



RESEARCH

Insights

Fixed Income Market Structure Compendium

2024 Market Metrics & Themes

February 2025

A Conversation with Coalition Greenwich: Volumes – For Treasuries, \$900B ADV became the new normal given market structure and macro trends, with uncertainty driving volatility. For corporates, ADV averaged over \$50B, driven more by macro vs. volatility (relatively low). **Electronic trading** – Treasuries <60% total volume; IG corporates ~50%, HY ~33%. **Surprise** – For Treasuries, the focus on the dealer-to-dealer market last year for e-trading. For corporates, portfolio trading was a big story but not a new story. **Trends** – On market liquidity, it is hard to think that a Treasury market routinely trading over \$1T a day has a liquidity problem. Also, the push towards workflow automation continues to grow as AI was injected into the conversation.

Market Themes: Treasury Clearing – First deadline September 2025 (recently extended one year by the SEC; timeline in this section). Not a big bang, rather a phase in as participants already changing behavior. Aggregate clearing volume expected to reach \$11.5T daily, up from ~\$9T peak in 2024. **Treasury Issuance** – \$2.4T in 2024, compared to <\$1T pa historically. Issuance skewed to shorter durations, in contrast with Treasury's (under the last administration) goal. **Federal Debt** – Debt held by public \$28.3T in 2024, total debt \$35.5T (includes intergovernmental debt due). Interest \$1.1T in 2024. **Treasury Holders** – The composition of Treasury holders has shifted: Fed 16.5%, foreign 33.0%, other 50.1%. The demand shift to price sensitive investors raises concerns about Treasury take-up and also increases term premiums, elevated at 69 bps, after dropping to almost zero in early September 2024.

Market Metrics (2024 average, Y/Y change): Total – issuance \$10.5T, +25.6%; ADV \$1.3T, +19.6%; outstanding \$46.9T, +5.7%. **UST** – issuance \$4.7T, +32.8%; ADV \$907.9B, +19.4%; outstanding \$28.3T, +7.2%. **Corporates** – issuance \$2.0T, +30.2%; ADV \$51.6B, +21.1%; outstanding \$11.2T, +4.4%.

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Executive Summary

A Conversation with Coalition Greenwich

Note: This conversation was recorded prior to the SEC extending the Treasury clearing deadlines by one year.

To learn more about key trends in fixed income markets in 2024, we sat down with Kevin McPartland, Head of Market Structure and Technology Research at Coalition Greenwich. This is an edited summary of Coalition Greenwich's responses.

Electronic trading: In 2024 for Treasuries, electronic trading at the top line was about flat. It is just shy of 60% of total volumes. For corporate bonds, e-trading continues to grow in investment grade to almost 50%. High yield seems to have taken a bit of a pause. About a third of the market traded electronically in 2024, which is about where it has been for the last two years.

Surprising trends: As to surprises in Treasuries, it seemed like there was a big focus on the dealer-to-dealer market last year for e-trading, which was really interesting. The shape of the dealer-to-dealer market is still evolving – it looks like the platforms are applying lessons learned over the years from the dealer-to-client space to create solutions tailor-made for the dealers. That was an interesting shift in 2024. In corporate bonds, portfolio trading (PT) was definitely a really big story in 2024, but not a new story. The tools keep getting better and are more accessible to more buy side market participants – its use will likely continue to grow.

Treasuries: Last year, Treasury ADV ended over \$900 billion – is this the new normal? Yes, given market structure and macro drivers. On the market structure front, automation is certainly allowing for higher volumes to trade on any given day. On the macro, I think there are two points. Volatility is certainly a driver of higher volumes, as there has been a lot of uncertainty in the market arguably for the last five years. If we look at correlations over the long run, it is less about volatility and volumes, and much more about the level of debt outstanding. As we watched the Treasury borrow more and more money – obviously issuing bonds – the volume goes up pretty lockstep with debt outstanding.

Corporate bonds: Last year, corporate bond ADV averaged over \$50 billion – is this the new normal? It is different than Treasuries in that volume growth was not driven by volatility. There is certainly a macro impact there as people are readjusting to monetary policy moves last year, i.e. rate cuts. The other big driver of volumes – and it is investment grade that is really driving aggregate volumes – is the natural demand by investors for these higher yielding bonds. On the market structure side automation is again playing into the higher volumes as well as portfolio trading.

Key trends: First, on market liquidity, it is hard to think that a Treasury market routinely trading over a trillion dollars a day has a liquidity problem. On the corporate bond side, spreads are actually tightening, suggesting liquidity is improving. Next, the impact of ETFs on the corporate bond market has been well documented over the last number of years, resulting in an increase in liquidity as it brought more players into the market – it will be interesting to see their impact as they move into other segments of fixed income. A final trend is the push towards workflow automation. First, the pandemic and working from home drove people to look for more efficient processes; then, a few years later, artificial intelligence (AI) was injected into the conversation and the opportunities got even greater. We are going to see even more automation.

Treasury clearing: Even before Chair Gensler said he would step aside, there was already a market wide recognition that the deadlines were too aggressive and would need to be pushed back. Now that we are going to see a change in that seat, it is effectively a given that deadlines will be pushed back. Any expectations that Treasury and repo clearing will be scrapped entirely I think are unfounded. I think the majority (of market participants) agree that, ultimately, this is the right thing for the market in the long term, despite the short term costs. It really now becomes a project of finding the best path forward to make the change efficient for and beneficial to the market, one that encourages competition and liquidity, as well as market resiliency.

Note: This SEC recently extended the Treasury clearing deadlines by one year.

Recapping 2024: Market Themes

Treasury Clearing – Now Starting a Year Later: The first deadline for the Treasury and repo clearing mandate is September 2025 (recently extended one year by the SEC; timeline in this section). These markets consist of \$27.8 trillion in Treasury securities outstanding and \$4.4 trillion in repo (UST only) average daily amount outstanding (primary dealers only). Unlike with the transition to T+1 settlement, which took place on a single set day last year, market participants are not expecting a big bang with Treasury clearing. Rather, they are expecting a phase in of activity heading into the deadlines. In fact, people are already changing behavior ahead of the 2025/2027 deadlines.

According to the Fixed Income Clearing Corporation (FICC) – currently the only approved clearing house for clearing Treasuries – when the SEC announced the Treasury clearing proposal in September 2022, they cleared \$4.5 trillion in Treasuries on average daily. On September 3, 2024, this figure reached a new high of \$9.2 trillion (+104.4% since September 2022). FICC currently clears cash Treasuries and repos at an average of over \$7.5 trillion a day. In their July 2024 report, FICC estimated volumes could rise by over \$4 trillion a day, bringing the aggregate volume to \$11.5 trillion daily, +53.3% to today's daily volume of \$7.5 trillion, with the potential for an additional increase.

The (Treasury) Printing Press Keeps on Turning: On average for the last ten years prior to COVID, Treasury issuance averaged just under \$1 trillion in privately held net marketable securities per annum. In 2020, issuance understandingly increased as the federal government poured money into an economy struggling from COVID, to over \$4 trillion (+343.5% to the annual historical average. In 2021 and 2022), we thought we were settling back down to a more normalized level, even if slightly elevated to the annual historical average: \$1.5 trillion per annum, +56.3% to historical. We were wrong.

In 2023 – a non-recession, non-war¹, non-emergency (of any kind) year – the US government issued \$3.1 trillion, +221.1% to the annual historical average. Then, in 2024, the federal government issued \$2.4 trillion. While this was down 23.7% from 2023, it was still up 144.9% to the historical average and +56.7% to the 2021/2022 average. This represented another elevated issuance level in a “non” year. (We note that the (over)issuance story does not change even after adjusting for SOMA redemptions, as we analyze in this section.)

Looking ahead to 2025, the recent estimates were for: first quarter \$0.8 trillion, second quarter \$0.1 trillion. This first half of the year would essentially be in line with the historical annual average (0.97x), and the first quarter alone represents 0.85x this average.

Issuance Skewed to Shorter Durations: The continuation of elevated levels of fiscal spending mean the Treasury Department must keep issuing debt – and issue they have. In the past ten years, total issuance increased 318%. Wait you say – but outstanding only increased by 115%. The growth in total issuance was driven by bills, +404%, while notes grew 116% and bonds grew 161%. In 2024, total issuance was \$29.3 trillion, of which the long-term portion – notes and bonds – was only \$4.7 trillion, or 16% of total. Bills have grown from less than 70% of total issuance to almost 85%. Meanwhile, the decreases for notes and bonds were 13 pps and 1 pps respectively. If Treasury's goal was to increase the average duration of Treasuries held, this was not the way to go about it.

¹ From the perspective that the US is not actively involved, as with the Russia/Ukraine war.

Looking at issuance growth rates across segments, while bills had a 19.7% three-year CAGR, growth rates for notes and bonds were -1.9% and -11.4% respectively. Issuance ended 2024 with the following breakout: bills 84.1%, notes 14.2%, and bonds 1.7%. This has essentially been the breakout for the last few years. In fact, since Treasury's announced strategy in 2021, issuance of bills has grown as a percentage of total issuance (+10 pps), while notes and bonds have fallen (-8 pps and -2pps respectively).

Ballooning Balance Sheet: The never ending fiscal spending also flowed through to the balance sheet, which is at eye popping levels. First, we look at federal debt securities held by the public. As of the end of 2024, the level of debt had grown to \$28.3 trillion: +7.6% Y/Y and +68.1% since pre COVID. Looking at just marketable Treasury securities, these securities ended 2024 at \$27.7 trillion: +7.7% Y/Y and +69.8% since pre COVID. In the last ten years, federal debt has increased 115%, up from a mere \$13.1 trillion. Now, the government has a much higher level of debt to service. i.e. pay interest, at a time when interest rates remain stubbornly high. This is not a healthy combination for a country's balance sheet. Interest payable has increased, from around \$70 billion prior to rate increases to \$134 billion in 2024. This represented a 17% Y/Y increase in 2022, the year rate increases began, followed by 44% and 15% increases the following two years.

Over this ten-year period, the mix of debt securities held by the public shifted as well. While bills grew, to 22% from 11% of the total (+11 pps), notes declined, to 52% from 65% (-13.5 pps). Bonds increased as well, to 17% from 13% (+4 pps). Notes – the middle of the bar, with two to ten year durations – fell from over two-thirds of the mix to around half. The weighting to the ends of the barbell – bills with one year or less duration and bonds with duration of twenty years or greater – shifted to almost 40%. The growth in shorter duration bills is fascinating, as it contrasts with former Treasury secretary Janet Yellen's strategy.

Adding in intergovernmental debt due, as of the third quarter in 2024, the US government held \$35.5 trillion in total public debt. After increasing 14% in the second quarter of 2020 to assist with COVID spending, debt has steadily climbed, averaging +1.7% per annum. The latest level was +52.7% from the start of 2020. Given the increase in borrowing costs, interest payments on total public debt were \$1.1 trillion in 2024, an increase of 76.5% since rate increases began and +106.6% since the start of 2020. Elevated rates compound the problem of a ballooning balance sheet.

Additionally, fiscal spending had led to the US running a federal deficit as a percent of GDP at levels typically reserved for recessions, wars, or financial crises. At 6.3%, the federal deficit as a percent of GDP is greater than several periods of economic stress, wars, or financial crisis, including the Great Depression and stock market crash, Black Monday, and the dotcom bubble burst. In dollar terms, at \$1.8 trillion, the current deficit level is the second highest recorded, with only COVID posting a higher deficit dollar value.

This is what continues to concern economists, though markets appear to be avoiding the issue.

Treasury Holders Landscape: At the same time, the composition of Treasury holders has shifted. At the end of 2024, the Fed held 16.5% of the total \$26.2 trillion Treasuries outstanding (based on Bloomberg data). Foreign holders represented 33.0%, and other holders stood at 50.1%, their peak share of total Treasury holdings. Other holders posted the largest increases, both over the last ten years and prior to COVID, +113.4% and +69.1% respectively.

Since 2023, the Fed's balance sheet has been on the decline, with the exception of a blip during the regional bank turmoil in 2023. The Fed's balance sheet ended 2024 at \$6.9 trillion, -10.4% in 2024. Foreign holders have also been pulling back Treasury holdings. The top ten countries represented 19.7% of total Treasury holdings in 2024, down from 31.6% in 2015. What is labelled as "other" holders of Treasuries have more than doubled over the last ten years, +113.4%. These investors are more price sensitive than central banks. The demand shift to price sensitive investors raises concerns about Treasury take-up and also increases term premiums. The term premium remains elevated, at 69 bps, after dropping to almost zero in early September 2024.

Volatility Disconnect Continues: A final theme we continued to monitor in 2024 was the disconnect between volatility in fixed income markets (MOVE index) versus equities (VIX index). Historically, movements in the two indices were correlated in direction – a 0.6074 correlation since 2000 – though varying in peaks/troughs and exact timing of directional shifts. However, this correlation turned slightly negative when looking at the 2019 through 2024 period, -0.0197. In 2024, the MOVE came down, albeit still elevated. The correlation between the MOVE and the VIX in 2024 was 0.4973. Looking at annual averages, the MOVE is coming back down after spiking in 2022. The average MOVE in 2024, 103.69, ranked eight out of the twenty-five years shown in our analysis.

Recapping 2024: Market Metrics

Before we can look to the future, we must assess the past. In the table below, we highlight key metrics for 2024 for fixed income markets issuance, trading average daily volume (ADV), and outstanding across the total market, US Treasuries (UST), corporate bonds (corporates), mortgage-backed securities (MBS), federal agency securities (agency), municipal bonds (munis), and asset-backed securities (ABS). We also assess outstanding data for money markets/commercial paper (MM/CP) and repurchase agreements (repos).

To summarize, Treasuries were once again the story. Long-term issuance was up another 32.8% Y/Y, with total outstanding now over \$28 trillion. Additionally, Treasury ADV topped the \$900 billion level, reaching what many market participants believe is the new normal. While a mere \$11 trillion versus Treasuries' \$28 trillion outstanding, corporates also posted strong numbers: issuance +30.2% Y/Y, a new record level ADV at over \$50 billion.

Long-Term Issuance (\$T)	2024	2023	Y/Y Change
Total Market	\$10.5	\$8.3	+25.6%
UST	4.7	3.5	+32.8%
Corporates	2.0	1.5	+30.2
MBS	1.6	1.3	+21.4%
Agency	1.3	1.3	+0.5%
Munis	0.5	0.4	+31.8%
ABS	0.4	0.3	+43.6%
Trading (ADV \$B)	2024	2023	Y/Y Change
Total Market	\$1,289.2	\$1,077.6	+19.6%
UST	907.9	760.5	+19.4%
Corporates	51.6	42.6	+21.1%
MBS – Agency	309.8	254.7	+21.6
MBS – Non Agency	1.4	1.3	+7.6
Agency	3.5	3.6	-2.8%
Munis	13.2	13.2	-0.1%
ABS	1.8	1.7	+4.8%
Outstanding (\$T)	2024	2023	Y/Y Change
Total Market	\$46.9	\$44.3	+5.7%
UST	28.3	26.4	+7.2%
Corporates	11.2	10.8	+4.4%
Agency	2.0	2.0	+3.4%
Munis	4.2	4.1	+2.6%
MM/CP	1.2	1.2	-0.7%
Primary Dealer Repo/Reverse	6.1	5.1	+18.5%
General Collateral Financing Repo	22.7	19.4	+17.1%

Source: Bloomberg, Federal Reserve Bank of New York, FINRA, Municipal Securities Rulemaking Board, Refinitiv, US Agencies, US Treasury, SIFMA estimates

Note: 2024 outstanding - corporates and munis as of 3Q24, all else 4Q24. Issuance equals totals for the year. Trading represents averages for the year. Outstanding is the amount on the last day of the year. Primary dealer repo/reverse repo represents average daily outstanding, while general collateral financing repo represent par amount.

A Conversation with Coalition Greenwich

Note: This conversation was recorded prior to the SEC extending the Treasury clearing deadlines by one year.

To learn more about key trends in fixed income markets in 2024, we sat down with Kevin McPartland, Head of Market Structure and Technology Research at Coalition Greenwich.

Katie Kolchin: Welcome back Kevin, to what is becoming an annual conversation for us. Let us begin with trading volumes. Last year, Treasury ADV ended over \$900 billion, a 19% increase. In fact, seven out of twelve months were up over this level, and August was over \$1 trillion. This is quite a jump from the year before. In fact, I remembered from our conversation last year you thought it was – let us call it – an impressive figure when ADV hit \$900 billion one day. Now it seems to be the norm. What do you think is driving this, and do you view it as the new normal?

Kevin McPartland: Hi Katie, thank you for having me. It is the new normal. I think there are market structure drivers, and there are macro drivers. On the market structure front, automation in the market is certainly allowing for higher volumes to trade on any given day. The Treasury market has been electronic for a very long time. We are finding ourselves heading towards the next phase that goes beyond point and click request for quote (RFQ) to much more automatic executions, whether that be Auto-X² from the sell side or the buy side using algorithms to auto route orders to the right dealers. Either way, it is automation helping the market to handle the higher levels of volumes.

On the macro, I think there are two points, one more important than the other. Volatility is certainly a driver of higher volumes. There has been a lot of uncertainty in the market arguably for the last five years. As the market digests that (uncertainty), it leads to more trading. Interestingly, if we look at correlations over the long run, it is less about volatility and volumes, and much more about the level of debt outstanding. As we watched the Treasury borrow more and more money – obviously issuing bonds – the volume goes up pretty lockstep with debt outstanding. The ratio of debt outstanding to turnover stayed pretty consistent over the last five years, although in the last year or two we saw volumes grow a little bit faster than the debt outstanding.

It does suggest that all three of these factors are coming into play, which is driving the volumes ahead of the debt issuance a bit.

Katie Kolchin: Keeping on Treasuries. The 10-year rate averaged 4.21% LY, peaking at 4.70%. We are below this peak level now, but at the time we recorded this there were expectations by some that we were heading over 5% (we hit this level the day we recorded this conversation). Investors remain concerned about potential fiscal spending and a second wave of inflation. What could this mean for trading volumes? And volatility?

² MarketAxess' algorithmic trade execution tools. Auto-X RFQ is an automatic RFQ execution protocol designed to streamline the traditional RFQ process. Adaptive Auto-X is an algorithmic trade execution tool designed for fixed income traders that applies data-driven analytics to enhance workflows and execute across multiple protocols.

Kevin McPartland: The uncertainty in the market drives both of those things higher: volumes and volatility. Whether or not we will get more certainty from Washington over the next couple of months is to be seen. That could be helpful for the market. It feels like the macro picture can change on a dime given how complex the world is today. The answer in the end is uncertainty is driving higher volumes and higher volatility.

Katie Kolchin: Now shifting to corporate bond trading. ADV may not be as sexy – we do not get to say “a trillion in notional” as with Treasuries – but a 21% Y/Y growth is impressive. ADV averaged over \$50 billion in 2024. What I found interesting were the monthly trends: 2024 had six months over \$50 billion and one month over \$60 billion; this compares to only one month over \$50 billion in 2023. Same questions – what do you think is driving ADV and do you view it as the new normal?

Kevin McPartland: It is different than Treasuries. As we just discussed, volatility was driving Treasury volumes. That does not seem to be the case in credit markets, as credit volatility is relatively low. September was the record month for volume, which coincided with the Fed's first rate cut in a number of years. There is certainly a macro impact there as people are readjusting. The other big driver of volumes – and it is investment grade that is really driving aggregate volumes – is the natural demand by investors for these higher yielding bonds. If you can lock in these 5% or higher rates – for what feels like almost no risk – there is still a lot of investor demand for that.

Just like Treasuries, there is a market structure component here as well. In the corporate bond market, electronification continues. We are just shy of half of investment grade bonds traded electronically. Automation is again playing in to the higher volumes as well as portfolio trading, which we can talk a little bit about later. Both of these factors lead to higher volumes.

Katie Kolchin: Keeping on the corporate bond theme, what was also impressive was the 30% increase in issuance, after fairly muted growth the prior year. Issuance almost hit the \$2 trillion level, which has not been reached since 2020 and 2021. How are you thinking about the factors driving issuance levels and how this flows into trading volumes?

Kevin McPartland: This is definitely more of a macroeconomic trend than a market structure trend. The demand – as we discussed earlier – from investors for particularly investment grade bonds has made the cost of borrowing relative to Treasuries as low as it can be for corporates. That has driven a lot of issuance, with January 2025 issuance still near record levels. There is a lot of demand from investors which is allowing corporates to borrow at levels they feel are manageable, given the rate environment.

Katie Kolchin: Now let us move on to updating where we are in electronic trading. If you could please run down the numbers and the trajectory the level of electronic trading has been on over the past year, maybe even going back longer. Also, were there any trends that surprised you – either to the up or downside?

First, for Treasuries?

Kevin McPartland: For Treasuries, electronic trading at the top line was about flat. It is just shy of 60% of total volumes. Sometimes it surprises people that it is not higher, but we have to remember there is a big off-the-run market that is often still traded over the phone. When we are doing notional calculations, big blocks are also often done away from the (electronic trading) platforms. From a notional perspective, that is going to impact the numbers.

As to surprises in Treasuries, it seemed like there was a big focus on the dealer-to-dealer market last year for e-trading, which was really interesting. Fenics³ has been in the news, and they have seen a lot of growth. Tradeweb, with some of their dealer-to-dealer offerings through their Dealerweb⁴ entity, had a really good year as well. The shape of the dealer-to-dealer market is still evolving. Ten years ago we thought about dealer-to-dealer as either high speed central limit order books or traditional interdealer brokers. Now, it looks like the platforms are applying lessons learned over the years from the dealer-to-client space to create solutions tailor-made for the dealers. That was an interesting shift in 2024.

Katie Kolchin: And then corporate bonds?

Kevin McPartland: For corporate bonds, e-trading continues to grow in investment grade to almost 50%. This year we had a few months where it was over 50%. That is a really big milestone. High yield seems to have taken a bit of a pause. About a third of the market traded electronically in 2024, which is about where it has been for the last two years. We will see how that plays out.

Portfolio trading (PT) was definitely a really big story in 2024, but not a new story. We started talking about PT just before the pandemic, but it saw a surge in usage in 2024. The tools keep getting better and are more accessible to more buy side market participants. I feel this is a rare occasion where this kind of innovation is really beneficial and liked by both the sell side and the buy side. As such, its use will likely continue to grow.

Katie Kolchin: Last year, when I asked what trend surprised you, you noted the – as you put it – “huge influx of retail interest in the bond market”. Do you have an update for us on what you called last year a “high trade count”, the signal for retail trading?

Kevin McPartland: The trade count did go up again in 2024, which is not surprising. It is worth noting, though, that while the average trade size went up slightly, given how much the notional volume for the total market grew, trade count actually grew a little slower than the total notional volume. Despite this, I think retail demand is still there.

There is a lot of investment on the tech side to improve retail access to the bond market. Separately managed accounts, in particular, for high net worth investors was a big focus for a lot of asset managers and technology providers. I think we will see a lot more of that going forward as well.

³ A fully electronic US Treasury trading venue owned and operated by BGC Financial.

⁴ An alternative trading system (ATS) acting as an interdealer broker (IDB) between commercial and investment banks and principal trading firms (PTFs), facilitating trades between buyers and sellers on electronic, hybrid, and voice platforms.

Katie Kolchin: And what about ETFs as an outlet for retail demand, still good participation and/or growth here?

Kevin McPartland: Credit ETFs continued to see inflows in 2024, despite the bond market not going exactly how some investors had expected. As a trading vehicle, ETFs absolutely continue to be a really important influence on the underlying bond market. Something we are going to continue to keep an eye on is that credit ETF trading relative to corporate bond market trading actually did slow a little in 2024. We think that is cyclical – based on market dynamics – and we should never underestimate the importance of ETFs to the bond market.

Katie Kolchin: Another theme that is frequently discussed is market liquidity – the delicate balance between dealer balance sheets and increasing volumes, which have been trending in opposite directions. Last year in our conversation, you noted that many dealers either could not, did not want to, or did not feel they needed to commit capital. First, how would you assess market liquidity today across the various bond markets?

Next, regulations and their impact on the cost of capital can play a role in dealers' positions. How much of what you mentioned on dealers committing capital is attributed to regulations – or the threat of impending new regulations, i.e. Basel III Endgame proposal – versus market structure?

Finally, Basel III Endgame is being repropose, after Vice Chair for Supervision Barr noted that “broad and material changes were warranted”. And then Barr announced he is stepping down, seen as a positive by market participants. I understand we do not have details here, but dealers have to plan ahead for their businesses. Does even the removal of that original proposal – widely considered a threat to dealers' willingness to commit capital – help?

Kevin McPartland: A lot to unpack there. First, on market liquidity, I appreciate that volume does not always equate to liquid markets, but it is hard to think that a Treasury market routinely trading over a trillion dollars a day has a liquidity problem. On the corporate bond side, data on bid ask spreads over the last number of months shows that spreads are actually tightening. This suggests that liquidity is improving broadly. As in equity markets, there are going to be pockets of off-the-runs and illiquid high yield bonds that do not trade often. That is not a market structure problem – that is just a demand problem for that debt.

Our research shows the same as yours. Dealer balance sheets' holdings of bonds – both Treasuries and corporates – have gotten smaller relative to volumes. It does suggest that the bond markets continue to move towards much more of an agency model, which reflects the growth in electronic trading. The cost of capital is certainly a big part of that, especially for the large dealers.

Getting to the change in leadership of the Vice Chair for Supervision, it does seem like the expectations for increased capital requirements on the banks will ultimately be lower than what we are reading about today. Perhaps those increases could go away altogether. That is too hard to know for sure, but the expectation that capital charges will not go up as meaningfully as expected is a reasonable assumption. That should ultimately be good for market liquidity, as banks can put that capital to work.

