

Global Rates Trader

Systemic concerns fuel rally

Near term data mix and banking system concerns in the US could keep peak rate pricing depressed and/or deepen curve inversion. Although higher rates are likely to eventually be realized, too early to add shorts given uncertainty, but also not attractive to add substantial duration longs given poor risk compensation. Medium-term case for lower rates volatility remains. Hawkish ECB implies little room for front-end rally until data turns. Sovereign spreads are vulnerable to ECB balance sheet policy. Expect tactical weakness in 5y5y HICP. UK near-term fiscal headroom to have limited pricing impact.

Praveen Korapaty
+1(212)357-0413 | praveen.korapaty@gs.com
Goldman Sachs & Co. LLC

George Cole
+44(20)7552-1214 | george.cole@gs.com
Goldman Sachs International

Simon Freyenet
+44(20)7774-5017 | simon.freyenet@gs.com
Goldman Sachs International

Ravi Raj
+1(212)934-8372 | ravi.raj@gs.com
Goldman Sachs India SPL

Vickie Chang
+1(212)902-6915 | vickie.chang@gs.com
Goldman Sachs & Co. LLC

United States/North America

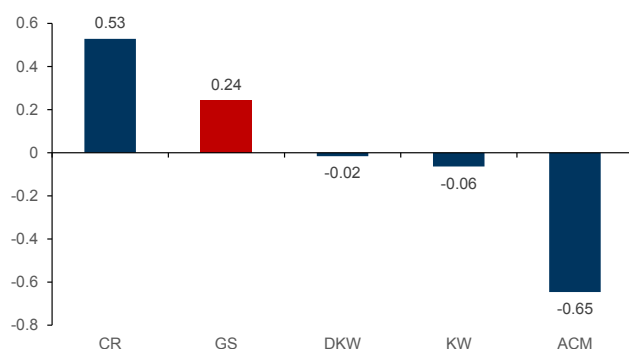
■ **Banking system concerns fuel a sharp late-week rally.** Market sentiment swung sharply over the course of the week, starting with Fed Chair Powell's semi-annual testimony to Congress. We suspect markets would have handled Powell's signaling of a higher terminal rate differently had it not been accompanied by his opening the door to reaccelerating the pace of hikes, which led to markets pricing high odds of a 50bp hike at the March meeting mid-week. Later in the week however, following two bank failures, financial stability and liquidity concerns began to dominate, leading to a sharp reversal rally. Shorter maturity yields saw intra-week swings of around 50bp, with longer maturities seeing tighter, but still wide ranges. The week also featured the February jobs report, which indicated a healthy labor market—the pace of job growth remains well above potential—alongside signs that reduce concerns about overheating (a surprise rebound in the unemployment rate, and softer-than-expected increase in average hourly earnings). Overall, the mix of news flow and data makes a 25bp hike at the March meeting more likely than a 50bp hike, in our view, though stickier price data next week (our economists expect a 0.45% mom increase in core CPI versus a 0.4% consensus) could lead to some rebuilding of premium for the larger hike. Beyond hike expectations for the next meeting, the net result of the week's price swings was both a deepening front end inversion and lower peak rate pricing. On the former, although we do not believe the easing currently priced at the front end of the curve is likely to be delivered, it may prove difficult to dislodge in the near term—any upside surprises on inflation, combined with current financial stability concerns and a softening labor market

This report is intended for distribution to GS institutional clients only.

Investors should consider this report as only a single factor in making their investment decision. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to www.gs.com/research/hedge.html.

could in fact *further deepen* the inversion. Therefore, we close our SFRM3/H4/Z4 belly-cheapening fly recommendation for a potential profit of 12bp, and will look to re-engage in front-end steepeners if and when the data mix moves in a direction of steady growth and softer inflation. The clearer opportunity here, in our view, is the decline in peak rate pricing. While we believe that the realized peak rate will be higher than current market pricing, and the fears about systemic risk are overdone (more below), they may take time to resolve.

Exhibit 1: Although term premium estimates from some models have turned positive, compensation for duration risk is still low
10y Term premium estimates from different models

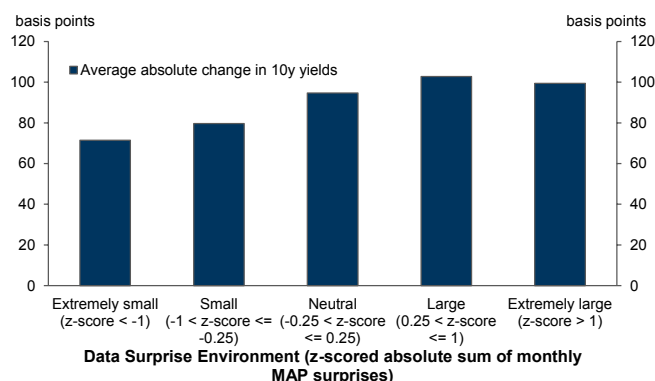


CR=Christensen-Rudebusch, DKW=D'Amico-Kim-Wei, KW=Kim-Wright, ACM=Adrian-Crump-Moench

Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 2: Yield volatility has tended to be higher in periods with large data surprises

Average sums of absolute daily changes in 10y yield over periods of small to large data surprises. Sample period is 2000-present.



Source: Goldman Sachs Global Investment Research

- **Is it time to buy bonds?** The selloff over the past month or so had until late this week brought yields to levels many investors find attractive. Is now a good time to be buying duration, especially given fears of broader stress? One approach to answering this question is through the lens of bond term premia, which is supposed to reflect the compensation for taking on duration risk. Some measures of term premia have turned positive, though there is considerable variation in models; estimates from some widely used models, such as Kim-Wright or ACM, are still negative, though our own GS term premium model estimate has turned positive ([Exhibit 1](#)). Although term premium models can vary in levels, changes tend to be fairly correlated—indeed, all model estimates, including from our own model, have risen by between 20-40bp over February. In [previous work](#), we've noted that an extra 10bp of term premium at the start of the holding period is consistent with a roughly 5bp improvement in excess returns over a 1y period, and 10bp improvement over a longer 3-5y horizon, all else being equal. Of course, with the policy rate path in flux, that latter caveat does not apply, and the modest improvement in term premia isn't large enough to cushion against the risks of cycle extension, in our view. Indeed, at current levels of term premium, assuming a higher long run equilibrium real rate of 1.5% and that the current forward path for policy rates will be realized, our excess return model projects modestly negative excess returns of between -10 to -30bp to owning 10y USTs over the next year. In other words, cash still seems to be the better alternative. However, from a portfolio context, this small negative return could be viewed as a contingency fee for "insurance"—bonds would

likely fare well in a recession or broader bank stress scenario, for instance.

Therefore, some legging into duration makes sense to us—though as we noted last fall when yields were at similar levels, we would refrain from accumulating large positions just yet.

- **Rates volatility likely to moderate over the medium term.** After a sharp decline in January, implied volatility picked up across the interest rate curve last month. Although idiosyncratic factors (Powell's testimony, concerns about banks) aided the move higher this week, the increase was, in our view, largely the result of large economic data surprises. [Exhibit 2](#) shows the average absolute monthly change in yields, bucketed by data surprise environment (z-scored monthly absolute sums of our growth and inflation surprise (MAP) indices over the same months), since the early 2000s. The economic data surprises over the past 6-8 weeks that we have seen along both growth and inflation dimensions are large relative to history (falling in the "large" category). As [Exhibit 2](#) shows, yield volatility has unsurprisingly tended to be higher in months where the data have surprised more. Volatility could persist in the near term—the pace of downward readjustment in yields this week leaves the market vulnerable to a reversal on stronger inflation data next week. That said, we do not believe the pickup in rates volatility will be long-lasting for a few reasons. Looking beyond this month, we expect the strength in data will moderate—elements of the latest employment reports offer some promise in this regard. This should remove the main source of volatility support. Second, as discussed earlier, although we think the peak funds rate will realize higher than current market pricing, the recent turn of events suggests a steady hiking pace is the more likely path to getting there. This should reduce the risks of the Fed 'overtightening,' and therefore narrow the rates distribution support. Finally, we think the more idiosyncratic factors, like banking system concerns, will recede, at least in terms of their read-through for Fed policy and rates markets. Still, given these risks are very much live in the near term, we close our existing 3m2y straddle short for a potential loss of -8bp, and would defer initiating vol shorts for a while, at the very least until after the March FOMC meeting.

European Rates

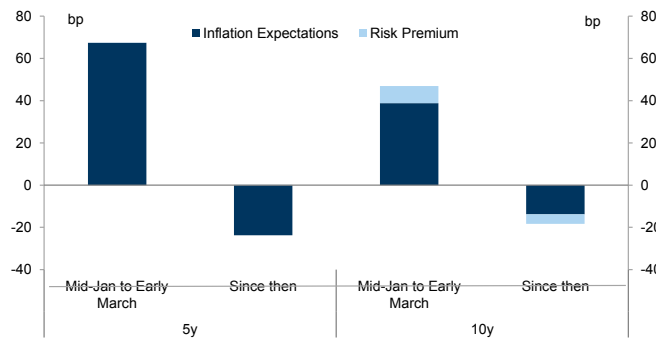
- **Hawkish ECB (and Fed) point to ongoing curve flattening**... With policy signals from both the ECB and the Fed turning more hawkish in the last week, we think that the transition from a nominal growth-led repricing of yields in February to a policy-driven flattening of the curve will continue. While we do not expect to see a literal delivery of GC member Holzmann's preference for four more 50bp hikes, we think that the broader ECB resolve to ensure its policy is sufficiently restrictive should guide markets from here. Restrictive policy would imply i) limited room for front-end rates to rally until data turns, ii) ongoing flattening of 1y1y vs 1y OIS, iii) wider credit spreads and iv) lower medium-term inflation forwards (the latter two discussed below). The limited tolerance for substantial upside surprises either on activity or prices imply stability in long-end yields, and while ultimately we think stronger economic activity will see yields higher over the medium term, the tactical risk is towards further curve flattening rather than a big shift higher in yield levels.

