Treasuries

Say hello, wave goodbye

- Treasury yields rose along the curve amid lower energy prices, a hawkish surprise from the ECB, and weak auction results. OIS forwards are now pricing in nearly 175bp of tightening in 2022, fully reversing the recent declines and actually making new highs
- Despite this week's moves and the repricing in the front end, intermediate Treasuries remain historically rich after controlling for their drivers. Moreover, the 10-year sector also looks rich along the curve after the recent outperformance…
- …We also look for a hawkish outcome at next week's FOMC meeting. While these factors lean us bearish on duration, geopolitical uncertainty remains high and we remain neutral on duration
- Dispersion has increased across the curve, but RMSE has risen the most in the 20-year sector. This underperformance indicates Treasury should continue to make disproportionately large cuts to 20-year sizes in the future, though we do not expect to learn anything new on this front before the next quarterly refunding announcement on May 4
- While Treasury market liquidity has weakened, and is amplifying moves in rates, we do not see the decline in market depth as foreshadowing another round of market disruption as we saw this time two years ago. Moreover, these bouts of illiquidity will likely be commonplace until we see increased intermediation alongside the rapid growth of the Treasury market
- The 2043-2045 sector is the peak of the curve and has cheapened sharply as 20s/30s has flattened. Furthermore, P-STRIPS have sharply underperformed similar-maturity whole bonds in recent weeks and offer value

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See page 11 for analyst certification and important disclosures.

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Market views

Exhibit 1: Treasury yields rose strongly over the past week and have retraced to expansion highs
Weekly changes in Treasury yields with 1-year statistics; bp unless otherwise indicated

Tenor	Current	1wk chg	1y high	1y low	1y avg	Percentile
2y	1.748	25.9	1.75	0.13	0.48	100%
3y	1.921	31.3	1.92	0.28	0.70	100%
5y	1.960	33.2	1.96	0.65	1.07	100%
7y	2.011	32.4	2.03	0.95	1.37	99%
10y	2.005	28.4	2.04	1.17	1.56	98%
20y	2.449	22.9	2.47	1.73	2.06	100%
30y	2.363	21.6	2.48	1.67	2.09	94%

Source: J.P. Morgan

Treasury yields reversed higher this week, amid lower energy prices, hawkish central bank developments in Europe, and a series of weak Treasury auctions. On the first point, oil prices retraced about half of last week's gains, supported by renewed optimism surrounding a resolution to the conflict in Ukraine. Meanwhile, Thursday's ECB meeting was decidedly hawkish: as the central bank decided on a

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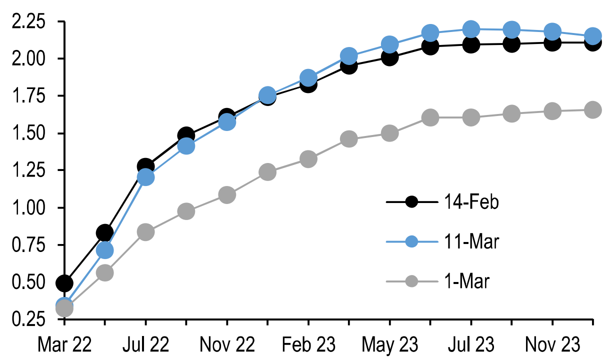
faster taper, opening the door to a rate hike in September or even July, though we continue to forecast the first hike in December (see *ECB: A faster taper and a hawkish inclination, but the situation is still very fluid*, Greg Fuzesi, 3/10/22). Finally, two of this week's three Treasury auctions tailed amid weaker end-user demand and weak primary dealer bidding. Though the 30-year auction stopped 2.3bp through pre-auction levels amid a record share of end-user demand on Thursday, it required a 10bp pre-auction concession in order to achieve this strong result. Against this backdrop, 2-, 5-, 10-, and 30-year Treasury yields rose 26bp, 33bp, 28bp, and 22bp, respectively (**Exhibit 1**).

