US Rates

The curve dynamic & the neutral rate

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Regime shift in the curve dynamic post covid

Since the unanchoring of the frontend of the curve in 4Q21, the 2s10s curve dynamic seems to be shifting in regime with an increase in the degree of freedom for the frontend. This increase may be reflecting a corresponding shift in regime for longer term inflation expectations and for the neutral rate view... potentially back to the pre-GFC regime, or an intermediate state between the pre- and post-GFC regimes.

Current cycle vs the generic bear flattening trajectory

We obtain generic bear-flattening and bull steepening trajectories for the curve under corresponding tightening and easing cycles, contingent on the view for the neutral rate.

The 2s10s bear flattening trajectory observed over most of the recent tightening cycle seems to be consistent with a neutral rate assumption around 1.75-2%, slightly lower in the early stages of the cycle, and converging to this range as the cycle progressed.

What about the recent bear steepening?

The recent steepening dynamic reflects a c.50bp upgrade of expectations for the neutral rate from c.1.75-2% to c.2.25-2.5% if we consider the average level for the curve over August '23 (roughly -75bp average), or above (up to 3.1% neutral level) if we consider the recent peak steepness for the curve (c.-65bp on 17 August).

Expectations for the bull steepening dynamic to come

The Fed is priced to start to cut frontend rates at a c.8m horizon. Neutral rate expectations c.2.5% (in line with the current longer run Fed dots) imply a bull steepening of the 2s10s curve back to flat levels for fed funds rates c.3.75-4%, and a maximum bull steepening potential for the curve at the ZLB c.140bp. A higher neutral rate c.3% implies flat levels for the 2s10s curve c.4.25-4.5% and a maximum bull steepening potential for the curve c.165bp.

Curve forwards suggest c.2.5-3% range for neutral

When we look at the forwards on the 2s10s curve and interpolate the forward horizon at which the curve steepens back to positive territory (currently 1-2y), we note that it corresponds to a level for 3m OIS forwards (see Exhibit 18) c.4.15%.

In the context of the framework introduced here, this c.4.15% level for 3m OIS forwards at which the 2s10s curve is expected to re-steepen back to positive territory is consistent with a neutral rate view in the 2.5-3% range. The Fed LT dots may shift higher near-term to 2.75% or potentially 3% to reflect this new reality.

GFC – Great Financial Crisis

c. – approximately

ZLB – Zero Lower Bound

LT – Longer Term

OIS – Overnight Index Swap

Timestamp: 29 August 2023 06:45AM EDT

The four modes for the curve dynamic

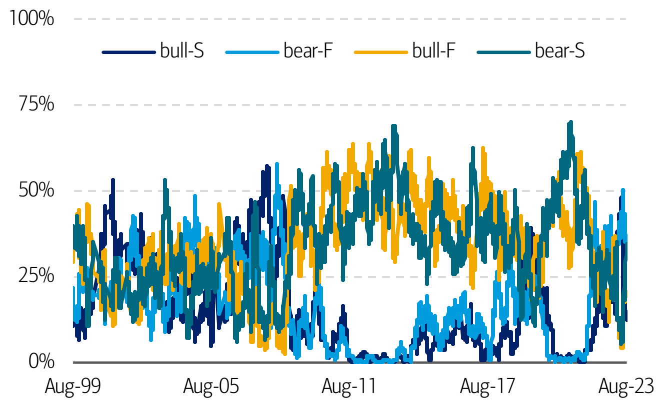
There are four different modes for the curve dynamic:

- bull steepening and bear flattening, which generally dominate when monetary policy action dominated the curve dynamic
- bull flattening and bear steepening, which are generally driven by shifting expectations around macro fundamentals

Measuring the frequency of these different moves over time provides valuable information around the relative importance of the repricing of policy expectation vs macro fundamentals in the dynamic of rates.