Next week we expect the ECB to deliver the 50bp hike it has guided towards, and to maintain the current guidance that it is “raising interest significantly at a steady pace.” Explicit guidance towards a May 50bp is not our base case, even as we expect the ECB to deliver it. The 2025 inflation projections should move closer towards 2% from the current 2.4%, which together with an absence of explicit guidance to 50bp in May might be interpreted slightly dovishly by markets. However, we would fade any front-end strength until there is compelling evidence of growth weakening or imminent financial stability risks—not our expectation ahead of May.

- **... widening in sovereign credit....** As above, restrictive ECB policy should lead to financial conditions tightening beyond just the level of rates and shape of the curve. If hawkish policy from the ECB limits the ability for growth expectations to rise further from here, this should start to become a less friendly environment for sovereign credit. March heralded the start of QT and while we do not expect this to cause an abrupt repricing, we will be watching upcoming ECB communication on the balance sheet – including the likely pace of QT beyond June – carefully. Earlier this week GC member Holzmann floated the possibility of reducing PEPP holdings as early as 2H 23. We see a change in the guidance regarding PEPP – full reinvestments of maturing securities until least end-24 – as unlikely, given the role of PEPP reinvestment flexibility as a first line of defence against fragmentation risks. But any further discussion along these lines would indicate an emboldened ECB when it comes to sovereign risk. On our QT sensitivities, 12 months’ worth of PEPP runoff would take 10y bund yields 3-5bp higher and, BTP-bund spreads about 5bp wider through stock effects; but we consider these estimates to be conservative given the corresponding potential for increased volatility. Given sovereign credit continues to trade well, in part as a result of existing ECB backstops, we see renewed hawkish communication from the ECB as a clear risk. As the ECB moves to an uncapped PSPP runoff later this year, we continue to expect wider sovereign spreads, with our 10y BTP-bund target set at 235bp by year-end.
- **...and downward pressure on traded HICP.** As we recently highlighted, 5y5y HICP pricing around 2.5% seems at odds with ongoing ECB willingness to front-load policy tightening. For that reason, we still see an asymmetry to the downside in intermediate maturity forwards. Last week, inflation sold off on a decline in three-year ahead inflation expectations in the ECB’s consumer expectation survey (CES), a datapoint that likely warrants some caution given the relatively short time series available. Our model of inflation risk premium indicates that while increasing inflation expectations have played a key role in the recent rally at the 5y, further out, inflation risk premium has been comparatively more important (Exhibit 3). As for duration, we expect inflation risk premium to remain elevated over the medium term as fiscal policy and commodity price risk continue to skew inflation risks to the upside. However, we see the tactical risks still skewed to the downside as financial conditions tighten as the ECB front-loads hikes.
- **UK budget to continue to support growth.** We expect a decline of around £20-25bn in funding needs in next week’s UK budget statement, with around half the £30bn of additional fiscal headroom committed as (largely) one-off spending increases. In addition to lower spending on energy subsidies and growth tailwinds,

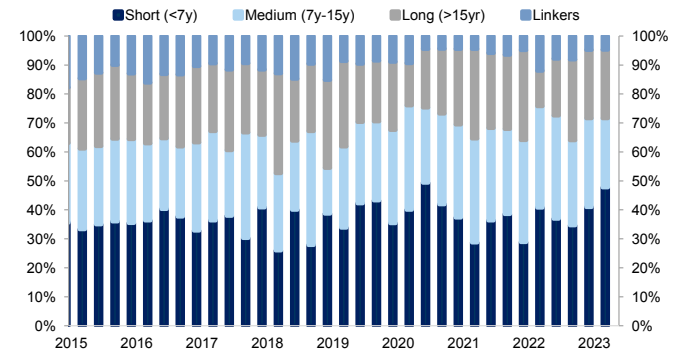
Gilt issuance may also be lower due to the potential increased use of NS&I bonds and Bills to raise cash. We expect the DMO to maintain its bias towards short-dated issuance ([Exhibit 4](#)). We believe that a reduction in funding needs of around £20-25bn is largely expected and that any relief to Gilts on a smaller-than-expected Gilt remit will likely be temporary given improving growth due to ongoing fiscal support, still-high Gilt supply over the medium term and QT. The ongoing common factor in G10 pricing will continue to drive pricing in the front-end, but we continue to think that cross-market UK front-end longs vs EU/US are attractive given diverging central bank communications and stronger monetary policy transmission.

Exhibit 3: Inflation risk premia more important at longer tenors
Eurozone inflation swaps decomposition



Source: Goldman Sachs, Goldman Sachs Global Investment Research

Exhibit 4: Gilt issuance to continue to be skewed towards shorter maturities
Gilt issuance by maturity bucket



Source: UK DMO, Goldman Sachs Global Investment Research

Latest Thematic Research:

[February 2023 Refunding Preview](#) - 25 January 2023

[BoJ's YCC surprise has limited spillovers \(for now\)](#) - 20 December 2022

[2023 Global Rates Outlook: Chasing Neutral](#) - 21 November 2022

[November 2022 Refunding Recap](#) - 2 November 2022

[November 2022 Refunding Preview](#) - 27 October 2022

Latest Global Markets Dailies:

[ECB QT Begins](#) - 1 March 2023

[What Ails the US Yield Curve?](#) - 8 February 2023

[Riksbank Inflation Tolerance to Steepen SEK Curve](#) - 3 February 2023

[Bund Scarcity Easing](#) - 31 January 2023

[European Bonds in a Growth-Driven Market](#) - 24 January 2023

The authors would like to thank Alberto Sannicandro for his contributions to this report.

Summary of Views

	Core Views	Recommendation	Entry Date
Duration	Though we expect near term consolidation for US yields, upside risks remain, particularly if upcoming data confirm the strength seen in January. Though we acknowledge the increasing value proposition of bonds, we believe that low risk premium suggests substantial duration longs are premature. In terms of location, given Fed willingness to reaccelerate, we expect both the front-end rates are particularly vulnerable to a repricing in the near-term.	--	--
	We maintain a bearish bias on European duration as activity and price data (particularly in core services) continue to show little signs of ECB policy having reached decidedly restrictive territory. We also believe that while markets have been able to anticipate QT for several months, its impact on duration has yet to be fully priced.	--	--
	Our economists expect a particularly strong transmission of the recent policy tightening in the UK, thanks in part to the relatively low maturity of mortgage debt, which should add up to a larger growth drag vs other major economies. We expect this to support UK duration and partially offset a still challenging Gilt supply backdrop, and elevated inflation.	--	--
	JGB yields likely to remain near the upper end of the wider YCC band, particularly if global yields reverse higher. Expect JPY curve dynamics to continue to reflect anticipation of further policy rate adjustments, with more meaningful shifts (rather than additional incremental changes to YCC) a more plausible next step.	--	--
Curve	Although we do not believe the easing currently priced at the US front-end is likely to be delivered, it may prove difficult to dislodge in the near term, with upside surprises on inflation, combined with current financial stability concerns and a softening labor market potentially deepening the inversion. We would however look to re-engage in front-end steepeners once the data mix moves in a direction of steadier growth and softer inflation.	--	--
	The inversion at the long end of the swaps curve should fade as investors either demand more risk premium for a volatile environment, or the current volatility abates.	10y/10y20y SOFR curve steepener	3-Mar-23
	Given ongoing ECB willingness to front-load policy tightening – our economists expect another 50bps at the May meeting – we see little room for the front-end to rally unless economic data turns. In this set-up, we expect duration to be comparatively better supported, and thus look for continued curve flattening.	--	--
	Given the more dovish BoE relative to other major central banks, we continue to see the UK front-end as a good cross-market receive. Further out the curve, a more aggressive balance sheet policy, and a less favourable medium term inflation profile points to increasing term-premium.	--	--
Spreads	We suspect markets will continue to test the 10y YCC band episodically, particularly into BoJ meetings once the new leadership is in place. In terms of yield curve pricing, we believe it should translate to steeper long end curves, particularly beyond the 5y point.	5s30s JGB curve steepeners	3-Mar-23
	Our issuance projections imply a fairly stable outlook for US duration supply, with balance sheet runoff impact likely felt only towards 2023. Shift towards more price elastic buyers has put pressure on spreads; eventual pivot towards levered investors a further incremental risk.	--	--
	We continue to see ECB policy headwinds and heavy duration supply as likely to take sovereign credit wider throughout the year. Though decline in gas prices improve the near-term growth-inflation trade-off, we also think uncertainty in medium-term Italian growth amid rising debt interest spending implies lingering sovereign risk. The main risk to this view is further decline in rates volatility sustaining inflows into EGBs, through more attractive carry.	--	--
	We continue to see ECB policy headwinds and heavy duration supply as likely to take sovereign credit wider throughout the year. Though decline in gas prices improve the near-term growth-inflation trade-off, we also think uncertainty in medium-term Italian growth amid rising debt interest spending implies lingering sovereign risk. The main risk to this view is further decline in rates volatility sustaining inflows into EGBs, through more attractive carry.	--	--
Vol	Short maturity Gilts are among the richest vs swap rates globally. BoE asset sales, alongside ongoing issuance needs should alleviate the scarcity of front-end gilts.	--	--
	We see the recent resurgence of implied vol across the curve as primarily a function of large economic surprises, which suggests to us volatility may remain elevated in the near-term ahead of key data points. Beyond however, we think that a combination of moderation in data strength, ebbing idiosyncratic concerns, and reduced risk of overtightening all point to a decline in rates vol.	--	--
Money Market	Increased demand for financing coupled with an eventual build in bill supply should see money funds allocate away from RRP facility, with reserve balances somewhat more stable. Near-term risks from the debt ceiling, however, could slow the bill supply build and suggest a slower pace of adjustment in 1H23.	--	--
	Bills should cheapen versus OIS and incentivize greater money fund demand over time, with Treasury set to rely more heavily on bill supply in 2023. Risks around the debt limit may mean a shallower bill supply trajectory, however, and attenuate impact of runoff in the near-term	--	--
Inflation	Market-implied inflation path repriced sharply this month. While sustained inflation this cycle coupled with the Fed's shift to a more cautious approach argue for higher average levels and more risk, risks are more balanced after the recent rally.	--	--
	Though we expect the inflation risk premium to remain elevated over the medium term, we think the clear ECB resolve to tighten financial conditions implies downside pressure on 5y5y HICP tactically, with a sustained sell-off likely contingent on clearer indications of receding inflation expectations.	--	--

