US Rates Watch

Monthly rates models: July ’24 edition

Rates models update

We update some of the rates models we use to gauge risk bias, positioning, and relative value across duration, curve, real yields, breakevens, and front-end spreads. 10y nominal yields trade flat/marginally rich to macro fundamentals, real yields trade flat, and breakevens marginally tight. Funding pressure has been most significant on large UST settlement dates, typically on mid-month and end of month dates. We expect front-end rates to trend higher with some temporary softening around the debt limit in 1H25. Portfolio risk appetite deteriorated over June but carry bias persists.

Duration & curve

10yT macro fair value steady at c.4.25-4.3%. Vs. global yields, we see c.4.3-4.35% fair value (c.-10bp over Jun). 10yT trade fair/marginally rich vs fundamentals & global yields. 2s10s forwards reflects neutral to c.3-3.5%. Jun 10yT dynamic reflects primarily downgrade of bearish inflation & risk shocks (27bp rally).

Breakevens, TIPS & real yields

10y BEs trade marginally tight vs fundamentals. 10y RY trade fair vs our macro framework. Dynamic reflects expectations for recoupling between inflation & growth fundamentals near-term. We see higher slowdown vs expansion likelihoods (c.68% slowdown vs 32% expansion currently).

Front end

SOFR/FF basis is likely to tighten in '24, but slowly, due to the slower pace of QT and expected TGA drain later this year from debt limit dynamics. We expect tightening pressures to slow or even reverse in the 1H25 due to debt limit dynamics.

Allocations

Allocation profiles likely stayed in a moderate risk-on regime over 2Q24 (steady vs 1Q). Gauges of risk appetite show a downgrade over Jun but the persistence of carry bias. Historically tight ERP suggests potential for negative feedback between yields and risk.

Duration: (1) 10yT macro model; (2) Global yield framework; (3) 10yT decomposition.

Curve: Curve directionality 2s10s & 5s30; curve dynamic versus neutral rate expectations.

Front End: SOFR/FF basis.

TIPS: (1) Macro model for Breakevens; (2) real yield (10y BE versus 10y nominal model); (3) PCA Breakevens; (4) 10y BE directionality.

Asset Allocation: (1) Flow & allocation bias; (2) 4-state framework for portfolio allocations; (3) positioning bias from futures across assets classes; (4) Equity RP.

Appendix: Model descriptions.

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09 July 2024

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Glossary:

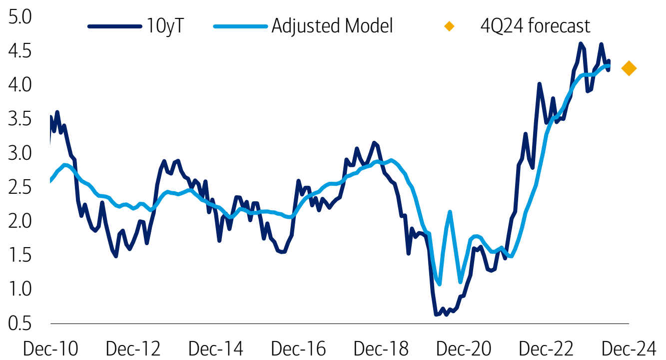
10yT – 10-year Treasury
BE – Breakeven
c. – circa
DM – Developed Markets
EFFR – Effective Federal Funds Rate
EM – Emerging Markets
ERP – Equity Risk Premium
ETF – Exchange Traded Funds
FF – Fed funds
GDP – Gross Domestic Product
IORB – Interest Rate on Reserve Balances
LC – Large Cap
ON RRP – Overnight Reverse Repo facility
PCA – Principal Component Analysis
QT – Quantitative Tightening
RP – Risk Premium
RV – Relative Value
RY – Real Yield
SC – Small Cap
SOFR – Secured Overnight Financing Rate
TGA - Treasury General Account
VAR – Vector Auto-Regressive

All levels as of 5 July ’24.

