

US Daily: Debt Limit: What (and When) Is the Deal? (Phillips/Krupa)

- The Treasury's "early June" deadline looks very accurate, in our view. Over the last few days, the outlook for Treasury's room under the debt limit has deteriorated slightly, though this might also reflect daily fluctuations in tax receipts that could reverse in coming days. That said, at the moment our central scenario is that by June 2 the Treasury's room under the debt limit will barely exceed \$30bn (the minimum cash the Treasury has targeted in prior debt limit projections) and that funds will run dry by June 9.
- Treasury Sec. Yellen indicated on May 24 that the Treasury will soon give Congress a more precise date than the "early June" and "as early as June 1" timing provided so far. Given our projections, it seems likely to us that Treasury will signal that Congress needs to raise the debt limit either by June 2 or June 5. It is unclear when this update might come, but Treasury might prefer to wait until early next week (e.g., May 30) once a deal has been reached rather than ahead of the weekend, in order to keep urgency behind debt limit talks.
- Negotiators appear to be closing in on an agreement. While it is hard to predict when an announcement could come, we think the odds are highest that a deal is announced late Friday (May 26) or on Saturday (May 27). If so, this would likely allow a House vote late Tuesday (May 30) or Wednesday (May 31). The Senate also needs to pass the deal, though procedural obstacles there are unlikely to be what prevents timely enactment.
- Last week we put the odds of a full-fledged agreement by the deadline at 70% and a short-term fix at 15%, with a 10% chance that Congress fails to act in time and a 5% chance that the deadline is postponed. We are incrementally more optimistic (80%) on a full-fledged deal and believe a short-term patch is less likely (10%) to be needed. We still think there is a 10% chance that Congress fails to act in time, but think the odds that the deadline is pushed back are close to zero.
- The core of the debt limit deal is likely to be spending caps. We estimate that the real reduction in spending next year would vary from around -0.1% of GDP (under a freeze at 2023 levels) to -0.5% (under the House-passed bill). A compromise that sets 2024 spending at the 2022 level indexed for inflation would result in modest cuts of around -0.2% of GDP in 2024. Regardless, the spending cuts under consideration do not appear likely to meaningfully affect the macroeconomic outlook.

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

Joseph Briggs
+1(212)902-2163 | joseph.briggs@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

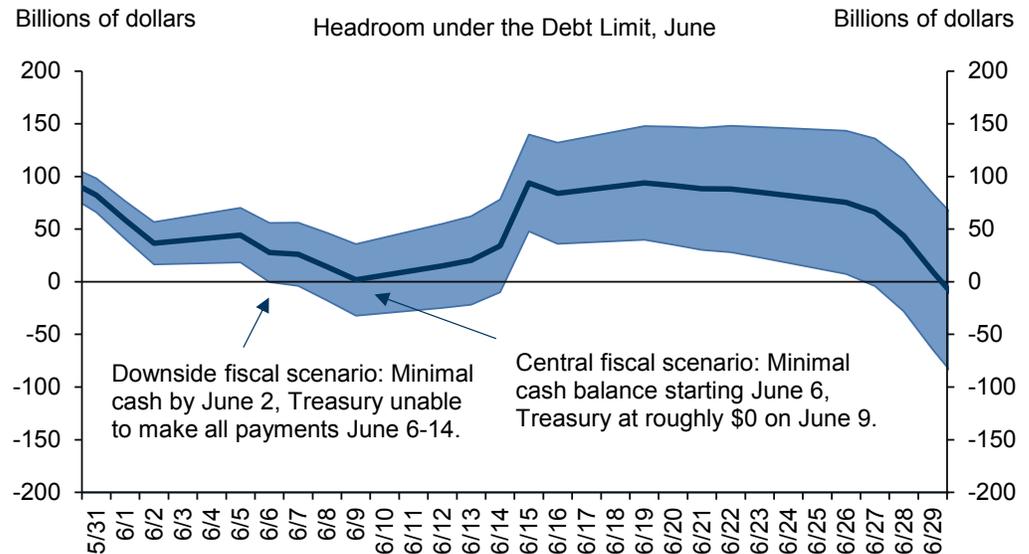
Manuel Abecasis
+1(212)902-8357 | manuel.abecasis@gs.com
Goldman Sachs & Co. LLC

Debt Limit: What (and When) Is the Deal?

The Clock Is Ticking

The Treasury’s “early June” deadline looks very accurate, in our view. Over the last few days, the outlook for Treasury’s room under the debt limit has deteriorated slightly, though this might also reflect daily fluctuations in tax receipts that could reverse in coming days. That said, at the moment our central scenario is that by June 2 the Treasury’s room under the debt limit will barely exceed \$30bn (the minimum cash the Treasury has targeted in prior debt limit projections) and that funds will be exhausted entirely by June 9. In a downside scenario in which withheld tax collections slow slightly, the Treasury would run out of funds as soon as June 6 (Exhibit 1).

