WEEKLY FUND FLOWS

Continued Japan Bond Fund Inflows

Lexi Kanter
+1(212)855-9701 |
alexandra.kanter@gs.com
Goldman Sachs & Co. LLC

Global fund flows, week ending September 2

- Flows into mutual funds and related investment products were positive across both equities and fixed income.
- Net flows into global **equity** funds remained positive in the week ending September 2 (+$3bn vs +$9bn in the previous week), though they have been more subdued in recent weeks. Within DM, US funds drove the net outflows for the second week in a row, while Japan saw net inflows. EM funds also saw net outflows, driven by China and Taiwan funds, while global EM benchmark funds saw continued inflows. At the sector level, technology funds saw the largest net outflows while energy funds saw the largest net inflows.
- Flows into global **fixed income** funds remained well-supported from inflows across fund types. Short-duration bond funds and inflation-protected bond funds have seen sustained inflows. In EM, hard-currency bond funds and local-currency bond funds saw net inflows. **Money market** fund assets increased by +$30bn. At the country level, flows into Japan bond funds have seen a recent increase across both domestic and foreign investors (see *Chart of the Week*). These data capture primarily retail flows. While evidence of broader repatriation has yet to be seen in the official data, we have been flagging that signs of rotation back towards Japanese assets could keep the Yen stronger for longer even without a shift in the global macro backdrop.
- Cross-border **FX flows** were largely positive, and USD and JPY saw the strongest net demand.

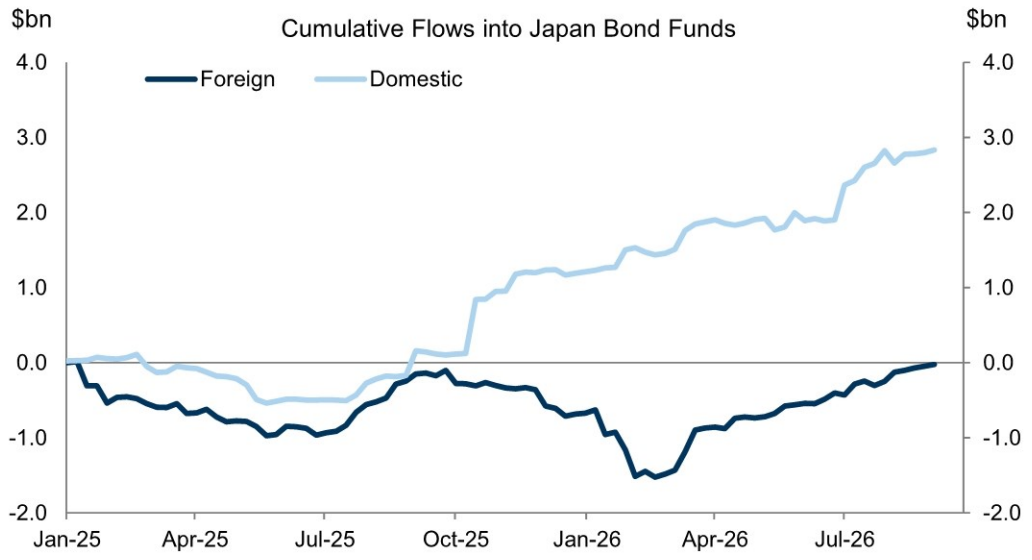
	Global Fund Flows Summary			
	Millions USD		% AUM	
	4wk sum	2-Sep	4wk avg	2-Sep
Equity	68,260	2,842	0.05	0.01
Fixed Income	83,608	18,612	0.21	0.19
of which: EM	8,802	1,129	0.30	0.16
Money Markets	63,352	29,961	0.14	0.26
FX Flows*	85,033	19,382	0.13	0.11