Source: Goldman Sachs Global Investment Research

Forecasts

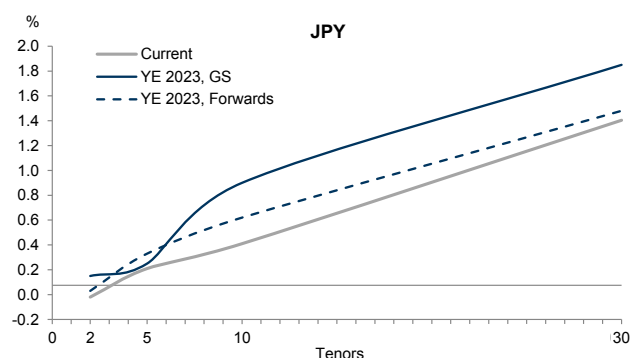
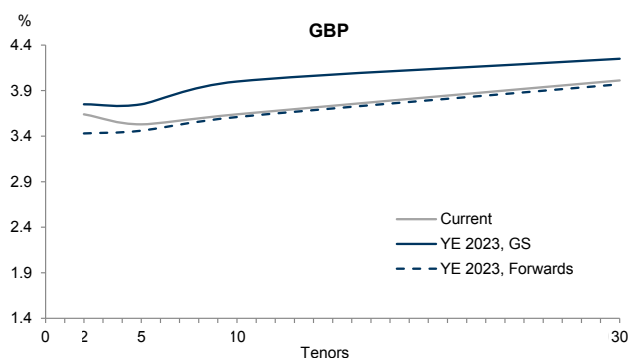
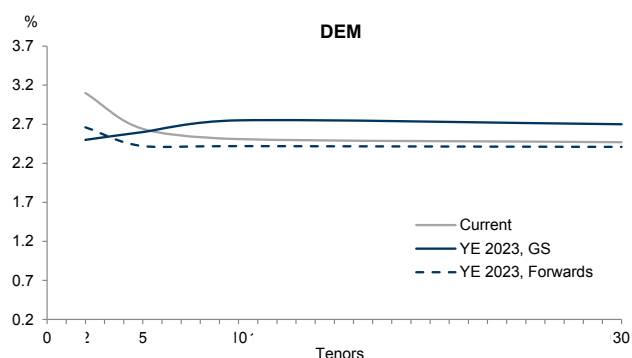
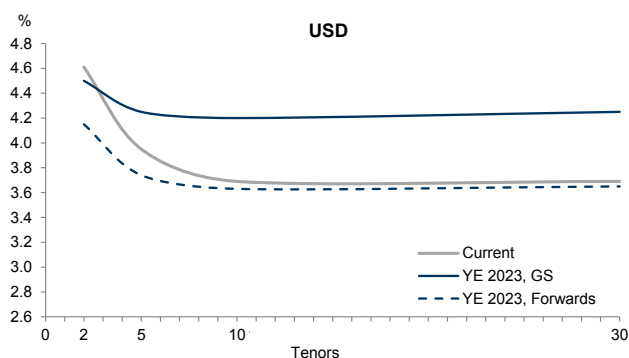
G10 10y yield forecasts

G10 10-Year Yield Forecasts											
	USD	DEM	GBP	JPY	CAD	CHF	SEK	NOK	AUD	NZD	
spot	3.69	2.51	3.64	0.41	2.99	1.38	2.40	3.16	3.58	4.45	
1Q23	3.65	2.75	4.00	0.50	3.00	1.60	2.45	3.75	3.70	4.60	
2Q23	4.10	2.75	4.00	0.80	3.20	1.60	2.45	3.75	4.00	4.75	
3Q23	4.25	2.75	4.00	0.90	3.40	1.60	2.45	3.75	4.20	4.60	
4Q23	4.20	2.75	4.00	0.90	3.40	1.50	2.35	3.65	4.20	4.50	
1Q24	4.10	2.60	3.90	0.85	3.30	1.50	2.35	3.65	4.20	4.35	
2Q24	4.05	2.50	3.80	0.80	3.30	1.50	2.35	3.60	4.10	4.25	
3Q24	4.00	2.25	3.75	0.75	3.30	1.45	2.30	3.55	4.00	4.20	
4Q24	4.00	2.25	3.75	0.75	3.30	1.45	2.30	3.50	4.00	4.20	
1Q25	4.00	2.25	3.75	0.75	3.30	1.40	2.25	3.45	4.00	4.20	
2Q25	4.00	2.25	3.75	0.75	3.30	1.40	2.25	3.45	4.00	4.20	
3Q25	4.00	2.25	3.75	0.75	3.30	1.40	2.25	3.40	4.00	4.20	
4Q25	4.00	2.25	3.75	0.75	3.30	1.40	2.25	3.40	4.00	4.20	
1Q26	4.00	2.25	3.75	0.75	3.30	1.40	2.25	3.45	4.00	4.20	
2Q26	4.00	2.25	3.75	0.75	3.30	1.40	2.25	3.45	4.00	4.20	
3Q26	4.00	2.25	3.75	0.75	3.30	1.40	2.25	3.40	4.00	4.20	
4Q26	4.00	2.25	3.75	0.75	3.30	1.40	2.25	3.40	4.00	4.20	

Deviation from Forwards											
	USD	DEM	GBP	JPY	CAD	CHF	SEK	NOK	AUD	NZD	
1Q23	-0.04	0.25	0.37	0.07	0.01	0.30	0.11	0.60	0.14	0.09	
2Q23	0.42	0.29	0.40	0.28	0.23	0.31	0.12	0.63	0.49	0.32	
3Q23	0.60	0.31	0.40	0.33	0.48	0.33	0.15	0.64	0.67	0.17	
4Q23	0.57	0.33	0.39	0.28	0.52	0.25	0.08	0.56	0.65	0.07	