Exhibit 1: Our Current Central Scenario Is That the Treasury’s Room Under the Debt Limit Will Barely Exceed \$30bn by June 2



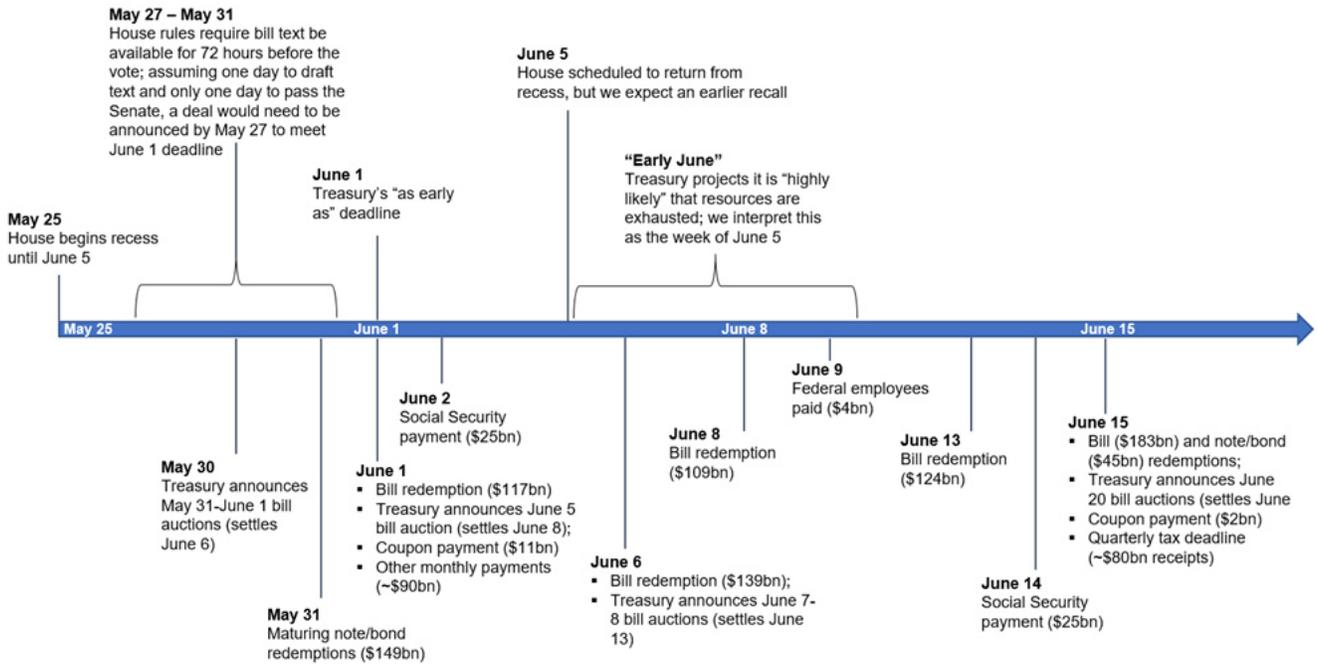
Source: Treasury, Goldman Sachs Global Investment Research

Treasury Sec. Yellen indicated on May 24 that the Treasury will soon give Congress a more precise date than the “early June” and “as early as June 1” timing the Treasury has provided so far. Given our projections, it seems likely to us that the Treasury will signal that Congress needs to raise the debt limit either by June 2 or June 5. It is unclear when this update might come, but Treasury might prefer to wait until early next week (e.g., May 30) rather than ahead of the weekend, in order to keep urgency behind debt limit talks.

Exhibit 2 provides a timeline with key procedural dates (top) and Treasury cash flows (bottom). The timing of a deal announcement is hard to predict, but the incentives are greatest to announce a deal late Friday May 26 or on Saturday May 27, we think. The House is on recess until June 5, but will reconvene to vote on the debt limit deal once ready. However, Speaker McCarthy has indicated that he intends to follow House rules requiring that a bill be available for 72 hours prior to the vote. Assuming a day to convert the deal into text and at least a few hours to vote on it, a deal would be needed by May

27 in order to pass the bill by May 31, leaving the Senate to pass it on June 1 (consideration of a bill in the Senate can often take more than a week, but we do not expect procedural obstacles in the Senate to prevent the bill from becoming law before the deadline).

