

# Discussion of Treasury Futures Positions Across Different Investor Types

Treasury Borrowing Advisory Committee

January 30<sup>th</sup>, 2024

*“According to Treasury futures positioning data, asset manager long positions and leveraged fund short positions have increased significantly. Please discuss the factors that could be driving this dynamic. What are the reasons for asset managers to prefer the Treasury futures market over the cash market for their duration needs? What type of activity does the leveraged short positioning reflect; for example, to what extent could this be cash-futures basis trading activity? What are important factors to consider when monitoring changes in cash-futures basis positions?”*

# Summary

- In this presentation, we examine the large increases in asset manager longs and leveraged fund shorts in Treasury futures and propose potential structural factors that may be contributing to the persistent increases over time.
- We discuss specific reasons why asset managers use Treasury futures and find that their strategic asset allocation has resulted in lower Treasury allocations and a potential structural need for Treasury futures.
- We also discuss how leveraged funds use Treasury futures, and what types of levered strategies might result in consistently opposing positions relative to asset managers.
- We conclude that relative-value trading strategies are the most likely driver of structural leveraged fund shorts in Treasury futures and propose some relevant relationships for Treasury to monitor on the Treasury futures basis trade.
- We suggest that a mutually beneficial relationship exists between asset managers and leveraged fund positioning in Treasury futures.
- We conclude with a brief discussion of potential interactions between asset-managers and leveraged fund positioning and possible areas of future research.

# **Review of CFTC Futures Data**

# Overview of CFTC Positioning Data

- The CFTC *Traders in Financial Futures (TFF)* report separates large traders in the financial markets into four categories<sup>(1)</sup>:

## CFTC Traders in Financial Futures (TFF) Categories

### Dealer / Intermediary

*“Includes large banks (U.S. and non-U.S.) and dealers in securities, swaps and other derivatives.”*

### Asset Manager / Institutional

*“Institutional investors, including pension funds, endowments, insurance companies, mutual funds and those portfolio/investment managers whose clients are predominantly institutional. “*

### Leveraged Funds

*“Typically hedge funds and various types of money managers, including registered commodity trading advisors (CTAs); registered commodity pool operators (CPOs) or unregistered funds identified by CFTC.3”*

### Other Reportables

*“Includes corporate treasuries, central banks, smaller banks, mortgage originators, credit unions and any other reportable traders not assigned to the other three categories.”*

# Overview of CFTC Positioning Data

- Investor category data is available since 2006.
- We first show in Figure 1 total futures open interest<sup>(1)</sup> vs. the size of the Treasury market.<sup>(2)</sup>
- For Treasuries, we use total coupons outstanding excluding SOMA holdings.
- Open interest has grown with the overall size of the Treasury market.
- As a percentage of the market (Figure 2), open interest has been stable after a large decline during the global financial crisis. Recently we've seen re-leveraging and wider range.

Figure 1: Treasury Futures Open Interest (Face Amount) vs. Treasury Coupons Outstanding (ex. SOMA)

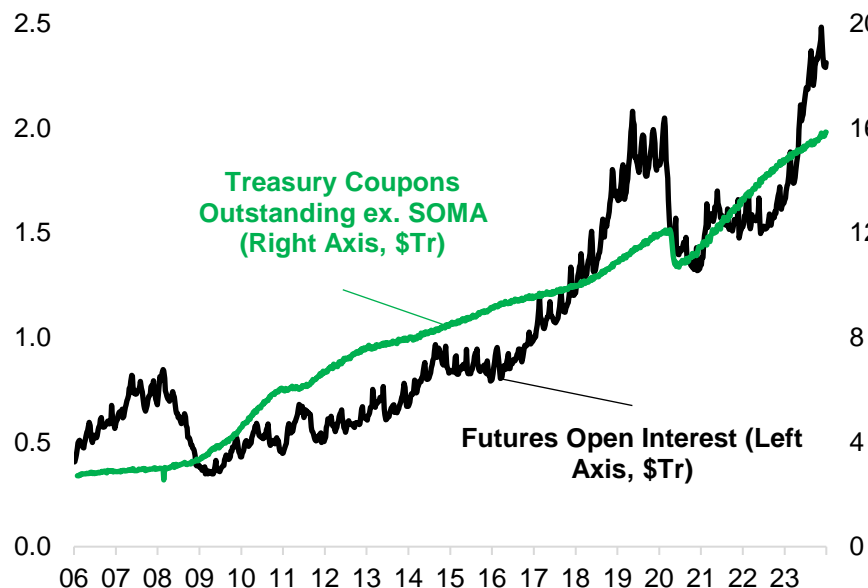
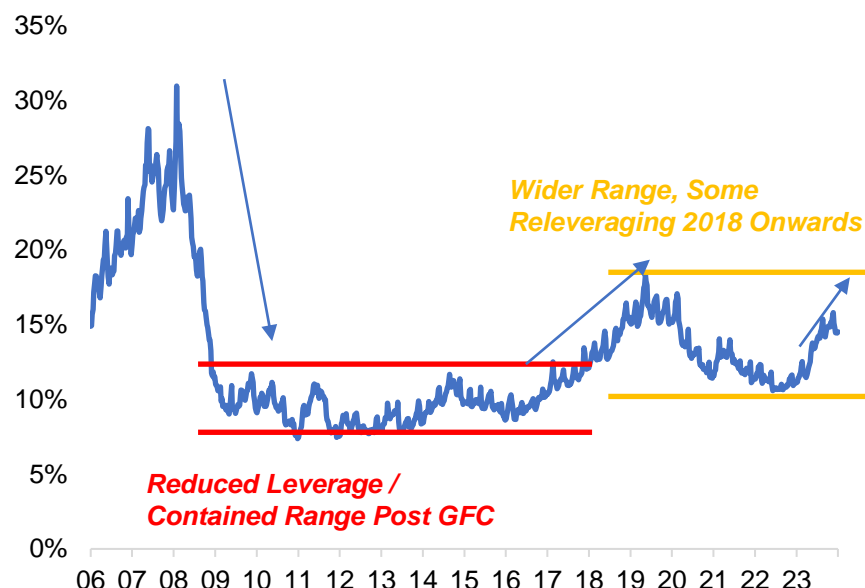


Figure 2: Treasury Futures Open Interest (Face Amount) % of Treasury Coupons Outstanding (ex. SOMA)



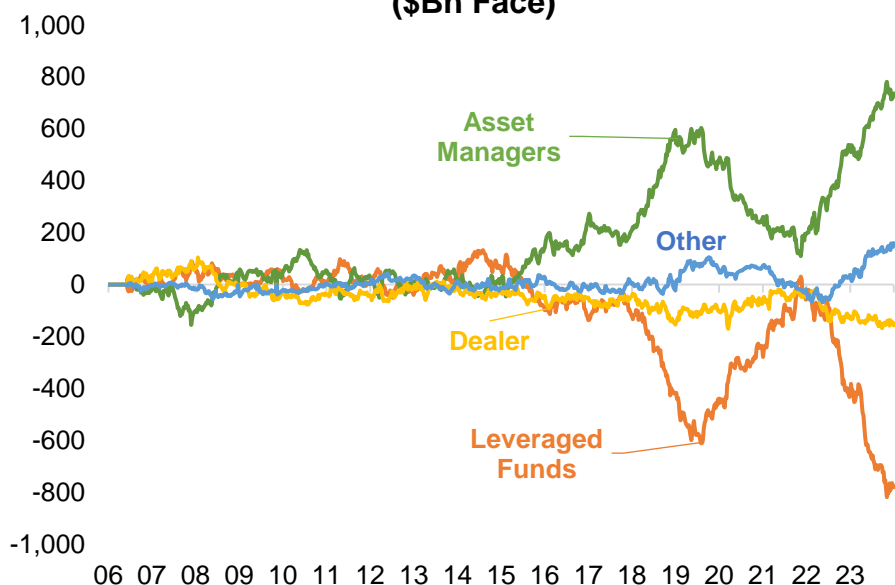
(1) Data on Treasury futures is sourced from the CFTC Traders in Financial Futures report as of Dec 2023

(2) Data on Treasury securities is sourced from US Treasury and NY Fed as of Dec 2023

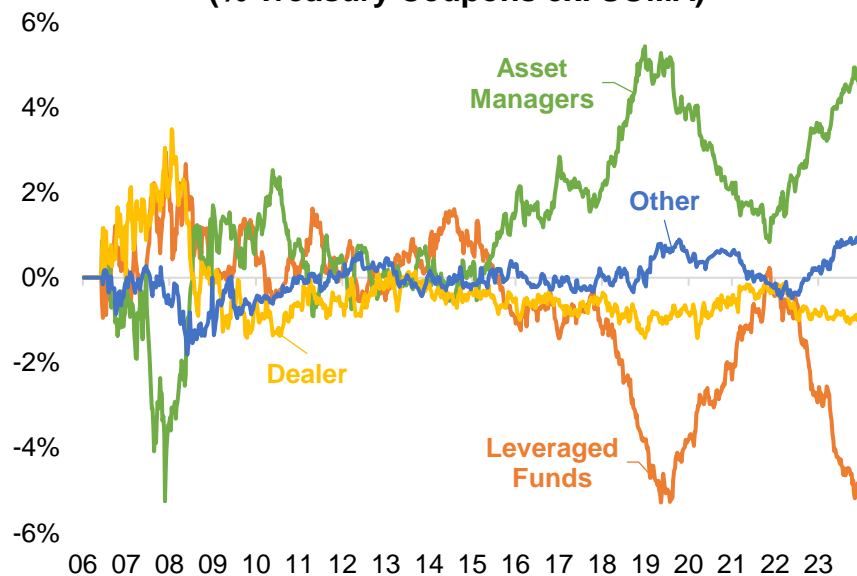
# Overview of CFTC Positioning Data

- Recently there have been large increases in both asset manager and leveraged fund positions in Treasury futures.
- Since November 2021, asset managers (AM) have increased their net position from \$100bn to over \$700bn, while leveraged funds (LF) have moved from flat to short almost \$800bn.<sup>(1)</sup>
- When normalized by the size of the Treasury market<sup>(2)</sup> in Figure 4, recent trends look similar. One interesting thing to note is the size of AM and LF positions is similar to 2019 peak (not larger).
- In the 2006-2007 period, AM and LF relative positions were flipped. This change could indicate a structural evolution in the ecosystem and how different investors behave.

