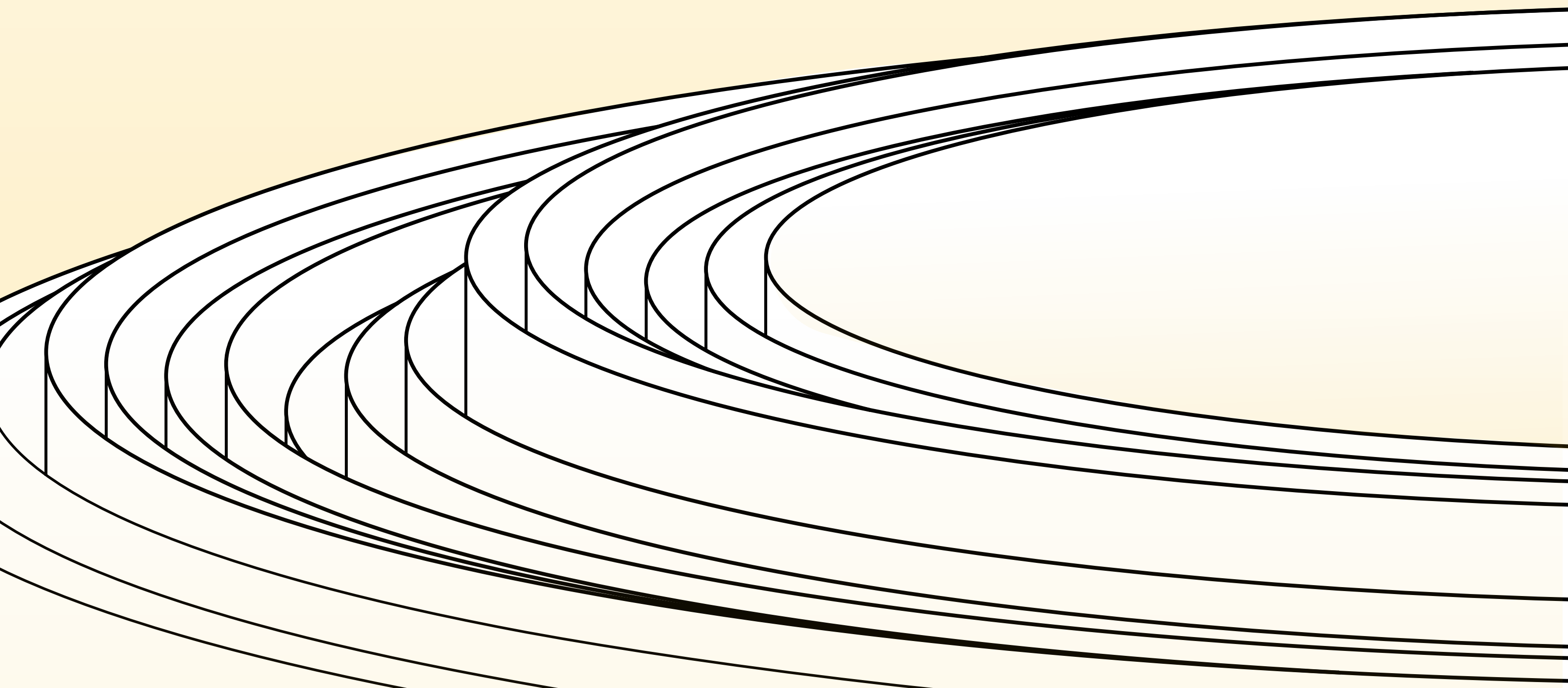
Arbitrum Treasury Perspective



Introduction

Now, more than ever, DAOs are beginning to put their capital to work more effectively.

After a successful run up in DeFi Summer, the treasuries of most DAOs have a portfolio consisting primarily of native protocol tokens, ETH and BTC, and lastly, holdings of stablecoins as cash reserves. While some teams have focused on liquidity allocations, grants, and supporting existing resources, DAO treasuries are missing a massive opportunity to grow the protocol's long-term self-sufficiency through exposure to real-world assets.

A DAO is an organizational approach to support an autonomous, sovereign protocol. The treasury is not just the corporate balance sheet of the contributing team, but a tool that should be used to support a protocol through its various needs. As protocol communities mature, there will be more pressure to proactively and effectively manage the treasury. Capital appreciation, non-correlated yields and treasury growth will become expected from top performing DAOs.

Supported by the Plurality Labs Treasury & Sustainability Working Group, the Centrifuge team is excited to contribute perspective on building an RWA strategy.

We believe communities should take a prudent approach to their DAO treasury management practices, establishing a treasury framework, ensuring that adequate work is done to develop a robust legal infrastructure, and building credit risk management practices.

Additionally, we believe that holistic thinking should be applied to create a diversified low-risk portfolio approach. To do so, it's important to fully understand the various asset classes. In this report, we dive into 3 top low-risk assets: US Treasurys, investment-grade credit, and mortgage-backed securities. We present a brief analysis of each of these markets, comparing and contrasting the assets, yields, and volatility of each.

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01

The Need for a Treasury Framework

The Arbitrum community has a massive opportunity with its treasury today.

On the back of years of builder-focused network development — and now outright leading the L2 narrative of the next cycle — the Arb community and its token are incredibly well positioned to capitalize on a literal wealth of opportunities. However, the community must be incredibly prudent with how it chooses to manage this wealth itself.

The Arb treasury, although heavily concentrated in its native token today, represents the best opportunity to build for the future of Arbitrum. As the community engages with prospective managers and seeks to address the most relevant and pressing concerns in front of it, it must ensure that any actions taken occur within a coherent and aligned treasury framework in mind.

Take diversification, the “only free-lunch in finance”, and an objective that is existentially realized after the collapse of DeFi native yields and the realization of the risk associated with holding zero-yield stablecoin positions. How much diversification is enough? When do you know if an investment portfolio is sufficiently diversified? How will the community judge the performance of a manager in achieving portfolio decentralization?

Similar questions can be posed for including real-world assets in a portfolio, to what extent and what type of investments are best, and so on. For any of these questions, the answers are not simple. For any solution that might identify volatility analysis, Sharpe ratios, or other financial metrics, they cannot be used in a vacuum.

