Goldman Sachs | Economics Research

2 July 2020 | 3:36PM EDT

Global Rates Trader

COVID resurgence restrains recovery repricing

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

William Marshall
+1(646)446-1751 | william.c.marshall@gs.com
Goldman Sachs & Co. LLC

Avisha Thakkar
+1(212)902-9964 | avisha.thakkar@gs.com
Goldman Sachs & Co. LLC

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

Strengthening data and repricing in inflation globally adds to case for higher yields. Firm US employment report strengthens recovery outlook, though recent growth in coronavirus cases could cap near-term yield upside. FOMC minutes suggest forward guidance is coming soon, but YCT isn't; rate vol should remain well-anchored even absent YCT. Reductions in net bill issuance can extend even amid potential increase in fiscal outlays. ECB comments lean against any further expansion in asset purchases, skewing risks to higher yields. Front-end HICP still underpriced relative to our projections, add 2y HICP longs. BOJ refrains from adding long-end purchases amid supply increases, furthering the case for curve steepening.

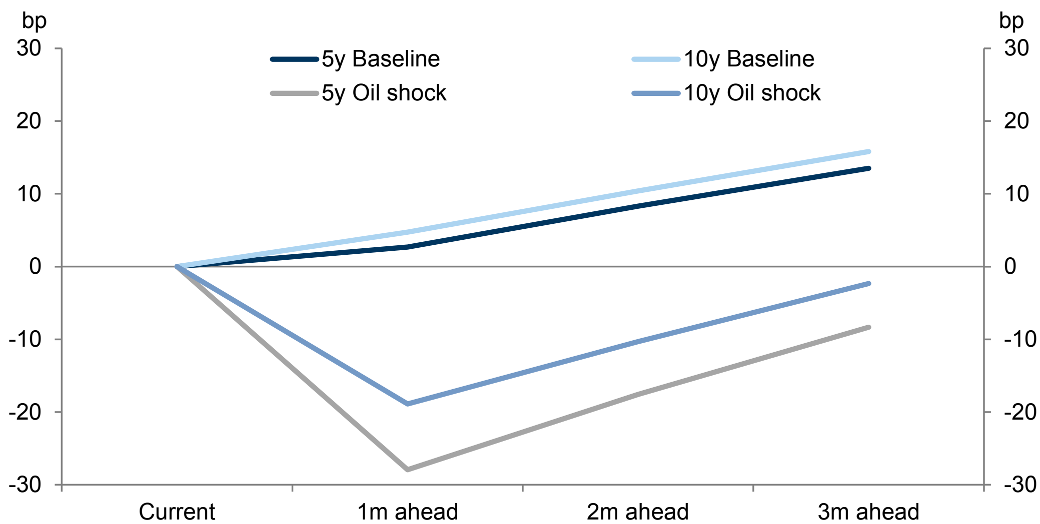
United States/North America

- **Another solid jobs report supports the case for higher yields.** Both establishment and household surveys for June contained upside surprises—nonfarm payrolls rose 4.8mn, compared to consensus expectations of +3.2mn, and both the unemployment rate and the "true" unemployment rate (corrected for misclassified "employed, not at work, other") fell sharply (to 11.1% and 12.3%, from 13.3% and 16.4% respectively). Job gains appear to have been broad-based, confirming a rapid sequential pace of recovery and supporting the case for higher yields. Admittedly, the information is somewhat stale, and it remains unclear if the recent sharp increases in coronavirus cases in the US will allow for additional large gains over summer. We believe that the balance of risks are still tilted towards higher yields in the US, though as we discuss in a later section, this may be clearer in the case of Europe, where the incidence of coronavirus cases is lower. That divergence in public health outcomes may also add some near-term downside risk to the UST-bund yield spread widener we had previously recommended.

- **FOMC minutes suggest YCT isn't coming this year.** The June FOMC minutes included an extensive discussion of forward guidance, asset purchases, and yield caps or targets (YCT). There appeared to be broad support for the first two options, and some skepticism on the necessity of YCT so long as outcome-based forward guidance remained credible. The minutes suggested a preference for the RBA version of YCT (where 3y sovereign yields are targeted) rather than the BoJ's approach (which targets the 10y yield). Our economists now expect the FOMC to conclude its framework review at the July meeting and announce forward guidance and a formalization of the asset purchase program at the September meeting, but no longer expect introduction of YCT alongside these other policy changes. From a rates perspective, our view has been that the additional benefit of YCT in the presence of credible forward guidance was a further reduction in volatility. Nevertheless, even without YCT, we remain short payers at the front end (2y2y for instance)—underlying economic conditions as well as upcoming forward guidance should be sufficient in containing yield moves to the upside in this part of the curve.

Exhibit 1: While our inflation framework suggests further upside to breakevens over the coming months, uncertainty around the growth outlook presents downside risk that leaves US inflation risk/reward more balanced

Change from current levels under baseline ECM dynamics and a $10/bbl demand-induced oil decline



Source: Goldman Sachs Global Investment Research

- **Near-term growth uncertainty leaves US inflation risk/reward more balanced.** Over the past many weeks, we have been bullish US traded inflation, either directly (for instance, via hedged Apr-21 TIPS longs) or on a relative basis (long 5y CPI versus short 5y HICP inflation swaps). The relative view was predicated on US traded inflation having gotten overly bearish in pricing persistently low inflation, and a brightening growth outlook. This has played out, with the spread widening about 25bp since we recommended the trade. While we still see value in being long US inflation medium term, the uncertainty around the growth outlook amid the sharp increase in new COVID cases leaves near-term risk/reward more balanced. Presently, our inflation error correction framework suggests an upside of 10-15bp and 15-20bp over the next three months for 5y and 10y breakevens respectively. However, a deterioration in the recovery outlook, which we proxy with a $10 demand-induced shock to oil prices (for reference, nearly $25 of the March oil sell-off was "demand-induced" under our approach), would imply about 30bp of downside to 5y breakevens and 20bp at the 10y point (Exhibit 1). We hold our long front-end TIPS recommendation given the short energy overlay and the upside we see to near-term CPI readings, but with 5y US-EUR spread near our target and the more explicitly reliant on growth upside, we recommend taking profits for a potential PnL of 23bp.