**Figure 3: Net Treasury Futures By Investor Type (\$Bn Face)**



**Figure 4: Net Treasury Futures by Investor Type (% Treasury Coupons ex. SOMA)**



(1) Data on Treasury futures is sourced from the CFTC Traders in Financial Futures report as of Dec 2023

# Overview of CFTC Positioning Data

- Most of the net position in futures is concentrated in shorter duration contracts (TU, FV, and TY) likely due to larger amounts of Treasuries outstanding in these maturity buckets.
- Currently, these three contracts represent 80% of the net asset manager **notional** position and 55% of the net **TY equivalent** position.
- For purposes of the analysis we have focused on notional exposure, as opposed to DV01 exposure, because it is most consistent with quantities of repo/funding needs.
  - That said, there are likely important things to consider around DV01 exposure, since it would more accurately reflect interest rate risk concentration in longer duration securities.

Figure 5: Net TU Position  
(\$Bn Face)

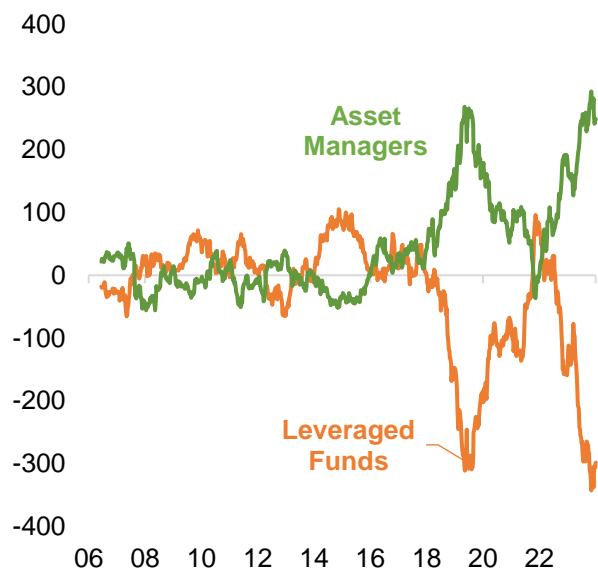


Figure 6: Net FV Position  
(\$Bn Face)

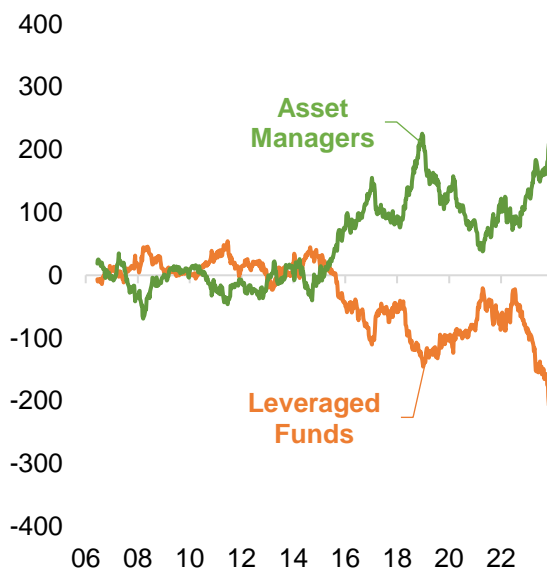
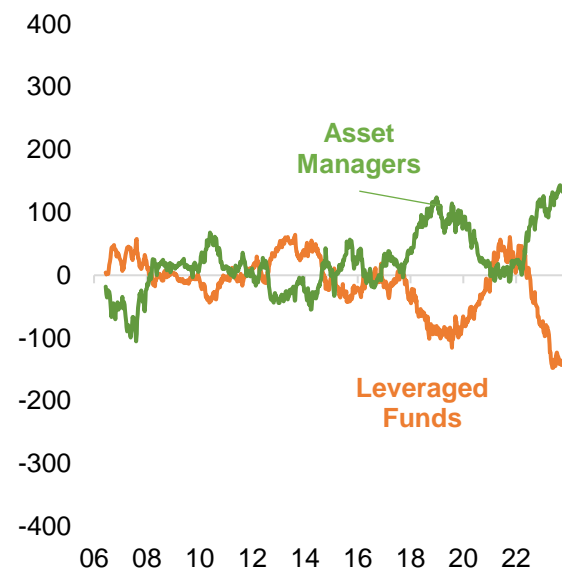


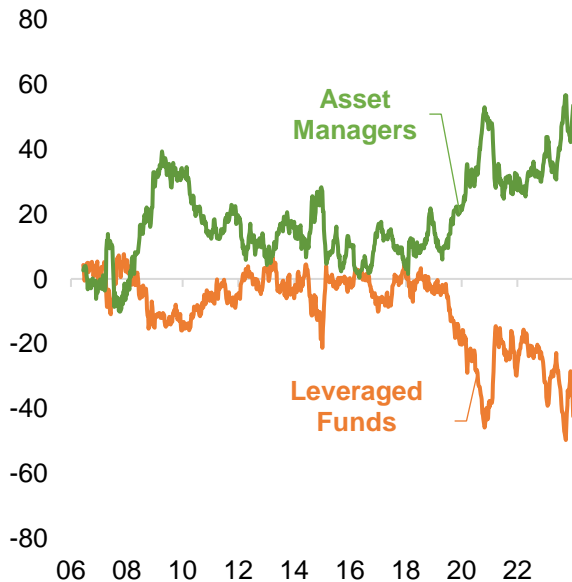
Figure 7: Net TY Position  
(\$Bn Face)



# Overview of CFTC Positioning Data

- We also show data for US and WN contracts (note the axis change) as well as all contracts in TY equivalent terms as of the end of 2023.
- While the contours are not all the same, the broad trends recently (expansion of AM longs and LF shorts) are consistent across all Treasury futures contracts.

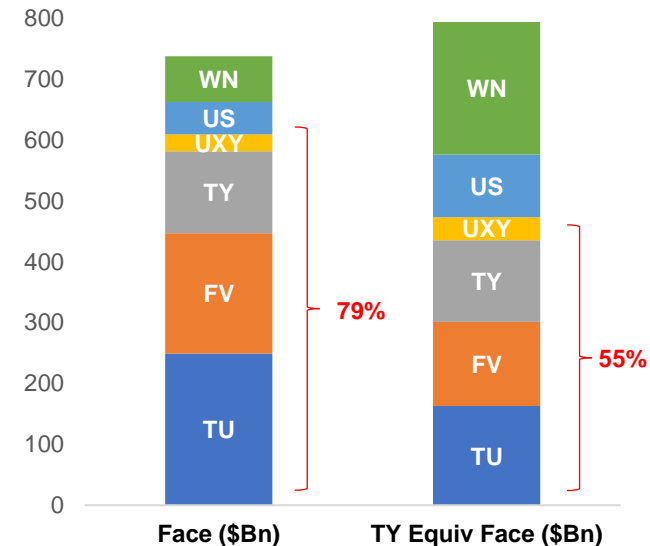
**Figure 8: Net US Position (\$Bn Face)**



**Figure 9: Net WN Position (\$Bn Face)**



**Figure 10: Asset Manager Current Face Amount & TY Equivalent Breakdown**



(1) Data on Treasury futures is sourced from the CFTC Traders in Financial Futures report as of Dec 2023



# **Asset Manager Discussion**

# How do Asset Managers Use Futures?

- **Active asset managers likely use Treasury futures for the following reasons:**
  1. Expressing directional views on duration and yield curve.
  2. Hedging and managing interest rate risk across different sectors & curve points.
  3. Obtaining financing / leverage to implement active views vs. benchmark.
  
- **Why might asset managers use Treasury futures instead of Treasuries?**
  1. Could simplify execution and operations (negates need for cash / repo trades).
  2. Eliminates reporting repo interest expense.
  3. Guidelines might not allow repo leverage (mostly separate accounts).
  4. Likely more leverage flexibility compared to 40-Act repo limits.