Duration

Macro model

Exhibit 1: 10yT macro fair value
10yT fair value consistent with current fundamentals c.4.25-4.3%



Source: BofA Global Research; Bloomberg

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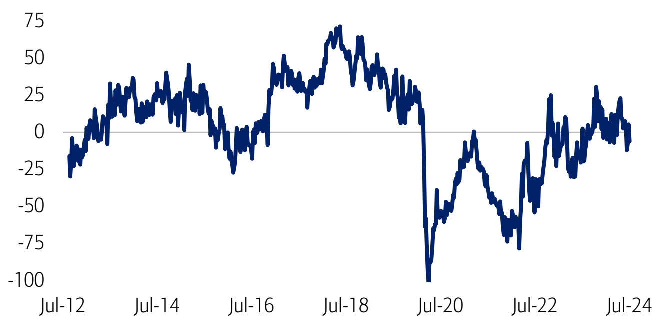
Our macro framework suggests that the 10yT fair value consistent with current US fundamentals is c.4.25-4.3%, steady over the last month (see Monthly rates models from 4 Jun '24). Treasury yields trade marginally rich vs fundamentals currently, after trading up to 30-35bp cheap recently.

We continue to hold our view on duration: neutral at 4-4.25% for 10yT, nibble at 4.25-4.5%, bite at 4.5-4.75% and gorge at 4.75-5% in the absence of a reacceleration catalyst.

Global yield framework

Exhibit 2: Residual of 10yT Global yield model
10yT fair value consistent with current global yields c.4.3-4.35%



Source: BofA Global Research

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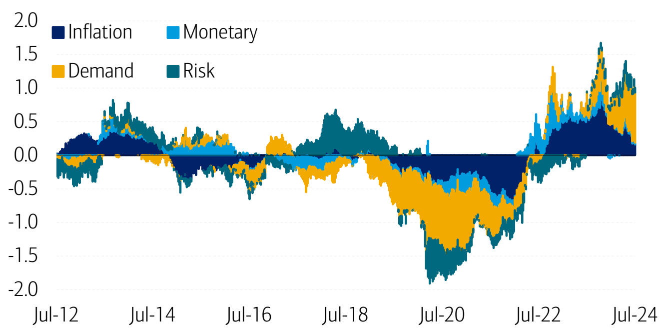
10yT fair value consistent with global yields is c.4.3-4.35%, marginally lower (c.10bp) over the last month. The 10yT yields are trading flat to marginally rich (c.5-10bp) relative to the global yield dynamic.

The late-cycle bias should be for USTs to trade fair to rich to global yields. In this framework. A material 10yT selloff beyond fair value levels likely needs to be supported by either: (1) a broader bearish momentum in global yields; or (2) a decoupling of US growth with the DM complex.

Decomposition of the 10yT dynamic

Exhibit 3: Decomposition of the 10yT dynamic
Over Jun we see: Monetary policy c.3bp (-2bp. over Jun), Risk c.7bp (-10bp); Inflation c.16bp (-17bp) and Demand c.77bp (+10bp)



Source: BofA Global Research

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Steady state is up from c.2% in early '22 to 2.85% currently, suggesting an upgrade of the neutral rate view. We expect it to consolidate in the c.2.75-3% range. Current shocks:

- Monetary policy c.3bp, -2bp over Jun
- Risk c.7bp; -10bp over Jun
- Inflation c.16bp, -17bp over Jun
- Demand c.75bp, +10bp over Jun

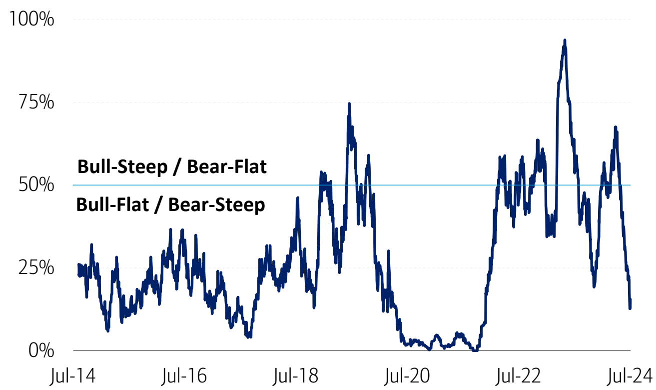
The moves reflect some decrease in inflation and risk sentiment (27bp rally over Jun together), and a marginally dovish repricing of the Fed, but still a relatively challenging demand context.