*Cross-border fund flows, excluding hard currency and FX-hedged funds

Source: EPFR, Haver Analytics, Goldman Sachs Global Investment Research

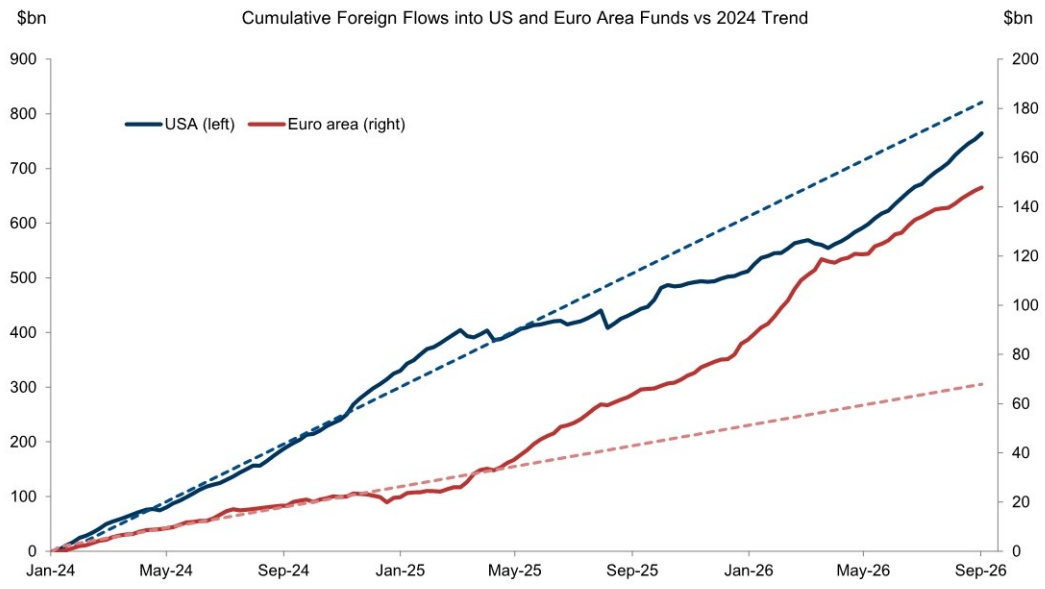
Investors should consider this report as only a single factor in making their investment decision. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to www.gs.com/research/hedge.html.