# How do Asset Managers Use Futures?

- The CFTC data shows that in recent years, asset managers have had a net long bias in Treasury futures, even with large swings in Treasury yields (10y yield of 0.5% in '21 to 5.0% in '23). Why would this be?
- First, what types of positions might cause asset managers to be net long Treasury futures?
  1. Active rate views (either long duration or curve steepener)
    - Based on an empirical analysis of 20 large mutual funds, asset managers appeared to trade short duration after the large drop in yields during the COVID pandemic. During this period, there was a large drop in the asset manager net futures long position, but it remained net long.
    - The empirical results<sup>(1)</sup> in Figure 12 show that asset managers have since moved closer to neutral, and yet the net futures positions now stand at an all-time high.
  2. Financing certain active and/or non-index portfolio allocations
    - **We view this as the most likely explanation for why asset managers might have a structural position in futures and will expand on that view in the coming slides**

Figure 11: Asset Manager Net Futures vs. 10Y Yield

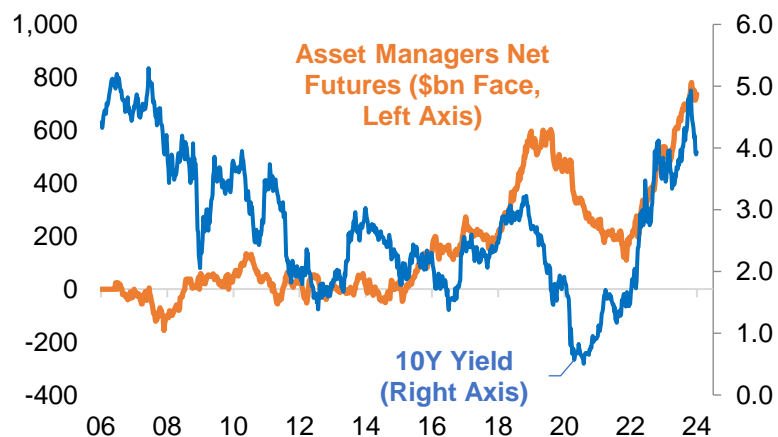
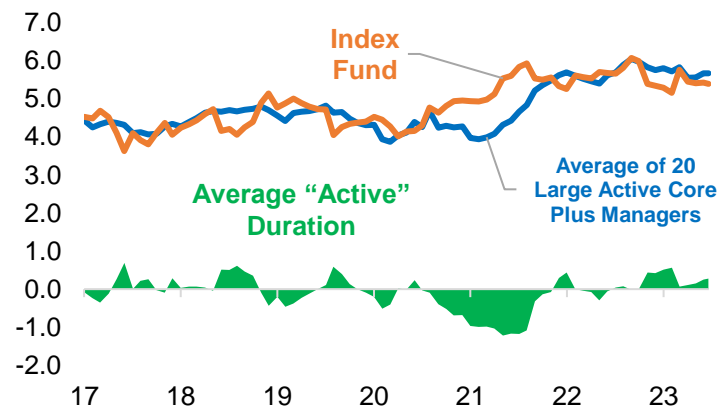


Figure 12: Asset Manager Empirical Duration Using Three Factor Regression<sup>(1)</sup>



(1) Sourced from Bloomberg and the presenter's firm's calculations. Fund returns are regressed on US 10Y, DXY, and IG Corporate OAS. Data as of 01/17/2024

# Asset Managers: Product Mix Tends to Favor Futures Relative to Treasury Repo

- Below, we show in Table 1 a broad overview of different asset management products with associated regulatory requirements for repo and futures usage.
- We focus on active fixed-income, since passive strategies, which largely track cash indices, are probably less likely to use Treasury futures.
- Based on industry estimates<sup>(1)</sup>, we conclude that most of CFTC asset manager data represents mutual funds and actively-managed separate accounts.

**Table 1: Asset Management Products Regulatory Requirements for Repo and Futures Usage**

Product Type	Governance	Guidelines	Allow Economic Leverage?	Allow Repo?	Allow Futures?
Active Mutual Fund	SEC / 1940 Act	Prospectus/SAI	Yes	Yes <sup>(2)</sup> , 50%	Yes
Active ETF	SEC / 1940 Act	Prospectus/SAI	Yes	Yes <sup>(2)</sup> , 50%	Yes
Collective Trust	ERISA	Prospectus/SAI	Yes	No	Yes
UCITS	ESMA / UCITS	Prospectus/SAI	Yes	Yes	Yes
Separate Account		Client IMA	Depends	Depends	Depends

(1) When looking at eVestment data for several large asset managers, we found that nearly 90% of AUM was in mutual funds and separate accounts as of Q3 2023

(2) 40-Act limit depends on the mutual fund's approach to repo under SEC rule 18f-4. Prior to 2020 introduction of 18f-4, repo was typically limited to 50%.

# Asset Managers: Product Mix Tends to Favor Futures Relative to Treasury Repo

- Mutual funds are regulated by the Investment Company Act of 1940 (“40-Act”)
  - While established in 1940, various rules and amendments to the 40-Act have been adopted over time.
  - For many years prior to 2020, the applicable rules created incentives for mutual funds to favor derivatives like futures over repo in certain cases, including limitations on the size of repo borrowing.
  - Rule 18f-4 adopted in 2020 established a new option for mutual funds to treat repo like other derivatives (which are subject to a “VaR test”), though some funds may not have updated their documentation or practices to utilize it. Given the change was relatively recent, its potential impacts warrant further investigation.
  - If not using this new option, mutual funds must limit their repo borrowing to 50% of NAV to meet the applicable asset coverage requirements.
  - In our view, many mutual funds are still limiting the size of their repo borrowing and achieving leverage through futures.
  
- Separate accounts are typically governed by the client investment management agreement (IMA) and associated investment guidelines.
  - Partial but representative data<sup>(1)</sup> suggests that most institutional accounts do not permit repo.
  - Futures therefore are in many cases the only way to obtain leverage in a separate account.

**Table 2: Separately Managed Accounts Investment Guidelines for Repo/Futures <sup>(1)</sup>**

	Core / Core Plus	Short Duration	Inflation	Credit
% SMA AUM that allows economic leverage	74%	98%	77%	84%
% SMA AUM that allows usage of repo	54%	12%	25%	25%
% SMA AUM that allows usage of Tsy futures	78%	27%	85%	97%

(1) Sourced from presenter firm’s data and may not correlate with aggregate industry level

# Asset Managers: 40-Act Mutual Fund Investment Expense Accounting Also Favors Futures

- While 40-Act mutual funds can use repurchase agreements, the “interest expense” associated with repos must be reported separately as an investment expense.
- In 2018, in accordance with FINRA Rule 2210(d)(5), some fund analysis providers started including “interest expense” in their databases of total expense ratios which include management fees and administrative fixed-costs.
- This change had the effect of making providers who prioritize Treasury repo over futures look more expensive, even though the two products are similar economically and repo is often less expensive.
- FINRA issued clarification D.1.2. in 2019, and while efforts have been made to exclude interest expense from published expense ratios<sup>(1)</sup>, the reality is that if a fund has high interest expense, it raises questions, even if interest expense generally associated with portfolio structures or leverage that are expected to add value to the overall portfolio.

## Typical Mutual Fund Operating Expenses Listed in Prospectus

Management Fees

Distribution Fees

Legal Fees

**Interest Expense**

Acquired Fund Fees

## One Expense Ratio to Rule Them All

What is the adjusted expense ratio, and why should you care?



Miriam Sjoblom • Mar 3, 2020

Share ↗

If you haven't been distracted by pandemic fears, falling stock prices, and U.S. Treasury yields plumbing new lows, you may have come across a new data point on Morningstar.com: the adjusted expense ratio. As we've noted before, our analysts have long used a modified version of the prospectus net expense ratio to make cost comparisons when researching and rating funds. That figure used to be incorporated in our methodology for calculating the prospectus net expense ratio, but we launched it as a separate data point in 2019. Here's why the adjusted expense ratio is important.

**Adjusted Expense Ratio, Defined** To calculate the adjusted expense ratio, we start with the gross expense ratio reported in a fund's prospectus, which is the percentage of fund assets expected to be paid over a year for operating expenses, management fees, and interest and dividend expenses. The net expense ratio takes that figure and removes any contractual fee waivers and reimbursements. The adjusted expense ratio further strips out interest and dividend expenses from the net figure, a step that helps provide the end investor with an apples-to-apples comparison of expense ratios across funds.

(1) [One Expense Ratio to Rule Them All | Morningstar](#)

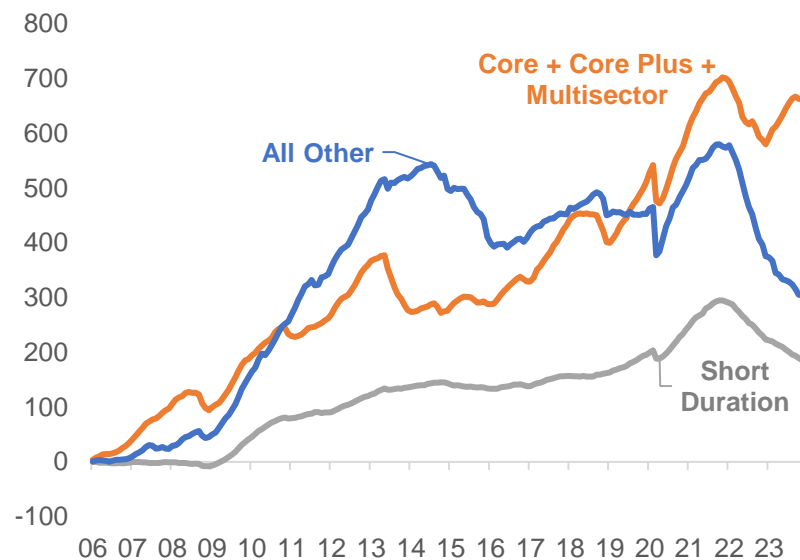
# Asset Managers: Largest Fixed-Income Categories

- The largest fixed-income mutual fund category is intermediate core / core plus at 39% of total assets. Many funds are benchmarked to the Bloomberg U.S. Aggregate Index (“the Agg”), which is a fairly good, but not complete, representation of the U.S bond market.
- Recently flows into short-duration products have also been substantial, where many funds are benchmarked to 1-3Y Government/Credit and 1-3Y Corporate indices.
- We go into some detail on the composition of these indices in the next slide.

