US Daily: Q&A on the Likely Federal Shutdown (Phillips)

- A government shutdown this year has looked likely for several months, and we now think the odds have risen to 90%. The most likely scenario is a shutdown starting Oct. 1. While there is still a chance that Congress can reach a last-minute deal to extend funding past Sep. 30, there has been little progress made and there is little time left. In the seemingly unlikely event Congress passes a short-term extension, we would still expect a shutdown sometime later in Q4.
- We continue to think a shutdown would last 2-3 weeks. If the government shuts down on Oct. 1, a quick reopening looks unlikely as political positions become more deeply entrenched. Instead, political pressure to reopen the government is likely to gradually build. In particular, pay dates for active-duty military (Oct. 13 and Nov. 1) could be potential pressure points, as well as possible deterioration in "essential" operations like airport screening and border patrol as workers go unpaid.
- We have estimated a shutdown would subtract 0.2pp from Q4 GDP growth for each week it lasts (adding the same to 1Q2024, assuming it has ended by then). Regardless of duration, federal employee furloughs should subtract 0.15pp for each week of shutdown. We have estimated the indirect private sector hit at 0.05pp per week, but this is likely to be smaller in a short shutdown, and larger in protracted shutdown lasting many weeks.
- We expect all data releases from federal agencies to be postponed until after the government reopens, except for releases from the Federal Reserve, which does not rely on congressional funding.
- Although we would expect the shutdown to end after 2-3 weeks, more than one shutdown is possible. The two parties are far apart on spending proposals, and any agreement to reopen the government after the likely shutdown is likely to expire before year-end, potentially risking another funding lapse.

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

Spencer Hill, CFA +1(212)357-7621 | spencer.hill@gs.com Goldman Sachs & Co. LLC

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

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

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

Q&A on the Likely Federal Shutdown (Phillips)

What are the odds the government shuts down?

A shutdown this year has looked likely for several months, and we now think the odds have risen to 90%. The most likely scenario in our view is that funding will lapse after Sep. 30, leading to a shutdown starting Oct. 1. That said, a short-term extension cannot be entirely ruled out. In the event that Congress avoids a shutdown starting Oct. 1, we would still expect a shutdown at some point later in Q4.

While there is likely sufficient support in both chambers of Congress to pass a short-term extension of funding—this is known as a "continuing resolution" (CR)—that is "clean" with no other provisions attached, the majority of that support would come from Democrats. The Senate is considering a CR that includes aid for disaster relief and Ukraine. House Republican leaders are under political pressure to pass a CR that includes Republican policy priorities that can pass with mainly or exclusively Republican support. At the moment, neither chamber looks likely to pass the other chamber's CR.

The outlook seemed bleak ahead of the debt limit deadline earlier this year, but Congress resolved it in time; why shouldn't we expect a last-minute deal once again?

The smaller economic hit from a shutdown puts less pressure on Republican leaders to override the objections of some in their party to reach a deal. Ahead of the debt limit deadline earlier this year, Republican leaders reached a deal over the objections of some in their party because the potential hit to the economy from an impasse would have been unpredictable and severe, and even lawmakers most strongly opposed to a compromise agreed that the debt limit must be raised. By contrast, the economic hit from a shutdown would be smaller and more predictable, as there have already been two protracted shutdowns over the last decade. While most lawmakers on both sides of the aisle would prefer to avoid a shutdown, both sides appear more willing to take the chance it occurs.

When will the outlook for a shutdown become clearer?

The Senate is considering a CR that includes funds for Ukraine and disaster aid. It is still possible those items will be removed before final passage, but for now they are likely to reduce support among Republicans and delay passage (to waive procedural obstacles, unanimous consent is required, which will be harder with these additions). Senate passage looks unlikely before the end of the week (around Sep. 29).

The House has yet to vote on a CR, but is also likely to do so later this week. House Republican leaders continue to look likely to include border security funding and potentially a spending cut in the House CR, which would likely mean little to no Democratic support and little chance of passing in the Senate. An Oct. 1 shutdown will continue to look likely unless one of the chambers changes course over the next few days.

How long will the shutdown last?

We think 2-3 weeks is a reasonable central scenario. If a shutdown occurs, it is likely to last more than a few days, as neither side seems likely to make immediate concessions. While some funding lapses have ended very quickly, the political environment going into the deadline is more reminiscent of the situation preceding longer shutdowns in the past. However, we are also skeptical of arguments that a government-wide shutdown would last for more than a few weeks (i.e., for a few months), as we would expect political pressure to build until it forces a political resolution.

The last shutdown took 5 weeks to end; why wouldn't this shutdown last at least as long?

The long shutdowns in the past affected only some agencies and, in particular, did not affect the Department of Defense. The 21-day shutdown that started in late 1995 affected agencies representing only around 1/4 of discretionary funding, while the 35-day shutdown that started in late 2018 affected around 1/3 of funding. In both cases, Congress had already approved defense funding and some non-defense spending bills. In 2013, the Department of Defense reopened after a few days, cutting the impact of the remaining period of shutdown in half (defense represents around half of discretionary funding). The upshot is that a full-government shutdown has never lasted longer than a week.

Shutdowns affecting the entire government are typically short because of the political ramifications of certain aspects of a shutdown. For example, while all active-duty military and some civilian employees of the Defense Department would continue to work, none would be paid for work during the lapse until the government reopens (the first pay date at risk is October 13, when roughly 1.3 million active-duty servicemembers should receive around \$4bn in pay). A failure to pay the military could have negative political consequences for whichever political party voters hold more responsible.