Source: Goldman Sachs Global Investment Research

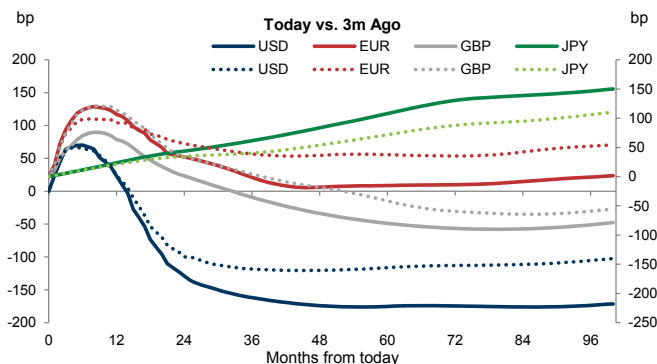
G4 Curve Forecast



Source: Bloomberg, Goldman Sachs Global Investment Research

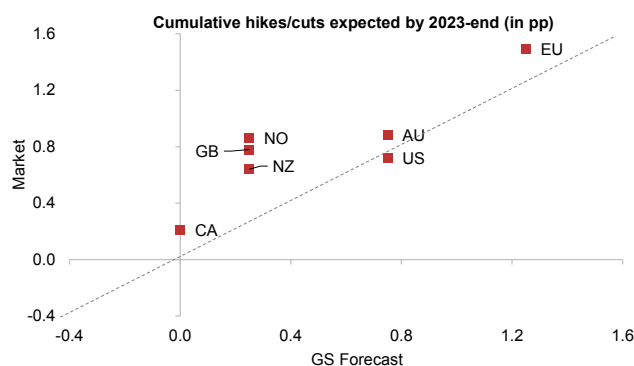
Central Bank Dashboard

Cumulative amount of hikes/cuts priced from today



Source: Goldman Sachs Global Investment Research

Expected hikes by year, GS vs. Market



Mar-2-2023 Close

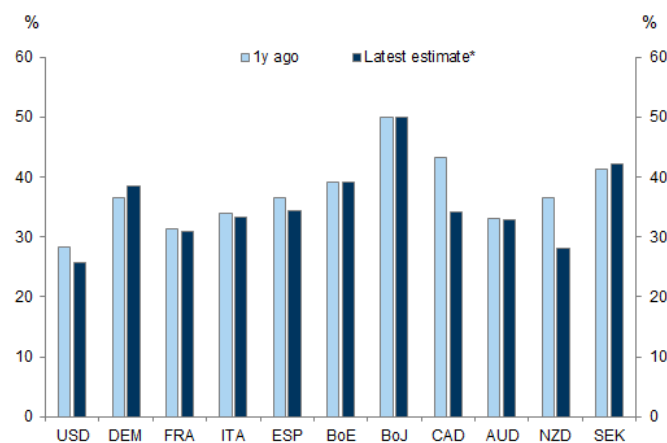
Source: Goldman Sachs Global Investment Research

Central Bank Sovereign QE expectations

	Current purchase pace	Forward-looking expectations
Fed	\$0	Runoff since May 2022
ECB	\$0	Partial APP runoff from March to June at an average monthly pace on €15bn. We expect a full passive runoff from July. After the backstop (TPI) announcement, we continue to expect PEPP reinvestment flexibility to remain the first line of defence.
BoE	£0	QT pace of £80bn/yr. Approximately evenly split between redemptions and outright sales.
BoJ	Unlimited	Expect coupon buying to keep up with pace of issuance, as to prevent significant deviations in 10y JGB target
BoC	\$0	Passive runoff since April 2022
RBA	A\$0	Asset purchases concluded in February 2022, and maturing bonds are no longer reinvested as of May 2022
RBNZ	NZ\$0	Passive runoff as of Feb-22 meeting. Bank commenced active bond sale program starting in July-22 at a pace of NZ\$5bn per fiscal year
Riks	kr0	Passive runoff from Jan-23, SEK 3.5bn/m active sales

Source: Goldman Sachs Global Investment Research

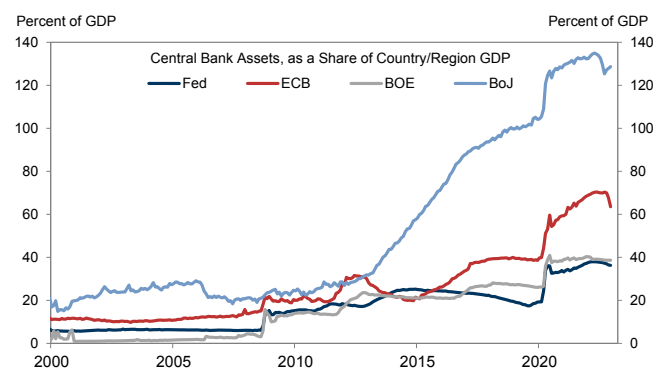
Central bank ownership of sovereign bonds, current vs. 1y ago



*Feb-2023

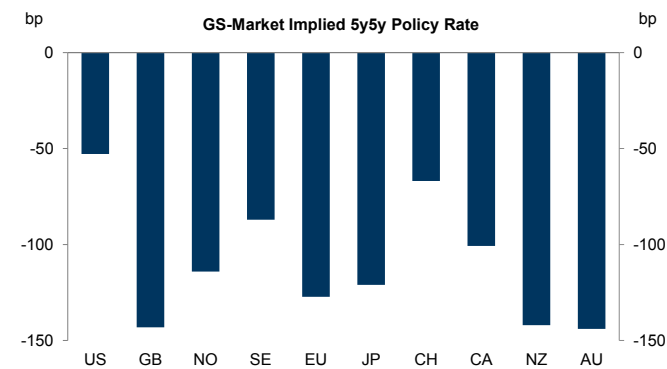
Source: Haver Analytics

Central bank assets as a share of GDP



Source: Goldman Sachs Group Inc., Goldman Sachs Global Investment Research, Haver Analytics

GS forecasts vs. market pricing of 5y5y average policy rate

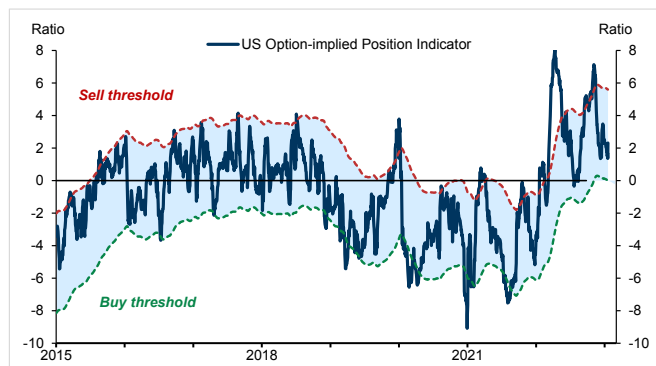


2-Mar-2023 close

Source: Goldman Sachs Global Investment Research

Positioning and Flows Monitor

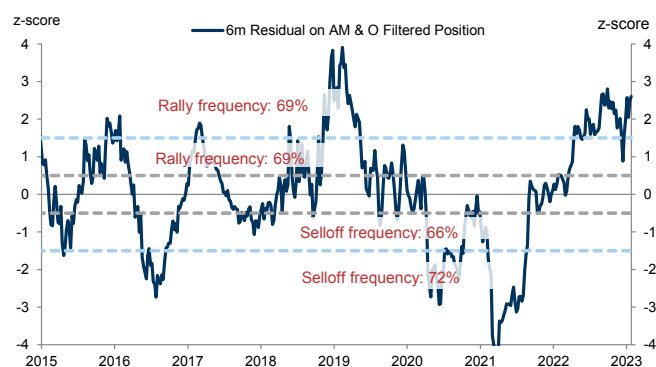
Option implied position indicator



Source: Goldman Sachs Global Investment Research

Residual of 10y UST yield changes on filtered AM position vs 6m ahead change in 10y UST yield

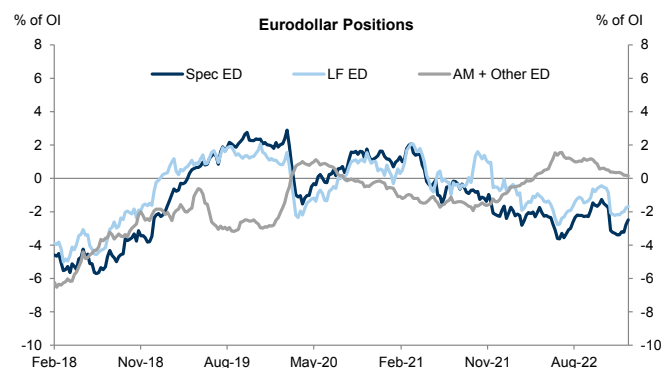
Gray lines denote +/- 0.25 standard deviations



Note: 6m residual changes on yield in filtered position (z-score) and 6m ahead change in 10s

Source: CFTC, Goldman Sachs Global Investment Research

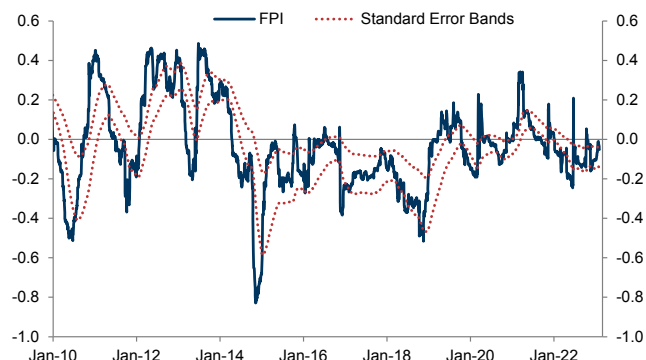
Net positions in Eurodollars



Note: Duration-weighted net position (long - short) as a % of duration-weighted gross exposure (long + short + spreading)

Source: CFTC, Goldman Sachs Global Investment Research

GS Fund Positioning Indicator



Source: Goldman Sachs Global Investment Research

CFTC Commitment of Traders and Traders in Financial Futures

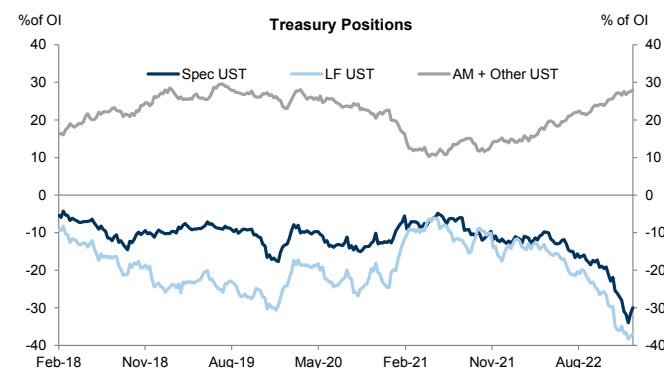
Duration-weighted net position by investor type