Exhibit 2: A Timeline of Key Procedural Dates (Top) And Treasury Cash Flows (Bottom); We Think Incentives Are Greatest to Announce a Deal Late May 26 or on May 27

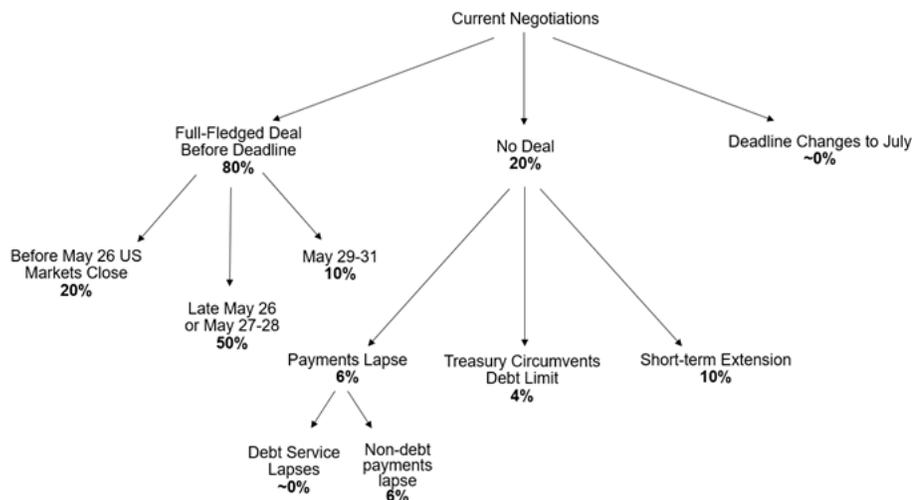


Source: Treasury, Bloomberg, Goldman Sachs Global Investment Research

A Higher Probability of a Full-Fledged Deal

Last week we put the odds of a full-fledged agreement by the deadline at 70% and a short-term fix at 15%, with a 10% chance that Congress fails to act in time and a 5% chance that the deadline is postponed. We are incrementally more optimistic (80%) on a full-fledged deal and believe a short-term patch is less likely (10%) to be needed. We still think there is a 10% chance that Congress fails to act in time, but think the odds that the deadline is pushed back are close to zero.

In the event that Congress fails to act, it is hard to predict what the White House would do, but we think it is slightly more likely (6%) that the Treasury would delay non-debt service payments, though it is possible that the Administration could circumvent the debt limit through a judicial ruling or through technical means (e.g. issuing high coupon/low par value notes or disinvesting internal trust funds). Exhibit 3 provides subjective odds of different outcomes.

Exhibit 3: We Are Incrementally More Optimistic on a Full-Fledged Deal and Believe a Short-Term Patch Is Less Likely

Source: Goldman Sachs Global Investment Research

What's the Deal?

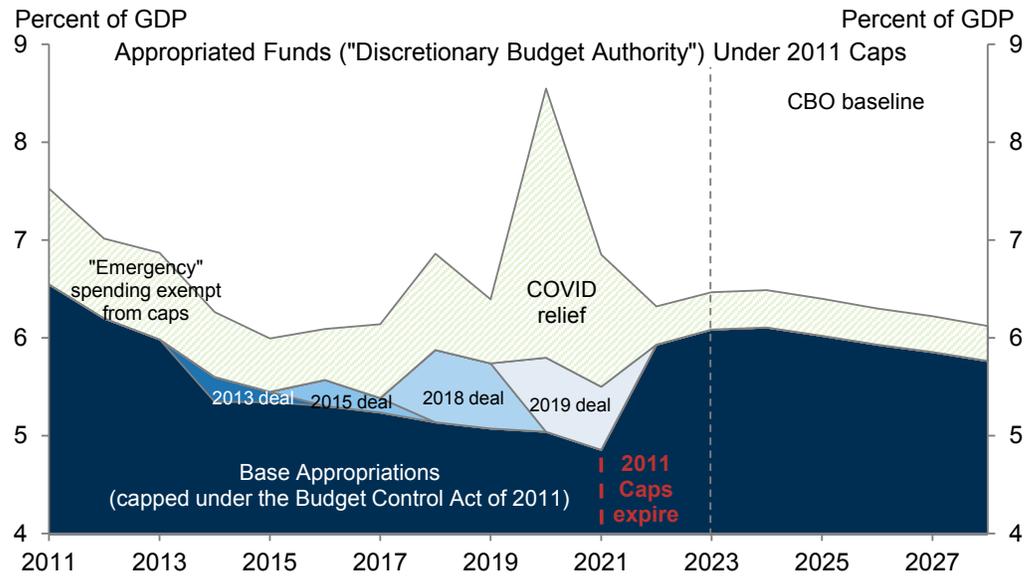
There is not much detail available regarding the potential compromise. That said, we expect the deal to include 4 or 5 things:

- A calendar-date suspension of the debt limit (as opposed to a dollar amount) that puts the next debt limit increase in mid-2025
- Caps on discretionary spending
- Work requirements on benefit programs (primarily Temporary Assistance for Needy Families, formerly known as “welfare benefits”, and possibly the Supplemental Nutrition Assistance Program, formerly known as “food stamps”)
- Rescission of unused covid funds
- Energy permitting reform

Of these, we view the debt limit suspension and spending caps as the core of the deal, with rescission of unused covid funds also very likely, work requirements likely, and energy permitting reform uncertain.