In Exhibit 1 we show the frequency of these different modes for the 2s10s curve dynamic over time, and in Exhibit 2 we aggregate the frequency of frontend driven moves in a directionality indicator. In this indicator: 0% corresponds to fully anchored 2y yields and a 2s10s curve driven predominantly by the 10y, generally with a Fed under forward guidance; while levels >50% reflect periods where the 2y drives the broader curve dynamic, generally with the Fed in tightening or easing mode.

Exhibit 1: Decomposition of the 2s10s dynamic ...
... into bull steepening, bear flattening, bull flattening and bear steepening moves



Source: BofA Global Research

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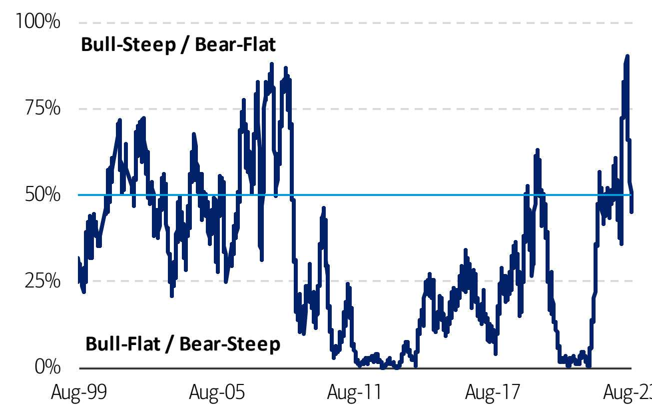
Exhibit 2: Directionality index for the 2s10s curve
2s10s unanchored in 4Q21 and is showing a higher degree of freedom than what was seen in the last cycle (potentially back to the pre GFC regime)



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Prevalence of the different modes for the curve over the cycle

There is a natural rotation of these different modes for the curve over the cycle. In fact, these 4 modes can be broadly mapped to the 4 stages of the economic cycle:

- Early cycle – improving macro fundamentals drive backend yields higher, but inflation tends to lag in the early cycle allowing the Fed to stay credibly on hold. The dominant dynamic in the early cycle is therefore bear-steepening.
- Mid cycle – In the transition to a mid-cycle dynamic the Fed guidance starts to lose credibility. This happens first at horizons c.3-5y leading to an un-anchoring of the belly of the curve (underperformance of belly vs wings), and only closer to liftoff at the frontend. The dominant dynamic in the mid cycle is therefore bear flattening, first in 5s30s (notice in Exhibit 3 the sharp un-anchoring of the 5y sector over the '13 taper tantrum and in 2Q22) and later in 2s10s (e.g., the un-anchoring of the 2y sector in 4Q22 in Exhibit 2).
- Late cycle – As the Fed overshoot the neutral, the bear flattening dynamic of the mid cycle pushes the curve into flat and eventually inverted levels, financial conditions tighten, macro data dispersion widens, and that starts to put downward pressure on backend yields even as the Fed continues to deliver at the frontend.

The curve continues to flatten in the late cycle, therefore, but the mechanism shifts from the dominant bear flattening seen in the mid cycle into a higher frequency of bull flattening moves in the late cycle (generally under an inverted curve). The late cycle transition is more diffuse and harder to pin.

- Finally, as the economy slows down and as the Fed is priced to deliver cuts near term, the curve starts to bull steepen. Initially one generally sees the outperformance of the belly vs the wings (5s30s steepening) and only closer to the first cut do we see the bull steepening extending to 2s10s more significantly.

Each mode for the curve dynamic therefore maps relatively well to a different stage of the cycle: early cycle = bear steepening, mid cycle = bear flattening, late cycle sees an increase in the frequency of bull flattening moves in a broader flattening dynamic, and recession = bull steepening.

