J.P.Morgan

North America Fixed Income Strategy
08 November 2024

U.S. Bond Futures Rollover Outlook

December 2024 / March 2025

- The period since the last roll has seen the onset of easing and 75bp in rate cuts, a dramatic shift in market expectations towards a shallower easing cycle, and - more recently - the passing of the election. Unsurprisingly, the Dec-to-Mar forward repo rate has traded in a wide range. But it now fairly priced given current expectations, and will likely remain stable over the next few weeks. Thus, forward financing rates will likely not be a major driver of calendar spreads during this roll period
- Investor positioning, on the other hand, remains a significant factor. Treasury futures open interest continues to make new highs, and the strong preference by commercial accounts to avoid the delivery month means that a sizeable net long or short commercial futures open interest in a given sector could bias the calendar spread narrower or wider respectively. This factor is expected to exert narrowing pressure to varying degrees in all sectors. The one exception is the classic bond contract, where commercial accounts are net short and therefore this factor is expected to pressure the spread wider
- Basis convergence is expected to not play a role in almost all sectors, but here too the classic bond contract is the exception. Front and back net bases are modestly rich and cheap respectively in the classic bond contract, and a correction would pressure the calendar spread wider. Additionally, in the back contract, the wildcard option could play a role. Although the current CTD has little wildcard optionality, higher yields could cause the CTD to shift to lower coupon bonds with higher wildcard option values. On the margin, this makes a widening in the back basis more likely during the roll period
- All sectors have different front and back CTDs, making calendar spreads directional with yields, and we recommend bpv-neutral hedge ratios for the roll. Different CTDs also means that relative value mispricings between front and back CTDs could play a role in influencing the calendar spread. Currently, this is only relevant in the TU contract, where the spread curve between CTDs is too steep. A relative value correction here would pressure the calendar wider, offsetting the narrowing bias from the large net commercial long position
- All in all, we are bullish on the weighted US contract calendar spread, bearish on the weighted FV and TY calendar spreads, mildly bearish on weighted calendar spreads in the UXY and WN sectors, and neutral on the TU calendar

US Rates Strategy

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	Front Price	Calendar Spread (/32nds)	HR*	CTD Front	CTD Back	View	Main drivers
WN	125-07	-0-02.625 /32nds	1000	4-3/4 Nov 53	4 Nov 52	Mildly bearish	Investor Positioning
US	117-25	-0-05.75 /32nds	978	4-5/8 Feb 40	4-3/8 May 40	Bullish	Basis Convergence, Investor Positioning
UXY	113-15.5	-0-08.625 /32nds	963	4-3/8 May 34	3-7/8 Aug 34	Mildly bearish	Investor Positioning
TY	110-10	-0-05.375/32nds	950	3-3/4 Aug 31	4-1/8 Oct 31	Bearish	Investor Positioning
FV	107-01	-0-07.125/32nds	939	4-1/4 Feb 29	4-1/2 May 29	Bearish	Investor Positioning
TU	102-25	-0-07.5625/32nds	881	0-7/8 Sep 26	1-1/4 Dec 26	Neutral	Investor Positioning, CTD RV

Source: J.P. Morgan.
* Hedge Ratio: recommended number of Back contracts per 1000 Front contracts. Contract prices and calendar spread levels are based on live levels on 11/8/2024. Calendar spread levels are quoted at theoretical mids and front contract prices are quoted at the bid side.

See page 14 for analyst certification and important disclosures.

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Overview

The December - March Treasury futures roll cycle this year comes after one of the most-watched weeks of the year, a week that brought the US Presidential election as well as the FOMC meeting in back to back sequence. In the three months since the last roll, the Fed began easing in September with a 50bp cut, and indicated a shift in its focus from predominantly inflation to a balanced mix of inflation and labor market health. Since then, labor market data has come in stronger than expected, which has led to a significant repricing of Fed expectations towards shallower cuts. More recently, all attention has been centered around the US Presidential election. As of this writing, the Republicans have taken the Presidency as well as the Senate, and appear likely to win the House as well. Given all these developments, yields have traded in a very wide range and sit near their 2-month peaks (**Figure 1**), forward OIS rates point to a shallower cycle, and our economists have also revised their Fed expectations after the election - they now look for a 25bp/quarter cadence after December until the funds rate reaches 3.5% (Economic implications of the elections, M. Feroli, 11/6/2024). These large swings in yields and Fed expectations has meant that policy uncertainty has crept back into the picture and now appears maximally elevated for next year. One way to see this is by looking at calls and puts at various strikes on June 2025 SOFR futures, backing out the implied probability density function, and then de-constructing it in a particular way that gives the implied weights on each possible policy path by mid next year. As seen in **Figure 2**, we swiftly moved from a period of policy clarity to a period of elevated policy uncertainty, where markets are now assigning roughly equal weights on shallow and deep cuts.

