US Daily: Q&A on the Fed's Jackson Hole Conference (Mericle)

- The Fed's Jackson Hole conference will take place Thursday through Saturday. The theme of this year's conference is "Reassessing the Effectiveness and Transmission of Monetary Policy." The key event is Chair Powell's speech on the economic outlook at 10am New York time on Friday.
- Powell's past remarks at Jackson Hole have shed valuable light on his thinking and have sometimes affected market pricing. We expect Powell to express a bit more confidence in the inflation outlook and to put a bit more emphasis on downside risks in the labor market than in his press conference after the July FOMC meeting, in light of the data released since then. A speech along these lines would be consistent with our forecast of a string of three consecutive 25bp cuts in September, November, and December. A dovish surprise could be any hint that the level of the funds rate is inappropriately high, while a hawkish surprise could be highlighting instead that broad financial conditions are still quite easy.
- We have written at length about the conference theme in our research over the last two years. In particular, we have argued that several factors unique to the pandemic cycle have dampened or delayed the transmission of the Fed's rate hikes to the economy. We have also argued that the lag time with which interest rate changes affect GDP growth is shorter than widely believed, though the lag time from changes in the output gap to changes in inflation can be quite long.

Jan Hatzius
+1(212)902-0394 | jan.hatzius@gs.com
Goldman Sachs & Co. LLC

Alec Phillips
+1(202)637-3746 | alec.phillips@gs.com
Goldman Sachs & Co. LLC

David Mericle
+1(212)357-2619 |
david.mericle@gs.com
Goldman Sachs & Co. LLC

Ronnie Walker
+1(917)343-4543 |
ronnie.walker@gs.com
Goldman Sachs & Co. LLC

Manuel Abecasis
+1(212)902-8357 |
manuel.abecasis@gs.com
Goldman Sachs & Co. LLC

Tim Krupa
+1(202)637-3771 | tim.krupa@gs.com
Goldman Sachs & Co. LLC

Elsie Peng
+1(212)357-3137 | elsie.peng@gs.com
Goldman Sachs & Co. LLC

Jessica Rindels
+1(972)368-1516 |
jessica.rindels@gs.com
Goldman Sachs & Co. LLC

Q&A on the Fed's Jackson Hole Conference

Q: What is the agenda for the Fed's Jackson Hole conference?

A: The theme of this year's conference is "Reassessing the Effectiveness and Transmission of Monetary Policy." The key event for markets is Chair Powell's speech on the economic outlook at 10am New York time on Friday, August 23. The rest of the conference on Friday and Saturday consists of research presentations, panel discussions, and policymaker speeches. The Fed will release the conference agenda on Thursday at 8pm and will release the papers and presentations just before each event begins.

Q: What is your current Fed forecast?

A: We expect an initial string of three consecutive 25bp cuts in September, November, and December, followed by quarterly rate cuts starting next year to a terminal rate of 3.25-3.5%. We think the increase in the unemployment rate to date and other softer signs in the labor market are enough for the FOMC to accelerate the initial pace from the plan implied by the dot plot to cut every other meeting to instead cut at consecutive meetings, but not enough to cut by 50bp. We see comments from Fed officials since the July employment report as consistent with our forecast of a 25bp cut in September. A weaker August employment report than we expect would be the most likely catalyst for a larger cut in September.

Q: What do you expect Chair Powell to say?

A: We expect Powell to offer a more dovish version of his message from the press conference after the July FOMC meeting in light of the soft CPI report, the weak job growth numbers, and the further increase in the unemployment rate since then. This might mean expressing a bit more confidence in the inflation outlook and putting a bit more emphasis on downside risks in the labor market. Powell might also reiterate that the FOMC is watching the labor market data carefully and is well positioned to support the economy if necessary. Comments along these lines would likely reinforce market expectations of a rate cut in September while deferring the 25bp vs. 50bp question to the August employment report.

Possible dovish surprises could include a more concerned take on the labor market or any suggestion that the high level of the fed funds rate is inappropriate in light of the progress made on inflation, either of which could lower the bar for a larger cut or a longer string of consecutive cuts. A possible hawkish surprise might be highlighting instead that broad financial conditions are still quite easy, which could imply that the high level of the funds rate, while perhaps unnecessary, is not an urgent problem.

Q: Does Jackson Hole matter? Has Powell provided useful monetary policy guidance in the past?

A: Powell's remarks at Jackson Hole have often shed valuable light on his thinking and have sometimes affected market pricing, as Exhibit 1 shows. Powell argued for quarterly cuts and outlined his skepticism about focusing too much on estimates of *r**

and u^* (the neutral fed funds rate and the unemployment rate compatible with 2% inflation) in 2018, hinted at the need to deliver cuts that the market had already priced in order to keep financial conditions easier and support the economy in 2019, announced the by then largely expected outcome of the FOMC's framework review in 2020, reinforced expectations of an upcoming taper in 2021, reiterated that it would be appropriate to slow the pace of tightening "at some point" but said that policy would likely have to remain restrictive "for some time" in 2022, and said the FOMC would "proceed carefully" in 2023, which wound up signaling that it would not hike at the next meeting.