Exhibit 3: Directionality index for the 5s30s curve
Unanchoring of the 5y in the '13 taper tantrum and in 2Q22

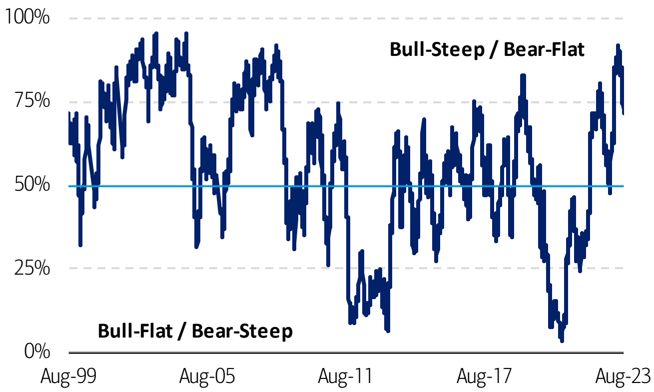

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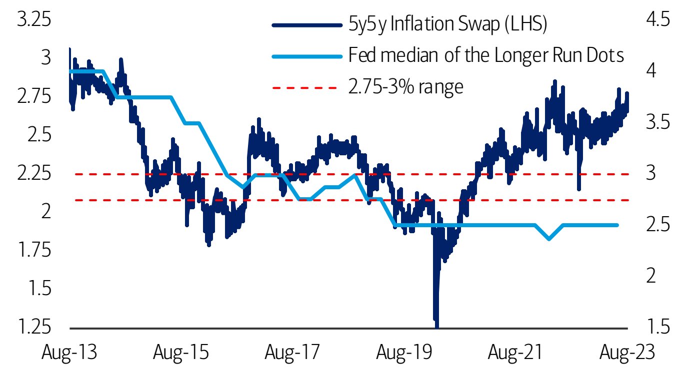
Exhibit 4: Median of the Longer run dots and 5y5y inflation
Median of the longer run Fed dots (proxy for the Fed's view of the neutral) has decoupled from longer term inflation expectations recently



Source: BofA Global Research

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A recent shift in regime for the curve?

One can think of the evolution of the curve dynamic over the cycle as a sequence of changes in regime for the curve. However, one noteworthy observation from Exhibit 2 is that the curve dynamic experienced a much more significant shift in regime around the GFC (outside of the ones expected over the cycle), with a collapse in the degree of freedom for the frontend over most of the last cycle (with the Fed at the ZLB).

More recently (after the unanchoring of the frontend in 4Q21), the curve dynamic seems to be shifting in regime once again with an increase in the degree of freedom for the frontend. Significantly, this increase may be reflecting a corresponding shift in regime for longer term inflation expectations and for the neutral rate view… potentially back to the pre-GFC regime, or an intermediate state between the pre- and post-GFC regimes as suggested by Exhibit 4 (the median of the longer run Fed dots is clearly lagging the recent dynamic of longer term inflation expectations).

Contingency of curve dynamic to the neutral rate view

The above discussion suggests some level of relationship between the broader curve dynamic over the cycle and market expectation for the level of the neutral rate for the US economy. Here we will make this connection more explicit.

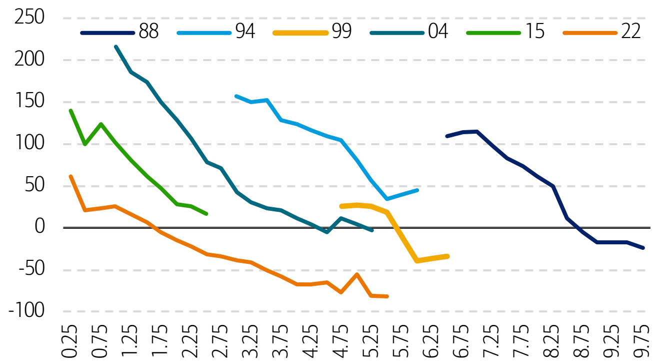
Generic bear flattening dynamic and the neutral rate

From a macro perspective, we expect the 2s10s curve to reach flat levels as the Fed reaches the neutral rate in a tightening cycle, and to invert as the Fed overshoots the neutral. Indeed, the degree of inversion of the 2s10s curve in the cycle should be contingent on the degree of Fed overshoot of the neutral.