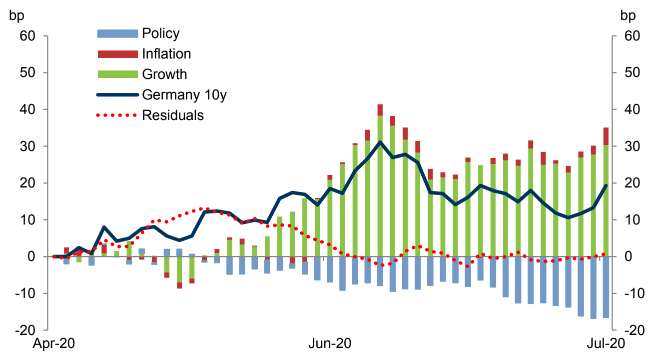
- **Reductions in bill supply have not yet eroded TGA.** Cuts to Treasury bill auction and CMB sizes over the course of June (total net bill issuance slowed to just $450bn) has led to Treasury undershooting its Q2 borrowing estimates by about $250bn. Despite this, because fiscal outlays have fallen significantly short of Treasury's (and to a lesser extent, our own) projections, the $1.72tn end-Q2 cash balance has far exceeded Treasury's stated $800bn target. Looking ahead to this month, we expect Treasury to continue reducing bill supply. Our current projection is for $90bn and -$21bn of net bill issuance in July and August respectively. If those projections are realized, Treasury cash balances are likely to remain substantially elevated. We therefore think there is risk of substantial further reduction in the pace of issuance beyond the already steep declines we are currently projecting. While a Phase 4 stimulus package, which our economists expect will likely be about $800bn, and enacted in late July or early August, would increase financing needs, we note that our prior projections already assumes $500bn for this round of stimulus. The current elevated level of the TGA provides a significant buffer, and in theory, the additional outlays could easily be accommodated by a reduction in cash balances rather than require any increases to the current issuance plan, at least in the near term. The risk to this view is that the eventual package turns out to be much larger, and closer to the Democrats' $3tn version, though our economists view that as unlikely.

European Rates

- **Shifting risk reward in EUR duration.** Tactically, we expect core yields to rise in Europe. Data continues to strengthen, risk assets are trading relatively well, and inflation globally is repricing higher. In addition, recent comments from ECB Governing Council members that the PEPP envelope is a "ceiling" rather than a commitment suggests an incrementally higher hurdle to any upsizing of balance sheet expansion. We do not think there are any clear near-term implications to these comments, but at the margin they should nudge lower overall expectations for the size of the future asset purchases. Since the lows in 10y bund yields at end-April, yields have lagged the repricing in growth and inflation factors by around 15bp, a gap explained by the policy factor. The latest shift in communication raises the hurdle for further policy surprises, skewing the risks to higher yields (Exhibit 2).

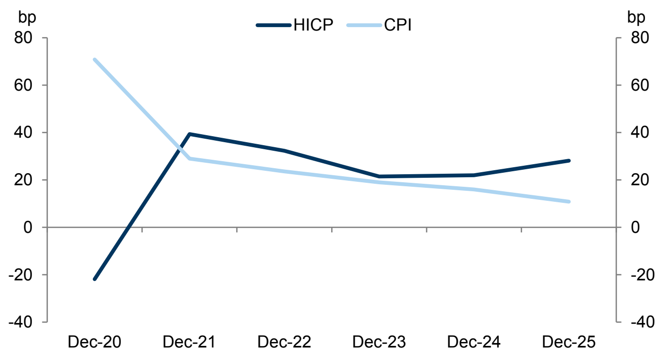
- **Near-term HICP offers upside; go long 2y HICP.** Euro area traded inflation has rebounded from the lows, but the move higher has lagged the US amid the improved risk backdrop. Interestingly, where the US recovery has been front-end led, the move in EUR traded inflation has been driven more by an improved path over longer horizons (Exhibit 3). The net effect has been the inflation curve holding somewhat steeper, with longer term forward HICP outperforming its beta to shorter dated HICP swaps. While we have taken a somewhat more neutral stance on US traded inflation this week, we think the shape of the recovery in the HICP curve and the lower sensitivity to any renewed deterioration in the recovery outlook favors setting longs at the front-end of the HICP curve, with the swaps market pricing 2020 headline HICP around -0.7%, and a rebound to 0.7% in 2021 and 2022—all well below our economists' forecast for 0.4% / 0.9% / 1.1% for 2020 through 2022. We therefore recommend going long 2y HICP on an outright basis, though we think there is also value to HICP curve flatteners (e.g. 2s10s) as well.

Exhibit 2: Since the end of April, Bund yields have lagged the repricing in growth and inflation factors
Cumulative change in 10y Bund yields since end April, by macro factor



Source: Goldman Sachs Global Investment Research

Exhibit 3: Where the improvement in US traded inflation has been front-end led, in Europe it has been driven more by the path over subsequent years
Change in market-implied y/y inflation path since May 15



Source: Goldman Sachs Global Investment Research

- **UK front end—still downside asymmetry.** UK rates continue to rally as the distribution of rates shift lower. This week, chief economist Haldane stated that the BoE's review into negative rates and the effective lower bound will continue into the second half of 2020. We think the review is likely to be delivered at either the August or November MPR, which suggests the timing is tight for a negative rate risk scenario in 2020. As a result, GBP OIS 1y1y still offers a better risk/reward for received positions, despite the recent rally. And even though our economists do not expect the BoE to cut rates into negative territory, we think receiving the UK front-end remains an effective hedge against duration shorts or credit longs.

Other G10 Markets

- **JGB issuance and BoJ purchase profile support curve steepening.** The BoJ's planned schedule of JGB purchases for July showed increases in the purchase range for JGBs up to the 10y maturity sector, while purchase amounts of ultra-longs were left unchanged. This comes under a backdrop of rising supply following the passage of the second supplementary budget for the fiscal year ending Mar-21 at the end of May to finance stimulus measures. While the increase in issuance is skewed toward shorter maturities, incremental supply at the long end, taken together with the lack of BoJ buying in that sector should support a steeper curve. The BoJ's apparent tolerance for this, taken together with our expectations for a 2H20 recovery and a likely reduced bid for JGBs keeps us in 10s30s JGB steepeners, but we switch to a trailing 3bp stop.