Exhibit 1: Chart of the Week

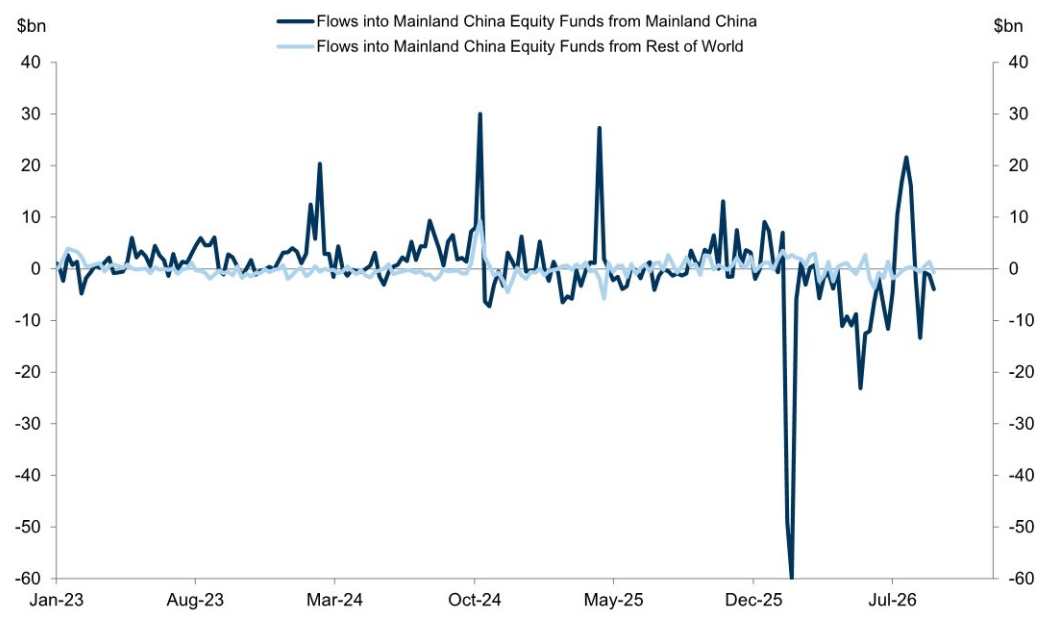


Source: EPFR, Goldman Sachs Global Investment Research, Haver Analytics

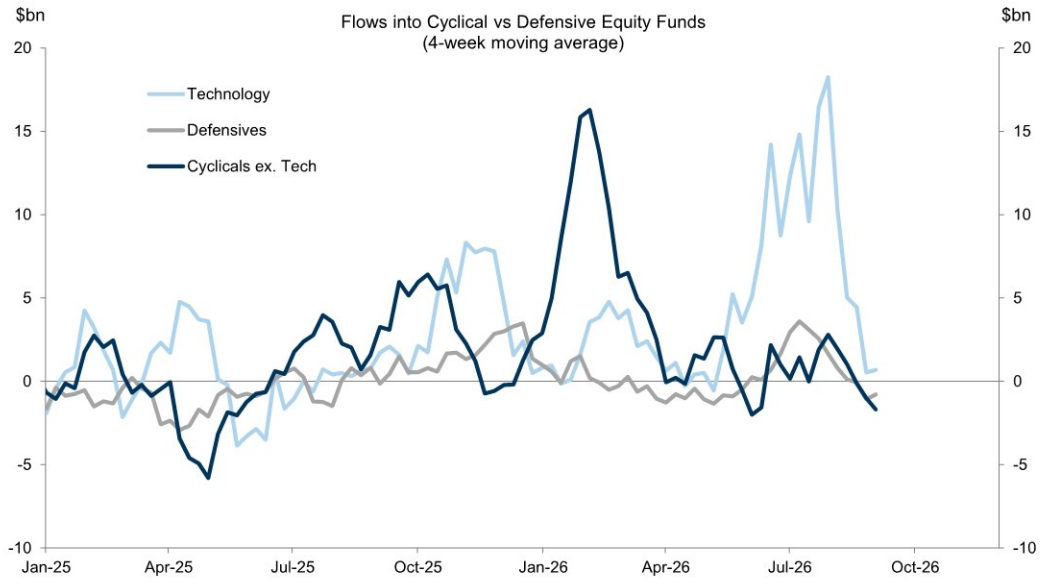
Global Fund Flow Trends



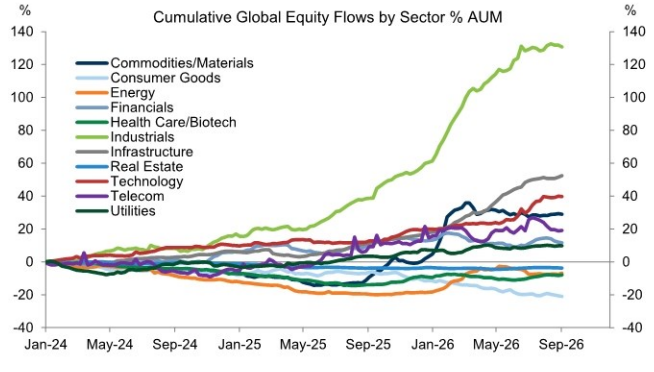
Source: EPFR, Goldman Sachs Global Investment Research



Source: EPFR, Goldman Sachs Global Investment Research

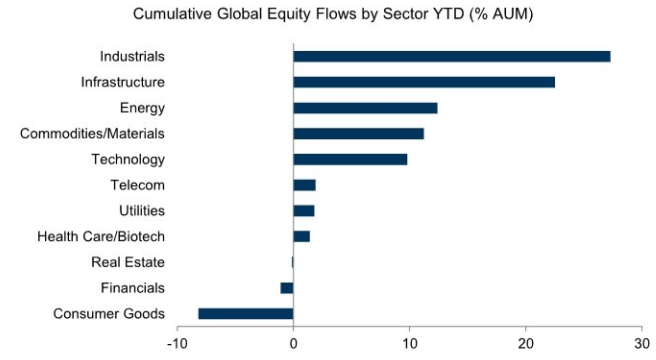


Source: EPFR, Goldman Sachs Global Investment Research



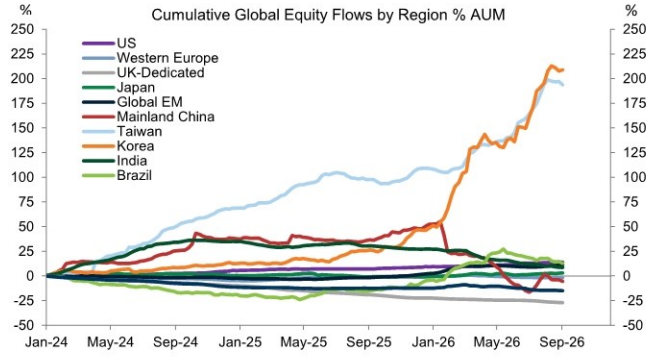
Captures flows to sector-dedicated funds