Katie Kolchin: Let us just expand on that one. I want to piece that together with something you said earlier. Let us say we do get a more rational capital neutral proposal for Basel III Endgame, meaning banks could be more willing to put their capital against trades. Bringing back your comment about the shifting to the agency model, are we already past any sort of inflection point moving toward more of this model that electronic trading brings? Maybe this the shift in Basel III Endgame does not matter as much if markets are already comfortable going the agency route. Or could the reproposal and corresponding increased willingness to commit capital make it a more dynamic market where you now have both options available?

Kevin McPartland: I think the latter. It makes for a more dynamic market, a more liquid market. It could encourage more trading in those sectors that I mentioned earlier, those that are often challenged like off-the-runs or less liquid corporate bonds. It also allows dealers to make those choices for their own businesses. There could be some dealers who excel in highly automated electronic trading that requires less balance sheet and other dealers that choose to focus their business on more capital intensive or complex trades with clients.

It opens up the market and allows for more choice, ultimately improving liquidity.

Katie Kolchin: Putting Treasury clearing to the side – we will get to that in a bit – what other trends did you see last year that peaked your interest? This can be either in Treasuries, corporate bonds, or both.

Kevin McPartland: We put out our market structure trends to watch at the beginning of every year. This year there are two themes we raised. One – and we discussed ETFs already – I am continuously fascinated by the role of ETFs in markets broadly and fixed income markets more specifically. Their impact on the corporate bond market has been well documented over the last number of years. As we move towards a market where ETFs track private credit, collateralized loan obligations (CLOs), and mortgages, their impact will be interesting to watch over time. The end result for corporate bond markets was an increase in liquidity as it brought more players into the market. ETFs provided a liquidity outlet through the creation-redemption process, and they created a method of hedging or arbitrage trading. As ETFs find their way into other markets, it should provide the same benefits and additional transparency as well. I am certainly going to keep an eye on that.

The second theme is really an ongoing theme but continues to be fascinating. This is the push towards workflow automation we have been talking about for years. First, the pandemic and working from home drove people to look for more efficient processes when everybody was not in the same room. Then, a few years later, artificial intelligence (AI) was injected into the conversation and the opportunities got even greater. We are going to see even more automation. We did not explicitly call out AI (in our market structure trends note) as a trend to watch in 2025. This is not because it was not a trend – quite the opposite – but it is a part of almost all conversations that are happening in and around trading technology right now.

Katie Kolchin: Yes, as you mentioned, AI seems to be embedded in everything rather than standalone. Now, let us close out with the topic du jour – a topic we cannot seem to go a day without mentioning – Treasury clearing. What are you hearing from your clients about the impending deadlines for the clearing of Treasuries and Treasury repo? And have you heard any early reads about what the change in administration and therefore SEC staff could mean for potential changes to the implementation timeline?

Kevin McPartland: Even before Chair Gensler said he would step aside, there was already an expectation that the deadlines were too aggressive and would need to be pushed back. Now that we are going to see a change in that seat, it is effectively a given that deadlines will be pushed back. It will be interesting to see how far back and how this is handled. We think a more phased approach would make sense, as we have seen with other large implementations over the last ten to fifteen years. I suspect that it will take a number of months to work through what the new administration thinks is the right approach here.

Any expectations that Treasury and repo clearing will be scrapped entirely I think are unfounded. I think the majority (of market participants) agree that, ultimately, this is the right thing for the market in the long term, despite the short term costs. It really now becomes a project of finding the best path forward to make the change efficient for and beneficial to the market, one that encourages competition and liquidity, as well as market resiliency.

Note: The SEC recently extended the deadlines.

Katie Kolchin: We are going to stop here, thank you for joining me today.

Kevin McPartland: Thank you so much for having me.

US Fixed Income Themes

Treasury Clearing – Now Starting a Year Later

(Anyone who did not expect us to begin the themes section with Treasury clearing must have been hibernating last year!) The SEC's Treasury clearing mandate is complex, and – given the global nature of the market and interconnectedness of the many market participants transacting in the market – it poses issues similar to recent large scale industry transitions, including the move away from the London Interbank Offered Rate (LIBOR) and the move to T+1 settlement. The industry can take lessons from both of those transitions, such as the need for collaboration across the industry.

How We Got Here

The Treasury market is undoubtedly the most important market in the world. In addition to funding the US government, the Federal Reserve conducts monetary policy through repo operations and quantitative purchases through Treasuries. Treasuries represent the risk free rate all other financial instruments are based on, acting as the benchmark for rates globally. In short, the Treasury market is vital to not only the US economy but others as well.

The Treasury market is complex, having five main categories of assets – bills, notes, bonds, treasury inflation-protected securities (TIPS), and floating rate notes (FRN) – and then additional subgroups within each group, across tenor (years to maturity), vintage (on or off the run), and trade size. The Treasury market is also quite large, with \$907.9 billion average daily trading volume in 2024.

As such, it is crucial that it remains the safest, most liquid, and most durable market in the world. Unfortunately, we have seen a few temporary dislocations in this market during stress periods. Some of the most notable events include:

- **2014 Flash Rally**⁵: On October 15, 2014, between 9:33 a.m. and 9:45 a.m. EST, the benchmark 10-year Treasury yield dropped 16 bps and then rebounded, without a clear cause. This volatility was unprecedented in the recent history of the Treasury market.
- **2019 Repo Spikes**⁶: On September 17, 2019, repo rates spiked dramatically, rising to as high as 10% intraday. Intraday repo rates rose to more than 300 basis points above the upper end of the federal funds target range, 30 times larger than the same spread during the preceding week. The disruption began on September 16, a day of Treasury settlement, which coincided with corporate tax deadlines. The combination resulted in a large transfer of reserves from financial markets to the government. This created a mismatch in the demand for and supply of repos, driving rates higher.

⁵ Source: Federal Reserve, Liberty Street Economics: <https://libertystreeteconomics.newyorkfed.org/2019/10/from-the-vault-a-look-back-at-the-october-15-2014-flash-rally/>

⁶ Source: Office of Financial Research: <https://www.financialresearch.gov/the-ofr-blog/2023/04/25/ofr-identifies-factors-that-may-have-contributed-to-the-2019-spike-in-repo-rates/#:~:text=A%20convergence%20of%20events%20caused,spread%20during%20the%20preceding%20week>

- **2020 Pandemic⁷:** In March 2020, bid-ask spreads widened out sharply. The widening for the thirty year reached levels over six times its post-crisis average, while the ten year doubled and the five year widened 50%. Looking next at depth of book – as measured by the average quantity of securities available for sale or purchase at the best bid and offer prices – depth declined to levels seen during the Global Financial Crisis. The five and ten year depth reached levels as low as 10% of their post-crisis averages, with depth for the thirty year reaching a low 38% of its post-crisis average. Measures of the price impact of trades also suggested a notable deterioration of liquidity. Based on the estimated price impact per \$100 million in net order flow – where buyer initiated trading volume was less than seller initiated volume – a larger price impact represents reduced liquidity. Price impacts peaked at levels roughly 5-6 times their post-crisis averages. The Treasury market became temporarily illiquid because people selling the securities outpaced those willing to buy.

The Treasury Market Practices Group (TMPG⁸) has worked for many years to identify market practice changes that would strengthen the foundation of this market and reduce risk in the system under times of stress. The Treasury market has undergone many changes, including the growth in electronic trading and new types of market participants. Additionally, while both velocity and volumes have grown significantly, the market structure has not changed. Expanded central clearing was a focus of the TPMG's five workstreams⁹, as central counterparty clearing houses (CCP) take risk out of the system. However, these benefits do not come without costs to market participants.

While market participants had been analyzing potential enhancements to market structure, the SEC put the fire under their feet by establishing a firm deadline. On December 13, 2023, the SEC adopted rules to enhance risk management practices for central counterparties in the Treasury market with a view towards facilitating additional clearing of Treasury transactions.

Not a Big Bang

Before we move into the logistics of what it will take to expand central clearing of the \$27.8 trillion Treasury market (total securities outstanding) and \$4.4 trillion repo market (UST only; average daily amount outstanding, primary dealers only), let us review how this could happen. In May of last year, the industry transitioned to T+1 settlement. While there was significant testing leading up to the deadline, the settlement change was a coordinated one time, all in event. Unlike T+1, market participants are not expecting a big bang with Treasuries. Rather, they are expecting a phase in of activity over the next eighteen months.

It has been noted by market participants that people are already changing behavior ahead of the 2025/2027 deadlines (timeline in next section). According to the Fixed Income Clearing Corporation (FICC, a subsidiary of The Depository Trust and Clearing Corporation/DTCC) – currently the only approved clearing house for clearing Treasuries – when the SEC announced the Treasury clearing proposal in September 2022, they cleared \$4.5 trillion in Treasuries on average daily. Once the SEC finalized the rule in December 2023, this number jumped to \$7.2

⁷ Source: Federal Reserve, Liberty Street Economics: <https://libertystreeteconomics.newyorkfed.org/2020/04/treasury-market-liquidity-during-the-covid-19-crisis/>

⁸ A group of market professionals committed to supporting the integrity and efficiency of the Treasury, agency debt, and agency mortgage-backed securities markets. The TMPG is composed of senior business managers and legal and compliance professionals from a variety of institutions – including securities dealers, banks, buy-side firms, market utilities, and others – and is sponsored by the Federal Reserve Bank of New York.

⁹ 1. Improving resilience of market intermediation. 2. Improving data quality and availability. 3. Evaluating expanded central clearing. 4. Enhancing trading venue transparency and oversight. 5. Examining the effects of leverage and fund liquidity risk management practices.

trillion on average (+66.7%). On September 3, 2024, this figure reached a new high of \$9.2 trillion (+22.7% since December 2023, +104.4% since September 2022). The amount cleared has already more than doubled since the time of the SEC proposal.

As we think about the mandate for Treasury clearing, we note that this is an expansion of what is already cleared, not an entirely new activity for the market. FICC has been clearing Treasuries for forty years and in 2024 cleared an average of over \$7.5 trillion a day across all Government Securities Division (GSD) activity (cash Treasuries and repos). In their July 2024 report, FICC estimated that clearing volumes are expected to rise by more than \$4 trillion in daily incremental indirect participant Treasury activity. This would bring the forecasted aggregate clearing volume – current clearing plus expanded clearing under the SEC mandate – to \$11.5 trillion daily, +53.3% to today's daily volume of \$7.5 trillion (and +155.6% to the noted 2022 volume). FICC's 2024 survey also indicated that there is potential for an additional increase – on top of the \$11.5 trillion – through voluntary clearing, as market participants opt to clear exempted activity based on commercial decisions or to reap benefits from risk offsets with cleared portfolios.¹⁰

We further note that the rule is directed at the clearinghouses, rather than sell side firms as with many regulations. As the only clearing house currently, FICC is required to submit three sets of proposed rule filings to the SEC:

- Enhancements to access models (sponsored services and agency).
- Implementation of a customer segregation regime in its Government Securities Division (GSD), to segregate house and client collateral, as well as setting up a regime for customers who choose to post margin.
- Implementation of the clearing requirement itself.

FICC noted that its proposals were filed with the SEC, after receiving many industry comments and making some amendments accordingly. The SEC approved the access models and margin segregation proposals at the end of last year. For the third proposal, the clearing requirement itself, the SEC must approve this proposal by the end of February 2025. FICC noted that the third filing has the most grey areas, as questions remain on what exactly is in scope, for example: tri-party repo, especially if mixed CUSIP¹¹ (Treasury plus another eligible security); inter affiliate repo; and the scope coverage, such as at bank branches.

The Logistics

The Treasury clearing timeline is very aggressive as compared to other major industry initiatives, and the last yard will be quite challenging. That said, the industry has come together before, and market participants are confident the industry will again collaborate to achieve this goal.

What's in scope: There are lingering issues on what exactly will be in scope, including: tri-party repo transactions and inter-affiliate transactions. On the affiliate side, the usability of the inter-affiliate exemption needs to be addressed.

¹⁰ FICC white paper, 2023: <https://www.dtcc.com/-/media/Files/Downloads/WhitePapers/Accessing-Potential-Expansion-US-Treasury-Clearing-White-Paper.pdf>. FICC white paper, 2024: <https://www.dtcc.com/-/media/WhitePapers/Treasury-Clearing-Mandate.pdf>

¹¹ Committee on Uniform Securities Identification Procedures. A nine character alphanumeric code that identifies a financial security in North America.

Access and clearing models: The choice of access model has been discussed as one of the most important decisions market participants have to make. The questions are centered around how firms will evaluate margin and how trades are given up.

Industry feedback points to a need to develop a commercially reasonable done away clearing model. While the done-away model allows for flexibility, there are issues to sort out with this model. One of which is developing the operational workflow to accommodate the new entrants to the clearing system. For example, firms will have to enable credit checks before trades are submitted for novation to FICC. Additionally, on the accounting side, firms need to understand how these structures might impact their balance sheets and how that might impact the viability of the models.

FICC indicated that both of their indirect access models – sponsorship and agency – can facilitate done-away clearing.

Margin: While the sponsored model has been around for years, the cost of funding margin will become a significant issue for market participants. In FICC's 2024 survey¹², they estimate the aggregate increase in margin that will need to be posted to the clearing house could be \$58.4 billion, of which \$27 billion, or 46%, represents segregated indirect participant margin. Panelists noted that clients will need to work with dealers to assess costs, as dealers may include margin costs within the total transaction cost.

It was also noted that as dealers prepare to take on client margin, they cannot offer unlimited capacity. Since dealers must guarantee the performance of the client trades they bring to the clearing house, they must cover the risk associated with these (as well as their own) trades by posting margin to the clearing house. Dealer balance sheets are constrained by regulations as to how much balance sheet capacity they can offer clients. As such, capital treatment for margin – key to finding balance sheet efficiencies – will be crucial to how dealers operate going forward. Otherwise, capacity constraints could cause concentration risk among the remaining firms as others deem it too costly to facilitate client trades.

Capital efficiencies will be key. To that end, FICC expects to expand its cross margining agreement with CME and is working with other clearing houses for cross margining arrangements. FICC has also developed two public calculators to simulate estimated liquidity and margin needs: Capped Contingency Liquidity Facility (CCLF) calculator and Value at Risk (VaR) calculator.¹³

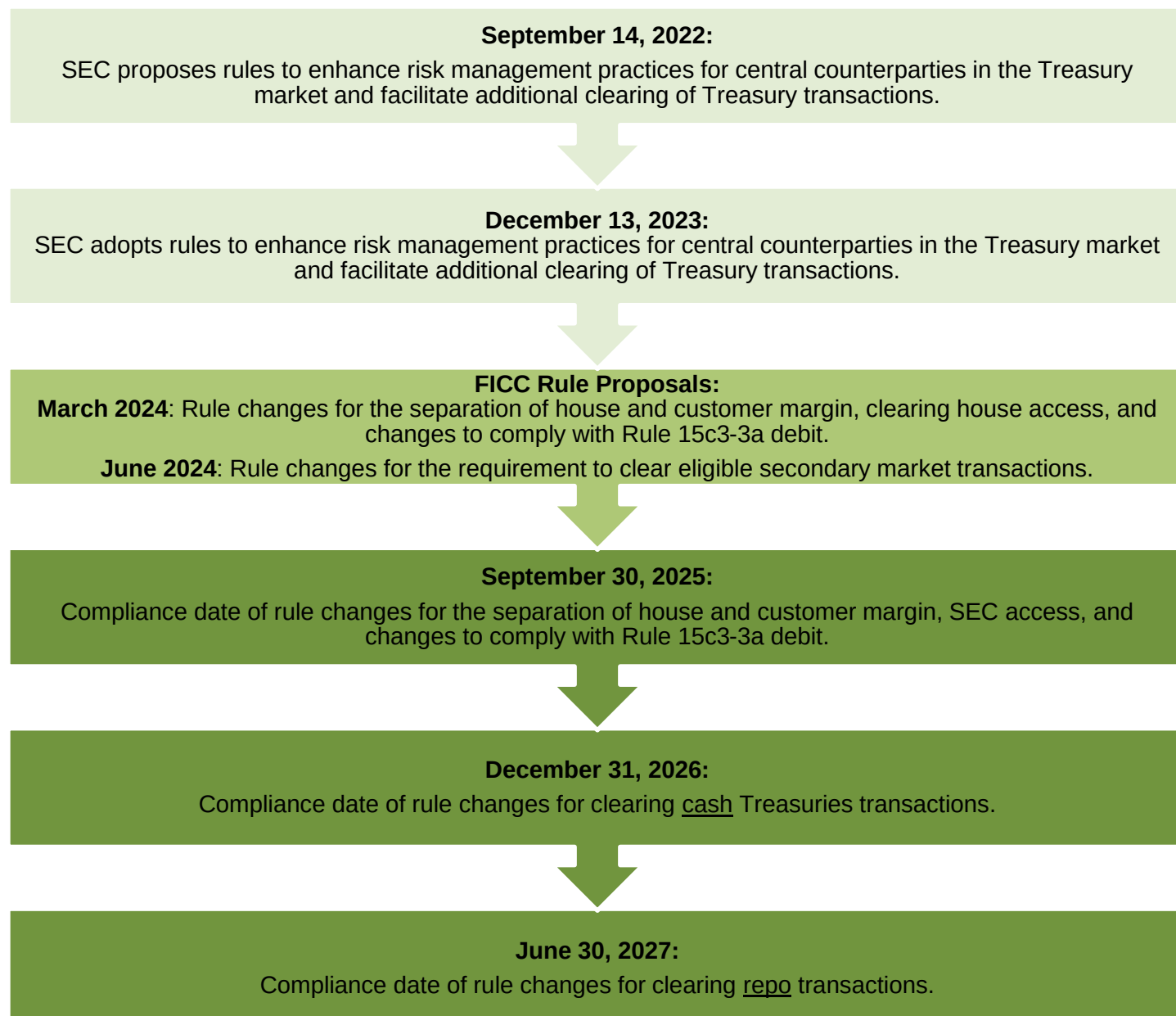
Other: Around operational efficiencies, some view Treasury clearing as an opportunity to innovate, for example: using technology to gain capital efficiencies in the sponsor model or using smart contracts to monitor margin changes in the done-away model. Standardization was also noted as key to expanding Treasury clearing, minimizing the differences in models from a technology perspective.

¹² <https://www.dtcc.com/-/media/WhitePapers/Treasury-Clearing-Mandate.pdf>

¹³ <https://www.dtcc.com/managing-risk/stress-testing-and-liquidity-risk-management/ccfl-public-calculator>

The Timeline

Below is the updated timeline for the Treasury clearing mandate, after the SEC recently extended the deadlines.



The (Treasury) Printing Press Keeps on Turning

A key theme – and not just in fixed income, but in equity markets as well – has been the never ending fiscal spending, paid for by elevated levels of treasury issuance. This pushed and kept the 10 year Treasury rate higher, hovering around 4.5% at the writing of this report, despite rate cuts from the Fed.

On average for the last ten years prior to COVID, Treasury issuance averaged just under \$1 trillion in privately held net marketable securities per annum. In 2020, issuance understandingly increased as the federal government poured money into an economy struggling from COVID, to over \$4 trillion (+344% to the annual historical average). In 2021 and 2022, we thought we were settling back down to a more normalized level, even if slightly elevated to the annual historical average: \$1.5 trillion per annum, +56% to historical.

We were wrong. In 2023 – a non-recession, non-war¹⁴, non-emergency (of any kind) year – the US government issued \$3.1 trillion, + 221% to the annual historical average and +106% to the 2021/2022 average. Then, in 2024, the federal government issued \$2.4 trillion. While this was down 24% from 2023, it was still up 145% to the historical average and +57% to the 2021/2022 average. This represented another elevated issuance level in a “non” year.

Looking ahead to 2025, the recent estimates were for: first quarter \$0.8 trillion, second quarter \$0.1 trillion. This first half of the year would essentially be in line with the historical annual average (0.97x), and the first quarter alone represents 0.84x this average. Extrapolating the first half estimate, we applied the 2024 quarterly percentages of total issuance to get the full year and remaining quarterly issuance levels. Based on the first half estimate, we could be looking at another over \$2 trillion year, at \$2.3 trillion. This issuance level would represent a 134% increase to the historical annual average, again in a “non” year.

US Treasury: Privately Held Net Marketable Borrowing

	Private Net Marketable Borrowing		
	\$B	vs Pre COVID	vs '21/22
Historical Avg	965		
COVID (2020)	4,281	343.5%	
Avg 2021/2022	1,509	56.3%	
2023	3,100	221.1%	105.5%
2024	2,364	144.9%	56.7%
2025E	2,258	133.9%	49.7%

Source: US Treasury, SIFMA estimates

Note: Historical average equals ten years prior to COVID. Actuals except for 2025 (1H25 estimate as of February 2025; 3Q, 4Q extrapolated using quarterly percentages from 2024); excludes rollovers in SOMA but includes financing required due to redemptions.

¹⁴ From the perspective that the US is not actively involved, as with the Russia/Ukraine war.

While the Treasury data we pull is listed at net marketable borrowing, is it truly net? This data actually includes redemptions in the Federal Reserve System Open Market Account (SOMA). As such, we adjusted this data to remove SOMA redemptions. In the chart below, we showed the differences in borrowing levels, with (dark green columns) and without (light green columns) SOMA redemptions, only labelling the adjusted years when the values were different.

From 2010 until 2018, there was not a need for an adjustment. In each year from 2017 through 2019, there were SOMA redemptions as the Fed underwent balance sheet normalization¹⁵. This did not occur again until 2022, continuing each year through 2024. The differences for these years – SOMA redemption adjusted level versus original resulted in the following reductions after reducing the net marketable borrowing net marketable borrowing level – were as follows:

- -21.4% in 2024
- -23.5% in 2023
- -19.2% in 2022
- -12.1% in 2019
- -17.6% in 2018
- -2.2% in 2017
- -2.9% in 2012
- -8.4% in 2008
- -21.8% in 2007

One can see the shift in adjustments, much higher in the last few years as redemptions grew.

¹⁵ For SOMA securities approaching maturity, the Federal Open Market Committee decides whether to reinvest these proceeds or allow them to roll off the balance sheet. If redeeming, the Open Market Desk at the Federal Reserve Bank of New York executes the redemption by allowing the securities to mature without reinvestment. The proceeds are used to manage liquidity in the financial system, either by holding them as reserves or using them in open market operations.

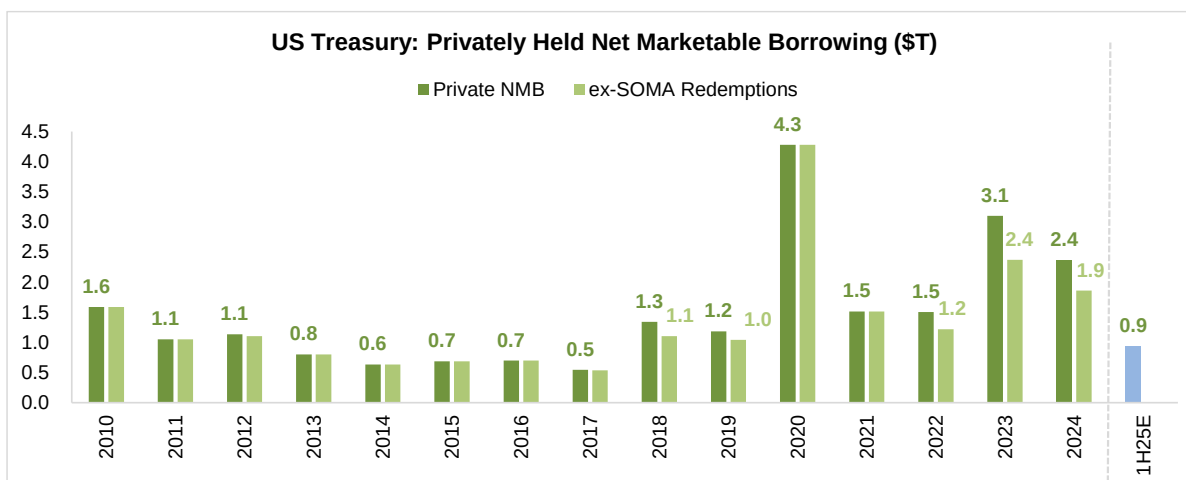
That said, the (over)issuance story does not change even after adjusting for SOMA redemptions. Since 2000, only nine adjustments were necessary. For our historical average calculation, dating back to 2010, seven adjustments were made, although 2012 and 2017 were essentially negligible. We adjusted the table from the earlier page to show the original net marketable borrowing level versus the SOMA redemption adjustment figure. The percentage increases remain significant, especially since we are discussing trillions of dollars. The non year spending levels, 2023 and 2024, were still +157% and +101% to the annual historical average.

US Treasury: Privately Held Net Marketable Borrowing

	Private Net Marketable Borrowing			Ex-SOMA Redemptions		
	\$B	vs Pre COVID	vs '21/22	\$B	vs Pre COVID	vs '21/22
Historical Avg	965			923		
COVID (2020)	4,281	343.5%		4,281	363.8%	
Avg 2021/2022	1,509	56.3%		1,364	47.8%	
2023	3,100	221.1%	105.5%	2,370	156.8%	73.8%
2024	2,364	144.9%	56.7%	1,858	101.3%	36.2%
2025E	2,258	133.9%	49.7%	na	na	na

Source: US Treasury, SIFMA estimates

Note: Historical average equals ten years prior to COVID. Private net marketable borrowing - actuals except for 2025 (1H25 estimate as of February 2025; 3Q, 4Q extrapolated using quarterly percentages from 2024); excludes rollovers in SOMA but includes financing required due to redemptions. Ex-SOMA redemptions - adjusted for redemptions.