Exhibit 1: Chair Powell's Speeches at Jackson Hole Have Shed Valuable Light on His Thinking and Have Sometimes Affected Market Pricing

Date	Impact on 2y Yield*	Key Messages from Chair Powell's Speech at Jackson Hole
8/24/2018	-1bp	Argued for gradual—interpreted to mean quarterly—rate hikes as a reasonable compromise. Expressed skepticism about focusing too much on estimates of r* (the neutral fed funds rate) and u* (the unemployment rate compatible with 2% inflation). Noted that overheating risks include destabilizing financial excesses, not just high inflation.
8/23/2019	-4bp	Argued for additional rate cuts in response to a long list of downside risks and hinted at the need to deliver cuts that the market had already priced in order to keep financial conditions easier and support the economy. China announced retaliatory tariffs on US exports the same morning as Powell's speech. We nudged up our odds of further rate cuts.
8/27/2020	+0.4bp	Announced the adoption of flexible average inflation targeting to conclude the monetary policy framework review. The announcement was a significant dovish long-term shift but was roughly in line with expectations. We pulled forward our forecast of when changes to the forward guidance and asset purchase program would be announced by one meeting.
8/27/2021	-2bp	Offered a balanced acknowledgement of both strong recent employment gains and the downside risks posed by the Delta variant. Reinforced expectations of an upcoming announcement of the tapering of asset purchases.
8/26/2022	+4bp	Reiterated that it would be appropriate to slow the pace of tightening "at some point" but balanced that by saying that policy would likely have to remain restrictive "for some time" in order to bring inflation down and that another 75bp hike "could be appropriate" and would depend on the data (two had already occurred and two more would follow).
8/25/2023	+4bp	Said the FOMC would "proceed carefully" when deciding whether to hike at future meetings, which wound up signaling that it would not hike at the next meeting or again this cycle. Gave an incrementally more hawkish assessment of risks to the outlook and noted that the FOMC was "attentive to signs that the economy may not be cooling as expected."

* We show the change in 2-year Treasury yields from 30 minutes before to 1 hour after the release of Powell's remarks.

Source: Goldman Sachs Global Investment Research

Q: What are your views on the conference theme, "Reassessing the Effectiveness and Transmission of Monetary Policy"?

A: We view the transmission of monetary policy to the economy through the lens of our financial conditions index (FCI) and use our FCI growth impulse model to estimate how changes in broad financial conditions driven by Fed policy or other forces affect GDP growth. Last fall, we summarized our views on the magnitude and timing of the impact of the Fed's rate hikes on the economy and why both might be somewhat different during the unique pandemic cycle.

We have argued since 2022 that several factors dampened or delayed the impact of rate hikes on the economy this cycle: surprisingly resilient risk sentiment has reduced the transmission to broad financial conditions; the two most rate-sensitive sectors—housing and autos—were constrained mainly by supply and were consequently less responsive to reduced demand; adjustable-rate mortgages are rare today; elevated corporate debt issuance at the start of the pandemic has so far limited corporates' refinancing needs and delayed the transmission from higher market interest rates to corporate interest expense; and the biggest net debtor in the economy, the federal government, has so far chosen not to cut spending or raise taxes in response to its higher projected interest expense. We also highlighted one factor that amplified the impact of rate hikes: runs on a few regional banks sparked an even sharper tightening in bank lending standards than would usually be associated with hikes of the magnitude delivered.

On the speed of transmission, we argued that the lag time with which monetary policy tightening affects GDP growth is shorter than widely believed. However, we also argued that the lag time from changes in the output gap to changes in inflation can be fairly long because some wage and price contracts are quite long-lasting, social norms can limit the speed with which sellers pass along increases in costs or market prices to loyal customers such as long-standing tenants, and the need to receive approval for price hikes from government regulators in some industries can also create delays.

The conference theme will likely be presented in a mostly backward-looking context. But a related forward-looking question is whether similar forces might also dampen the impact of potential future rate cuts if the Fed needs to stimulate a weak economy at some point. We see some reasons why the answer might be yes—for example, interest rate cuts will initially provide less of a cash flow boost through the refinancing channel than usual because so many homeowners already have such low mortgage rates. But in light of how much room the Fed has to cut, we are not very worried about this.

David Mericle

Disclosure Appendix

Reg AC

We, Jan Hatzius, Alec Phillips, David Mericle, Ronnie Walker, Manuel Abecasis, Tim Krupa, Elsie Peng and Jessica Rindels, 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 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. Investment in securities market are subject to market risks. Read all the related documents carefully before investing. Registration granted by SEBI and certification from NISM in no way guarantee performance of the intermediary or provide any assurance of returns to investors. Goldman Sachs (India) Securities Private Limited Investor Grievance E-mail: india-client-support@gs.com. Compliance Officer: Anil Rajput |Tel: + 91 22 6616 9000 | Email: anil.m.rajput@gs.com. **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 resolution ("ACPR") and regulated by the Autorité de contrôle prudentiel et de resolution and the Autorité des marches 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 (Sw. 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 (Finansinpektionen) 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.