

Global Strategy Views

Concentration & Correction – what to do next

1. The equity markets' correction, triggered by news of the DeepSeek LLM model, has been the first fall of more than 3.5% of the Magnificent 7 since last Autumn. **In our view this is a correction and not the start of a sustained bear market.** Most bear markets are triggered by expectations of falling profits driven by fears of recession. Our economists remain confident about world growth and remain above consensus on their forecasts for the US, putting the probability of recession in the next 12 months at 15%. We also expect interest rates to be cut, albeit modestly this year, alongside more progress on inflation moderation – and a cheaper entrant into the AI space might increase confidence in this trend. This combination of macro conditions has historically been supportive of risk assets ([Exhibit 1](#)).

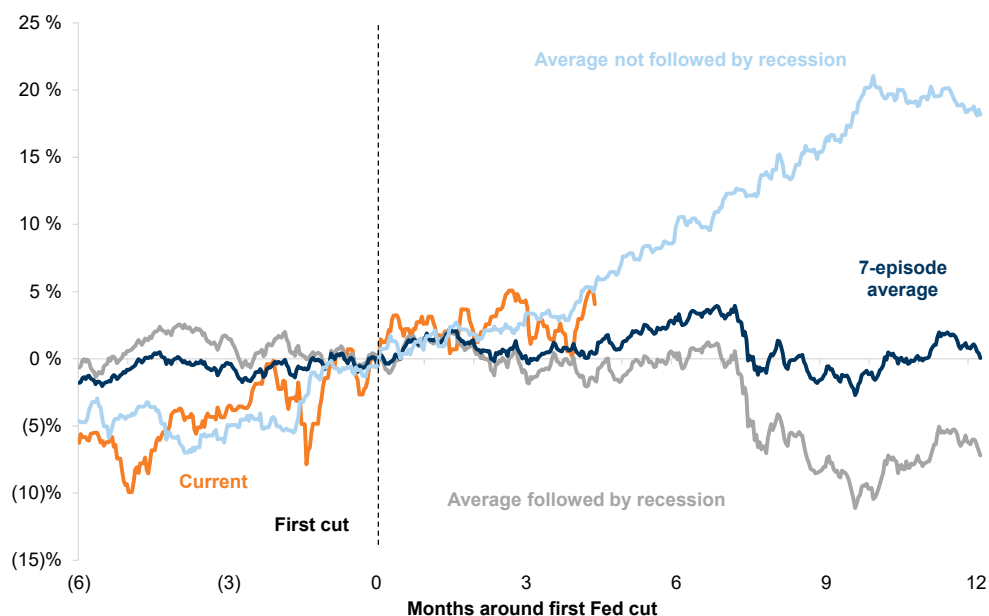
Peter Oppenheimer
+44(20)7552-5782 | peter.oppenheimer@gs.com
Goldman Sachs International

Sharon Bell
+44(20)7552-1341 | sharon.bell@gs.com
Goldman Sachs International

Guillaume Jaisson
+44(20)7552-3000 | guillaume.jaisson@gs.com
Goldman Sachs International

Lilia Peytavin
+33(1)4212-1716 | lilia.peytavin@gs.com
Goldman Sachs Bank Europe SE - Paris Branch

Exhibit 1: The current combination of macro conditions has historically been supportive of risk assets
Global equities around Fed cut with and without recession



Source: Datastream, Goldman Sachs Global Investment Research

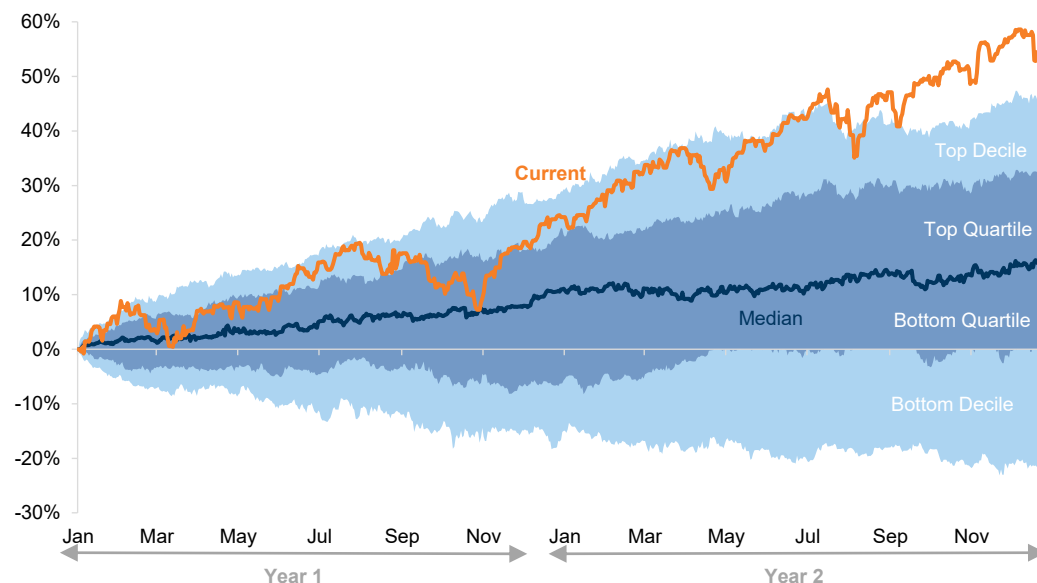
2. Nevertheless, we have argued that context is important and that equity markets came into the year priced for perfection, leaving them vulnerable to disappointments. Returns in equity markets, led by the US, have been unusually strong over the past couple of years, and particularly since October 2023 ([Exhibit 2](#))

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

as investors began to become more optimistic about the prospects for lower inflation and interest rates alongside a soft landing.