Figure 1: Forward funds rates and Treasury yields are sharply higher in recent months

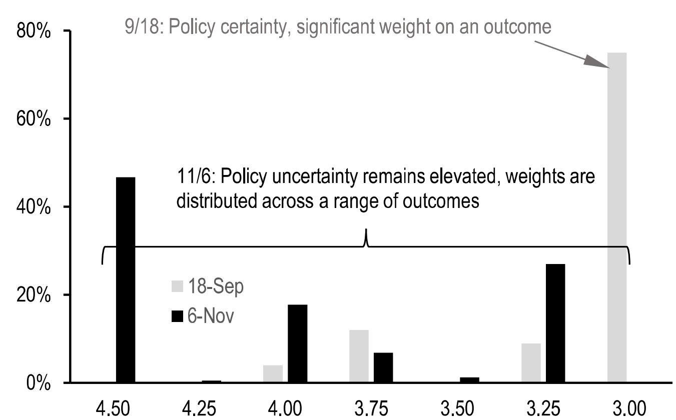
Summary statistics for forward 1M OIS rates at select FOMC meeting dates and UST yields, 9/3/2024 - 11/7/2024; %

	start	chg	end	min	mean	median	max	range
Fwd OIS - Dec '24	4.33	0.08	4.41	4.04	4.28	4.33	4.43	0.40
Fwd OIS - Mar '25	3.77	0.37	4.14	3.38	3.77	3.88	4.16	0.77
Fwd OIS - Jun '25	3.42	0.50	3.92	2.99	3.44	3.59	3.95	0.96
2Y UST Yield	3.89	0.33	4.22	3.52	3.86	3.93	4.27	0.75
5Y UST Yield	3.66	0.53	4.19	3.40	3.77	3.81	4.27	0.87
10Y UST Yield	3.84	0.50	4.34	3.62	3.96	3.98	4.42	0.81
30Y UST Yield	4.13	0.41	4.54	3.94	4.25	4.27	4.60	0.66

Source: J.P. Morgan.

Figure 2: Weights attributable to shallow paths are now somewhat comparable to weights associated with deeper cuts, implying that policy uncertainty has risen

Weights on 1H25 policy rate scenarios representing a range of different Fed Funds rates, as calculated from a decomposition of the implied probability distribution associated with Jun 2025 SOFR futures*; as of 9/18 and 11/6



* We enumerate a list of scenario-specific Normal distributions with fixed standard deviations and means that are separated by 25bp, and then require the implied distribution to be a weighted combination of these individual distributions. The weights are then solved for, by fitting to the observed prices of calls and puts at various different strikes. For more details of our approach, see What's the rush?.

Source: J.P. Morgan., CME

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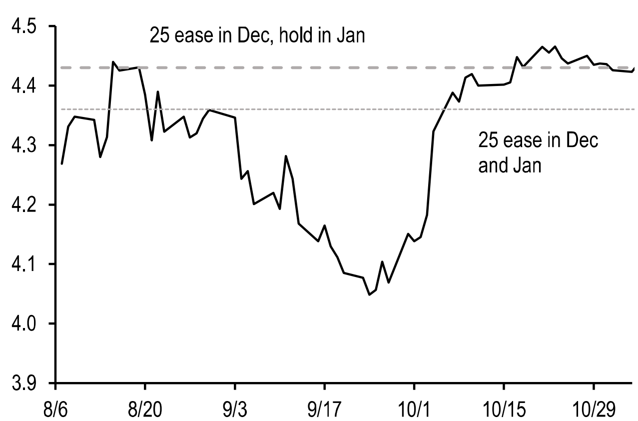
Similar to the last roll cycle, the uncertainty in Fed expectations can impact calendar spreads via multiple ways. **One**, Fed expectations get priced into forward repo rates between the Dec and March contract delivery horizons. All else equal, lower forward repo rates implies higher carry for the back contract CTD, and therefore a lower forward price, which in turn widens the calendar spread. This impact is symmetric, and higher forward repo rates would imply narrower calendar spreads. Thus, volatile Fed expectations can beget volatile calendar spreads. **Two**, shifts in Fed expectations also have the potential to shift optimal delivery in March to last delivery day, which could bring about additional cheapening in the back contract. Our current Fed outlook (we look for 25bp cuts in the Dec Fed meeting, and 25bp/quarter cuts in the next meetings), implies a forward repo rate of 4.3% in the month of March. Given the current CTD coupons, this may not be sufficient enough to shift the optimal delivery date, but any repricing of forward expectations lower can lower this forward repo rate and shift optimal delivery date. As **Figure 3** shows, forward financing rates (spanning the period between the currently optimal delivery dates into December and March contracts) have been volatile, ranging from 4% to 4.5%, but are now currently priced to our economist expectations for policy. Therefore**, we expect financing rates to find some stability in the near term given that the US election and FOMC meeting are behind us, and not impact calendar spreads**.

Figure 3: Forward rates are likely to find some stability during the roll period after exhibiting considerable volatility in the past three months

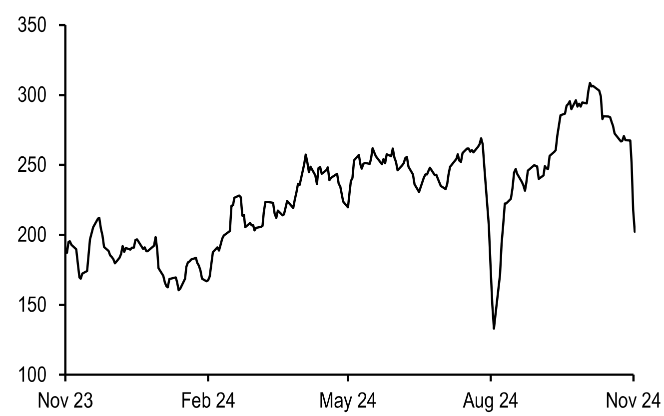
12/3/2024 x 3/3/2025 SOFR swap rate, and estimates* for where this forward rate would be for different scenarios, past three months, %



* Projected IOER under different scenarios - 6bp
Source: J.P. Morgan.