Latest Thematic Research:

Picking the right yield curve steepener - 22 May 2020

A Monetary and Fiscal Policy Tango - 18 May 2020

ECB (T)LTROs to offer limited relief for sovereigns - 15 May 2020

Oil rebalancing an eventual tailwind for US traded inflation - 15 May 2020

Post-refunding announcement thoughts - *6 May 2020*

Latest Global Markets Dailies:

A Significant Slowdown in Fed Balance Sheet Growth - *23 Jun 20*

Sovereign Spreads - Looking for the Next Positive Surprise - *18 Jun 20*

A Period of Calm for US Funding Markets - *16 Jun 2020*

Swap Spreads and the Flow Effect - *4 Jun 2020*

Limited Foreign Demand for US Treasuries - *28 May 2020*

Summary of Views

	Core Views	Recommendation	Entry Date
Duration	Ongoing recovery suggests yields have further room to increase, though an early resurgence in coronavirus cases poses some downside risk. Front end yields are likely to remain sticky around current levels. The balance of risks continue to suggest higher longer (10y and 30y) maturity yields	--	--
	Fed purchases can offset a portion US fiscal stimulus impact on UST duration supply, but over the medium term asymmetry of low yield levels and deficit trajectory likely be another driver of higher yields	--	--
	US-German yield spread compression likely to reverse as UST yields see greater upside in the medium term. Divergent public health trajectories is a risk to this view	*10y UST-Bund spread wideners*	12-Jun-20
	With stronger data, improving risk assets, and a positive inflection for inflation, there is scope for a tactical move higher in core European yields, particularly in light of recent ECB comments that the PEPP envelope represents a "ceiling"	--	
	BoE's indication that negative rates are under review has driven a belly-led rally in UK rates and presents further downside risk to UK yields given potential for market to shift distribution of possible outcomes through the whole curve. The slower BoE QE pace argues for higher term premium, implying a steeper curve as the negative rate discussion anchors the front-end	--	--
Curve	US curve should remain highly directional. With front-end yields comparatively anchored, recovering economy and weight of supply present further long-end steepening risk, though positioning may present a near-term risk in the event that news on the recovery cast doubt on the trajectory	*5s30s TIPS curve steepener*	22-May-20
	Skew of ECB's German purchases towards shorter maturities, recovery of inflation, and ongoing Euro strength have supported Euro area curve steepening, which can run further as front-end yields likely remain anchored and inflation rebound is supported by improved risk tone	--	--
	Japan stimulus means substantial increase in JGB issuance, while BoJ's additional buying in the 1y-10y part of the curve is consistent with desire for curve steepening. With purchases falling short of current target, see little impact from any move to uncapped JGB buying. Taken together with expectations for a strong sequential bounce next quarter and a likely diminishing bid for JGBs in favor of foreign sovereigns, long-end JGB curve can steepen further	*10s30s JGB curve steepener*	12-Jun-20
	Either upsizing of QE program or move to negative rates can induce curve flattening. While additional fiscal stimulus is a risk, it's likely to be accompanied by more aggressive RBNZ buying	*2s10s NZD swap curve flattener*	1-May-20
Spreads	Long-end swap spreads should still tighten as investors should require added compensation for taking long-duration risk under backdrop of heavy supply and steady state Fed purchases	*Sell 30y swap spreads*	1-May-20
	The combination of the Franco-German Recovery Fund proposal, ECB over-delivery, and improving growth have been a tailwind for EMU spreads and resulted in a much improved backdrop. From here, upside is harder, and with overall valuation signals neutral, there appears modest room for further compression.	--	--
Vol	Our preference is to collect vol premium further in on the curve given likely insulation from eventual Fed guidance. Attractive rolldown supportive of selling payers, and return to guidance regime suggests room for further tail curve steepening	*Short 2y2y payers* *Short 1y2y vs 1y30y straddles (vega-neutral)*	5-Jun-20 19-Jun20
	The large rally since late 2018 and expiring call lock-ups means a high volume long-dated accreters being called. Renewed vol supply due to new callable issuance through the rest of 2020 should put modest downward pressure on USD vega	--	--
Money Market	Libor-OIS has normalized quicker than expected, driven by compression of CP amid prime fund AUM rebounding and tightening in FX OIS bases (to a lesser extent). With CP yields at fair levels given uncertain economic backdrop, pace of tightening in Libor should slow	--	--
	The steady decline in government money fund AUM, elevated dealer inventories in T-bills and diminished end-user demand at auction all suggest demand for bills has peaked. Near-term the risk is bills cheapen vs OIS on additional bill supply, though Prime fund support for the market may be an offset, and a potnetial sharper drop-off in bill supply in the coming months should mean any cheapening is shortlived	--	--
	The €1.31tn allotment of the first TLTRO operation offering the -100bp bonus rate represented net borrowing of almost €550bn. That excess liquidity injection on June 24 should be worth 2-3bp on ESTR, consistent with what is currently priced, and going forward the ongoing TLTRO availability should dampen front-end volatility	--	--
Inflation	US front-end inflation has further room to increase as the recovery takes hold; much of recent repricing is due to base effects	*Long Apr-21 TIPS, hedged with RBOB futures*	26-Jun-20
	Despite rebound in Euro area traded inflation, front-end inflation has underperformed US inflation. Shape of recovery in HICP curve and lower sensitivity to any renewed deterioration in the outlook favors longs in front-end EUR inflation.	*Long 2y HICP inflation*	2-Jul-20
	Relative outperformance of front-end of UK inflation curve attributable in large part to currency weakness year-to-date. Further out the curve, risks from RPI reform have contributed to long-end flattening, which we expect to persist	--	--