Exhibit 2: Returns in equity markets, led by the US, have been unusually strong over the past couple of years and particularly since October 2023

2 year calendarized S&P 500 performance starting in January. Data since 1928

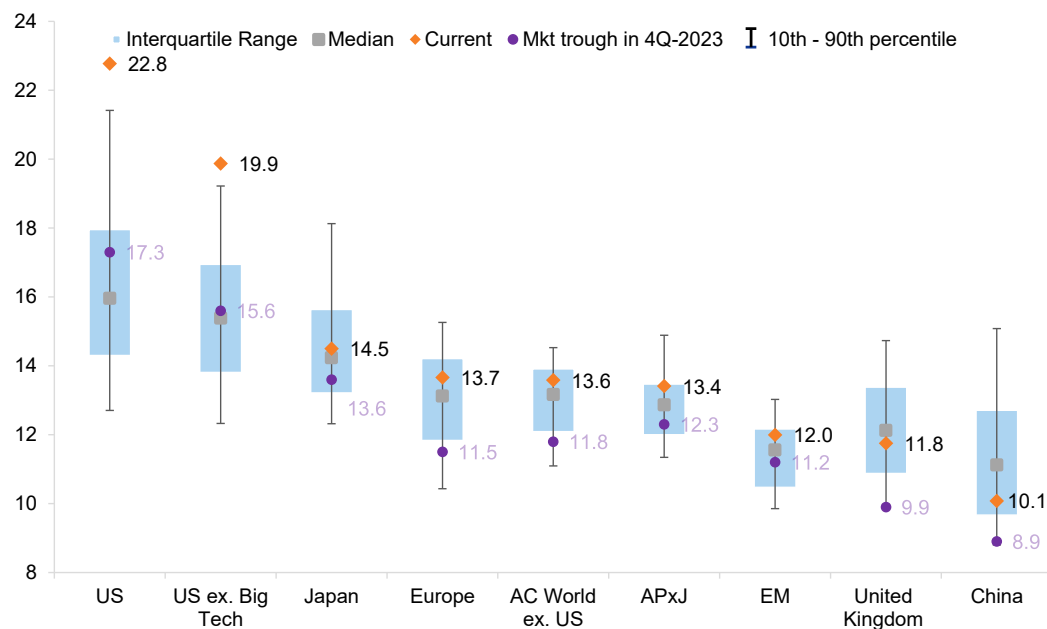


Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

3. Overall levels of valuation had reached very high levels, particularly in the US, and P/E multiples have increased meaningfully since Q4 2023 (see [Exhibit 3](#)). In the case of the US, while much of this reflects the largest technology companies, the equity market remains expensive relative to history even if we exclude large cap technology (the second column). Furthermore, while other equity markets around the world are much cheaper than the US, most are not particularly cheap relative to their own history. The main exception is China.

Exhibit 3: The US has a valuation at its 20-year peak and this remains true even if we exclude the largest technology companies

12m fwd P/E, MSCI regions; data since 2003



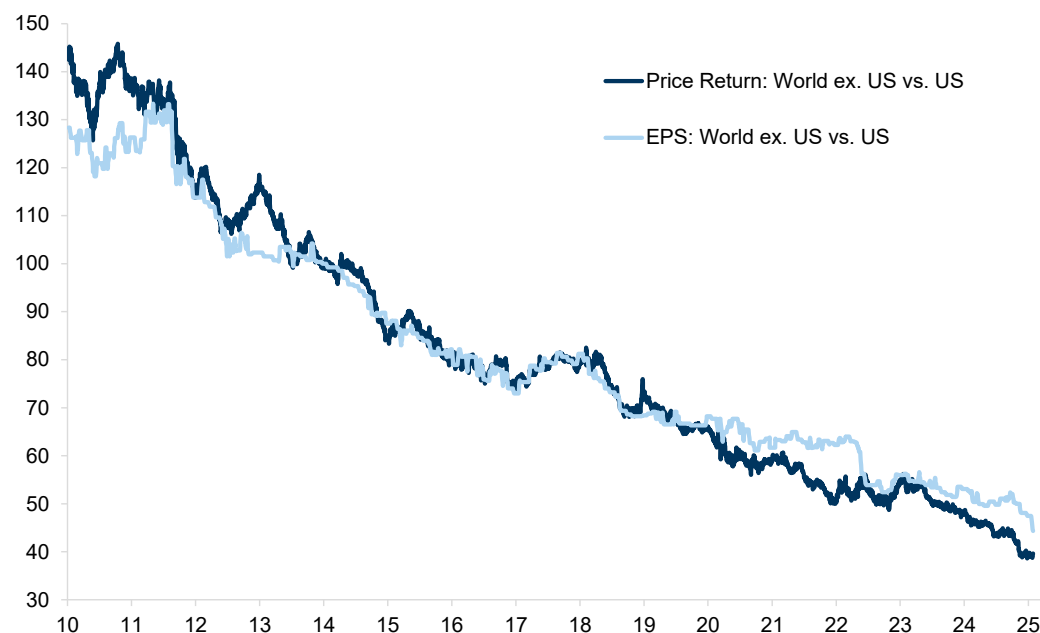
Source: FactSet, Goldman Sachs Global Investment Research

4. While surging equity returns coupled with high valuation provide fertile conditions for a correction, **it is also the concentration of equities as an asset class that has left equity investors vulnerable to disappointments.** The rising concentration in equities has taken three forms (see *The Concentration Conundrum; What to do about market dominance*, 11 March 2024): the growing dominance of the US equity market in the global index, the ascent of the technology sector, and the rise in single stock concentration (particularly in the US).

To be clear, **these factors have emerged as a function of strong fundamentals, not as the result of speculation or irrational exuberance.** The growing dominance of the US equity market has simply mirrored its relative profit growth since the financial crisis ([Exhibit 4](#)).