Curve

Curve directionality

Exhibit 4: 2s10s directionality Index

Frontend driving less of the 2s10s curve dynamic over the last month



Source: BofA Global Research

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Front-end drives 7% of the 2s10s curve dynamic over the last two weeks, marginally lower from the 9% over the last month. Bear steepening frequencies dominated over the last 2m, with bull flattening in second place, reflecting still a relatively mixed reaction from the curve to mixed data.

Exhibit 5: Decomposition of the 2s10s dynamic

Frontend (bull steepening and bear flattening moves) driving more of the 2s10s curve dynamic over the last two weeks

	bull-Steep	bear-Flat	bull-Flat	bear-Steep
2w	7%	0%	25%	68%
1m	5%	4%	34%	57%
2m	3%	12%	37%	48%

Source: BofA Global Research

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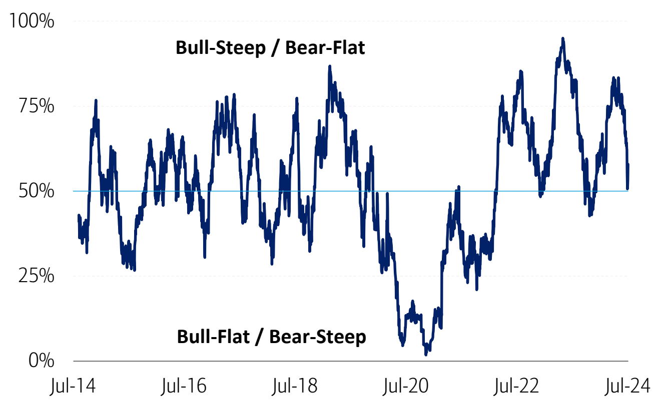
Exhibit 6: 5s30s directionality Index

Frequency of bear steepening moves dominated the last two weeks



Source: BofA Global Research

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Belly drives 42% of the 5s30s curve dynamic over the last two weeks, lower than the 49% over the last month. The bias, over the last 2w has been for bear steepening (higher likelihood of higher yields and vol scenarios), which have increased over the last 2m (followed by bull steepening).

Exhibit 7: Decomposition of the 5s30s dynamic

Belly continues to lead the dynamic

	bull-Steep	bear-Flat	bull-Flat	bear-Steep
2w	37%	5%	11%	47%
1m	33%	16%	19%	32%
2m	31%	27%	15%	27%

Source: BofA Global Research

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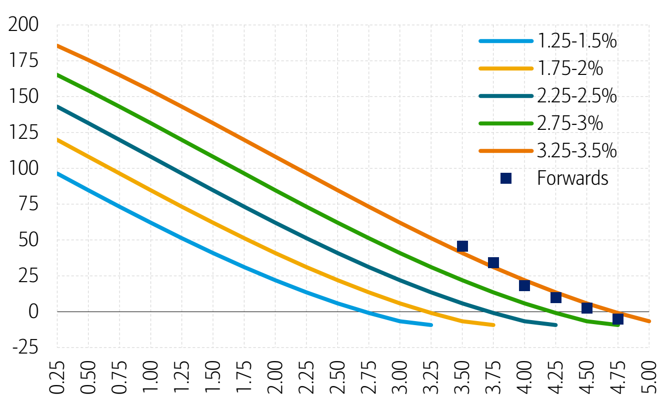
Flattening dynamic in the cycle vs neutral rate view

Exhibit 8: 2s10s bull steepening dynamic vs neutral rate view

Curve levels (y-axis) vs fed funds (x-axis) … curve forwards consistent with neutral rate expectations c.3-3.5%



Source: BofA Global Research

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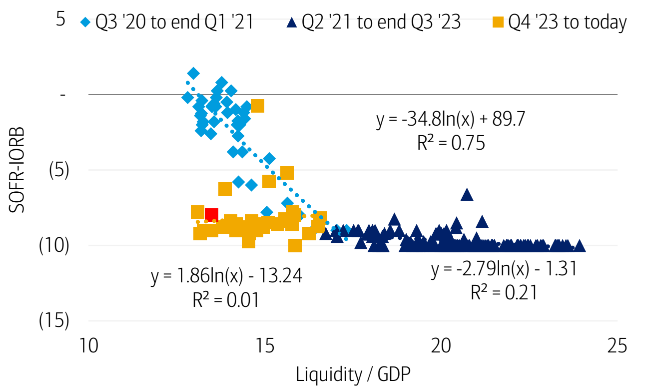
The 2s10s bull steepening trajectory priced in curve forwards vs 3m OIS fwds seems to be consistent with a neutral rate assumption around 3-3.5% (from 3.25-3.5%, i.e., widening of the range on the downside over the last couple of months).