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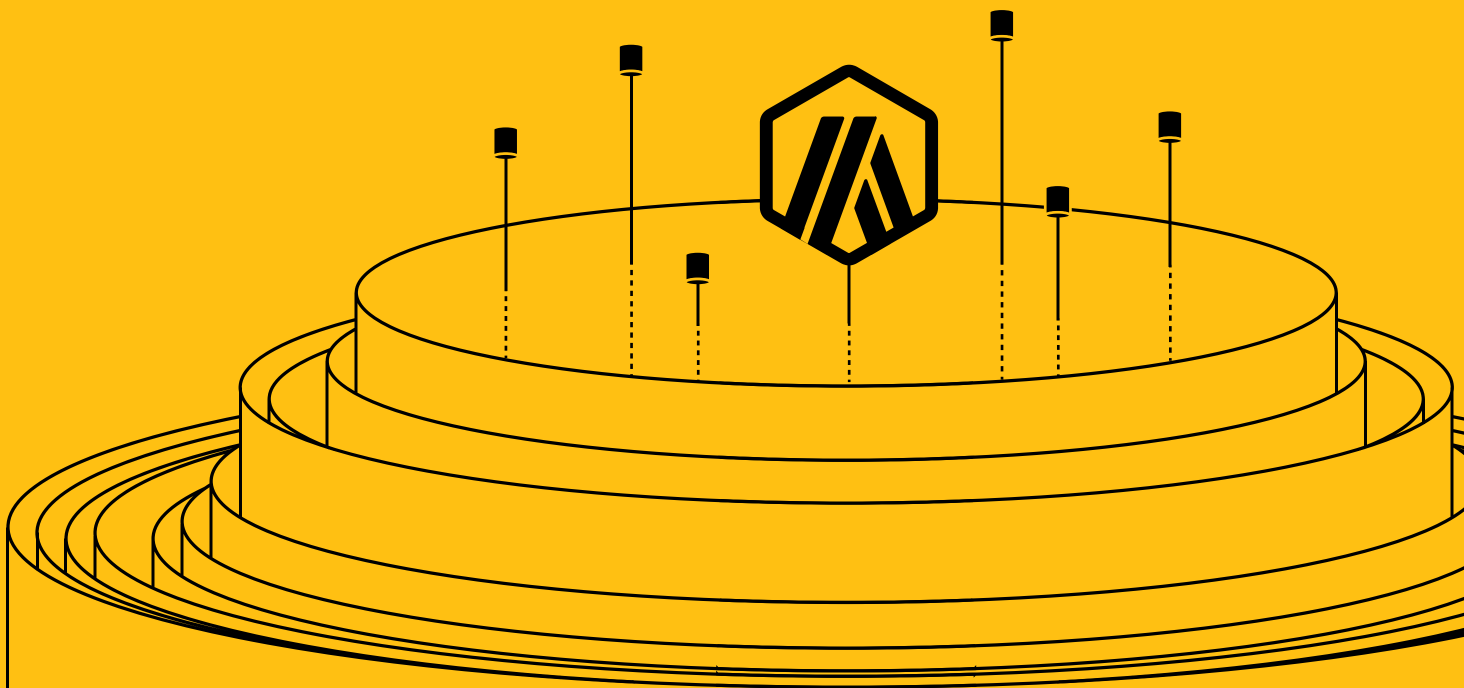
Any successful strategy needs to be built with a treasury framework and investment objectives before progressing down the path of financial and economic analysis.

For the Arb community, it is imperative these goals are aligned with the larger community's vision. Only then can the community and the treasury sufficiently serve its purpose.

To answer these questions and develop a robust and comprehensive real-world asset strategy, the community must establish a clear treasury framework, including an investment policy, proper risk frameworks and a technology mandate. Additionally, a legal structure and infrastructure to support safe investments and credit expertise is critical.



1.1. The Crucial Role of an Investment Policy

1.2. Establishing Risk Appetite

1.3. Tooling and Technology is a Differentiator

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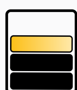
1.1

The Crucial Role of an Investment Policy

As the Arbitrum community begins to establish relationships with asset managers and investment providers, a key component necessary to bring these parties together will be an investment policy. Often known as an investment policy Statement, this document will provide the guiding principles and foundational framework for which treasury actions will be executed against.

The critical items in an investment policy may include:

Objectives: The specific financial goals that will be achieved with any prospective investment strategy, such as maximizing returns, generating income, or preserving capital. These objectives are often stated in relation to additional organizational objectives or constraints with regards to liquidity requirements, spending policies, or even inflation or purchasing power preservation targets.



Risk Tolerance: The level of risk that an investment strategy seeks to satisfy. This is typically expressed as a range of acceptable portfolio volatility or a maximum acceptable loss.

Constraints: Any restrictions on the investment strategy, such as ecosystem objectives, liquidity needs, or even ethical considerations.

The definition of an investment policy isn't a one-time event, nor is it a daily adjusted operational item. Once established, it should be reevaluated on a periodic basis, conducive to allowing investment strategies the time they need to perform while also reacting to significant changes in the market environment that may affect the investment policy.

Typically, an investment policy is established and maintained by an investment management team, addressed on an annual basis, and often approved by a group of qualified and diverse stakeholder representatives in the form of an investment committee.

The investment policy is the key document that helps answer, "what investment?" and, most importantly, "why?"

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1.2
Establishing Risk Appetite

The financial landscape across crypto and non-crypto assets can be unpredictable and chaotic. Developing an acceptable risk framework is a crucial step for ensuring the long-term stability and success of a treasury towards its objective.

In simple terms, the risk framework is a perspective on what tolerance of volatility a treasury should be exposed to, among other financial risk factors. The risk framework must incorporate the objectives and needs stipulated upon the treasury, such as spending targets and cash-flow requirements, in order to properly develop an informed perspective. Ultimately, it will serve as a roadmap for how to manage risk introduced by various investment objectives.

A transparent risk framework should foster collaboration and alignment between the community and management team. By clearly communicating risk tolerance levels and acceptable exposure limits, the risk profile serves as a shared reference point for informed decision-making and promotes a culture of risk awareness throughout the community. This collaborative approach ultimately strengthens the treasury’s overall risk management framework and contributes further to its long-term success.

When developing a treasury risk framework it is important to consider three items:

01 **Alignment with investment policy:** The risk framework should be closely aligned with the organization's overall strategic goals and objectives. This ensures that risk management practices support the achievement of strategic priorities and prevent risk-taking that could derail the organization's trajectory.

02 **Continuous review and update:** Risk management is a dynamic and evergreen activity. The framework should be regularly reviewed and updated to reflect changes in the market environment, risk landscape, and risk appetite. A dynamic approach ensures that the framework remains relevant and effective in mitigating emerging risks.

03 **Collaborative development:** Just as an investment policy must be developed alongside the community, so too should the risk framework. This collaborative approach ensures that diverse perspectives are considered and the resulting profile reflects the collective risk tolerance and strategic priorities of the community.

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1.3

Tooling and Technology is a Differentiator

For a DAO — a blockchain-enabled organization — technology can be the defining capability for the organization's success. Treasury investments will be made through Web3 rails, utilizing various dapps, protocols, and platforms with dynamic technical capabilities. A successful treasury management team will use this technology to their advantage and build features that provide a differentiated edge.

Using technology to create efficiencies, maximize transparency, and execute appropriately should be a goal of every treasury team. If done correctly, technology will allow a treasury to:

01 **Do More with Less:** Leveraging automation, analytics, and tooling will allow a treasury team to maximize the potential of their resources. Resourcing is often a significant constraint for Web3 entities, and effective tooling and infrastructure is the most capable solution to overcome this challenge.

02 **Trust, but Verify:** Transparent record keeping that is sufficiently done onchain will maximize trust within the community. Allowing public visibility and leveraging open-source style participation will improve the alignment across the community and treasury stakeholders.

03 **Improved Risk Management:** Effective tooling should result in an improved risk profile. Non-custodial wallets, multi-signature transactions, analytics, and trading tools should greatly improve the ability for a treasury team to reduce and mitigate potential risks.

We are strong believers that RWA providers should leverage Web3 rails as much as possible in order to provide the best quality of service to the market. Done correctly, RWAs can exist alongside existing Web3 and DeFi infrastructure as composable primitives to take advantage of automation for scale and efficiency. It will provide the highest level of transparency, a necessary capability for community-driven protocols and organizations, that traditional off-chain structures can simply not achieve.

For teams managing these processes, this type of technology and transparency is the key differentiator that will allow them to scale and offer the most up to date services for their customers — like DAO treasuries.

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02

Establishing Real-World Asset Infrastructure

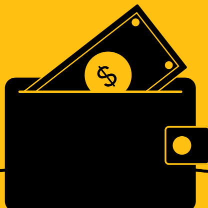
With a treasury framework in place and an investment policy and risk framework established, most communities will begin advocating for allocations to real-world asset investments. In a market with consistently depressed DeFi yields, the need to step out of the crypto-native market is obvious and the opportunity very tangible. However, the allocation process can become complex quickly.