Exhibit 5 illustrates this view... It shows the average level for the 2s10s curve vs the level of the fed funds rate over every tightening cycle since the late 1980's. Over time, the bear flattening dynamic has shifted to the left (i.e., the curve reaches flat levels and starts to invert at lower levels for the fed funds rate), reflecting a secular downtrend in neutral rate expectations. We note that:

- In the '04-'06 tightening cycle the 2s10s curve reached average flat levels for fed funds c.4.25-4.5% (consistent with a 4.5% nominal neutral rate suggest by the LW estimates pre-GFC – see Exhibit 6)
- Over the '22-'23 tightening cycle the 2s10s curve reached average flat levels for fed funds c.1.75%, lower than the c.2.5-3% range of estimates from LW and HLW, suggesting a lower view for the neutral priced by the market (Fed estimates for the neutral were in fact discontinued over the covid crisis given the high uncertainty around these estimates).

Exhibit 5: Average for the 2s10s curve vs fed funds over every tightening cycle since the late '80s
Flattening dynamic shifts to the left (curve reaching flat levels in the cycle for lower levels of fed funds) as expectations for the neutral rate move lower



Source: BofA Global Research

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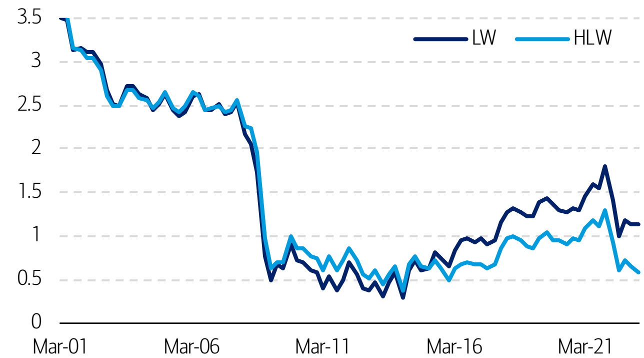
Exhibit 6: Laubach Williams (LW) and Holston-Laubach Williams (HLW) estimates for the real neutral rate over the last two cycles
Real neutral rate collapsed from c.2.5% (4.5% nominal) pre-GFC to lows around c.0.5% (2.5-3% nominal) post-GFC



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To a significant degree, the bear flattening curves observed over different cycles in Exhibit 5 are self-similar. One can observe that best by normalizing all the curves to an arbitrary level for the neutral c.4.25-4.5% (pre-GCF) as in Exhibit 7. This allows us to obtain a generic bear flattening dynamic for the 2s10s curve vs fed funds rate levels (through a weighted average of the different curves in Exhibit 7), which can then be shifted left/right given an assumption for the neutral rate level (lower/higher vs the 4.25-4.5% arbitrary level chosen). We show this generic bear flattening in Exhibit 8.

Exhibit 7: Bear-flattening curves over recent cycles normalized to a nominal neutral rate level of c.4.25-4.5%
Bear flattening curves are to a large extent self-similar

