

# Treasury Buyback Program Effectiveness Assessment

Treasury Borrowing Advisory Committee  
February 4, 2025

Charge Text:

*Treasury has been conducting regular buybacks since May 2024 with liquidity support and cash management objectives. Please assess the effectiveness of the buyback program to date in achieving its objectives. Are there any changes to the program that Treasury should consider? Please elaborate.*

# Contents

- Executive Summary
- Buyback Operation Specifications
- Summary Results
  - Statistics by Operation and Maturity Band
  - Cumulative Accepted Offers by Issue
  - Fills and Total Offers
  - Relative Value of Treasury Securities Accepted for Buyback
- Buybacks in Context of the Off-the-Run Market
  - Accepted Offers by Sector as a Percent of Market Volumes
  - Accepted Offers by Sector as a Percent of Primary Dealer Balances
- Treasury Market Conditions
- Temporal Market Data Analysis
- Conclusions
- Potential Study Items for the Program

# Executive Summary

## *Treasury Objectives*

- Treasury established the current buyback program with the following objectives:
  - Liquidity Support buybacks aim to bolster market liquidity by establishing an opportunity for market participants to sell off-the-run Treasury securities.
  - Cash Management buybacks aim to reduce volatility in Treasury's cash balance and Treasury bill issuance, minimize bill supply disruptions, and/or reduce borrowing costs over time.
  - Offers are evaluated based on their proximity to prevailing market prices at the close of the operation, as well as measures of relative value.
  - Buybacks are regular and predictable and are not currently intended to mitigate episodes of acute market stress.

# Executive Summary

## *Analysis Results*

- A study of buyback result statistics over the period from May 29, 2024 to Jan 22, 2025 provides some insight into the effectiveness of the program so far:
  - Nominal coupon operations spanning Liquidity Support and Cash Management buybacks were well-subscribed.
    - In 68% of operations, the maximum amount made available was purchased.
  - TIPS Liquidity Support buybacks experienced more variable results.
    - In 33% of operations, the maximum amount made available was purchased.
  - In total, \$92.052bn of Par Amount was accepted out of a potential \$115bn over the study period.
    - The top 10% of issues accepted comprised \$48.422bn of Par Amount bought back, suggesting significant market axes to exhaust specific inventory via cumulative buybacks.
  - Treasury accepted a higher proportion of maximum operation size when primary dealers offered higher multiples of maximum operation size
  - Bonds which were bought back generally screened as cheap in a relative value framework.
  - Buyback operations are significant in size in each sector on the day that they occur.
  - Buyback operations are more modest in size relative to overall market volumes and dealer balances.
- Studies of some Treasury market dynamics add color to the market backdrop for buybacks during the study period
  - Analysis of model Z-spread measures suggests the market's appetite for off-the-run Treasury relative value was stable over the study period.
  - Analysis of in-month seasonality suggests that primary issuance auctions and month end are peaks for off-the-run volumes.
- The current buyback program is broadly achieving its stated objectives and there is little evidence of a pressing need to change the program from its current setting.
- We offer some potential study items which could lead to even greater program effectiveness in the future

# Buyback Operation Specifications

- Schedule announced at the Quarterly Refunding.
  - Cash management buybacks will generally take place seasonally, predominantly during the weeks immediately surrounding major tax payment dates.
  - Liquidity support buybacks will generally be conducted once per week, taking into account holidays and market events.
- Treasury anticipates purchasing within each maturity bucket at least one time per quarter.
- Excluded Securities:
  - On-the-runs and recently issued securities.
  - Repo specials.
  - Securities in exceptional demand compared with similar issues.
  - Securities that may be considered the cheapest-to-deliver for an actively traded futures contract.
  - Coupon securities that are trading at a significantly lower yield than Treasury bills with similar maturities.
  - TIPS maturing within one year of the buyback settlement date.
- Treasury does not intend to buy back bills, floating rate notes, or STRIPS.
- Purchase limits maintain the free float above \$10 billion par amount for nominal coupon securities and \$5 billion par amount for TIPS. SOMA holdings will not exceed 70% of outstanding par amount after the buyback operation is settled.
- Treasury may carry forward capacity from one cash management buyback operation to subsequent operations; but for liquidity support operations, does not intend to carry forward unused capacity.

# Summary Results

## Liquidity Support and Cash Management

- **Nominal Coupons**

- On average, 37% of issues made available for buyback were filled in some amount.
- In 68% of operations, the maximum amount made available was purchased.
- Liquidity Support and Cash Management buybacks in the [1M,2] year sector were very well subscribed and filled.
- Liquidity Support buybacks in the (10,20] year and (20,30] year sectors were also well subscribed and filled.
- Buybacks in the belly of the curve were more sporadically filled and buybacks in the (7,10] year sector were notably small.

- **TIPS**

- On average, 39% of issues made available for buyback were filled in some amount.
- In 33% of operations, the maximum amount made available was purchased.
- There were no especially marked differences in dynamics between the [1,7.5] and (7.5,30] year sectors.

