Global Markets Analyst

The Fed and Neutral—Actions Speak Louder Than Words (Wilson/Chang)

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- Markets have become more focused on where the funds rate should settle over the long term as the Fed tightening cycle approaches its end. We have consistently argued that the "neutral" funds rate is likely to be meaningfully higher than in the last cycle. Market measures of that rate have moved sharply higher, including over the last two months. Uncertainty about where neutral rates belong is high. But we think that discussions of market pricing of the neutral rate tend to place too little weight on the role of actual and historic market outcomes and what they reveal to the market about where the distribution of policy rates belongs in driving perceptions of these longer-term rates.
- Longer-term instantaneous rates over the last 20 years have tended to reprice sharply over defined periods after spending time within stable ranges. Until the latest repricing higher from mid-2022, these longer-dated forward real rates broadly moved in three successively lower neutral rate pricing regimes. Only since mid-2022 has the market durably pushed longer-term rates back into higher regimes.
- The timing of these "regime shifts" does not map well to key information about savings/investment balances or many of the main drivers of structural views of neutral rates. The biggest repricings in neutral rates were associated not with major macro events but instead came alongside Fed policy shifts that challenged the prevailing pricing of the distribution of the future funds rate.
- The fact that market pricing of long-term rates has shifted much more around events related to the Fed's actions does not mean that the deeper structural forces that are often discussed are not driving the underlying neutral rate. It is plausible that shifts in Fed policy ranges are the way in which the market learns about and updates its pricing of those deeper forces. Nor does it support the idea that the Fed has special insight into the level of the neutral rate. The rise in long-term rates since 2022 has not been driven by FOMC meeting "windows" or by a move higher in the Fed's long-term dot.
- The implications of this logic for the current environment are simple. The Fed funds range has essentially already returned to the levels of the pre-GFC cycle ranges and that period is likely to provide a better template than the post-2008 period. The longer we spend time with a 5%-plus funds rate, the more likely it is

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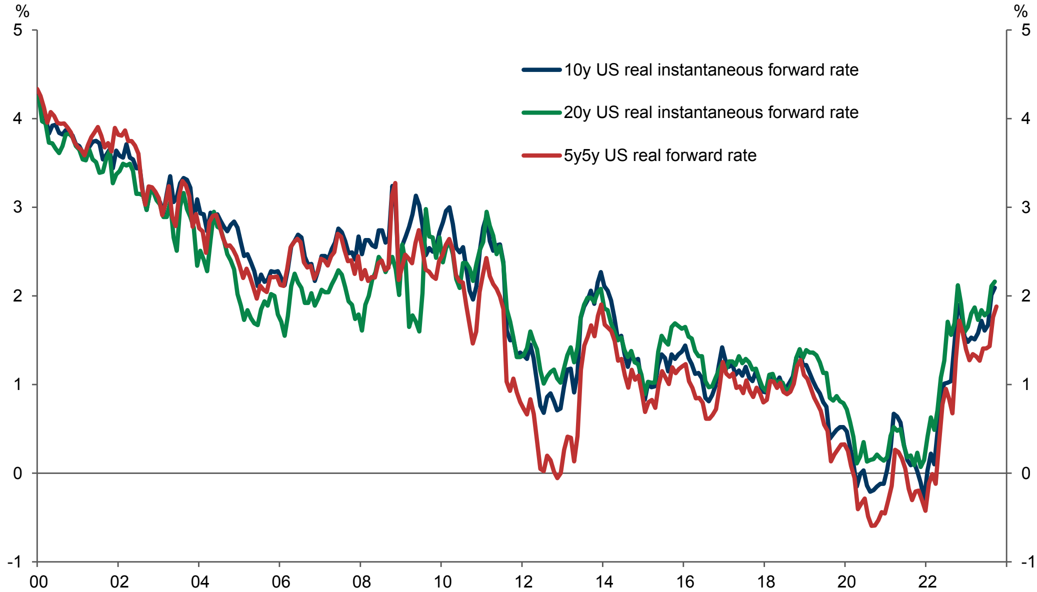
that we are to anchor towards the upper end of that range. Markets have shifted in that direction significantly but still view the current level of the funds rates as restrictive relative to its pricing of the neutral rate. If the economy continues to behave in a way consistent with only average recession probabilities, the risks to those forward rates are probably still modestly to the upside.