Source: US Treasury, SIFMA estimates

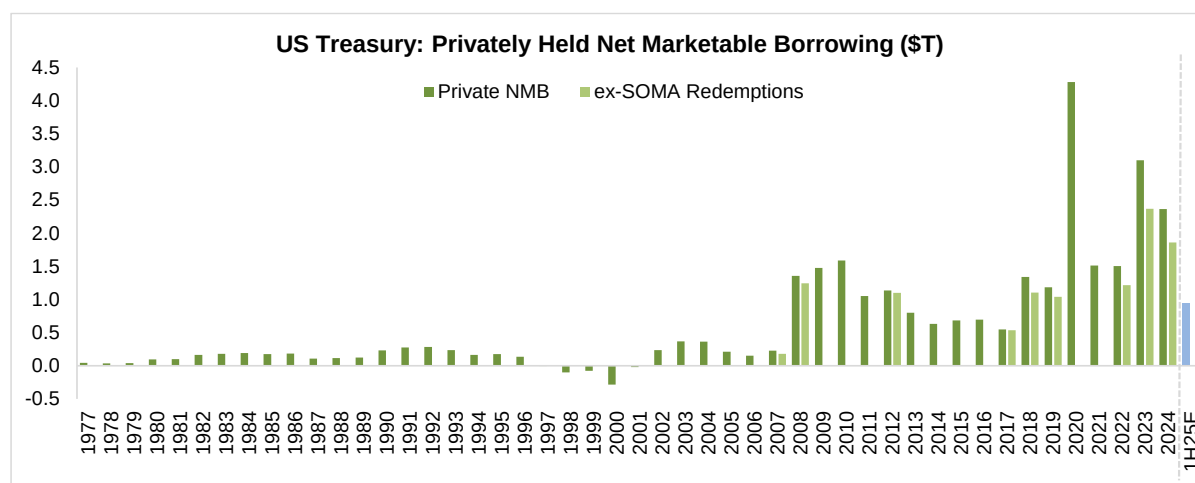
Note: Dark green column - actuals except for 1H25 (estimate as of February 2025); excludes rollovers in SOMA but includes financing required due to redemptions. Light green column - adjusted for SOMA redemptions.

Next, we looked at Treasury issuance over a longer time period, back to 1977. From 1977 to 2007, prior to the global financial crisis, Treasury issuance averaged only \$0.1 trillion, with a peak issuance level of \$0.4 trillion. There were ebbs and flows in issuance levels as the economy fought through recessions, wars, and other macro events. However, the short-lived elevated levels to get the country through these events were not as exaggerated as seen since the global financial crisis.

During the global financial crisis years, average issuance shot up to \$1.5 trillion. Issuance then settled down to its new post global financial crisis level of \$0.9 trillion. We discussed above the COVID peak and the attempt to settle back down to new normal of \$1.5 trillion. Depending how you look at it – excluding 2025 or using our estimate calculated above – the new, new normal appears to be in the \$2.6-2.7 trillion.

Again we looked at these figures excluding SOMA redemptions. The numbers still show the same story – the unsustainable path of fiscal spending remains concerning (at least to economists if not markets).

	Unadjusted	Adjusted
1977 to 2007	0.1	0.1
Global financial crisis	1.5	1.4
Post GFC to pre COVID	0.9	0.8
COVID year	4.3	4.3
2 years post COVID	1.5	1.4
Last 3 years:		
With estimated 2025	2.6	na
Excluding 2025	2.7	2.1

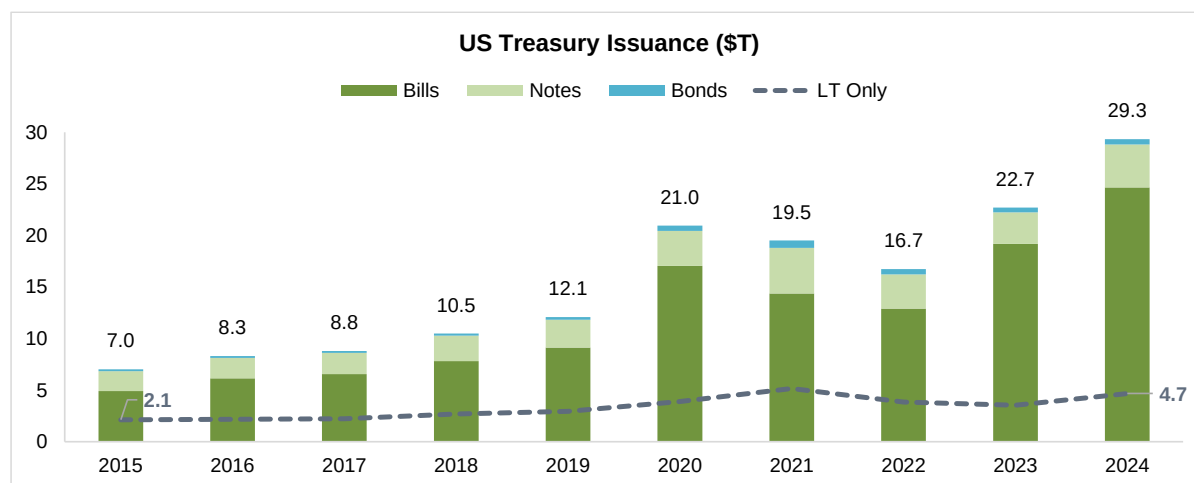


Source: US Treasury, SIFMA estimates

Note: Actuals except for 2025 (1H25 estimate as of February 2025; 3Q, 4Q extrapolated using quarterly percentages from 2024). Unadjusted (dark green column) – private net marketable borrowing; excludes rollovers in SOMA but includes financing required due to redemptions. Adjusted (light green column) – Excludes SOMA redemptions.

Issuance Skewed to Shorter Durations

The continuation of elevated levels of fiscal spending mean the Treasury Department must keep issuing debt – and issue they have. In the past ten years, total issuance increased 318%. Wait you say – but outstanding only increased by 115%. The growth in total issuance was driven by bills, +404%, while notes grew 116% and bonds grew 161%. In 2024, total issuance was \$29.3 trillion, of which the long-term portion – notes and bonds – was only \$4.7 trillion, or 16% of the total.



Source: US Treasury, SIFMA estimates

Over the past ten years, bills have grown from less than 70% of total issuance to almost 85%. Meanwhile, the decreases for notes and bonds were 13 pps and 1 pps respectively. If Treasury's goal was to increase the average duration of Treasuries held, this was not the way to go about it.

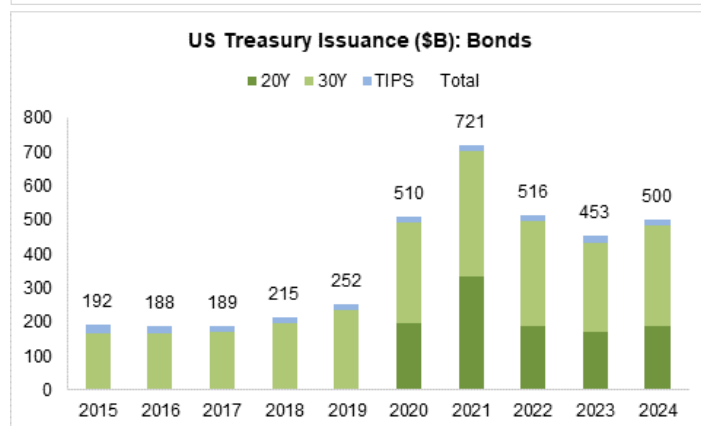
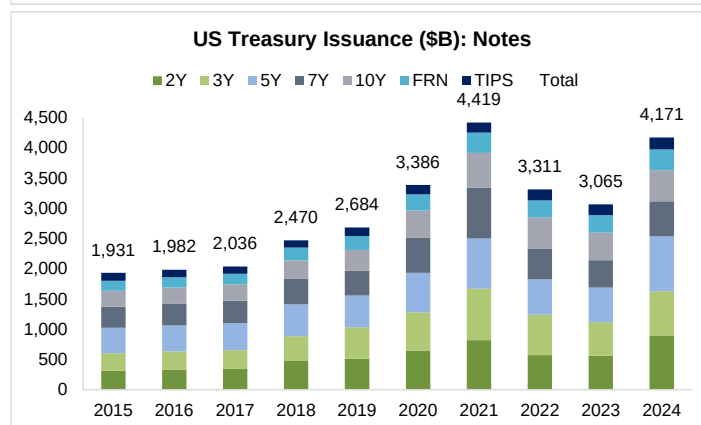
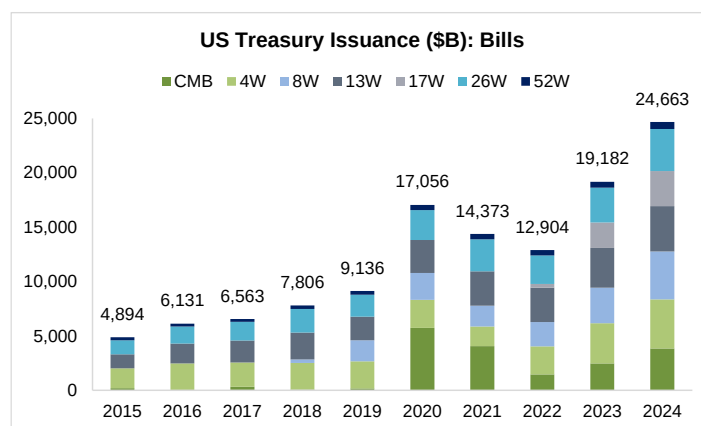
	Bills	Notes	Bonds	LT Only	Total	Bills	Notes	Bonds	LT Only
Issuance (\$T)						% of Total			
2015	4.9	1.9	0.19	2.1	7.0	69.8%	27.5%	2.7%	30.2%
2016	6.1	2.0	0.19	2.2	8.3	73.9%	23.9%	2.3%	26.1%
2017	6.6	2.0	0.19	2.2	8.8	74.7%	23.2%	2.1%	25.3%
2018	7.8	2.5	0.21	2.7	10.5	74.4%	23.5%	2.0%	25.6%
2019	9.1	2.7	0.25	2.9	12.1	75.7%	22.2%	2.1%	24.3%
2020	17.1	3.4	0.51	3.9	21.0	81.4%	16.2%	2.4%	18.6%
2021	14.4	4.4	0.72	5.1	19.5	73.7%	22.6%	3.7%	26.3%
2022	12.9	3.3	0.52	3.8	16.7	77.1%	19.8%	3.1%	22.9%
2023	19.2	3.1	0.45	3.5	22.7	84.5%	13.5%	2.0%	15.5%
2024	24.7	4.2	0.50	4.7	29.3	84.1%	14.2%	1.7%	15.9%
Y/Y Change						Y/Y Change (pps)			
2015	1.6%	-4.6%	0.4%	-4.2%	-0.2%	1.3	-1.3	0.0	30.2
2016	25.3%	2.6%	-2.2%	2.2%	18.3%	4.1	-3.6	-0.5	-4.1
2017	7.0%	2.7%	0.6%	2.5%	5.9%	0.8	-0.7	-0.1	-0.8
2018	18.9%	21.3%	13.7%	20.7%	19.4%	-0.3	0.4	-0.1	0.3
2019	17.0%	8.6%	17.4%	9.3%	15.1%	1.3	-1.3	0.0	-1.3
2020	86.7%	26.2%	102.4%	32.7%	73.6%	5.7	-6.1	0.3	-5.7
2021	-15.7%	30.5%	41.3%	31.9%	-6.9%	-7.7	6.5	1.3	7.7
2022	-10.2%	-25.1%	-28.4%	-25.5%	-14.3%	3.5	-2.9	-0.6	-3.5
2023	48.6%	-7.4%	-12.1%	-8.1%	35.7%	7.4	-6.3	-1.1	-7.4
2024	28.6%	36.1%	10.4%	32.8%	29.2%	-0.4	0.7	-0.3	0.4
% Changes									
3Y CAGR	19.7%	-1.9%	-11.4%	-3.1%	14.6%				
5Y CAGR	22.0%	9.2%	14.7%	9.7%	19.4%				
10Y CAGR	17.7%	7.5%	10.1%	7.7%	15.4%				
15-'24	403.9%	116.0%	160.9%	120.1%	318.1%	14.3	-13.3	-1.0	-14.3

Source: US Treasury Department, SIFMA estimates

Looking at issuance growth rates across segments, while bills had a 19.7% three-year CAGR, growth rates for notes and bonds were -1.9% and -11.4% respectively. Issuance ended 2024 with the following breakout: bills 84.1%, notes 14.2%, and bonds 1.7%.

This has essentially been the breakout for the last few years. In fact, since Treasury's announced strategy in 2021, issuance of bills has grown as a percentage of total issuance (+10 pps), while notes and bonds have fallen (-8 pps and -2pps respectively).

That is not the strategic direction that aligns with Treasury's goal. Even within long-term only issuance, the direction has not been going in the right direction to meet the goal. Notes at a percentage of total issuance increased, ending 2024 at 89% of total long term issuance, while bonds decreased.



Source: US Treasury, SIFMA estimates

The composition has shifted within each category as well. Over the last ten years, cash management bills (CMB¹⁶) as a percentage of total bills issuance grew 11.5 pps to 15.6% in 2024. Eight weeks and seventeen weeks grew 13.8 pps and 10.5 pps respectively – and these categories had not been issued in the first three and first seven years of our ten-year view. The remaining weeks – four, thirteen, twenty-six and fifty-two – all declined as a percent of total. At the end of 2024, securities with maturities of eight weeks or less represented over 50% of total bills issuance.

For notes, securities with maturities of three years or less represented under 40% of total notes issuance, or 45% of issuance excluding floating rate notes (FRN) and TIPS. Over the last ten years, these two tenors grew as a percentage of total, +5 pps and +3 pps respectively, while all other tenors declined.

Finally, on bonds, 2024 ended the year skewed to the thirty year – in line with Treasury's goal – at 59% or 61% of issuance excluding TIPS. However, this percentage of total declined 29 pps over the last ten years. The twenty year was the next highest total at 37%. These bonds were not issued for the first five years of the time series.

Why all of the short-term issuance when the stated goal is to increase the amount of long-term debt? This issuance is funding the ever increasing fiscal spending, which continues to bother bond markets.

	Bills								Notes								Bonds				Total	LT Only
	CMB	4W	8W	13W	17W	26W	52W	Total	2Y	3Y	5Y	7Y	10Y	FRN	TIPS	Total	20Y	30Y	TIPS	Total		
Issuance (\$T)																						
2015	200	1,820		1,307		1,289	278	4,894	312	289	420	348	265	164	132	1,931	169	23	192		7,017	2,123
2016	0	2,475		1,840		1,562	254	6,131	328	305	430	354	269	171	124	1,982	167	20	188		8,301	2,169
2017	327	2,238		2,025		1,713	260	6,563	342	311	448	369	274	172	120	2,036	170	19	189		8,787	2,224
2018	80	2,450	315	2,469		2,172	320	7,806	475	409	523	429	298	212	123	2,470	196	19	215		10,491	2,685
2019	173	2,504	1,924	2,186		2,003	346	9,136	511	521	524	409	346	229	143	2,684	237	15	252		12,071	2,935
2020	5,740	2,575	2,471	3,038		2,750	482	17,056	639	640	653	582	448	269	154	3,386	195	299	16	510	20,951	3,896
2021	4,075	1,793	1,923	3,144		2,943	495	14,373	817	852	831	841	575	334	168	4,419	335	368	18	721	19,512	5,139
2022	1,463	2,591	2,238	3,145	340	2,633	494	12,904	571	669	583	510	517	283	179	3,311	190	306	20	516	16,731	3,827
2023	2,485	3,691	3,260	3,650	2,353	3,196	546	19,182	561	556	573	452	455	288	179	3,065	169	264	20	453	22,700	3,518
2024	3,845	4,525	4,400	4,164	3,231	3,858	640	24,663	894	734	907	579	514	346	196	4,171	187	296	17	500	29,334	4,671
% of Total																						
2015	4.1%	37.2%		26.7%		26.3%	5.7%		16.2%	15.0%	21.8%	18.0%	13.7%	8.5%	6.8%		88.0%	12.0%				30.2%
2016	0.0%	40.4%		30.0%		25.5%	4.1%		16.6%	15.4%	21.7%	17.9%	13.6%	8.6%	6.3%		89.1%	10.9%				26.1%
2017	5.0%	34.1%		30.9%		26.1%	4.0%		16.8%	15.3%	22.0%	18.1%	13.4%	8.5%	5.9%		90.1%	9.9%				25.3%
2018	1.0%	31.4%	4.0%	31.6%		27.8%	4.1%		19.2%	16.6%	21.2%	17.4%	12.1%	8.6%	5.0%		91.3%	8.7%				25.6%
2019	1.9%	27.4%	21.1%	23.9%		21.9%	3.8%		19.0%	19.4%	19.5%	15.2%	12.9%	8.5%	5.3%		93.9%	6.1%				24.3%
2020	33.7%	15.1%	14.5%	17.8%		16.1%	2.8%		18.9%	18.9%	19.3%	17.2%	13.2%	8.0%	4.5%		38.3%	58.6%	3.1%			18.6%
2021	28.4%	12.5%	13.4%	21.9%		20.5%	3.4%		18.5%	19.3%	18.8%	19.0%	13.0%	7.6%	3.8%		46.4%	51.1%	2.5%			26.3%
2022	11.3%	20.1%	17.3%	24.4%	2.6%	20.4%	3.8%		17.2%	20.2%	17.6%	15.4%	15.6%	8.6%	5.4%		36.8%	59.4%	3.8%			22.9%
2023	13.0%	19.2%	17.0%	19.0%	12.3%	16.7%	2.8%		18.3%	18.1%	18.7%	14.8%	14.9%	9.4%	5.8%		37.3%	58.3%	4.4%			15.5%
2024	15.6%	18.3%	17.8%	16.9%	13.1%	15.6%	2.6%		21.4%	17.6%	21.8%	13.9%	12.3%	8.3%	4.7%		37.3%	59.2%	3.5%			15.9%
Change (pps)	11.5	(18.8)	13.8	(9.8)	10.5	(10.7)	(3.1)		5.3	2.6	(0.01)	(4.1)	(1.4)	(0.2)	(2.1)		(0.9)	(28.8)	(8.5)			(14.3)

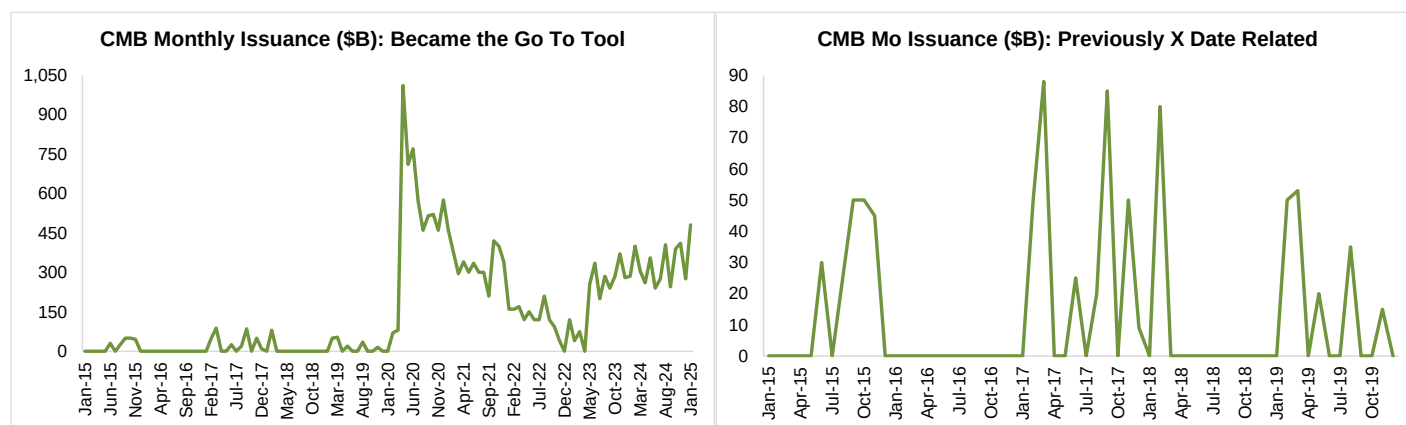
Source: US Treasury Department, SIFMA estimates

¹⁶ Treasury issues short-term cash management bills periodically to manage short-term financing needs.

That said, some of the bills issuance could be what is considered noise. Over the last ten years, the US government came perilously close to hitting the X Date, the day on which it can no longer meet its obligations in full and on time. Set by law, the debt limit controls the amount of money the federal government can borrow. If reached, the Treasury Department is no longer able to borrow money to fund operations. When approaching X Date, Treasury can temporarily draw on extraordinary measures¹⁷ to continue operations for a limited time period. Once depleting cash reserves and extraordinary measures, the federal government reaches X Date.

According to the Bipartisan Policy Center, Treasury neared X Date in: 2015, 2017, 2018, 2019, 2021 (two times), and 2023. Prior to COVID, CMB issuance was a frequently used tool to get the government through a debt ceiling debate. However, COVID muddled the picture. From 2015 through 2019, the average monthly CMB issuance was \$13.0 billion. From 2020 through January of this year – where Treasury issued \$480.0 billion as it hit the debt ceiling and began extraordinary measures – CMB issuance averaged \$296.5 billion, an increase of around 2,200%. Removing the COVID related issuance years of 2020 and 2021 (though you can argue 2021 should not have been thought of as a COVID year given the economy recovered in fall 2020), the 2022 through January 2025 average issuance was \$223.6 billion, an increase of around 1,600%. And these were non-recession, non-war, non-emergency (of any kind) years.

Looking just at the pre COVID period, the spikes typically indicate an increase in CMB issuance around debt ceiling debates. For example in 2015, CMB issuance totals started climbing until the debt ceiling was raised in early November. From August through November, CMB issuance averaged \$43 billion versus a \$4 billion average for the earlier part of the year. (These numbers seem so quaint versus today's levels.)



Source: US Treasury, SIFMA estimates

¹⁷ The federal employee thrift savings plan includes a portion – the G Fund – invested in special non-marketable Treasuries that mature each day – Treasury can choose not to fully invest this fund from day to day. Treasury can undertake a similar process with the exchange stabilization fund, an account used for currency-related operations composed of the same securities as the G Fund. With the civil service retirement and disability fund (and the postal service retiree health benefits fund), Treasury can wait to credit interest on the fund's securities and delay rollovers of maturing securities until after the debt limit is increased.

Ballooning Balance Sheet

The never ending fiscal spending flowed through to the balance sheet, which is at eye popping levels. First, we look at federal debt securities held by the public. As of the end of 2024, the level of debt had grown to \$28.3 trillion: +7.6% Y/Y and +68.1% since pre COVID. Looking at just marketable Treasury securities, these securities ended 2024 at \$27.7 trillion: +7.7% Y/Y and +69.8% since pre COVID. In the last ten years, federal debt has increased 115%, up from a mere \$13.1 trillion.

The level of debt hit the \$20 trillion level in 2020, an almost 25% increase from the prior year. Then on top of this already elevated level we saw four years of significant Y/Y changes, ranging from +7.4-8.7%. These growth rates came at the same time as interest rates increased. This caused interest payments to increase, from around \$70 billion prior to rate increases to \$134 billion in 2024. This represented a 17% Y/Y increase in 2022, the year rate increases began, followed by 44% and 15% increases the following two years.

Now, the government has a much higher level of debt to service. i.e. pay interest, at a time when interest rates remain stubbornly high. This is not a healthy combination for a country's balance sheet.

Federal Debt Securities Held by the Public

\$B	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Treasury Securities										
Treasury bills	1,355.2	1,644.8	1,799.6	2,239.5	2,376.4	5,028.1	3,712.9	3,643.7	5,259.3	6,004.2
Treasury notes	8,366.0	8,624.3	8,798.9	9,150.3	9,756.0	10,655.9	12,570.5	13,696.5	13,724.9	14,338.0
Treasury bonds	1,688.2	1,825.3	1,948.4	2,115.0	2,311.5	2,668.1	3,340.8	3,867.7	4,240.2	4,701.4
Treasury inflation-protected securities (TIPS)	1,135.4	1,209.8	1,286.1	1,376.2	1,454.7	1,522.4	1,652.0	1,839.8	1,934.9	2,051.1
Treasury floating rate notes (FRN)	287.1	334.1	342.6	369.1	424.1	478.3	579.3	625.9	575.5	615.5
Total marketable Treasury securities	12,831.9	13,638.3	14,175.6	15,250.1	16,322.7	20,352.8	21,855.5	23,673.6	25,734.8	27,710.2
Nonmarketable securities	292.0	535.1	497.8	511.1	486.4	666.0	427.4	625.6	595.3	597.1
Net unamortized premiums/(discounts)	(31.4)	(33.8)	(39.2)	(44.8)	(42.7)	(26.7)	(26.8)	(71.7)	(118.7)	(123.0)
Total Treasury securities, net (public)	13,092.5	14,139.6	14,634.2	15,716.4	16,766.4	20,992.1	22,256.1	24,227.5	26,211.4	28,184.3
Agency Securities										
Tennessee Valley Authority	23.7	23.8	23.9	22.4	21.0	19.8	19.3	19.0	19.3	20.0
All other agency securities	0.2	0.2	0.1	0.1	0.1	0.1				0.3
Total agency securities, net	23.9	24.0	24.0	22.5	21.1	19.9	19.3	19.0	19.3	20.3
Accrued interest payable	56.1	57.5	65.9	73.8	73.5	70.9	69.4	81.5	117.0	134.3
Total	13,172.5	14,221.1	14,724.1	15,812.7	16,861.0	21,082.9	22,344.8	24,328.0	26,347.7	28,338.9
Y/Y Change										
Treasury bills	-3.9%	21.4%	9.4%	24.4%	6.1%	111.6%	-26.2%	-1.9%	44.3%	14.2%
Treasury notes	2.5%	3.1%	2.0%	4.0%	6.6%	9.2%	18.0%	9.0%	0.2%	4.5%
Treasury bonds	10.0%	8.1%	6.7%	8.6%	9.3%	15.4%	25.2%	15.8%	9.6%	10.9%
Treasury inflation-protected securities (TIPS)	8.7%	6.6%	6.3%	7.0%	5.7%	4.7%	8.5%	11.4%	5.2%	6.0%
Treasury floating rate notes (FRN)	133.4%	16.4%	2.5%	7.7%	14.9%	12.8%	21.1%	8.0%	-8.1%	7.0%
Total marketable Treasury securities	4.6%	6.3%	3.9%	7.6%	7.0%	24.7%	7.4%	8.3%	8.7%	7.7%
Total Treasury securities, net (public)	2.6%	8.0%	3.5%	7.4%	6.7%	25.2%	6.0%	8.9%	8.2%	7.5%
Accrued interest payable	3.5%	2.5%	14.6%	12.0%	-0.4%	-3.5%	-2.1%	17.4%	43.6%	14.8%

Source: US Treasury Department, SIFMA estimates

Note: Types of marketable securities: Bills-Short-term obligations issued with a term of 1 year or less. Notes-Medium-term obligations issued with a term of 2-10 years. Bonds-Long-term obligations of more than 10 years. TIPS-Term of 5 years or more. FRN-Term of 2 years. Federal debt held by the public consists of securities outside the government by individuals, corporations, state or local governments, FRBs, foreign governments, and other non-federal entities. The above table details government borrowing primarily to finance operations and shows marketable and nonmarketable securities at face value less net unamortized premiums and discounts including accrued interest. Securities that represent federal debt held by the public are issued primarily by Treasury and include: Interest-bearing marketable securities (bills, notes, bonds, inflation-protected, and FRN). Interest-bearing nonmarketable securities (Government Account Series held by fiduciary and certain deposit funds, foreign series, state and local government series, domestic series, and savings bonds). Non-interest-bearing marketable and nonmarketable securities (matured and other). Total agency securities = net of unamortized premiums and discounts.