Security Type	Operation	Date	Issues	Accepted	Maximum (\$mm)	Accepted (\$mm)	% Count Accepted	% Amount Accepted
Nominal Coupons	[1M,2Y]	5/29/2024	20	9	2,000	2,000	45%	100%
		8/7/2024	66	16	4,000	4,000	24%	100%
		11/13/2024	57	5	4,000	4,000	9%	100%
	(2Y,3Y]	6/26/2024	20	7	2,000	2,000	35%	100%
		9/4/2024	31	6	4,000	2,295	19%	57%
		12/5/2024	31	13	4,000	2,267	42%	57%
	(3Y,5Y]	7/18/2024	20	8	2,000	809	40%	40%
		10/16/2024	49	21	4,000	4,000	43%	100%
		1/22/2025	49	17	4,000	4,000	35%	100%
	(5Y,7Y]	6/20/2024	20	14	2,000	1,864	70%	93%
		10/10/2024	26	13	4,000	2,469	50%	62%
		1/15/2025	25	13	4,000	2,190	52%	55%
	(7Y,10Y]	7/24/2024	10	0	2,000	0	0%	0%
		9/10/2024	10	5	4,000	449	50%	11%
		12/9/2024	10	3	4,000	195	30%	5%
	(10Y,20Y]	7/2/2024	20	12	2,000	2,000	60%	100%
		8/28/2024	25	8	2,000	2,000	32%	100%
		10/31/2024	26	12	2,000	2,000	46%	100%
		11/25/2024	28	5	2,000	2,000	18%	100%
		6/5/2024	20	20	2,000	2,000	100%	100%
(20Y,30Y]	8/15/2024	34	9	2,000	2,000	26%	100%	
	9/24/2024	35	13	2,000	2,000	37%	100%	
	11/20/2024	34	14	2,000	2,000	41%	100%	
	1/7/2025	36	4	2,000	2,000	11%	100%	
	9/5/2024	35	18	5,000	5,000	51%	100%	
Nominal Coupons (Cash Management)	CM [1M,2Y]	9/12/2024	39	3	5,000	5,000	8%	100%
		9/19/2024	41	9	5,000	5,000	22%	100%
		9/25/2024	37	19	5,000	5,000	51%	100%
		12/4/2024	49	20	7,500	7,500	41%	100%
		12/10/2024	49	19	7,500	7,500	39%	100%
		12/19/2024	47	14	7,500	3,729	30%	50%
TIPS	[1Y, 7.5Y]	6/11/2024	20	5	500	500	25%	100%
		8/21/2024	26	8	500	351	31%	70%
		10/2/2024	26	7	500	235	27%	47%
		11/6/2024	26	6	500	170	23%	34%
	1/9/2025	26	8	500	500	31%	100%	
	(7.5Y,30Y]	7/10/2024	14	5	500	53	36%	11%
		9/17/2024	18	9	500	153	50%	31%
		10/23/2024	18	12	500	323	67%	65%
12/17/2024		18	11	500	500	61%	100%	

# Summary Results

## Cumulative Purchases

- Purchase Statistics

- 319 issues were available for buyback, and 205 were accepted.
  - \$92.052bn of Par Amount was accepted out of a potential \$115bn.
  - Among issues accepted, the median and mean cumulative purchase sizes were \$188mm and \$449mm respectively.
  - Among all issues, including those which were not accepted as zeroes, the median and mean cumulative sizes were \$60mm and \$289mm respectively.
- It is notable that 10% of issues accepted comprised \$48.422bn of Par Amount bought back (52.6% of total) over a median of 4 cumulative operations.
- The buyback program provided significant cumulative liquidity to those particular offer interests in the market.

CUSIP	Coupon	Maturity	Cumulative \$ Accepted	# Ops With Fills
91282CHN4	4.75%	7/31/2025	6,164,000,000	7
91282CFE6	3.13%	8/15/2025	4,906,000,000	4
91282CAB7	0.25%	7/31/2025	4,656,000,000	3
912828K74	2.00%	8/15/2025	4,565,000,000	5
91282CBQ3	0.50%	2/28/2026	3,672,000,000	6
912810SY5	2.25%	5/15/2041	3,500,000,000	4
912810RNO	2.88%	8/15/2045	2,018,000,000	4
91282CAT8	0.25%	10/31/2025	1,927,000,000	5
91282CAZ4	0.38%	11/30/2025	1,741,000,000	4
91282CAJ0	0.25%	8/31/2025	1,597,000,000	3
91282CHV6	5.00%	8/31/2025	1,533,000,000	3
912810RQ3	2.50%	2/15/2046	1,450,000,000	3
91282CJE2	5.00%	10/31/2025	1,353,000,000	5
91282CCW9	0.75%	8/31/2026	1,306,000,000	4
912828V98	2.25%	2/15/2027	1,278,000,000	1
912828P46	1.63%	2/15/2026	1,202,000,000	2
912828X88	2.38%	5/15/2027	1,192,000,000	3
91282CEQ0	2.75%	5/15/2025	1,176,000,000	3
912828ZT0	0.25%	5/31/2025	1,123,000,000	4
912810RM2	3.00%	5/15/2045	1,047,000,000	3
91282CFC0	2.63%	7/31/2029	1,016,000,000	3