Similar to the 2011 debt limit episode, spending caps look likely to be central to the debt limit deal. The 2011 agreement capped discretionary funding for 10 years, but Congress did not wait long before raising the caps. Roughly every two years after enactment, Congress passed legislation to allow for more spending (Exhibit 4). These increases were relatively minor during the Obama Administration when Republicans controlled one or both chambers of Congress, but became larger under the Trump Administration. “Emergency” spending exempt from caps also increased later in that period (before but particularly during the pandemic).

Exhibit 4: The 2011 Deal Capped Discretionary Funding for 10 Years, but Congress Passed Legislation to Allow For More Spending



Source: Treasury, Goldman Sachs Global Investment Research

There is also a key difference with 2011 that likely makes this situation somewhat easier to resolve: there is no particular deficit reduction goal. In 2011, congressional Republicans insisted that each dollar of debt limit increase be matched with a dollar of spending cuts (measured over ten years). With a \$2.1 trillion debt limit increase needed to last through the coming election, this meant finding \$2.1 trillion in spending cuts. This year, the debt limit is likely to be suspended, rather than increased, so there is no specific dollar figure involved (extending the debt limit to mid-2025 will likely take an increase well over \$3 trillion). This, along with a general lack of public attention to the fiscal outlook, has meant very little debate over the total amount of deficit reduction that needs to be achieved in any deal.

That said, negotiators still need to reach some type of spending agreement. In the current debt limit negotiations, at least four parameters regarding spending caps need to be decided:

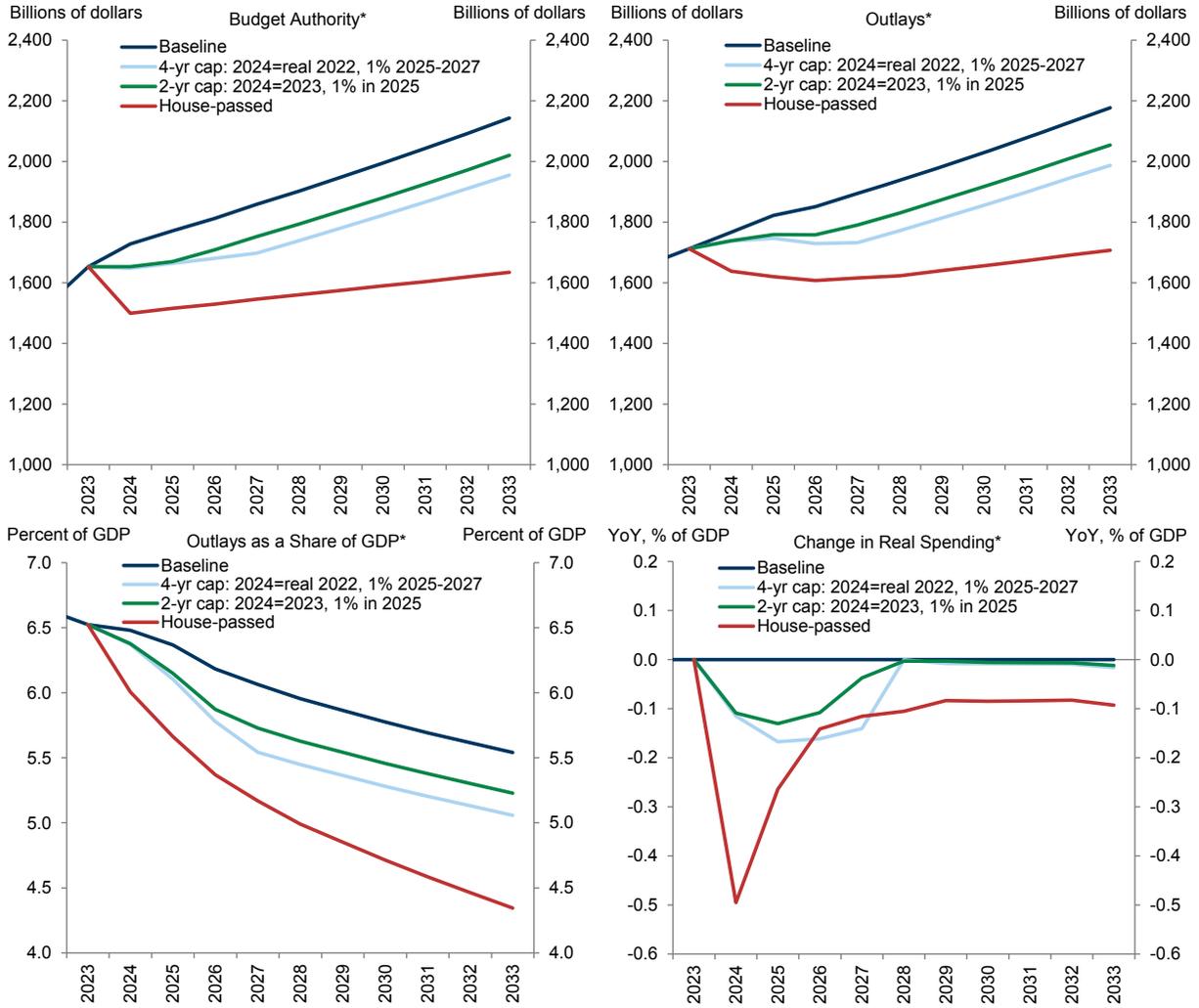
- **Spending level for FY2024:** The White House has reportedly offered to freeze spending at the 2023 level. The House passed Republican bill would reduce it to the FY2022 level, a 9% nominal reduction. The middle ground could be to set 2024 spending to the 2022 level adjusted for inflation. This would allow both sides to claim a win (spending would go down slightly in nominal terms, but would be no lower in real terms than what President Biden and Democrats in Congress agreed to in late 2021).
- **Length of caps:** The White House has reportedly agreed to cap spending for at least 2 years. The House Republican bill would have capped spending for 10 years, but that position has reportedly been shortened to a 6-year cap. The middle ground here is clear, though the final decision will depend on other aspects of the deal, particularly the growth rate of the caps.