Over this ten-year period, the mix of debt securities held by the public shifted as well. While bills grew, to 22% from 11% of the total (+11 pps), notes declined, to 52% from 65% (-13.5 pps). Bonds increased as well, to 17% from 13% (+4 pps). Notes – the middle of the bar, with two to ten year durations – fell from over two-thirds of the mix to around half. The weighting to the ends of the barbell – bills with one year or less duration and bonds with duration of twenty years or greater – shifted to almost 40%. (Ironically, the percentage of Treasury Inflation Protected Securities/TIPS – securities meant to protect against inflation – declined beginning in 2020 and remained lower through 2024, right as inflation took flight in the spring of 2021.)

The growth in shorter duration bills is fascinating, as it contrasts with former Treasury secretary Janet Yellen's strategy. Beginning in early 2021, Treasury's goal was to increase the average duration of Treasuries held, which would lock in lower interest rates for a longer period and reduce the cost of servicing the national debt. By issuing more long-term bonds and fewer short-term bonds, Treasury sought to mitigate the risk of rising interest rates in the future. However, growth of bills – the short end of the barbell – outpaced that of bonds.

In 2021 and 2022, the percentage of bills decreased, however this was just math. Treasury had used bills to fight the economy's way out of COVID in 2020, with issuance totaling \$21 trillion that year, of which CMBs were \$17.1 trillion, or 81%. The percentage of total Treasuries outstanding represented by bills has increased in each of the last two years.

Total Marketable Treasury Securities Outstanding

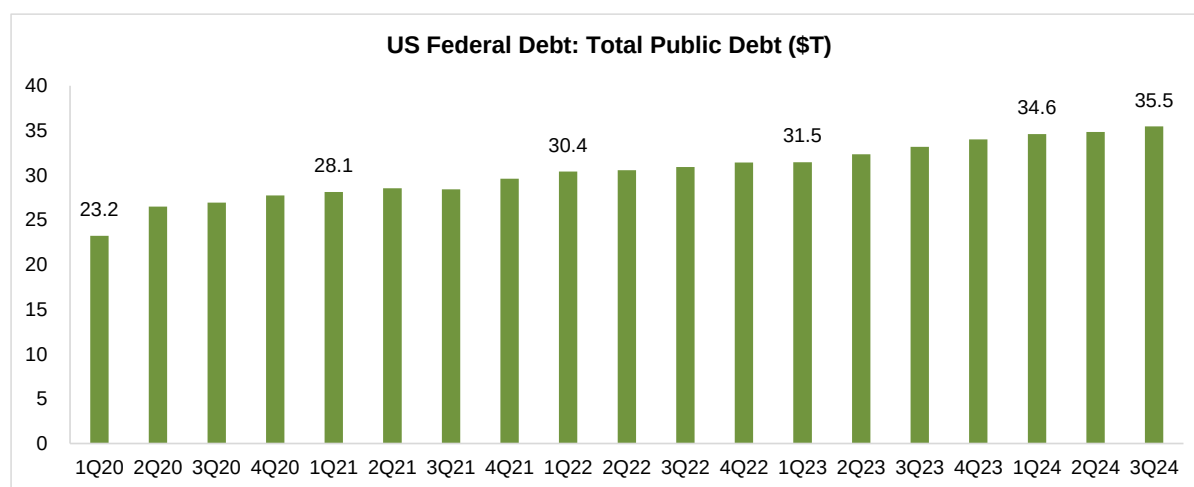
												Change (pps)	
\$B	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	'15-'24	'22-'24	
Treasury Securities													
Treasury bills	10.6%	12.1%	12.7%	14.7%	14.6%	24.7%	17.0%	15.4%	20.4%	21.7%	11.1	6.3	
Treasury notes	65.2%	63.2%	62.1%	60.0%	59.8%	52.4%	57.5%	57.9%	53.3%	51.7%	(13.5)	(6.1)	
Treasury bonds	13.2%	13.4%	13.7%	13.9%	14.2%	13.1%	15.3%	16.3%	16.5%	17.0%	3.8	0.6	
Treasury inflation-protected securities (TIPS)	8.8%	8.9%	9.1%	9.0%	8.9%	7.5%	7.6%	7.8%	7.5%	7.4%	(1.4)	(0.4)	
Treasury floating rate notes (FRN)	2.2%	2.4%	2.4%	2.4%	2.6%	2.4%	2.7%	2.6%	2.2%	2.2%	(0.0)	(0.4)	

Source: US Treasury Department, SIFMA estimates

Now that we have analyzed the federal debt securities held by the public, the \$28.3 trillion, we add in intergovernmental debt due to arrive at the total public debt¹⁸ figure, \$35.5 trillion as of the third quarter in 2024.

We looked back in history to analyze how long it took the debt level to cross certain thresholds. Debt reached the \$10 trillion level in the third quarter of 2008 (we note that debt increased during the global financial crisis at an average 2% rate per quarter). It took over nine years to hit the \$20 trillion level in the third quarter of 2017. It then took almost half this time – under five years – to reach the \$30 trillion level in the first quarter of 2022 (crisis level spending for COVID averaged 6% per quarter).

The chart below shows the steady climb in total public debt since 2020. After increasing 14% in the second quarter of 2020 to assist with COVID spending, debt steadily climbed, averaging +1.7% per annum. By the third quarter of 2024, the US had already crossed the \$35 trillion threshold, taking just under three years to do so. The \$35.5 trillion in the third quarter last year was an increase of 52.7% since the first quarter of 2020.

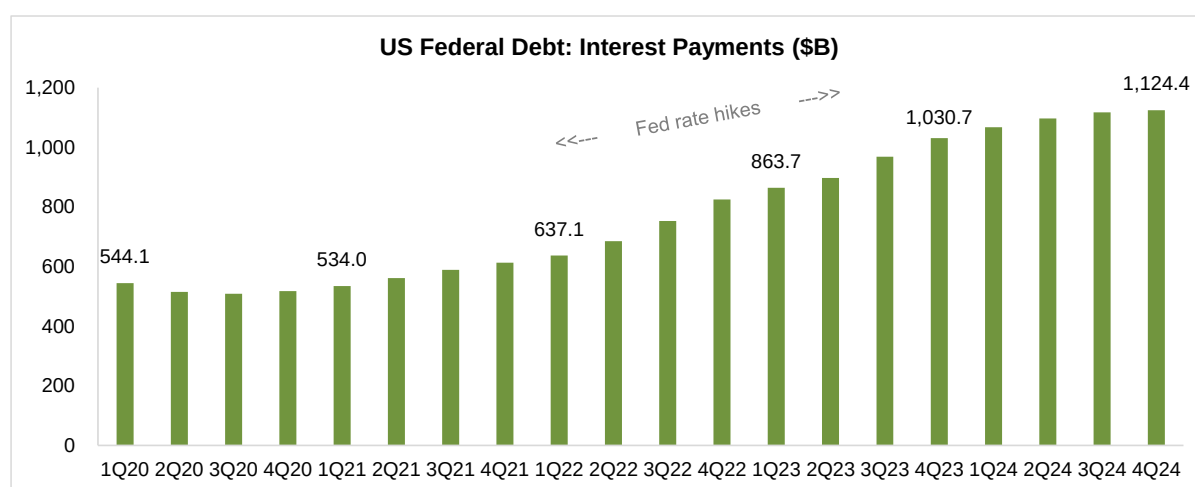


Source: FRED, SIFMA estimates

¹⁸ Federal debt securities held by the public is the debt the government owes to entities outside of the federal government (businesses, foreign governments, etc.). Total public debt adds in intragovernmental debt, debt the government owes to itself (ex: Social Security trust fund).

Debt that has been issued must then be serviced. Interest payments on total federal debt were \$1.1 trillion in 2024, an increase of 106.6% since the start of 2020. Interest payments crossed the \$1 trillion threshold in the fourth quarter of 2023. As Fed rate hikes caused borrowing costs to increase, the pace of growth for interest payments accelerated. Since rate hikes began in early 2022, total interest payments increased 76.5%, with an average quarterly growth rate of 5%. This compares to an average quarterly growth rate of 2% in the first half of the time series shown in the chart below (we note that 2% is in line with inflation).

Elevated rates compound the problem of a ballooning balance sheet – more debt means more interest due, higher rates mean higher payments.

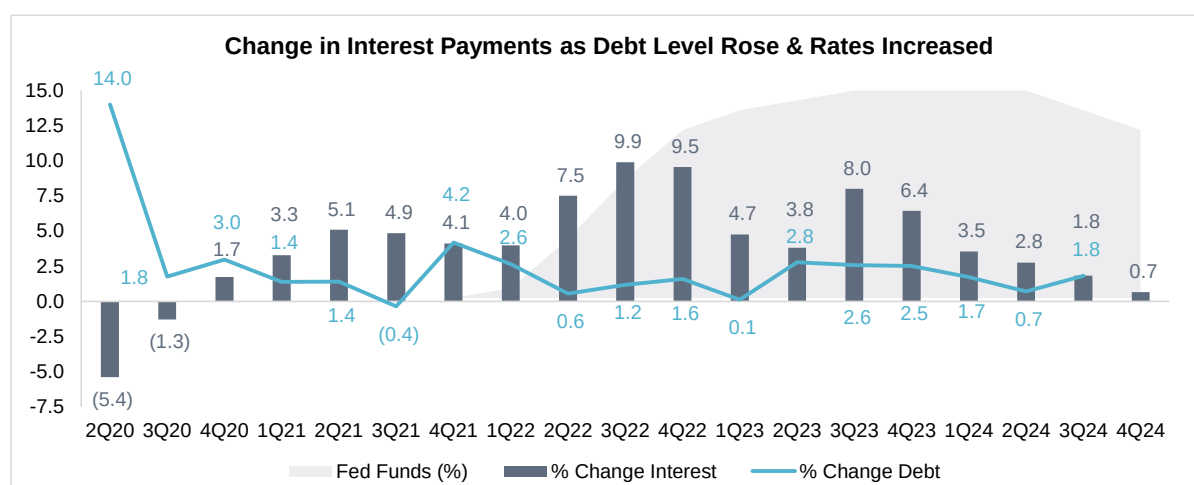


Source: FRED, SIFMA estimates

Interest on federal debt has been a double edged sword for the government. Not only has the level of debt increased, but interest rates rose as well. The Fed began rate cuts in March of 2022 (light purple shading in the chart below), raising the Fed Funds rate 525 bps over seventeen months to fight inflation. Rates remained elevated until the first rate cut in September 2024, with a total 100 bps in cuts through the end of the year. The Fed Funds rate ended 2024 at 4.25-4.50%.

Given the increase in borrowing costs, the growth rate for interest payments began to climb. In the chart below, you see the growth rates for interest payments (dark purple columns) spike in 2022 as the Fed Funds rate quickly rose over 4% from 0%. Growth rates for interest payments attempted to stabilize once the Fed Funds rate reached peak level. However, growth rates for the debt level accelerated in 2023 – remember above that we mentioned that the government spent over \$3 trillion in a non-crisis year – once again increasing the growth rate for interest payments.

That was a Tyson special (back hook to the body, back upper cut to the head) for interest payments. Now, the US government has to spend over \$1 trillion per annum just to service its debt. Let us put it this way, there are only nineteen countries in the world which have a GDP over \$1 trillion – with eight of these having a GDP only in the \$1-2 trillion range – and the US spends this amount each year on interest payments.

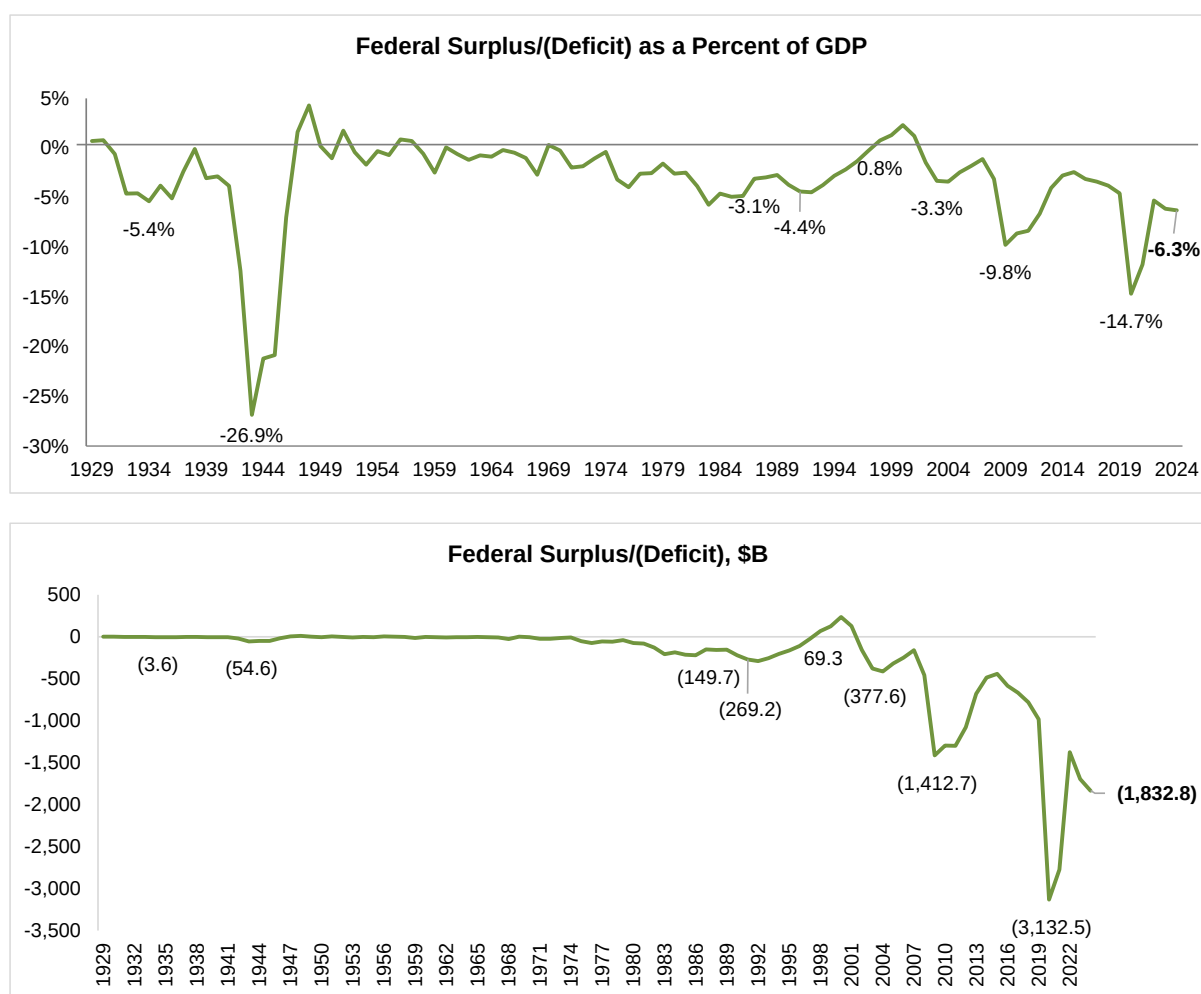


Source: FRED, SIFMA estimates

Given fiscal (over)spending, the US is running a federal deficit as a percent of GDP at levels typically reserved for recessions, wars, or financial crises. Yet, these levels are occurring in non-stress years.

At 6.3%, the federal deficit as a percent of GDP is greater than several periods of economic stress, wars, or financial crisis, including: the Great Depression and stock market crash, -5.4%; Black Monday, -3.1%; the first Gulf war, -4.4%; the Asian Financial Crisis and failure of Long Term Capital Management, +0.8%; and the dotcom bubble burst, -3.3%. The only time periods where the US held higher deficit levels than today's rate was during World War II (-26.9%), the global financial crisis (-9.8%), and COVID (-14.7%). In dollar terms, at \$1.8 trillion, the latest deficit level reported was the second highest recorded, with only COVID posting a higher deficit dollar value.

This also continues to concern economists, though markets appear to be avoiding the issue.



Source: FRED, SIFMA estimates

Treasury Holders Landscape

Despite what we outlined above on the growing balance sheet and growth in interest payable, the government keeps on spending. This means Treasury will need to keep on issuing. The first half estimates for 2025 are already out, at \$0.9 trillion, the same level as what used to be the full year spending total historically.

At the same time, the composition of Treasury holders has shifted. At the end of 2024, the Fed held 16.5% of the total \$26.2 trillion Treasuries outstanding (based on Bloomberg data). Foreign holders represented 33.0%, and other holders stood at 50.1%. Ending 2024 at peak share of total Treasury holdings, other holders posted the largest increases, both over the last ten years and prior to COVID, +113.4% and +69.1% respectively. The Fed had increased holdings post COVID to fund the economic recovery, but their holdings have steadily declined over the last three years. Its share of Treasury holdings has declined 9.0 pps since its 2022 peak of 25.4%. Foreign holders shed 10.7 pps of share since their 2017 peak of 43.7%.

Holders of US Debt

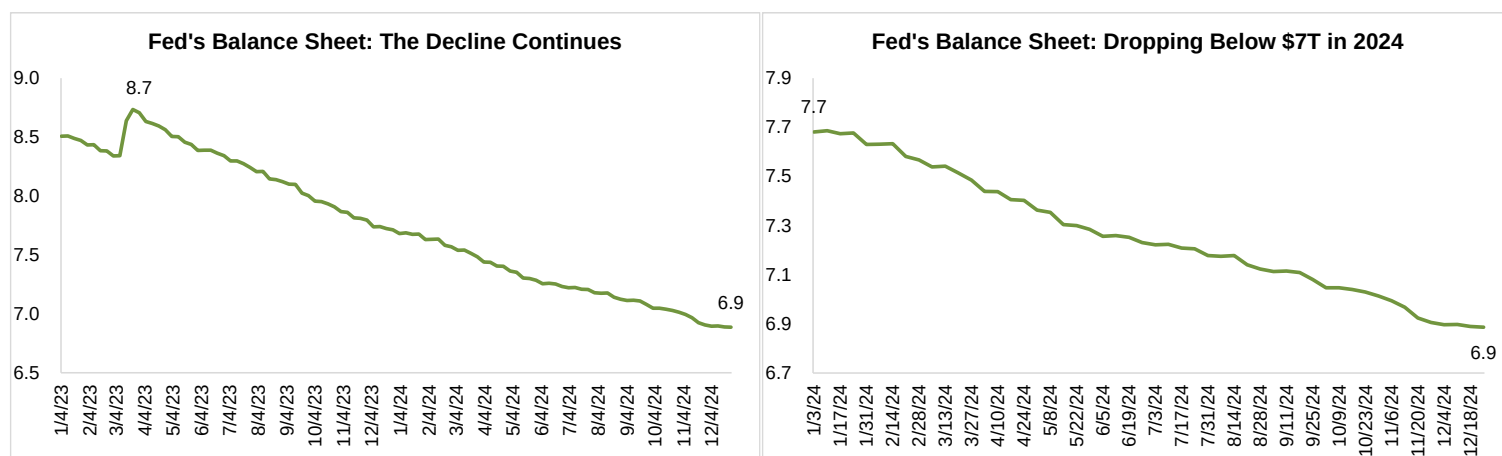
\$B	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Change	
											24/'15	24/'19
Total UST	13,146.2	13,731.9	14,201.1	15,179.0	16,924.0	21,953.0	22,935.7	21,622.4	24,309.8	26,172.0	99.1%	54.6%
Other Holders	6,146.2	6,002.8	5,535.6	6,668.2	7,758.1	10,193.4	9,543.4	8,923.6	11,573.8	13,116.1	113.4%	69.1%
Foreign Holders	4,538.4	5,265.5	6,211.3	6,270.1	6,844.2	7,070.7	7,740.4	7,197.8	7,944.8	8,634.6	90.3%	26.2%
Federal Reserve	2,461.6	2,463.6	2,454.5	2,240.7	2,250.5	4,688.9	5,582.8	5,500.9	4,813.4	4,308.8	75.0%	91.5%
Y/Y Change												
Total UST	4.2%	4.5%	3.4%	6.9%	11.5%	29.7%	4.5%	-5.7%	12.4%	7.7%		
Other Holders	53.9%	-2.3%	-7.8%	20.5%	16.3%	31.4%	-6.4%	-6.5%	29.7%	13.3%		
Foreign Holders	-26.3%	16.0%	18.0%	0.9%	9.2%	3.3%	9.5%	-7.0%	10.4%	8.7%		
Federal Reserve	0.0%	0.1%	-0.4%	-8.7%	0.4%	108.3%	19.1%	-1.5%	-12.5%	-10.5%		
Category % Total												
Other Holders	46.8%	43.7%	39.0%	43.9%	45.8%	46.4%	41.6%	41.3%	47.6%	50.1%	3.4	4.3
Foreign Holders	34.5%	38.3%	43.7%	41.3%	40.4%	32.2%	33.7%	33.3%	32.7%	33.0%	(1.5)	(7.4)
Federal Reserve	18.7%	17.9%	17.3%	14.8%	13.3%	21.4%	24.3%	25.4%	19.8%	16.5%	(2.3)	3.2

Source: Bloomberg, SIFMA estimates

Note: 2024 is as of 3Q24.

The Fed: The Fed holds 16.5% of total Treasuries, or \$4.3 trillion. It had been a top buyer of Treasuries under its Quantitative Easing (QE) program, ongoing since the global financial crisis. It then kept building its balance sheet after the crisis, a policy questioned by many market participants. As fiscal spending spiked to assist the economy during COVID (over \$7 trillion spent across two Presidents), the Fed's balance sheet grew, peaking at \$9.0 trillion in April 2022, +115.2% from where it ended 2019.

However, the Fed began Quantitative Tightening (QT)¹⁹ in June 2022, becoming a net seller of Treasuries. Since 2023, the Fed's balance sheet has been on the decline, with the exception of a blip during the regional bank turmoil in 2023. The Fed's balance sheet ended 2024 at \$6.9 trillion. Over the last two years, the balance sheet declined 19.1%, with a 10.4% decrease in 2024 alone.