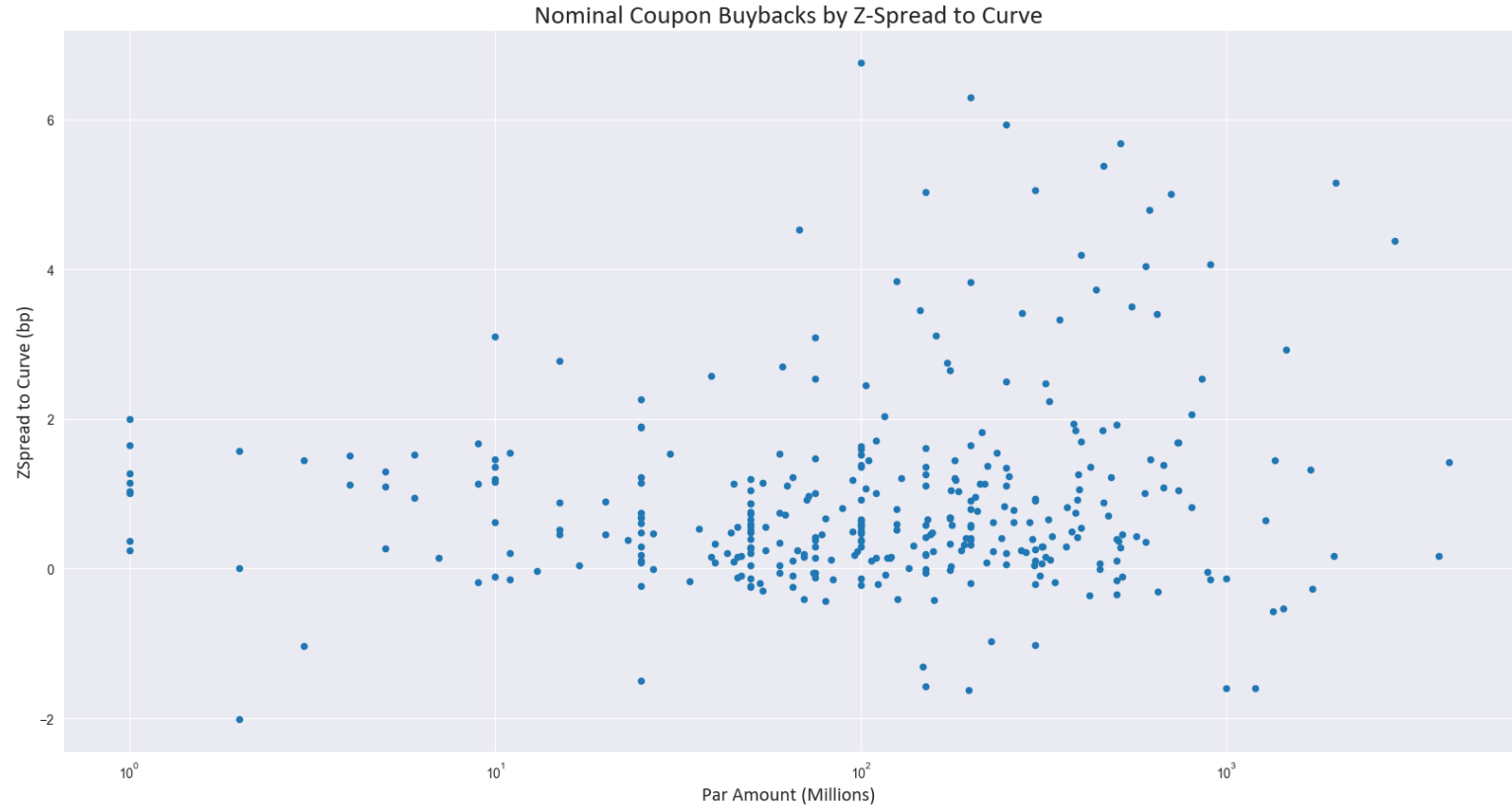




# Summary Results

## Relative Value of Accepted Offers

- This chart shows the basis point spread of each bond that was bought to the presenter's internal Z-spread spline\* on the COB of the day it was purchased.
- The results generally show balance between relative value (mostly, but not uniformly positive on the presenter's model) and liquidity provision.
- Regardless of relative value measures, liquidity provision at prevailing prices supports liquidity in primary and secondary markets, as suggested by a prior TBAC presentation.\*\*



Buyback Category	[1M, 2Y]	(2Y,3Y]	(3Y,5Y]	(5Y,7Y]	(7Y,10Y]	(10Y,20Y]	(20Y,30Y]
Notional-Weighted Average Cheapness (bp)	1.79	0.88	0.52	0.26	0.37	0.58	0.18

source: <https://treasurydirect.gov/auctions/announcements-data-results/buy-backs/> and presenter's own data and models

\*the presenter's spline is weighted to prioritize off-the-run Treasury Z-spreads

\*\*<https://home.treasury.gov/system/files/221/TBACCharge2Q32022.pdf>

# Buybacks in Context of the Off-the-Run Market

Accepted Offers by Sector as a Percent of Market Volumes

- Portion of 3 day rolling average volume:
  - Accepted nominal coupon averaged 10% of rolling average volume around operation dates
  - If all operations had been fully filled, the operations would have averaged 13% of the rolling average volume.
- Treasury buybacks constitute a significant portion of purchase activity on the day of operations in each sector.
- But taking into account \$183bn of average daily off-the-run volume during the study period, buybacks constitute a relatively small participation rate relative to total market volumes.