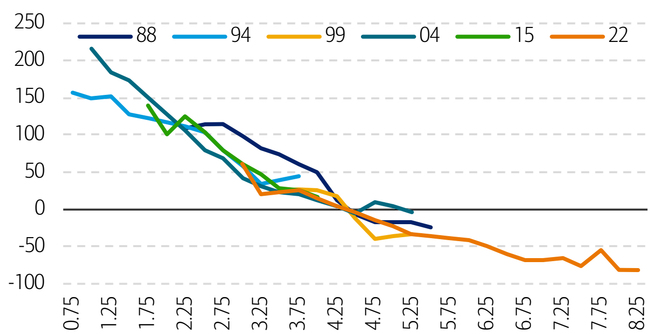

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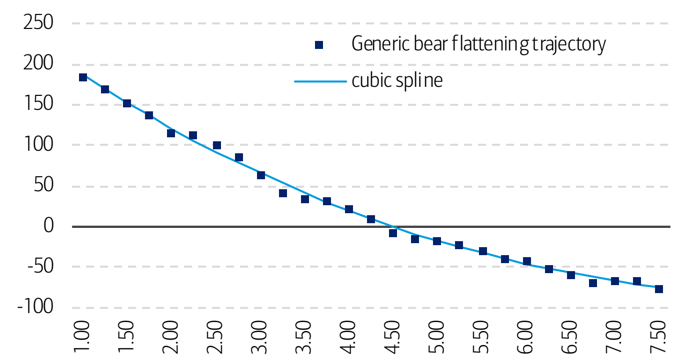
Exhibit 8: Generic assumption for a bear flattening dynamic
Normalized to an arbitrary level for the neutral rate c.4.25-4.5%



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Generic bull steepening dynamic and the neutral rate

The same approach that we just followed for the mid-cycle bear-flattening dynamic when the Fed tightens monetary policy can be used for the end-cycle bull steepening when the Fed cuts policy rates.

In Exhibit 9 we show the average level for the 2s10s curve vs the level of the fed funds rate over every easing cycle since the late 80's. Over time the bull steepening dynamic shifts to the left (i.e., a progressively lower steepening potential for the curve at the ZLB), reflecting again a secular downtrend in neutral rate expectations.

Exhibit 9: Average for the 2s10s curve vs fed funds over every easing cycle since the late '80s

Steepening dynamic shifts to the left (lower steepening potential for the curve at the zero lower bond) as expectations for the neutral rate move lower

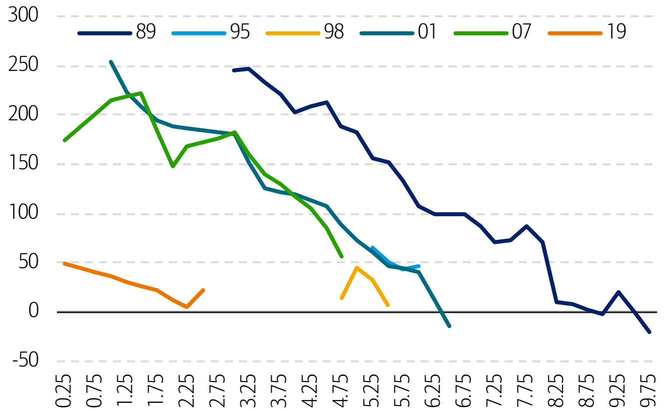

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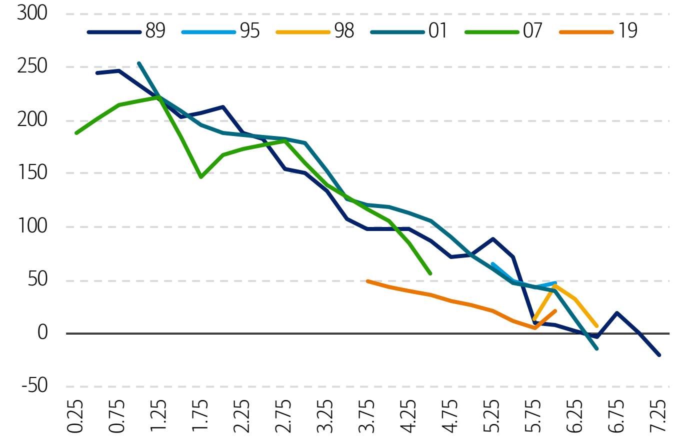
Exhibit 10: Bull steepening curves over recent cycles normalized for to a nominal neutral rate level of c.5.25-5.5% (to the '01 dynamic)