Source: Goldman Sachs Global Investment Research

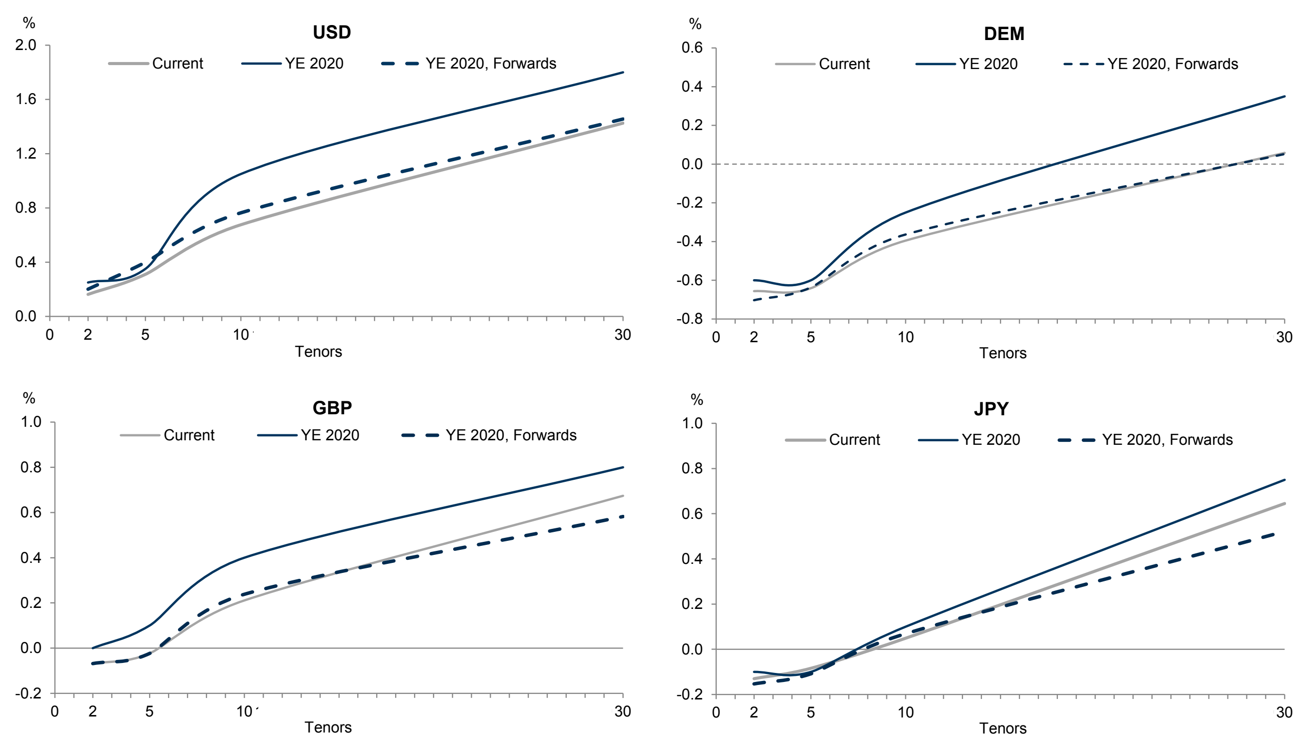
Forecasts

G10 Yield Curve Forecasts

G10 10-Year Yield Forecasts										
	USD	DEM	GBP	JPY	CAD	CHF	SEK	NOK	AUD	NZD
spot	0.68	-0.40	0.21	0.05	0.53	-0.40	0.01	0.69	0.94	0.97
3Q20	0.95	-0.35	0.35	0.05	0.75	-0.35	0.20	0.85	1.05	0.95
4Q20	**1.05**	**-0.25**	**0.40**	**0.10**	**0.85**	**-0.25**	**0.30**	**0.95**	**1.15**	**1.00**
1Q21	1.15	-0.15	0.50	0.10	0.95	-0.15	0.35	1.05	1.25	1.05
2Q21	1.25	-0.05	0.55	0.10	1.00	-0.10	0.40	1.10	1.30	1.10
3Q21	1.35	0.05	0.60	0.15	1.05	-0.05	0.45	1.15	1.35	1.15
4Q21	**1.45**	**0.10**	**0.65**	**0.15**	**1.10**	**0.00**	**0.50**	**1.20**	**1.40**	**1.20**
1Q22	1.50	0.15	0.70	0.20	1.15	0.05	0.55	1.25	1.45	1.25
2Q22	1.55	0.20	0.75	0.20	1.20	0.10	0.60	1.30	1.50	1.30
3Q22	1.60	0.25	0.80	0.20	1.25	0.15	0.65	1.35	1.55	1.35
4Q22	**1.65**	**0.30**	**0.85**	**0.20**	**1.30**	**0.20**	**0.70**	**1.40**	**1.60**	**1.40**
1Q23	1.70	0.35	0.90	0.25	1.35	0.20	0.75	1.45	1.60	1.45
2Q23	1.75	0.40	0.95	0.25	1.40	0.25	0.80	1.50	1.60	1.50
3Q23	1.80	0.45	1.00	0.25	1.45	0.25	0.85	1.55	1.60	1.55
4Q23	**1.85**	**0.50**	**1.05**	**0.25**	**1.50**	**0.30**	**0.90**	**1.60**	**1.60**	**1.60**

Deviation from Forwards										
	USD	DEM	GBP	JPY	CAD	CHF	SEK	NOK	AUD	NZD
3Q20	0.22	0.03	0.11	-0.04	0.18	0.05	0.14	0.16	0.05	-0.02
4Q20	**0.28**	**0.11**	**0.14**	**-0.02**	**0.25**	**0.13**	**0.21**	**0.23**	**0.12**	**0.00**
1Q21	0.34	0.19	0.21	-0.04	0.33	0.20	0.22	0.30	0.18	0.02
2Q21	**0.40**	**0.27**	**0.22**	**-0.06**	**0.35**	**0.23**	**0.24**	**0.33**	**0.20**	**0.03**