Security Type	Maturity*	Date	Off-the-Run Volume 3d Rolling Average Notional (\$mm)	Buyback Notional (\$mm)	Max Buyback Notional (\$mm)	Buyback/Volume	Maximum/Volume	
Nominal Coupons	(0,2]	5/29/2024	53,166	2,000	2,000	4%	4%	
		8/7/2024	45,966	4,000	4,000	9%	9%	
		11/13/2024	45,700	4,000	4,000	9%	9%	
	(2,3]	6/26/2024	14,166	2,000	2,000	14%	14%	
		9/4/2024	19,266	2,295	4,000	12%	21%	
	(3,5]	12/5/2024	18,200	2,267	4,000	12%	22%	
		7/18/2024	31,833	809	2,000	3%	6%	
		10/16/2024	29,966	4000	4,000	13%	13%	
	(5,7]	1/22/2025	37,833	4,000	4,000	11%	11%	
		6/20/2024	14,233	1,864	2,000	13%	14%	
		10/10/2024	12,033	2,469	4,000	21%	33%	
		1/15/2025	21,133	2,190	4,000	10%	19%	
	(7,10]	9/10/2024	11,800	449	4,000	4%	34%	
		12/9/2024	17,066	195	4,000	1%	23%	
		7/2/2024	14,533	2,000	2,000	14%	14%	
		(10,20]	8/28/2024	20,500	2,000	2,000	10%	10%
			10/31/2024	18,033	2,000	2,000	11%	11%
	11/25/2024		30,600	2,000	2,000	7%	7%	
	(20,30]	6/5/2024	29,933	2,000	2,000	7%	7%	
		8/15/2024	52,500	2,000	2,000	4%	4%	
9/24/2024		30,600	2,000	2,000	7%	7%		
11/20/2024		32,733	2,000	2,000	6%	6%		
1/7/2025		29,100	2,000	2,000	7%	7%		
Nominal Coupons (Cash Management)	(0,2]	9/5/2024	48,200	5,000	5,000	10%	10%	
		9/12/2024	34,966	5,000	5,000	14%	14%	
		9/19/2024	33,566	5,000	5,000	15%	15%	
		9/25/2024	58,900	5,000	5,000	8%	8%	
		12/4/2024	68,366	7,500	7,500	11%	11%	
		12/10/2024	42,300	7,500	7,500	18%	18%	
		12/19/2024	59,833	3,729	7,500	6%	13%	

# Buybacks in Context of the Off-the-Run Market

*Accepted Offers by Sector as a Percent of Market Volumes*

- Off-the-run TIPS volumes are significantly smaller and more variable than Nominals.
- Buyback volumes constituted anywhere from 1% to 36% of local total volumes.
- In the long end of the curve in particular, maximum size fills could match the entirety of daily sector volumes.
- TIPS buybacks constitute a significant portion of purchase activity on the day of operations in each sector.
- TIPS buybacks may constitute a more significant cumulative liquidity provision to the off-the-run market, especially if more fully filled in future operations.

Security Type	Maturity*	Date	Off-the-Run Volume	Buyback	Max Buyback	Buyback/Volume	Maximum/Volume
			3d Rolling Average Notional (\$mm)	Notional (\$mm)	Notional (\$mm)		
TIPS	(0,5]	6/11/2024	3,700	500	500	14%	14%
		8/21/2024	2,333	191	500	8%	21%
		10/2/2024	6,633	200	500	3%	8%
		11/6/2024	4,133	60	500	1%	12%
		1/9/2025	7,466	115	500	2%	7%
	(5,10]	8/21/2024	2,266	160	500	7%	22%
		9/17/2024	2,500	88	500	4%	20%
		10/2/2024	2,500	35	500	1%	20%
		10/23/2024	1,100	115	500	10%	45%
		11/6/2024	900	110	500	12%	56%
		12/17/2024	1,100	210	500	19%	45%
	(10,30]	1/9/2025	1,566	385	500	25%	32%
		7/10/2024	400	53	500	13%	125%
		9/17/2024	533	65	500	12%	94%
		10/23/2024	700	208	500	30%	71%
		12/17/2024	800	290	500	36%	63%

# Buybacks in Context of the Off-the-Run Market

Accepted Offers by Sector as a Percent of Primary Dealer Balances

- On average, accepted Nominal Coupon volume constituted 19% of primary dealer balances in the (0,3] year sector and 4% of primary dealer balances in the (3,30] year sector.
- Treasury buybacks occur at a significant size relative to primary dealer balance sheet size in the short end.
- Treasury buybacks are also significant in size as compared to weekly changes in primary dealer balances in each sector.

Operation Type	Maturity	Date*	Dealer Balance Notional (\$mm)	Week Balance Change Notional (\$mm)	Buybacks Notional (\$mm)	% of Net Balance	
Liquidity Support	(0,2]	5/29/2024	26374	5433	2000	8%	
		8/7/2024	24190	-1685	4000	17%	
		11/13/2024	17039	-11241	4000	23%	
	(2,3]	6/26/2024	13644	-2703	2000	15%	
		9/4/2024	13508	-1946	2295	17%	
		12/5/2024	18552	539	2267	12%	
	(3,6]	6/20/2024	66651	-82	1022	2%	
		7/18/2024	69905	1836	809	1%	
		10/10/2024	65790	-4949	1294	2%	
		10/16/2024	60841	-4949	4000	7%	
		1/15/2025	91939	4660	1827	2%	
	(6,7]	**1/22/2025	91939	-	4000	4%	
		6/20/2024	25756	696	842	3%	
	(7,11]	10/10/2024	20621	-527	1175	6%	
		1/15/2025	16639	-6707	363	2%	
		9/10/2024	27097	1229	449	2%	
		12/9/2024	34470	2553	195	1%	
		(11,21]	6/5/2024	21458	3376	73	0%
			7/2/2024	22652	8	2000	9%
			8/15/2024	26675	-2216	520	2%
			8/28/2024	26778	2319	2000	7%
			9/24/2024	24033	-1927	500	2%
			10/31/2024	21910	369	2000	9%
11/20/2024	20967		596	922	4%		
11/25/2024	20967	4331	2000	10%			
(21,30]	1/7/2025	29367	-5391	1000	3%		
	6/5/2024	27100	-1616	1927	7%		
	8/15/2024	35165	1046	1480	4%		
	9/24/2024	36855	68	1500	4%		
	11/20/2024	31885	3594	1078	3%		
Cash Management	(0,2]	1/7/2025	42470	337	1000	2%	
		9/5/2024	34686	1231	5000	14%	
		9/12/2024	35917	-8357	5000	14%	
		9/19/2024	27560	-7381	5000	18%	
		9/25/2024	20179	-7381	5000	25%	
		12/4/2024	21377	10301	7500	35%	
		12/10/2024	21377	-3334	7500	35%	
12/19/2024	23001	3794	3729	16%			

sources: <https://treasurydirect.gov/auctions/announcements-data-results/buy-backs>, <https://www.newyorkfed.org/markets/counterparties/primary-dealers-statistics>