Bull steepening curves are also to some extent self-similar



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These bull steepening curves are to some extent also self-similar, and in Exhibit 10 we normalize the curves to an arbitrary nominal neutral rate c.5.25-5.5% seen over the '01 easing dynamic (see the '99 tightening cycle in Exhibit 5, and the LW/HLW estimates for r* in Exhibit 6). This allows us to obtain a generic bull steepening dynamic for the 2s10s curve vs fed funds rate levels (through a weighted average of the different curves in Exhibit 10), which can then be shifted left/right given a different neutral rate assumption (lower/higher vs the 5.25-5.5% arbitrary level chosen). We show this generic bull steepening in Exhibit 11.

Exhibit 11: Generic assumption for a bull steepening dynamic

Normalized to an arbitrary level for the neutral rate c.5.25-5.5%

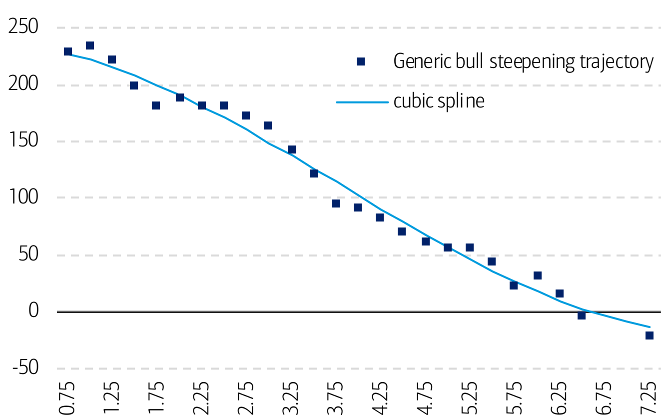

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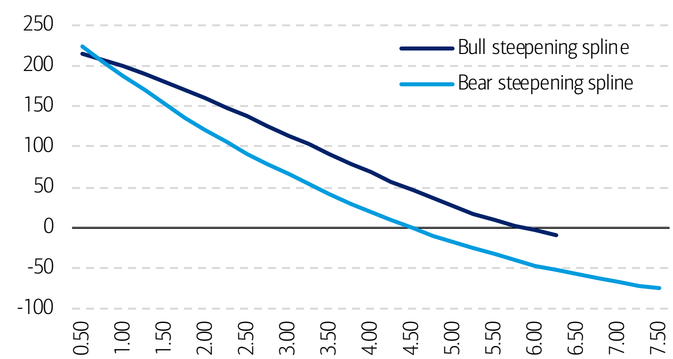
Exhibit 12: Expectations for a bear-flattening & bull-steepening dynamic in the context of a neutral rate c.4.25-4.5%

Gap between bull-steepening and bear-flattening curves reflects frontloaded steepening/flattening momentum early in the easing/tightening cycle



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We shift the generic bull steepening trajectory to reflect the same 4.25-4.5% neutral used for the generic bear flattening trajectory and contrast the two in Exhibit 12 (using the cubic splines). The gap between bear-flattening and bull-steepening curves for the same neutral rate assumption reflects a frontloaded flattening/steepening momentum early in the tightening/easing cycle.

Case study: current cycle vs the generic trajectory

We can now use the generic dynamics for the curve obtained above, particularly the bear flattening one, to offer some context to what we have seen for the 2s10s dynamic in the recent tightening cycle… and to understand the recent bear steepening move which is relatively unorthodox this late in a cycle.