Figure 4: Market depth has been slow to recover this year and has declined sharply in this week with heavy event risk

Duration weighted market depth*, past 1 year; $mn



* Market depth is the size of the top 3 bids and offers by queue position, averaged between 8:30 - 10:30am daily. Duration weighted market depth refers to the weighted sum of market depth in 2s, 5s, 10s, and 30s using weights of 0.25, 0.5, 1 and 2, respectively.
Source: J.P. Morgan, BrokerTec

Policy uncertainty will continue to have an impact on market volatility and can impact broad market liquidity. As we've noted in other publications (see Déjà vu awaits in funding markets), during times of elevated policy uncertainty every bit of data or Fed-speak will likely lead to weights on the implied distributions to be recalibrated, which in turn can produce large swings in the forward rates and result in elevated delivered volatility. Additionally, while market depth had recovered from the lows in August, it has declined sharply in the past few weeks amidst higher policy uncertainty (**Figure 4**). All in all, **this would result in higher delivered volatility, which would make long basis positions in the ultra-long contract** (due to elevated wildcard option) **attractive**. Currently, the high coupon Nov '53 is the CTD into the December contract,

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but this CTD can switch to a lower-coupon bond in a sell-off, which means investors holding long basis positions may delay rolling at current levels, leaving commercial longs with a weaker hand.

Indeed, this was the case in the last roll cycle where shorter maturity contracts delivered within a few days of the first delivery date, given the negative carry across all contracts, but the WN contract delivered very close to last delivery day (**Figure 5**). Given that CTD carry continues to be negative in all contracts, **early delivery remains a highly likely occurrence, especially in shorter duration contracts with low optionality, and we recommend investors who wish to avoid delivery risk to roll their positions ahead of first notice day**.

Wildcard optionality could play a role in the classic bond contract as well. Lower coupon bonds have the potential to become CTD into USH5 in a selloff, which would result in higher wildcard optionality in USH5 and widen the fair value of the USH5 CTD net basis. We discuss this later in the section on basis convergence.

The backdrop of policy uncertainty, elevated volatility and weaker broad-market liquidity is likely to exacerbate the effect of any technical imbalances. At the risk of being repetitive, **we see investor positioning continuing to play an important role in this cycle again as open interest in the futures complex has once again risen to historic highs** (**Figure 6**). This means that there are a lot of contracts that need to be rolled, during a short period of time. To be sure, liquidity in calendar rolls is typically much better than the liquidity in outright duration trades; nevertheless, we expect technical pressures to be felt in sectors where net commercial futures open interest is significantly net long, as these investors will typically roll positions ahead of first notice day. This is largely a factor in the TU, FV and TY contracts where commercial longs are elevated. In the UXY contract, commercials are net long but are near historic averages and therefore we expect a modest narrowing pressure. In the WN contract, we expect technicals to lend some narrowing bias given that they are net long, despite being below historical averages. In the US contract, we expect technicals to pressure calendar spreads wider (see Investor Positioning).

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Figure 5: Early delivery remains a mainstay in Treasury futures contracts except in the WN sector

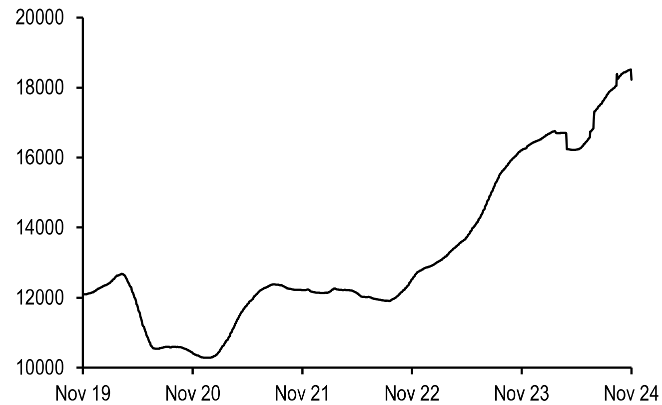
Total contracts delivered and weighted-average number of days from first delivery day for various September 2024 future contracts

Contract	Total Contracts	Days from FDD
TU	55598	0
FV	106093	1
TY	44055	2
UXY	19670	3
US	31001	4
WN	10847	27

Source: J.P. Morgan., CME

Figure 6: Aggregate open interest in the futures complex continues to make new highs

Total risk weighted open interest in Treasury futures contracts*, 000s of UXY equivalents; past 5Y



* Calculated as the weighted sum of the 3-month moving average of the open interest across TU, FV, TY, UXY, US and WN contracts, using weights of 0.5, 0.5, 0.75, 1, 1.5 and 2.5 respectively.
Source: J.P. Morgan., CFTC