\*The date reflects the date of the buyback operation in which the purchases occurred. The dealer balances are reported weekly, and the table contains the closest date prior to the operation date. Some dates appear more than once as some buybacks straddled multiple maturity buckets used in the Federal Reserve's Primary Dealer Balance data, e.g. 9/25/2024 has a single liquidity support operation split into the (11,21] and (21,31] buckets.

\*\* At time of writing, the data for dealer balances for this observation has not yet been published.

# Buybacks in Context of the Off-the-Run Market

*Accepted Offers by Sector as a Percent of Primary Dealer Balances*

- TIPS buybacks have been generally smaller as a percentage of primary dealer balances.
- On average, accepted Nominal Coupon volume constituted 2% of dealer balances in the (0,11] year sector.
- In the long end of the TIPS curve, primary dealer balances are small to begin with, so in that sector buybacks can be and have been large by comparison.
- In all sectors, TIPS buybacks are significant in size as compared to weekly changes in primary dealer balances.

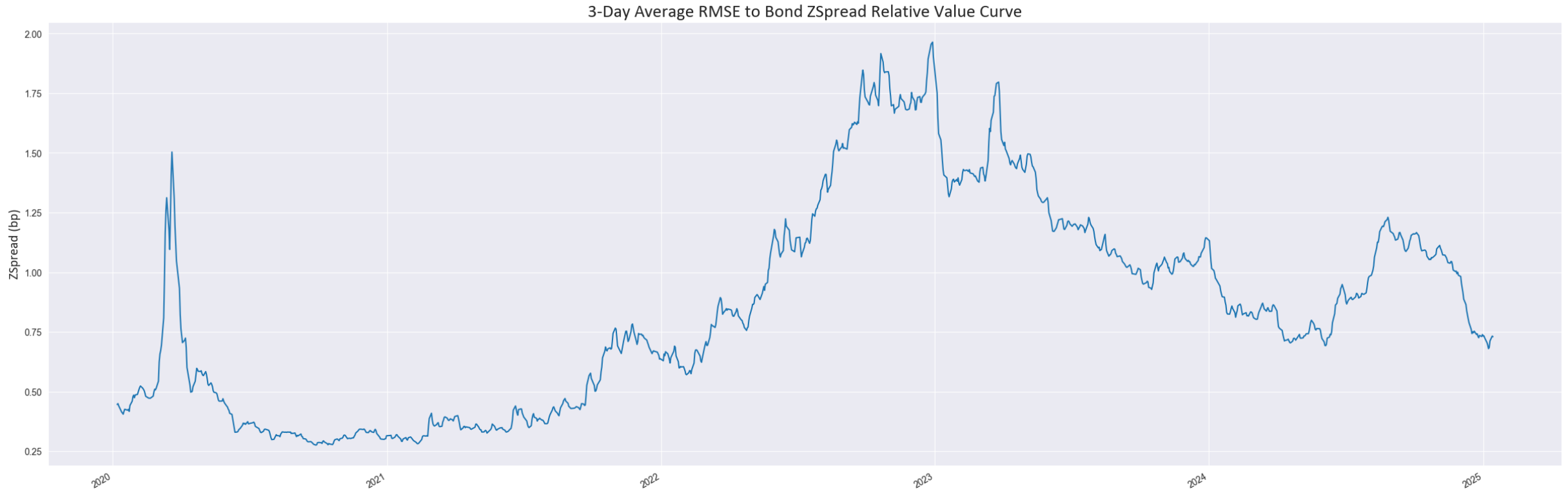
Security Type	Maturity	Date*	Dealer Balance	Week Balance Change	Buybacks	% of Net Balance
TIPS	(0,2]	6/11/2024	15795	-2451	372	2%
		8/21/2024	11168	-787	30	0%
		10/2/2024	11399	-6	1	0%
		1/9/2025	8976	210	10	0%
	(2,6]	6/11/2024	5039	1927	128	3%
		8/21/2024	6755	384	286	4%
		10/2/2024	8355	706	199	2%
		11/6/2024	8665	468	145	2%
		1/9/2025	9349	-1417	190	2%
	(6,11]	8/21/2024	5018	877	35	1%
		9/17/2024	4964	-424	88	2%
		10/2/2024	3236	-1835	35	1%
		10/23/2024	3252	-749	115	4%
		11/6/2024	2623	-1462	25	1%
		12/17/2024	4016	-354	210	5%
		1/9/2025	3184	-335	300	9%
	(11,31]	7/10/2024	396	123	53	13%
9/17/2024		-357	147	65		
10/23/2024		-87	451	208		
12/17/2024		22	202	290	129%	

sources: <https://treasurydirect.gov/auctions/announcements-data-results/buy-backs>, <https://www.newyorkfed.org/markets/counterparties/primary-dealers-statistics>