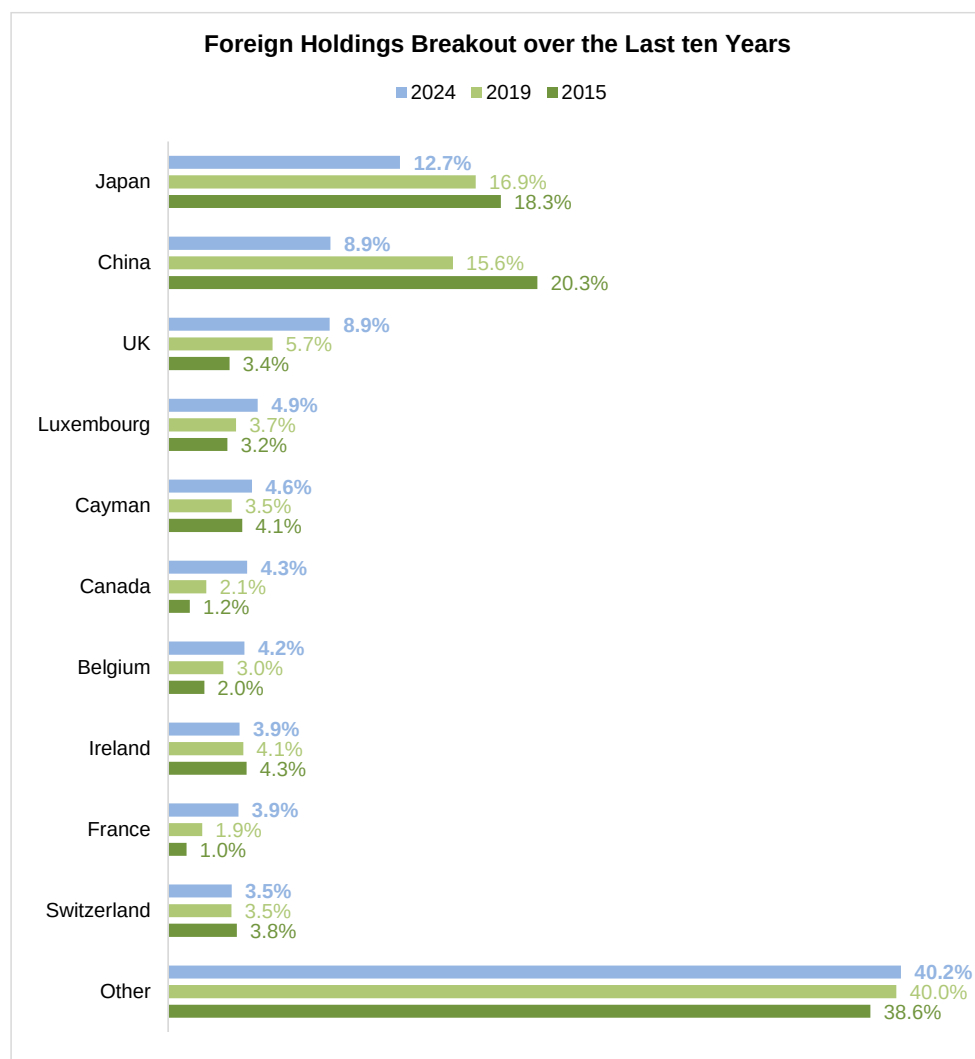


Source: FRED, SIFMA estimates

¹⁹ QE is used to stimulate the economy by reducing interest rates; the Fed purchases Treasuries and mortgage-backed securities. QT is used to cool the economy by raising interest rates; the Fed sells Treasuries and mortgage-backed securities or allows securities to mature off its balance sheet.

Foreign holders: Foreign holders represent 33.0% of total Treasuries. However, this group has also been pulling back its holdings. Looking at the \$8.6 trillion in foreign holdings to end 2024, the top holder, Japan, represented 12.7%. This differs from ten years ago when the top holder, China, was 20.3% of the total. While Japan and China represented over 20% of foreign holdings in 2024, this is down from almost 40% in 2015²⁰.

Looking at the top ten countries share of total foreign holders, this group has fallen to 59.8% in 2024 from 67.6% in 2015. We note that the top ten countries represented 19.7% of total Treasury holdings in 2024, down from 31.6% in 2015.



Source: Bloomberg, SIFMA estimates (2024 as of November)

Note: T10 countries as of 2024, same countries carried back through past periods. T10 (not in order): 2015 Japan, China, UK, Luxembourg, Cayman, Ireland, Switzerland, Taiwan, Hong Kong, & Brazil; 2019 Japan, China, UK, Luxembourg, Cayman, Belgium, Ireland, Switzerland, Hong Kong, & Brazil.

²⁰ Japanese investors now have an investment alternative in their own government bonds, after its central bank moved away from yield curve control, thereby increasing yields. China's slowing economy means there is less money to invest in these (and other) securities.

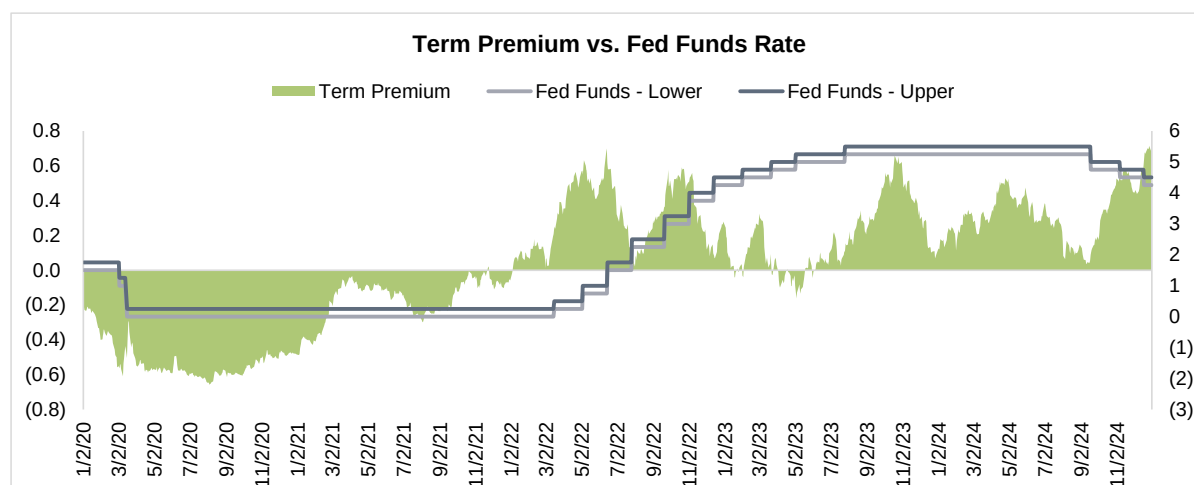
Other holders: Other holders represented 50.1% of total Treasuries in 2024, or \$13.1 trillion. Holdings have more than doubled over the last ten years, +113.4%. This share represented the peak level for this group, having grown 4.3 pps since 2019.

Within this group, the top ten asset managers held \$2.6 trillion in Treasuries, 19.9% of total other holdings and 10.0% of total Treasuries outstanding. The top ten insurance companies held \$0.3 trillion in Treasuries, 2.3% of total other holdings and 1.1% of total Treasuries outstanding. The largest pension fund on the list alone held \$0.2 trillion in Treasuries, 1.5% of total other holdings and 0.7% of total Treasuries outstanding. These investors are more price sensitive than central banks (the Fed, foreign holders). Banks are also large holders of Treasuries. The top ten banks held \$1.6 trillion in Treasuries, 12.2% of total other holdings and 6.1% of total Treasuries outstanding. While these investors are quite savvy, their purchases may often be associated with their responsibilities as primary dealers. As such, their price sensitivity will be limited when acting in this capacity (to an extent).

The demand shift to price sensitive investors raises concerns about Treasury take-up. While we have not seen issues yet, primary dealers remain concerned about how much capacity the system has to absorb new issuances at Treasury auctions.

Additionally, price sensitivity can increase term premiums. Increasing the Fed Funds rate, the short end of the curve, typically feeds through rates on the long end of the curve, increasing the ten year Treasury. Additionally, market expectations – in this case around the inflation environment and the need for the Fed to raise rates to combat inflation – can push long rates higher. As the risk of holding a bond over a longer period increases, so does the term premium.

When the Fed held a 0% interest rate, the term premium was negative. As the Fed began rate hikes in March 2022, the term premium began to rise. For the most part, as rates rose and remained higher for longer, the term premium rose, albeit ebbing and flowing across the years as markets anticipated Fed rate moves. (Interesting that the term premium rose prior to the first rate hike. By late 2021, when the Fed was calling inflation transitory, bond markets had priced in a more stubborn inflation picture, as shown in the spreads.) These moves make sense.

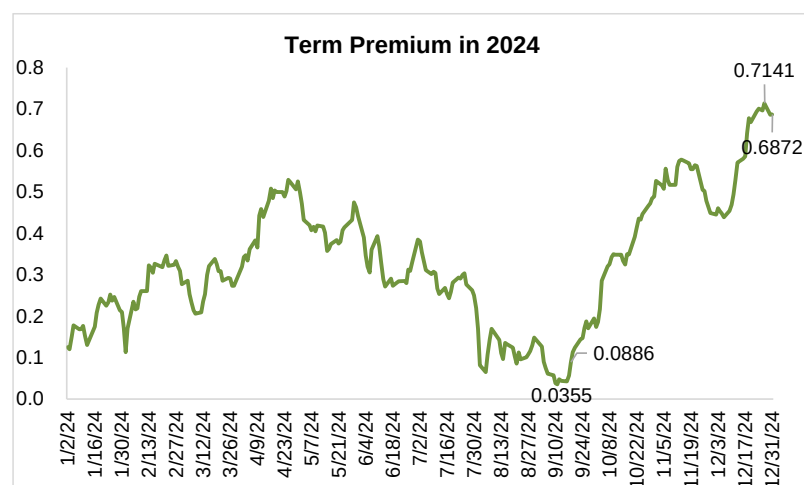


Source: Bloomberg, SIFMA estimates

Note: Term premium on a 10 year UST. The yield on a nominal Treasury security can be decomposed into the sum of the compounded expected future short-term interest rate over the maturity of the bond and a risk or term premium to compensate investors for the uncertain return on holding the bond (over a horizon less than its maturity).

What was not obvious based on historical patterns and correlations to rate hikes/cuts was the increase in the term premium in September 2024. Overall, the term premium had been falling since the spring of 2024, with a steeper decline after economic data in July caused markets to anticipate that rate cuts were close. The term premium was close to zero by early September. After hitting peak level of 5.25-5.50% in July 2023, the fed Funds rate remained at this level for almost fifteen months until the first rate cut in mid-September 2024 (and this was an unexpected 50 bps cut). However, the term premium climbed after that meeting, continuing to increase through the end of the year.

Question: Why the disconnect? Answer: Fiscal spending. As we discussed above, market expectations are built into the term premium. Market participants see no end to fiscal spending (an expectation held for both candidates leading into the presidential election last fall). Fiscal spending is inflationary, meaning a slowing – or we hate to say it, a reversal – of rate cuts. As such, the term premium remains elevated, at 69 bps. This is compared to an average of 0.25 bps in 2022/2023 and 0.28 bps on average in 2024 ahead of the September FOMC meeting.



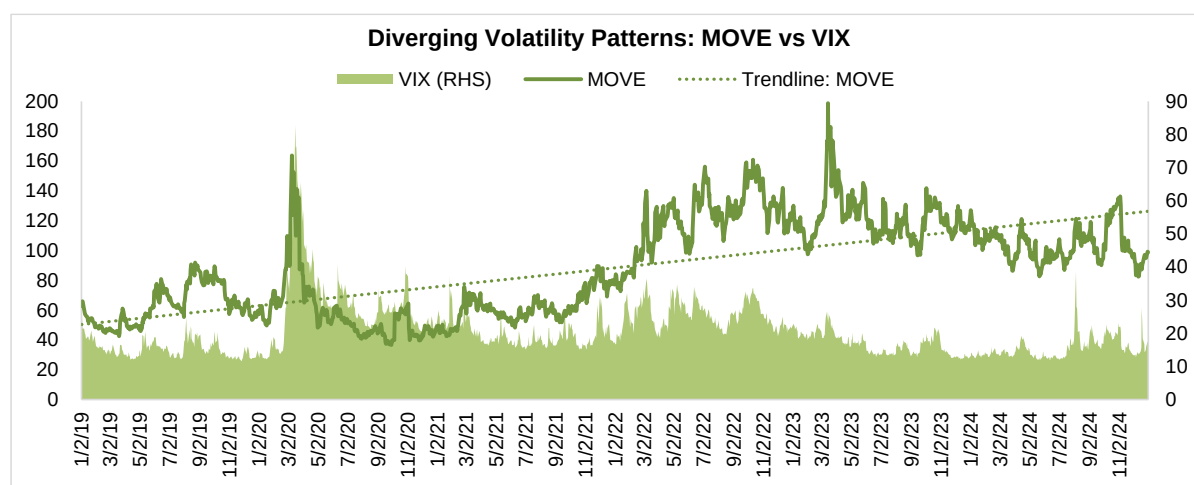
Source: Bloomberg, SIFMA estimates

Note: Term premium on a 10 year UST. The yield on a nominal Treasury security can be decomposed into the sum of the compounded expected future short-term interest rate over the maturity of the bond and a risk or term premium to compensate investors for the uncertain return on holding the bond (over a horizon less than its maturity).

Volatilities Disconnect Continues

A final theme we continued to monitor in 2024 was the disconnect between volatility in fixed income markets (MOVE index) versus equities (VIX index)²¹.

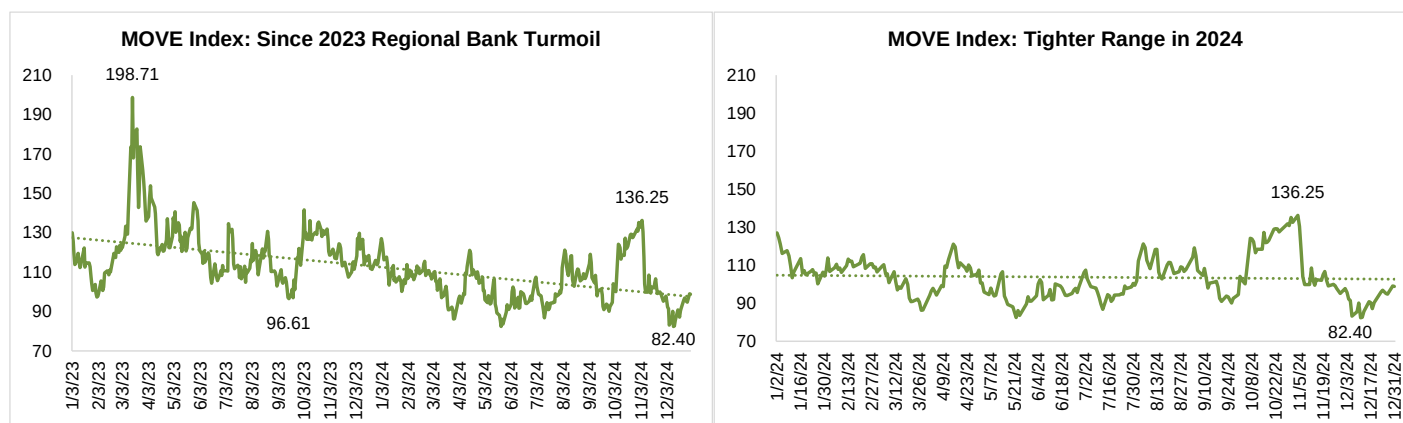
Historically, movements in the two indices were correlated in direction – a 0.6074 correlation since 2000 – though varying in peaks/troughs and exact timing of directional shifts. However, this correlation turned slightly negative when looking at the 2019 through 2024 period, -0.0197. In 2021, the disconnect between the two volatility measures began – the MOVE became elevated to historical levels, while the VIX remained relatively more in line with historical levels. In 2024, the MOVE came down, albeit still elevated. The correlation between the MOVE and the VIX in 2024 was 0.4973.



Source: Bloomberg, SIFMA estimates

²¹ Implied volatility indices use options contracts – options on stocks for the VIX, options on US Treasuries for the MOVE – to measure the expected price movements of securities, reflecting market participants' aggregate expectations of future volatility.

The MOVE has been on the decline since the regional bank turmoil in the spring of 2023. At the height of that event, the MOVE peaked at 198.71 but then came back down and leveled out. The MOVE ended 2023 at 114.62, declining to 98.80 to end 2024.



Source: Bloomberg, SIFMA estimates

Looking at annual averages, the MOVE is coming back down after spiking in 2022. The average MOVE in 2024, 103.69, ranked eight out of the twenty-five years shown here. The two highest ranked years were during the global financial crisis – 2024 average MOVE was down around 27% on average to these years. Interestingly, MOVE in the 2020 COVID year only ranked twenty-three – although its peak level ranked number five – and 2024 average MOVE was up 75% to this year. While the MOVE came down in 2024, the slope of the line was essentially flat, meaning the MOVE could be stalled around this level.

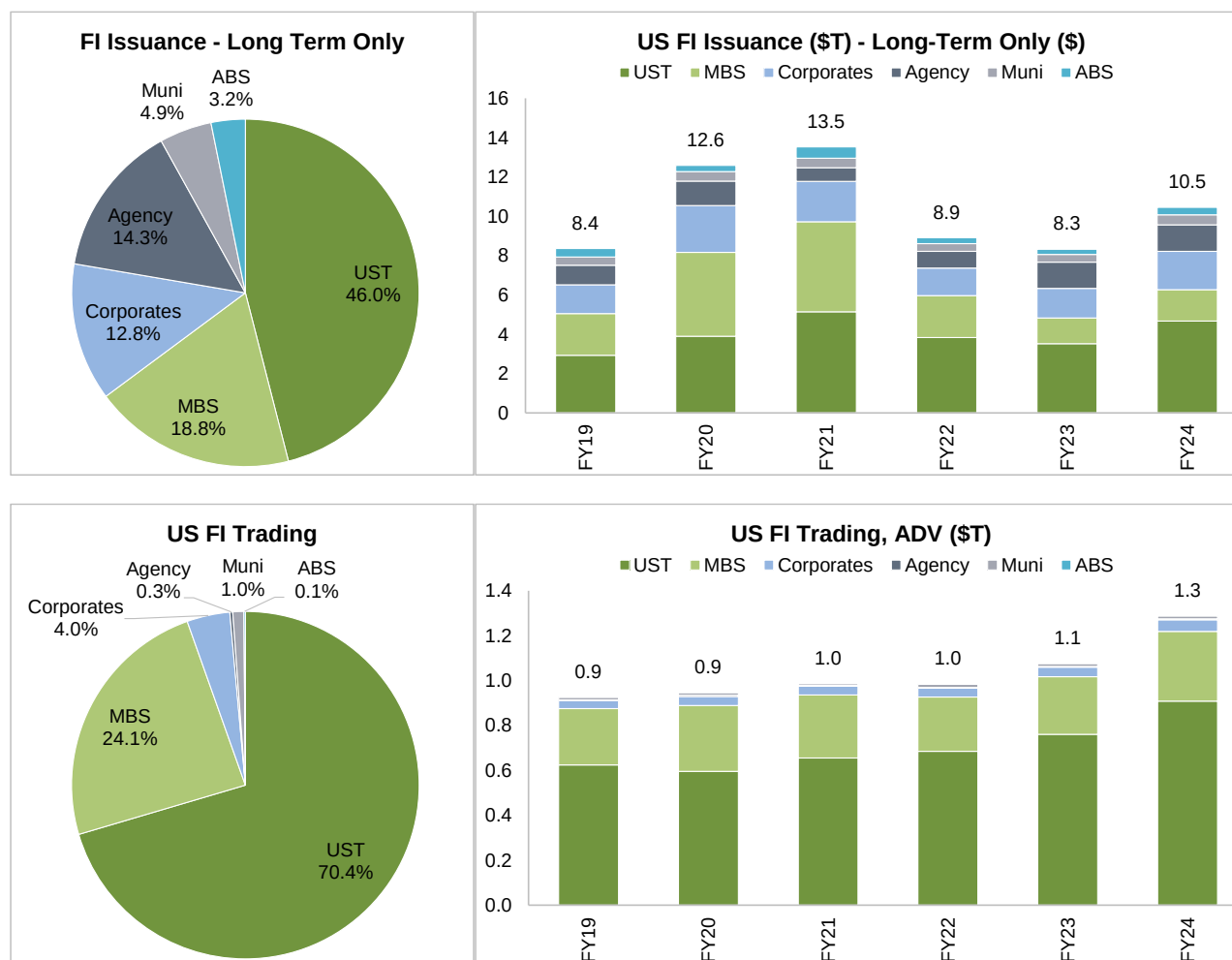
	Average	Peak
2000	95.62	124.48
2001	109.83	166.51
2002	122.92	158.55
2003	113.48	160.86
2004	99.33	137.81
2005	78.73	101.41
2006	64.66	75.65
2007	85.23	154.70
2008	154.55	264.60
2009	131.68	190.30
2010	92.25	125.20
2011	94.21	117.80
2012	69.76	95.40
2013	71.41	117.89
2014	62.08	101.28
2015	80.97	98.47
2016	71.83	97.94
2017	56.91	78.32
2018	53.96	71.78
2019	63.05	91.82
2020	59.14	163.70
2021	61.89	89.45
2022	120.31	160.72
2023	121.61	198.71
2024	103.69	136.25

Source: Bloomberg, SIFMA estimates

US Fixed Income Market Metrics

Total Fixed Income

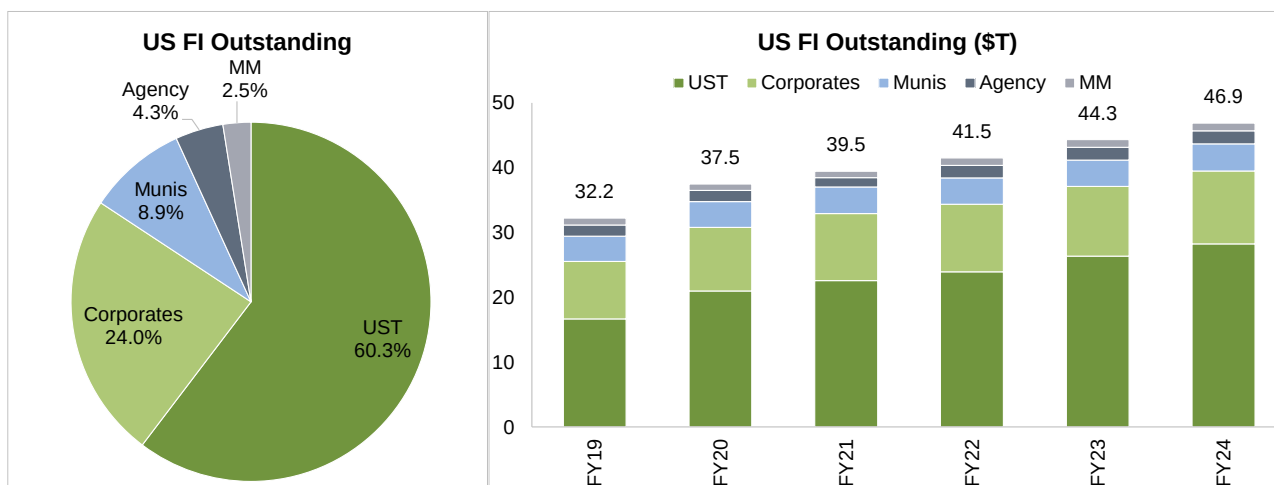
- Issuance: \$10.5T; +25.6% Y/Y
- ADV: \$1.3T; +19.6% Y/Y



Source: Bloomberg, The Federal Reserve, Federal Reserve Bank of New York, FINRA, Municipal Securities Rulemaking Board, Refinitiv, US Agencies, US Treasury, SIFMA estimates

Note: UST = US Treasury securities, MBS = mortgage-backed securities, Corporates = corporate bonds, Agency = federal agency securities, Munis = municipal bonds, ABS = asset-backed securities.

- Outstanding: \$46.9T; +5.7% Y/Y

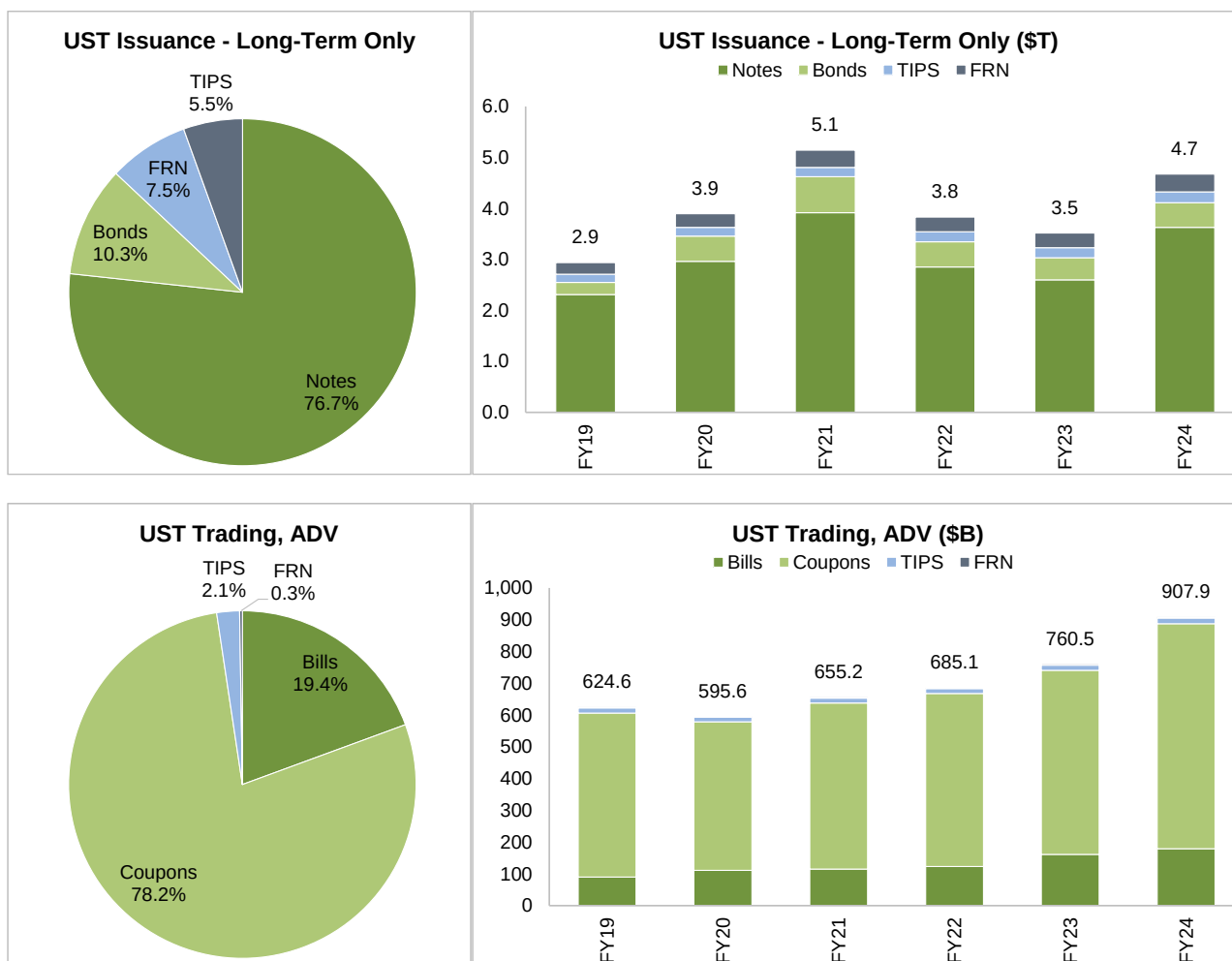


Source: Bloomberg, The Federal Reserve, Federal Reserve Bank of New York, FINRA, Municipal Securities Rulemaking Board, Refinitiv, US Agencies, US Treasury, SIFMA estimates

Note: UST, Agency as of 4Q24, Corporates, Munis as of 3Q24. UST = US Treasury securities, MBS = mortgage-backed securities, Corporates = corporate bonds, Agency = federal agency securities, Munis = municipal bonds, ABS = asset-backed securities.