Source: EPFR, Goldman Sachs Global Investment Research



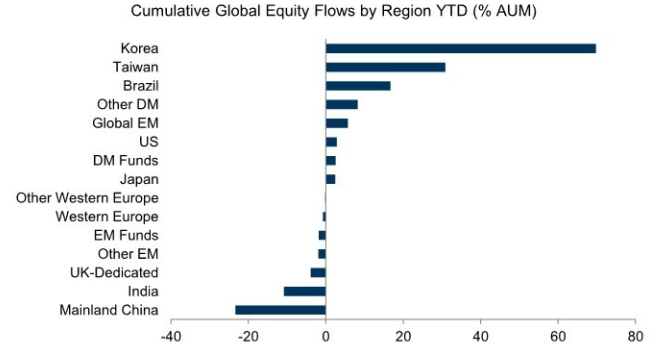
Captures flows to sector dedicated funds

Source: EPFR, Goldman Sachs Global Investment Research



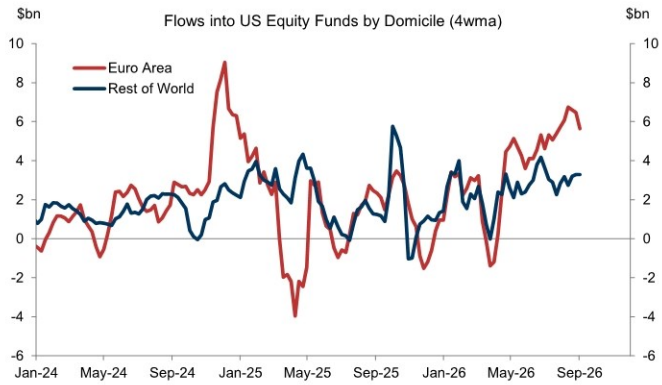
Captures flows to country- and region-dedicated funds