Our research and collaboration across the market has shown repeated challenges for decentralized organizations: Communities can easily be overwhelmed by the volume of inbound opportunities, and management teams are understaffed compared to the many dimensions of expertise that they must contend with. The combination of the two allows deeper risks to exist than what is on the surface.

There are a few essential complexities with any real-world asset investments, that when overlooked, can pose existential risks to an organization. We believe the two biggest challenges are around compliant legal infrastructure and adequate risk management resourcing.

2.1 Compliant and Effective Legal Structures

2.2 Credit Risk Analysis is Critical



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2.1

Compliant and Effective Legal Structures

In today's market, it often seems that compliance and regulation are at odds with crypto and decentralization. In the world of investment management, there is no tension. A legal and compliant investment approach is a critical element of any principal preservation or capital accumulation strategy.

The principles for a sound legal structure are easy to identify at the surface. Any structure that enables compliance with traditional requirements of investment opportunities, such as KYC/AML checks or relevant jurisdiction constraints, would suffice. Consideration for being able to manage default or wind down scenarios, participate in legal agreements, or otherwise support investment procedures is also critical. However, what is often under appreciated is the significance of a legal framework beyond the obvious benefits.

When structured appropriately, we believe a sound legal framework enables:

- **Compliance and credibility:** Beyond simply being able to comply with KYC/AML processes, a sound legal structure brings credibility to a team's operations and its investment platform. The legal structure can enable significant partners and service providers to engage with a DAO in support of their investment objectives.
- **Clarity and control:** A legal framework can provide legally enforced processes to be established for investment arrangements. For decentralized organizations with a variety of operations and contributors, this can provide structure that makes clear the limits and scope of control for involved parties.
- **Scale and flexibility:** A well structured legal framework should enable an investment management team to scale and adapt to the rapidly changing environment DAOs find themselves in. Having a solid foundation from which to build upon is a key determinant of success here.

For Centrifuge Prime, a managed services offering that allows ease of onboarding to the Centrifuge protocol, we've formulated a legal framework that incorporates these principles in mind. We rely on well known concepts and robust service providers in a proven market.

At a high-level, the Centrifuge Prime framework enables DAOs to set up a legal conduit that can be used to facilitate critical processes within real-world asset investing in a manner that is robust and reliable. The legal structure can be integrated with DAO governance, is capable of investing and holding assets on behalf of the DAO, and allows a DAO to retain critical legal recourse to their investments. Structured through a proven offshore financial center, and iterated based on years of work building the MakerDAO framework, we believe this structure is both adaptive and resilient to developments in crypto native markets.

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2.2

Credit Risk Analysis is Critical

The market has seen the size of allocations to RWAs from DAOs and protocols grow significantly in 2023. As the yields on US sovereign debt have risen, so too has the demand for that debt from onchain investors. DAOs, with the fresh reminder of the USDC depeg event, have been eager to exchange out of idle stablecoin holdings and into onchain cash equivalents paying a yield.

However, communities and investment teams lack the established expertise to properly evaluate these investments and their associated risks. Frustratingly, even despite best efforts to mitigate this, the challenge in keeping up with decentralized markets and other important community objectives often prevents the appropriate capabilities from being built out internally. Traditional financial markets can prove to be an overwhelming complexity for DAOs to adapt to while the DAO landscape itself is immature.

The need however is critical. Offchain investments require analysis beyond economic facts, and often require subjective or experiential knowledge to truly understand the risk exposure present in a DAO. Treasury management at its core is an exercise in trading off risk for reward. A risk event that results in significant or outsized losses, compared to an insignificant return, can prove existential to a community’s longevity.

In today's market, where RWA products are still being developed amidst a turbulent and unclear regulatory background, we believe that DAOs have little choice when it comes to solutions. Investment teams must pick partners that can augment their capability to perform adequate risk analysis and effective risk management, commensurate with the desired risk profile of the community. We largely refer to this capability as credit analysis, but truly it requires an ability to perform analysis across risk spectrums, such as credit and counterparty risk, economic and financial risks, structural and operational risks, and the many other considerations that involve a credit investment.

An effective risk management capability will provide a few key results:

- **Avoiding “too good to be true” investments:** Sales and relationships can tend to drive financial markets more than underlying fundamentals. Nothing better than investments that claim to meet all needs. Thorough analysis and diligence is the only solution that can dig past a sales approach and into the meat of an offering.

- **Identifying deeper and structural risks:** As stated before, economic analysis is not the only requirement for a credit investment. From aspects such as how the mechanics in which the cash flows are realized and brought onchain, to complexities such as the legal mechanisms used to ensure collateral is appropriately pledged and secured, the full range of operational and structural concerns must be evaluated for an investment.

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- **Adequately assessing risk-reward:** The key to any investment is ensuring the risk is worth the return, and an effective risk management capability will allow this focus to be stronger. When strong standards and effective controls are in place, the process for negotiating or identifying the appropriate risk-reward ratio is made even stronger.

The Centrifuge Protocol spun out the Credit Group, a DAO resource for risk analysis when onboarding and evaluating prospective pools. Through Centrifuge Prime, a direct relationship with the Credit Group can be established with other communities and protocols. Using a diverse group of professional resources, the Credit Group can provide a strong risk analysis capability to augment a treasury management team in their RWA journey.

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03

Balancing the Abitrum Portfolio with Real-World Assets

The Arbitrum community has already expressed a strong interest in RWAs. This has been driven by the recognition of the need for diversification away from the community's heavily skewed portfolio. It is important to restate the need for diversification here and address the most obvious point of investment in RWAs: low-risk asset classes.

Diversification, the “only free lunch in finance”, is truly a measure of how correlated the assets within a portfolio are. Most protocols and communities are already heavily skewed towards crypto native assets, through holding native tokens, grant programs, liquidity provisioning, and other essential business activities. While most treasury portfolios include some capital appreciation assets in the form of Bitcoin, Ether, and positions in DeFi markets, these assets are all prone to trending in the same direction at the same time, exhibiting a high rate of correlation. It is here that the need for real-world assets is most obvious. Being able to allocate to investment opportunities that are uncorrelated with crypto market activity provides the critical ability for a portfolio to dampen its realized volatility and facilitate a smoother rate of return.

From this line of thinking, most treasury management teams immediately begin to look for “low-risk” investment opportunities in the market. Treasury bills, the conventional source of the market's benchmark or risk-free rate, are the most obvious asset to fit this label. However, that’s not the only viable low-risk investment option. Just as we advise uncorrelated yields in crypto, it’s also a sound strategy to invest across multiple different RWA asset-classes.

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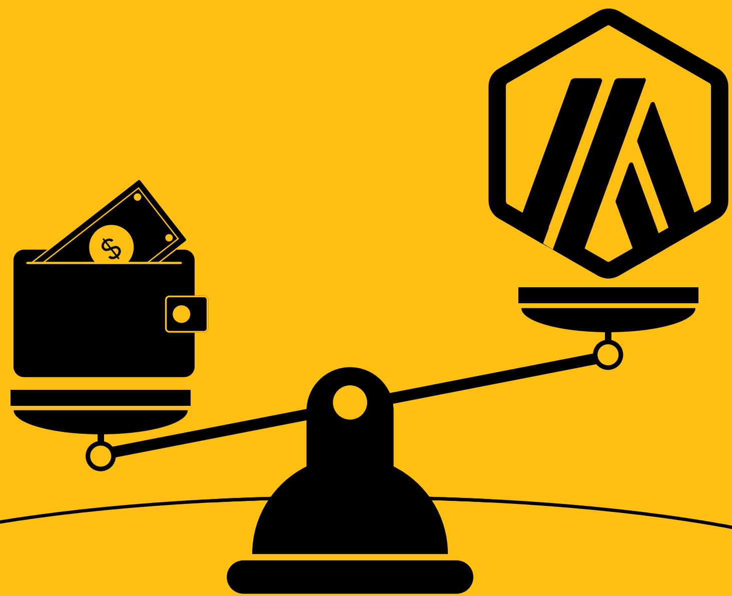
So the question we hear is, “What are the low-risk assets I should be looking at?”

