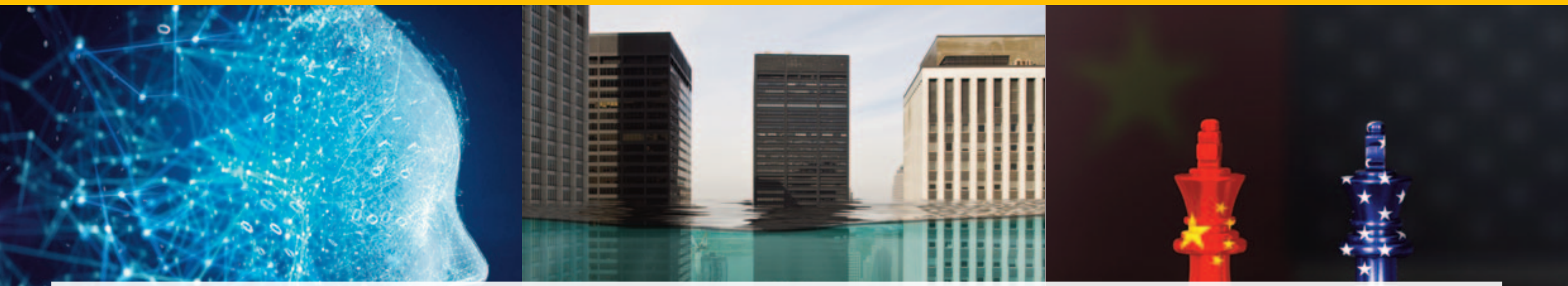

Goldman Sachs

Special Issue | December 18, 2023 | 4:00 PM EST

GLOBAL MACRO RESEARCH

# TOP *of* MIND

# 2023: 3 THEMES IN CHARTS

In this very special Top of Mind year-end edition,
Charting the story of this year is our mission.
2023 wasn't just about Taylor's wildest dreams,
But also three important themes.

Markets worried first about growth, but then sticky inflation,
Which meant that higher interest rates could be here for the duration.
This **higher-for-longer rate environment** came with consequences galore,
Bringing bank panics, corporate credit concerns, and commercial real estate risks to the fore.

Notable **political and geopolitical developments** also occurred,
Like rising US-China tensions, which makes more decoupling all but assured.
The US hitting its debt limit, which, as usual, set off a political fight,
And the Israel-Hamas war, which thrust the Middle East back into the spotlight.

Amid all that, two **longer-term** questions attracted heated debate:
Can US economic and asset outperformance continue?
And is the potential of generative AI really that great?

We hope you find our favorite 2023 charts on these themes insightful,
And our annual crossword—which you can solve by reading our 2023 pieces—delightful.
Thank you for your readership, and hope your holidays are filled with joy and more,
We can't wait to engage with you again in 2024.

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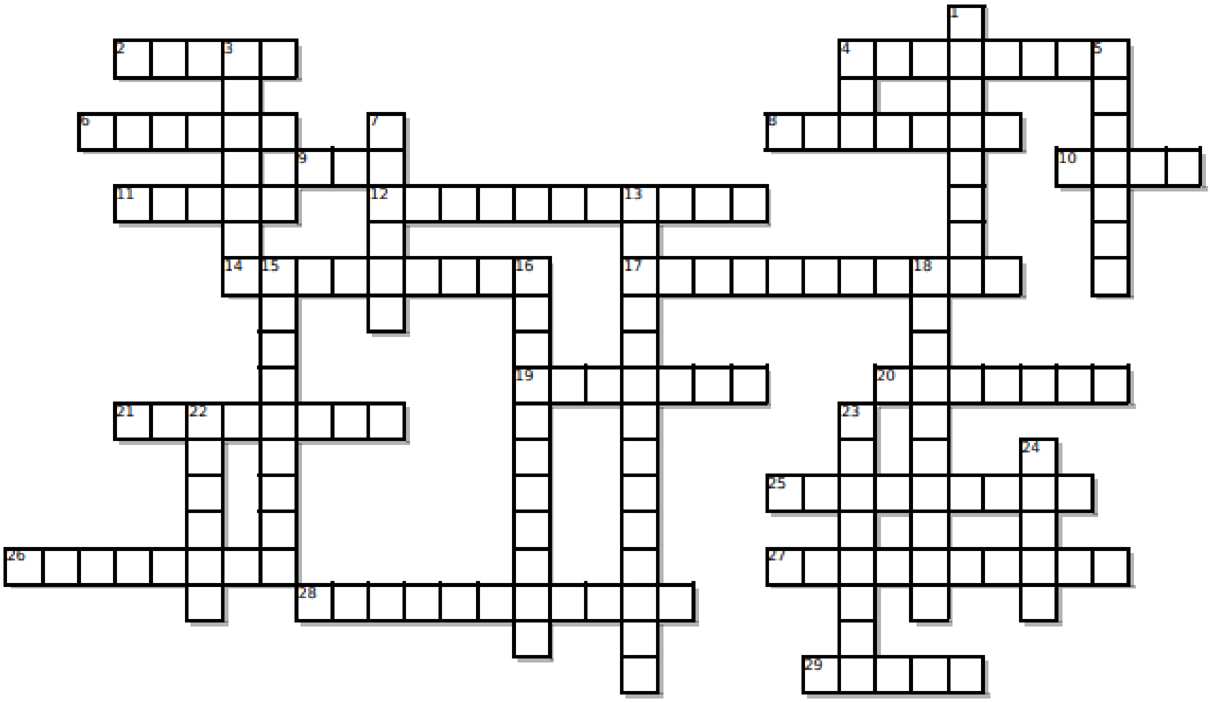
# Revisiting 2023 themes, crossword-style