Delivery optionality and basis convergence is likely to be a factor **in the classic bond contract as the front net basis appears too wide with respect to fair value and the back basis appears to be underpricing any optionality**. Although back bases do not usually exhibit basis convergence during the roll cycle, there could still be some widening pressure on the calendar spread from both sides, especially since there is a chance of CTD shifts producing wildcard optionality in USH5. **In the ultra-long bond contract**, while the front basis appears too wide with respect to the traditional switch optionality that we see in the contract, the CTD switch would be to a low-coupon, high-wildcard bond, which would pressure the net basis wider. Therefore, we think the **markets are likely to preserve the current wide levels of the front net basis. Given this, and the fact that back contract net bases in the WN sector typically remain stable during the roll, we don't expect basis convergence to influence the WN calendar spread**. **In the TU, FV , TY and UXY sectors, we don't expect basis convergence to be a driver of calendar spreads in this contract (**see CTD switch optionality, basis convergence, and the wildcard **)**

As of this writing all contracts have different CTDs into front and back contracts, which creates the potential for the curve between CTDs to impact the calendar spread in each sector. **In the TU contract**, the swap spread curve between the front and back CTDs appears too steep with respect to recent history. **A correction in this could cheapen the back CTD relative to the front, which would exert widening pressure on the calendar spread** (see CTD Relative Value). Additionally, **given the different CTDs into the front and back contracts in most sectors, we recommend BPV-weighted hedge ratios when rolling positions forward to mitigate the directional exposure of calendar spreads**. Our recommended hedge ratios and other details pertaining to the contracts can be found in the contract-specific tables (see Contract Tables).

In summary (**Figure 7**), **we are mildly bearish on the ultra-long bond and ultra ten-year note weighted calendar spreads** on the back of technical pressures from commercial longs. **We are bullish on the classic bond weighted calendar spread** as basis convergence may pressure the calendar spread wider, and commercial accounts are

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net short. **We are bearish on the ten-year note and five-year note calendar spreads** on the back of investor positioning. **In the two-year note sector, offsetting influences from investor positioning and relative value considerations leave us neutral on the calendar spread**.

Figure 7: Summary of our views on calendar spreads and their main drivers

Main drivers of calendar spreads and their impact on the calendar spreads

	WN	US	UXY	TY	FV	TU
Basis Convergence	-	Bullish	-	-	-	-
Investor Positioning	Mildly bearish	Bullish	Mildly bearish	Bearish	Bearish	Bearish
CTD Relative Value	-	-	-	-	-	Bullish
Fwd. Financing Rates	-	-	-	-	-	-
Conclusion	Mildly bearish	Bullish	Mildly bearish	Bearish	Bearish	Neutral

Source: J.P. Morgan.

Investor Positioning

As is typically the case, investor positioning will continue to be material during this roll cycle, as the aggregate open interest in the futures complex has only continued to increase over time (see Figure 6). This means that large gross positions need to be rolled within a short window of time. Such a concentration of roll activity into a narrow time window can be helpful for liquidity, and is the reason why liquidity in calendar spreads is usually better than what might be expected based on broader metrics such as market depth. **But in commercial accounts in aggregate have a much stronger preference to avoid delivery risk** (incentivizing commercial longs to roll early), **sectors where commercial accounts are significantly net long tend to see narrowing pressure on the spread. Moreover, since commercial accounts roll early even they are net short, sectors where commercial accounts are net short tend to see widening pressure on the calendar**.

Normalizing for recent history, net commercial futures open interest is highly elevated in the two-year note (TU) and five-year note (FV) (**Figure 8**), as well as the ten-year note (TY) sector. In contrast, net commercial futures open interest is closer to the lower end of the range in the classic bond contract (US) contract, and closer to recent averages in the ultra-long bond (WN) and the ultra ten-year note (UXY) contracts- (**Figure 9**). As commercial accounts look to roll these positions ahead of first notice day, **we expect technical narrowing pressures to be significant in the two-year note, five-year note, and ten-year note contract sectors** as first notice day approaches. **In the classic bond contract**, the statistically significant net commercial short position is likely to exert (all else equal) **widening pressure** on the calendar spread.

In the ultra-long bond contract too, we expect technicals to lend some narrowing bias despite the fact that net commercial longs are near historical averages. This is because the wildcard option exposes longs to the risk of significantly suboptimal delivery, which can be avoided by rolling early. Thus, regardless of investor type, longs have an compelling incentive to roll early, which strengthens the hand of shorts and therefore typically begets narrowing pressure on the calendar spread. To be sure, the higher coupon in the CTD means that the front contract has less wildcard optionality than in the past. Nevertheless, this dynamic is powerful enough and causes us to expect some narrowing bias in this contract as well from technicals.