To address this question fully, we provide a deeper overview of the “low-risk” markets, reviewing US Treasurys, investment-grade credit, and mortgage backed securities markets. We believe these are the 3 asset classes that should be considered in the analysis and thinking that should comprise the initial foray of RWA investments.



3.1 US Treasurys

3.2 US Investment Grade Bonds

3.3 US Mortgage Backed Securities

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3.1

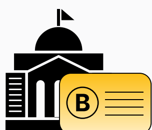
US Treasurys

US Treasurys are debt instruments issued by the US government to finance its activities. They are backed by the full faith and credit of the US government. Owing to the creditworthiness and status of the US as the world's leading economy, the US Treasury market is often described as the "biggest, deepest and most essential bond market on the planet."

Treasurys are also often used as benchmarks for other fixed-income securities. Whether you are an US corporation or an agricultural business based in Brazil looking to raise a fund by issuing bonds, the further away you are from the risk profile of US Treasurys, the bigger the spread (the premium on top of a base US Treasury rate) you are required to pay to compensate investors for the additional jurisdictional, credit, duration and other risks.

According to the FT, the US Treasury securities market is roughly $25 trillion in size today, five times what it was at the start of 2008. The average daily trading volume, as of October 2023, is $752.4 billion.

There are 3 general buckets for the US Treasurys:



Bills

These are US government debt obligations with 4, 8, 13, 17, 26, and 52 weeks in maturity. T-bills are issued at a discount from the par value of the bill. Purchasers get the full face value back at the end of maturity.

Notes

These are 2, 3, 5, 7 and 10 years in maturity. Notes pay a fixed rate of interest every six months until they mature.

Bonds

These are 20 or 30 years in maturity. Bonds pay a fixed rate of interest every six months until they mature.

At the end of Oct 2023, the split between these different categories amongst the total outstanding amount was approximately 30%, 60% and 10% according to this estimate.

While each segment has its own supply and demand dynamics, they are all subjects of a common influence: the Federal Funds Rate (FFR).

Yields - Rapid rise and mechanisms

The Federal Open Markets Committee sets the FFR to guide overnight lending among US banks. It's set as a range between an upper and lower limit. Currently, it is between 5.25%-5.50%.

The Fed has a range of arsenal at its disposal when it comes to guiding the daily FFR to be within this range, including Repo and Reverse Repo operations. These are typically overnight lending and borrowing between the Fed and banks collateralized by US Treasurys. These mechanisms allow the Fed to effectively pin the short end of the US Treasury market very close to the Fed Funds Rate.

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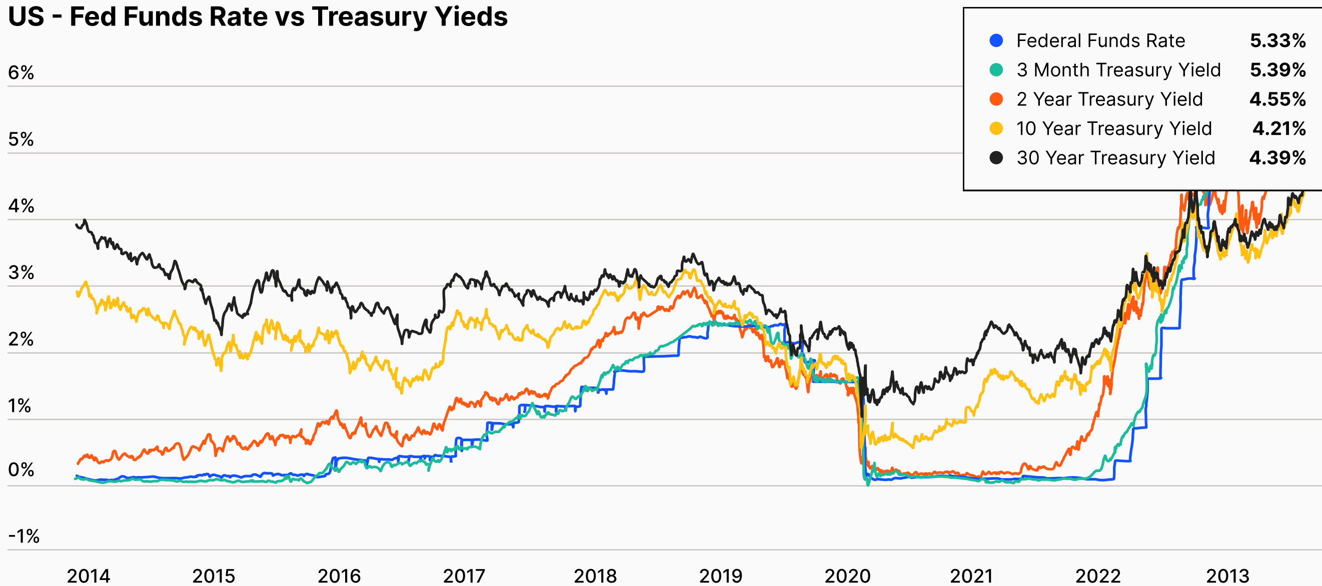
From March 2022 to July 2023, the Federal Reserve has increased the Federal Funds Rate 11 times from 0.25% to 5.25% in order to tame inflation. Below offers a summary of these changes.

FOMC Meeting Date	Rate Change	Federal Funds Rate
July 26, 2023	+25 bps	5.25% to 5.50%
May 3, 2023	+25 bps	5.00% to 5.25%
March 22, 2023	+25 bps	4.75% to 5.00%
Feb 1, 2023	+25 bps	4.50% to 4.75%
Dec 14, 2022	+50 bps	4.25% to 4.50%
Nov 2, 2022	+75 bps	3.75% to 4.00%
Sept 21, 2022	+75 bps	3.00% to 3.25%
July 27, 2022	+75 bps	2.25% to 2.50%
June 16, 2022	+75 bps	1.50% to 1.75%
May 5, 2022	+50 bps	0.75% to 1.00%
March 17, 2022	+25 bps	0.25% to 0.50%

Source: *Forbes*

Whenever the Fed changes the Fed Funds Rate, the yield curve adjusts accordingly, with the shortest duration often having the strongest correlation. See the chart below.



Source: Macromicro.me - December 1, 2023

As you can see, for example, the Fed Funds Rate on 1st Dec 2023 was 5.33% vs 5.39% for the 3m T-Bill and 4.39% for the 30yr T-Bond yield.