Front end

SOFR/FF basis

Exhibit 9: SOFR-IORB spread versus Liquidity / GDP

As liquidity has declined, SOFR has begun to print higher in the range



Source: BofA Global Research, Bloomberg, FRB. Note, red dot implies latest week of data

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We update our regression for SOFR-IORB spread using a log linear regression of ON RRP + Fed Reserves (Fed liquidity) over GDP. We break out the regression into three periods, (1) 3Q20-1Q21: ON RRP take-up < $200b, (2) 2Q21-3Q23: ON RRP take-up > $200b, (3) 4Q23 to today: current period of ON RRP decline.

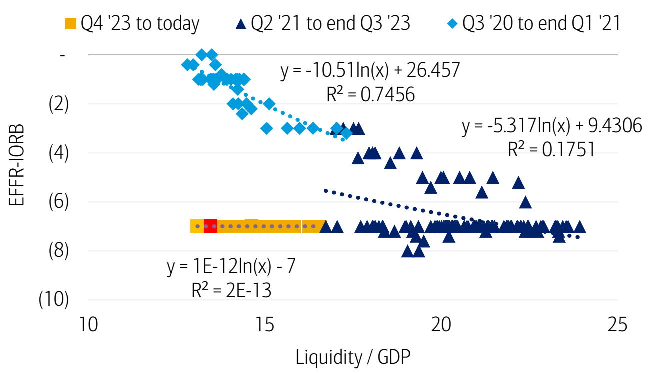
Once the debt limit is resolved, which we forecast for June '25, we expect to see SOFR-IORB move up faster as liquidity is drained, as we saw in the Q3 '20 to end Q1 '21 period.

The most recent data point, in the red dot, shows that we are seeing SOFR lift off the ON RRP rate.

We expect to see liquidity continue to decline going forward, though at a slower pace due to the reduction in the QT cap, which should put further upward pressure on SOFR.

Exhibit 10: EFFR-IORB spread vs Liquidity / GDP

EFFR has been sticky despite liquidity drain



Source: BofA Global Research, Bloomberg, FRB. Note, red dot indicates latest week of data

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We also updated our regression for EFFR-IORB spread. We use a log linear regression of ON RRP + Fed Reserves (Fed liquidity) over GDP using the same 3 regression periods.

We find that EFFR has been sticky at 7bps below IORB despite the reduction in Fed liquidity since Jun '22 and upward pressure in SOFR.

The 75th EFFR percentile has continued to print 1-2bps above EFFR, implying there is some upward pressure in the rate starting to appear.

Going forward we expect EFFR to eventually move upward in the range as cash is drained and smaller domestic banks begin bidding up for reserves. The increase in EFFR is likely to be lagged to SOFR

Exhibit 11: Regression outputs for FF-SOFR spread (bps)

Using 3 regression periods we forecast SOFR/FF basis tightening

Date	SOFR-IORB	EFFR-IORB	FF-SOFR
Jun-2024	-6.3	-4.0	2.3
Sep-2024	-5.4	-3.5	1.9
Dec-2024	-5.3	-3.5	1.8
Mar-2025	-6.3	-4.0	2.3
Jun-2025	-6.3	-4.0	2.3
Sep-2025	-2.6	-2.6	0.0
Dec-2025	-2.4	-2.6	-0.1
Mar-2026	-2.3	-2.5	-0.2

Source: BofA Global Research

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To calculate our regression output, we now break our model weights out into (1) pre-debt limit resolution where liquidity is more abundant and (2) post debt limit resolution when the TGA is rebuilt and liquidity is drained. The 3 regression periods pre-debt limit resolution are weighted as: (1) 25% 3Q320-1Q21: ON RRP take-up < $200b, (2) 50% 2Q21-3Q23: ON RRP take-up > $200b, (3) 25% 4Q23 to today: recent ON RRP period.