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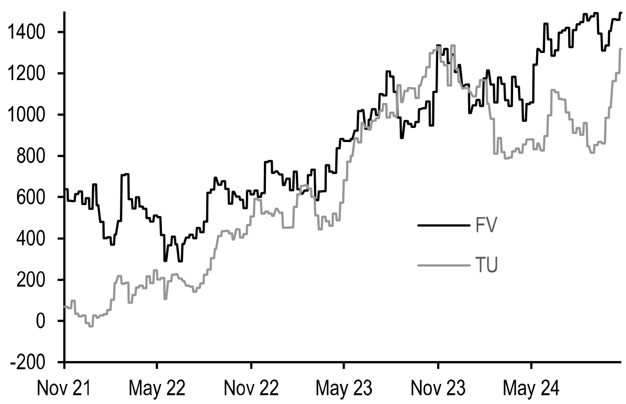
In the UXY contract, net commercial futures open interest is close to historical averages, but is positive. **Technical pressures are unlikely to be significant, but could be a source of modest narrowing pressure on the margin**.

Figure 8: Net commerical longs in the 2-year note and the 5-year note contracts are significantly elevated relative to history

Net commercial longs minus shorts in the TU and FV sectors, past 3 years; '000s of contracts



Source: J.P. Morgan., CFTC

Figure 9: Commercial net longs are elevated in the TY and shorter maturity contracts, short in the classic bond contract, and close to average elsewhere

3-year statistics* on net commercial longs for the various treasury futures contracts; '000s of contracts, past 3Y history

Contract	Current	Min	Max	Mean	Std. Dev.	Percentile	Z-score
WN	308	213	413	320	40	39%	-0.31
US	-33	-86	210	44	63	9%	-1.23
UXY	183	-19	350	207	76	35%	-0.29
TY	790	173	991	555	160	94%	1.47
FV	1494	289	1494	880	337	100%	1.83
TU	1318	-26	1335	659	395	98%	1.68

* Current as of 10/29/2024
Source: J.P. Morgan. CFTC

CTD Relative Value

As of the time of this writing, all contracts have different CTDs into front and back contracts, which creates the potential for relative value considerations between front and back CTDs to impact the calendar spread during the roll cycle.

In the TU sector, the swap spread curve between the 0.875% Sep 2026 and 1.25% Dec 2026 issues (front and back CTDs respectively) appears too steep relative to its recent average, by ~2bp. As can be seen in **Figure 10**, this spread curve has steepened as the broader 2s/3s spread curve has flattened, suggesting that the CTD spread curve steepening is related to futures market technicals and could therefore reverse during the roll period. **Such a correction in this spread curve would pressure the TU weighted calendar spread wider, to the tune of ~0.6/32nds per 1bp**. Thus, this factor could contribute ~1.5-2/32nds of widening pressure on the weighted TU calendar spread.

In the other contracts, the front and CTDs appear fairly priced with respect to each other, and CTD relative value considerations are unlikely to play a significant role in driving calendar spreads during the upcoming roll period.

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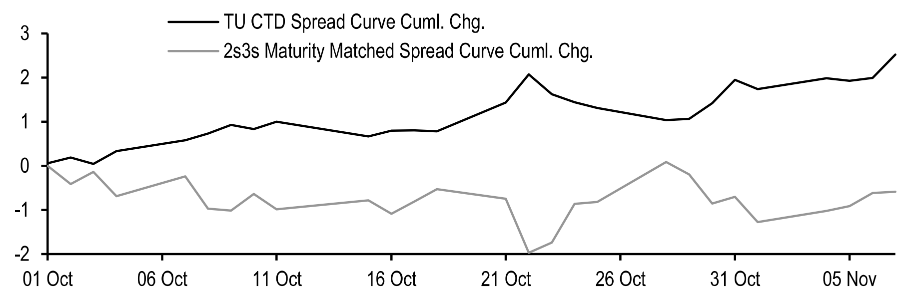
Figure 10: In the TU contract sector, the swap spread curve between the front CTD and the back CTD has steepened as the broader 2s/3s spread curve has flattened, and a reversal would pressure calendar spreads wider

Cumulative change of the spread curve between front CTD (0.875% Sep 2026) and back CTD (1.25% Dec 2026) for the TU contract as well as cumulative change in the 2s3s maturity matched spread curve, 10/1 - Current; bp



Source: J.P. Morgan.

CTD switch optionality, basis convergence, and the wildcard

In the TU, FV and UXY sectors, there is little CTD switch optionality because of yield and curve movements in the front as well as back contracts (see Contract Tables for current CTDs into each contract). In the TU and FV sectors, both front and back bases are trading near zero, making basis convergence a non-issue for calendar spreads in these sectors. In the UXY contract, front net bases are trading near zero while the back bases are trading near 1/32nds. Despite the slight richness in the back basis, it is worth noting that back bases typically remain stable during the roll period, and any convergence towards fair value usually only occurs after the roll is complete. Therefore **we don't expect basis convergence to be a driver of calendar spreads in the TU, FV and UXY sectors**.

In the TY sector, the story is largely similar. Delivery optionality is negligible in the front contract. In the back, there is some potential for the WI 7Y note to be CTD into TYH5, but all in all the delivery option is estimated to be relatively small at around ~2/32nds. Although this is not currently priced into the back basis (both front and back bases are near zero currently), history suggests that this difference is not significant enough. As such, **we expect that both front and back net bases in the TY sector will likely remain stable near current levels, and basis convergence should not play much of a role**.