- **Spending growth under caps:** The House Republican bill proposed to grow caps by 1% (nominal) per year. The White House reportedly agreed to a 1% growth rate in the caps, though this would have applied for only one year. A 1% growth rate could be hard for the White House to agree to if the caps lasted 4 or 6 years. That said, it is likely to be lower than CBO's baseline, which assumes discretionary funding grows at around 2.5%.
- **Allocation between defense and non-defense:** Democrats are likely to insist on separate defense and non-defense caps, as most Democrats support robust non-defense spending while there is greater overall support (among both parties) for defense spending. A plausible scenario is that defense could rise slightly for FY2024 while non-defense falls in FY2024, but that caps on both grow at the same rate thereafter.

Exhibit 5 shows the effect of three spending cap scenarios with the CBO baseline for comparison: (1) the House-passed bill, which cuts 2024 spending to the 2022 nominal level and raises the cap 1% annually for the next 9 years, (2) a 2-year cap that freezes spending for 2024 and raises it 1% for FY2025, and (3) a potential compromise 4-year cap that sets the 2024 level at the 2022 level adjusted for inflation and then grows it at 1% for the next 3 years.

Budget authority refers to the amount of funding that Congress approves in appropriations bills. The pace of spending (outlays) differs by program, but in general it takes a few years for a given change in funding to be fully reflected in spending. If the cuts apply mainly to non-defense, a drop in funding would result in a slightly faster drop in spending. Regardless, with the exception of the cuts in the House-passed bill, these scenarios look unlikely to produce a year-on-year reduction in spending of more than around 0.2% of GDP.

Exhibit 5: Spending Cap Scenarios Look Unlikely to Produce a Year-On-Year Reduction in Spending of More Than Around 0.2% Of GDP



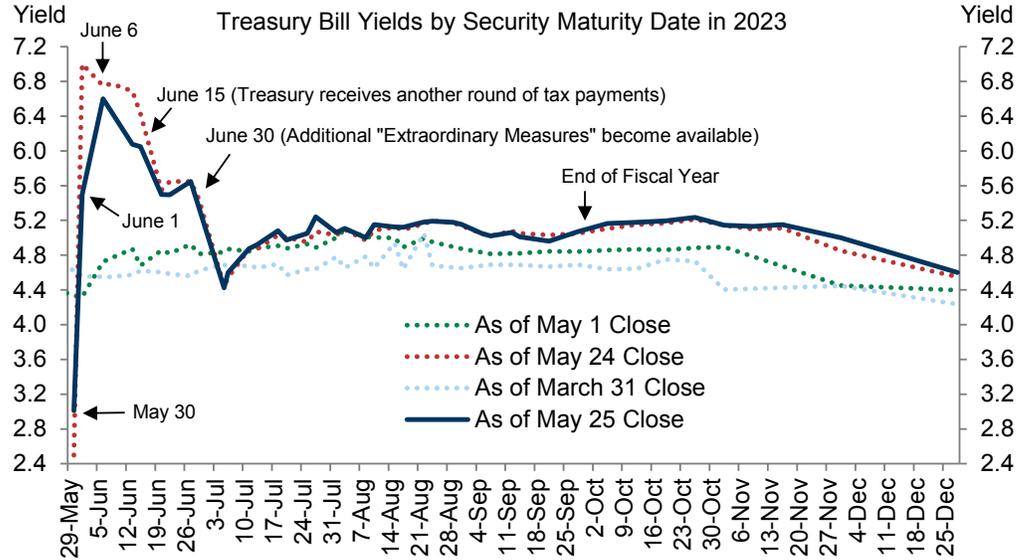
*Regular appropriations excluding emergency spending