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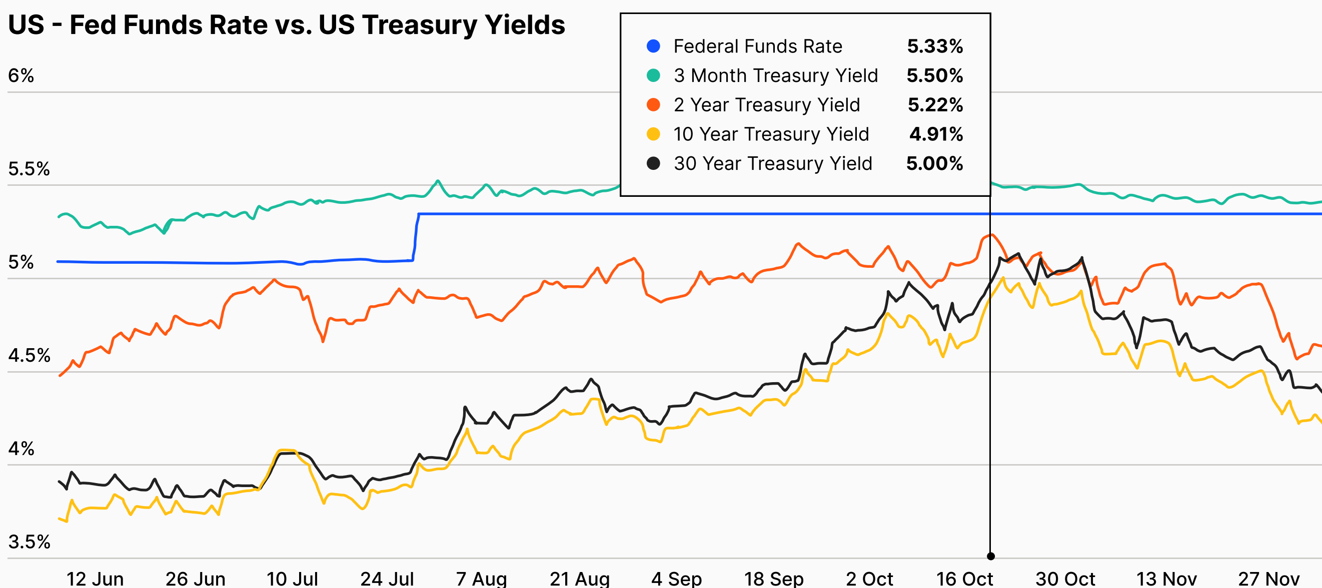
The further we go out on the yield curve, the fewer arsenal the Fed has to exert influence and the more market supply and demand forces play a role in determining the yield level.

For example, while the 3 months T-Bill yield has been pinned around the Fed Funds Rate, as recently as Oct, the 10 year and 30 year T-Bonds were yielding close to 5%, see below, due to a variety of factors such as large issuance on the supply side and buyers wanting higher term premia on the demand side.



Source: Macromicro.me - December 18, 2023

When compared to the shorter end of the yield curve, the 10-year Treasury yield impacts many more longer term rates in the economy such as fixed-rate mortgages and corporate borrowing costs.

Volatility in the Treasury market

We often hear that bond price moves in the opposite direction as its yield. In other words, bond prices increase when interest rates decline and decrease when interest rates go up. The extent to which a bond's price fluctuates due to changes in interest rates is called its volatility.

In global fixed-income manager Nuveen's own words, a bond's price volatility depends on two factors: its coupon rate and maturity.

- The longer the maturity, the greater the price volatility.
- The lower the coupon rate, the greater the price volatility.

If two bonds have the same maturity, the lower coupon bond will be more volatile. If two bonds have the same coupon rate, the one with the longer maturity will be more volatile. When it comes to comparing the volatility of two bonds with different coupon rates and maturities, we use duration.

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$$\text{Duration} = \frac{\text{sum of (present value of each payment} \times \text{time until that payment is received)}}{\text{price of bond}}$$

Duration is measured in years. In general, the longer the duration or the longer you need to wait for the payment of coupons and return of principal, the more its price will drop as interest rates rise.

Using this BlackRock approximation method, for every 1% increase or decrease in interest rates, a bond's price will change approximately 1% in the opposite direction for every year of duration.

So for example, a 1% increase in interest rate may lead to approximately 1% decrease in a 1 year T-Bill but close to a 9% decrease in a 10 year T-Bond price.

The rapid rise in yields since March 2022 has led to unprecedented volatility in bonds. This in turn led to a huge return divergence in the treasury bonds of various maturities. The table below is a comparative study of returns of different duration bond ETFs.

	2018	2019	2020	2021	2022	YTD 2023
iShares $ Treasury 0-1yr ETF	-	-	0.90%	0.00%	1.00%	4.57%
iShares 3-7 Year Treasury Bond ETF	1.36%	5.78%	6.88%	-2.51%	-9.59%	2.42%
iShares 20+ Year Treasury Bond ETF	-2.07%	14.93%	17.92%	-4.76%	-31.41%	-3.83%

As the Fed raised the FFR, the shorter end of the yield curve benefited as these T-Bills matured within a year or less with higher yields. The belly of the curve suffered some losses due to their longer duration, but the brunt of the damage was borne by the longer dated Treasurys.

According to this Bloomberg piece, losses on longer-dated Treasurys are beginning to rival some of the most notorious market meltdowns in US history. Bonds maturing in 10 years or more have slumped 46% since peaking in March 2020. That’s just shy of the 49% plunge in US stocks in the aftermath of the dot-com bust at the turn of the century. The rout in 30-year bonds has been even worse, tumbling 53%, nearing the 57% slump in equities during the depths of the financial crisis.

Depending on your view of the Fed Funds Rate, there is perhaps some good news on the horizon. Just as the longer dated Treasurys bore the brunt of the damage when the Fed raised rates, when the Fed eventually cut rates, the longer end will enjoy convexity but this time to the upside. But of course, the Fed may stick to higher for longer and keep rates where they are.

A diversified Treasury portfolio with different durations may provide exposure to the upside while continuing to enjoy high coupons of short durations.

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3.2

US Investment Grade Bond

While US Treasurys are a stable allocation target, there are also other options many investors like to include in a diversified low-risk portfolio. At $5.9 trillion, the US investment grade (IG) corporate bond market is one of the largest and most liquid asset classes in the world.

An investment grade is a rating that signifies a corporate bond presents a relatively low-risk of default. Below are investment grade ratings of the three major bond rating agencies.

Moody’s Investment Grade

	Minimal credit risk	Very low credit risk			Low credit risk			Moderate credit risk		
Fitch	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-
S&P	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-
Moody’s	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3

There are 2 major categories when it comes to corporate bonds:

1. Investment-grade refers to bonds rated Baa3/BBB- or better.
2. High-yield, or non-investment-grade or junk, refers to bonds rated Ba1/BB+ and lower.

The best rating among the IG universe is of the AAA grade. Triple A rated companies are entities of exceptionally high quality (established, with consistent cash flows) that have minimal credit risk. Focusing on AAA rated bonds allows a study of minimum credit risk exposure possible.

Since there is extra credit risk (no matter how small it is) associated with the AAA rated corporate bonds when compared to the US Treasurys, there should be extra yield to compensate for the additional risk.

Moody's Aaa Corporate Bond, also known as "Moody's Aaa" for short, is an investment bond that acts as an index of the performance of all bonds given an Aaa rating by Moody's Investors Service. This corporate bond is often used in macroeconomics as an alternative to the federal 10 year Treasury Bill as an indicator of the interest rate.

Moody’s Seasoned Aaa Corporate Bond Yield (DAAA)

Source: Moody’s

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As of 4th Dec 2023, the average yield of Moody's Aaa index is at 4.96%. In absolute terms, this is higher than the Covid period peak of 3.92%, but lower than the global financial crisis (GFC) peak of 6.47%. Of course, these are extreme values at extreme times in the market.

What is perhaps more interesting is that despite a much lower Fed Funds Rate, the index was yielding in a 5%-6% range between 2008-2010 vs 4%-2.5% in the 10 yr. If the Fed holds its rate at where it is today (5.25%-5.50%) and the 10 year continues to trade between 4%-4.5%, the extra yield offered by triple AAA over the 10 year Treasurys is much lower than that of the GFC period.

In fact, using the ICE BofA AAA US Corporate Index Option-Adjusted Spread, the credit spread of Moody's Aaa index over similar maturity US Treasurys is at the lowest in over 20 years.