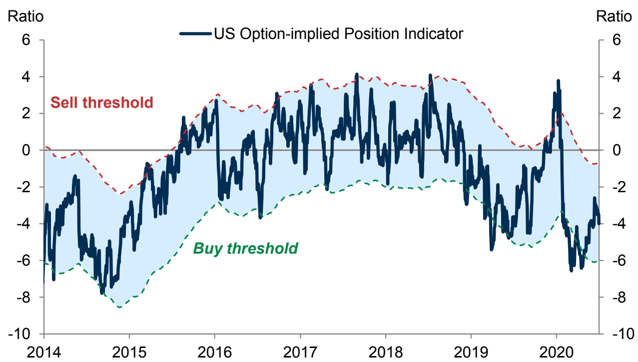
G4 Curve Forecasts

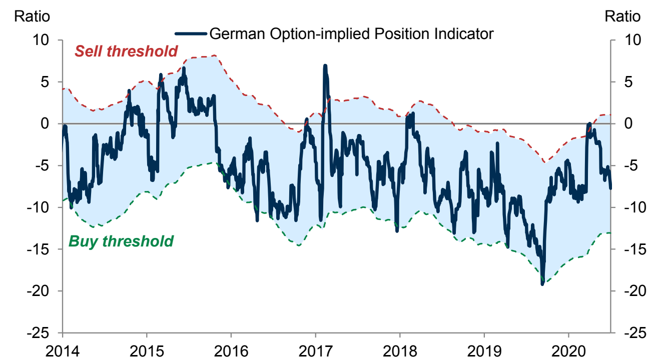


Source: Goldman Sachs Global Investment Research

Positioning and Flows Monitor

Option-Implied Position Indicator

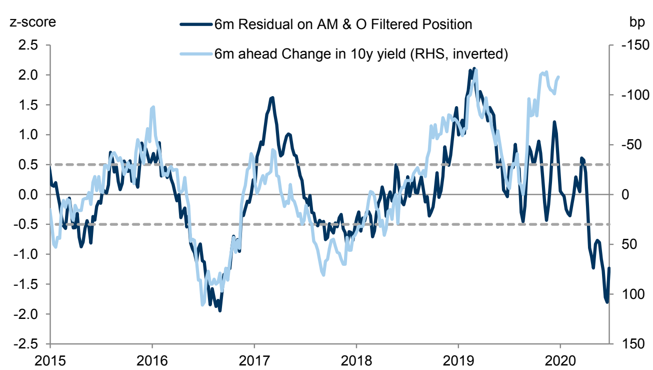




Source: Goldman Sachs Global Investment Research

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

CFTC Commitment of Traders and Traders in Financial Futures

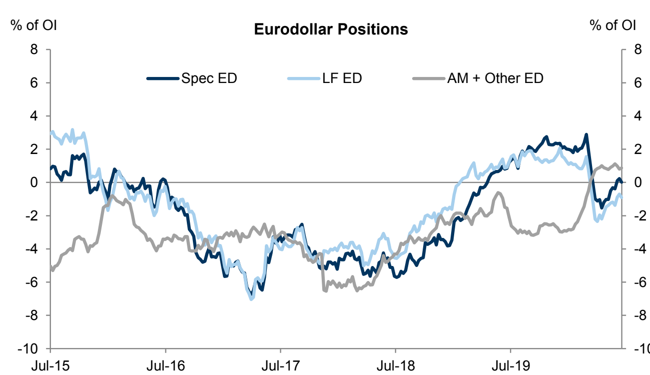
Duration-weighted net position by investor type

Duration-Weighted Positioning, by Contract

$mm/bp	ED	TU	FV	TY	TN	US	WN
Spec Current	0.2	-11.5	-7.4	1.4	2.9	-20.6	-119.7
Spec 1w Chg	-2.7	-1.0	0.3	3.7	2.1	-1.7	1.0
LF Current	-12.8	-20.1	-47.3	-45.8	7.5	-56.7	-153.5
LF 1w chg	-2.9	-1.6	-0.2	6.4	-2.0	-4.2	-2.4
AM + Other Current	13.8	23.7	62.3	53.9	-0.7	79.1	190.1
AM + Other 1w Chg	0.8	0.9	0.5	-3.2	1.6	3.6	5.5
Dealer Current	0.9	-6.9	-15.3	-10.2	4.9	-26.3	-56.4
Dealer 1w Chg	0.6	0.6	0.8	-3.1	0.1	-0.1	-3.9

Source: CFTC, Goldman Sachs Global Investment Research

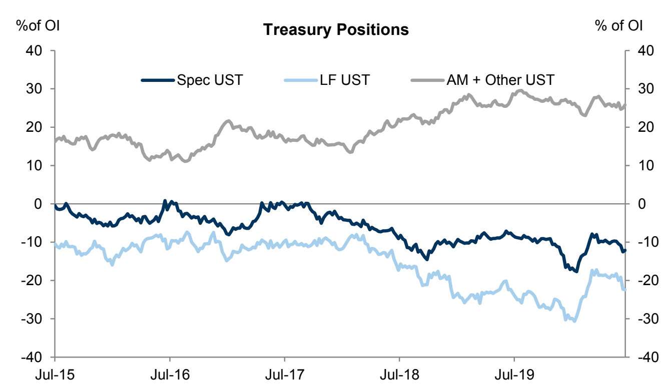
Net positions in Eurodollars



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

Source: CFTC, Goldman Sachs Global Investment Research

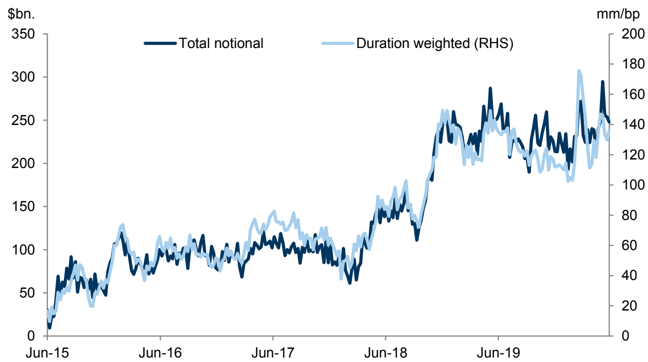
Net positions in UST futures



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

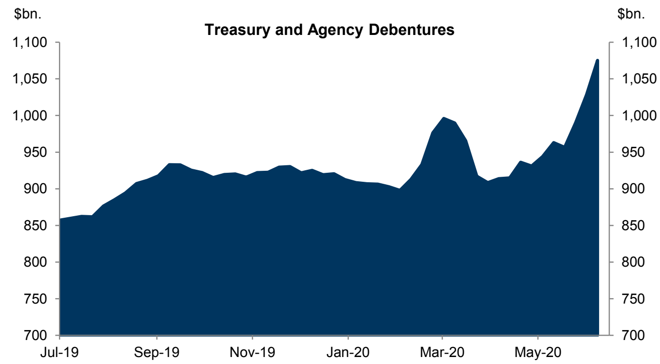
Source: CFTC, Goldman Sachs Global Investment Research

Primary dealer transactions
Net dealer position in US Treasuries



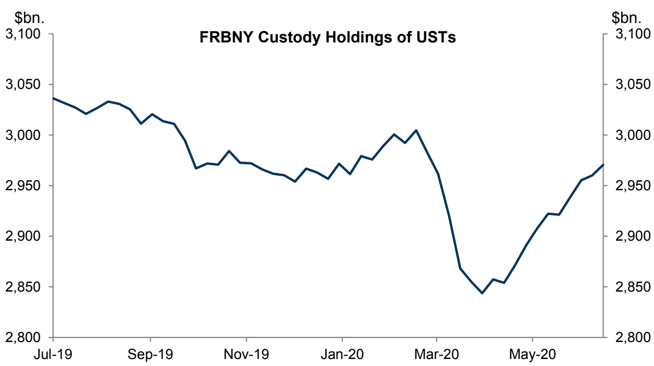
Source: Federal Reserve Bank of New York, Goldman Sachs Global Investment Research

US Commercial Banks' Holdings of Treasury and Agency Securities
Total domestic and foreign holdings, all commercial banks