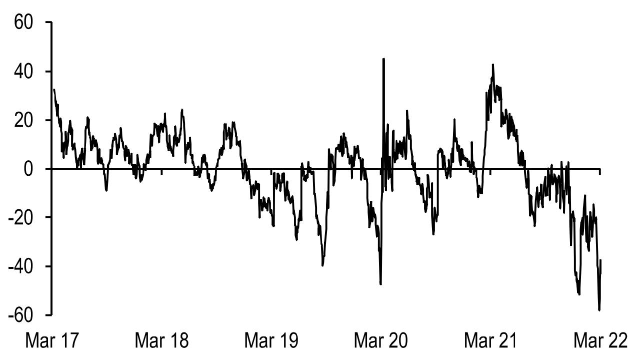
From a high level perspective, it appears that the Treasury market has unwound the whole risk premium being priced in for the conflict in Ukraine, as Treasury yields have completely retraced their descent following the invasion late last month, and have made new highs at the front end: **Exhibit 2** shows that OIS forwards had reduced the implied Fed tightening in 2022 by 50bp from the highs in mid-February to the local lows 10 days ago. However, the OIS curve has retraced completely and made new highs: OIS forwards are now pricing in nearly 175bp of tightening in 2022. Moreover, the front end is pricing a Fed funds rate that peaks at 2.20%, eclipsing the mid-February highs, but approximately 6 months earlier than previously. Similarly, longer out the curve, 30-year yields have retraced to their highest levels since March 2021.

Exhibit 2: OIS forwards have risen 50bp from their local lows, and are pricing in a peak funds rate of 2.20%, 6m earlier than a month ago…
OIS forward rates by FOMC meeting date; %



Source: J.P. Morgan

Exhibit 3: …but intermediate Treasuries remain historically rich after controlling for their drivers
Residual of J.P. Morgan 10-year Treasury Fair-Value model*; %



* Regression of 10-year Treasury yields on 5Yx5Y seasonally-adjusted TIPS breakevens (%), 3m3m OIS rates (%), Fed policy guidance (months), J.P. Morgan US Forecast Revision Index (%), and CFTC spec positions in interest rate futures (3y z-score). Regression from 3/11/17-3/11/22. R-squared = 96%, SE = 14.0bp

Source: J.P. Morgan, CFTC

Despite this backdrop, it's evident that there is a risk premium built into the Treasury market related to the Russia/Ukraine conflict, as intermediate Treasuries remain very expensive relative to the market's Fed policy, growth, and inflation expectations. **Exhibit 3** shows that 10-year yields rose 10bp more than implied by their fundamental drivers over the week, but even with this move remain more than 2 standard deviations below their model-implied fair value, and about 20bp richer than they stood prior to the invasion on this basis. **Indeed, this gap tells us that to justify current yield levels, inflation or growth expectations would need to decline significantly**. We can also observe this same dynamic via the sharp outperformance of the intermediate sector along the curve over the last month since geopolitical concerns began to escalate. **Exhibit 4** shows the rolling one-month change in the 2s/10s/30s Treasury butterfly over the last 15 years, and

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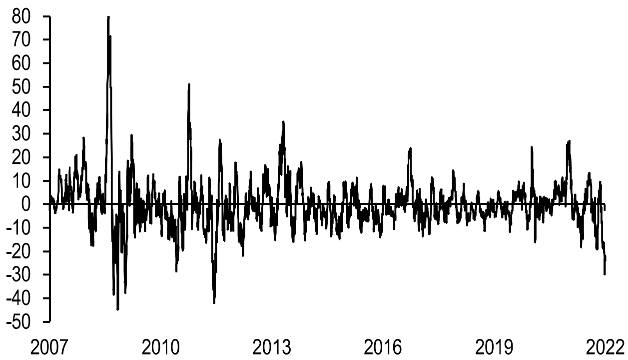
indicates the moves over the last month have been the largest since August 2011, when brinksmanship around the debt ceiling drove S&P to downgrade the US sovereign rating, driving a major flight-to-quality, amid renewed concerns over the peripheral crisis in Europe. Prior to that episode, there were multiple such moves during the 2008-2009 Great Financial Crisis when risk aversion increased substantially. Even more locally we can observe this, as the 10-year sector now looks about 6bp rich along the curve, even after adjusting for the slope of the curve and the level of yields (**Exhibit 5**).