ICE BofA AAA US Corporate Index Option-Adjusted Spread

Source: Ice Data Indices, LLC

The market is pricing for very little credit risks and very strong economic fundamentals. As an investor, you will have to decide if you are getting paid adequately for the extra credit risk you are taking at these levels.

As a matter of practicality, if an investor were looking to allocate a portion of their portfolio to triple A rated IG credit, what product offers them the access and how would this product compare to the US Treasurys options?

Unless the investor is willing and able to construct their own triple A rated portfolio by accessing and purchasing each individual bond, the closest and cheapest instrument at disposal is the iShares Aaa - A Rated Corporate Bond ETF. This is an ETF focused on single A or better rated US corporate bonds.

The Option-Adjusted Spread for each of the rating categories are:

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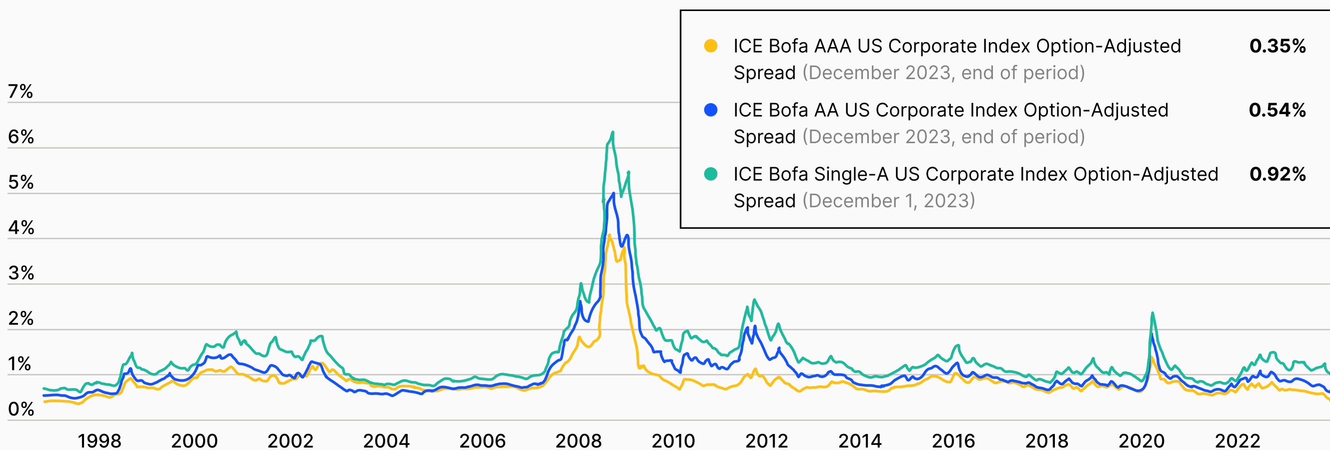

Source: Ice Data Indices, LLC

On an absolute basis, all three credits are at the low end of their historical series despite the aggressive FFR hikes and the accompanying projection of economic gloom. By contrast, the single A credit seems to be more cheaply priced vs both double A and triple A.

The effective maturity of the whole iShares Aaa - A Rated Corporate Bond ETF is 7.01 years while carrying an average yield-to-maturity of 5.26%.

How does this compare to the various segments of the Treasury market?

Total Returns	2018	2019	2020	2021	2022	YTD 2023	Effective Duration in Years	Average Yield-to--Maturity	Standard Deviation (3yrs)
iShares $ Treasury 0-1yr ETF	-	-	0.90%	0.00%	1.00%	4.57%	0.36	5.30%	0.68%
iShares 3-7 Year Treasury Bond ETF	1.36%	5.78%	6.88%	-2.51%	-9.59%	2.42%	4.41	4.29%	4.99%
iShares 7-10 Year Treasury Bond ETF	0.82%	8.38%	9.84%	-3.27%	-15.23%	0.40%	7.38	4.28%	7.55%
iShares 20+ Year Treasury Bond ETF	-2.07%	14.93%	17.92%	-4.76%	-31.41%	-3.83%	16.81	4.55%	14.66%
iShares Aaa - A Rated Corporate Bond ETF	-2.30%	12.54%	9.81%	-2.22%	-15.31%	4.08%	7.01	5.26%	8.05%

The Aaa-A rated IG ETF is currently offering a risk/return profile most similar to that of the iShares 7-10 Year Treasury Bond ETF. With a slightly shorter duration (lower interest rate risk) and a higher average yield-to-maturity on a portfolio level, the iShare AAA-A rated corporate bond ETF looks interesting.

% of Market Value as of Dec 04, 2023

	Fund
AAA Rated	2.25%
AA Rated	13.92%
A Rated	83.80%
Cash and/or Derivatives	0.03%

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Interestingly the bulk (83.8%) of the AAA-A IG ETF is allocated to single A credit. Whether the extra yield of 98bps is good enough to compensate for the extra credit risk is up to the investor to decide.

3.3

US Mortgage Backed Securities

The birth of the modern US mortgage-backed securities (MBS) market emerged in the 1970 as a way to decouple mortgage lending from mortgage investing. These securitized mortgages, packaged and sold as bonds, are easily traded and held by institutional investors, allowing investors the opportunity to diversify their portfolios beyond traditional Treasurys and corporate bonds.

Securitization today allows these mortgages to be held and traded by investors all over the world. You can read more about the onchain securitization market here.

Outside of the US Treasurys (USTs), agency MBS represent the second largest segment of the US bond market, constituting 26% of the Bloomberg Barclays Aggregate Index. The US MBS market is one of the largest and most liquid global fixed-income markets, with more than $11 trillion in outstanding value and nearly $300 billion in average daily trading volume.

There are 2 ways to classify an MBS:

01

Agency vs nonagency
Agency MBS carry a government-backed credit guarantee from one of three housing agencies: Fannie Mae, Freddie Mac or Ginnie Mae.

Fannie Mae and Freddie Mac purchase and securitize "conforming" mortgages, which are typically prime-quality loans. Fannie Mae and Freddie Mac are government-sponsored enterprises or GSEs. Although not explicitly government-owned, their debt is perceived to carry an implicit public guarantee, and the two GSEs have been in public conservatorship since 2008. Ginnie Mae guarantees MBS assembled from mortgages explicitly insured by Federal government agencies, primarily the Federal Housing Administration (FHA) and Veterans Affairs (VA).

Nonagency MBS, on the other hand, are issued by private financial institutions and are not guaranteed. Instead, securities are tranched in terms of seniority to cater to investors with different credit risk appetites.

02

Residential vs commercial
The part of the MBS market consisting of mortgages on individual residential properties are called residential mortgage backed securities or RMBS. There is also an active commercial MBS (CMBS) market secured by a diverse range of commercial real estate (e.g., office, multifamily, industrial, hotel, and warehouse properties). Commercial mortgages are larger, more complex and more heterogeneous than residential mortgages, and these features are reflected in the design of CMBS.

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Between the 2 dimensions, the US RMBS market is more than twice the size of its CMBS counterpart. And the agency MBS market makes up $7.7 trillion (70%) of the total $11 trillion MBS market.

MBS risks and returns

Since the agency MBS market has the implicit back-stop guarantee of the US government, its credit risk is minimized to that of the US Treasury market. However, an agency MBS does typically provide a yield premium to Treasurys as compensation for investors assuming the prepayment risk embedded in the underlying mortgages. Investors in an agency MBS are compensated for the uncertainty of “when” they receive the bond’s principal, but not “if”.

The key risks associated with agency MBS are:

- **Spread Volatility**
  Similar to any non-government fixed-income security, agency MBS valuations are subject to changes in spreads. If spreads widen, the prices of agency MBS will decline. If spreads tighten, the prices of agency MBS will increase.