Exhibit 4: The growing dominance of the US equity market has simply mirrored its relative profit growth since the financial crisis

Price return and 12m fwd EPS in local currency. Indexed to 100 in Jan-2014

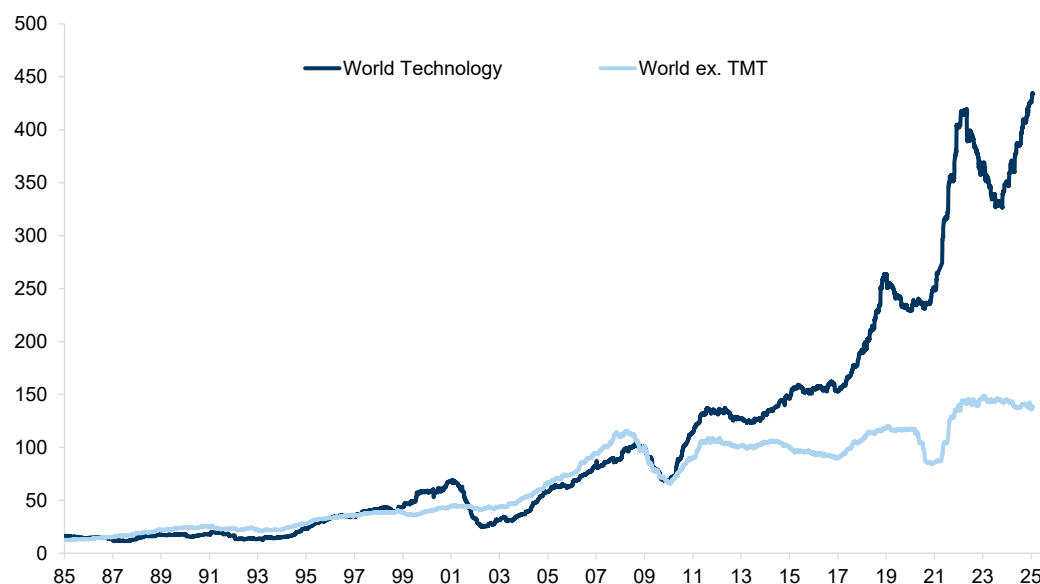


Source: Datastream, STOXX, Goldman Sachs Global Investment Research

Meanwhile, the growing influence of technology on market returns reflects the significant outpacing of technology profits relative to other industries over the same period ([Exhibit 5](#)).

Exhibit 5: The growing influence of technology on market returns reflects the significant outpacing of technology profits relative to other industries over the same period

12m Trailing EPS (USD). Indexed to 100 on Jan-2009.



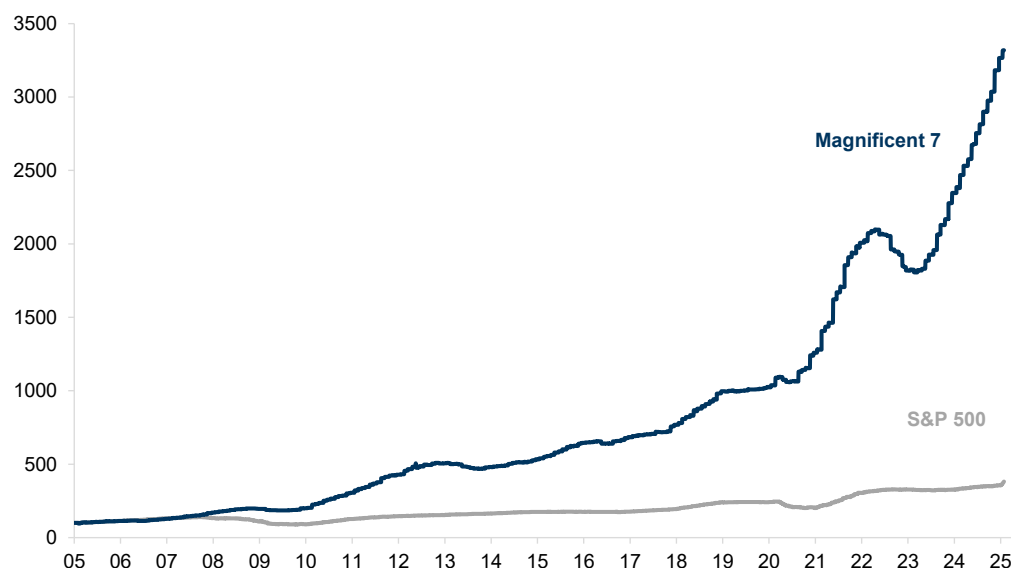
Source: Datastream, Worldscope, Goldman Sachs Global Investment Research

Furthermore, the dominance of the biggest companies in the US equity market is a

function of their vastly superior earnings power over the past decade ([Exhibit 6](#)).

Exhibit 6: The dominance of the biggest companies in the US equity market is a function of their vastly superior earnings power over the past decade

Magnificent Seven and S&P 500, 12m trailing EPS. Indexed to 100 on Jan-2005



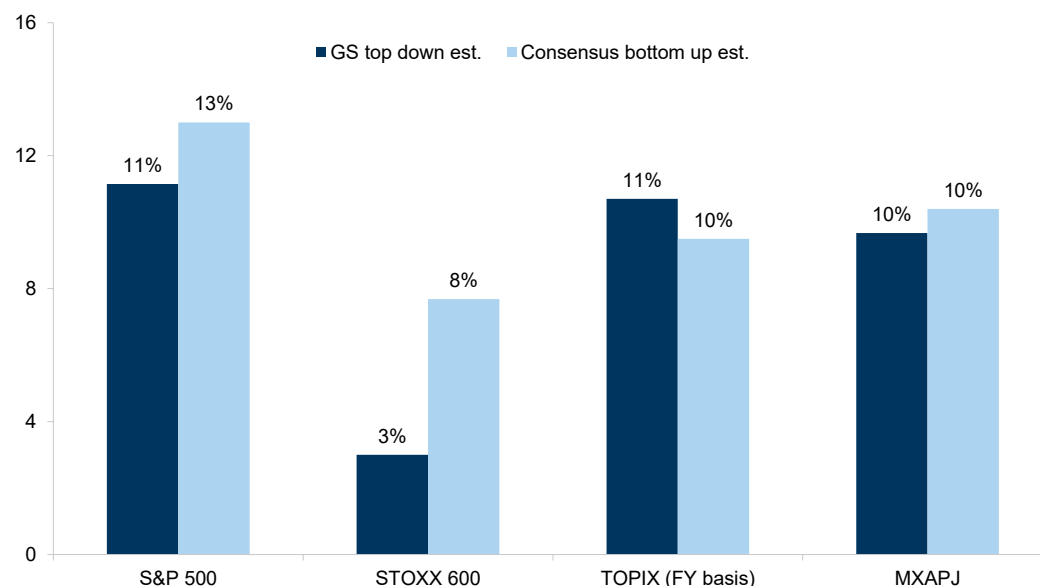
Source: FactSet, Goldman Sachs Global Investment Research