Similarly, customs and border patrol agents, airport screeners, and other critical workers would go unpaid but still be required to work. During the 2018-2019 shutdown, a failure to pay airport screeners led to a rise in absences and resignations, which in turn led to delays and airport terminal closures. The tight labor market could exacerbate these kinds of effects if the government shuts down in October.

If political pressure is insufficient to force a reopening, there is also a procedural backstop against a prolonged shutdown. In general, the Speaker of the House controls the agenda on the House floor, including which bills come up for a vote. However, a majority of the House can sign onto a "discharge petition" to circumvent the Speaker and bring a piece of legislation up for a vote. This would not prevent a shutdown, as most if not all Republican lawmakers would resist siding with Democrats against the leader of their own party. The process also involves multiple steps that would likely take at least two weeks, far longer than the time remaining before funding expires. However, once a shutdown occurs, and particularly once political pressure builds, a discharge petition might come into play as a means of ending the shutdown.

How might the economic effect of the shutdown change if it grows longer?

We have estimated a shutdown would reduce Q4 GDP growth by 0.2pp for each week it

lasts, but the per-week effect would depend on the duration of the shutdown. The main effect of the shutdown is the hit to GDP from the missed work that furloughed workers do not perform. We estimate the direct effect to be -0.15pp per week, assuming the funding lapse affects all agencies, and this per-week effect should not change regardless of how long the shutdown lasts.

There are likely some indirect effects on private sector activity as well, and we assume another -0.05pp hit to Q4 GDP growth for each week of shutdown due to indirect effects on the private sector. However, this indirect effect would depend on the timing and length of the shutdown. A one-week shutdown would have a minimal impact on private sector activity, as it would not last long enough to affect federal pay, procurement, permitting, or other activities that intersect with the private sector (an exception would be services that depend on federal facilities being open, like janitorial or food services). If it occurred at the start of the quarter, there would be ample time to make up lost activity before the end of the quarter. By contrast, a two-month shutdown could affect growth in private-sector activity by more than the -0.05pp per week of shutdown we estimate. In a longer shutdown, new federal contracts for goods and services would slow if not stop, existing contracts could be affected by the absence of federal officials to provide guidance, and federal inputs for private activity—IRS tax transcripts used in mortgage underwriting, environmental reviews for construction projects, and the like—would not be available.

What would a shutdown mean for economic data releases?

If the government shuts down, agencies that rely on congressional funding will not publish periodic economic data. As of now, Congress has not yet passed the appropriations bills that fund the Dept. of Labor or the Dept. of Commerce, so a failure to enact a CR by Sep. 30 would affect releases from both agencies. Commodity-related reports from the Dept. of Agriculture and Dept. of Energy would also be postponed. (The Federal Reserve does not rely on congressional funding and will continue to release data on schedule.) This stands in contrast to the 2018-2019 shutdown, when some agencies (e.g., the Dept. of Labor) continued to release data on schedule, because Congress had already passed the spending bills that fund them.

Although federal statistical agencies should already have September survey data in hand, those data will not be released while the government is closed and would likely be released with a delay following reopening to allow time for processing. In general, releases are likely to come out roughly the same number of days after reopening as they were originally scheduled to come out after the start of the month (e.g., the employment report scheduled for Oct. 6 would come out around 6 days following reopening). A shutdown lasting 2-3 weeks could also complicate the gathering of data for October (the reference week for the employment situation report will be Oct. 9-13), likely leading to delays in publication of reports due in November. While it would depend on how long the shutdown lasted, there is a clear possibility that there will be little or no additional data available at the next FOMC meeting on November 1 beyond what had been published ahead of the last meeting.

What would a shutdown mean for overall spending and Treasury issuance?

A shutdown lasting a few weeks should have little overall effect on the Treasury's financing needs but would delay some payments until after the government reopens. The main short-term impact would be to delay payments to federal employees and military personnel by around \$20bn per month. Beyond this, there would likely be a slight reduction in miscellaneous payments, but most payments would continue, either because they are not funded through appropriations—this is generally the case for benefit programs—or because they relate to activity that occurred before funding expired. Overall, the shutdown is unlikely to meaningfully change the roughly \$20bn in funds the Treasury is likely to raise in October.

Once the government reopens, could it shut down again?

Multiple shutdowns are a distinct possibility, and there is historical precedent: In 1995, funding for all agencies lapsed for 5 days, restarted, and then lapsed a month later for a subset of agencies, lasting 21 days. In 2018, funding for all agencies lapsed briefly at the start of 2018, and then for 35 days for a subset of agencies at the end of that year. This year, Congress has made little progress on the 12 annual appropriations bills it needs to pass, so it looks likely that at least one—and probably more than one—CR will be necessary while work on the full-year bills continues. Whether Congress enacts that CR before or after current funding expires on Oct. 1, the end-date of the next CR Congress passes is likely to pose a new shutdown risk. The upshot is that uncertainty regarding federal operations will likely persist for the next few months, regardless of how the next week plays out.

Alec Phillips

Reg AC

We, Jan Hatzius, Alec Phillips, David Mericle, Spencer Hill, CFA, Ronnie Walker, Tim Krupa and Manuel Abecasis, 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)

6

(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 Kinodom 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 (<u>https://www.sipc.org</u>).

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.