Exhibit 4: The belly outperformed over the last month by a magnitude not seen since the summer of 2011…

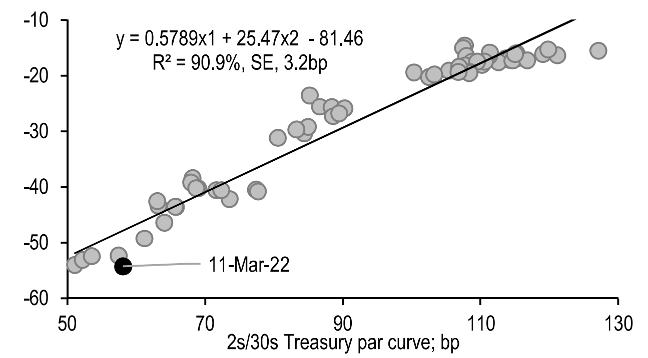
Rolling 1-month change in 2s/10s/30s Treasury butterfly; bp



Source: J.P. Morgan

Exhibit 5: …after the recent outperformance, the 10-year sector looks rich along the curve

2s/10s/30s par Treasury butterfly regressed on 2s/10s par Treasury curve (bp), and 10-year par Treasury yields (%), regression over the last 3 months; bp



Source: J.P. Morgan

Taken together, while the front end is pricing a path for the Fed that looks remarkably like our own forecast through early 2023, it is somewhat likely the Fed will deliver an even more hawkish outcome next week. It's a *fait accompli* that the FOMC will deliver its first rate hike since December 2018, but the focus will fall squarely on a new SEP and the Chair's comments on the timing and speed of SOMA normalization. On the former, our economists forecast the median dots will project six 25bp hikes in 2022, three hikes in 2023, and two hikes in 2024, which would put the terminal Fed funds rate at 2.75-3.0%, indicative of restrictive policy against the back drop of the 2.5% longer-run dot (see *FOMC Preview*, Michael Feroli, 3/11/22). **At face value, with markets pricing in substantially less tightening over this cycle, this should leave substantial room for yields to reprice higher.**

Taken together, relatively rich valuations in intermediate Treasuries, against the backdrop of the potential for a hawkish outcome at next week's FOMC meeting, make a strong case to turn bearish on duration once again. Moreover, it appears that investor positioning has turned more neutral as well: our latest Treasury Client Survey shows that 24% of respondents remain positioned for higher yields but this share has fallen by 10%-pts over the last two weeks, and positioning is now in line with average levels observed over the last year (see *US Treasury Client Survey*, 3/8/22). However, with yields having moved 30bp higher this week and a clear lack of visibility into developments in Ukraine, we would rather wait for better location to position for higher yields, and this is why we unwound 10s/30s flatteners earlier this week (see *US Treasury Market Daily*, 3/9/22). **As a result we recommend maintaining a neutral stance on duration over the near term.**

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Treasury market liquidity canary in the coal mine or much ado about nothing?

Both Treasury market depth and the RMSE of our Treasury par curve show little improvement from last week's depressed levels. On the other hand, trends across GC repo relative to matched-maturity OIS as well as on-the-run versus near-off-the-run valuations remain rather unremarkable, with these relationships near historical averages (**Exhibit 6**). Overall, while liquidity conditions remain weak, funding remains widely available and dealer inventories have not increased substantially, indicating circumstances are quite different from the last time liquidity conditions were this weak two years ago (see Treasuries, *US Fixed Income Markets Weekly,* 3/4/22).