  Given the unprecedented volatility in the rates market following the Fed’s Quantitative Tightening and rate hikes, the spread on MBS has widened to historical highs, reducing its returns.

- **Prepayment/Negative Convexity**
  When homeowners pay back more principal than required by the regular amortization schedule, it is considered a prepayment. This may occur for a number of reasons. For example, the homeowner might refinance into a mortgage with a lower rate, experience a life-changing event (relocation for a new job, divorce or death) and move into a new home. Because the principal is being returned to the investor at par, this can detract from returns if the MBS was purchased at a premium price.

  This means unlike US Treasurys and IG credits that appreciate in value when the rates fall, the MBS lose value as homeowners refinance into lower rates. In other words, MBS exhibits negative convexity.

When thinking about MBS returns, it is important to compare it to other high quality fixed-income assets such as Treasurys and IG credits. The chart below shows the spread premium on current coupon MBS vs 5/10 yr Treasury blend and IG.

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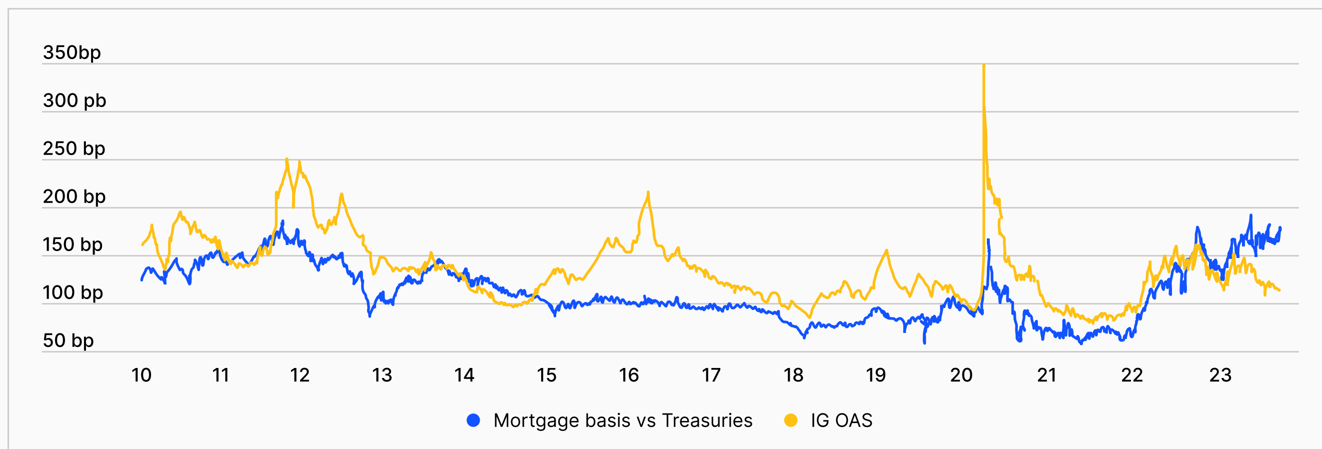
Mortage Basis (Current Coupon Mortgage Rate - 5/10 Year Treasury Rate) and IG Option-Adjusted Spread

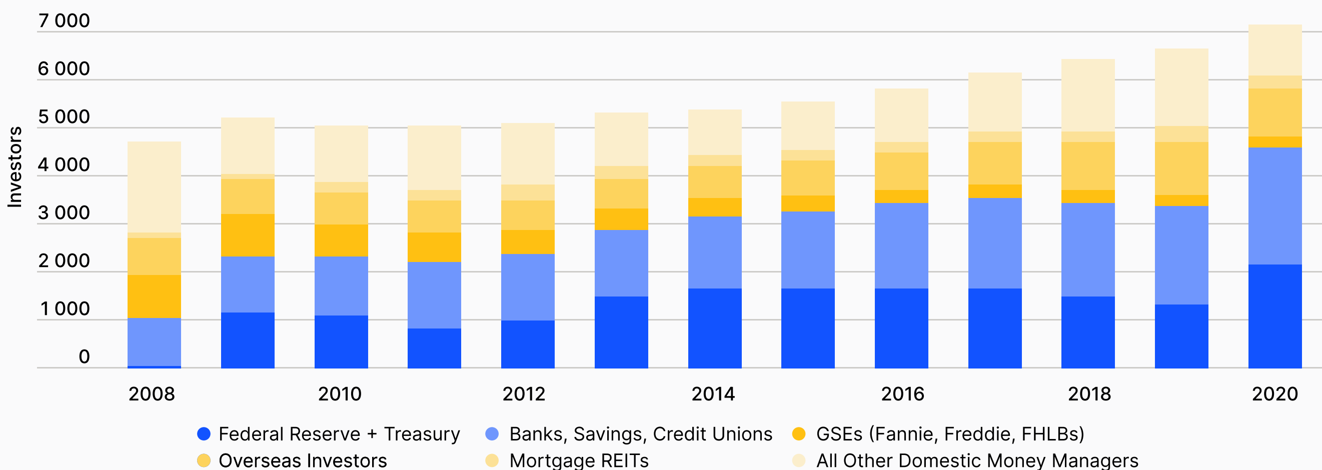


Source: Goldman Sachs Global Investment Research, as of 9/29/23. Past performance is not indicative of future results. You cannot invest directly in an Index. IG OAS is based on the Bloomberg U.S. Corporate Index.

On an absolute basis, the current coupon MBS spread over similar tenor Treasurys is close to historical highs at 170bps. Even when compared to the excess spread offered by IG credit, current coupon MBS commands an additional premium of close to 50bps.

If the economy does indeed go into a recession and the market takes on a risk-off nature, agency MBS may be better positioned to receive support from the Fed than IG credit. After all, the Fed was a key buyer of agency MBS during its Quantitative Easing phase.

Agency MBS Investors



According to DoubleLine, since 1976, there have been 6 recessions, and total returns have been positive for agency MBS 12 months following each recession. Apart from the 2020 recession, agency MBS has outperformed IG credit 5 out of the 6 times.

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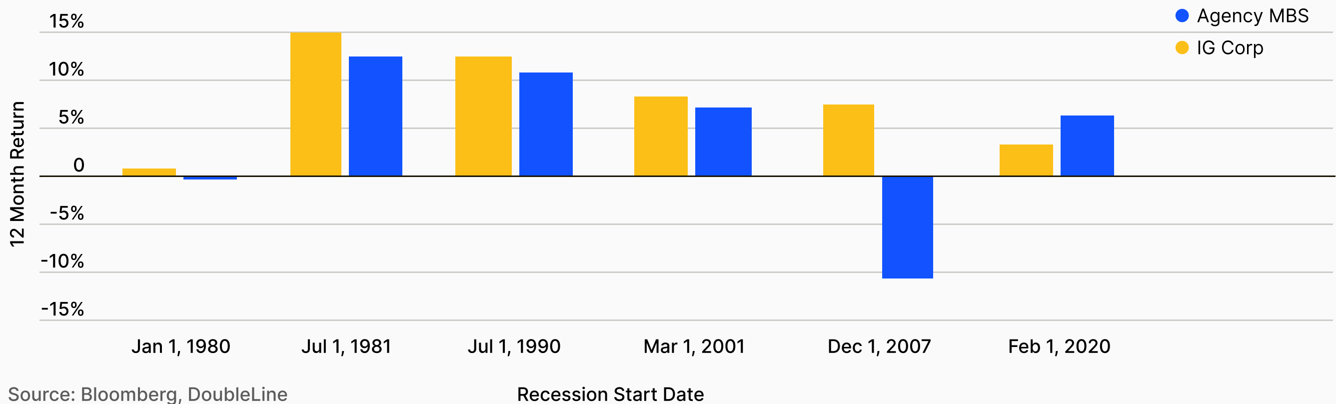
Post-Recession Performance



Source: Bloomberg, DoubleLine

Using iShares MBS ETF as an illustrative example, if an investor were looking to allocate to the agency MBS sector, here is how iShares MBS ETF performed vs other high quality fixed-income assets in the past.