Source: EPFR, Goldman Sachs Global Investment Research

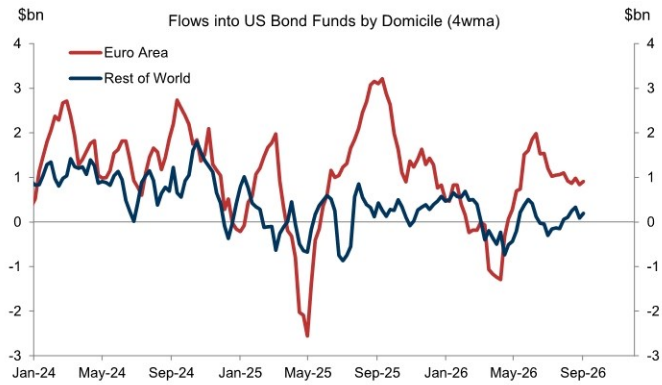


Captures flows to country- and region-dedicated funds

Source: EPFR, Goldman Sachs Global Investment Research



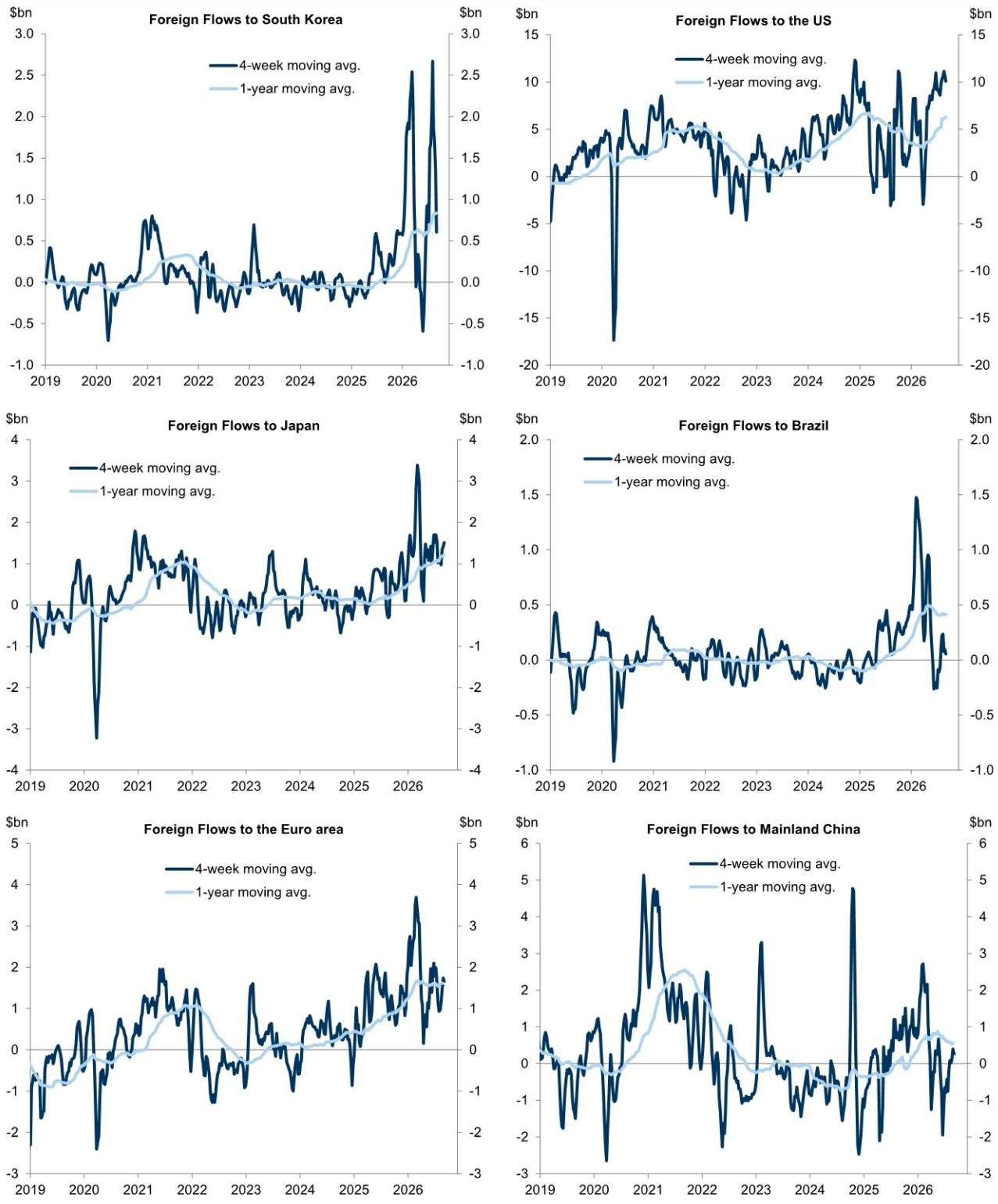
Source: EPFR, Goldman Sachs Global Investment Research