5. The dominance of US equity market, technology sector, and dominant companies does not represent a bubble based on irrational exuberance but is rather a reflection of superior fundamentals. Nevertheless, while stronger growth has justified the patterns of returns that have driven equity markets over the recent past, they do not tell us about the future expectations or returns.

On a forward-looking basis, while the US equity market is likely to move higher based on solid earnings growth, **its superior earnings growth at the index level is set to fade, opening up opportunities for more diversification.** For this year at the index level our top-down forecasts are similar across all regions (except for Europe) ([Exhibit 7](#)), suggesting more opportunity for geographic diversification.

Exhibit 7: For this year at the index level our top-down forecasts are similar across all regions (except for Europe)

GS top-down vs. consensus bottom-up estimates of 2025 EPS growth

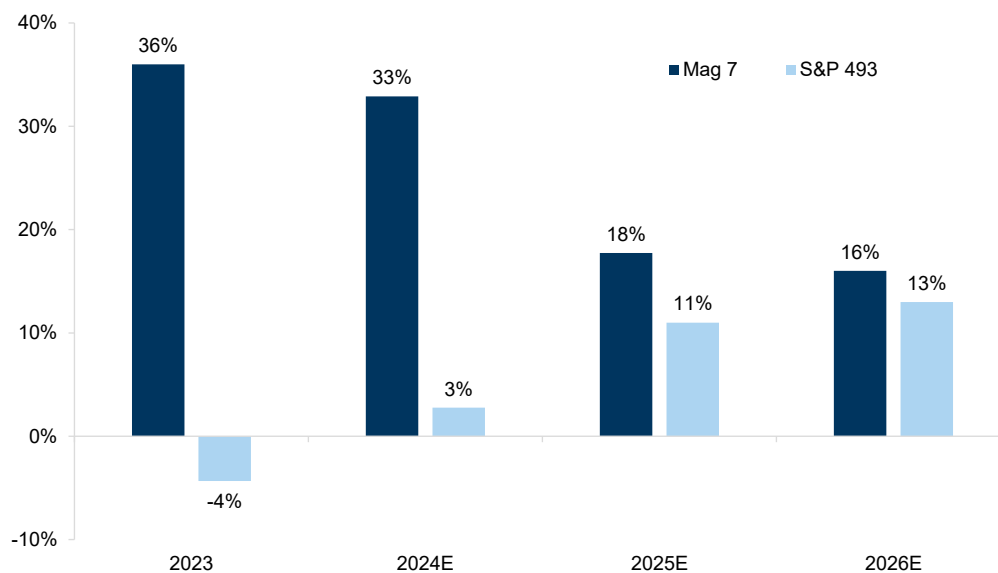


Source: I/B/E/S, Toyo Keizai, STOXX, MSCI, Goldman Sachs Global Investment Research

At the same time, our US strategists expect **the strong pace of earnings growth of the dominant technology companies to continue but also to moderate on a relative basis** (see *2025 US Equity Outlook: The Art of the Deal*, 18 November 2024) (Exhibit 8).

Exhibit 8: Our US strategists expect the strong pace of earnings growth of the dominant technology companies to continue but also to moderate on a relative basis

Annual earnings growth



Magnificent 7 is a list of companies including: Meta, Amazon, Apple, Microsoft, Alphabet, Tesla, NVIDIA

Source: Datastream, Goldman Sachs Global Investment Research

The dominant companies are still expected to see superior growth but the gap is narrowing. We have argued that this leaves a risk in such a concentrated market. The price action of the GRANOLAS in Europe last year, provides a good use-case for the risk of high concentration in the US with the Magnificent 7. Despite their earnings continuing to grow faster than the rest of the European market, the GRANOLAS valuations have significantly declined, resulting in flat year-over-year performance. This derating has negatively impacted the overall market due to the size of these companies (see *Strategy Espresso: GRANOLAS, worth another bite?*, 17 January 2025).

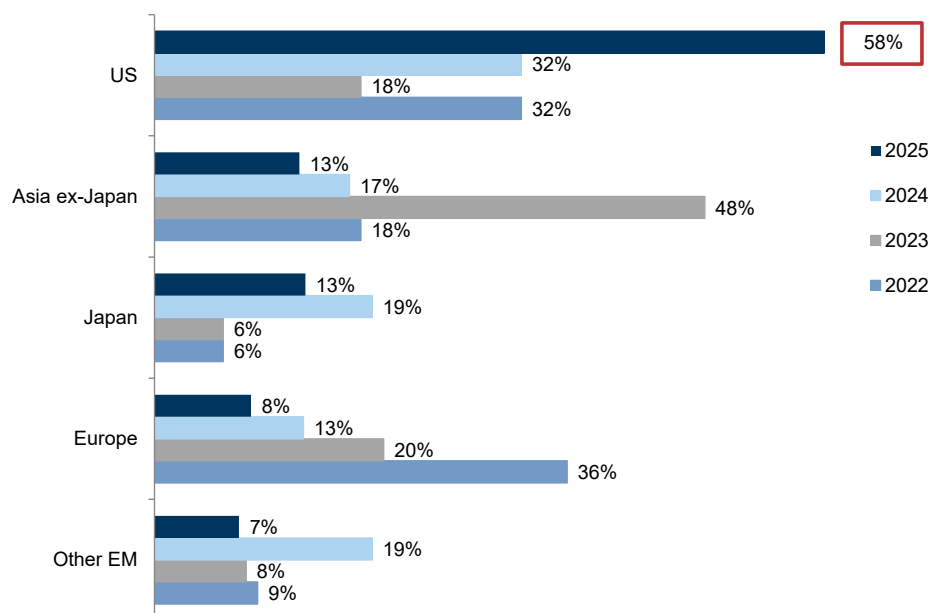
6. The acceleration in the vast sums of money that the dominant technology companies are spending on capex raises two important questions. First, whether the optimism around future growth generated by AI would accrue to the current dominant companies that were spending the money on the capex. Second, whether the optimistic growth rates of leading technology companies could be achieved without complementary growth in companies in other industries – often with much lower valuations – that could facilitate the roll out of infrastructure and increased electrification.