In Exhibit 13 we contrast the bear flattening trajectory of the 2s10s curve in the recent tightening cycle with assumptions for the generic bear flattening trajectory under different neutral rate ranges. A couple of observations are noteworthy:

- The bear flattening trajectory seen over the recent tightening cycle seems to be consistent with a neutral rate assumption around 1.75-2%, slightly lower in the early stages of the cycle, and converging to this range as the cycle progressed
- At -100bp for 2s10s the curve seems to be too flat, but the analysis is constrained by limited historical data for these levels of curve inversion
- The steepening of the 2s10s curve into c.-55bp for fed funds levels around 5% was driven by a bull steepening dynamic (during the March risk off episode) and therefore inconsequential for this analysis…
- … but the recent bear steepening is quite consequential. In this analysis the recent steepening dynamic seems to reflect a c.50bp upgrade of expectations for the neutral rate from c.1.75-2% to c.2.25-2.5% (see Exhibit 14 for an a refocus of Exhibit 13 to the range of interest) if we consider the average level for the curve over August '23 (roughly -75bp average), and to up to 3.1% for the neutral if we consider the recent peak steepness for the curve (c.-65bp on 17 August).

Exhibit 13: The flattening dynamic in '22/23 vs generic bear flattening trajectories and implications for neutral rate expectations
Most of the bear flattening dynamic in the current cycle seems consistent with a neutral rate c.2%.

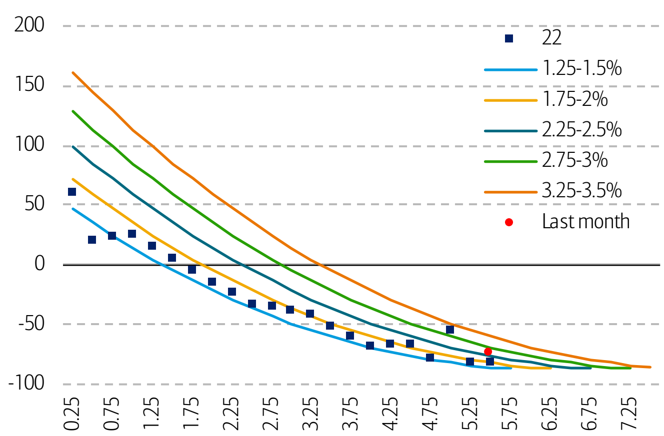

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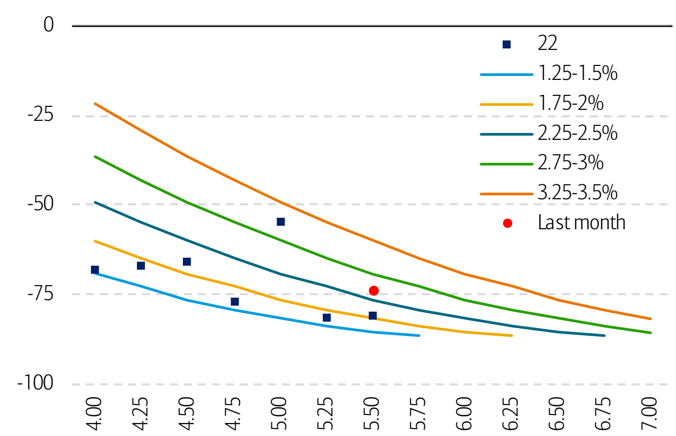
Exhibit 14: The flattening dynamic in '22/23 vs generic bear flattening trajectories and implications for neutral rate expectations
Recent bear steepening suggests an upgrade of neutral to c.2.5%, and potentially to levels as high as c.3.1%.



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Expectations for the bull steepening dynamic to come

From the generic bull steepening trajectory calculated above, we can also construct expectations for the bull steepening dynamic in the upcoming easing cycle (the first Fed cut is still priced for mid-'24 – Exhibit 15), contingent on the market view for the neutral.

- Neutral rate expectations around 2.5% (in line with the current longer run Fed dot) imply a bull steepening of the 2s10s curve back to flat levels for fed funds rates c.3.75-4%, and a maximum bull steepening potential for the curve at the ZLB c.140bp (see Exhibit 16).
- A higher neutral rate c.3% implies flat levels for the 2s10s curve c.4.25-4.5% and a maximum bull steepening potential for the curve c.165bp.