- The broader message is that we think it makes sense to rely more heavily on the distribution of the actual funds rate and the behavior of the broad economy and financial conditions relative to those settings to guide views of the appropriate long-term interest rate, compared to the more common structural and statistical estimates, and we worry that many investors still remain too anchored in the experience of the post-GFC cycle. Our preferred framework for the way that US monetary policy operates—in which changes in financial conditions matter more for growth than levels—also provides less of a role for a stable, well-defined neutral rate.

The Fed and Neutral—Actions Speak Louder Than Words

As the Fed tightening cycle moves into its closing stages, markets are becoming more focused on where the funds rate should settle over the long term. Our Rates team and our US economists have consistently argued that the so-called "neutral" funds rate is likely to be meaningfully higher than in the last cycle, and well above the Fed's long-run "dot" which has remained anchored at 2.5%. And we have speculated that one side effect of a soft landing could be upward pressure on neutral rate pricing. Over the last few weeks, many versions of that market rate have hit fresh cycle highs in both real and nominal terms and in some cases are approaching pre-GFC levels. Exhibit 1 shows various measures of longer-dated real rates: the instantaneous forward rate at 10 and 20 years calculated by the Fed from Treasury curves, and the commonly followed 5-year/5-year real yield on US Treasuries. They show the long decline in those measures and then the sharp reversal higher in the last 18 months or so.

Exhibit 1: Forward real rates—a long decline and a sharp reversal



Source: Haver Analytics, Goldman Sachs Global Investment Research

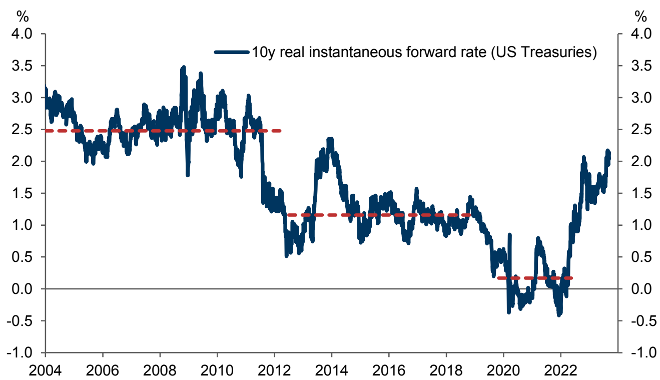
It is by now a truism that it is hard to be confident in views of neutral and Chair Powell has consistently emphasized the uncertainty around views of neutral in describing Fed policy. Prominent statistical measures like the Fed's Holston-Laubach-Williams rate have some commonly cited weaknesses. But estimates based on structural forces (demographics, fiscal deficits, productivity growth, savings-investment balances) are also hard to implement empirically in a way that delivers much precision. We think both approaches tend to under-emphasize the key role played by actual and historic policy outcomes and what they reveal to the market about where the distribution of policy rates belongs in driving perceptions of these longer-term rates.

Longer-term rate "regimes" more linked to Fed shifts than to macro events

Stepping back to view the history of the last 20 years or so, what is striking is that measures of longer-term instantaneous US rates appear to have been characterized less by a continuous process and more by "regimes". We focus here on the 10-year instantaneous real yield (which aims to estimate the spot real yield, 10 years forward), but our core arguments here apply to many parts of the forward real and nominal rate curve. This is further out than some commonly accepted definitions of the "neutral" real rate but is clearly beyond the horizon at which even persistent cyclical pressures should matter. Market rates at this horizon embed risk premia as well, so are not directly equivalent to a neutral or natural rate measure, but focusing on real instead of nominal rates reduces some of the potential wedges from risk premia.