Table 3: Fixed-Income Mutual Fund Sector Breakdown <sup>(1)</sup>

Morningstar Sub-Category	Total Net Assets (\$Bn)	% Fixed-Income Category
Intermediate Core-Plus Bond	681	25%
Intermediate Core Bond	381	14%
Short-Term Bond	339	12%
Multisector Bond	267	10%
High Yield Bond	244	9%
Ultrashort Bond	142	5%
Nontraditional Bond	109	4%
Inflation-Protected Bond	85	3%
Intermediate Government	82	3%
Corporate Bond	75	3%
Bank Loan	75	3%
Global Bond-USD Hedged	56	2%
Global Bond	46	2%
Emerging Markets Bond	43	2%
Other	109	4%
<b>Total</b>	<b>2,734</b>	<b>100%</b>

Figure 13: Cumulative Fixed-Income Strategy Flows (2006-2023, \$bn) <sup>(1)</sup>



(1) Sourced from Morningstar as of 12/29/2023

# Asset Managers: Benchmark Indices

- Presently, the Agg is about 42% Treasuries, and in total, about 80% government risk <sup>(1)</sup>. It is an investment-grade only, market value weighted index. The 1-3Y Gov/Credit index is 66% Treasuries and over 70% government risk.
- Notably, the main explanatory market risk factor for the Agg is the level of Treasury yields, which generally account for over 75% of the modeled risk of the index.

Table 4: Bloomberg Aggregate Index <sup>(2)</sup>			
Sector	Market Value %	YTM	Duration
<b>Treasuries</b>	<b>42%</b>	<b>4.07</b>	<b>6.15</b>
Government Related	5%	4.59	5.26
<b>Agency</b>	<b>2%</b>	<b>4.44</b>	<b>3.42</b>
<i>Local Authority</i>	1%	4.80	8.03
<i>Sovereign</i>	1%	5.20	8.58
<i>Supranational</i>	1%	4.22	3.47
IG Corporate	25%	5.09	7.10
<i>Industrial</i>	14%	4.97	7.85
<i>Utility</i>	2%	5.10	8.82
<i>Financial Institutions</i>	8%	5.31	5.31
Securitized	29%	4.67	5.53
<b>Agency MBS</b>	<b>27%</b>	<b>4.63</b>	<b>5.66</b>
<i>ABS</i>	0%	4.92	2.76
<i>CMBS</i>	2%	5.36	4.26
<b>Total</b>	<b>100%</b>	<b>4.52</b>	<b>6.17</b>

Table 5: Bloomberg 1-3Y Government Credit <sup>(2)</sup>			
Sector	Market Value %	Yield to Maturity	Duration
<b>Treasuries</b>	<b>66%</b>	<b>4.30</b>	<b>1.89</b>
Government Related	8%	4.55	1.71
<b>Agency</b>	<b>5%</b>	<b>4.58</b>	<b>1.68</b>
<i>Local Authority</i>	0%	4.52	1.86
<i>Sovereign</i>	0%	4.81	1.70
<i>Supranational</i>	3%	4.46	1.72
IG Corporate	25%	5.13	1.78
<i>Industrial</i>	12%	4.91	1.74
<i>Utility</i>	1%	5.10	1.81
<i>Financial Institutions</i>	12%	5.36	1.82
<b>Total</b>	<b>100%</b>	<b>4.53</b>	<b>1.85</b>

(1) The term "government risk" refers to Treasury debt, Agency debt, and Agency MBS and is highlighted in red.

(2) Sourced from Bloomberg as of 12/29/2023. Treasury weights exclude SOMA holdings.



# Asset Managers: Structural Credit Overweights

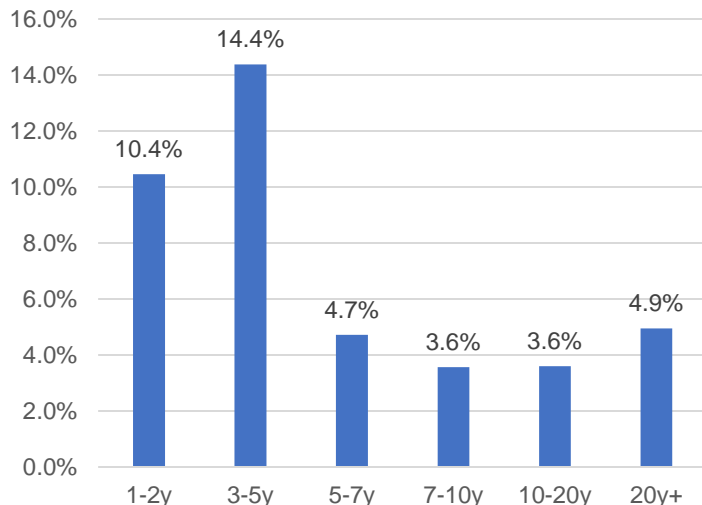
- When managing against the Bloomberg Aggregate Index, active managers will often allocate to higher yielding spread assets to achieve an income advantage and a more diversified portfolio given the heavy interest rate sensitivity of the benchmark.
- Spread sector investment decisions are made in assets of varying durations and maturities, and are often thought of separately from interest rate investment decisions.
- Although asset managers have different investment approaches, we believe it's common to separate decisions made on interest rate duration and credit spread duration.
- Futures allow asset managers to make credit allocation decisions relatively seamlessly, without impacting interest rate risk exposures, but can introduce basis risk between the futures allocation and the Treasury allocation in the index.
- While the process is more precise with Treasuries + repo, it is more cumbersome to implement operationally.
- **It's likely that structural overweight positions in credit products could result in persistently higher allocations to Treasury futures amongst asset managers.**

# Asset Managers: Structural Credit Overweights

When allocating out of Treasuries into credit sectors, we highlight two broad transaction types. We focus on the second type and the implications for how asset managers hedge duration and curve.

- **Matched substitution:** The manager buys a credit and can sell a Treasury of similar duration.
  - Results in a reduction of the Treasury allocation and an increase in credit exposure. Minimal need for futures or repo.
- **Mismatched substitution:** The manager buys a credit and must sell a Treasury of different duration.
  - To control for duration and curve risk, the manager will need to use futures or repo and reverse repo<sup>(1)</sup>.
  - This happens for several reasons, to name a few:
    - (1) Manager buys a floating rate credit asset with zero duration.
    - (2) Manager runs out of similar duration Treasuries to sell from the portfolio.
    - (3) Manager buys a non-USD credit asset.

**Figure 14: Bloomberg Agg Index Treasury Allocation by Maturity Bucket<sup>(2)</sup>**



**Table 6: Ways to Hedge Duration and Curve Risk With Mismatched Treasury/Credit Substitution**

Type	Transactions Involved	Cost/Benefit
<b>Perfect Hedge with Repo and Borrow</b>	(1) Buy credit (2) Short perfect Treasury hedge (3) Borrow perfect Treasury (4) Repo another Treasury to fund credit	- Most operationally complex - Generates interest expense
<b>Partial Hedge with Repo Only</b>	(1) Buy credit (2) Short Treasury futures hedge (3) Repo another Treasury to fund credit	- Some operational complexity - Generates interest expense - Introduces some curve risk
<b><u>Futures Hedge</u></b>	(1) <u>Buy credit</u> (2) <u>Sell Treasury</u> (3) <u>Execute futures curve trade</u>	- <u>Less operationally complex</u> - <u>Introduces basis and curve risk</u>

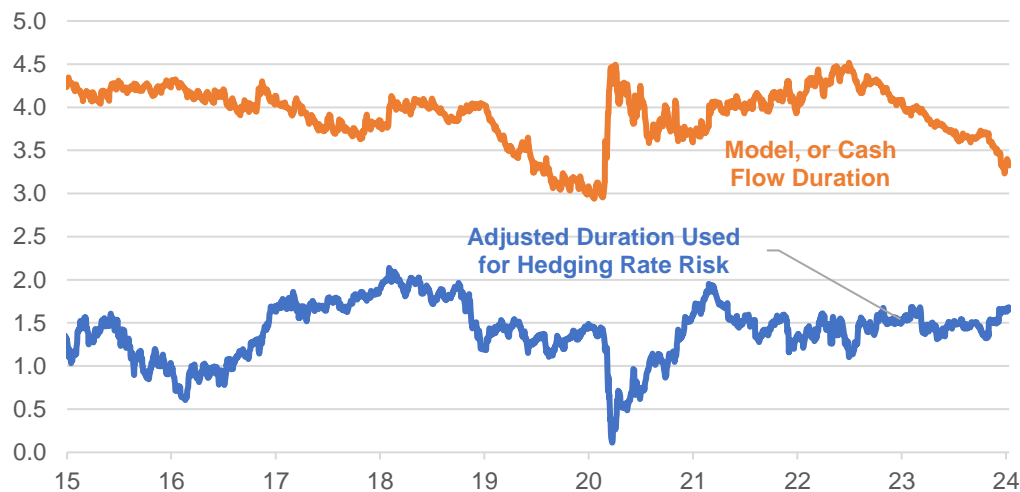
(1) Note, we assume portfolio managers will typically use the cheapest form of repo with lowest haircut (Treasuries)

(2) Sourced from Bloomberg as of 12/29/2023.