History provides some useful lessons. First, the original capex spenders on revolutionary technology are not always the biggest beneficiaries; the experience of the Telecom companies in the late 1990s is a good example. Second, even very dominant companies eventually succumb to competition – often from new companies in the same sector – just as AMD and Intel experienced, for example, with the ascent of Nvidia. The extent to which these observations are relevant to the current market setup is still not clear. But the news around DeepSeek has been a wake up call that has shaken the confidence that was reflected in market pricing. Indeed, our technology analysts argue “DeepSeek has introduced pricing competition into the foundational model layer at a point in time where models are just about good enough for many enterprise use cases”. The revelation of a cheaper competitor entering the AI space has exposed the risk of concentration. This is relevant because **equity markets are not typically driven by absolute outcomes, but rather by outcomes relative to expectations.**

7. We noted last week that the polling responses to questions asked at our annual Global Strategy Conferences revealed a very strong consensus that the patterns of leadership that drove the returns over the past couple of years is set to continue, leaving room for disappointment. For example, at our London conference, 58% of the votes – the highest ever – were for the US equity market to be the best performer in 2025. This marks an increase from 32% last year and 18% the year before. Meanwhile, Europe remains the least preferred, receiving only 8% of the votes compared to 13% last year (*Exhibit 9*). We find *similar examples* of US exceptionalism as a driver of outperformance in the responses at our Asia Strategy conference where a record low 3% believed Europe would outperform.

Exhibit 9: Which region will perform best in 2025 (in local currency terms)?

Based on respondents at our GS Global Strategy conference, London January 2022, 2023, 2024 & January 2025

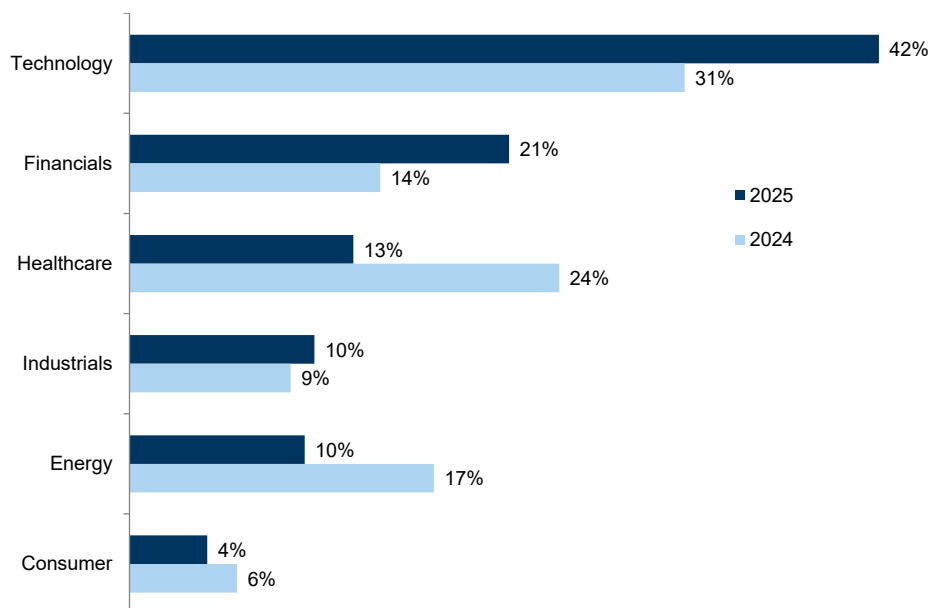


Source: Goldman Sachs Global Investment Research

There was a similar degree of confidence in the ongoing dominance of the technology sector as the likely winner this year ([Exhibit 10](#)).

Exhibit 10: Which sector will perform best in 2025?