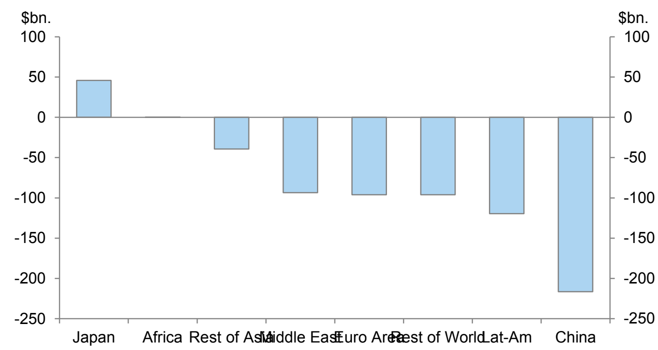
Source: Federal Reserve Board

NY Fed Custody Holdings
Marketable US Treasuries



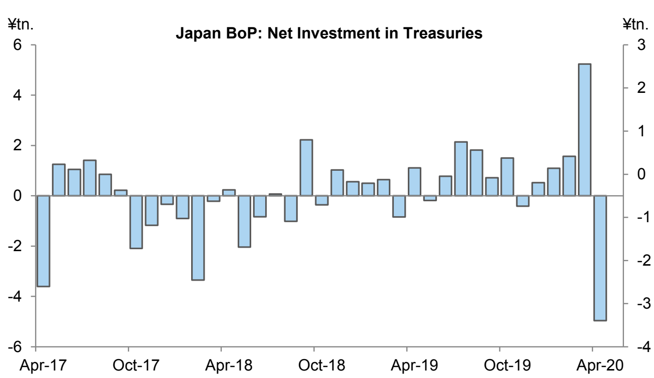
Source: Federal Reserve Bank of New York

US TIC Treasury Flows
12m change in valuation-adjusted holdings of USTs, by holder of debt



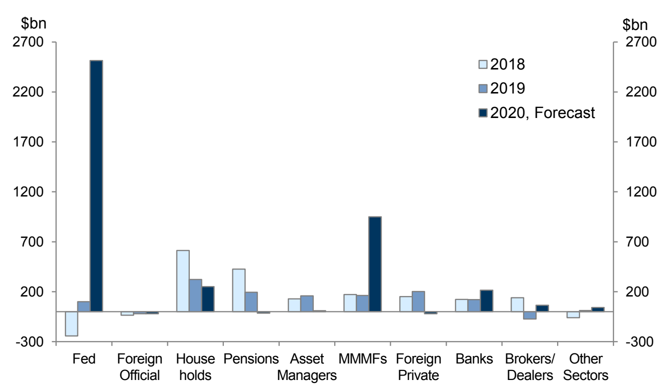
Source: US Treasury, Goldman Sachs Global Investment Research

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



Source: Bank of Japan, Haver Analytics

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

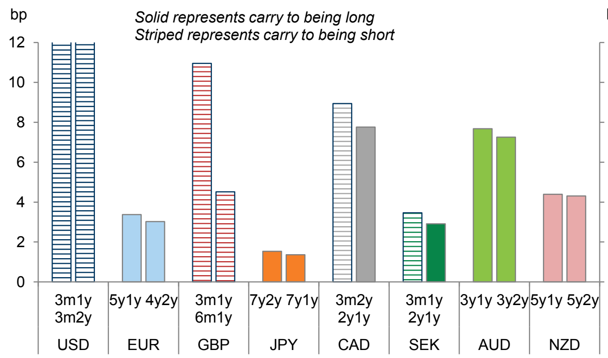


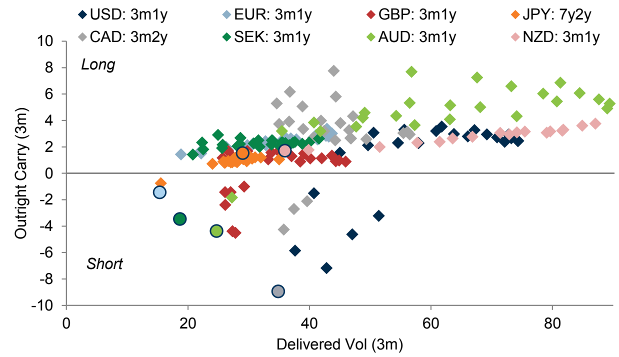
Source: Federal Reserve Board, Goldman Sachs Global Investment Research