Once the debt limit is resolved, which we forecast for June '25, we expect to see a steeper slope like we see in the 3Q20-1Q21 period and therefore shift our weight to 33% for each of the 3 periods.

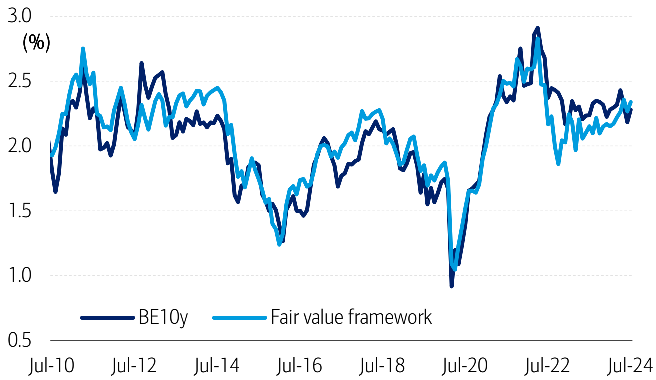
The SOFR-FF basis is likely to tighten this year but slowly due to the slower pace of QT and TGA drain from debt limit dynamics later this year.

TIPS

Macro framework for breakevens (BEs)

Exhibit 12: Macro framework for 10y BE

10y BE fair value steady c.230-235bp, in-line with market pricing



Source: BofA Global Research; Bloomberg

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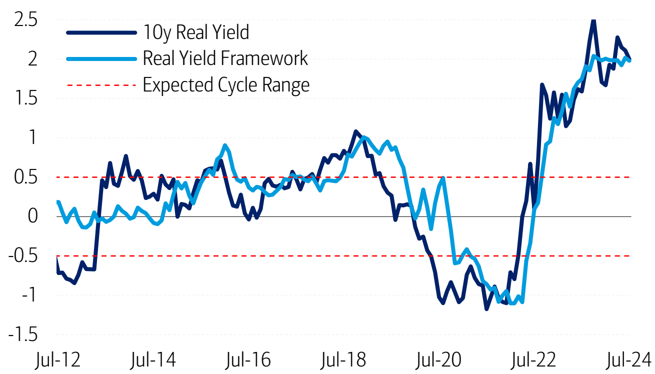
We model 10y BE as a function of inflation expectations, inflation risk premium, and inflation liquidity premium components.

US 10y breakevens fair value is c.230-235bp, marginally higher (0-5bp) over the last month. Market trading 0-5bp tight vs fundamental fair levels.

Real yield (10y BE vs 10y nominal model)

Exhibit 13: 10y real yield framework

Fair value for 10y real yields in macro framework c.195-200bp



Source: BofA Global Research

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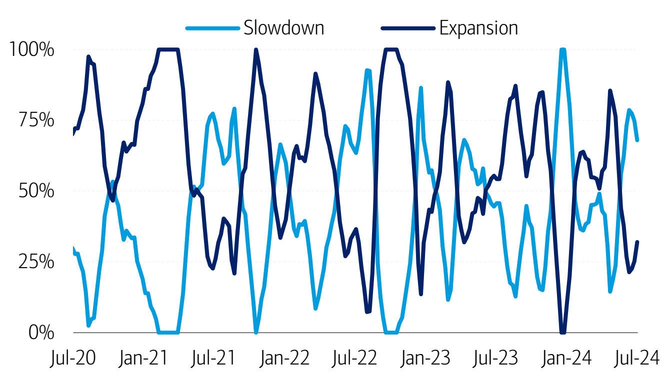
US 10y real rate fair value is c.95-200bp, marginally lower over the last month (c.5bp). The market is trading 10y real yields at flat levels relative to fair value level suggested by our macro framework (after trading 20-25bp cheap recently).