Exhibit 6: Market depth improved marginally this week while RMSE rose somewhat, indicating liquidity conditions remain depressed, but we continue to see no increase in liquidity preference and funding remains widely available

Various metrics of Treasury market function; units as indicated

Indicator	Today	1wk chg	2y avg	2y min	2y max	2y z-score
Duration weighted mkt depth*; $mn	166	13	384	37	659	-1.7
10y UST price impact**; 32nds	0.8	0.1	0.7	0.0	2.0	0.7
1m GC/OIS; bp	-4.3	-4.1	1.0	-9.5	44.9	-0.8
UST curve RMSE***; bp	3.6	0.5	1.3	-9.5	3.9	3.4
10s/3x old 10s ASW; bp	-0.4	0.1	0.2	-9.5	3.5	-0.3
30s/3x old 30s ASW; bp	-0.3	0.8	-0.3	-9.5	3.3	0.0

* Market depth is the sum of the three bids and offers by queue position, averaged between 8:30 and 10:30am daily

** Price impact defined as the average move in order book mid-price against a $100mn flow in traded notional. See Drivers of price impact and the role of hidden liquidity, J. Younger et al., 1/13/17 for more details.

*** Root Mean Square Error of J.P. Morgan par fitted Treasury curve (see *The new and improved Treasury par curve model*, 7/16/18)

Source: J.P. Morgan, BrokerTec

Along the curve, the pain is being felt most acutely in the 20-year sector. While dispersion has increased across the curve, the most aggressive manifestation of this dispersion is evident in off-the-run 20-year bonds: **Exhibit 7** shows the RMSE of the 7- to 20-year sector is twice the RMSE of the overall Treasury curve. As a result, this has left the 20-year point at its cheapest levels compared to a 10s/30s butterfly since mid-2009, at which point we all know there was no organic 20-year supply (**Exhibit 8**). The sector has suffered in various bouts of illiquidity over the last year, and much of this issue stems from sizing: even as Treasury has cut auction sizes in the sector more aggressively than in surrounding tenors, that does not help the large-sized, illiquid off-the-run complex. Moreover, this latest bout of underperformance indicates Treasury should continue to make disproportionately large cuts to 20-year sizes in the future, and the minutes of the February TBAC meeting indicate this is likely as well (see *US Treasury Market Daily*, 2/2/22). This is also incorporated into our own forecasts, but given Treasury's tenet as a regular and predictable borrower, we do not expect to learn anything new on this front before the next quarterly refunding announcement on May 4. In the meantime, it will require a sizeable decline in volatility and commensurate improvement in liquidity for the 20-year sector to retrace richer along the curve.

Clearly the weakening in high-profile liquidity metrics has drawn attention from market participants: Treasury curve dispersion via RMSE has eclipsed the highs observed this time two years ago when the historic breakdown in market functioning required unprecedented Fed intervention. As a result, we've been fielding questions

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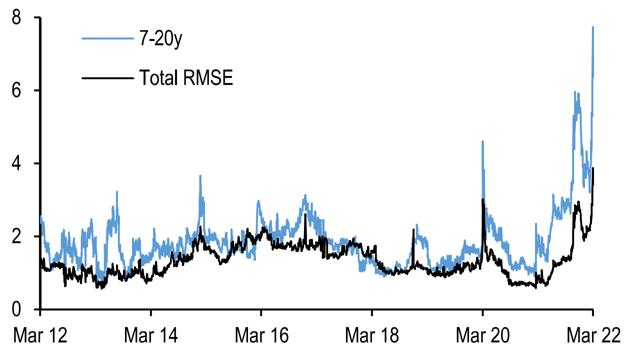
about whether Treasury market functioning is once again the proverbial canary in the coal mine for a broader disruption in financial market functioning. However, not all liquidity measures paint the same picture, as a number of other market functioning factors show lower levels of stress than we observed two years ago: the price impact of each trade in 10-year Treasuries has risen only modestly, and there is no strong evidence of liquidity preference via the performance of on-the-runs relative to near off-the-runs, unlike what transpired in March 2020. Finally, repo markets seem to be functioning well given the relatively stable nature of GC/OIS spreads, and this makes sense, given that reserve balances have doubled over the last two years and an additional$1.5tn in liquidity sits in the overnight RRP facility.