Source: EPFR, Goldman Sachs Global Investment Research

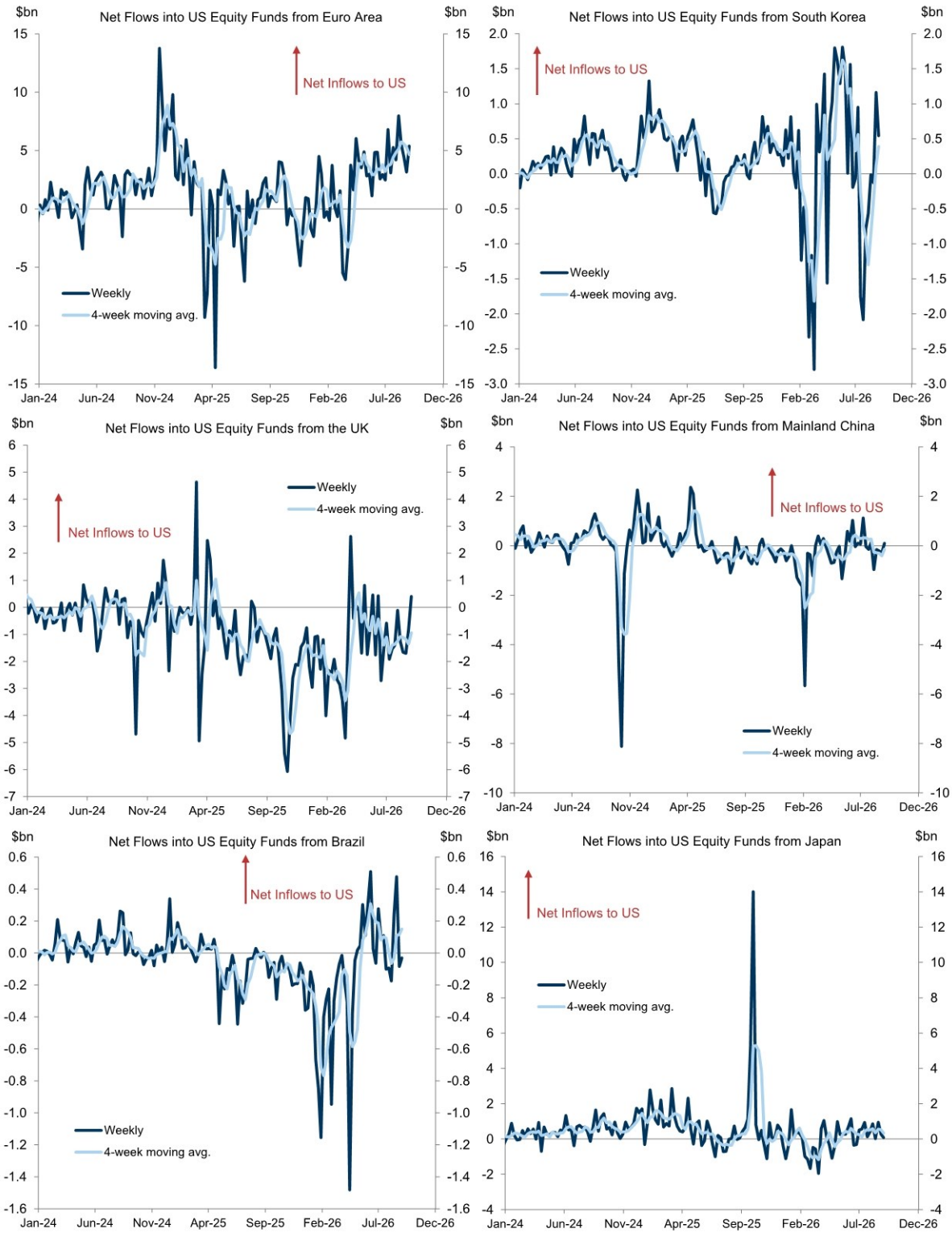


Total Unhedged Foreign Flows By Country



Source: EPFR, Goldman Sachs Global Investment Research

Net Unhedged Flows into US Equity Funds



Source: EPFR, Haver Analytics, Goldman Sachs Global Investment Research

Fixed Income & Equity Flows

	Global Fund Flows							
	Millions USD					% AUM		Z-score of
	4wk sum	2-Sep	26-Aug	19-Aug	12-Aug	4wk avg	2-Sep	4wk sum
Total Equity	**68,260**	**2,842**	**9,243**	**40,090**	**16,085**	**0.05**	**0.01**	**0.13**
Global Benchmarks[1]	**44,442**	**11,841**	**9,885**	**11,654**	**11,061**	**0.14**	**0.15**	**1.46**
Including US	33,486	9,550	6,891	8,791	8,255	0.15	0.18	1.71
Excluding US	10,956	2,292	2,994	2,864	2,806	0.11	0.09	0.47
Developed Markets[2]	**40,993**	**-3,609**	**-1,088**	**28,812**	**16,877**	**0.05**	**-0.02**	**0.09**
US	34,261	-5,891	-4,390	28,929	15,613	0.05	-0.03	-0.08
Western Europe	2,169	846	-150	242	1,230	0.03	0.04	0.52
UK-dedicated	-2,317	-475	-331	-985	-526	-0.17	-0.14	-0.26
Other	4,486	1,321	181	1,228	1,756	0.06	0.07	0.53
Japan	2,557	1,360	2,663	-1,711	245	0.05	0.11	0.36
Other	2,005	76	789	1,351	-211	0.11	0.02	0.14
Emerging Markets[3]	**-17,175**	**-5,390**	**445**	**-377**	**-11,853**	**-0.14**	**-0.18**	**-0.92**
Global EM Benchmarks	8,693	2,204	2,267	2,147	2,075	0.15	0.16	0.97
Mainland China	-20,851	-5,213	-376	-739	-14,522	-0.76	-0.80	-0.83
Taiwan	-2,589	-1,695	181	-400	-676	-0.24	-0.63	-1.68
Korea	367	418	-1,285	-758	1,993	0.06	0.22	-0.44
India	-882	-170	-270	-366	-77	-0.27	-0.21	-0.78
Brazil	-963	-345	87	-234	-471	-1.04	-1.40	-1.68
Other	-951	-590	-158	-28	-175	-0.06	-0.16	0.15
Equity Sector Flows								
Commodities/Materials	972	-376	464	152	732	0.08	-0.13	0.05
Consumer Goods	-3,441	-534	-1,070	-737	-1,100	-0.42	-0.27	-0.92
Energy	1,728	1,925	-557	36	325	0.13	0.58	0.50
Financials	-8,770	-1,069	-2,322	-4,102	-1,277	-0.46	-0.23	-1.68
Health Care	-798	1,212	-1,067	-162	-780	-0.04	0.28	0.13
Industrials	-688	-869	-53	-657	891	-0.07	-0.32	-0.93
Infrastructure	1,361	722	626	-30	44	0.22	0.48	0.28