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

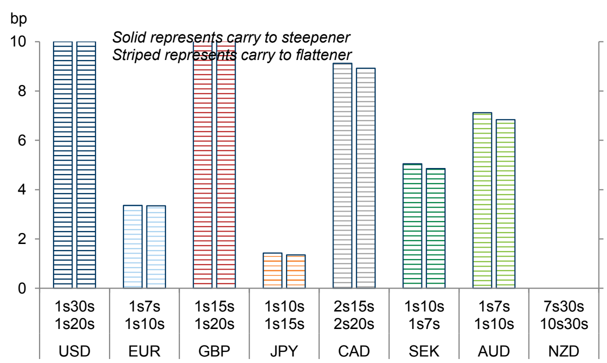


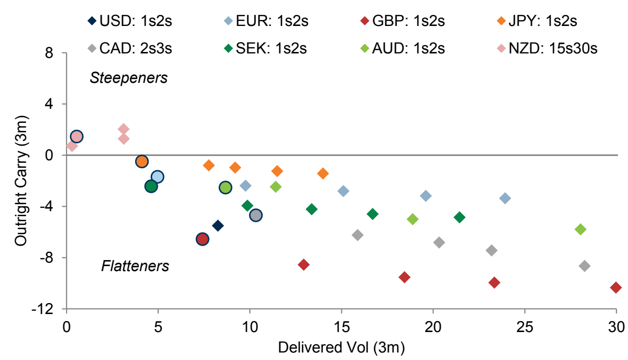


Source: Goldman Sachs Global Investment Research

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

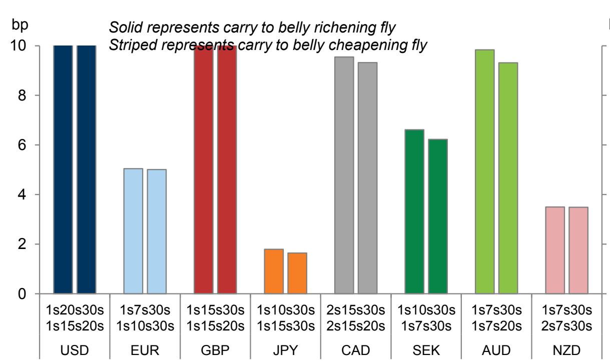


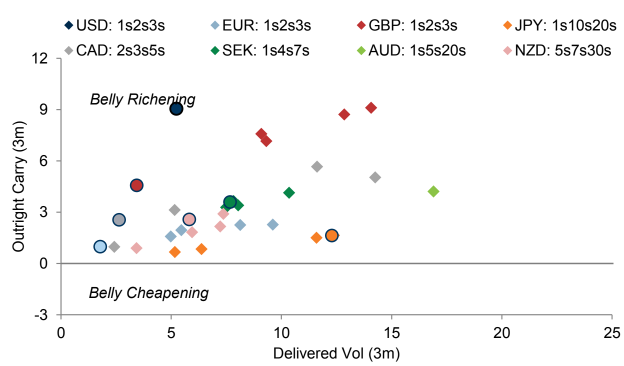


Source: Goldman Sachs Global Investment Research

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

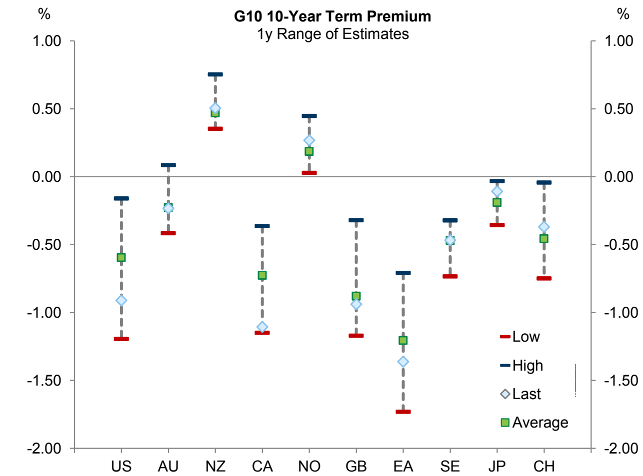


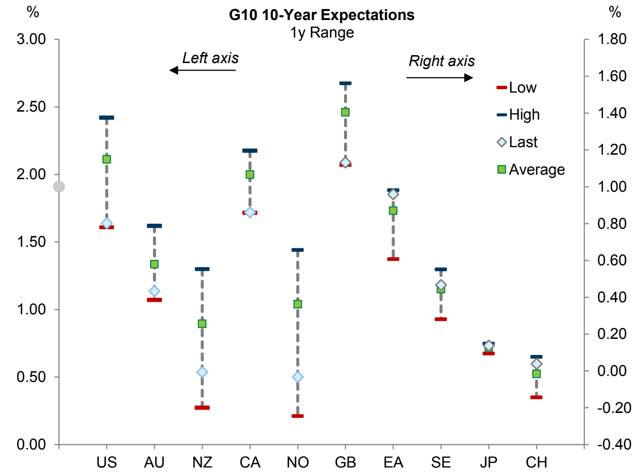


Source: Goldman Sachs Global Investment Research

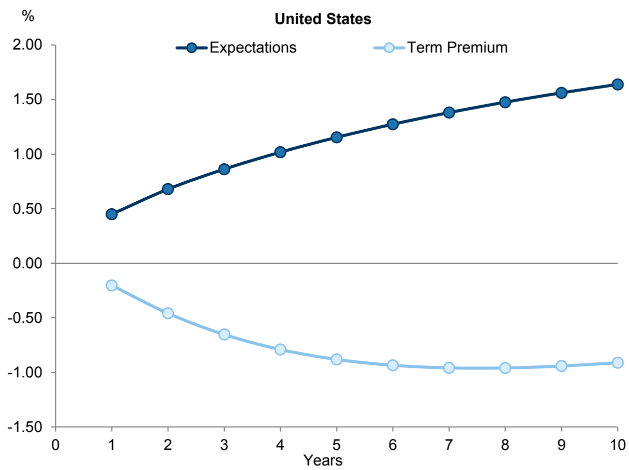
GS Term Premium Decomposition

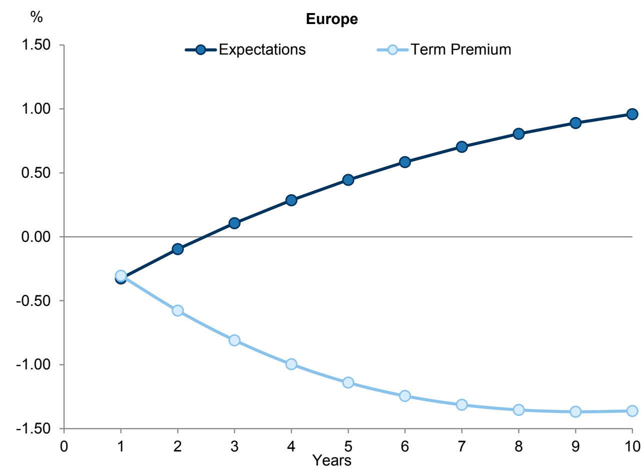
1y Range of G10 10y Yields, by Term Premium and Expectations Components