Treasuries (UST)

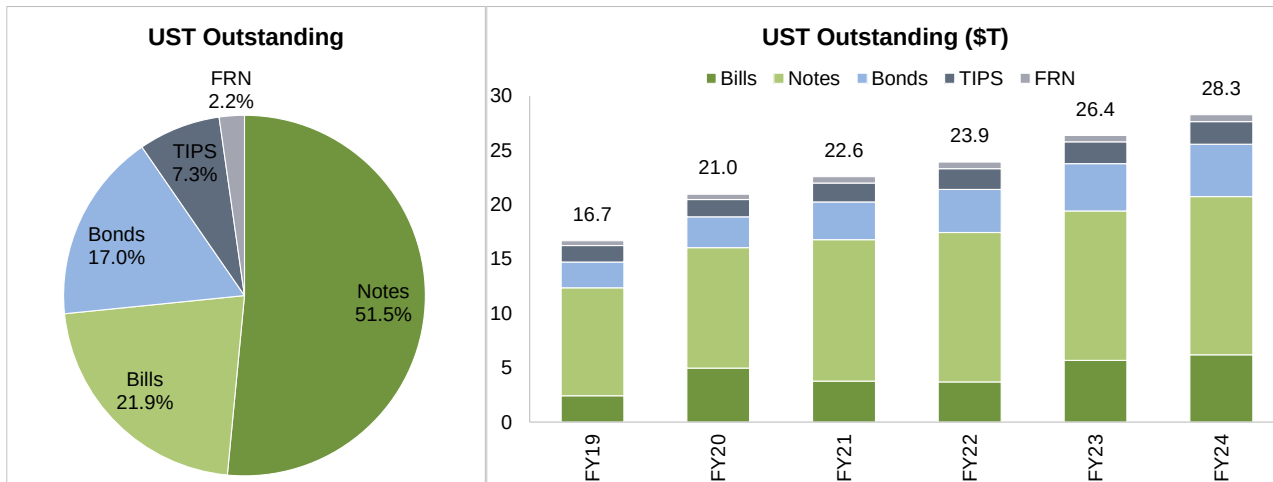
- Issuance (long-term only): \$4.7T; +32.8% Y/Y
- ADV \$907.9B; +19.4% Y/Y



Source: FINRA, NY Fed, US Treasury, SIFMA estimates

Note: FRN = floating rate note, TIPS = Treasury inflation-protected securities

- UST Outstanding: \$28.3T; +7.2% Y/Y

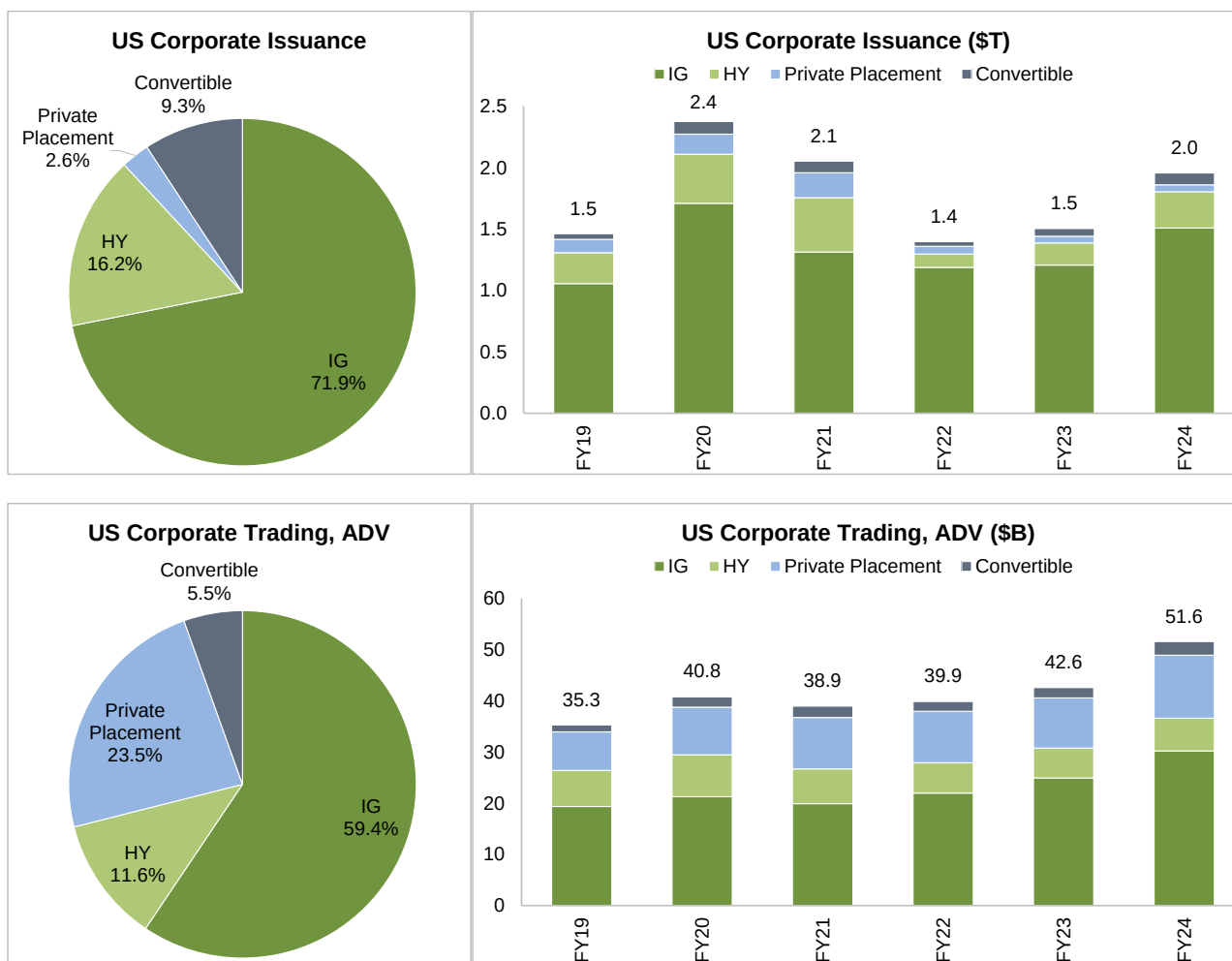


Source: FINRA, NY Fed, US Treasury, SIFMA estimates

Note: FRN = floating rate note, TIPS = Treasury inflation-protected securities

Corporate Bonds (Corporates)

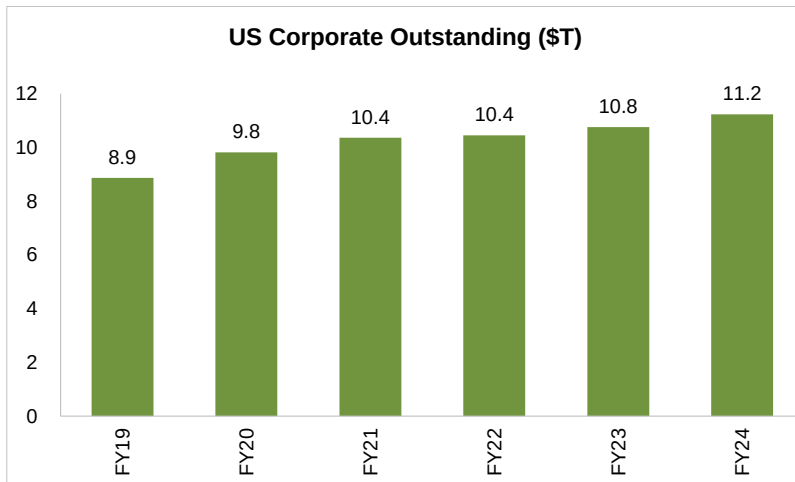
- Issuance: \$2.0T; +30.2% Y/Y
- ADV: \$51.6B; +21.1% Y/Y



Source: Refinitiv, FINRA, The Federal Reserve, SIFMA estimates

Note: IG = investment grade, HY = high yield

- Outstanding: \$11.2T, +4.4% Y/Y

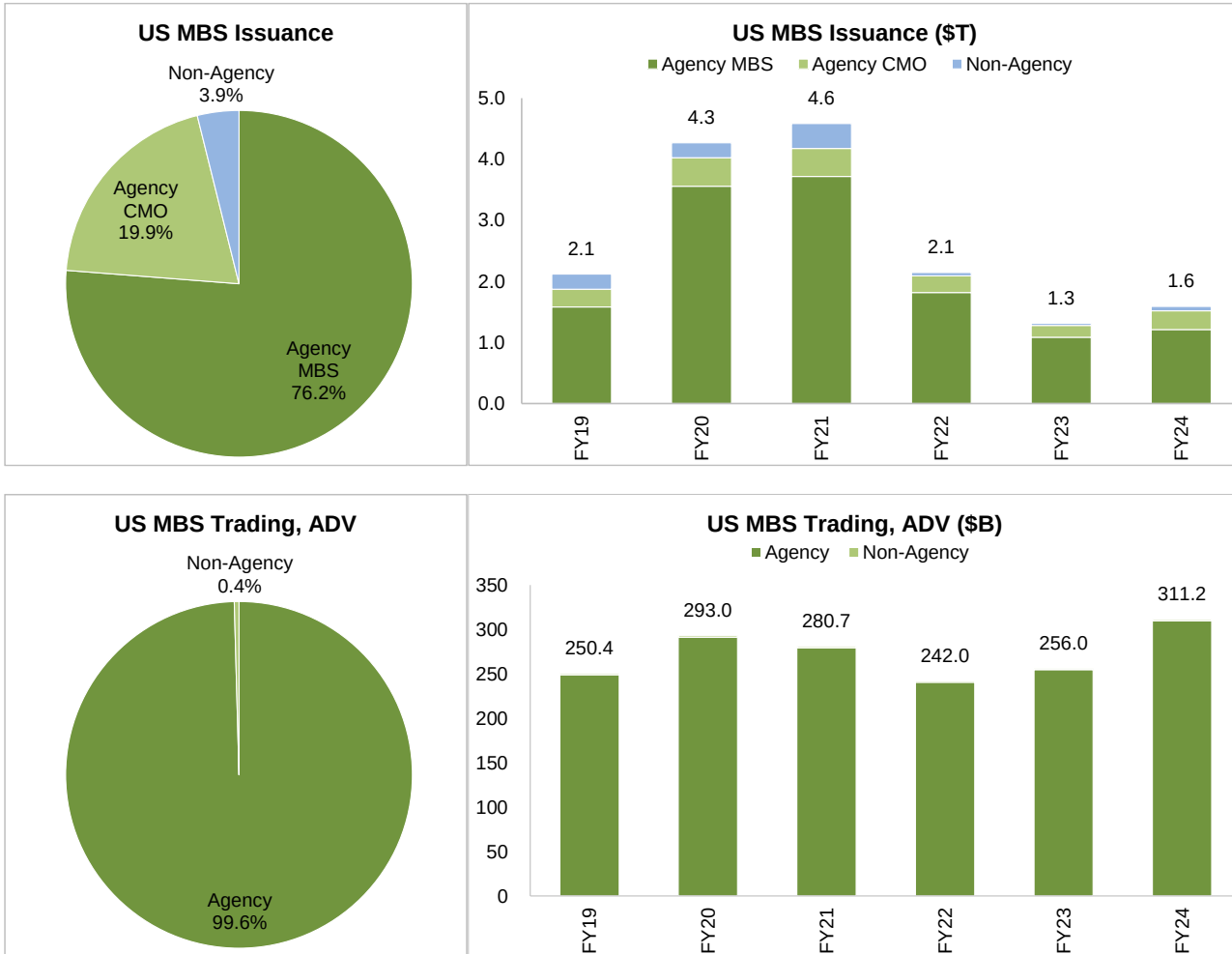


Source: The Federal Reserve, SIFMA estimates

Note: Data as of 3Q24.

Mortgage-Backed Securities (MBS)

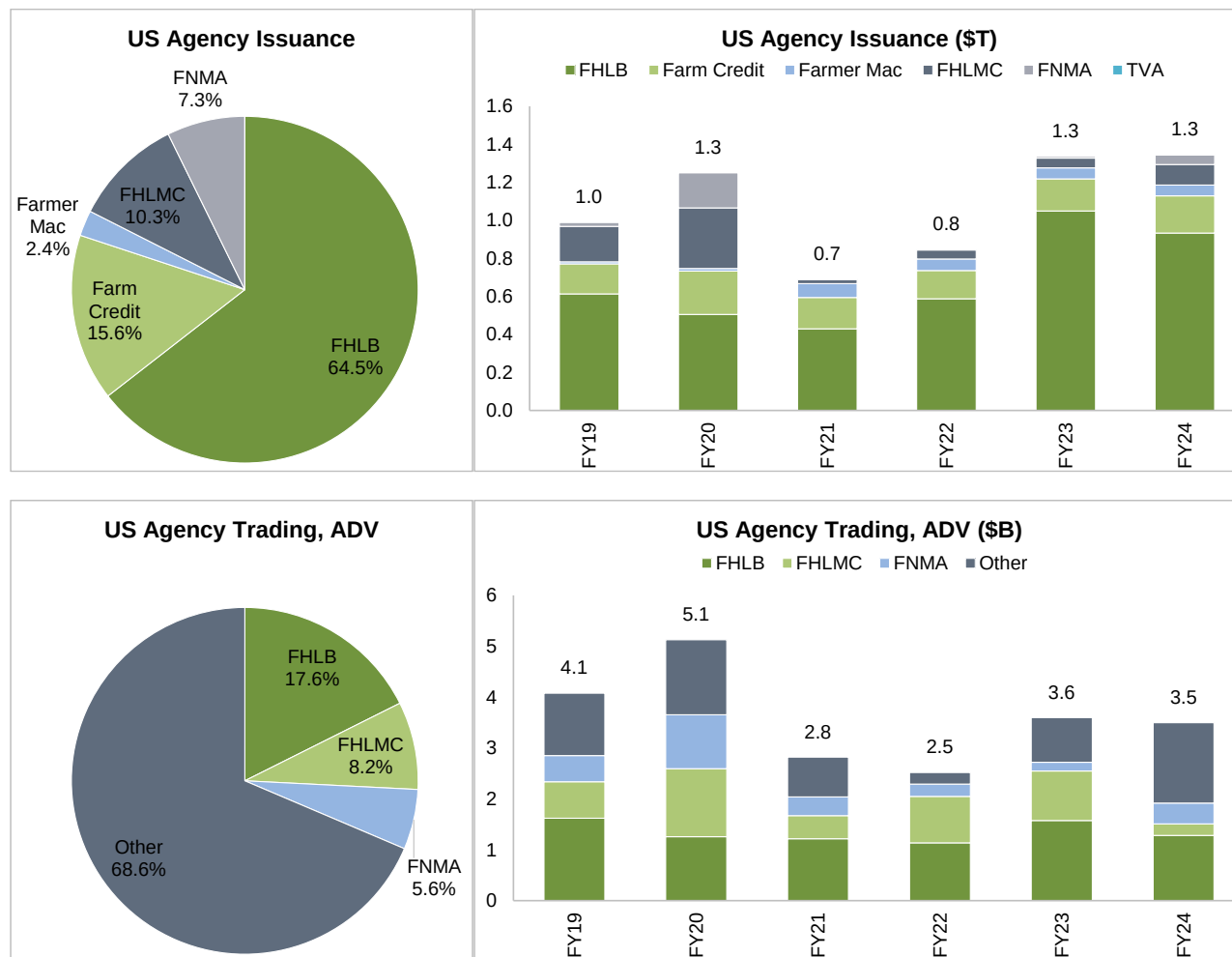
- Issuance: \$1.6T; +21.4% Y/Y
- ADV: \$311.2B; +21.6% Y/Y



Source: Bloomberg, US Agencies, FINRA, SIFMA estimates
 Note: CMO = collateralized mortgage obligation

Federal Agency Securities (Agency)

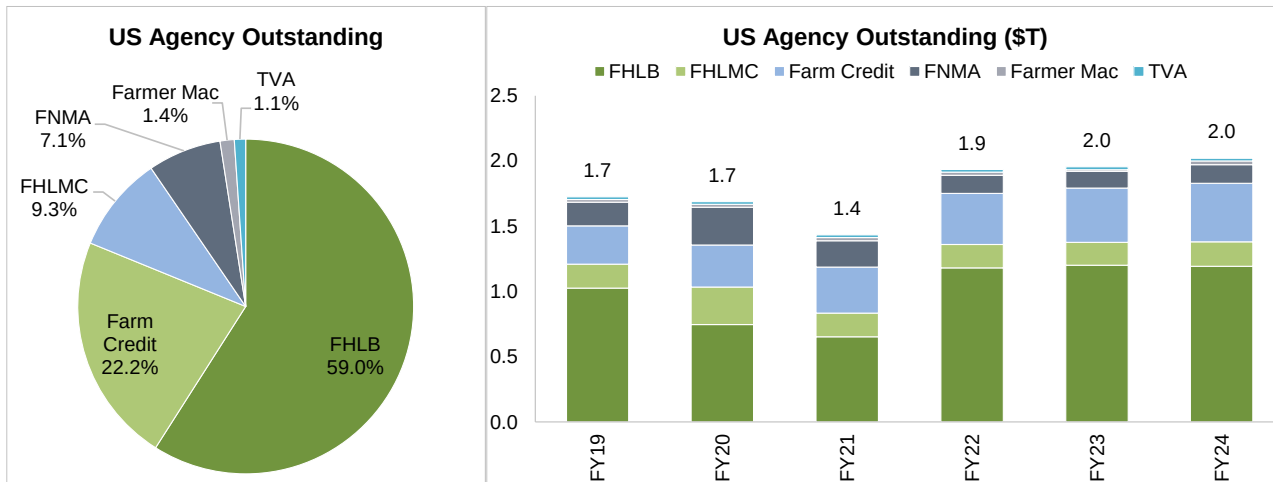
- Issuance: \$1.3T; +0.5% Y/Y
- ADV: \$3.5B; -2.8% Y/Y



Source: FINRA, US Agencies, SIFMA estimates

Note: FHLB = The Federal Home Loan Banks, FHLMC = The Federal Home Loan Mortgage Corporation (Freddie Mac), FNMA = The Federal National Mortgage Association (Fannie Mae), TVA = The Tennessee Valley Authority

- Outstanding: \$2.0T; +3.4% Y/Y

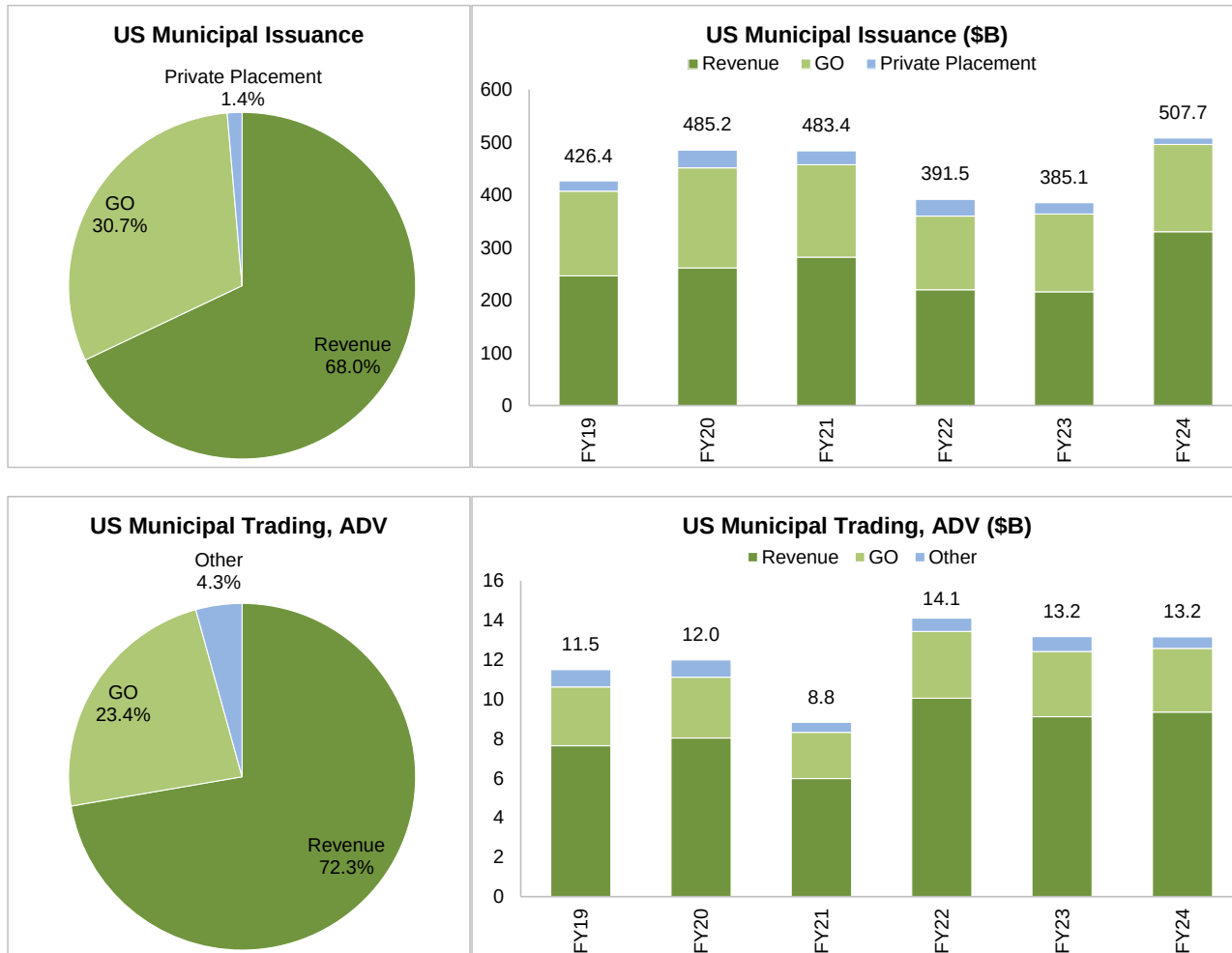


Source: US Agencies, SIFMA estimates

Note: FHLB = The Federal Home Loan Banks, FHLMC = The Federal Home Loan Mortgage Corporation (Freddie Mac), FNMA = The Federal National Mortgage Association (Fannie Mae), TVA = The Tennessee Valley Authority

Municipal Bonds (Munis)

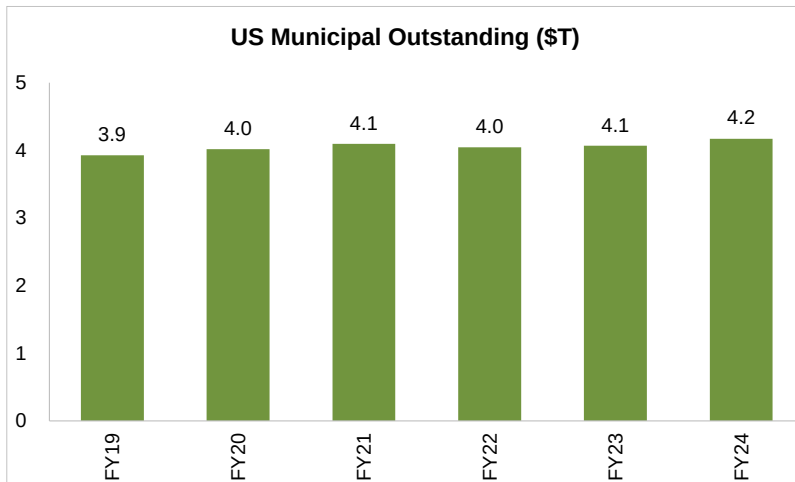
- Issuance: \$507.7B; +31.8 Y/Y
- ADV: \$13.2B; -0.1% Y/Y