Real Estate	-892	-97	-320	-329	-146	-0.04	-0.02	-0.13
Technology	2,760	-2,463	7,533	1,125	-3,435	0.03	-0.11	-0.47
Telecom	-1,111	172	-404	24	-904	-0.33	0.21	-0.86
Utilities	-334	128	180	-437	-205	-0.04	0.07	-0.30
High Beta[4]	-4,733	-1,952	-918	-2,220	357	-0.16	-0.27	-0.95
Low Beta[4]	-2,931	-271	-859	-917	-884	-0.11	-0.04	-0.60
Total Fixed Income	**83,608**	**18,612**	**18,843**	**22,074**	**24,080**	**0.21**	**0.19**	**0.97**
Developed Markets[5]	**72,336**	**17,130**	**14,718**	**18,106**	**22,382**	**0.20**	**0.19**	**0.81**
Government	25,044	6,175	4,245	7,410	7,215	0.37	0.37	1.56
Mortgage-backed	2,808	492	1,194	497	626	0.23	0.16	0.48
Municipal	5,355	205	2,285	1,278	1,587	0.19	0.03	0.74
Agg-type	21,155	7,310	3,902	5,515	4,428	0.18	0.25	0.33
IG Credit	4,063	-1,841	2,426	321	3,156	0.09	-0.16	-0.36
High yield	1,757	1,503	-720	668	307	0.06	0.21	-0.10
Bank loan	2,283	-551	812	582	1,441	0.30	-0.28	0.15
Long-duration[6]	6,555	1,502	816	2,594	1,643	0.32	0.29	0.28
Short-duration[6]	34,657	11,863	9,028	5,966	7,800	0.36	0.50	1.81
Inflation-protected	2,033	279	160	794	800	0.28	0.16	1.02
Emerging Markets	**8,802**	**1,129**	**3,001**	**3,264**	**1,408**	**0.30**	**0.16**	**1.07**
Hard	1,093	28	516	440	109	0.10	0.01	0.62
Blend	531	126	141	160	104	0.19	0.18	0.63
Local	7,177	975	2,344	2,664	1,195	0.46	0.25	1.08
Money Markets	**63,352**	**29,961**	**9,198**	**-1,246**	**25,440**	**0.14**	**0.26**	**-0.19**

1. Primarily MSCI World and MSCI ACWI benchmarks. 2. Sum of DM country- and region-dedicated funds; excludes global DM benchmark funds (e.g. MSCI World funds). 3. Sum of Global EM benchmark funds and EM country- and region-dedicated funds. 4. High beta funds include commodity, financial, & industrial sector funds. Low beta funds include consumer goods, real estate, & utility sector funds. 5. Benchmarks may include some investment grade EM bonds; categories below include DM & EM funds. 6. Long-duration includes long-term Agg-type, long-term corporate, and long-term government bond funds. Short-duration includes short-term Agg-type, short-term corporate, and short-term government bond funds.