Duration-Weighted Positioning, by Contract

\$mm/bp	ED	TU	FV	TY	TN	US	WN
Spec Current	-20.2	-10.6	-18.9	-24.9	-8.0	-16.0	-87.9
Spec 1w Change	0.2	0.5	-1.6	-3.4	-2.4	0.6	-1.5
LF Current	-16.3	-10.2	-26.2	-32.8	-4.7	-33.2	-161.5
LF 1w Change	0.3	-1.5	-6.3	-4.8	-1.1	-1.1	0.4
AM + Other Current	16.2	19.6	47.0	50.2	12.9	44.3	157.2
AM + Other 1w Change	-1.1	1.2	7.8	3.7	-0.1	3.6	-3.0
Dealer Current	6.5	-6.4	-14.7	-14.3	0.2	-14.1	-8.9
Dealer 1w Change	0.2	-0.3	-0.7	1.5	-0.1	-1.1	-0.3

Source: CFTC, Goldman Sachs Global Investment Research

Net positions in UST futures

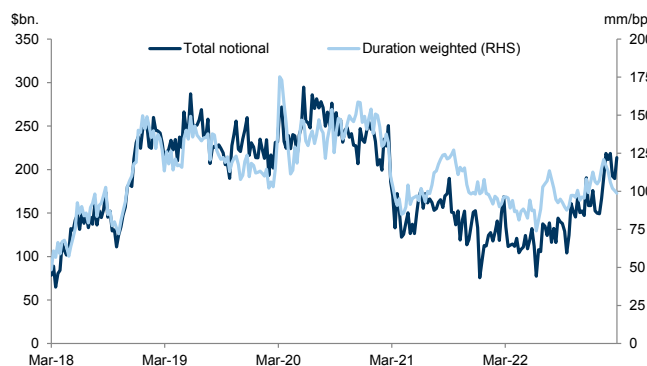


Note: Duration-weighted net position (long - short) as a % of duration-weighted gross exposure (long + short + spreading)

Source: CFTC, Goldman Sachs Global Investment Research

Primary dealer transactions

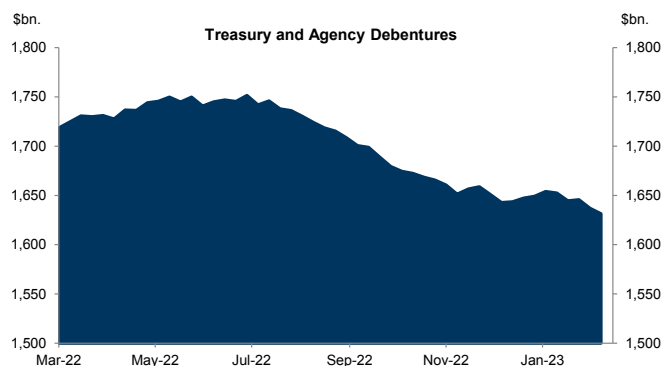
Net dealer position in US Treasuries



Source: Federal Reserve Bank of New York, Goldman Sachs Global Investment Research

US Commercial Banks' Holdings of Treasury and Agency Securities

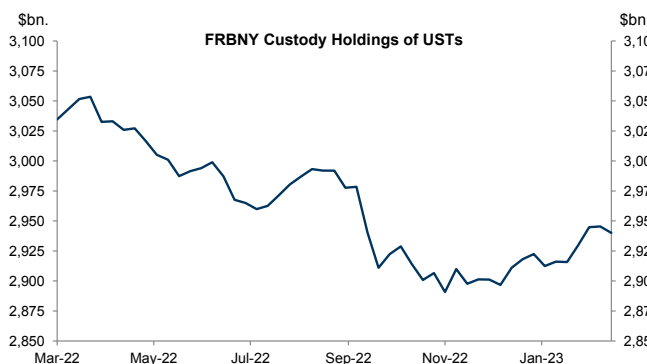
Total domestic and foreign holdings, all commercial banks



Source: Federal Reserve Board

NY Fed Custody Holdings

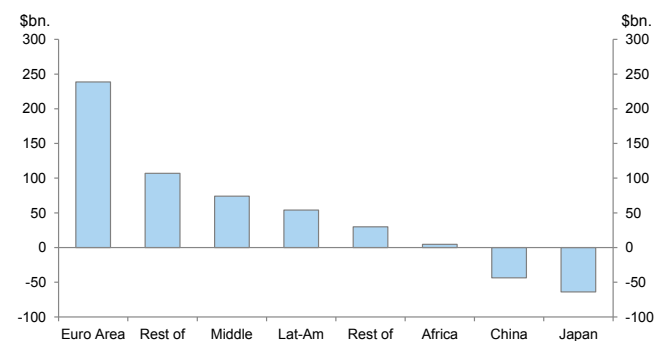
Marketable US Treasuries



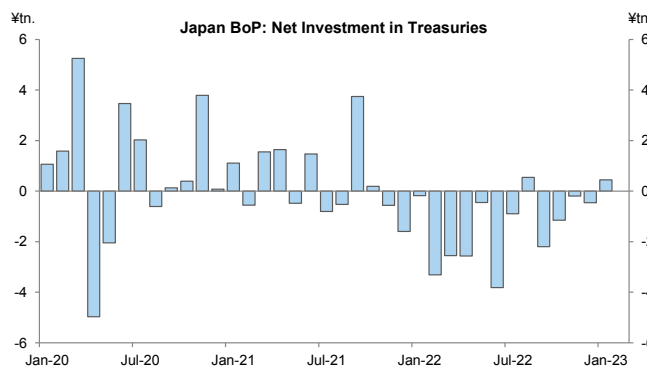
Source: Federal Reserve Bank of New York

US TIC Treasury Flows

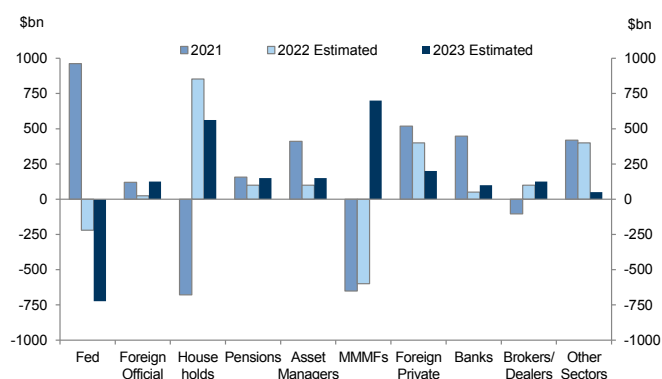
12m change in valuation-adjusted holdings of USTs, by holder of debt



Source: US Treasury, Goldman Sachs Global Investment Research

Net monthly purchases of short and long term US Treasuries by Japanese investors

Source: Bank of Japan, Haver Analytics

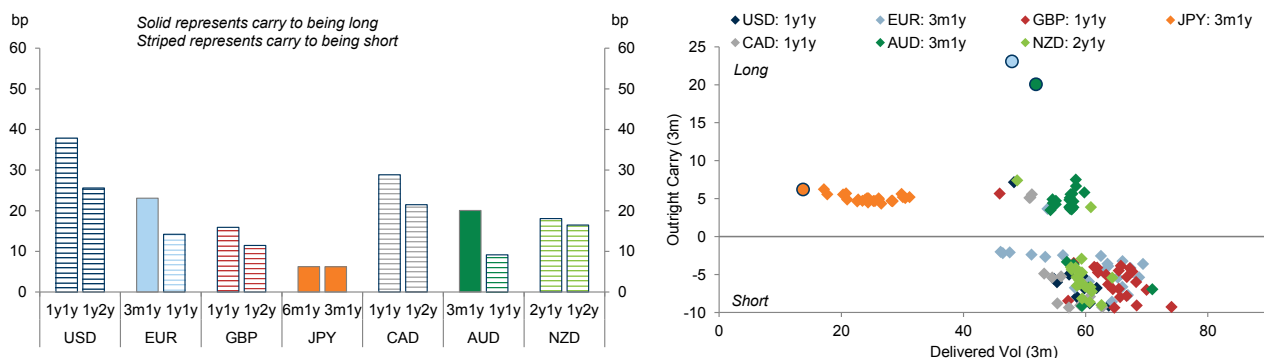
Flow of Funds annual net purchases of US Treasuries, by sector