Source: Congressional Budget Office, Goldman Sachs Global Investment Research

A Few Parts of the Financial Markets Reflect Debt Limit Concerns

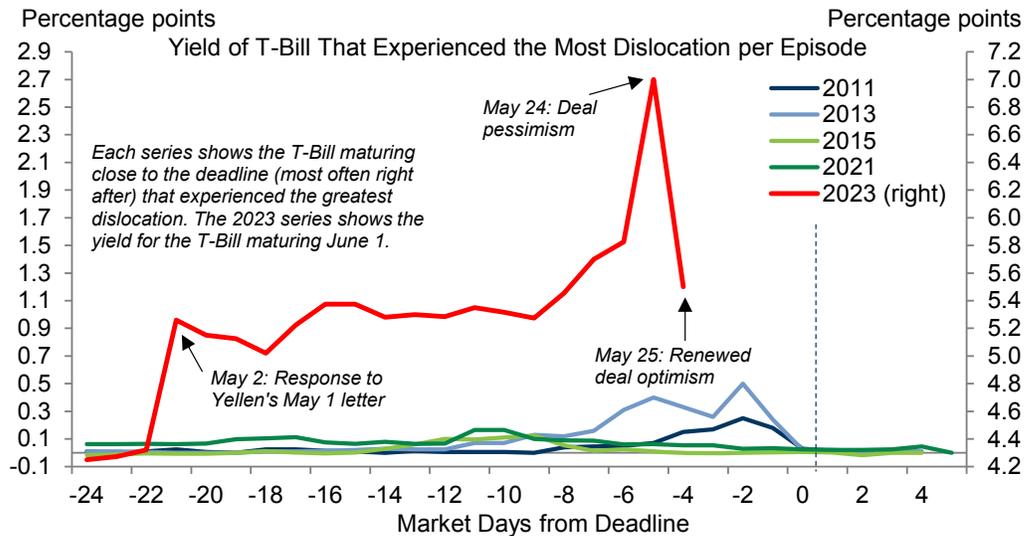
Debt limit-related concerns seem limited to a few markets, primarily the short end of the Treasury curve and sovereign CDS. Yields on bills maturing on June 1 and the days that follow have cheapened substantially (Exhibit 6). That said, recent positive headlines have understandably led to some recovery (Exhibit 7).

Exhibit 6: Treasury Bills Maturing Just After the Expected Deadline Have Cheapened Substantially...