# Asset Managers: Structural Credit Overweights

- A separate complication, which is obscure but meaningful, is that portfolio managers will sometimes treat credit duration differently than risk-free duration. This matters more for lower quality credit products, where spread volatility dwarfs interest rate volatility. Bonds that trade on dollar price, like lower rated high yield, exhibit lower “empirical duration.”<sup>(1)</sup>
- Therefore, an allocation out of Treasuries into lower quality credit, would typically require a manager to buy back more duration in futures, compared to higher quality credit.

**Figure 15: Bloomberg High Yield Bond Index<sup>(2)</sup>**



(1) Empirical duration can be thought of as a statistical duration as opposed to a cash flow duration

(2) Sourced from Bloomberg as well as the presenter's firm's calculations as of 01/10/2024

# Asset Managers: Structural Credit Overweights

Four examples<sup>(1)</sup> where a mismatched substitution results in a net long position in futures:

- **Example 1: Buying a floating rate asset**
- Manager sells Treasuries, replaces risk with Treasury futures, buys a floating rate CLO.
- Since the CLO has no duration, for a 5% allocation, a +5.0% net futures position is created.

Trade	Security	Notional %	Cash %	Duration Contrib	Wtd Avg Life	Yield	OAS
Sell	Treasury	-5.0%	-5.0%	(0.31)	7.9	4.10%	
Buy	Treasury Futures	4.8%		0.31			
<b>Buy</b>	<b>CLO</b>	<b>5.0%</b>	<b>5.0%</b>	<b>0.00</b>	<b>2.0</b>	<b>8.00%</b>	<b>2.32%</b>
<b>Net Treasury Futures</b>		<b>4.8%</b>					
<b>Net Change to Fund<sup>(2)</sup></b>			<b>0.0%</b>	<b>0.00</b>		<b>0.12%</b>	<b>0.12%</b>

- **Example 2: Buying an asset with duration < 2 years**
- Manager sells Treasuries, replaces risk with Treasury futures, buys a 1y duration ABS, hedges duration with TU futures.
- For a 5.0% allocation to the ABS, a +1.7% net futures position is created, net duration change is zero.

Trade	Security	Notional %	Cash %	Duration Contrib	Wtd Avg Life	Yield	OAS
Sell	Treasury	-5.0%	-5.0%	(0.31)	7.9	4.1	
Buy	Treasury Futures	4.8%		0.31			
Buy	Short-Dated ABS	5.0%	5.0%	0.06	1.2	6.7	2.14%
Sell	TU Futures Hedge	-3.1%		(0.06)			
<b>Net Treasury Futures</b>		<b>1.7%</b>					
<b>Net Change to Fund<sup>(2)</sup></b>			<b>0.0%</b>	<b>0.00</b>		<b>0.11%</b>	<b>0.11%</b>

(1) Data in the examples shows the presenter's firm's calculations

(2) These simplified examples exclude potential yield impact of Treasury-futures basis or FX hedging cross-currency basis

# Asset Managers: Structural Credit Overweights

Four examples<sup>(1)</sup> where a mismatched substitution results in a net long position in futures:

- **Example 3: Buying a high spread credit asset**
- Similar to previous examples, but the high-risk credit is modeled with a duration less than its cash flow weighted duration. Because of this, the manager has to sell fewer futures to hedge the credit allocation than are bought to replace Treasuries.

Trade	Security	Notional %	Cash %	Duration Contrib	Wtd Avg Life	Yield	OAS
Sell	Treasury	-5.0%	-5.0%	(0.31)	7.9	4.1	
Buy	Tsy Futures	4.8%		0.31			
Buy	High Yield Corp	5.0%	5.0%	0.08	5.3	7.9	3.33%
Sell	Tsy Futures Hedge	-2.1%		(0.08)			
<b>Net Treasury Futures</b>		<b>2.6%</b>					
<b>Net Change to Fund<sup>(2)</sup></b>			<b>0.0%</b>	<b>0.00</b>		<b>0.17%</b>	<b>0.17%</b>

- **Example 4: Buying a Non-USD asset**
- Also similar to previous examples. In this case, the manager buys a non-USD credit with a different base currency curve.
- For a 5.0% allocation to the credit, the manager ends up long 5.0% Treasury futures and short 5.0% non-USD futures.

Trade	Security	Notional %	Cash %	Duration Contrib	Wtd Avg Life	Yield	OAS
Sell	Treasury	-5.0%	-5.0%	(0.31)	7.9	4.1	
Buy	Treasury Futures	4.8%		0.31			
Buy	EUR IG Credit	5.0%	5.0%	0.22	7.2	3.9	1.40%
Sell	5Y Bobl Futures Hedge	-5.0%		(0.22)			
Sell	EUR/USD Fwd	-5.0%					
<b>Net Treasury Futures</b>		<b>4.8%</b>					
<b>Net Change to Fund<sup>(2)</sup></b>			<b>0.0%</b>	<b>0.00</b>		<b>0.07%</b>	<b>0.07%</b>

(1) Data in the examples shows the presenter's firm's calculations

(2) These simplified examples exclude potential yield impact of Treasury-futures basis or FX hedging cross-currency basis

# Asset Managers: Structural Credit Overweights

- Stylized example shows what an active manager's allocation could often look like (Figure 17) compared to an index (Figure 16). In this example, the actively managed portfolio has a 20% out-of-index credit allocation and a higher yield than the index but maintains the same duration and yield curve exposure.
- To accomplish this, the active positions are funded by selling Treasuries, the net duration and curve are hedged with Treasury futures (resulting in a net long futures exposure and positive net leverage).
- Alternatively, the manager could have repo'd Treasuries to fund the allocations which would have generated interest expense.

Figure 16: Bloomberg Agg Index

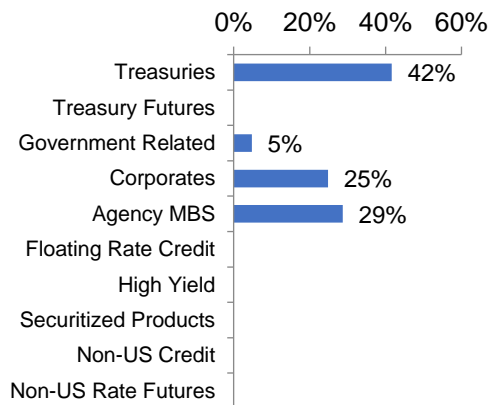


Figure 17: Hypothetical Active Manager

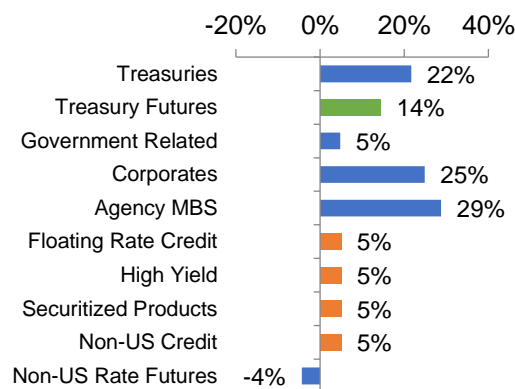
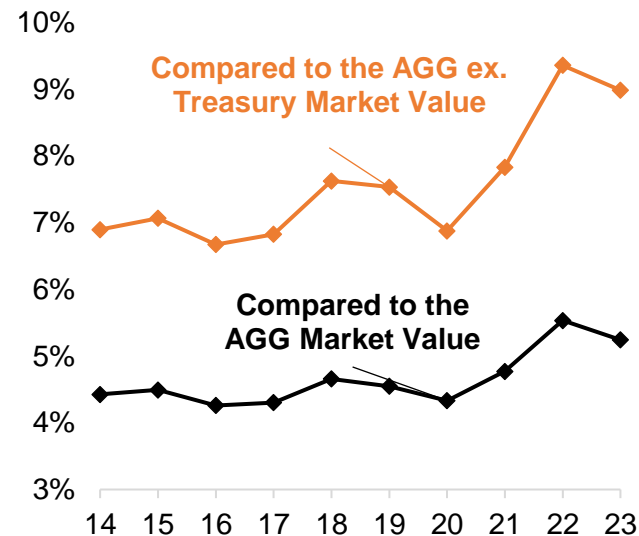


Figure 18: Recent Growth in Floating Securitized Assets<sup>(2)</sup>



Aggregate Index			Active Manager		
Yield	Duration	Avg. OAS	Yield	Duration	Avg. OAS
4.52	6.17	0.38	5.36	6.17	1.07

(1) Sourced from Bloomberg as of 12/29/2023 and the presenter's firm's calculations

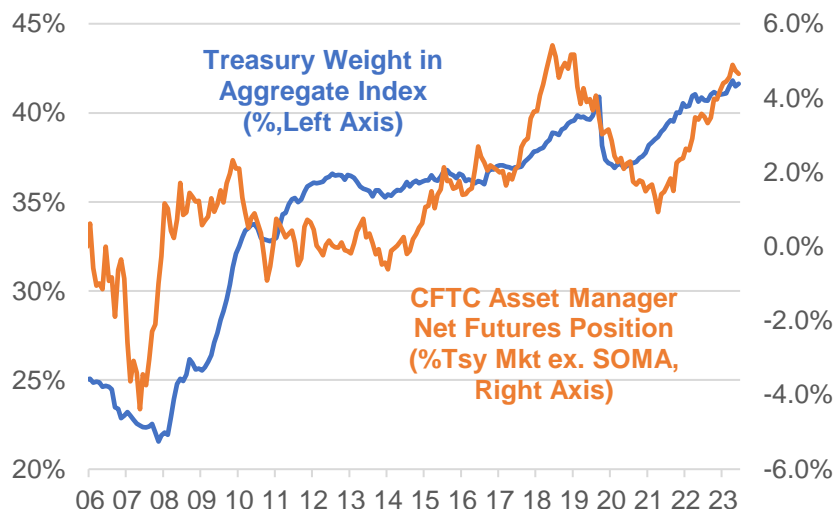
(2) Sourced from Bank of America as of Dec 2023