Source: Municipal Securities Rulemaking Board, SIFMA estimates

Note: GO = general obligation

- Outstanding: \$4.2T; +2.6% Y/Y

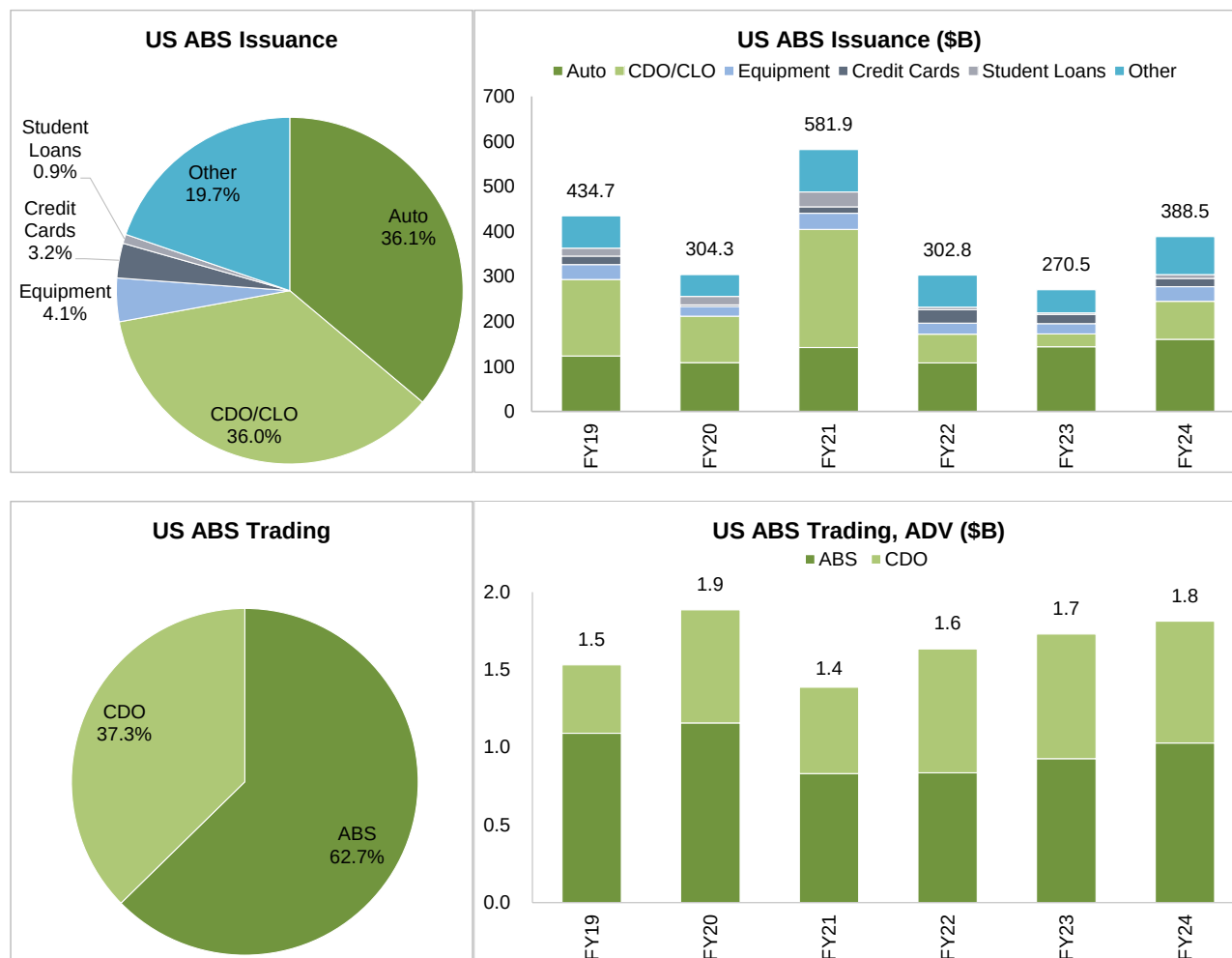


Source: Municipal Securities Rulemaking Board, SIFMA estimates

Note: Data as of 3Q24

Asset-Backed Securities (ABS)

- Issuance: \$388.5B; +43.6% Y/Y
- ADV: \$1.8B; +4.8% Y/Y

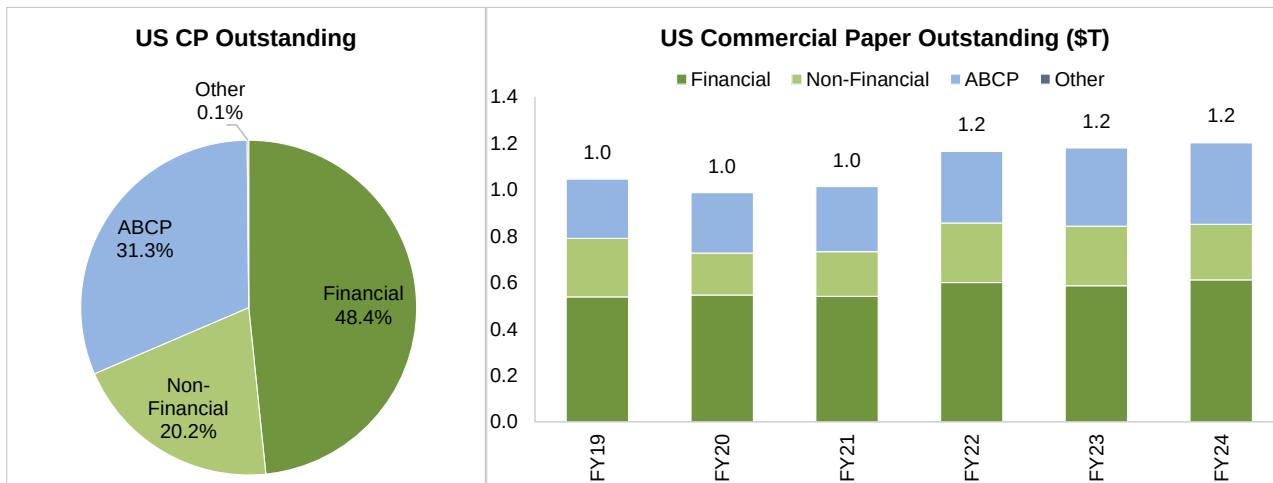


Source: Bloomberg, FINRA, Refinitiv, SIFMA estimates

Note: CDO = collateralized debt obligation, CLO = collateralized loan obligation

Money Markets (MM)

- Outstanding: \$1.2T; +2.1% Q/Q, -0.7% Y/Y

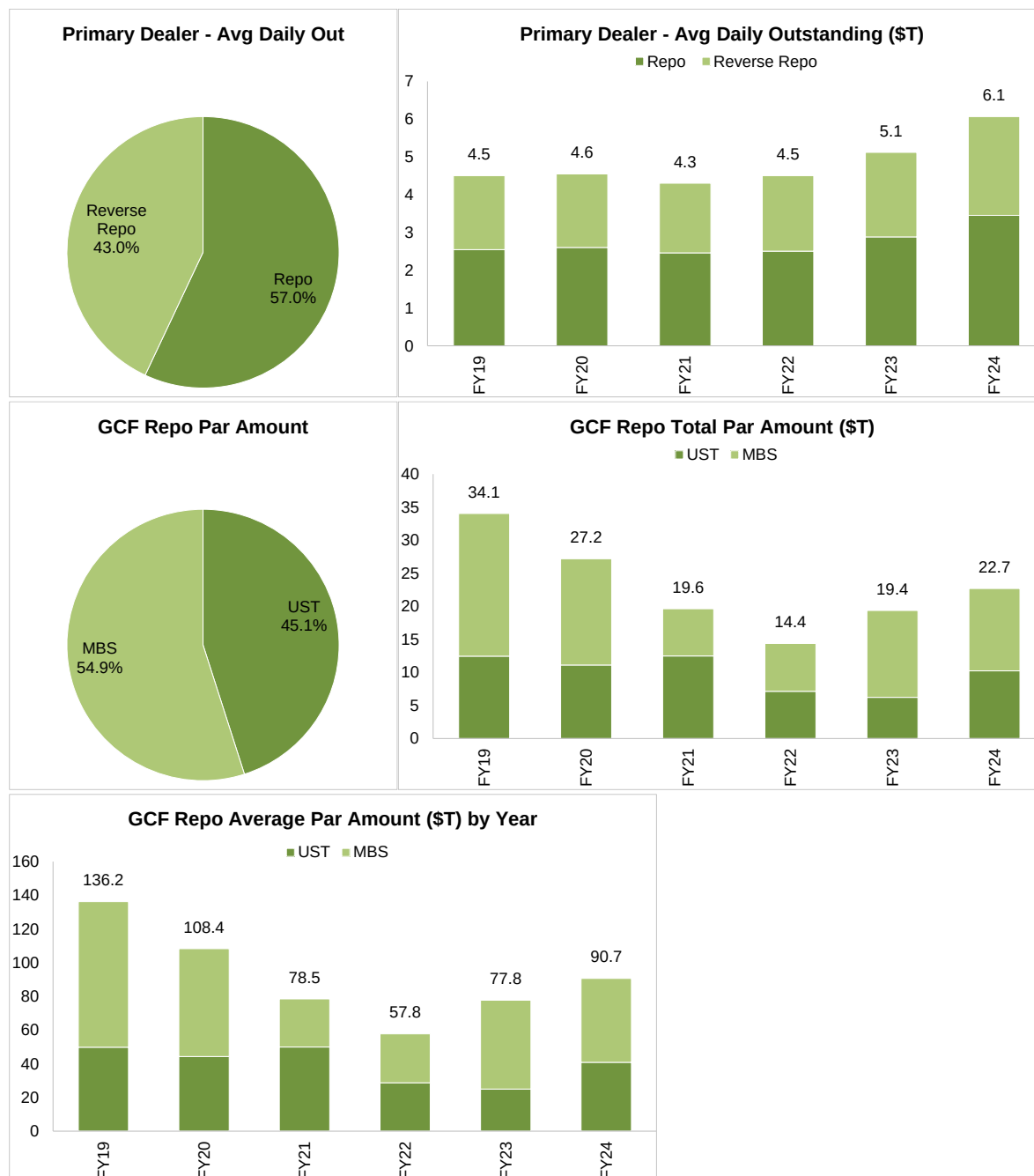


Source: The Federal Reserve Bank of New York, SIFMA estimates

Note: ABCP = asset-backed commercial paper

Repurchase Agreement (Repo)

- Primary dealer repo and reverse repo average daily outstanding: \$6.1T; +3.6% Q/Q, +21.5% Y/Y
- General collateral financing (GCF) repo par amount: total: \$22.7T; +13.0% Q/Q, +40.9% Y/Y; average: \$90.7B; +16.7% Q/Q, +40.9% Y/Y

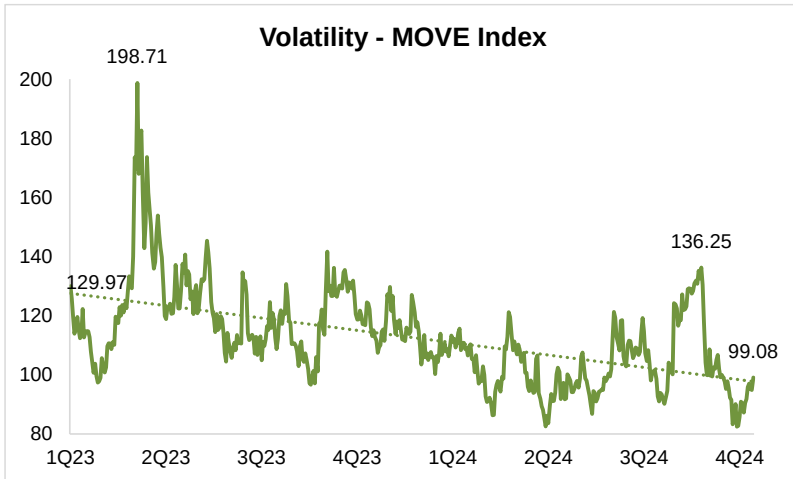


Source: The Federal Reserve Bank of New York, SIFMA estimates

Rates Review

Volatility (MOVE Index)

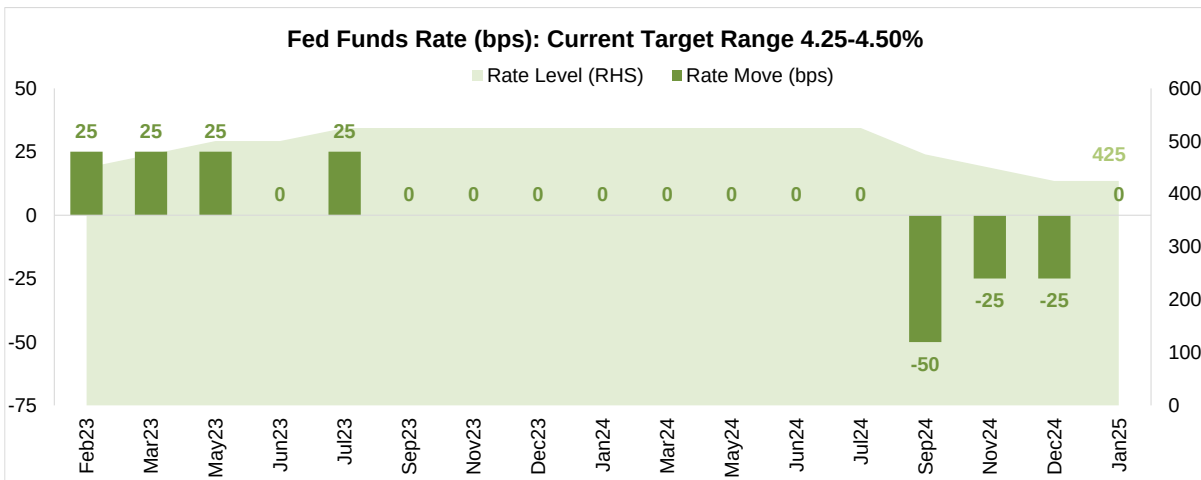
- Year end: 99.08
- Peak: 136.25 on 11/4/24



Source: Bloomberg, SIFMA estimates

Federal Funds Rate (Fed Funds)

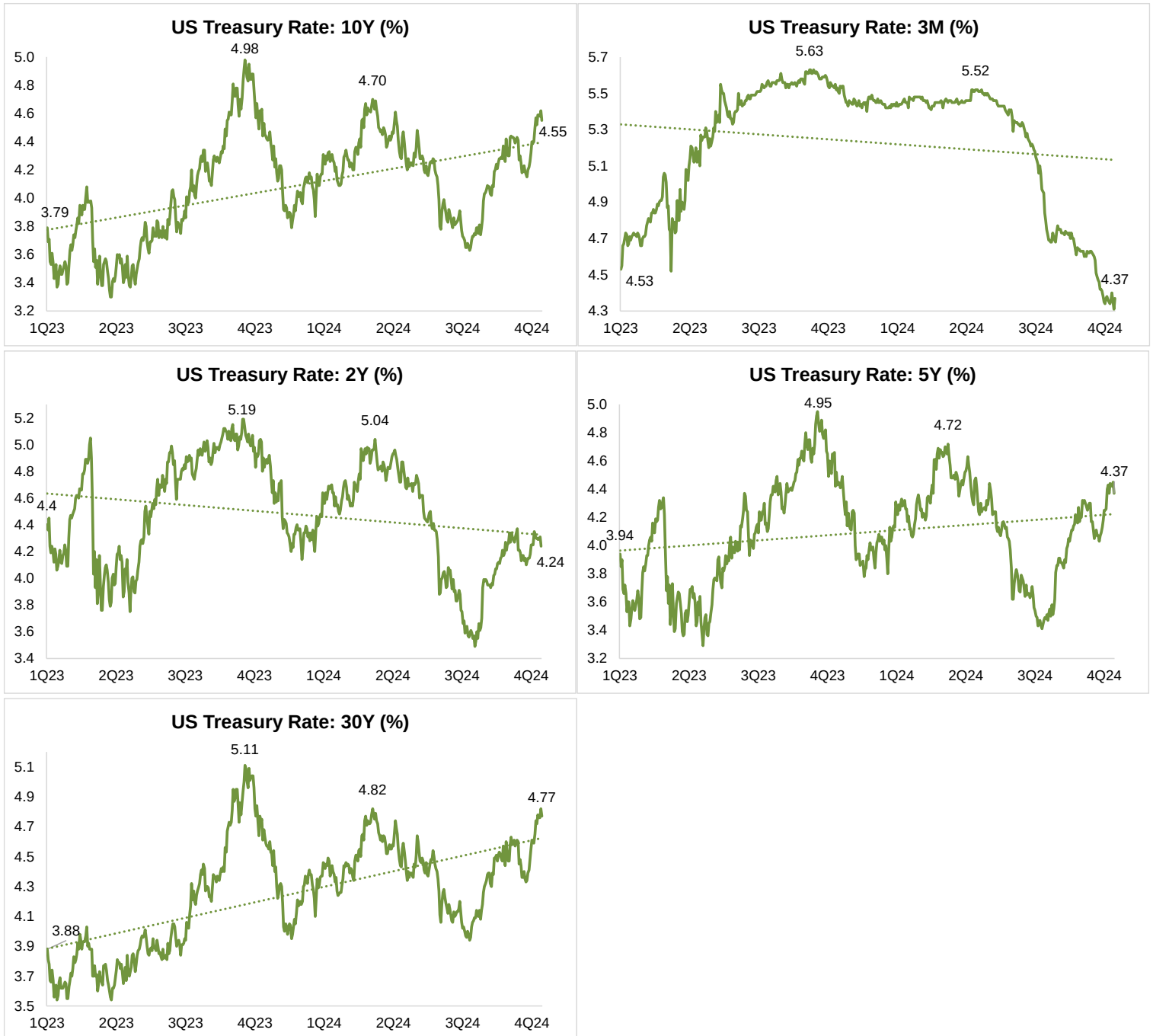
- Current (next FOMC meeting March 18-19, 2025): 4.25%-4.50% (upper bound shown in the chart)



Source: Bloomberg, SIFMA estimates

UST by Tenor

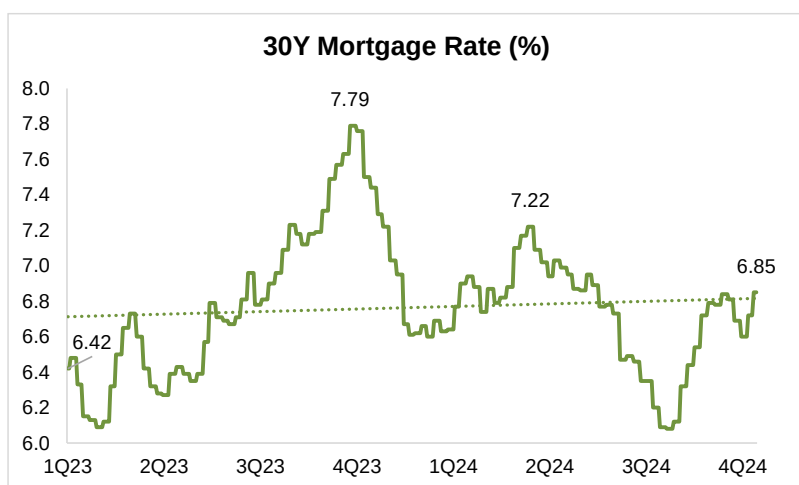
- 10 Year Benchmark
 - Year end: 4.55%
 - Peak: 4.70% on 4/25/24



Source: Bloomberg, SIFMA estimates

30-Year Mortgage Rate

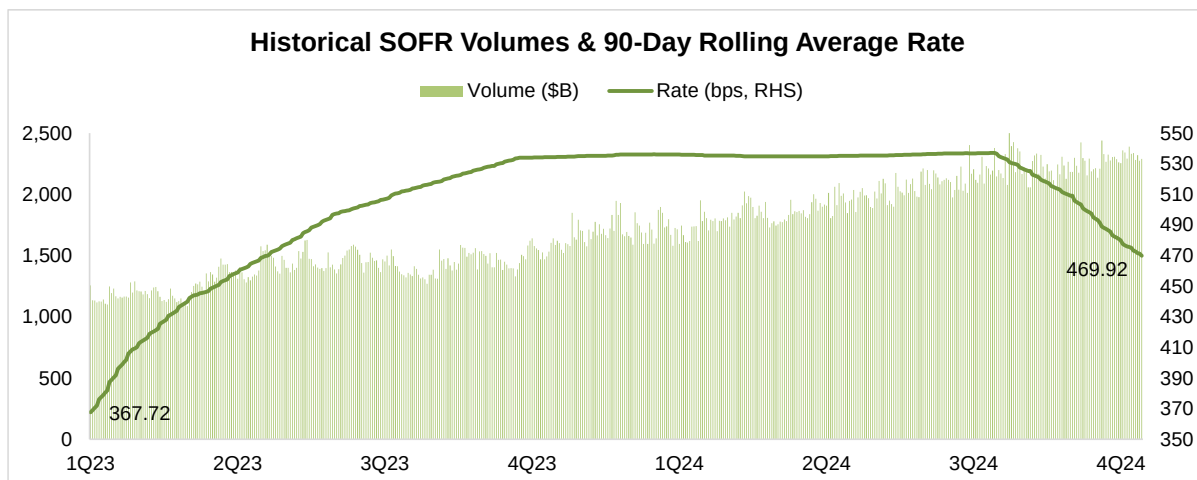
- Year end: 6.85%
- Peak: 7.22% week of 5/2/24



Source: Bloomberg, SIFMA estimates

Secured Overnight Financing Rate (SOFR)

- Year end (90 day rolling average): 469.92 bps
- Year end Fed Volumes: \$2,290.0B



Source: Federal Reserve Bank of New York, SIFMA estimates

Appendix: Definitions & Purpose

In general, fixed income securities are borrowed capital for the issuer to fund government operations, public projects, or corporate investments, thereby fueling economic growth. The diversity of fixed income products both increases the amount of funds available to borrow and spreads credit risk across multiple market participants.

- **US Treasury Securities (UST)** – UST are debt obligations of the federal government used to fund its operations. Since UST are backed by the full faith and credit of the US government, these securities are considered by market participants as the benchmark credit. As such, UST have a diversity of holders, in both institutional and retail, and domestic and foreign. UST include the following securities:
 - Treasury Bills (T-Bills): Non-interest bearing (zero-coupon) short-term securities with maturities of only a few days or 4, 8, 13, 17, 26, or 52 weeks. They are purchased at a discount to par (face) value and paid out at par value at maturity.
 - Treasury Notes (T-Notes): These are fixed-principal securities with maturities of 2, 3, 5, 7, and 10 years. Interest is paid semiannually, with the principal paid at maturity.
 - Treasury Bonds (T-Bonds): These are fixed-principal, long-term securities issued with a maturity of 20 or 30 years. Outstanding T-bonds have remaining maturities of 10 to 30 years. Interest is paid semiannually, with the principal paid at maturity.
 - Treasury Inflation Protected Securities (TIPS): These are indexed to inflation, as measured by the Consumer Price Index (CPI), acting as a hedge against the negative effects of inflation. They come in 5, 10, and 30 year maturities, and interest is paid semiannually. TIPS are considered a low-risk investment since the par value rises with inflation, while the interest rate remains fixed.
 - Floating Rate Notes (FRN): These are debt instruments with a 2 to 5 year maturity and a variable interest rate. Its interest rate is tied to a benchmark (US T-Bill rate, Fed Funds rate).
- **Repurchase Agreements (Repos)** – Repos are financial transactions in which one party sells an asset to another party with a promise to repurchase the asset at a pre-specified later date (a reverse repo is the same transaction seen from the perspective of the security buyer). Repos can be overnight (duration one day) or term (duration up to one year; some are up to two years, but the majority are three months or less). The repo market enables market participants to provide collateralized loans to one another, and financial institutions predominantly use repos to manage short-term fluctuations in cash holdings, rather than general balance sheet funding. In general, repos aid secondary market liquidity for the cash markets (for example, US Treasuries/UST), allowing dealers to act as market makers in a very efficient manner.

- **Corporate Bonds (Corporates)** – Corporates are debt securities issued by public and private corporations. They are issued to raise money to fund investments or expansion plans. Corporates are considered riskier than UST and commonly receive ratings from credit ratings agencies that help investors determine creditworthiness, i.e. the probability of repayment of debt in according to its terms.
 - Corporates include the following categories of securities:
 - Publicly Traded: SEC-registered bonds.
 - 144A: Securities Act Rule 144A creates a mechanism for the sale of bonds that are not registered with the SEC, if certain conditions are met.
 - High Yield: Bonds rated by the credit rating agencies below BBB, indicating a higher risk of default.
 - Investment Grade: Bonds rated by the credit rating agencies as BBB or higher, indicating a lower risk of default.
 - The securities may have one or more of the following structural features:
 - Fixed Rate: These pay the same rate of interest for its entire term, i.e. a guaranteed interest rate throughout maturity.
 - Floating Rate: These pay a variable interest rate, typically tied to a benchmark rate, such as the US Treasury bill rate, Fed Funds rate, SOFR, or the prime rate.
 - Callable: These resemble standard bonds, but the issuer has an option to recall (retire) and prepay the bonds. Otherwise, the bond retires at the originally specified maturity date.
 - Non-Callable: These cannot be redeemed early by the issuer except with the payment of a penalty.
 - Convertible: These can be converted into a predetermined amount of the underlying company's equity at certain times during the bond's life, usually at the bondholder's discretion.

- **Mortgage-Backed Securities (MBS)** – A mortgage is a debt instrument collateralized by a specified real estate property(ies). Mortgages may be related to residential or commercial properties. A typical residential mortgage has a term of 15 or 30 years, fully amortizing, and is freely prepayable by the borrower. Commercial mortgages may have varying terms and typically feature a bullet maturity as opposed to being fully amortizing. A pool of mortgages will serve as collateral for, and the source of repayment of, MBS. MBS include the following securities:
 - Agency MBS: Issued by Fannie Mae, Freddie Mac, or Ginnie Mae. Can be residential or commercial. Many residential agency MBS are traded in the so-called TBA market, where securities are sold on a forward basis, provide an important hedging mechanism for mortgage lenders, and allow borrowers to get free or low-cost rate locks when they shop for loans.
 - Non-Agency MBS: Issued by private entities, such as finance companies or banks. Can be residential or commercial.
 - Passthrough: The security simply "passes through" payments made by borrowers to security holders (subject to customary fees, such as servicing fees).
 - Collateralized Mortgage Obligation: Cashflows from a pool of mortgage loans are structured in to multiple classes of bonds which may have varying terms, and levels of prepayment, credit, or other risks.
 - Residential MBS (RMBS): A bond collateralized by residential mortgages on 1-4 family homes.
 - Commercial MBS (CMBS): A bond collateralized by commercial and/or multifamily mortgages.
 - Fixed-Rate Mortgage: The borrowers on the mortgage that collateralize the MBS pay the same interest rate for the life of their loans, i.e. monthly principal and interest payment never change.
 - Adjustable-Rate Mortgage (ARM): The borrowers on the underlying mortgages have variable interest rates that are commonly fixed for an initial term but then fluctuate with market rates or relative to an index. Monthly payments may change
- **Asset-Backed Securities (ABS)** – Similar to MBS, ABS are securities collateralized by a pool of assets such as auto loans, student loans, credit card debt (cards), equipment, home equity loans, aircraft leases, other loans and leases, royalties, or account receivables. Pooling these assets creates a more liquid investment vehicle, with a valuation based on the cash flows of the underlying assets and the structure of the transaction.