Exhibit 7: The increase in dispersion in off the runs has been evident across the curve, has been most acutely felt in off-the-run 20-year bonds…

Root mean square error of J.P. Morgan Treasury curve, overall versus 7- to 20-year sector*; bp

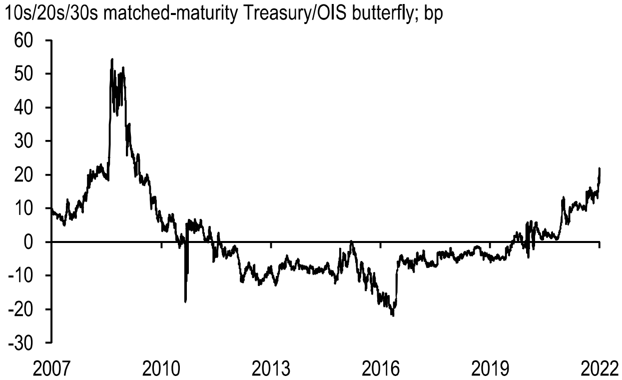


* see *The new and improved Treasury par curve model*, 7/16/18

Source: J.P. Morgan

Exhibit 8:…driving the 20-year sector to its cheapest levels since 2009

10s/20s/30s matched-maturity Treasury/OIS butterfly; bp



Source: J.P. Morgan

What then explains this divergence in liquidity metrics? At its root, Treasury market liquidity remains highly sensitive to volatility, with depth decreasing as volatility increases, and vice versa (see *US Treasury Market Structure and Liquidity: The changing dynamics of liquid markets*, 4/2/15). Moreover this dynamic has only become more pronounced in recent years given the growing dominance of algorithmic traders on interdealer trading platforms (see *Far from the shallow now? Liquidity provision by high frequency participants in US rates*, 4/12/19). Thus, against the backdrop of a sharp increase in volatility, it stands to reason that market depth should weaken substantially. But what can explain the extreme dislocations in deep off-the-runs? We think a few factors are at work.

First, while the monetary policy focus has been rightly on the timing of liftoff and the pace of rate hikes over the coming year, we can't ignore how the Fed's asset purchases have impacted valuations as well: **Exhibit 9** shows that Treasury curve RMSE has steadily increased as the Fed's duration purchases have been tapered towards zero. Intuitively, this makes sense as the Fed behaves like a relative value trader, focusing its purchases in bonds that appear cheap along the curve. Thus, as the monthly pace of duration purchases has dropped from an average of $60bn 10-year equivalents per month in early 2021 to almost nothing now, it's no surprise that off-the-run dispersion has risen.

Second, RMSE is materially higher now than it was the last time the Fed tapered in 2014, but it's worth noting the Treasury market is nearly twice as large as it was at the end of the QE3 episode. **Additionally**, intermediation hasn't kept pace with the