In the classic bond contract, the 4.625% Feb 40 is the CTD into the front contract and is well entrenched. In the back contract, 4.375% May 40 is the current CTD. However, the back contract has some switch optionality and the 1.875% Feb 2041 could become CTD in a ~70bp selloff (and the 1.125% Aug 2040 becomes CTD in a larger selloff). The recent increase in delivery optionality has been largely driven by the increase in long end yields (**Figure 11**), and there remains significant probability of a switch given the longer time horizon to March delivery. Currently, both front and back contract net bases are near 1.5/32nds; given negligible delivery option value in the front and ~3/32nds of option value in the back contract, this makes the front basis modestly rich and the back basis modestly cheap. Thus, **basis convergence in both front and back contracts has**

the potential to exert widening pressure on the calendar spread.

This time, **the case for a wider back contract basis in the US sector is somewhat strengthened by the potential for wildcard optionality**. As our readers will recall, the wildcard option stems from two facts - (i) the bpv-neutral ratio is closer to the conversion factor (which is currently far below 1) while the delivery ratio is always 1 which means that the difference or "tail" will need to be sold while making delivery, and (ii) invoice prices for delivery are determined at 3pm NY time while a notice to deliver can be made several hours later. Thus, if the market rallies after futures close, the tail can be sold for a profit and the remaining bonds can be delivered, creating the so called wildcard option payoff for a long basis investor (for a more detailed discussion of the wildcard option, see U.S. Bond Futures Rollover Outlook: June 2024 / September 2024). Although there is relatively small wildcard optionality right now, given the relatively high conversion factor for the CTD into USH5, several lower coupon bonds could emerge as the CTD in a selloff, which would cause wildcard optionality to rise. Thus, **we see classic bond contract back month basis as poised to widen during the roll period. As a result, basis convergence is likely to pressure the US calendar spread wider in coming weeks.**

In the WN contract, as of this writing, the CTD into the front contract is the 4.75% Nov '53, and the CTD into the back contract is the 4% Nov '52. There is ~1/32nds of switch optionality in the front and ~2.5/32nds in the back contract. In the front contract, switches are possible in a selloff between the current CTD and the 4% Nov '52, and in a further selloff to the 2% Feb '50. In the back contract switches are possible between the current CTD and the 4.75% Nov '53 in a rally, or the 2.375% May '51 in a large selloff. Currently the front basis is trading at ~6/32nds - this is much larger than what the CTD switch option is worth, but that is likely because of the significant wildcard optionality that may occur in the event of a switch to the low coupon, low conversion factor 2% Feb '50.

Currently, **with the potential for elevated intra-day volatility on the back of post-election information flow, the wildcard option is likely more valuable than usual**. If we assume a post-futures-close volatility of 2bp on any given day in the delivery month, the wildcard option in the front contract is estimated to be worth 3/32nds in the net basis. However, if the CTD were to shift to the Feb 50s, the wildcard option in WNZ4 would be closer to 8/32nds, in terms of the Feb 50 basis (**Figure 12**). **Given these estimates, the current net basis in the front month is likely to remain steady in coming weeks**. But what about the back month net basis? After accounting for the delivery and wildcard option value, we estimate that the WN back contract net basis is several ticks narrow to fair value. But historical experience suggests strongly that the back contract net basis is unlikely to correct during the roll period. Therefore, **we expect the back basis to remain stable in coming weeks. In sum, basis convergence in the WN sector is unlikely to emerge as as significant source of pressure on the WN calendar spread in coming weeks**.

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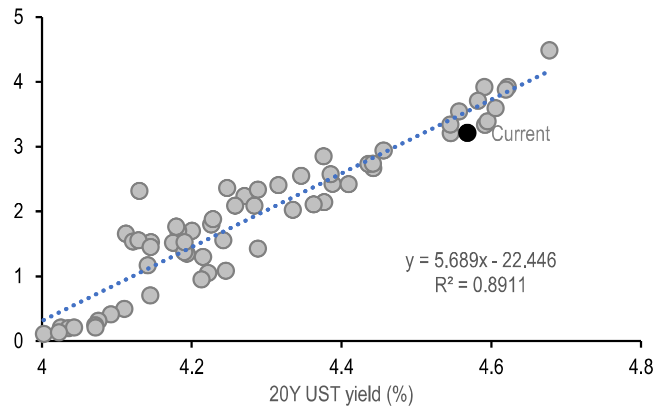
Figure 11: The increase in delivery option value in the back US contract has coincided with the recent selloff in 20Y yields

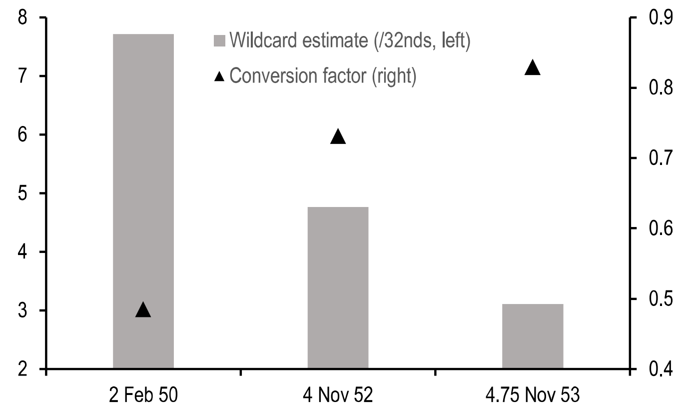
US back contract JPM estimate of delivery option value (/32nds) versus 20Y UST yields (%), past 3 months



Source: J.P. Morgan.