Based on respondents at our GS Global Strategy conference, London January 2025

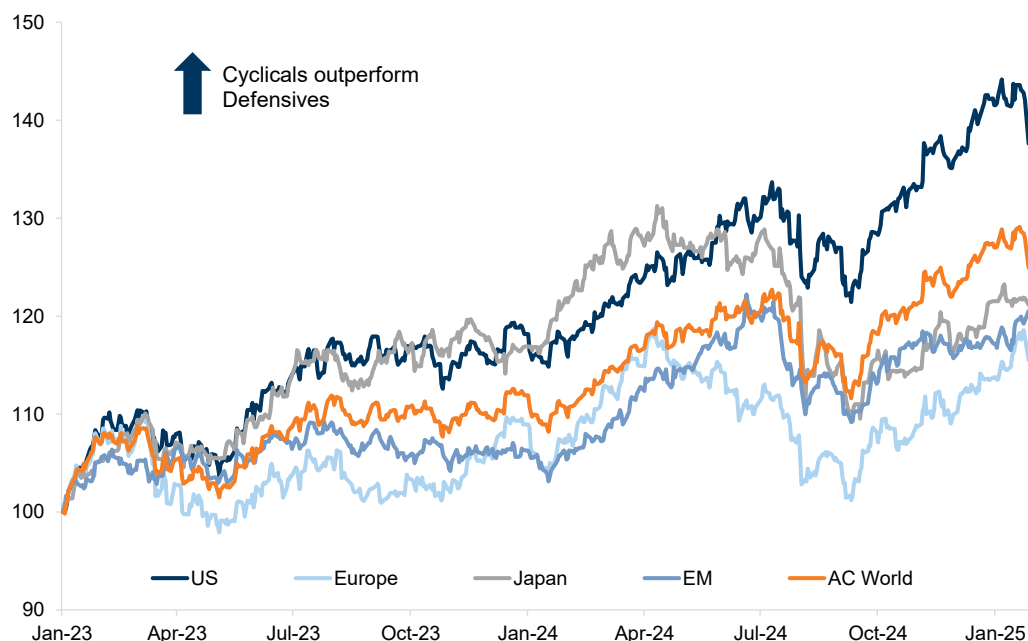


Source: Goldman Sachs Global Investment Research

At the same time, the outperformance of cyclical sectors – a reflection of growing investor confidence in growth – has also led them to become expensive and vulnerable

to any slowing of growth.

Exhibit 11: The strength in equities in recent months has reflected higher growth expectations
Cyclicals vs. defensives price performance. Indexed to 100 on 01-Jan-2023



For details on the construction of the indices, please see: Cyclicals vs. Defensives: A global implementation

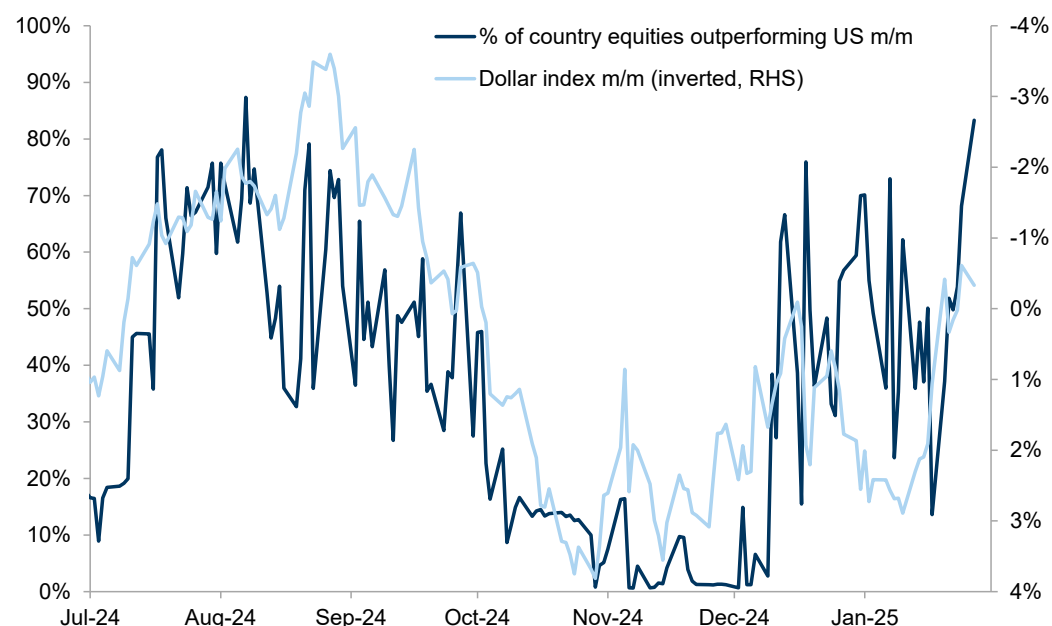
Source: Datastream, Worldscope, Goldman Sachs Global Investment Research

8. While the macro set up for equities remains supportive, we have been recommending that investors stay invested but diversify to improve risk adjusted returns. This takes several forms. First, from an asset allocation perspective, we have recommended staying long equities but hedging the downside risk while also being overweight bonds. Second, within the US, we have recommended focusing on the equally weighted S&P or the S&P 400. Third, from a sector perspective, we have also favoured global growth compounders outside of the technology sector (our list of EX Tech Compounders); these have the advantage of being cheaper than technology but also more diversified. Fourth, geographically we have called for more breadth in investor exposure.

9. Some of these opportunities have begun to pay off triggered by the events this week, and we would anticipate further opportunities to diversify. Bonds, for example, have generally rallied while equities have sold off. Despite expectations so far non-US equity markets have been outperforming since the start of this year (Exhibit 12). Our forecasts point to similar total returns across most regions in 2025, providing a broader scope for diversification.

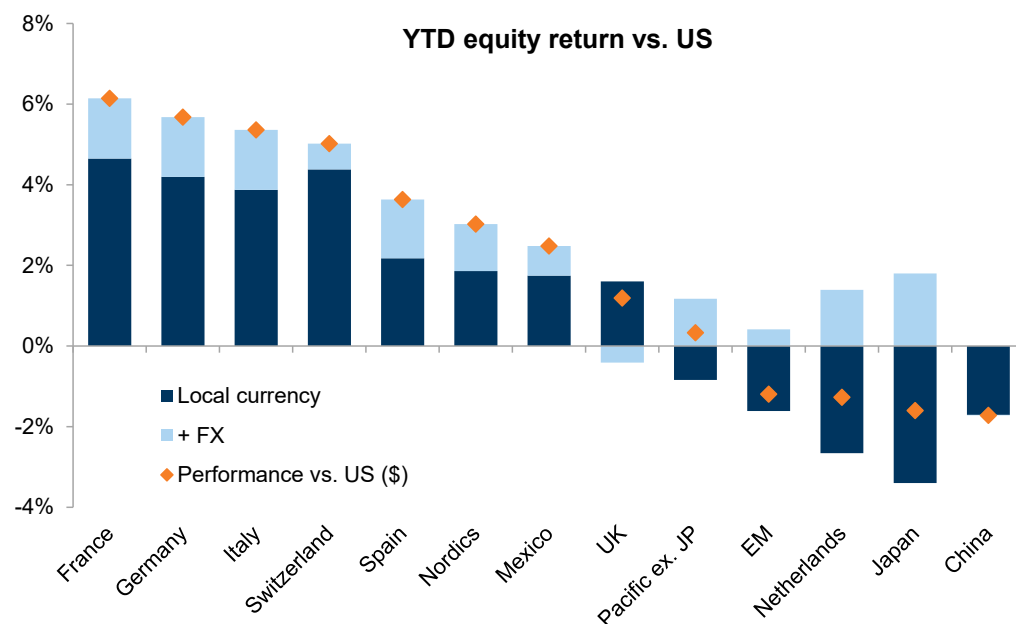
Exhibit 12: Despite expectations, so far non-US equity markets have been outperforming since the start of this year