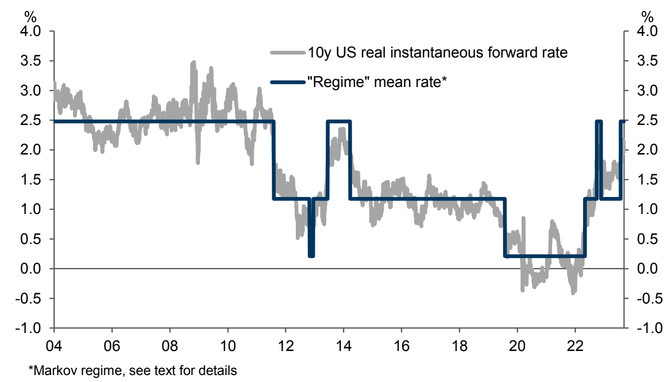
This part of the bond market appears to have spent periods of time pricing within relatively stable ranges before repricing significantly over defined periods and settling into a new range. Exhibit 2 suggests that, until the latest repricing higher from mid-2022, these longer-dated forward real rates broadly moved in three successively lower neutral rate pricing regimes. The timing of the shifts between those regimes provides potentially important clues as to how the market has updated its view of neutral rates over time. On these measures, the main shifts lower occurred in August 2011 and in 2019. A more formal approach, using a Markov switching model, confirms those three regimes and those switching periods (Exhibit 3). The model identifies an attempt to break back into the prior (higher) regime during the taper tantrum in 2013/2014 that did not prove durable.[1] Only since mid-2022 has the market durably pushed longer-term rates back into a higher regime, with a further step to the pre-2011 regime identified by the latest move up in rates in August of this year.

Exhibit 2: Forward real rates appear to have repriced in stages



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 3: Three successively lower regimes in forward real rates, and now a rebound



Source: Haver Analytics, Goldman Sachs Global Investment Research

What is also striking is that the timing of these "regime shifts" does not map well to key information about savings/investment balances or many of the main drivers of structural views of neutral rates. There was no major decline in neutral rate pricing around the Global Financial Crisis or the immediate recovery period and QE launch (nor earlier during the tech bubble collapse). More recently, the shift to a third lower neutral regime largely preceded the COVID pandemic onset and held through the most significant period of recovery and the largest fiscal boosts of the pandemic in 2021 and early 2022. Instead, what distinguishes those dates more clearly in our view are shifts in the policy rate environment itself that made the distributions of the prior "regime" untenable.

In August 2011, the Fed introduced calendar-based forward guidance, promising to keep rates at the zero lower bound for at least two more years (so close to 5 years cumulatively). This occurred at a time when the US economy stumbled again, and large fiscal restraint was baked into the resolution of the debt ceiling crisis. At that point, the market may have decided that, with the funds rate set to spend a multi-year period at the bottom end of the previous cycle's prior 0-6pct range, it needed to lower its expectations about the distribution of rates further along the curve. In late 2018, the realization that the Fed hiking cycle had peaked at a 2.5% rate— a move confirmed by Fed rate cuts starting in July 2019—made it hard to price the long-term rate meaningfully above that level. In 2022, the acceleration of the Fed hiking cycle to a 50bp

[1] There was also a significant though smaller spike in real yields in early 2021 on the back of vaccine-related optimism that was not enough for the model to identify a regime switch.

pace in May 2022 and 75bp pace in June 2022 made it far easier to envisage policy rates exceeding the 2018 peak (and more recently the peaks of the 2004-06 cycle) than when policy rate changes were seen to be capped at 25bp increments. And now, an economy that appears to be avoiding recession with a funds rate firmly above 5pct has made it easier for markets to entertain that rates could more persistently stay close to current levels. Even the attempt to revert to the pre-2011 regime in 2013/2014 was clearly related to the perceived shift in the Fed's policy stance amidst the taper tantrum and hopes of an earlier exit from zero rates.

The simple fact here is that new information about the likely limits of the Fed's fund rate distribution, and what they reveal about the economic context, seem to have mattered much more than information about shocks to the economy itself. This may seem like a trivial insight. But given the standard view that it is real economic forces that drive neutral rates and not the Fed, it is surprising that the biggest repricings in neutral rates were associated not with the collapse of the global financial system, not with the onset of a global pandemic, not with the massive income replacement that followed it, and not with the pandemic discovery of an effective vaccine but instead alongside Fed policy decisions that challenged prevailing pricing of the distribution of the future funds rate.