\*The date reflects the date of the buyback operation in which the purchases occurred. The dealer balances are reported weekly, and the table contains the closest date prior to the operation date. Some dates appear more than once as some buybacks straddled multiple maturity buckets used in the Federal Reserve's Primary Dealer Balance data, e.g. 8/21/2024 contains a single liquidity support operation between 1Y and 7.5Y split into [0,2], (2,6], (6,11] buckets in accordance with the Fed's available data

# Treasury Market Conditions

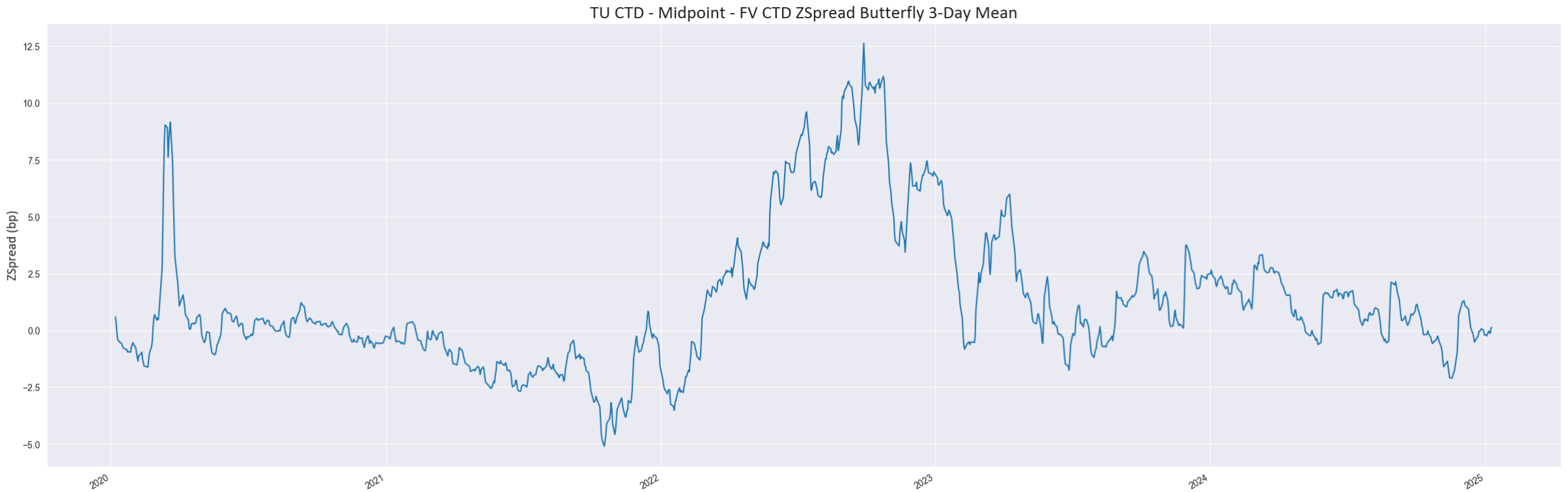
*Trimmed RMSE Of SOFR Z-Spread RV Curve*



- Higher uncertainty during the COVID liquidity crunch and the volatile selloff to higher rates in 2022 increased Treasury Asset Swap spline errors.
- Once 5% outliers (especially rich, aged bonds at the front end of the curve) are trimmed, spline errors have generally trended lower since the start of 2023 and varied within a range in the past year.
- This may indicate generally increased or at least stable market appetite for Treasury relative value over the period during which buybacks have taken place.

# Treasury Market Conditions

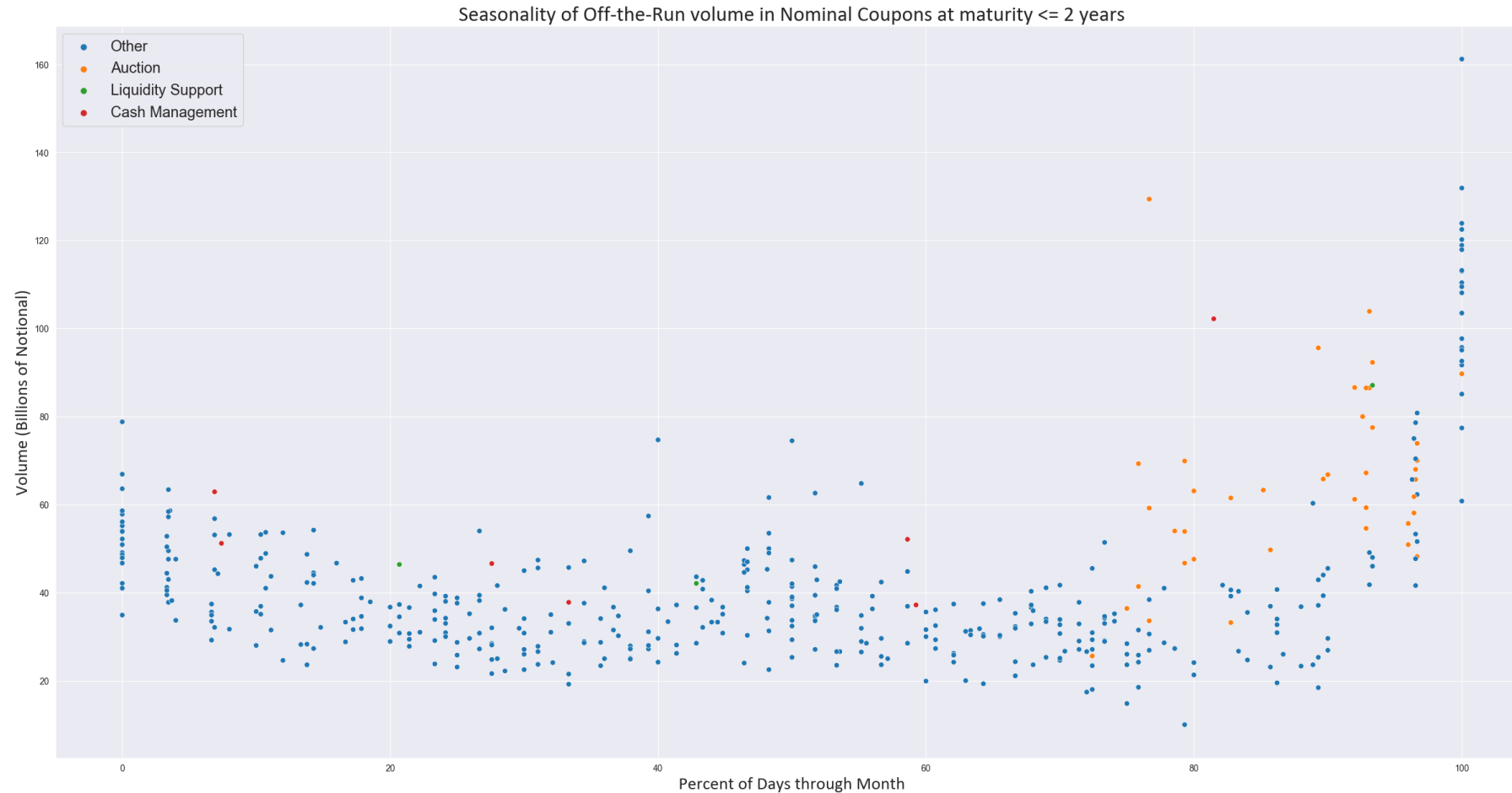
*TU – 3.5Y – FV SOFR Z-Spread Butterfly*