Source: Bloomberg, Goldman Sachs Global Investment Research

Exhibit 7: ...But Recent Positive Headlines Have Led to Some Recovery

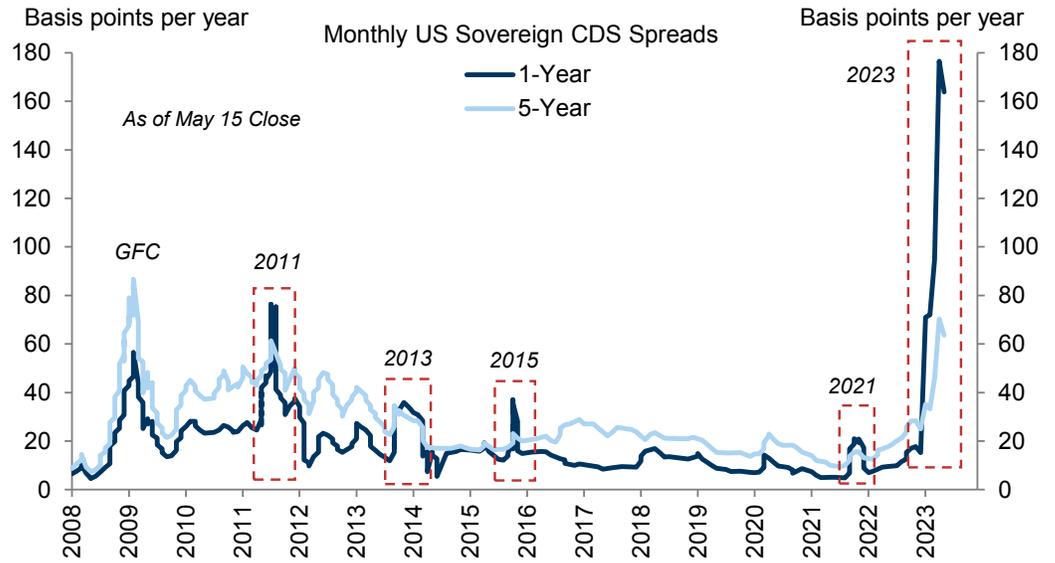


Maturities for securities shown: 8/4/2011, 10/24/2013, 11/12/2015, 12/23/2021, 6/1/2023

Source: Bloomberg, Goldman Sachs Global Investment Research

Sovereign CDS continues to reflect an elevated probability of debt default (Exhibit 8). This is hard to reconcile with what we believe are low odds that the Treasury is unable to make all payments and even lower odds that the Treasury fails to make timely debt service payments.

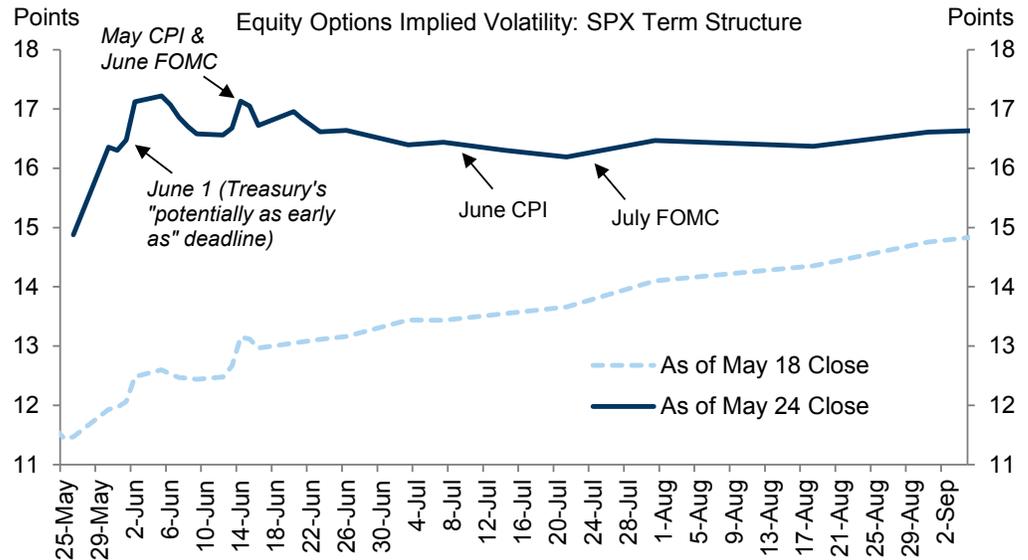
Exhibit 8: CDS Remains Elevated, but We Believe the Odds That Treasury Fails to Make Timely Debt Service Payments Are Very Low



Source: Bloomberg, Goldman Sachs Global Investment Research

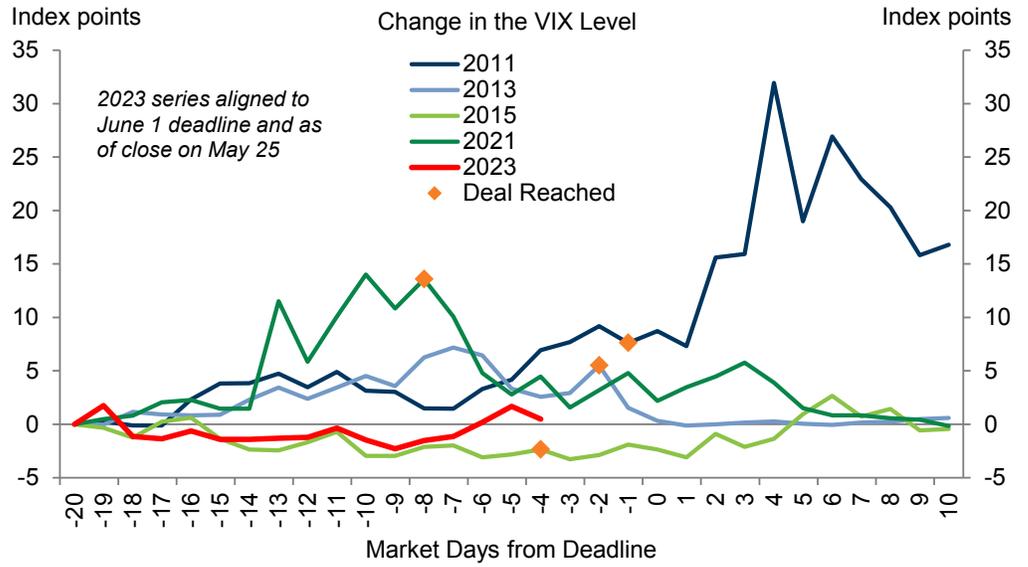
Equity market implied volatility reflects modest risk around the debt limit deadline (Exhibit 9). The rise in volatility ahead of this debt limit deadline has been milder than prior episodes (Exhibit 10). Although the VIX rose as the deadline approached in those prior years, negotiators did not announce a deal in those episodes until a couple of days before the deadline.