1-month returns in USD. % of market cap



Source: Datastream, Goldman Sachs Global Investment Research

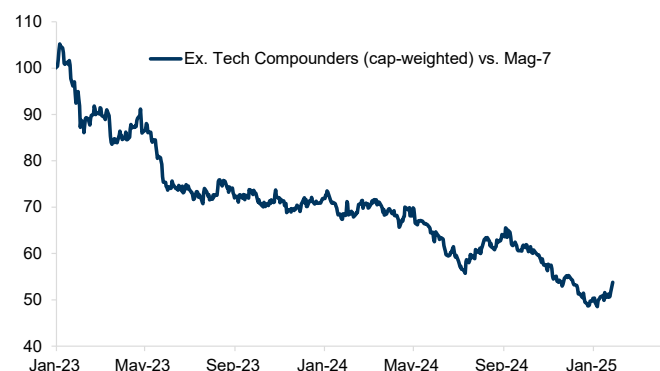
Europe – which was the least favoured market this year according to our survey – has been the best performing ([Exhibit 13](#)) so far. It has benefited from a lower currency but also (as it did in 2022), lower exposure to technology.

Exhibit 13: Europe outperformed YTD, also thanks to the contribution from a weaker dollar


Source: Datastream, Goldman Sachs Global Investment Research

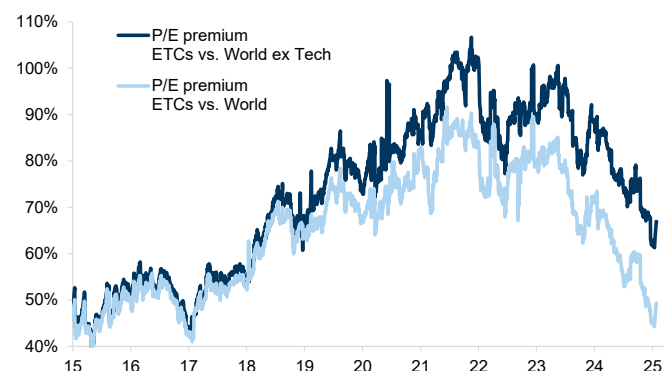
The hit to the technology sector has also resulted in the outperformance of our Ex Tech Compounders (ETCs) list, many of which are relatively defensive companies that remain relatively cheap ([Exhibit 14](#) and [Exhibit 15](#)).

Exhibit 14: The hit to the technology sector has also resulted in the outperformance of our Ex Tech Compounders list (ETCs)...
Performance of Ex-Tech Compounders vs. the Magnificent 7 (indexed to 100 in Jan 2023)



Source: Datastream, Goldman Sachs Global Investment Research

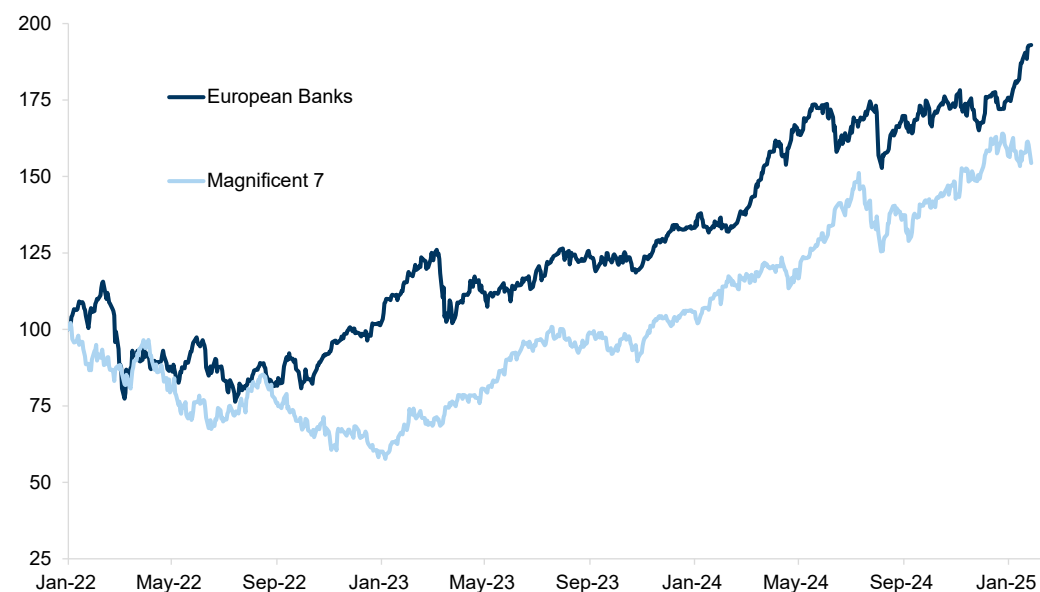
Exhibit 15: ...many of which are relatively defensive companies that remain relatively cheap
12m fwd P/E premium



Source: Datastream, Goldman Sachs Global Investment Research

We have also been suggesting that the bifurcation of growth versus value – a pattern that has dominated equity returns over recent years – is also breaking down in favour of a more eclectic mix of value and growth. While technology grabs much of the headlines, for example, over the past couple of years US technology has outperformed together with European banks, from a total return standpoint ([Exhibit 16](#)). This is a mix of value and growth that we have not seen for many years.