Source: EPFR, Haver Analytics, Goldman Sachs Global Investment Research

FX Flows

	FX Flows[1]							
	Millions USD					% AUM		Z-score of
	4wk sum	2-Sep	26-Aug	19-Aug	12-Aug	4wk avg	2-Sep	4wk sum
Total	**85,033**	**19,382**	**18,002**	**22,141**	**25,509**	**0.13**	**0.11**	**1.27**
G10	**64,214**	**16,792**	**12,901**	**16,283**	**18,239**	**0.14**	**0.15**	**1.69**
USD	40,333	11,128	7,719	10,471	11,015	0.16	0.18	1.42
EUR	6,604	1,283	1,544	1,652	2,126	0.12	0.09	0.85
GBP	4,356	1,100	1,108	736	1,411	0.10	0.10	0.51
AUD	932	341	200	165	226	0.12	0.17	1.09
NZD	67	20	15	15	17	0.14	0.15	0.86
CAD	1,942	486	380	765	311	0.14	0.14	1.03
CHF	2,379	540	398	600	840	0.13	0.12	1.20
NOK	394	28	54	124	187	0.09	0.03	0.58
SEK	1,163	213	179	294	477	0.12	0.09	1.12
JPY	6,045	1,652	1,304	1,459	1,631	0.15	0.16	1.40
Asia	**8,252**	**1,095**	**2,623**	**2,172**	**2,363**	**0.08**	**0.04**	**0.62**
CNY	1,057	-577	1,555	649	-570	0.04	-0.08	0.25
HKD	479	109	113	139	118	0.11	0.10	0.93
INR	128	69	6	-86	139	0.01	0.02	-0.22
KRW	2,423	521	-51	301	1,653	0.11	0.11	0.53
MYR	194	47	67	42	38	0.14	0.13	0.81
SGD	523	158	82	133	149	0.13	0.15	1.73
TWD	2,814	641	658	805	710	0.12	0.11	1.39
THB	196	42	52	66	36	0.11	0.09	0.83
IDR	293	71	96	74	52	0.16	0.15	0.72
PHP	147	14	47	48	38	0.15	0.05	1.08
Americas	**1,257**	**564**	**720**	**-169**	**142**	**0.08**	**0.14**	**0.12**
ARS	22	-5	20	-2	9	0.06	-0.05	-0.21
BRL	220	287	329	-346	-51	0.02	0.14	-0.21
MXN	508	151	215	58	85	0.12	0.14	0.50
CLP	174	45	54	36	39	0.14	0.14	0.51
PEN	144	38	47	30	29	0.15	0.15	0.58
COP	189	48	55	55	31	0.18	0.18	0.84
EMEA	**1,658**	**344**	**403**	**438**	**473**	**0.16**	**0.13**	**0.85**
CZK	94	20	22	27	25	0.11	0.10	0.22
HUF	189	39	48	57	45	0.17	0.14	1.17
PLN	438	69	84	101	184	0.21	0.12	1.12
RON	97	18	30	28	21	0.16	0.12	0.62
RUB	4	1	1	1	1	0.10	0.08	0.56
TRY	182	44	53	47	39	0.19	0.18	0.93
ILS	247	55	56	67	69	0.13	0.12	0.67
ZAR	407	99	108	110	90	0.15	0.14	0.65
Frontier	**232**	**49**	**75**	**72**	**36**	**0.11**	**0.09**	**0.43**
UAH	15	3	5	5	1	0.20	0.18	0.92
EGP	67	16	20	19	11	0.16	0.15	0.76
NGN	43	10	14	13	6	0.17	0.16	0.99
KWD	18	6	6	4	2	0.13	0.15	0.91
SAR	89	14	30	31	15	0.07	0.05	0.16

Note: AUM is calculated at the domicile level.

1. FX flows are measured as cross-border equity and fixed income fund flows (based on the domicile of underlying funds), excluding hard currency EM-bond funds and FX-hedged products.

Source: EPFR, Goldman Sachs Global Investment Research

The G10 FX Strategy Team

Michael Cahill
+44(20)7552-8314
michael.e.cahill@gs.com
Goldman Sachs International

Karen Reichgott Fishman
+1(212)855-6006
karen.fishman@gs.com
Goldman Sachs & Co. LLC

Stuart Jenkins
+44(20)7051-4700
stuart.jenkins@gs.com
Goldman Sachs International

Lexi Kanter
+1(212)855-9701
alexandra.kanter@gs.com
Goldman Sachs & Co. LLC

Disclosure Appendix

Reg AC

I, Lexi Kanter, hereby certify that all of the views expressed in this report accurately reflect my 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.

Contributing Authors: Lexi Kanter Goldman Sachs & Co. LLC.

Unless otherwise stated, the individuals listed in the Contributing Authors disclosure 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; registered market maker. 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 a subject company, public appearances and trading in securities covered 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, 10th Floor, Ascent-Worli, Sudam Kalu Ahire Marg, Worli, 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. 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, a copy of the annual compliance audit report and other relevant information and disclosures can be found at this link: https://www.goldmansachs.com/worldwide/india/research-analyst. **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, and Investment Management Association of Japan. 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: 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 within the European Economic Area.

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, make a market or act as liquidity provider in, and buy or sell, any securities, derivatives, or other financial instruments referred to in this research (including any financial instruments issued by the companies referred to herein), 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.goldmansachs.com/disclosures/cftc_fcm_disclosures. 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.

© 2026 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.