- This is a time series of a Z-spread butterfly where the wings are the TU and FV futures CTDs, and the body is a model off-the-run bond with maturity =  $\text{Average}(\text{TU CTD maturity}, \text{FV CTD maturity})$ .
- It may be a good indicator of liquidity premiums in one high volume sector of the yield curve.
- While elevated during the COVID liquidity crunch and the volatile selloff to higher rates in 2022, this butterfly has generally traded in a stable range in the lower half of its 5y min/max range over the past year.
- This may indicate generally increased or at least stable market appetite for Treasury relative value over the past year.

# Temporal Market Data Analysis

## *In-Month Seasonality of (0Y,2Y] Off-the-Run Volumes*

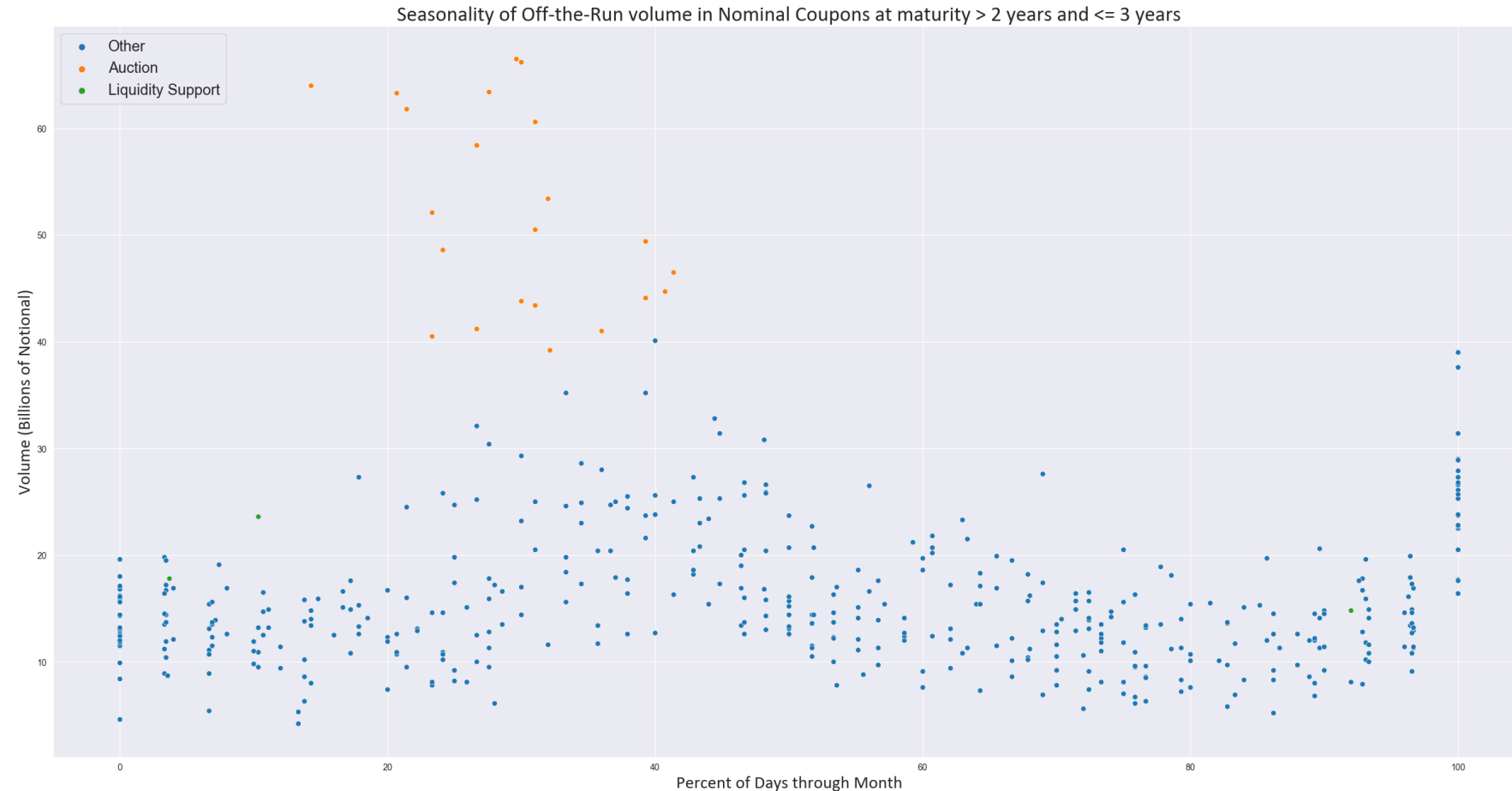


- There is in-month seasonality whereby more higher-volume days occur after the day after primary issuance and at month end:
  - Some of the higher off-the-run volumes around primary auction days is likely attributable to rolls from very recently issued bonds to the on-the-run bond.
  - Some of the higher off-the-run volumes could also present liquidity provision opportunities for the buyback program.
  - Treasury could study volume data available via Treasury TRACE to explore this dynamic.



# Temporal Market Data Analysis

## *In-Month Seasonality of (2Y,3Y] Off-the-Run Volumes*



- There is in-month seasonality whereby more higher-volume days occur after the day after primary issuance and at month end:
  - Some of the higher off-the-run volumes around primary auction days is likely attributable to rolls from very recently issued bonds to the on-the-run bond.
  - Some of the higher off-the-run volumes could also present liquidity provision opportunities for the buyback program.
  - Treasury could study volume data available via Treasury TRACE to explore this dynamic.

# Conclusions

- Operation Fills :
  - Cash Management buybacks and Liquidity Support buybacks in the [1M,2] and (10,30] Nominal sectors were very well filled.
  - Operations in the belly of the Nominal curve and in TIPS were less consistently subscribed and filled, which may indicate less of a need for liquidity during the period, less willingness to sell at necessary prices to get filled, or both.
  - Higher volume of offers relative to maximums in the operations were generally correlated to higher fills as a % of maximums.
- Market Conditions:
  - There is some evidence that Treasury market conditions during the study period were characterized by stable relative value opportunities and liquidity premiums. Future periods may see more demand for off-the-run liquidity.
  - Relative value measurements do seem to support healthy operational balance between liquidity provision and relative value.
- Portion of Market Volume:
  - Cumulative accepted volume was concentrated in the top percentiles of issues, indicating some local and ongoing market axes to exhaust specific inventory via buyback operations.
  - Treasury buybacks constitute significant percentages of volumes, primary dealer balance sheet sizes, and weekly changes in primary dealer balances at the localized time of each operation.
  - Given the modest size of operations in the context of cumulative market volumes, and when the time lags between operations in each sector are considered, the impact of buybacks in the context of the Treasury market is moderate.