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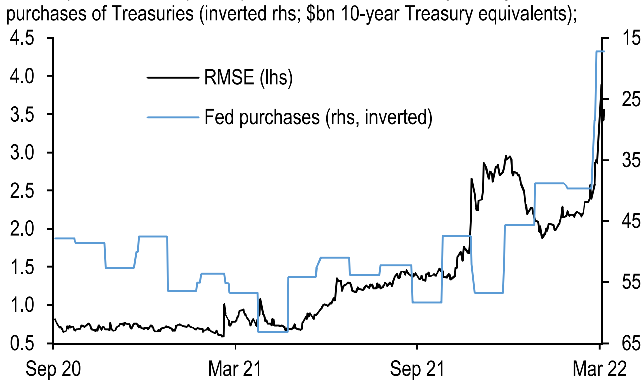
growth of the Treasury market over this period. While the number of primary dealers is now larger than at any point since the turn of the century, risk-taking capacity has not grown commensurately as dealer positions represent less than 1% of total outstanding Treasuries, significantly below the pre-crisis peak. Regulatory developments over the past decade have limited the accumulation of inventory, and leaned heavily on the principal trading model. The Fed, FDIC, and OCC temporarily excluded reserves and Treasuries from the denominator of the SLR in the spring of 2020, but this relief expired a year ago. In their testimonies before the Senate Banking Committee, FOMC Chair Pro Tempore Powell and Governor Brainard advocated adjusting the SLR in a way that does not reduce overall capital levels, and former policy makers made the same argument in a panel at the 2021 Treasury market conference (see *US Treasury Market Daily*, 11/17/21). Nevertheless, there has been no further progress on adjusting the SLR, and we doubt this will change until the FOMC has a Vice Chair for Supervision. In that vein, Sarah Bloom Raskin has been nominated to serve in this capacity, but the Senate Banking Committee has yet to vote on her nomination or any other. Until there is a Vice Chair for Supervision, progress on regulatory reform is likely to be glacial.

Exhibit 9: Curve dispersion has increased as Fed purchases have declined towards zero

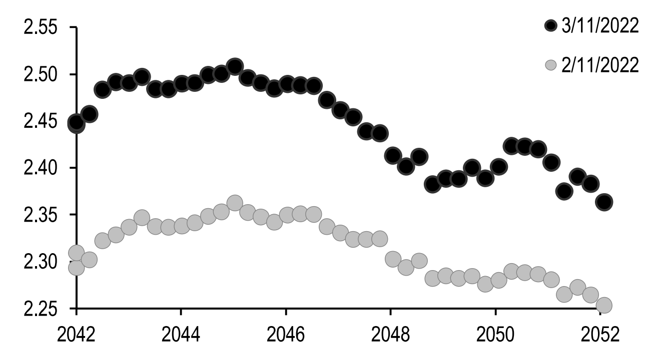
Treasury curve RMSE (lhs, bp) versus one-month moving average of Fed purchases of Treasuries (inverted rhs; $bn 10-year Treasury equivalents);



Source: J.P. Morgan, Federal Reserve Bank of New York

Exhibit 10: Though the 20-year sector looks historically cheap, the 2043-2045 sector is the peak of the curve, and this has become more pronounced as 20s/30s has inverted further

2042-2052 sector of Treasury curve, 3/10/22 versus 2/10/22; %



Source: J.P. Morgan

On balance, while Treasury market liquidity has weakened, and is amplifying moves in rates, we do not see the decline in market depth as foreshadowing another round of market disruption as we saw this time two years ago, for the reasons stated above. **Moreover, we continue to argue that these bouts of illiquidity will be commonplace until a more concerted effort is made to strengthen market resiliency and increase intermediation to keep up with the ongoing growth of the Treasury market.**

The long end: the peak of the curve appears cheap in whole bonds and P-STRIPS

Though the 20-year sector has underperformed sharply and appears historically cheap, it's notable that the peak of the curve at the long end is actually originally-issued 30-year bonds in the 2043-2045 sector (**Exhibit 10**). This is not necessarily a new development as this sector has been the peak of the Treasury curve for over a month now. In large part, we think this is due to the inversion of the 20s/30s curve as well: the impaired liquidity conditions we discussed above have been disproportionately felt in sectors where liquidity was challenged to begin with. To be sure, the relative lack of liquidity in this part of the market is not a recent