What the Fed does, not just what the Fed says

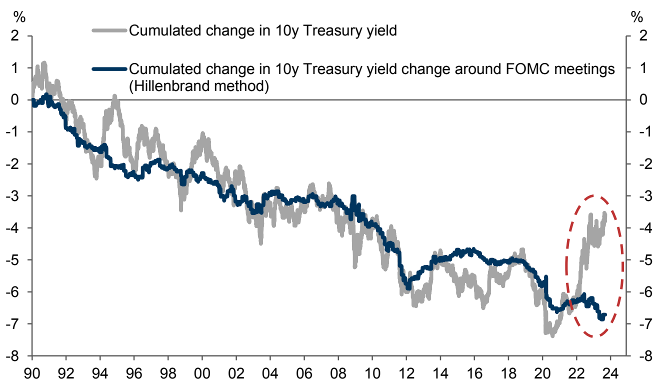
It is not a new insight to see the Fed's actions as important drivers of longer-term rates and of the distribution of the longer-term funds rate. Sebastian Hillenbrand has, for instance, illustrated that between 1994 and 2021, shifts in longer-dated yields in short windows around FOMC meetings could account for essentially all the declines in yields over that period. The same is broadly true for the instantaneous forward measures of real and nominal rates that we have presented here. Hillenbrand's preferred explanation was that Fed communication and long-term guidance play a key role in driving neutral rate views both because the Fed may have superior information about where that rate lies and because it may serve as a "coordinating mechanism" for investors.[2]

We are skeptical, though, that the importance of Fed events reflects any special insight the Fed has into where neutral or longer-term rates lie. The Fed's track record of forecasting longer-term rates is not obviously better than the market's (for instance, late 2018's "a long way from neutral" comment). In general, the Fed appears to have learned that its prevailing longer-run rate view needed to be adjusted from the behavior of the economy much like everyone else. It is notable too that the Hillenbrand pattern that prevailed as rates fell does not hold as rates have moved higher since 2020. Updating yield shifts around FOMC windows shows that, unlike the long move lower in rates, the move higher in the market's longer-term rate pricing over the last 18 months has not been driven by these FOMC periods. In fact, FOMC meeting windows have remained a source of downward drift in rates even over the last year as rates rose sharply. Nor has the move higher in yields been validated by the Fed's long-term dot, which remains stuck at 2.5%, although our US economists expect that dot to rise to 2.75% at the upcoming meeting.

2 We too have found that neutral rate pricing does seem to have been responsive to shifts in the Fed's long-term "dots" since 2011, when the SEP process was launched.

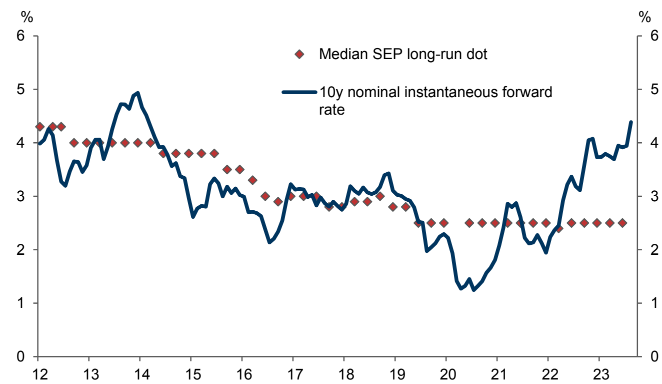
We suspect that this may be in part because the Fed is much more reluctant to surprise markets at FOMC meetings when tightening than when easing policy (an asymmetry which would mean that cumulated Fed surprises will be negative over long periods of time). But the fact that market repricing has risen so substantially without any validation from the Fed's long-term dots is also hard to square with a market that systematically credits the Fed with special insight into the appropriate longer-term rate. Ultimately it may matter as much, if not more, what the Fed does (or promises to do) with the funds rate as what they say about the long-term view. As in prior regime shifts, the most obvious explanation for the shifts in longer-term rate pricing since 2022 is simply that realized policy outcomes made the prior pricing untenable.

Exhibit 4: FOMC meeting windows have not captured the move higher in rates…



Source: Sebastian Hillenbrand, Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 5: …nor have the Fed dots