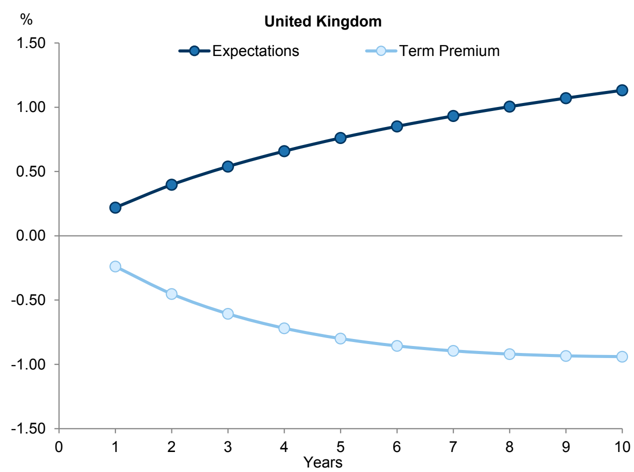


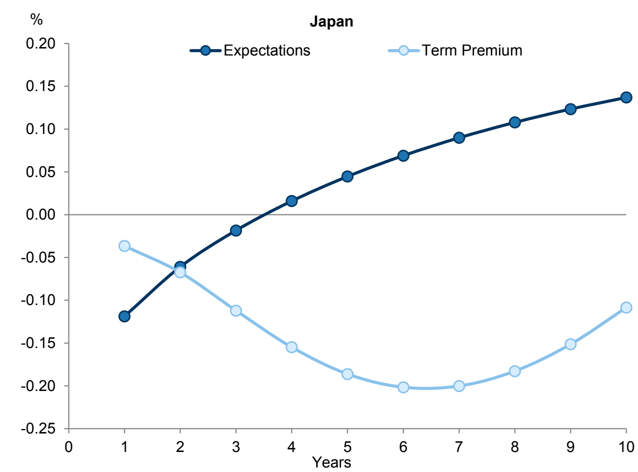


Term Structure of Fitted Yields, by Component









Source: Goldman Sachs Global Investment Research

2020 Trade Recommendations

GS Rates Trades						
Active	**Entry Date**	**Opened**	**Latest**	**Stop**	**Target**	**PnL**
1. Sell 30y Treasuries vs OIS	1-May-20	-0.69	-0.71	-0.60	-0.85	+2 bps
2. 2s10s NZD swap curve flattener	1-May-20	0.53	0.53	0.65	0.35	+0 bps
3. 5s30s US real yield curve steepener	22-May-20	0.38	0.71	5bp trailing stop		+20 bps
4. Sell 2y2y USD payers	5-Jun-20	0.56	0.34	10bp trailing stop		+10 bps
5. Long 10y Bunds vs 10y UST	12-Jun-20	1.14	1.11	1.00	1.30	-4 bps
6. JGB 10s30s curve steepener	12-Jun-20	0.52	0.62	3bp trailing stop		+9 bps
7. Sell 1y2y USD straddles vs 1y30y straddles	19-Jun-20	40.8 abp	43.5 abp	30 abp	55 abp	+3 bps
8. Buy Apr21 TIPS hedged w/ Mar21 RBOB	26-Jun-20	0	-0.03	-0.40	0.80	-3 bps
9. Long 2y HICP swaps	2-Jul-20	0.33	0.33	0.10	0.70	+0 bps
Closed	**Entry Date**	**Closed**	**PnL**			
1. 5s30s UST curve steepener	29-Nov-19	31-Dec-19	+13 bps			
2. Sell 10y Gilts outright	21-Nov-19	10-Jan-20	+2 bps			
3. Receive RBA Feb-20 OIS	8-Nov-19	17-Jan-20	+2 bps			
4. Buy double old 2y USTs vs OIS	13-Dec-19	31-Jan-20	+11 bps			
5. Pay Jan MPC OIS vs. May	24-Jan-20	31-Jan-20	+5 bps			
6. Receive RBA Mar-20 OIS	31-Jan-20	5-Feb-20	-6 bps			
7. SONIA 1y1y/2y1y steepeners	9-Aug-19	14-Feb-20	+2 bps			
8. Buy Buxl on asset swap	13-Sep-19	20-Feb-20	-13 bps			
9. 2s30s UST curve steepener	24-Jan-20	21-Feb-20	-7 bps			
10. Long 10y US breakevens	1-Jan-19	28-Feb-20	-4 bps			
11. Receive Apr-20 RBA OIS	26-Feb-20	28-Feb-20	+18 bps			
12. Sell 10y Gilts on OIS ASW	25-Oct-19	6-Mar-20	-5 bps			
13. 5s30s UST steepener vs. EUR swap flattener	21-Feb-20	6-Mar-20	+26 bps			
14. Receive 5y USD real rates vs 5y EUR	21-Nov-19	10-Mar-20	+40 bps			
15. 2s10s Gilts curve steepener	14-Feb-20	13-Mar-20	+3 bps			
16. 5s30s AUD swap curve flatteners	28-Feb-20	13-Mar-20	+25 bps			
17. Long BTPs vs PGBs	21-Nov-19	17-Mar-20	-35 bps			
18. Sell 30y US swap spreads	31-Jan-20	17-Mar-20	+23 bps			
19. Receive Dec-20 IMM CHF FRA vs Euribor	21-Feb-20	18-Mar-20	+11 bps			
20. Long 30y JGBs	13-Mar-20	19-Mar-20	-11 bps			
21. Receive Jun-20 BoC OIS	26-Feb-20	20-Mar-20	+123 bps			
22. 2y2y FF/Libor basis wideners	13-Mar-20	23-Mar-20	+6 bps			
22. Receive 30y AUD swaps	13-Mar-20	24-Mar-20	+45 bps			
23. Receive 30y CAD swaps	20-Mar-20	7-Apr-20	-23 bps			
24. Jun-20 FRA/OIS wideners	3-Apr-20	24-Apr-20	-9 bps			
25. Sell Jun-20 Eurodollar	17-Apr-20	28-Apr-20	-11 bps			
26. Sell 2y USTs vs OIS	1-Apr-20	8-May-20	+1 bps			
27. Sell 2y2y Payers	9-Apr-20	8-May-20	+15 bps			
28. Long 5y bunds vs 5y gilts	24-Apr-20	22-May-20	-10 bps			
29. Sell USD 6m10y straddles (PnL in % of notional)	3-Apr-20	3-Jun-20	+134 bps			
30. Receive 6m6m EONIA vs 10y EONIA (2:1 weighting)	5-Jun-20	12-Jun-20	-9 bps			
31. Long 5y CPI vs 5y HICP swaps	24-Apr-20	2-Jul-20	+23 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, William Marshall, Avisha Thakkar and Simon Freycenet, 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

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 the Global Investment Research Division 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 Instruction 598 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 Instruction 598, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. **Canada:** Goldman Sachs Canada Inc. is an affiliate of The Goldman Sachs Group Inc. and therefore is included in the company specific disclosures relating to Goldman Sachs (as defined above). Goldman Sachs Canada Inc. has approved of, and agreed to take responsibility for, this research report in Canada if and to the extent that Goldman Sachs Canada Inc. disseminates this research report to its clients. **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:** Further information on the covered companies referred to in this research may be obtained from Goldman Sachs (Singapore) Pte. (Company Number: 198602165W). **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: 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 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 and Type II Financial Instruments Firms 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

The Global Investment Research Division of Goldman Sachs 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.; Ombudsman Goldman Sachs Brazil: 0800 727 5764 and / or ouvidoriagoldmansachs@gs.com. Available Weekdays (except holidays), from 9am to 6pm. Ouvidoria Goldman Sachs Brasil: 0800 727 5764 e/ou ouvidoriagoldmansachs@gs.com. Horário de funcionamento: segunda-feira à sexta-feira (exceto feriados), das 9h às 18h; in Canada by either Goldman Sachs Canada Inc. or 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 and European Union.

European Union: Goldman Sachs International authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, has approved this research in connection with its distribution in the European Union and United Kingdom.

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 our Global Investment Research Division. 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 the Global Investment Research division of GS 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.