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development: we've argued for a while how the 20-year sector suffers from systematically reduced liquidity, which we attributed to Treasury's initial decision in 2020 to start auction sizes on par with the 30-year bond, despite recommendations to the contrary from end users, primary dealers, and the TBAC (see *Treasuries 2022 Outlook*, 11/23/21). For the time being, given the reduced liquidity of these securities, they might continue to trade cheap while overall liquidity remains depressed, as investors are likely to continue to favor more liquid parts of the curve. However, as delivered volatility in rates normalizes, and as Treasury goes ahead with further disproportionately large cuts to the 20-year auction size at the May refunding, where we expect the 20-year auction size to decline to $17bn, relative to $22bn for 30-year bonds, we think we should see a gradual improvement in outright and relative liquid in the sector that should support valuations and eventually lead the 20-year sector to outperform on the curve.

Zooming in on some of the individual CUSIPS, we note that yield errors are not only elevated on an outright basis, but they are also stretched relative to recent history: **Exhibit 11** shows that most issues in this sector are 2.5-3 standard deviations cheap to their 6-month averages, with the biggest dislocations evident in the 2043 sector. This dynamic has extended to the STRIPS market as well, as P-STRIPS have significantly underperformed similar-maturity whole bonds in recent weeks. Given the duration difference between P-STRIPS and similar-maturity whole bonds, these spreads can be seen as levered curve trades, and spread widening should be of little surprise given the broader steepening that has taken place at the long end. However, the exhibit also shows these spreads look too wide, even after adjusting for the slope of the curve. **Moreover, given our outlook for the 5s/30s curve to flatten to 25bp through mid-2022 from 40bp now, and the expectation for liquidity conditions to improve upon the reduction of realized volatility and more locally the cuts to 20-year auction sizes, we see value in P-STRIPS in the 2043-2045 sector for long-duration investors, even though outright yield pickups are relatively small.**

Exhibit 11: Bonds in the 2043-2045 maturity sector are the cheapest along the curve and P-STRIPS are even cheaper in that sector…
Relative value statistics for bonds in the peak of the curve with P/whole bond spreads and relative value to slope of broader yield curve; units as indicated

Bonds							P-STRIPS			6m regression of P-STRIPS vs. 5s/30s curve		
Cpn	Mat	Yield	YE	6m Z-score	Size ($bn)	SOMA %	O/S $bn	Spread (bp)	6m Z-score	Beta	R-sqr (%)	Resid (bp)
3.125	Feb-43	2.49	4.3	3.4	42	54	5	8.6	1.8	0.05	81	3.8
2.875	May-43	2.50	3.8	3.2	42	28	5	8.3	1.8	0.05	82	3.7
3.625	Aug-43	2.48	3.4	2.9	42	48	4	9.5	1.8	0.06	81	4.4
3.750	Nov-43	2.48	3.0	3.1	42	47	4	9.6	1.8	0.06	81	4.6
3.625	Feb-44	2.49	2.7	2.7	42	44	7	9.4	1.8	0.06	81	4.5
3.375	May-44	2.49	1.7	2.7	42	48	5	8.6	1.7	0.06	83	4.2
3.125	Aug-44	2.50	1.5	2.9	42	33	4	8.0	1.5	0.06	85	3.9
3.000	Nov-44	2.50	0.8	3.0	42	41	5	7.8	1.6	0.06	86	3.9
2.500	Feb-45	2.51	-0.1	2.8	42	22	6	6.7	1.5	0.05	88	3.5

Source: US Treasury, J.P. Morgan

In particular, **Exhibit 12** shows Nov-43 P-STRIPS have severely underperformed their whole bond counterparts over the last few weeks, and have cheapened significantly when adjusted for curve slope, coinciding with the reduction in market liquidity we've discussed extensively.