Exhibit 15: Current prizing for the timing of the first Fed rate cut

First rate cut (y-axis in months) fully priced an 8m horizon (c.2Q24)

Source: BofA Global Research

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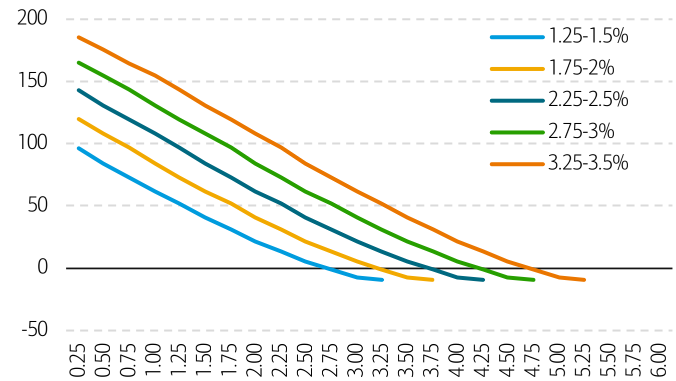
Exhibit 16: Expectations for the bull steepening dynamic in the upcoming easing cycle contingent on the market view for the neutral

A 3% neutral rate assumption implies 2s10s > 0bp for fed funds c.4.25-4.5% and a maximum steepening potential for the curve c.165bp



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Significantly, we can look at the forwards on the 2s10s curve (from 3m to 7y forwards – see Exhibit 17), interpolate the forward horizon at which the curve steepens back to positive territory, and look at the corresponding level for 3m OIS forwards (see Exhibit 18). Currently the re-steepening of the 2s10s curve back to positive levels is priced at a 1-2y horizon (see Exhibit 19), which corresponds to c.4.15% for 3m OIS forwards.

In the context of the framework above, the c.4.15% level for 3m OIS forwards at which the 2s10s curve is expected to re-steepen back to positive territory is consistent with a neutral rate view in the 2.5-3% range.

Exhibit 17: 2s10s curve forwards

2s10s steepens back to > 0 at 1-2y horizons

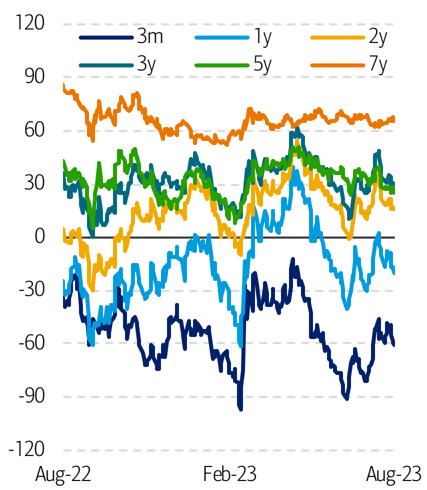

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Exhibit 18: 3m OIS forward level at which the 2s10s curve is priced to steepen back to >0

2s10s steepens back to > 0 for 3m OIS c.4.15%

Source: BofA Global Research

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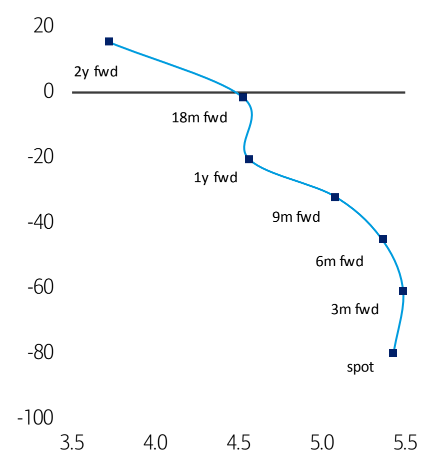
Exhibit 19: 2s10s curve forwards (y-axis) vs 3m OIS forwards (x-axis)

2s10s steepens back to > 0 at 1-2y horizons



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