Source: Federal Reserve Board, Goldman Sachs Global Investment Research

Carry/Rolldown Monitor

Outright Carry

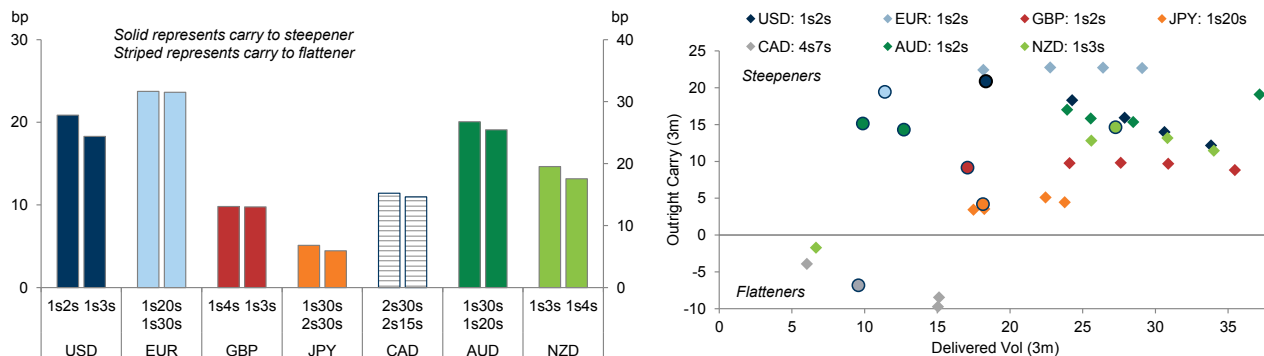
Bar chart shows top two carry points by currency, with solid reflecting carry to a long position and striped carry to a short position. Scatter illustrates top 25 carry/vol points by currency, with top point by currency noted



Source: Goldman Sachs Global Investment Research

Curve Carry

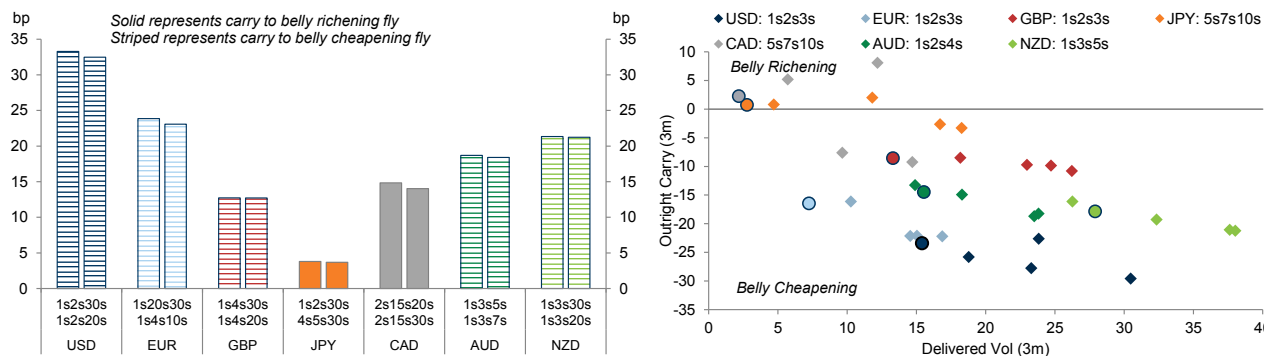
Bar chart shows top two carry curves by currency, with solid reflecting carry to a steepening position and striped carry to a flattening position. Scatter illustrates top 5 carry/vol curves by currency, with top curve by currency noted



Source: Goldman Sachs Global Investment Research

Fly Carry

Bar chart shows top two carry flies by currency, with solid reflecting carry to a belly-richening fly and striped carry to a belly-cheapening fly. Scatter illustrates top 5 carry/vol flies by currency, with top fly by currency noted



Source: Goldman Sachs Global Investment Research

Treasury Supply Monitor

Gross Treasury auction size estimates by year end, with GS projections

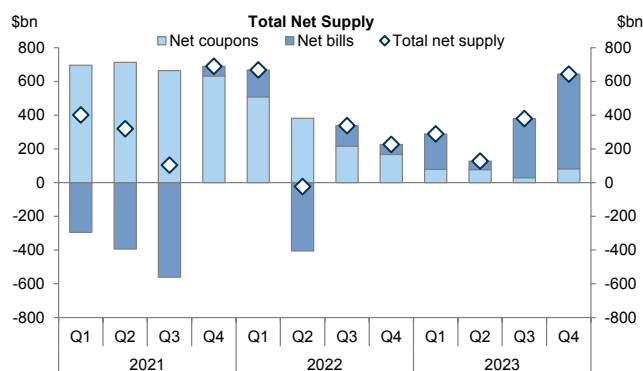
Monthly Auction Amounts at End of Calendar Year (\$ billions)											
	2y FRNs	2y	3y	5y	7y	10y	20y	30y	5y TIPS	10y TIPS	30y TIPS
CY19	20 / 18 (r)	40	38	41	32	27 / 24 (r)	--	19 / 16 (r)	17 / 15 (r)	14 / 12 (r)	8 / 7 (r)
CY20	26 / 24 (r)	56	59	59	38	41 / 38 (r)	27 / 24 (r)	27 / 24 (r)	17 / 15 (r)	14 / 12 (r)	8 / 7 (r)
CY21	26 / 24 (r)	56	54	57	56	39 / 36 (r)	23 / 20 (r)	25 / 22 (r)	19 / 17 (r)	16 / 14 (r)	9 / 8 (r)
CY22	24 / 22 (r)	42	40	43	35	35 / 32 (r)	15 / 12 (r)	21 / 18 (r)	21 / 19 (r)	17 / 15 (r)	9 / 8 (r)
CY23, GS	26 / 24 (r)	46	44	47	37	37 / 34 (r)	16 / 13 (r)	22 / 19 (r)	21 / 19 (r)	17 / 15 (r)	9 / 8 (r)

* Original Issue / Reopening listed for FRNs, 10s, 20s, 30s, and TIPS.

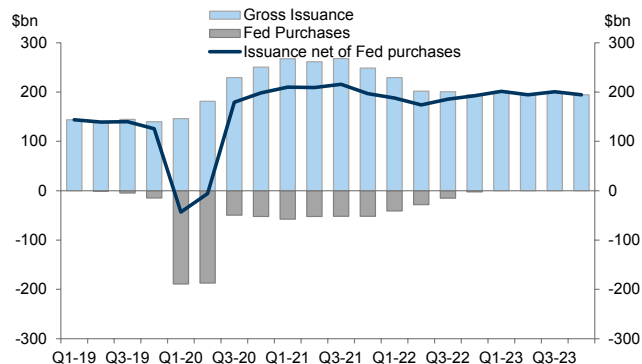
US Treasury Net Issuance by Calendar Year (\$ billions)						
	Net Coupons	Fed	Net of Fed	Net Bills	Fed	Net of Fed
CY 2019	1107	77	1030	77	170	-93
CY 2020	1734	2184	-450	2547	157	2391
CY 2021	2706	931	1775	-1194	0	-1194
CY 2022	1288	-168	1456	-73	-37	-36
CY 2023, GS	253	-649	903	1142	-75	1217

Duration supply (\$bn 10y equiv)		
Gross supply	Fed	Net of Fed
1703	39	1663
2421	1276	1145
3144	566	2578
2391	60	2331
2192	0	2192

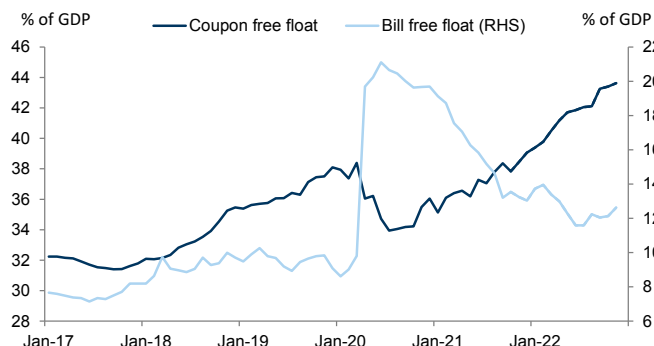
Net issuance per quarter



Average monthly UST issuance, gross and net of Fed purchases; \$bn 10y equivalents

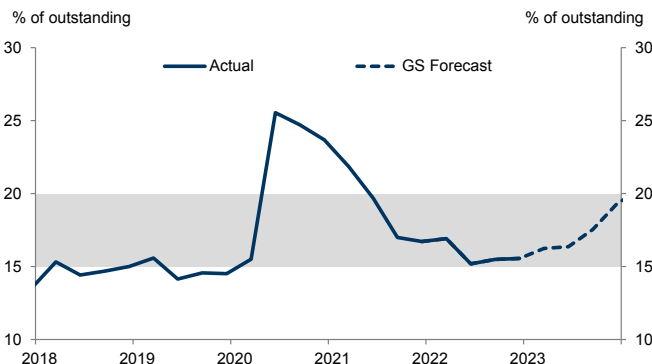


Free float (Treasury's outstanding less Fed and foreign official holdings) as % of GDP