# Asset Managers: Structural Credit Overweights

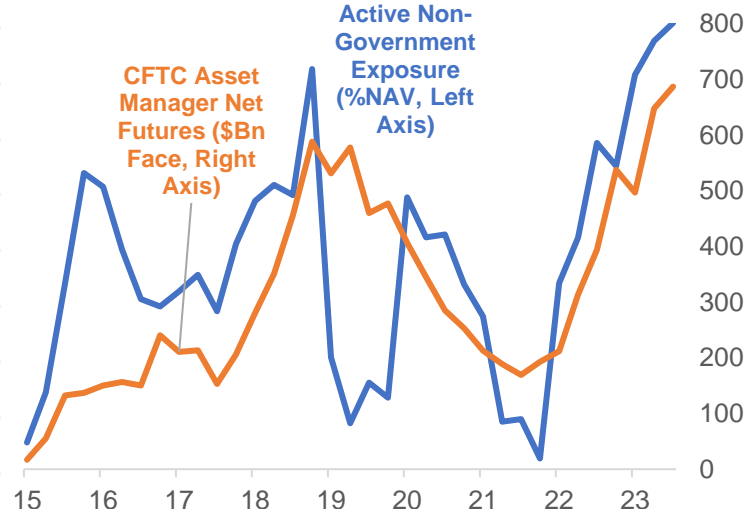
Looking deeper at index and industry data, two observations are worth investigating further:

- (1) There appears to be a positive relationship between the Treasury allocation in the Aggregate Index<sup>(1)</sup>, and the CFTC asset manager net futures position (as a % of the Treasury market), shown in Figure 19
  - It's not obvious why this relationship exists. One possible explanation is that as Treasury allocations have risen over time, asset managers chose to increase their overweights to higher returning credit sectors relative to Treasuries.
- (2) Using eVestment data<sup>(2)</sup> and looking at rough sector positioning for 14 large core and core plus active management platforms (\$900bn AUM), there does appear to be a correlation between the AUM weighted active credit sector exposure and the CFTC asset manager net futures position
  - This relationship lends some support to the hypothesis that Treasury futures are used to fund active credit sector positions
  - It does not prove the point definitively, however. More investigation into the types of credit assets owned is required.

**Figure 19: Treasury Index Weight vs. Asset Manager Net Futures Position % of Tsy Mkt**



**Figure 20: eVestment Active Non-Govt Allocation AUM Weighted Avg of 14 Large Asset Managers**

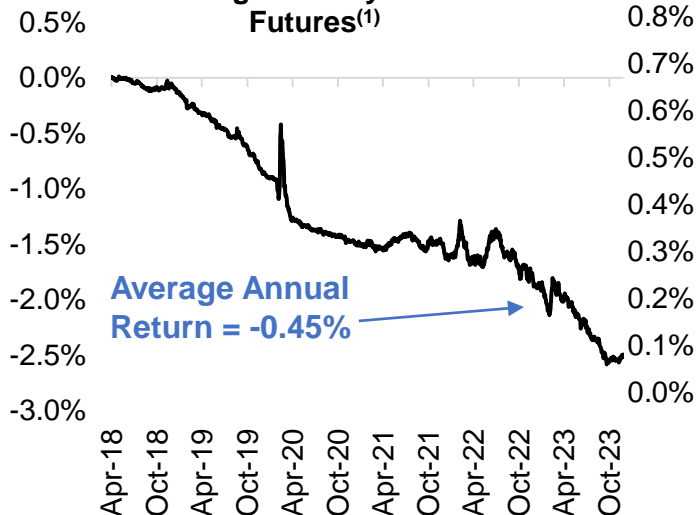


(1) Sourced from Bloomberg, CFTC, and the presenter's firm's calculations as of 12/29/2023  
 (2) Sourced from eVestment as of Q3 2023

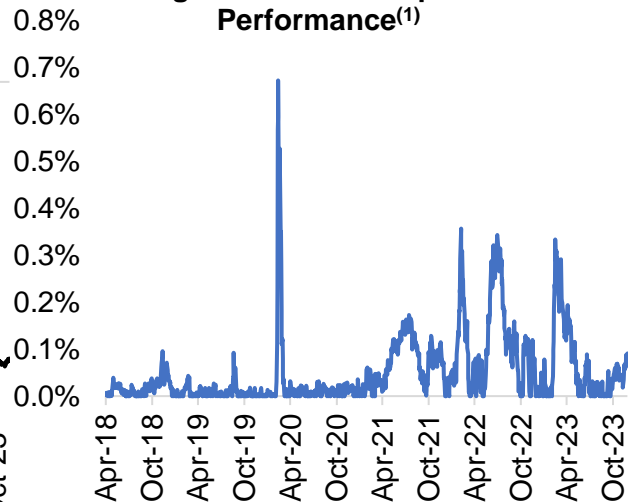
# Illustration of Futures Replication Costs

- In Figure 21 we show the cumulative performance costs from replicating the Bloomberg Treasury Index with the 6 available Treasury futures contracts.
- The methodology assumes a key-rate duration hedged portfolio and subtracts the cash return using the overnight SOFR rate.
- Importantly, the return shown here is not the same as a pure basis trade (long CTD, short Treasury future), it includes the performance of the whole Treasury market.
- From 2018-2023, futures replication had an **average annual cost of 0.45%**. Most fixed-income spread products have hurdled that carry cost (Figure 23).

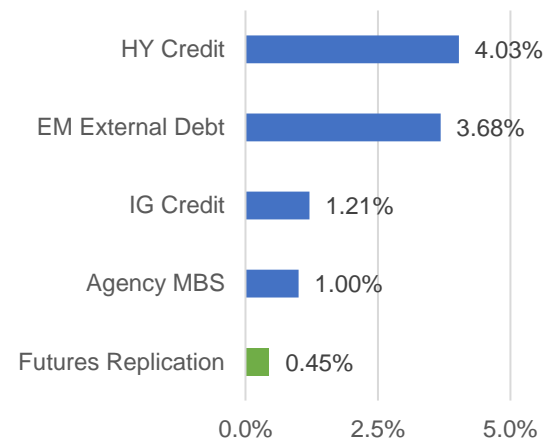
**Figure 21: Cost of Replicating Bloomberg Treasury Index with Futures<sup>(1)</sup>**



**Figure 22: Trough to Peak Changes in Futures Replication Performance<sup>(1)</sup>**



**Figure 23: Credit Spreads vs. Cost of Tsy Futures (2018-2023 Avg)**



(1) Data shows the presenter's firm's calculations as of 12/29/2023



# Leveraged Fund Discussion

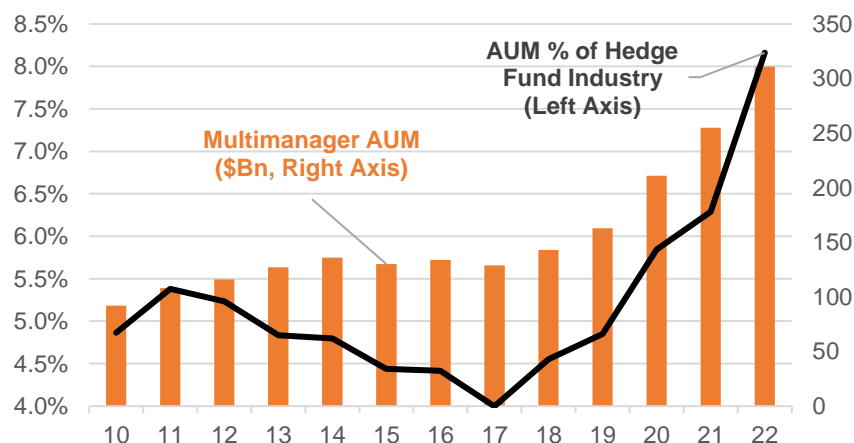
# How Do Leveraged Funds Use Treasury Futures?

- Leveraged funds typically use futures for some of the same reasons asset managers do:
  1. Taking directional views on duration and yield curve
  2. Hedging and managing interest rate risk across different sectors
- One important difference, however, is that leveraged funds employ relative-value strategies with greater size relative to their assets under management (more leverage).
- These relative-value strategies seem likely to reside mostly within the multimanager community, and potentially within some single strategy relative-value or quantitative hedge funds.
- As shown in Figure 24, because of strong performance, multimanager strategies have grown faster than the rest of the industry. With this may have come a growth in dedicated relative value AUM.