Exhibit 9: Equity Implied Volatility Is Pricing Modest Risk Around the Deadline



Source: Goldman Sachs Global Investment Research

Exhibit 10: Volatility Remains Relatively Low



Source: Chicago Board Options Exchange, Goldman Sachs Global Investment Research

Alec Phillips

Tim Krupa

Disclosure Appendix

Reg AC

We, Jan Hatzius, Alec Phillips, David Mericle, Spencer Hill, CFA, Joseph Briggs, 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 U714140MH2006FTC160634, Phone +91 22 6616 9000, Fax +91 22 6616 9001. Goldman Sachs may beneficially own 1% or more of the securities (as such term is defined in clause 2 (h) the Indian Securities Contracts (Regulation) Act, 1956) of the subject company or companies referred to in this research report. **Japan:** See below. **Korea:** This research, and any access to it, is intended only for "professional investors" within the meaning of the Financial Services and Capital Markets Act, unless otherwise agreed by Goldman Sachs. Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **New Zealand:** Goldman Sachs New Zealand Limited and its affiliates are neither "registered banks" nor "deposit takers" (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for "wholesale clients" (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests is available at: <https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html>. **Russia:** Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. Research reports do not constitute a personalized investment recommendation as defined in Russian laws and regulations, are not addressed to a specific client, and are prepared without analyzing the financial circumstances, investment profiles or risk profiles of clients. Goldman Sachs assumes no responsibility for any investment decisions that may be taken by a client or any other person based on this research report. **Singapore:** Goldman Sachs (Singapore) Pte. (Company Number: 198602165W), which is regulated by the Monetary Authority of Singapore, accepts legal responsibility for this research, and should be contacted with respect to any matters arising from, or in connection with, this research. **Taiwan:** This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. **United Kingdom:** Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union and United Kingdom: Disclosure information in relation to Article 6 (2) of the European Commission Delegated Regulation (EU) (2016/958) supplementing Regulation (EU) No 596/2014 of the European Parliament and of the Council (including as that Delegated Regulation is implemented into United Kingdom domestic law and regulation following the United Kingdom's departure from the European Union and the European Economic Area) with regard to regulatory technical standards for the technical arrangements for objective presentation of investment

recommendations or other information recommending or suggesting an investment strategy and for disclosure of particular interests or indications of conflicts of interest is available at <https://www.gs.com/disclosures/europeanpolicy.html> which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

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

Global product; distributing entities

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

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

European Economic Area: GSI, authorised by the PRA and regulated by the FCA and the PRA, disseminates research in the following jurisdictions within the European Economic Area: the Grand Duchy of Luxembourg, Italy, the Kingdom of Belgium, the Kingdom of Denmark, the Kingdom of Norway, the Republic of Finland and the Republic of Ireland; GSI - Succursale de Paris (Paris branch) which is authorised by the French Autorité de contrôle prudentiel et de résolution ("ACPR") and regulated by the Autorité de contrôle prudentiel et de résolution and the Autorité des marchés financiers ("AMF") disseminates research in France; GSI - Sucursal en España (Madrid branch) authorized in Spain by the Comisión Nacional del Mercado de Valores disseminates research in the Kingdom of Spain; GSI - Sweden Bankfilial (Stockholm branch) is authorized by the SFSA as a "third country branch" in accordance with Chapter 4, Section 4 of the Swedish Securities and Market Act (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 (Finansinspektionen) disseminates research in the Kingdom of Sweden.

General disclosures

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

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

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

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

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

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

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

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

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

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors.

Investors should review current options and futures disclosure documents which are available from Goldman Sachs sales representatives or at <https://www.theocc.com/about/publications/character-risks.jsp> and https://www.fiadocumentation.org/fia/regulatory-disclosures_1/fia-uniform-futures-and-options-on-futures-risk-disclosures-booklet-pdf-version-2018. Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

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

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

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

© 2023 Goldman Sachs.

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