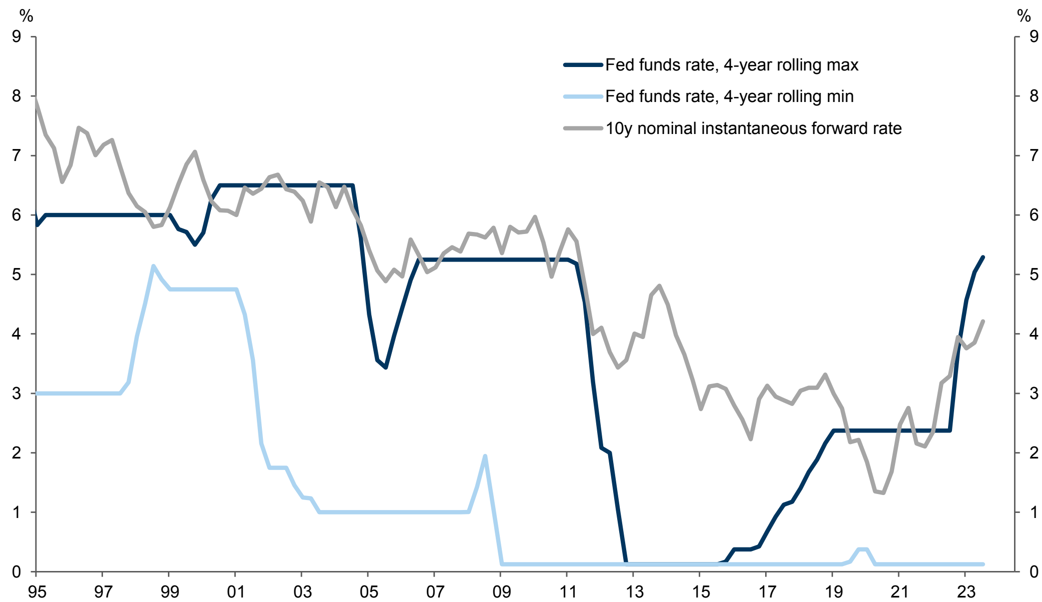
Source: Haver Analytics, Goldman Sachs Global Investment Research

Guided by the funds rate range

Our interpretation of the evidence is that the market updates its views of the long-term policy rate distribution over time based in part on a mix of Fed communications and the economic outlook. But we think the timing of the shifts in long-term rate pricing suggest that the actual realization of policy and recent history of the funds rate and its relationship with the economic backdrop (particularly at the limits of its ranges) play a key role in informing that distribution. The market understands that Fed policy generally spends time in a relatively narrow range during stable expansions; falls sharply in recessions and then rises again in recoveries. It has an assumed range for the funds rate in mind, based in part on realized historic ranges, alongside the Fed's communications and the current cyclical state. Only when that distribution is fundamentally challenged has it generally attempted to adjust its views.

Exhibit 6, for instance, shows a rolling maximum and minimum Fed funds rate (with a 4-year lookback) as a simple illustration of the information from realized history. In the 2001/02 recession, for instance, the Fed funds rate fell sharply to 1pct. But the market reassessed its view of the long-term rate only modestly. The judgment was that the sharp drop in the funds rate was likely to prove temporary and that, as the temporary forces holding the economy back reversed, the funds rate would return to its prior levels. With rates moving higher steadily after only a limited period at the lows, that view was mostly validated as the funds rate recovered. The market held onto a similar view in the early years of the post-GFC recovery—viewing the pressures as a temporary shock that would recede. But the long period of zero rates, cemented by forward guidance in 2011, fundamentally challenged that assumption. A similar process has happened over the last two years in reverse, with the sharp shifts in Fed policy opening a part of the funds rate distribution again that the market had assumed was closed. In essence, if rates are at zero for an extended period and the economy is still struggling how plausible is it that the "neutral" rate can be at 5-6%? If rates are at 5% and the economy is relatively resilient how plausible is it that the "neutral" rate can be at 2.5%?

Exhibit 6: The Fed funds rate distribution—a declining, then a rising, range



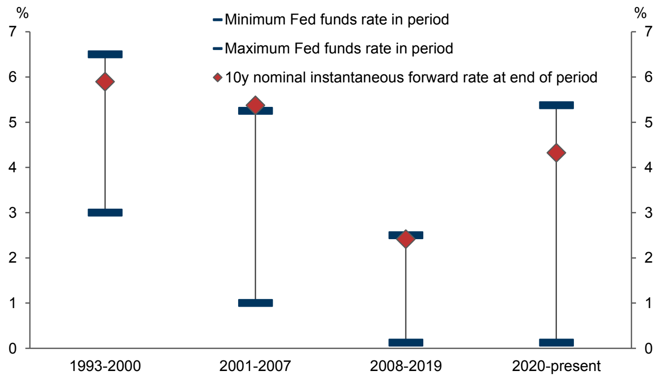
Source: Haver Analytics, Goldman Sachs Global Investment Research