**Hedge Fund Strategies**

Strategy	Typical Use of Futures?
Macro	Directional
CTA/Momentum	Directional
Risk Parity	Directional
Quant	Directional + RV
Relative-Value	RV
Multimanager	Directional + RV

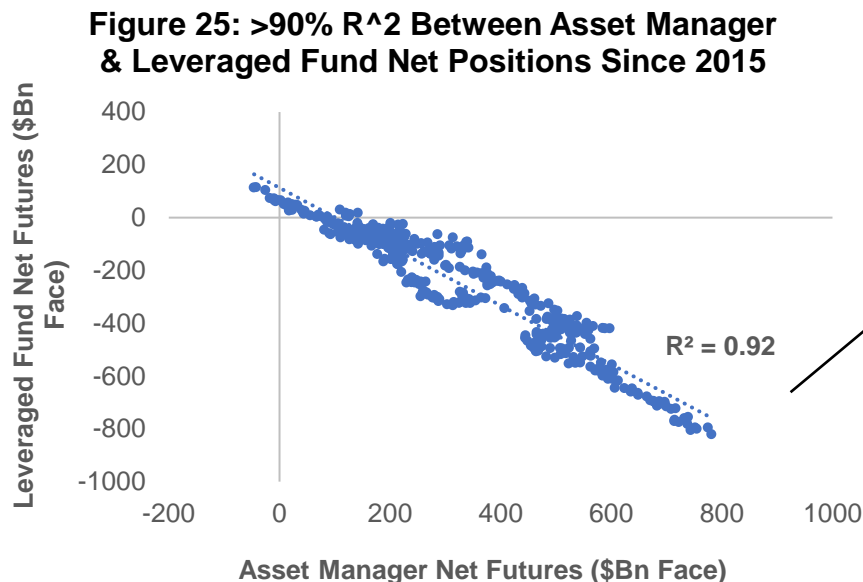
**Figure 24: Growth in Multimanager AUM <sup>(1)</sup>**



(1) Sourced from Goldman Sachs Research as of Dec 2022

# How Do Leveraged Funds Use Treasury Futures?

- While asset managers have shown a net long bias in futures, the opposite is true of leveraged funds, which have showed a persistent net short bias, despite large swings in markets.
- Similar to the discussion about asset managers, we think it's unlikely that directional positions are generating a structural bias to futures positioning recently.
  - But large hedge funds and CTA's are likely to have influenced shorter term positions at various times.
- As has been discussed extensively by regulators and market participants, it seems most likely to us that the persistent futures short by leveraged funds reflects Treasury basis relative-value positions.
- As we showed on the prior slides, there is a persistent risk premium to be harvested in Treasury futures basis. It appears that asset managers are willing to pay this premium to invest in higher yielding products, while hedge funds earn the premium.

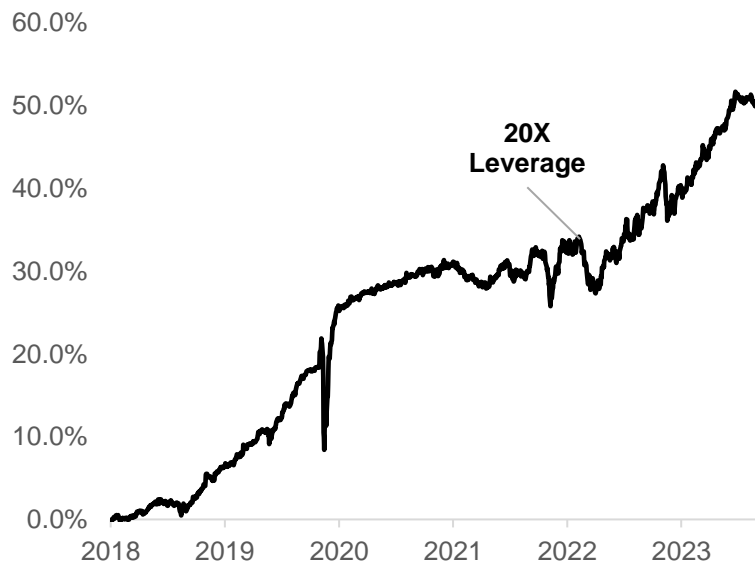


- Asset manager and leveraged fund positions track each other with a 92% R<sup>2</sup> since 2015
- Logically, it makes little sense that these two investor categories would take opposing directional views with such a high frequency
- ***Structural factors seem more likely to explain this relationship, where hedge funds facilitate structural futures demand by asset managers as the Treasury market has grown***

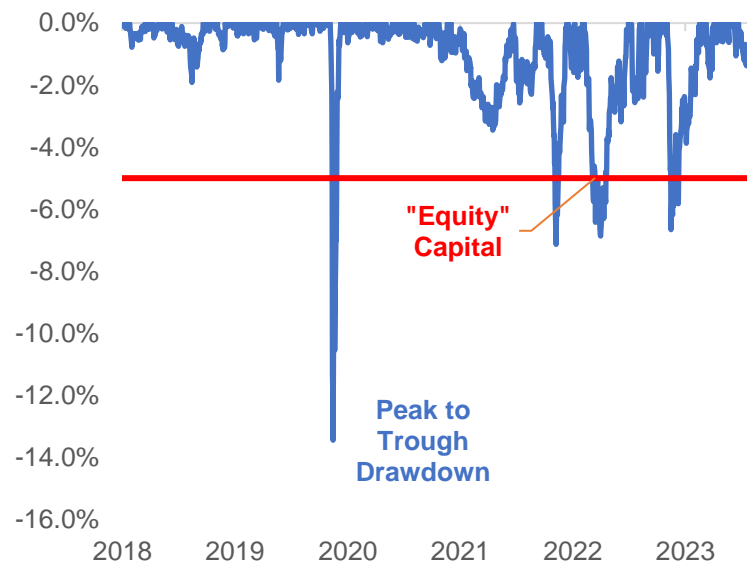
# Leveraged Funds: Returns in the Treasury Basis Trade

- We can estimate the returns to the basis trade using the data on the cost of futures replication:
  - We assume a leverage ratio of 20x and show cumulative performance (excess of cash return).
  - Anecdotally, 20x appears to be a good approximation of leverage typically used in these trades. Repo and futures margins do permit higher leverage, however. 20x leverage could generate 9-10% annualized excess returns using this framework.
  - March 2020 would have more than wiped out equity capital in such a strategy, explaining the stress during this period. To the extent these strategies live inside of multimanager, other capital may have been injected during this period.

**Figure 26: Cumulative Excess Returns Treasury Index vs. Futures**

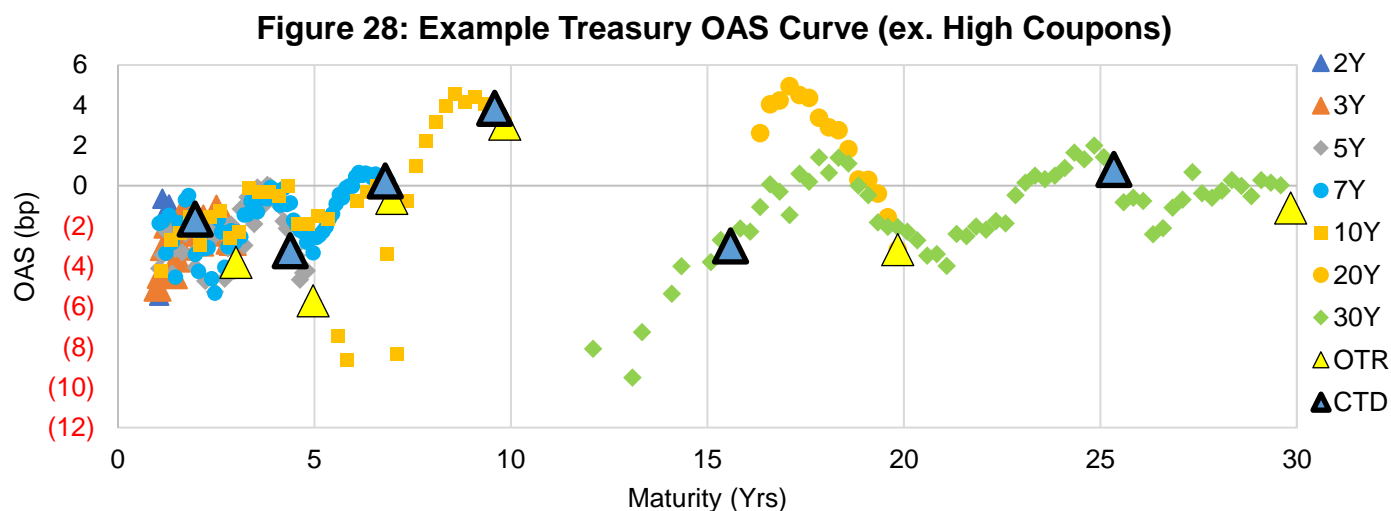


**Figure 27: Peak to Trough Drawdown Using 20x Leverage Multiple**



# Leveraged Funds: Returns in the Treasury Basis Trade

- The performance we show is an approximation and not that of a pure basis trade (future vs. CTD).
- That said, it's likely that hedge funds who implement the basis trade do so in ways that involve using Treasuries other than CTDs, with numerous other real-world complexities to consider, including:
  - Type of repo funding (term v. daily)
  - CTD switch option (recall volatility in USZ3 in Fall 2023)
  - Spot vs. deferred CTD analysis
  - Futures roll timing, optimal delivery and wildcard option
  - Barriers to entry given balance sheet scarcity/repo capacity
  - Usage of cheaper off-the runs
- In addition to expensive implied repo, looking below, we see that futures CTDs can often trade with negative spreads to Treasury fitted curve.
  - Similar to “on-the-run” Treasuries, it's likely that CTDs trade this way due to a liquidity premium vs. off-the-runs.
  - Recalling the period of March 2020, dealers reported<sup>(1)</sup> large liquidations in off-the-run sectors from the relative-value community, suggesting that basis implementation involves more varied expressions.