Directionality of 10y BEs

Exhibit 14: Likelihood of slowdown vs resilience scenarios (2m average frequencies) extracted from the dynamic of 10y breakevens

Slowdown probabilities > than expansion, the first time since early Feb



Source: BofA Global Research

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10y BEs frequency or orthodox moves (bull tightening + bear widening > 90%) higher than historical averages, suggesting expectations for recoupling between inflation and growth fundamentals. Slowdown scenarios likelihood > expansion scenarios. **Normalized frequencies over the last month stand at 68% slowdown vs 32% expansion**. We generally see likelihoods about c.70% as a potential contrarian indicator.

Exhibit 15: 10y Breakeven directionality

Orthodox moves driving 100% of 10y BE dynamic vs 75-80% historically

	bull-Tight	bear-Wide	bull-Wide	bear-Tight
Current	57%	43%	0%	0%
1m	68%	32%	0%	1%
2m	70%	29%	0%	1%
3m	53%	40%	4%	5%

Source: BofA Global Research

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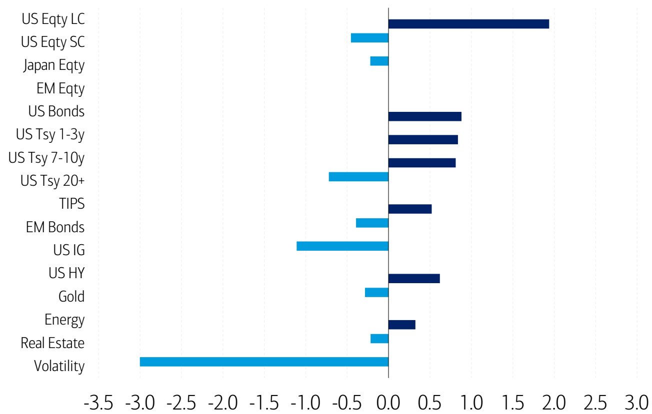
Asset allocation

Flows and allocation bias

Exhibit 16: Gauge of risk profile obtained from ETF flows
Profile suggests some downgrade of the risk bias over the last month



Source: BofA Global Research

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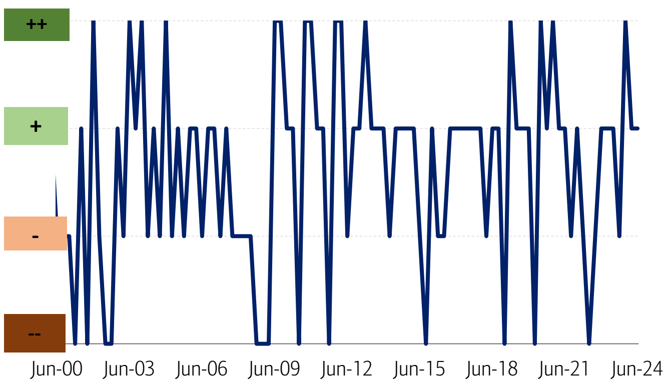
Gauge of risk profile and allocations obtained from ETF flows suggests some downgrade of risk bias over the last month. Currently we see:

- Bonds – Long US bonds, short the backend of the UST curve vs the frontend/belly (steepeners). Long TIPS and short EM bonds.
- Equities – Long US LC & marginally short SC, short Japan, and flat EM.
- Credit – Short IG & marginal long HY
- Alternatives – Marginally short gold, long Energy and short Real Estate
- Volatility – Short equity volatility suggesting still some bias towards carry.

Exhibit 17: 4-factor framework for relative asset class returns
Steady risk bias from moderate risk-on in 1Q24 into 2Q24



Source: BofA Global Research

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Historical transition probabilities suggest that from a moderate risk-on state we see: (1) 10-15% likelihood of transition to risk-off (hard landing in the current context), (2) 30-35% likelihood of transition to moderate risk-off (soft landing in the current context), (3) 45-50% likelihood of staying moderate risk-on (no landing in the current context); and (4) <10% likelihood of shifting to risk-on (which contains reacceleration scenarios).