Bills as a share of Treasuries outstanding and GS forecast

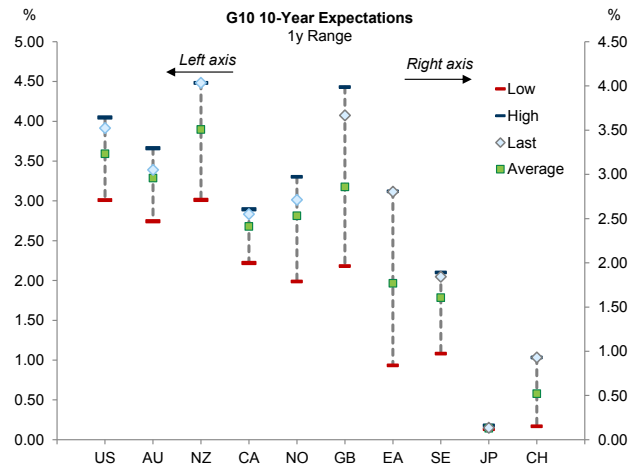
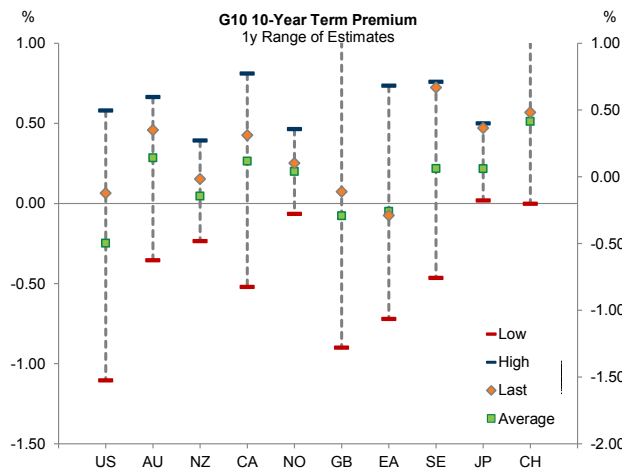
Gray shading denotes TBAC recommended 15-20% range



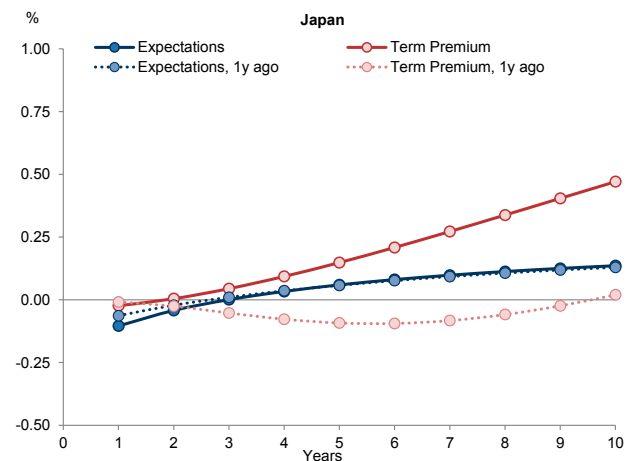
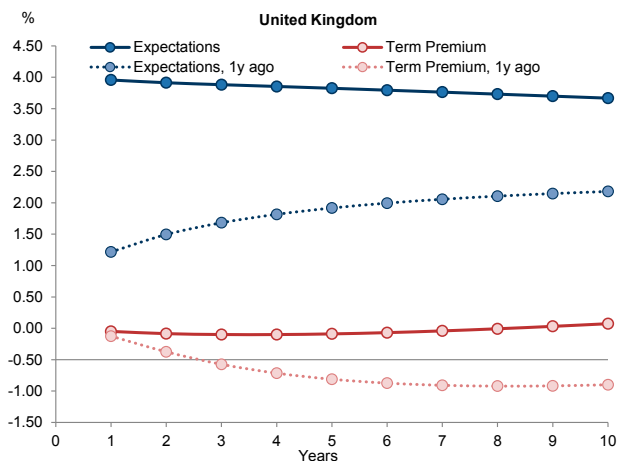
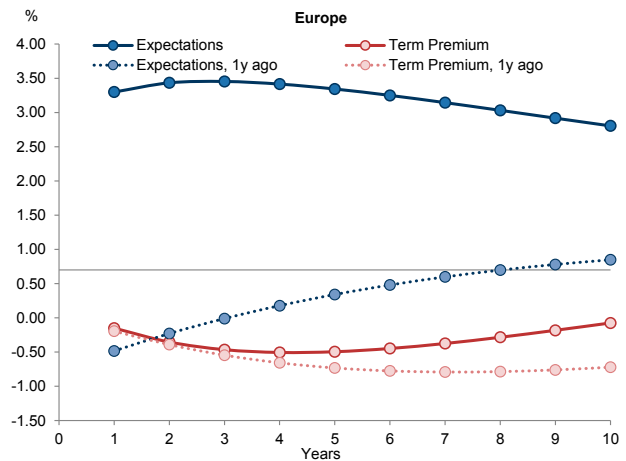
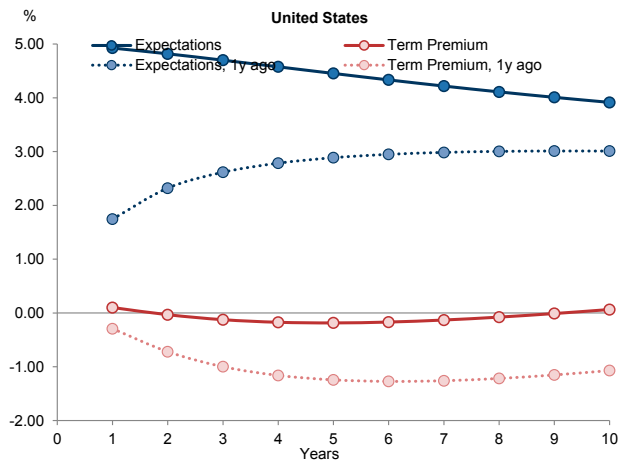
Source: Haver Analytics, Goldman Sachs Global Investment Research, US Treasury

GS Term Premium Decomposition

1y Range of G10 10y Yields, by Term Premium and Expectations Components



Term Structure of Fitted Yields, by Component



Source: Goldman Sachs Global Investment Research

2023 Trade Recommendations

GS Rates Trades						
Active	Entry Date	Opened	Latest	Stop	Target	Performance
1. 10y/10y20y SOFR curve steepeners	03-Mar-23	-0.84	-0.83	-1.00	-0.55	+1 bps
2. 5s30s JGB curve steepeners	03-Mar-23	1.19	1.23	1.10	1.40	+4 bps
Closed	Entry Date	Closed	Performance			
1. Jan/Mar BoC meeting OIS flattener	06-Jan-23	19-Jan-23	+9 bps			
2. Long 10y US Breakeven	16-Dec-22	27-Jan-23	+24 bps			
3. Sell SFRZ3	11-Nov-22	07-Feb-23	+33 bps			
4. Sell 6m2y Receivers	11-Nov-22	08-Feb-23	+20 bps			
5. 2s10s Bund Swap spread curve flattener	03-Feb-23	08-Feb-23	-1 bps			
6. Sell 6m 10s30s USD curve floor vs long 6m2y payer	30-Sep-22	10-Feb-23	+11 bps			
7. Sell 6m5y5y USD midcurve receivers	09-Dec-22	17-Feb-23	+26 bps			
8. Short 10y OATs	13-Jan-23	22-Feb-23	+37 bps			
9. Sell BAZ3	10-Feb-23	01-Mar-23	+75 bps			
10. Belly cheapening SFRZ3/M4/Z4 fly hedged w/ M4 1y MC call	27-Jan-23	10-Mar-23	+12 bps			
11. Sell 3m2y delta-hedged straddles	10-Feb-23	10-Mar-23	-8 bps			

Note: Potential profit/loss estimates are given as per unit of duration risk, through yesterday's close.

Source: Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

We, Praveen Korapaty, George Cole, Simon Freyenet, Ravi Raj and Vickie Chang, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

Disclosures

Option Specific Disclosures

Price target methodology: Please refer to the analyst's previously published research for methodology and risks associated with equity price targets.

Pricing Disclosure: Option prices and volatility levels in this note are indicative only, and are based on our estimates of recent mid-market levels (unless otherwise noted). All prices and levels exclude transaction costs unless otherwise stated.

General Options Risks – The risks below and any other options risks mentioned in this research report pertain both to specific derivative trade recommendations mentioned and to discussion of general opportunities and advantages of derivative strategies. Unless otherwise noted, options strategies mentioned in this report may be a combination of the strategies below and therefore carry with them the risks of those strategies.

Buying Options - Investors who buy call (put) options risk loss of the entire premium paid if the underlying security finishes below (above) the strike price at expiration. Investors who buy call or put spreads also risk a maximum loss of the premium paid. The maximum gain on a long call or put spread is the difference between the strike prices, less the premium paid.

Selling Options - Investors who sell calls on securities they do not own risk unlimited loss of the security price less the strike price. Investors who sell covered calls (sell calls while owning the underlying security) risk having to deliver the underlying security or pay the difference between the security price and the strike price, depending on whether the option is settled by physical delivery or cash-settled. Investors who sell puts risk loss of the strike price less the premium received for selling the put. Investors who sell put or call spreads risk a maximum loss of the difference between the strikes less the premium received, while their maximum gain is the premium received.

For options settled by physical delivery, the above risks assume the options buyer or seller, buys or sells the resulting securities at the settlement price on expiry.

Regulatory disclosures

Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs trades or may trade as a principal in debt securities (or in related derivatives) of issuers discussed in this report.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage.