Like most approaches to determining the appropriate long-term interest rate, validating or operationalizing this kind of approach with much confidence is difficult. There are too few episodes and too many potential drivers of the long-term rate and the extent to which the market acknowledges shifts ahead of time likely varies across different episodes. But we think two simple illustrations are helpful. The first is just the ranges of past policy cycles versus the pricing of that forward rate at the end of those periods. As that shows, the current funds rate range from this latest cycle (2020-present) is now broadly comparable to the funds rate range in the 2001-2007 cycle. Exhibit 7 shows that the market has generally priced towards the upper end of the recent policy range or above it. The second illustration mimics a simplistic version of the approach to market updating described above. Exhibit 8 shows a weighted average of the rolling maximum and minimum funds rate paths shown before, subject to a floor during the long zero rate period before the 2016-2018 cycle revealed new the policy rate peak.[3] It generally mirrors the key moves in the market's pricing of longer-dated forward rates. These

[3] The illustration here shows an 80/20 weighting of the rolling max and minimum funds rates, roughly equivalent to the unconditioned probabilities of being in expansion or recession. We set a 2.75pct floor here for views of the max fund rate prior to the 2018 cycle peak, when it was revealed to be lower. Simple ways to estimate those parameters led to comparable time paths.

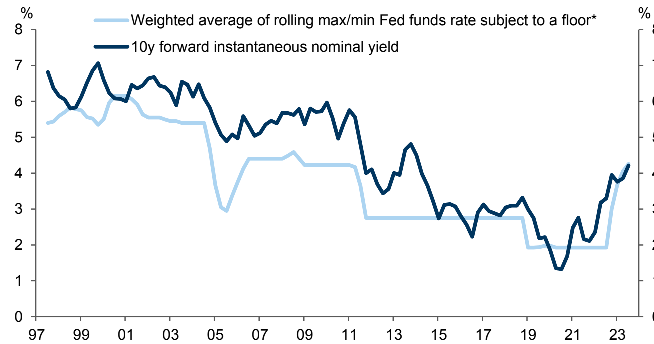
assumptions are ad hoc so should not be taken too literally. But we think a more nuanced version of this kind of process is often effectively how the market is judging the forward distribution.

Exhibit 7: Forward rates have generally priced near the top of the prior funds rate range



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 8: A simple illustration of the Fed funds distribution captures key shifts in forward rates



*80/20 weighted average of rolling max and min Fed funds rate. 2.75% floor pre-2019. See text for details

Source: Haver Analytics, Goldman Sachs Global Investment Research

Policy itself and financial conditions as guideposts

The fact that the market pricing of long-term rates has shifted much more around events related to the Fed's actions themselves does not mean that the deeper structural forces that are often discussed are not driving the underlying neutral rate. Those deeper forces clearly affect the way the economy is operating as reflected through shifting Fed policy. From 2008-2010, the market was likely already wrong to expect that the post-GFC headwinds would abate quickly, for instance, even if it took until 2011 for pricing to acknowledge that. It is plausible that shifts in Fed policy ranges are the way in which the market learns about and updates its pricing of those deeper forces.