Exhibit 18: Transition probabilities over the next 1-2Q
Obtained from historical switches between different relative return regimes

	--	-	+	++
--	21%	7%	21%	50%
-	19%	22%	44%	15%
+	13%	32%	47%	9%
++	0%	25%	55%	20%

Source: BofA Global Research

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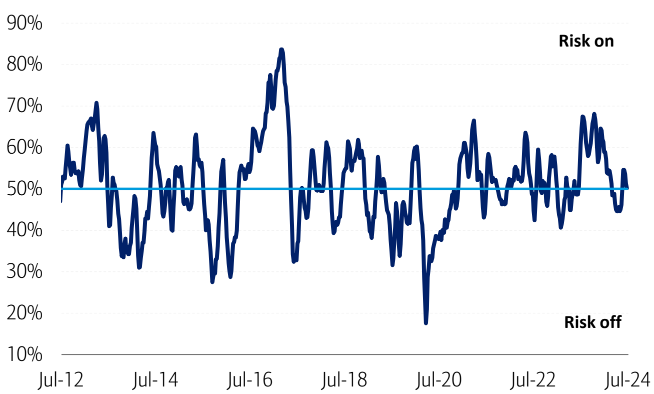
Exhibit 19: Positioning bias extracted from futures across assets
Risk bias over the last month switched to marginal risk-on (c.50% currently)



Source: BofA Global Research

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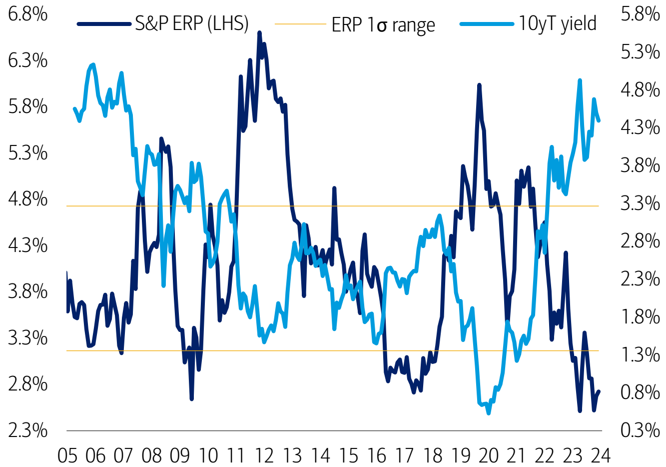
Positioning bias extracted from futures across asset classes downgraded back to flat currently (c.50%) from marginal risk-on in late recently (c.55%).

Exhibit 20: Equity Risk Premium (ERP) framework
ERP at historically tight levels



Source: BofA Global Research

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Tight ERP levels create scope for negative feedback loops between bond yield selloffs and risky assets, and the potential for that feedback to close into a bid for USTs in scenarios where further bond selloffs are not accompanied by an upgrade to earnings.

Appendix: Model descriptions

Macro model

In our macro framework for the dynamic of Treasuries, we calculate the first two PCs of the rates curve (2s, 5s, 10s and 30s), and regress each of these on Fed funds (to define cycle dynamic) and the principal components of growth variables, inflation variables, and employment variables (see our report, A hitchhikers guide to RV on the UST curve).

Macro models are calibrated over long historical windows, generally longer than the average cycle length (somewhere between 7 years and 15 years) to capture the broader dynamic of Treasuries throughout the cycle. Significantly, these models tend to break down in periods of significant non-economic buying of Treasuries. We have seen several of these periods over the last couple of cycles, for example the following:

- The Greenspan conundrum, when we saw the back end of the Treasury curve rallying even as the Fed hiked rates in the early stages of the 2004-06 tightening cycle, driven foreign central bank buying.
- Quantitative easing (QE) periods, when the Fed acts as a non-economic buyer. Indeed, in general, these periods drive a negative correlation between growth and yields, and it is a challenge to avoid solutions that converge to these sorts of non-economic betas in macro frameworks for the dynamic of yields
- Global yield demand in a context of very low global yields. Indeed, global demand for USTs may be driven less by US fundamentals but more by yield differentials to other DM yields and the cost of hedging the FX exposure

To account for the pressures on the Treasury curve from these non-economic distortions, we include in our independent data set the dynamic of the Fed balance sheet and the first principal component of global DM rates. In our framework, therefore, we converge to two solutions: one whereby we express fair value consistent with US macro fundamentals alone and an adjusted framework whereby we incorporate the impact of overseas demand on the Treasury curve.