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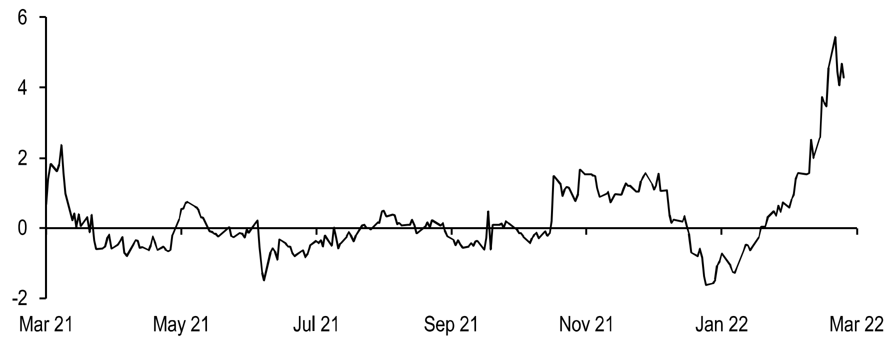
Exhibit 12: …and much of this cheapening has occurred over the last month
Residual of Nov-43 P-STRIPS/bond spread regressed on 5s/30s curve, bp



R-squared = 82.7%, SE = 1.1bp

Source: J.P. Morgan

Trade recommendations

- **Maintain 40:56 weighted 1.375% Nov-31s/2.25% May-41s/2.0% Feb-50s belly-richening butterflies**
– Sell 40% risk, or $4.5mn notional of T 1.375% Nov-31s (yield: 1.99%; bpv: $852/mn)
– Buy 100% risk, or $6.3mn notional of T 2.25% May-41s (yield: 2.401%; bpv: $1511/mn)
– Sell 56% risk, or $2.7mn notional of T 2% Feb-50s (yield: 2.337%; bpv: $1958/mn)
– (*US Fixed Income Markets Weekly*, 2/25/22): P/L since inception: -1.5bp

- **Maintain 1.125% Feb-2031s/1.25% Aug-2031s flatteners**
– Stay short 100% risk, or $29.6mn notional of T 1.125% Feb-31s
– Stay long 100% risk, or $28.2mn notional of T 1.25% Aug-31s

– (*US Fixed Income Markets Weekly*, 11/12/21): P/L since inception: -3.3bp

Closed trades in last 12 months
P/L reported in bp of yield unless otherwise indicated

TRADE	ENTRY	EXIT	P/L
Duration			
2-year duration longs	10/18/21	11/04/21	5.0
10-year duration shorts	06/11/21	02/11/22	36.2
Curve			
3s/7s steepener	04/09/21	01/07/22	-34.8
10s/30s steepener	09/28/21	01/07/22	-15.0
10s/30s flattener	03/05/22	03/09/22	7.0
Relative value			
0.125 Jan-24s/2.125 Jul-24s flatteners	3/26/2021	5/7/2021	2.3
10s20s30s belly-richening fly	01/22/21	05/07/21	-5.1
99.1/100 weighted 0.625% Aug-30s/1.125% Feb-31s steepeners	03/05/21	06/11/21	-1.0
16:99 weighted 1.125% Feb-31s/ 2.25% May-41s/1.25% May-50s belly-richening flies	05/21/21	08/20/21	-5.8
99:100 weighted 2.75% Feb-28s/3.125% Nov-28s flatteners	06/11/21	09/17/21	2.8
146:25 weighted old 2s/old 3s/5s belly richening butterfly	09/10/21	09/30/21	2.6

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100:85 weighted 2.875% May 25s/ 2.125% May 26s steepeners	08/20/21	10/01/21	3.1
19:86 weighted 10s/20s/30s belly-richening butterflies	10/29/21	11/05/21	2.8
100:93 2.25% Oct-24s/ 0.25% Sep-25s curve flatteners	2/18/22	2/23/22	2.5
Number of positive trades			9
Number of negative trades			5
Hit rate			64%
Aggregate P/L			2.6

Source: J.P. Morgan

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