- **Federal Agency Securities (Agency)** – Agency debt is issued by quasi-governmental agencies to fund operations. Unlike UST, these securities are not always fully guaranteed by the US government but are considered to have some degree of an implicit guarantee.
 - Federal Government Agency Bonds: These are backed by the full faith and credit of the US government and include bonds issued by the Small Business Administration (SBA), etc.
 - Government-Sponsored Enterprise Bonds (GSE): These are not backed by the same guarantee as federal government agencies and are issued by the Federal National Mortgage Association (Fannie Mae or Fannie), Federal Home Loan Mortgage (Freddie Mac or Freddie), Federal Farm Credit Banks Funding Corporation (Farm Credit) or the Federal Home Loan Bank (FHLB), Federal Agricultural Mortgage Corporation (Farmer Mac). Tennessee Valley Authority (TVA) is unique. A wholly owned agency of the US government, the TVA is a self-supporting entity whose debt is not guaranteed by the government but rather is supported strictly by TVA revenues.
- **Municipal Bonds (Munis)** – Munis are debt securities issued by state or local governments or other government agencies and public entities, such as public utilities or school districts. The money raised funds public projects, predominantly infrastructure projects such as: roads, bridges, transit systems, water treatment centers, schools, airports or hospitals. Efficient muni markets enable states and municipalities to borrow at low rates and finance capital expenditures over a longer period commensurate with their useful lives. Munis include the following securities:
 - General Obligation Bond (GO): These are backed by dedicated property taxes or general funds of the municipality, not by revenue from a specific project.
 - Revenue Bond: These are backed by revenue from a specific project.
 - Negotiated: An underwriter sells the bonds to its clients, after determining the bond price by gathering indications of interest during a presale.
 - Competitive: Bonds are advertised for sale, and any market participant may bid, with the bonds going to the bidder offering the lowest interest cost.
 - Private placement: A broker-dealer sells the entire muni bond placement to its clients.
 - Refunding: Retiring or redeeming an outstanding bond issue at maturity by using the proceeds from a new debt issue, typically at a lower interest rate.
 - New Capital: First issue of a bond, not a refunding.
 - Tax-Exempt Bond: The interest earned by investors is generally free from federal income tax and often state and local income tax.

- Taxable Bond: The interest earned by investors is subject to taxation
- **Money Markets (MM)** – The money markets involve highly liquid, short maturity (typically overnight to less than one year) financial instruments, which are used by issuers and investors to borrow and lend in the short term. Common money market instruments include:
 - Commercial Paper (CP): A short-term, unsecured debt instrument issued by a corporation, typically to finance short-term liabilities (accounts receivables, inventories, etc.). Maturities are usually under 270 days. CP is most often issued at a discount from face value and reflects prevailing market interest rates.
 - Certificate of Deposit (CD): A savings certificate with a fixed maturity date and interest rate, which restricts access to the funds until the maturity date. CDs are generally issued by commercial banks, in essentially any denomination, and are insured by the FDIC up to \$250,000 per individual.
 - Bankers Acceptances: A promised future payment, or time draft, guaranteed by and drawn on a deposit at the bank. The amount, date and holder of the draft are specified at issuance, at which time the draft becomes a liability of the bank. The holder of the draft can sell the bankers acceptance for cash to a buyer who is willing to wait until the maturity date for the funds in the deposit.
- **Secured Overnight Financing Rate (SOFR)** – As the world transitioned away from the London Interbank Offered Rate (LIBOR), SOFR was chosen by the US as its chosen alternative reference rate. Publication of the SOFR rate began in April 2018. Trading and clearing of SOFR based swaps and futures began in May 2018.

Appendix: Description & Purpose of Repo Markets

Defining Repo Markets

A repurchase agreement (repo) is a financial transaction in which one party sells an asset to another party with a promise to repurchase the asset at a pre-specified later date (a reverse repo is the same transaction seen from the perspective of the security buyer). Repos can be overnight (duration one day) or term (duration up to one year, albeit some are up to two years and the majority are three months or less). The repo market enables market participants to provide collateralized loans to one another, and financial institutions predominantly use repos to manage short-term fluctuations in cash holdings, rather than general balance sheet funding.

In general, repos aid secondary market liquidity for the cash markets (for example, US Treasuries/UST), allowing dealers to act as market makers in a very efficient manner. Market makers stand ready to buy and sell securities, providing liquidity to markets. These firms must take the other side of trades when there are short-term buy and sell imbalances in customer orders. Healthy repo markets provide them the necessary cash and access to securities to perform these actions and keep secondary cash markets running effectively. The ability to finance and efficiently source securities contributes to lower interest rates paid by the issuers, most notably the US Treasury, which lowers debt servicing costs borne by taxpayers.

The repo markets allow investors to manage excess cash balances safely and efficiently. Dealers also benefit from significantly reduced funding costs, the capacity to finance long positions in securities and the ability to borrow securities to cover short positions to satisfy client needs. Long holders of securities can also gain incremental returns by engaging in repo transactions with cash investors for securities they own but have no immediate need to sell.

Types of Repo Markets

While a broad array of assets may be financed in the repo market, the most commonly used instruments include UST, federal agency securities, high quality MBS, corporate bonds and money market instruments.

The repo market can be split into two main segments:

- **Bilateral Repo** – The bilateral repo market has investors and collateral providers directly exchange money and securities, absent a clearing bank. Bilateral repo transactions can either allow for general collateral or impose restrictions on eligible securities for collateral. Bilateral repo is preferred when market participants want to interact directly with each other or if specific collateral is requested.
- **Tri-Party Repo** – The tri-party repo market is named as such given the role played by clearing banks in facilitating settlement. Clearing banks act as an intermediary, handling the administrative details between the two parties in the repo transaction. Tri-party repo is used to finance general collateral, with investors accepting any security within a broad class of securities. According to the Federal Reserve Bank of New York (New York Fed), market participants view tri-party repo as more cost efficient.

There is also the **general collateral finance (GCF) repo** market, which is offered by the Fixed Income Clearing Corporation (FICC), a central clearing counterparty. GCF repo is predominantly used by securities dealers, who negotiate the trade on an anonymous basis and then submit it to FICC. FICC then interposes itself as the legal counterparty to both sides of the repo transaction.

Repo Market Participants

Securities dealers are at the heart of the repo market, operating in all repo market segments. The diagram on the following page shows the interaction of market participants in both repo market segments described above.

Additional participants in the repo market include:

- **Financial institutions** – Primary dealers (see appendix for a current list), banks, insurance companies, mutual funds, pension funds, hedge funds
- **Governments** – The New York Fed (used in its implementation of monetary policy), other central banks, municipalities
- **Corporations**

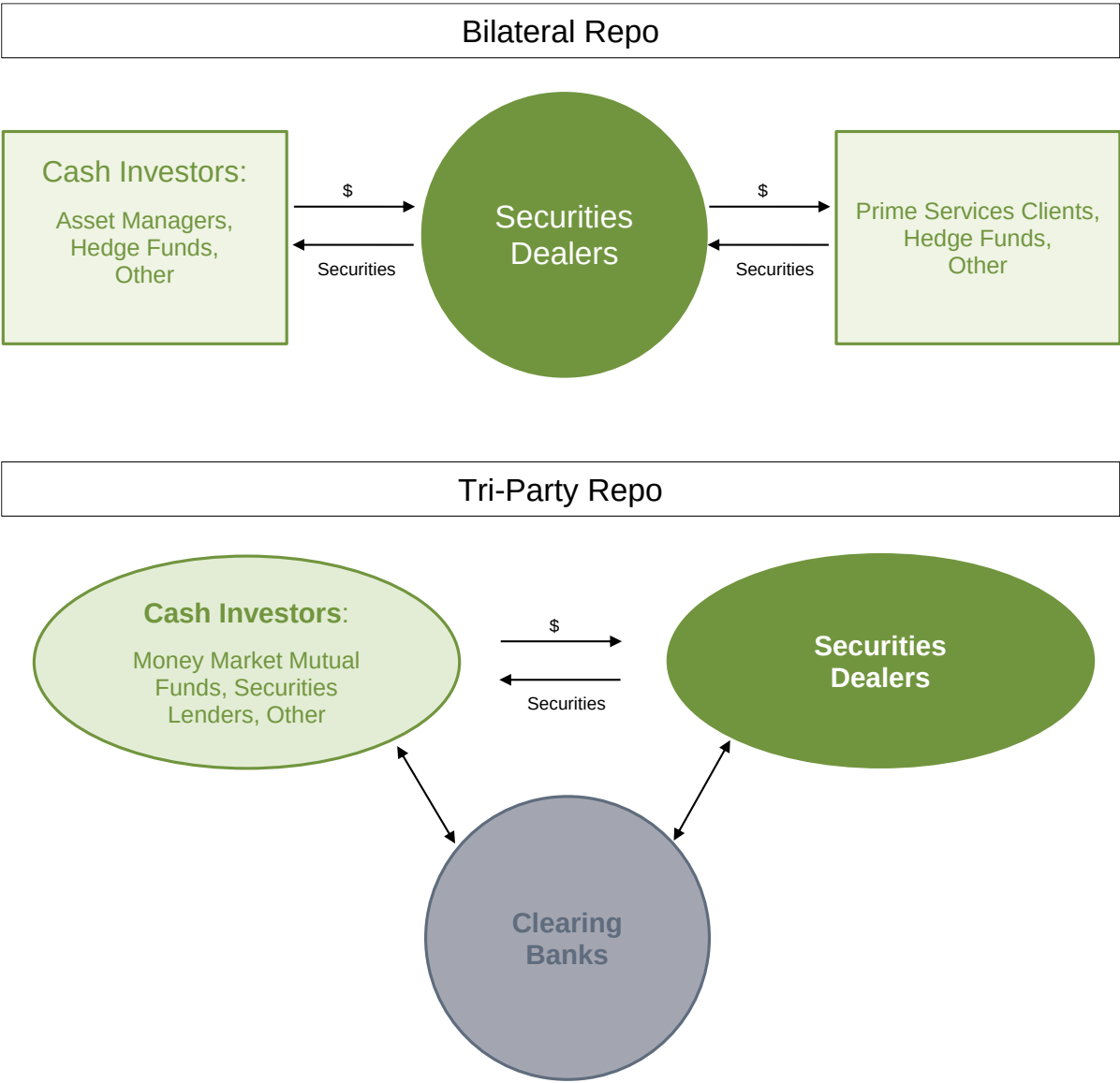
These entities all benefit from the security, operational efficiency and low funding costs available in the repo market. Repos offer cash providers collateralization (with additional margin requirements in most cases) marked-to-market daily to ensure continuing protection. The operational efficiencies developed through tri-party repo and the largely centralized settlement mechanism for repos further minimize risks. Standardized documentation, broadly accepted by market participants, provides further certainty for market participants.

Repo Regulation

Prior to the financial crisis, some financial institutions used repos to fund leveraged position taking in securities. As asset prices declined during the crisis, repo lenders increased the amount of collateral required, limiting the level of repo activity for some investors holding leveraged portfolios. This created a funding shortfall and forced investors to decrease leverage by selling assets, leading to even lower asset valuations. This fed back into additional asset sales, and the circle went round and round. Repos backed by government securities also faced stress. Flight to safety tendencies drove increased demand for these standalone assets, leading to shortages of available collateral in the repo market.

In light of this, the New York Fed works continuously with market participants – most notably with the Treasury Market Practices Group – to monitor repo infrastructure and recommend reforms as necessary, to ensure these markets remain stable sources of funding during periods of market stress. The New York Fed also provides data for market participants on the repo markets. While comprehensive data for all segments of repo markets are not available, data is provided for certain segments of and specific firms operating in this market.

Repo Operations



Sources: Federal Reserve Bank of New York, SIFMA

Appendix: Terms to Know

Statistics

Y/Y	Year over Year
Q/Q	Quarter over Quarter
M/M	Month over Month
W/W	Week over Week
D/D	Day over day
YTD	Year to Date
QTD	Quarter to Date
MTD	Month to Date
WTD	Week to Date
BPS	Basis Points
PPS	Percentage Points
CAGR	Compound Annual Growth Rate
RHS	Right hand side (for charts)

Other

AUM	Assets Under Management
DCM	Debt Capital Markets
ECM	Equity Capital Markets

Regulators

North America	
FINRA	Financial Industry Regulatory Authority (United States)
SEC	Securities and Exchange Commission (United States)
CSC	Canadian Securities Administrators
European Union	
ESMA	European Securities and Markets Authority
AMF	Autorité des marchés financiers (France)
BaFin	Federal Financial Supervisory Authority (Germany)
FINMA	Swiss Financial Market Supervisory Authority (Switzerland)
United Kingdom	
FCA	Financial Conduct Authority
AsiaPac	
ASIC	Australian Securities and Investments Commission
CSRC	China Securities Regulatory Commission
SFC	Securities and Futures Commission (Hong Kong)
SEBI	Securities and Exchange Board of India
FSA	Financial Services Agency (Japan)
MAS	Monetary Authority of Singapore

Trading

ADV	Average Daily Trading Volume
Algo	Algorithm (algorithmic trading)
ATS	Alternative Trading System
Best Ex	Best Execution
BPS	Basis Points
CLOB	Central Limit Order Book
D2C	Dealer-to-Client
D2D	Dealer-to-Dealer
ECN	Electronic Communication Network
ETP	Electronic Trading Platforms
HFT	High-Frequency Trading
IDB	Inter-Dealer Broker
IOI	Indication of Interest
MM	Market Maker
OTC	Over-the-Counter
SDP	Single-dealer platform
Bid	An offer made to buy a security
Ask, Offer	The price a seller is willing to accept for a security
Spread	The difference between the bid and ask price prices for a security, an indicator of supply (ask) and demand (bid)
NBBO	National Best Bid and Offer
Locked Market	A market is locked if the bid price equals the ask price
Crossed Market	A bid is entered higher than the offer or an offer is entered lower than the bid
Opening Cross	To determine the opening price of a stock, accumulating all buy and sell interest prior to the market open
Closing Cross	To determine the closing price of a stock, accumulating all buy and sell interest prior the market close

Order Types

AON	All or none; an order to buy or sell a stock that must be executed in its entirety, or not executed at all
Block	Trades with at least 10,000 shares in the order
Day	Order is good only for that trading day, else cancelled
FOK	Fill or kill; must be filled immediately and in its entirety or not at all
Limit	An order to buy or sell a security at a specific price or better
Market	An order to buy or sell a security immediately; guarantees execution but not the execution price
Stop	(or stop-loss) An order to buy or sell a stock once the price of the stock reaches the specified price, known as the stop price

Post Trade

DTCC	The Depository Trust and Clearing Corporation
CSD	Central Securities Depository
CCP	Central Counterparty Clearing House
CP	Counterparty
IM	Initial Margin
VM	Variation Margin
MPR	Margin Period at Risk
T	Trade Date
T+1	Settlement Date

Investors

Institutional	Asset managers, endowments, pension plans, foundations, mutual funds, hedge funds, family offices, insurance companies, banks, etc.; fewer protective regulations as assumed to be more knowledgeable and better able to protect themselves
Individual	Self-directed or advised investing

Equities

EMS	Equity Market Structure
NMS	National Market System
Reg NMS	Regulation National Market System
SIP	Security Information Processor; aggregates all exchange's best quotes, sent back out to the market in one data stream
PFOF	Payment For Order Flow
Tick Size	Minimum quote increment of a trading instrument
CAT	Consolidated Audit Trail
SRO	Self Regulatory Organization

ETFs/Funds

AP	Authorized Participant
PCF	Portfolio Composition File
NAV	Net Asset Value
IIV	Intraday Indicative Value
ETF	Exchange-Traded Fund
ETP	Exchange-Traded Product
MF	Mutual Fund
OEF	Open-End Fund
CEF	Closed-End Fund
UIT	Unit Investment Trust

Options

Call	The right to buy the underlying security, on or before expiration
Put	The right to sell the underlying security, on or before expiration
Holder	The buyer of the contract
Writer	The seller of the contract
American	Option may be exercised on any trading day on or before expiration
European	Option may only be exercised on expiration
Exercise	To put into effect the right specified in a contract
Underlying	The instrument on which the options contract is based; the asset/security being bought or sold upon exercise notification
Expiration	The set date at which the options contract ends, or ceases to exist, or the last day it can be traded
Stock Price	The price at which the underlying stock is trading, fluctuates continuously
Strike Price	The set price at which the options contract is exercised, or acted upon
Premium	The price the option contract trades at, or the purchase price, which fluctuates constantly
Time Decay	The time value portion of an option's premium decreases as time passes; the longer the option's life, the greater the probability the option will move in the money
Intrinsic Value	The in-the-money portion of an option's premium
Time Value	(Extrinsic value) The option premium (price) of the option minus intrinsic value; assigned by external factors (passage of time, volatility, interest rates, dividends, etc.)
In-the-Money	For a call option, when the stock price is greater than the strike price; reversed for put options
At-the Money	Stock price is identical to the strike price; the option has no intrinsic value
Out-of-the-Money	For a call option, when the stock price is less than the strike price; reversed for put options

Equity Capital Formation

IPO	Initial Public Offering; private company raises capital by offering its common stock to the public for the first time in the primary markets
SPAC	Special Purpose Acquisition Company; blank check shell corporation designed to take companies public without going through the traditional IPO process
Bought Deal	Underwriter purchases a company's entire IPO issue and resells it to the investing public; underwriter bears the entire risk of selling the stock issue
Best Effort Deal	Underwriter only guarantees the issuer it will make a best effort attempt to sell the shares to investors at the best price possible; issuer can be stuck with unsold shares
Secondary	(Follow-on) Issuance of shares to investors by a public company already listed on an exchange
Direct Listing	(Direct placement, direct public offering) Existing private company shareholders sell their shares directly to the public without underwriters. Often used by startups or smaller companies as a lower cost alternative to a traditional IPO. Risks include, among others, no support for the share sale and no stock price stabilization from the underwriter after the share listing.

Underwriting

Underwriting	Guarantee payment in case of damage or financial loss and accept the financial risk for liability arising from such guarantee in a financial transaction or deal
Underwriter	Investment bank administering the public issuance of securities; determines the initial offering price of the security, buys them from the issuer and sells them to investors.
Bookrunner	The main underwriter or lead manager in the deal, responsible for tracking interest in purchasing the IPO in order to help determine demand and price (can have a joint bookrunner)
Lead Left Bookrunner	Investment bank chosen by the issuer to lead the deal (identified on the offering document cover as the upper left hand bank listed)
Syndicate	Investment banks underwriting and selling all or part of an IPO
Arranger	The lead bank in the syndicate for a debt issuance deal
Greenshoe	Allows underwriters to sell more shares than originally planned by the company and then buy them back at the original IPO price if the demand for the deal is higher than expected, i.e. an over-allotment option

Documentation

Pitch	Sales presentation by an investment bank to the issuer, marketing the firm's services and products to win the mandate
Mandate	The issuing company selects the investment banks to underwrite its offering
Engagement Letter	Agreement between issuer & underwriters clarifying: terms, fees, responsibilities, expense reimbursement, confidentiality, indemnity, etc.
Letter of Intent	Investment banks' commitment to the issuer to underwrite the IPO
Underwriting Agreement	Issued after the securities are priced, underwriters become contractually bound to purchase the issue from the issuer at a specific price
Registration Statement	Split into the prospectus and private filings, or information for the SEC to review but not distributed to the public, it provides investors adequate information to perform their own due diligence prior to investing
The Prospectus	Public document issued to all investors listing: financial statements, management backgrounds, insider holdings, ongoing legal issues, IPO information and the ticker to be used once listed
Red Herring Document	An initial prospectus with company details, but not inclusive of the effective date of offering price, filed with the SEC
Tombstone	An announcement that securities are available for sale. (Also a plaque awarded to celebrate the completion of a transaction or deal)

Process

Roadshow	Investment bankers take issuing companies to meet institutional investors to interest them in buying the security they are bringing to market
Non-Deal Roadshow	Research analysts and sales personnel take public companies to meet institutional investors to interest them in buying a stock or update existing investors on the status of the business and current trends
Pricing	Underwriters and the issuer will determine the offer price, the price the shares will be sold to the public and the number of shares to be sold, based on demand gauged during the road show and market factors
Stabilization	Occurs for a short period of time after the IPO if order imbalances exist, i.e. the buy and sell orders do not match; underwriters will purchase shares at the offering price or below to move the stock price and rectify the imbalance
Quiet Period	(Cooling off period) The SEC mandates a quiet period on research recommendations, lasting 10 days (formerly 25 days) after the IPO

SEC Filings

Reg S-K	Regulation which prescribes reporting requirements for SEC filings for public companies
Reg S-X	Regulation which lays out the specific form and content of financial reports, specifically the financial statements of public companies
Form S-1	Registration statement for U.S. companies (described above)
Form F-1	Registration statement for foreign issuers of certain securities, for which no other specialized form exists or is authorized
Form 10-Q	Quarterly report on the financial condition and state of the business (discussion of risks, legal proceedings, etc.), mandated by the SEC
Form 10-K	More detailed annual version of the 10Q, mandated by the SEC
Form 8-K	Current report to announce major events shareholders should know about (changes to business & operations, financial statements, etc.), mandated by the SEC
EGC	Emerging Growth Company; qualified companies may choose to follow disclosure requirements that are scaled for newly public

Fixed Income

CUSIP	Committee on Uniform Securities Identification Procedures; a nine character security identifier
FICC	Fixed Income, Currencies and Commodities
FI	Fixed Income
TRS	Total Return Swap

Rates Markets

UST	U.S. Treasury Securities
FRN	Floating Rate Note
T-Bill	U.S. Treasury Bill
T-Note	U.S. Treasury Note
T-Bond	U.S. Treasury Bond
TIPS	Treasury Inflation Protected Securities
Repo	Repurchase Agreement; also have reverse repos
Agency	Federal Agency Securities
FAMC	Farmer Mac/Federal Agricultural Mortgage Corporation
FCS	Farm Credit System
FHLB	Federal Home Loan Banks
FHLMC	Freddie Mac/Federal Home Loan Mortgage Corporation
FNMA	Fannie Mae/Federal National Mortgage Association
GNMA	Ginnie Mae/Government National Mortgage Association
TVA	Tennessee Valley Authority

Credit Markets

Corporates	Corporate Bonds
HY	High Yield Bond
IG	Investment Grade Bond
Munis	Municipal Securities
GO	General Obligation Bond
Revenue	Revenue Bond

Securitized Products

MBS	Mortgage-Backed Security
CMO	Collateralized Mortgage Obligation
CMBS	Commercial MBS
RMBS	Residential MBS
ABS	Asset-Backed Securities (auto, credit card, home equity, student loans, etc.)
CDO	Collateralized Debt Obligation

Money Markets (MM)

CP	Commercial Paper
ABCP	Asset-Backed Commercial Paper
MMF	Money Market Funds

Appendix: SIFMA Insights Research Reports

SIFMA Insights: www.sifma.org/insights

- Ad hoc reports on timely market themes
- Market Structure Compendium (annual report)
- COVID Related Market Turmoil Recaps: Equities; Fixed Income and Structured Products

Monthly Market Metrics and Trends: www.sifma.org/insights-market-metrics-and-trends

- Statistics on volatility and equity and listed options volumes
- Highlights an interesting market trend

Market Structure Primers: www.sifma.org/primers

- Capital Markets Primer Part I: Global Markets & Financial Institutions
- Capital Markets Primer Part II: Primary, Secondary & Post-Trade Markets
- Global Equity Markets
- Electronic Trading
- US Capital Formation & Listings Exchanges
- US Equity
- US Multi-Listed Options
- US ETF
- US Fixed Income

Conference Debriefs

- Insights from market participants into top-of-mind topics
- Pre-Conference Survey Comparison, compares survey results across various conferences

Equity Market Structure Analysis

- The ABCs of Equity Market Structure: How US Equity Markets Work and Why
- Analyzing the Meaning Behind the Level of Off-Exchange Trading, Part II
- Analyzing the Meaning Behind the Level of Off-Exchange Trading
- Why Market Structure and Liquidity Matter

Top of Mind with SIFMA Insights

- Podcasts with market participants on key market and economic themes, including reference guides defining terms and providing charts on the topics discussed on the podcast

Appendix: About Coalition Greenwich

Coalition Greenwich, a division of CRISIL, an S&P Global Company, is a leading global provider of strategic benchmarking, analytics and insights to the financial services industry. Coalition Greenwich specializes in providing unique, high-value and actionable information to help its clients improve their business performance. Its suite of analytics and insights encompass all key performance metrics and drivers: market share, revenue performance, client relationship share and quality, operational excellence, return on equity, brand perception, behavioral drivers, and industry evolution.

<https://www.greenwich.com/>

Reports Referenced:

- Top market structure trends: <https://www.greenwich.com/market-structure-technology/top-market-structure-trends-watch-2025>
- Credit e-trading numbers: <https://www.greenwich.com/market-structure-technology/january-spotlight-us-corporate-bond-trading-2024-numbers>
- UST e-trading numbers: <https://www.greenwich.com/market-structure-technology/january-spotlight-us-treasury-trading-2024-numbers>

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