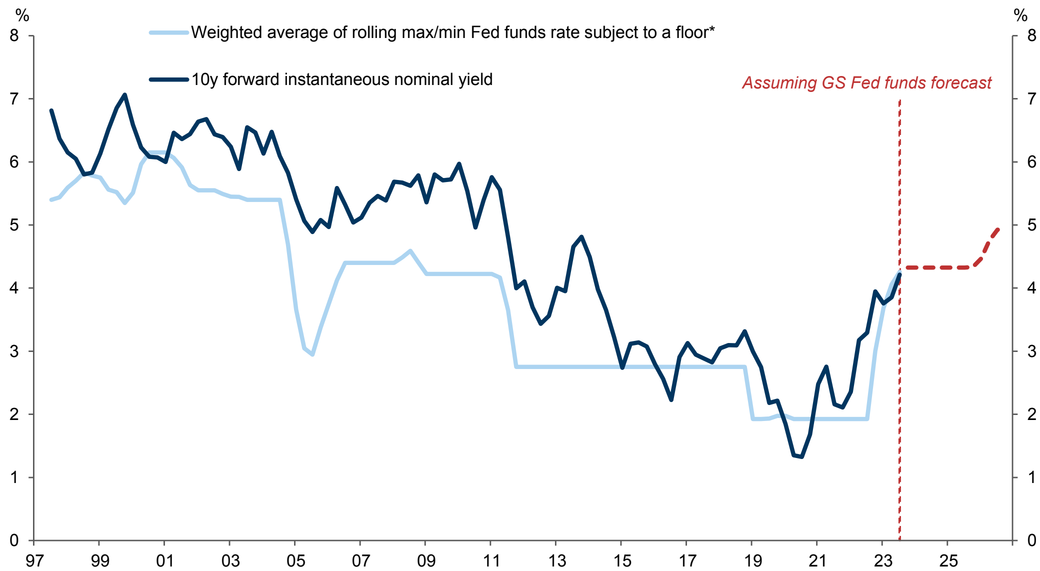
But we think two points are important in this context. First, regardless of whether deeper structural forces are shifting the long-term rate pricing but those shifts are mostly revealed through policy, or whether the neutral rate itself is not well-defined, the practical implications may be similar. The bottom line is that Fed actions that challenge the prevailing view of the long-term distribution seem to shift neutral rate pricing more consistently than large shifts in the economic outlook. Second, our preferred framework for the way that US monetary policy operates does provide less of a role for a stable, well-defined neutral rate. We find that changes in financial conditions matter more than levels for growth outcomes. Changes in financial conditions are themselves delivered mostly by Fed policy "surprises" or by other shocks to the growth or financial outlook. In this framework, in which *changes* in policy matter as much if not more than *levels*, the "neutral" levels of financial conditions and the "neutral" rate that underpins them may not be as stable a structural parameter as the standard view implies. And a sequence of large enough shocks (including policy shocks) may be enough to push the appropriate long-term rate into new regimes. In that case, it makes sense to put less weight on structural priors about where the neutral rate belongs and more weight on the behavior of financial conditions and performance of the economy at a given funds rate.

Upside risk to forward rates the longer we survive a 5%-plus funds rate

The implications of this logic for the current environment are simple. The Fed funds range has essentially already returned to the levels of the pre-GFC cycle ranges and that period is likely to provide the better template than the post-2008 period. The longer we spend time with a 5%-plus funds rate, the more likely it is that we are to anchor towards the upper end of that range. This is why we have argued that greater acceptance of a soft landing could keep the market's neutral rate views under upward pressure.

Markets have shifted in that direction significantly but still view the current level of the funds rates as well above likely "neutral" pricing (as do our own current forecasts), and as highly restrictive and likely to prove temporary. If the economy continues to behave in a way consistent with only average recession probabilities (as we believe is currently the case), the risks to those forward rates are probably still modestly to the upside. Rolling forward the simple exercise from earlier using our policy rate forecasts suggests that current pricing is now much more appropriate but suggests it could certainly move higher if either the funds rate itself is nudged up further or as the possibility of zero rate policies becomes a more distant memory (Exhibit 9).

Exhibit 9: Fed funds range aligns with higher forward rates



*80/20 weighted average of rolling max and min Fed funds rate. 2.75% floor pre-2019. See text for details

Source: Haver Analytics, Goldman Sachs Global Investment Research

The broader message, beyond humility, is that we think it makes sense to rely more heavily on the likely distribution of the actual funds rate and the behavior of the broad economy and financial conditions relative to those settings to guide views of the appropriate long-term interest rate. Analysis of the nature of the cycle may provide more clues to that distribution, and hence the neutral rate, than the more common structural and statistical estimates. A relatively unstable, imprecisely estimated parameter that is best revealed by the actual performance of the economy and policy rates is not a very helpful lodestar. And we worry that many investors remain too anchored still in the experience of the post-GFC cycle. An extended private sector deleveraging cycle alongside public sector austerity is a very different environment from one with strong private sector balance sheets and persistently supportive fiscal policy. Capturing those differences adequately in a structural model of the neutral rate is hard, so what realized policy tells us about the likely funds rate range may prove at least as good an anchor.

Dominic Wilson

Vickie Chang

Disclosure Appendix

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