Figure 12: A switch to the Feb 50s is a possibility, and would significantly increase the wildcard option value thanks to a much lower conversion factor

Estimate of wildcard option value* (32nds, left) for various CTD candidates and their conversion factors (right) , as of 11/7/2024



* The vol assumptions used for the wildcard calculation are based off of the 3-month close-to-open volatility during previous roll cycles. Wildcard estimates and conversion factors are shown for the WNZ4 contract

Source: J.P. Morgan., CME

Contract Tables

Table 1: Key attributes of the front and back Ultra-long bond futures contracts

Projected key attributes of the front and back WN contracts*

	Front	Back
Price	124-01	124-04
DV01 ($/contract)	204.35	204.35
Hedge Ratio	1000	-1000
CTD	4-3/4 Nov 53	4 Nov 52
CTD repo	4.71	4.66
Proj. CTD 60bp selloff	4-3/4 Nov 53	4 Nov 52
Proj. CTD 60bp rally	4-3/4 Nov 53	4 Nov 52
Switch option value (32nds)	1.1	2.4
Implied Repo	1.97	4.54
Calendar Spread	-0-03 /32nds	

	Front	Back
CTD carry (32nds)	-0.4	-2.7
Repo sensitivity (32nds/10bp)	0.22	0.93
Gross Basis (32nds)	5.7	-1.6
BNOC (32nds)	6.1	1.1
First Trade Date	Mar 20 2024	Jun 20 2024
Last Trade Date	Dec 19 2024	Mar 20 2025
First Notice Date	Nov 29 2024	Feb 28 2025
First Delivery Date	Dec 02 2024	Mar 03 2025
Last Delivery Date	Dec 31 2024	Mar 31 2025

Source: J.P. Morgan, Bloomberg Finance L.P., CME
* Market data as of COB 11/7/2024

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Table 2: Key attributes of the front and back "Classic" Bond contracts

Projected key attributes of the front and back US contracts*

	Front	Back		Front	Back
Price	117-03	117-08	CTD carry (32nds)	-0.6	-2.5
DV01 ($/contract)	130.86	133.80	Repo sensitivity (32nds/10bp)	0.22	1.01
Hedge Ratio	1000	-978	Gross Basis (32nds)	1.0	-1.0
CTD	4-5/8 Feb 40	4-3/8 May 40	BNOC (32nds)	1.6	1.6
CTD repo	4.71	4.66	First Trade Date	Mar 20 2024	Jun 20 2024
Proj. CTD 60bp selloff	4-5/8 Feb 40	4-3/8 May 40	Last Trade Date	Dec 19 2024	Mar 20 2025
Proj. CTD 60bp rally	4-5/8 Feb 40	4-3/8 May 40	First Notice Date	Nov 29 2024	Feb 28 2025
Switch option value (32nds)	0.0	3.2	First Delivery Date	Dec 02 2024	Mar 03 2025
Implied Repo	3.96	4.50	Last Delivery Date	Dec 31 2024	Mar 31 2025
Calendar Spread	-0-05 /32nds				

Source: J.P. Morgan, Bloomberg Finance L.P., CME
* Market data as of COB 11/7/2024

Table 3: Key attributes of the front and back ultra 10-year note contracts

Projected key attributes of the front and back UXY contracts*

	Front	Back		Front	Back
Price	113-06+	113-13+	CTD carry (32nds)	-0.9	-7.4
DV01 ($/contract)	87.67	91.04	Repo sensitivity (32nds/10bp)	0.22	0.99
Hedge Ratio	1000	-963	Gross Basis (32nds)	-0.6	-6.4
CTD	4-3/8 May 34	3-7/8 Aug 34	BNOC (32nds)	0.3	1.0
CTD repo	4.71	4.66	First Trade Date	Mar 20 2024	Jun 20 2024
Proj. CTD 60bp selloff	4-3/8 May 34	3-7/8 Aug 34	Last Trade Date	Dec 19 2024	Mar 20 2025
Proj. CTD 60bp rally	4-3/8 May 34	3-7/8 Aug 34	First Notice Date	Nov 29 2024	Feb 28 2025
Switch option value (32nds)	0.0	0.0	First Delivery Date	Dec 02 2024	Mar 03 2025
Implied Repo	4.58	4.56	Last Delivery Date	Dec 31 2024	Mar 31 2025
Calendar Spread	-0-07 /32nds				

Source: J.P. Morgan, Bloomberg Finance L.P., CME
* Market data as of COB 11/7/2024

Table 4: Key attributes of the front and back 10-year contracts

Projected key attributes of the front and back TY contracts*

	Front	Back		Front	Back
Price	110-06	110-10+	CTD carry (32nds)	-1.9	-5.0
DV01 ($/contract)	64.67	68.07	Repo sensitivity (32nds/10bp)	0.21	0.99
Hedge Ratio	1000	-950	Gross Basis (32nds)	-1.5	-5.0
CTD	3-3/4 Aug 31	4-1/8 Oct 31	BNOC (32nds)	0.4	0.0
CTD repo	4.71	4.66	First Trade Date	Mar 20 2024	Jun 20 2024
Proj. CTD 60bp selloff	3-3/4 Aug 31	1-3/8 Nov 31	Last Trade Date	Dec 19 2024	Mar 20 2025
Proj. CTD 60bp rally	3-3/4 Aug 31	4-1/8 Oct 31	First Notice Date	Nov 29 2024	Feb 28 2025
Switch option value (32nds)	0.6	2.5	First Delivery Date	Dec 02 2024	Mar 03 2025
Implied Repo	4.54	4.65	Last Delivery Date	Dec 31 2024	Mar 31 2025
Calendar Spread	-0-04+/32nds				