- Dealer feedback\* has described that the program functions well, provides outlets for off-the-run inventory, and is moderately supportive of off-the-run Treasury market liquidity and functioning.
- The current buyback program is broadly achieving its stated objectives and there is little evidence of a pressing need to change the program from its current setting.

# Potential Study Items for the Program

## *Nominal Coupons*

- Treasury should continue to study the results of the buyback program at its current capacity, and give thought to how the capacity might scale with future changes in total primary issuance and the size of the off-the-run market.
  - Treasury has communicated liquidity support buyback maximums of \$30bn per quarter.
  - Over time, amounts offered and/or accepted could grow to suggest that demand for larger operations is growing.
  - Primary issuance sizes and sector composition will evolve.
  - It is useful to continue to study heuristics for sizing buybacks relative to primary issuance.
- While buyback scheduling may be constrained by Treasury's operational preferences and limitations, there is evidence of in-month seasonality in off-the-run volumes. It may follow that there is a workable schedule that more optimally meets elevated intra-month demand for liquidity.
  - Some of the higher off-the-run volumes around primary auction days is likely attributable to rolls from very recently issued bonds to the on-the-run bond.
  - Some of the higher off-the-run volumes could also present liquidity provision opportunities for the buyback program.
  - Treasury could study volume data available via Treasury TRACE to explore this dynamic, as well as discussing it with primary dealers.
- Demand for off-the-run liquidity currently seems more concentrated at the short and long ends of the curve.
  - This could be transient (e.g., short term supply/demand effects).
  - It could also be persistent (e.g., segmentation of market participants by sector leading to more of a liquidity need in some parts of the curve, market making returns on market risk or regulatory constraint differing by curve and product segment, etc.).
  - This could be a study item and a discussion topic for Treasury's interactions with dealers.
- It is worth exploring with primary dealers whether any uncertainties (e.g., duration hedging, timing of result releases, fair value assessment, etc.) prevents the buyback program from being even more effective than it already is.

# Potential Study Items for the Program

## *TIPS*

- Buybacks in TIPS have had uneven result statistics. Treasury should monitor whether this changes in time.
  - The under 1y sector of TIPS is excluded from the program despite being a sector where liquidity support could prove beneficial.
  - If either of the above is due to complexity in assessing the relative value of offers, valuation modeling could be researched.
    - Primary dealers who are active in the TIPS market publish research that highlights how they approach fair value modeling.
    - As the buyback program matures, and as market data continues to become richer, conducting research in this space can add value.
    - It is worth discussing the above topic with primary dealers in the context of TIPS buybacks.
-