Total Returns	2018	2019	2020	2021	2022	YTD 2023	Effective Duration in Years	Average Yield-to--Maturity	Standard Deviation (3yrs)	Average YTM/SD
iShares $ Treasury 0-1yr ETF	-	-	0.90%	0.00%	1.00%	4.57%	0.36	5.30%	0.68%	7.79
iShares 3-7 Year Treasury Bond ETF	1.36%	5.78%	6.88%	-2.51%	-9.59%	2.42%	4.41	4.29%	4.99%	0.86
iShares 7-10 Year Treasury Bond ETF	0.82%	8.38%	9.84%	-3.27%	-15.23%	0.40%	7.38	4.28%	7.55%	0.57
iShares 20+ Year Treasury Bond ETF	-2.07%	14.93%	17.92%	-4.76%	-31.41%	-3.83%	16.81	4.55%	14.66%	0.31
iShares Aaa - A Rated Corporate Bond ETF	-2.30%	12.54%	9.81%	-2.22%	-15.31%	4.08%	7.01	5.26%	8.05%	0.65
iShares MBS ETF	0.81%	6.27%	4.03%	-1.27%	-11.86%	1.94%	5.93	5.05%	6.47%	0.78

The last column shows the upside per 1% standard deviation risk of an asset class. This provides a way to think about how these different assets stack up against one another when adjusted for their return dispersion. By this measure, the short term T-Bills ETF looks most attractive. With intermediate notes around 3-7 year tenor being the second and the MBS taking the third place.

Of course, this is but one way of measuring and comparing these quality fixed-income assets. The actual allocation decisions need to be preceded by a well-thought out investment policy or objective. For example, if an investor wants to target an annualized yield of 7% over a 10 year period and believes the interest rate and inflation will both be below 2% soon, then perhaps the 20 year Treasury Bond ETF with its longer duration and higher total return will be more suitable.

The key for an investor is understanding how each asset can perform in a fixed-income portfolio. And given a set of economic assumptions, what assets are best suited to achieve one's investment objectives.

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Conclusion

Regardless of what treasury strategy is developed for Arbitrum, it is clear that real-world assets will have a role to play. RWA stands out as a diversification strategy away from crypto-native assets, and RWA markets can provide better risk-adjusted returns than available alternatives.

In this report, we've established the need for a treasury framework and the critical components needed to engage with RWA markets. We've shared insight and overview of how to think about the landscape of low-risk RWA as well. In order for the community to develop a capability that incorporates these thoughts and can put action to this perspective, we believe it is important that the appropriate partners are selected for the job. It will be difficult to select a single product that can offer everything the community needs, but rather offerings and collaborations should be selected that can provide the tooling, resources, and network necessary to develop a true RWA capability.

Centrifuge Prime has been developed for exactly this type of need. It is a managed services offering that allows Centrifuge's experience and ecosystem to be integrated into the governance and infrastructure of other decentralized communities. It provides resources and expertise necessary to build dedicated RWA infrastructure for protocols, stablecoins, and DAO treasuries. Centrifuge Prime can be used as a single service provider or in collaboration with another management team to augment their capabilities.

Ultimately, we believe DAOs are on the path to developing more mature treasury practices — and we believe Centrifuge can be the best partner for that journey.

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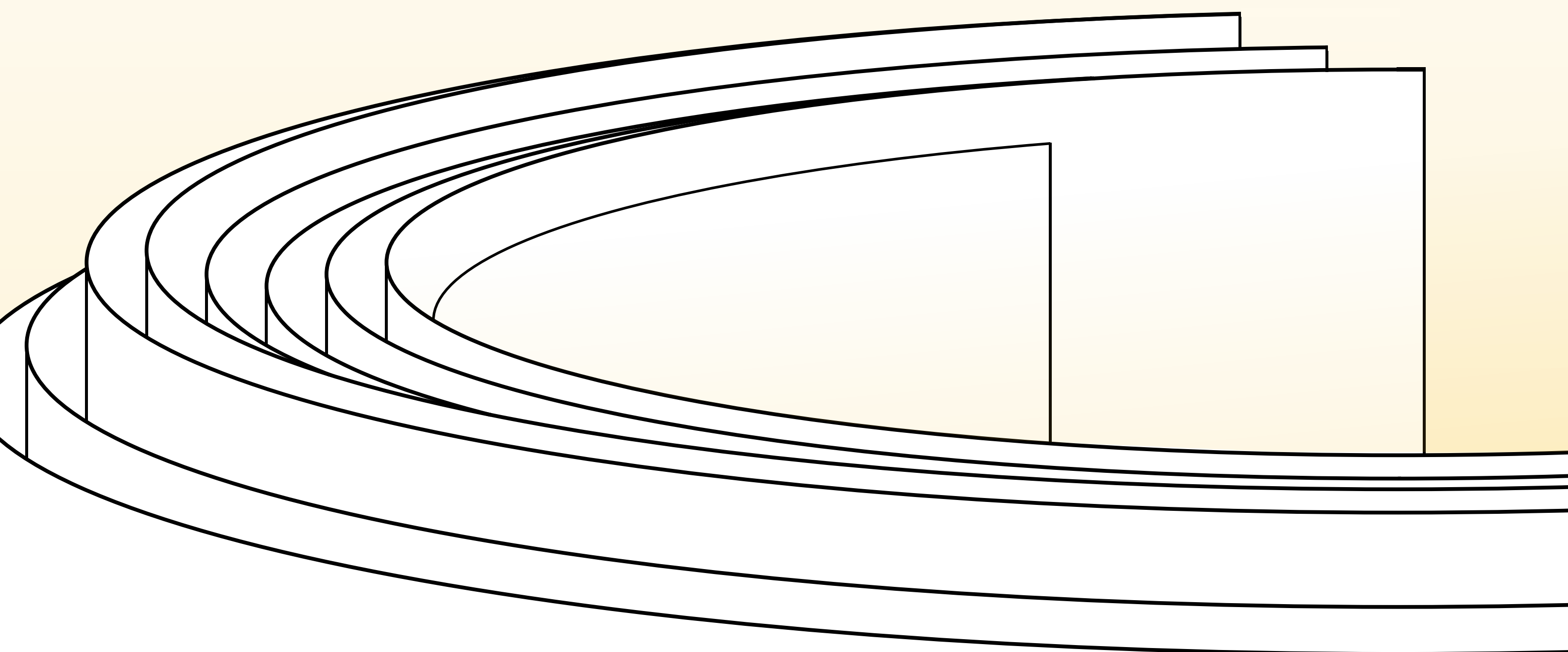

Centrifuge has a long track record of working with DAOs to bring RWAs on as collateral. Notable firsts include minting MakerDAO's first real-world asset, structuring the first onchain securitization, and partnering with BlockTower to bring the first credit fund operations onchain.

Centrifuge Prime is built for the needs of large decentralized organizations. It provides the infrastructure and services to quickly and easily onboard and scale a fully diversified portfolio of real-world assets. Through Centrifuge Prime, decentralized organizations can get access to an institutional ecosystem of RWA partners and service providers to curate a portfolio of assets across their desired risk profiles.

Reach out to Centrifuge to get started today
marketing@centrifuge.io