Exhibit 16: While technology grabs much of the headlines, over the past couple of years US technology has outperformed together with, for example, European banks
Total return; Indexed to 100 in Jan 2022



Source: Datastream, Goldman Sachs Global Investment Research

10. Despite the market moves this week, we reiterate our view that this is not a bear market and there remain attractive opportunities both within the US and also in technology. **Interestingly, the PEG ratio for technology versus the World stock market – which had risen sharply in recent months – has now converged** ([Exhibit](#)

17). This suggests that we are not at the start of a major rotation out of all that has performed best into everything that has lagged, but rather are at the start of a longer period of market broadening. This could also provide opportunities for the Hyperscalers as costs come down, and they are less constrained by the supply of chips. It is also noteworthy that our US strategy team's recommendation of broadening out within the technology space into their Phase 3 of the AI evolution with the potential to monetize AI by generating incremental revenues (GSCBAIP3) has outperformed over the past couple of days.

Exhibit 17: The PEG ratio for technology versus the World stock market – which had risen sharply in recent months – has now converged

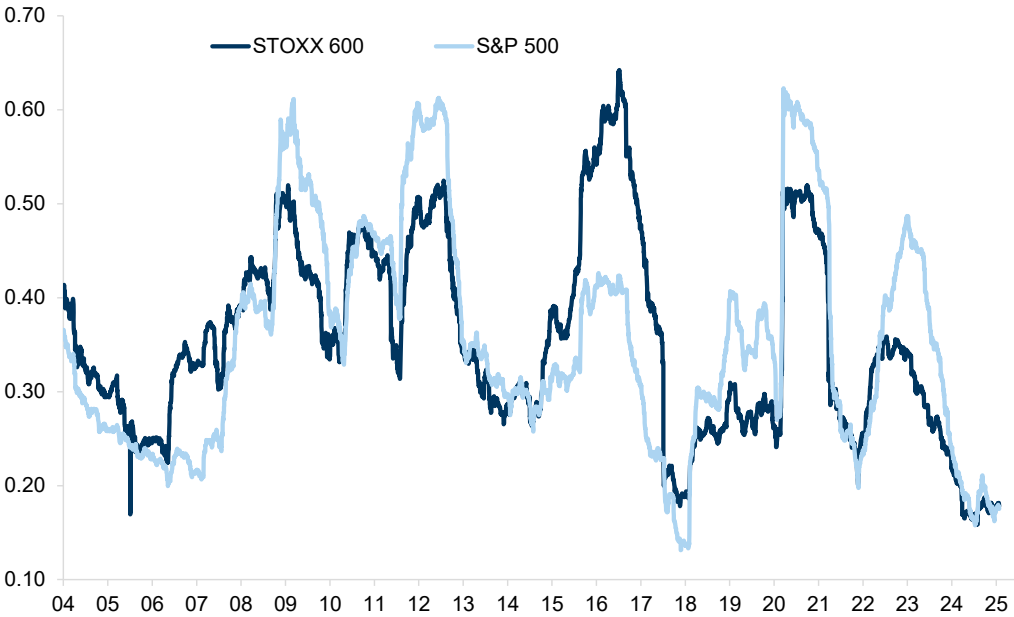
PEG ratio (12m fwd P/E divided by second 12m fwd EPS growth)



Source: Datastream, Goldman Sachs Global Investment Research

Our view remains that this is an opportunity for selectivity and, as stock correlation falls (Exhibit 18) – the year of the Alpha Bet.

Exhibit 18: Pairwise correlations on a 12-month rolling basis have fallen, suggesting a more attractive opportunity set for alpha generation
12m average pairwise correlation



Source: Bloomberg, Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

We, Peter Oppenheimer, Sharon Bell, Guillaume Jaisson and Lilia Peytavin, 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

Marquee disclosure

Marquee is a product of Goldman Sachs Global Banking & Markets. Any Marquee content linked in this report is not necessarily representative of GS Research views. If you need access to Marquee, please contact your GS salesperson or email the Marquee team at gs-marquee-sales@gs.com.

MSCI disclosure

All MSCI data used in this report is the exclusive property of MSCI, Inc. (MSCI). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced or redisseminated in any form and may not be used to create any financial instruments or products or any indices. This information is provided on an "as is" basis, and the user of this information assumes the entire risk of any use made of this information. Neither MSCI, any of its affiliates nor any third party involved in, or related to, computing or compiling the data makes any express or implied warranties or representations with respect to this information (or the results to be obtained by the use thereof), and MSCI, its affiliates and any such third party hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the data have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages. MSCI and the MSCI indexes are service marks of MSCI and its affiliates. The Global Industry Classification Standard (GICS) were developed by and is the exclusive property of MSCI and Standard & Poor's. GICS is a service mark of MSCI and S&P and has been licensed for use by The Goldman Sachs Group.

Equity Basket disclosure

The ability to trade the basket(s) discussed in this research will depend upon market conditions, including liquidity and borrow constraints at the time of trade.

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 compliance officer and investor grievance contact details can be found at this link:

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

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

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

Global product; distributing entities

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

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

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

© 2025 Goldman Sachs.

You are permitted to store, display, analyze, modify, reformat, and print the information made available to you via this service only for your own use. You may not resell or reverse engineer this information to calculate or develop any index for disclosure and/or marketing or create any other derivative works or commercial product(s), data or offering(s) without the express written consent of Goldman Sachs. You are not permitted to publish, transmit, or otherwise reproduce this information, in whole or in part, in any format to any third party without the express written consent of Goldman Sachs. This foregoing restriction includes, without limitation, using, extracting, downloading or retrieving this information, in whole or in part, to train or finetune a machine learning or artificial intelligence system, or to provide or reproduce this information, in whole or in part, as a prompt or input to any such system.