(1) See page 56 of this report <https://home.treasury.gov/system/files/221/CombinedChargesforArchivesQ22021.pdf>

# Leveraged Funds: Estimating Size of the Basis Trade

- Recent research from the Fed <sup>(1)</sup> suggests that the basis trade has grown in size lately, similar to levels seen in 2018-2019. They cite the futures data, but also show some evidence from the sponsored repo market and collateral posting data, shown below:
  - Another piece of research <sup>(2)</sup> released in September of 2023 quantifies the basis trade at \$550bn at the end of 2022.
  - The authors used data from form PF, and the size seems fairly consistent with size of futures exposure at the time.
  - Bottom line, estimating size of relative-value AUM is hard especially as a large portion of capital pursuing these strategies may be embedded in multimanager hedge-funds, where little public data on sub-strategy allocations is available.

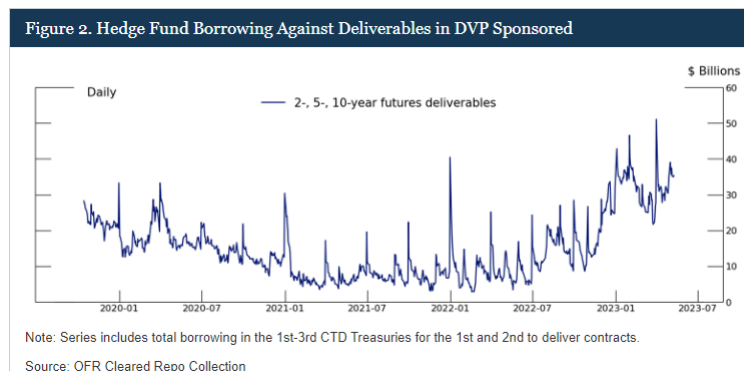
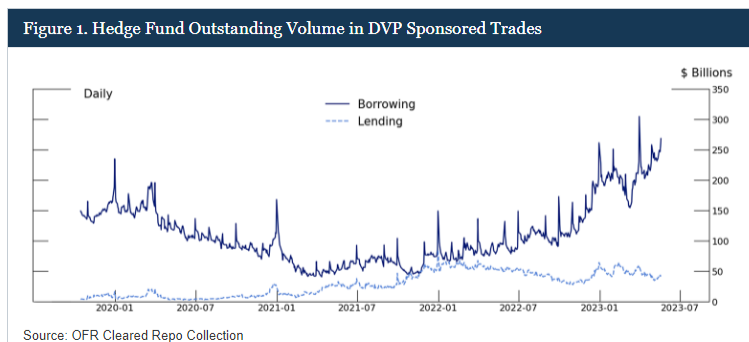


Table 1: The impact on hedge funds of a floor on Treasury repo haircuts

Make Full Screen

	As of December 2022	200 bps min. haircut, no change in borrowing	200 bps min. haircut, no change in capital
Treasury repo borrowing	\$553 billion	\$553 billion	\$247 billion
Capital supporting Treasury repo	\$9.88 billion	\$22.29 billion	\$9.88 billion
Leverage on Treasury repo	56-to-1	25-to-1	25-to-1

Note: The first column reflects data and estimates as of December 2022. The second and third columns consider the effects of a hypothetical 200-basis point floor on Treasury repo haircuts faced by hedge funds. The second column assumes borrowing remains at Dec. 2022 levels, while the third column assumes borrowing levels adjust to post-requirement leverage levels.

(1) <https://www.federalreserve.gov/econres/notes/feds-notes/recent-developments-in-hedge-funds-treasury-futures-and-repo-positions-20230830.html>  
 (2) <https://www.federalreserve.gov/econres/notes/feds-notes/hedge-fund-treasury-exposures-repo-and-margining-20230908.html>

# Leveraged Funds: Monitoring the Basis Trade

Some potential metrics to consider monitoring:

Item	Notes
<b>Treasury Futures Open Interest Relative to the Size of Treasury Market</b>	<ul style="list-style-type: none"><li>Disproportionate growth could indicate excessive systemic leverage.</li></ul>
<b>Size of Cleared Repo Market</b>	<ul style="list-style-type: none"><li>Will be more valuable when all Treasury repo is cleared in 2026.</li></ul>
<b>Treasury-Futures Basis Valuations</b>	<ul style="list-style-type: none"><li>Viewed in the context of changes to open interest, valuations could be an important indicator.</li><li>For example, if cash richens vs. futures and open interest is growing, suggests position crowding.</li></ul>
<b>Dealer Inventories of Treasury Securities</b>	<ul style="list-style-type: none"><li>Supplement with real time flow color in off-the-run trading activity.</li></ul>
<b>Term structure of Repo Funding Levels</b>	<ul style="list-style-type: none"><li>Monitor overnight vs. term repo spreads as an indicator of funding pressures.</li></ul>
<b>Changes in Margin Requirements</b>	<ul style="list-style-type: none"><li>Monitor CME exchange margins and repo.</li></ul>
<b>Concentration of Funding Sources in Bilateral Repo Market</b>	<ul style="list-style-type: none"><li>Overreliance on single institutions could create counterparty risk.</li></ul>

# **Potential Interactions Between Asset Managers & Levered Fund Positions**



# Potential Interactions to Consider

- Amidst record Treasury issuance, and procyclical fiscal stimulus, we conclude that a symbiotic relationship has emerged between asset managers and hedge funds.
  - Large procyclical deficits have driven Treasury weights higher in bond indices at a time when the economy is relatively healthy and active bond managers prefer credit relative to Treasuries.
  - This cyclical preference for credit, alongside the structural asset allocation of active bond managers, may be resulting in lower cash Treasury demand and increased use of Treasury futures.
  - This preference for futures vs. cash improves valuations and the investment opportunity for RV hedge funds.
- While the system seems stable to us now, it's worth thinking through potential risks that might arise, as asset managers have moved down in liquidity while hedge funds have increased leverage.
  - A reduction in credit risk by asset managers would naturally facilitate unwinding the basis trade by hedge funds.
  - However, if asset managers experience rapid outflows while market liquidity is impaired, these outflows could initially be funded through Treasury sales. This type of behavior could pressure RV basis positions, and it's possible this dynamic was at play during March 2020 when everyone in the market scrambled for liquidity. We see below a high tail risk correlation between Treasury-futures basis performance and 1-3y Corporate spreads. This period likely also simply reflected extreme liquidity preference which would pressure secured vs. unsecured funding spreads.

Figure 29: Trailing 1Y US Deficit (%GDP) vs. 1Y Average Unemployment Rate

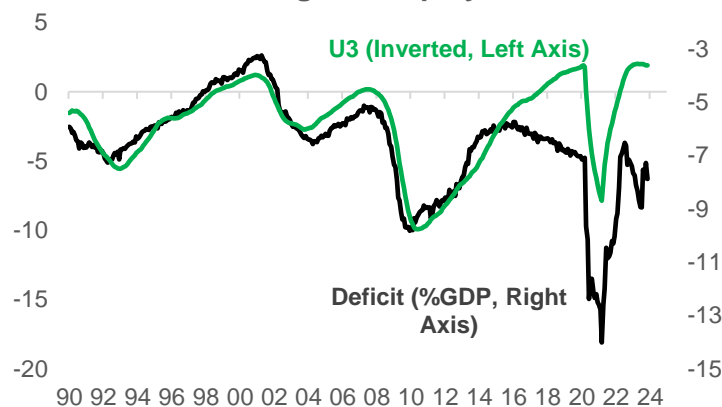
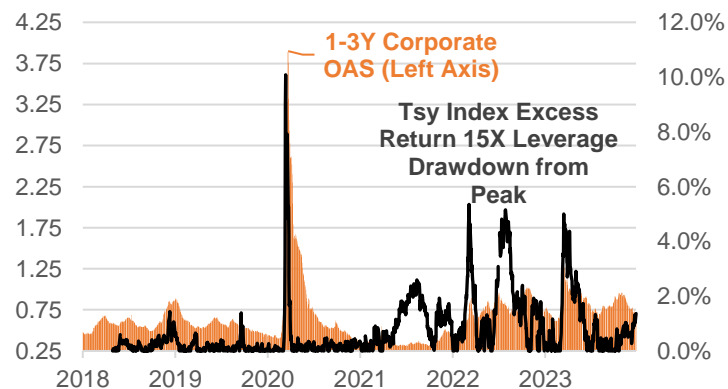


Figure 30: Short Maturity Credit Spreads vs. Proxied Basis Trade Drawdowns



# Conclusions and Areas of Further Research

- The structural asset allocation preference of active fixed-income managers appears to create a need to own Treasury futures persistently over time.
- Procyclical fiscal stimulus, which has contributed to rising Treasury allocations in bond indices alongside a healthy economy, may be amplifying this trend.
- While there is a cost to using Treasury futures, this cost is easily hurdled by active managers who are allocating out of Treasuries into more attractive sectors.
- Persistent demand for Treasury futures likely contributes to rich valuations when compared to Treasury bonds. This valuation creates an investment opportunity for relative-value strategies that can utilize leverage to exploit small price differences.
- There are a number of relationships that are worthwhile for Treasury to monitor when tracking the Treasury futures basis trade over time. Treasury repo clearing may provide an opportunity to gain greater insights in the coming years.
- Potential areas of future study could include the following:
  - More granular research into asset manager quarterly holdings through time.
  - More detailed analysis of the size of non-index credit and floating rate markets.
  - Quantitative modeling of variables that seem to contribute to asset manager futures positions, including the size of the Treasury allocation in the index, quarterly estimates of credit holdings, and empirical duration exposure of major bond mutual funds.
  - Greater study of potential interactions between asset manager and leveraged funds, particularly during times of market stress and liquidity contraction.