Source: J.P. Morgan, Bloomberg Finance, L.P., CME
* Market data as of COB 11/7/2024

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Table 5: Key attributes of the front and back 5-year contracts

Projected key attributes of the front and back FV contracts*

	Front	Back		Front	Back
Price	107-01+	107-08	CTD carry (32nds)	-1.1	-2.9
DV01 ($/contract)	41.90	44.61	Repo sensitivity (32nds/10bp)	0.22	1.04
Hedge Ratio	1000	-939	Gross Basis (32nds)	-0.9	-3.3
CTD	4-1/4 Feb 29	4-1/2 May 29	BNOC (32nds)	0.2	-0.3
CTD repo	4.71	4.66	First Trade Date	Apr 01 2024	Jul 01 2024
Proj. CTD 60bp selloff	4-1/4 Feb 29	4-1/2 May 29	Last Trade Date	Dec 31 2024	Mar 31 2025
Proj. CTD 60bp rally	4-1/4 Feb 29	4-1/2 May 29	First Notice Date	Nov 29 2024	Feb 28 2025
Switch option value (32nds)	0.0	0.0	First Delivery Date	Dec 02 2024	Mar 03 2025
Implied Repo	4.62	4.69	Last Delivery Date	Jan 06 2025	Apr 03 2025
Calendar Spread	-0-06+/32nds				

Source: J.P. Morgan, Bloomberg Finance L.P., CME
* Market data as of COB 11/7/2024

Table 6: Key attributes of the front and back 2-year contracts

Projected key attributes of the front and back TU contracts*

	Front	Back		Front	Back
Price	102-26+	103-02	CTD carry (32nds)	-7.6	-32.4
DV01 ($/contract)	37.91	43.01	Repo sensitivity (32nds/10bp)	0.20	0.97
Hedge Ratio	1000	-881	Gross Basis (32nds)	-7.7	-32.6
CTD	0-7/8 Sep 26	1-1/4 Dec 26	BNOC (32nds)	-0.1	-0.2
CTD repo	4.71	4.66	First Trade Date	Apr 01 2024	Jul 01 2024
Proj. CTD 60bp selloff	0-7/8 Sep 26	1-1/4 Dec 26	Last Trade Date	Dec 31 2024	Mar 31 2025
Proj. CTD 60bp rally	0-7/8 Sep 26	1-1/4 Dec 26	First Notice Date	Nov 29 2024	Feb 28 2025
Switch option value (32nds)	0.0	0.0	First Delivery Date	Dec 02 2024	Mar 03 2025
Implied Repo	4.77	4.68	Last Delivery Date	Jan 06 2025	Apr 03 2025
Calendar Spread	-0-07+/32nds				

Source: J.P. Morgan, Bloomberg Finance L.P., CME
* Market data as of COB 11/7/2024

Appendix

1. *Calendar spread relative value.* For contracts with negligible embedded option values, the relative value of the calendar spread can be determined by comparing the implied repo rate (IRP) of the calendar spread to the forward three-month funding rate. The calendar spread IRP is the breakeven funding rate for going long the calendar spread, taking delivery in the front month and making delivery in the back month contract. If the calendar IRP is historically low compared to the forward financing rate for a particular market, the calendar spread may be considered rich.

   For contracts where delivery options in the futures are valuable, such as U.S. Treasury bond futures, we think a simple IRP analysis is inadequate because it overlooks the potential impact of switches in the cheapest-to-deliver bond. In these cases, the option-adjusted relative values of the front and back contracts should be compared to determine the relative value of the calendar spread. If

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the Option-Adjusted Basis Net of Carry (OABNOC) or Risk-Adjusted Yield Spread (RAYS) is lower for the front month than for the back month contract, the calendar spread is considered rich.

2. *Changes in short-term funding rates.* An increase in funding rates generally causes futures prices to rise relative to cash prices, since it decreases the carry basis. Thus, the calendar spread reflects changes in the shape of the short end of the yield curve: for example, if four-month funding rates rise while one-month rates remain the same, the calendar spread would be expected to fall. Changes in funding rates affect back-month futures more than front-month futures, since the back-month contract has three months more of carry in its basis. As a rule of thumb, for a parallel change in funding rates:

   -1 x (change in funding rate) / 4 = change in calendar spread.

   For example, if short-term rates increase by 25 basis points, the calendar spread is expected to decrease by approximately .0625 or 2/32nds:

   -1 x 0.25 / 4 = -0.0625 (in decimal form, or -2/32nds).

3. *Supply and demand pressures.* The calendar spread may become richer or cheaper depending on the balance of long and short hedgers and investors who are rolling positions.

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