Analyst compensation: Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy generally prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director or advisor of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman Sachs & Co. LLC and therefore may not be subject to FINRA Rule 2241 or FINRA Rule 2242 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. **Australia:** Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. In producing research reports, members of Global Investment Research of Goldman Sachs Australia may attend site visits and other meetings hosted by the companies and other entities which are the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting. To the extent that the contents of this document contains any financial product advice, it is general advice only and has been prepared by Goldman Sachs without taking into account a client's objectives, financial situation or needs. A client should, before acting on any such advice, consider the appropriateness of the advice having regard to the client's own objectives, financial situation and needs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests and a copy of Goldman Sachs' Australian Sell-Side Research Independence Policy Statement are available at: <https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html>. **Brazil:** Disclosure information in relation to CVM Resolution n. 20 is available at <https://www.gs.com/worldwide/brazil/area/gir/index.html>. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 20 of CVM Resolution n. 20, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. **Canada:** This information is being provided to you for information purposes only and is not, and under no circumstances should be construed as, an advertisement, offering or solicitation by Goldman Sachs & Co. LLC for purchasers of securities in Canada to trade in any Canadian security. Goldman Sachs & Co. LLC is not registered as a dealer in any jurisdiction in Canada under applicable Canadian securities laws and generally is not permitted to trade in Canadian securities and may be prohibited from selling certain securities and products in certain jurisdictions in Canada. If you wish to trade in any Canadian securities or other products in Canada please contact Goldman Sachs Canada Inc., an affiliate of The Goldman Sachs Group Inc., or another registered Canadian dealer. **Hong Kong:** Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. **India:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited, Research Analyst - SEBI Registration Number INH000001493, 951-A, Rational House, Appasaheb Marathe Marg, Prabhadevi, Mumbai 400 025, India, Corporate Identity Number U74140MH2006FTC160634, Phone +91 22 6616 9000, Fax +91 22 6616 9001. Goldman Sachs may beneficially own 1% or more of the securities (as such term is defined in clause 2 (h) the Indian Securities Contracts (Regulation) Act, 1956) of the subject company or companies referred to in this research report. **Japan:** See below. **Korea:** This research, and any access to it, is intended only for "professional investors" within the meaning of the Financial Services and Capital Markets Act, unless otherwise agreed by Goldman Sachs. Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **New Zealand:** Goldman Sachs

New Zealand Limited and its affiliates are neither “registered banks” nor “deposit takers” (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for “wholesale clients” (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests is available at: <https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html>.

Russia: Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. Research reports do not constitute a personalized investment recommendation as defined in Russian laws and regulations, are not addressed to a specific client, and are prepared without analyzing the financial circumstances, investment profiles or risk profiles of clients. Goldman Sachs assumes no responsibility for any investment decisions that may be taken by a client or any other person based on this research report. **Singapore:** Goldman Sachs (Singapore) Pte. (Company Number: 198602165W), which is regulated by the Monetary Authority of Singapore, accepts legal responsibility for this research, and should be contacted with respect to any matters arising from, or in connection with, this research. **Taiwan:** This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. **United Kingdom:** Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union and United Kingdom: Disclosure information in relation to Article 6 (2) of the European Commission Delegated Regulation (EU) (2016/958) supplementing Regulation (EU) No 596/2014 of the European Parliament and of the Council (including as that Delegated Regulation is implemented into United Kingdom domestic law and regulation following the United Kingdom's departure from the European Union and the European Economic Area) with regard to regulatory technical standards for the technical arrangements for objective presentation of investment recommendations or other information recommending or suggesting an investment strategy and for disclosure of particular interests or indications of conflicts of interest is available at <https://www.gs.com/disclosures/europeanpolicy.html> which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

Japan: Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer registered with the Kanto Financial Bureau under registration number Kinsho 69, and a member of Japan Securities Dealers Association, Financial Futures Association of Japan Type II Financial Instruments Firms Association, The Investment Trusts Association, Japan, and Japan Investment Advisers Association. Sales and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

Global product; distributing entities

Goldman Sachs Global Investment Research produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; Public Communication Channel Goldman Sachs Brazil: 0800 727 5764 and / or contatogoldmanbrasil@gs.com. Available Weekdays (except holidays), from 9am to 6pm. Canal de Comunicação com o Público Goldman Sachs Brasil: 0800 727 5764 e/ou contatogoldmanbrasil@gs.com. Horário de funcionamento: segunda-feira à sexta-feira (exceto feriados), das 9h às 18h; in Canada by Goldman Sachs & Co. LLC; in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman Sachs & Co. LLC. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom.

Goldman Sachs International (“GSI”), authorised by the Prudential Regulation Authority (“PRA”) and regulated by the Financial Conduct Authority (“FCA”) and the PRA, has approved this research in connection with its distribution in the United Kingdom.

European Economic Area: GSI, authorised by the PRA and regulated by the FCA and the PRA, disseminates research in the following jurisdictions within the European Economic Area: the Grand Duchy of Luxembourg, Italy, the Kingdom of Belgium, the Kingdom of Denmark, the Kingdom of Norway, the Republic of Finland and the Republic of Ireland; GSI - Succursale de Paris (Paris branch) which is authorised by the French Autorité de contrôle prudentiel et de résolution (“ACPR”) and regulated by the Autorité de contrôle prudentiel et de résolution and the Autorité des marchés financiers (“AMF”) disseminates research in France; GSI - Sucursal en España (Madrid branch) authorized in Spain by the Comisión Nacional del Mercado de Valores disseminates research in the Kingdom of Spain; GSI - Sweden Bankfilial (Stockholm branch) is authorized by the SFSA as a “third country branch” in accordance with Chapter 4, Section 4 of the Swedish Securities and Market Act (Sv. lag (2007:528) om värdepappersmarknaden) disseminates research in the Kingdom of Sweden; Goldman Sachs Bank Europe SE (“GSBE”) is a credit institution incorporated in Germany and, within the Single Supervisory Mechanism, subject to direct prudential supervision by the European Central Bank and in other respects supervised by German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) and Deutsche Bundesbank and disseminates research in the Federal Republic of Germany and those jurisdictions within the European Economic Area where GSI is not authorised to disseminate research and additionally, GSBE, Copenhagen Branch filial af GSBE, Tyskland, supervised by the Danish Financial Authority disseminates research in the Kingdom of Denmark; GSBE - Sucursal en España (Madrid branch) subject (to a limited extent) to local supervision by the Bank of Spain disseminates research in the Kingdom of Spain; GSBE - Succursale Italia (Milan branch) to the relevant applicable extent, subject to local supervision by the Bank of Italy (Banca d'Italia) and the Italian Companies and Exchange Commission (Commissione Nazionale per le Società e la Borsa “Consob”) disseminates research in Italy; GSBE - Succursale de Paris (Paris branch), supervised by the AMF and by the ACPR disseminates research in France; and GSBE - Sweden Bankfilial (Stockholm branch), to a limited extent, subject to local supervision by the Swedish Financial Supervisory Authority (Finansinspektionen) disseminates research in the Kingdom of Sweden.

General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. The information, opinions, estimates and forecasts contained herein are as of the date hereof and are subject to change without prior notification. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by Global Investment Research. Goldman Sachs & Co. LLC, the United States broker dealer, is a member of SIPC (<https://www.sipc.org>).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and principal trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, principal trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

We and our affiliates, officers, directors, and employees will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research, unless otherwise prohibited by regulation or Goldman Sachs policy.

The views attributed to third party presenters at Goldman Sachs arranged conferences, including individuals from other parts of Goldman Sachs, do not necessarily reflect those of Global Investment Research and are not an official view of Goldman Sachs.

Any third party referenced herein, including any salespeople, traders and other professionals or members of their household, may have positions in the products mentioned that are inconsistent with the views expressed by analysts named in this report.

This research is focused on investment themes across markets, industries and sectors. It does not attempt to distinguish between the prospects or performance of, or provide analysis of, individual companies within any industry or sector we describe.

Any trading recommendation in this research relating to an equity or credit security or securities within an industry or sector is reflective of the investment theme being discussed and is not a recommendation of any such security in isolation.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options and futures disclosure documents which are available from Goldman Sachs sales representatives or at <https://www.theocc.com/about/publications/character-risks.jsp> and https://www.fiadocumentation.org/fia/regulatory-disclosures_1/fia-uniform-futures-and-options-on-futures-risk-disclosures-booklet-pdf-version-2018. Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

Differing Levels of Service provided by Global Investment Research: The level and types of services provided to you by Goldman Sachs Global Investment Research may vary as compared to that provided to internal and other external clients of GS, depending on various factors including your individual preferences as to the frequency and manner of receiving communication, your risk profile and investment focus and perspective (e.g., marketwide, sector specific, long term, short term), the size and scope of your overall client relationship with GS, and legal and regulatory constraints. As an example, certain clients may request to receive notifications when research on specific securities is published, and certain clients may request that specific data underlying analysts' fundamental analysis available on our internal client websites be delivered to them electronically through data feeds or otherwise. No change to an analyst's fundamental research views (e.g., ratings, price targets, or material changes to earnings estimates for equity securities), will be communicated to any client prior to inclusion of such information in a research report broadly disseminated through electronic publication to our internal client websites or through other means, as necessary, to all clients who are entitled to receive such reports.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For research, models or other data related to one or more securities, markets or asset classes (including related services) that may be available to you, please contact your GS representative or go to <https://research.gs.com>.

Disclosure information is also available at <https://www.gs.com/research/hedge.html> or from Research Compliance, 200 West Street, New York, NY 10282.

© 2023 Goldman Sachs.

No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.