Global yield framework

This framework is an alternative approach to PCA, which addresses the shortcoming of PCA not being able to capture trends in the data to a large extent. The framework can achieve this by capturing the shared covariances in the dataset through hidden state processes and also allows for the modeling of the time-varying dynamic of these factors explicitly. In a relatively simple specification, a number of factors (determined a-priori) are defined through a given state equation:

$$x(t) = B * x(t - 1) + w(t)$$

while the independent variables are modeled as a function of these factors:

$$y(t) = Z * x(t) + v(t)$$

where:

$$w(t) \sim MVN(0, Q)\ ,\ \ v(t) \sim MVN(0, R)\ ,\ x(0) \sim MVN(X0, V0)$$

The factors (*x's*) are calibrated to explain the dynamic of the independent variables (*y's*) through the linear combinations defined by the calibrated projection matrix (*Z*). The projection matrix Z can be constrained to add more intuition to the interpretability of the factors.

Decomposition of the 10yT dynamic

In statistics, the traditional frequentist approach assumes that each parameter has a "true" value, and the goal is to find a close estimate to that (fixed) value. In contrast, the Bayesian approach views each parameter as a random variable, characterized by some underlying probabilistic distribution, along with constraints on the relative dynamic of the different parameters. The latter allows the analyst to avoid non-economic solutions, for example models where Treasury yields are negatively correlated with growth.

The vector auto-regressive framework is used to capture the relationship between multiple time series as they evolve over time, versus lagged levels. A *p*th-order VAR refers to a VAR model with a time lag for the last *p* time periods and is denoted VAR(*p*). This can be expressed as follows:

$$y(t) = a0 + A1 * y(t-1) + \ldots + Ap * y(t-p) + \varepsilon(t) \text{ with } \varepsilon(t) \sim N(0,\Sigma)$$

Where $y(t)$ is the $M \times 1$ vector of endogenous variables, $a0$ is the $M \times 1$ vector of constants, Ai is the $M \times M$ time-variant coefficient matrix, and $\varepsilon(t)$ is the $M \times 1$ exogenous factor or the error terms with a Gaussian distribution with mean zero and variance-covariance matrix Σ.

In our formulation, we adapt an existing European Central Bank (ECB) framework[1] to decompose the dynamic of 10yT yields in terms of monetary policy, demand, risk, and inflation shocks. The key in this model is to define the sign restriction priors that transform the dynamic of the underlying variables in the model (10yT yields, 5y5y inflation, real effective exchange rate for the dollar, and cyclical adjusted P/E ratios) into the shocks below (see our report, A hitchhikers guide to RV on the UST curve).

Curve directionality

One framework that adds to the understanding of the dynamic of the curve is a measure of how frequent the different modes for the curve (bull flattening, bear steepening, bear flattening, and bull steepening) have been in recent history. One can do this by constructing 4 indices, one for each mode, that measure the number of bp moves that can be attributed to that mode in a given historical window versus the sum of absolute moves on the curve over the same period. Those 4 indices can be grouped into short leg (2yT leg in the 2s10s dynamic) driven moves (adding the bear-flattening and bull steepening indices) and belly (10yT in the 2s10s dynamic) driven moves (adding bull flattening and bear steepening moves). This framework is useful to gauge the prevailing modes on the curve and understand the periods when the curve is undergoing a shift in its dynamic.

PCA on global 10y BEs

We run a 2-factor PCA on 10y breakevens across US, UK, AU, JP, EU, and CAD with at least 6 years of history. While central bank policy is certainly a factor for the global inflation market, especially around pivots or other surprises, we find that the first principal component (PC1) explains 85% of the variance in global breaks and is highly correlated with the price of oil. The second principal component of breakevens accounts for 9% of the variance, which results in a total of 94% covered by 2 factors. We find that PC2 correlates well to global financial stress and the Fed's published real rate term premium (see our report, Rates relative value update with PCA, 14 December 2022).

[1] *European Central Bank, Financial Stability Review, Nov. 2018,* www.ecb.europa.eu/pub/pdf/fsr/ecb.fsr201811.en.pdf

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