**Across:**

2. GS MENA economist Farouk Soussa warns that the current war in Gaza will pose challenges for regional economies, with, for example, tourism already hard hit in ____________ (Issue 124).
4. GS Chief Global Equity Strategist Peter Oppenheimer argues that US equity outperformance over the last decade likely won't be ____________ to the same extent over the next decade (Issue 123).
6. The US corporate debt ____________ is relatively light today given that many companies took advantage of extraordinarily low interest rates in the post-GFC period to lock in cheap debt, according to GS US equity strategist Ben Snider (Issue 121).
8. NYU's Gary Marcus argues that we are very far from achieving artificial ____________ intelligence (Issue 120).
9. Goldman Sachs economists find that the peak drag on US growth from a tightening in financial conditions occurs after ____________ quarters, on average (Issue 115).
10. Heading into 2023, GS multi-asset strategist Christian Mueller-Glissmann made the case that ____________ was not trash (Issue 116).
11. Columbia University's Takatoshi Ito characterized the BoJ's December 2022 yield curve control (YCC) adjustment as them putting on their ____________ in preparation for exit from their very accommodative monetary policy stance (Issue 116).
12. RXR's Scott Rechler warns that current concerns around office real estate could eventually spread to the ____________ sector (Issue 122).
14. The Carlyle Group's David Rubenstein argues that the most successful investors are ones that invest in ___________ market conditions (Issue 115).
17. Management focus on ___________ returns largely explains superior US equity performance since 2000, according to GS US equity strategists David Kostin and Lily Calcagnini (Issue 123).
19. The debt ____________ is a rare feature of the US political system that potentially limits the ability of the executive branch to fund spending that it is legally obligated to spend (Issue 119).
20. The US budget deficit has roughly ______ over the past year (Issue 123).
21. The US Constitution grants the power of issuing debt solely to ____________ (Issue 119).
25. GS EM strategist Tadas Gedminas makes the case that structural shifts in Israel's economy over the past two decades have left it more __________ to challenges than in the past (Issue 124).
26. Conviction's Sarah Guo says we're entering an era of "________ 3.0" in which foundational large language models are now widely available, which makes gen AI technology more accessible and less expensive (Issue 120).
27. Columbia Business School's Stijn Van Nieuwerburgh believes that the crisis in the office real estate market is a ______ in slow motion (Issue 122).
28. BlackRock's Rick Rieder argues that the economy tends to follow the ____________ curve over the medium term, only veering from it during periods of extraordinary monetary or fiscal stimulus or an exogenous shock, like the pandemic (Issue 116).
29. In the US, bank loans to the office real estate sector account for roughly ____________ percent of total US bank loans (Issue 122).

**Down:**

1. A supply shock only changes a ____________ price, whereas inflation is the phenomenon of all prices and wages rising together, according to Stanford Hoover Institution's John Cochrane (Issue 115).
3. Saba Capital Management's Boaz Weinstein warns that "amend and __________" cannot prevent defaults from eventually occurring (Issue 121).
4. The failure of SVB and Signature Bank was a classic bank ____________ say Daniel Tarullo, former Chairman, Federal Reserve Board's Committee on Supervision and Regulation, and Yale's Gary Gorton (Issue 117).
5. David Beers, former Head of Sovereign Credit Ratings at Standard & Poor's, says it is not true that sovereigns can't ____________ on their local currency debt (Issue 119).
7. GS credit strategists Michael Puempel and Ben Shumway find that so-called ____________ firms—economically unviable firms that survive only thanks to cheap debt—represent only a sliver of US public debt markets (Issue 121).
13. Both Edward Djerejian, former US Ambassador to Israel and Syria, and Emile Hokayem, Director of Regional Security and Senior Fellow for Middle East Security at IISS, worry that a ___________ could lead to a wider conflict in the Middle East (Issue 124).
15. A key debate that emerged from the failure of SVB and Signature Bank in March was whether the federal deposit ____________ limit should be raised (Issue 117).
16. Harvard's Graham Allison argues that US-China competition today is a classic ____________ rivalry, whereby a rapidly rising power is threatening to displace a major ruling power (Issue 118).
18. Rhodium Group's Daniel Rosen argues that the substantial daylight between the economic systems of the US and China means further ____________ is likely (Issue 118).
22. ____________ networks are mathematical models inspired by the human brain structure (Issue 120).
23. The cause of the 1Q23 US bank failures was an underlying duration ____________ between the asset and liability sides of bank balance sheets, according to GS bank analyst Richard Ramsden (Issue 117).
24. A seminal moment in the semiconductor industry occurred in 2010 when ____________ opened a chip manufacturing factory in Dalian, China, according to semiconductor industry veteran Richard Hill (Issue 118).

*Puzzle made at www.puzzle-maker.com.*
*Solutions on pg. 41.*

# In the words of our 2023 interviewees

**"Given the role that bank runs played in this episode—and especially the extraordinary speed of deposit outflows—I couldn't agree more with the calls to review liquidity regulations."**
**– Daniel K. Tarullo, former Chairman, Federal Reserve Board's Committee on Supervision and Regulation**
*(Issue 117, April 3)*

"It's just not feasible for the US, China, or any place else for that matter to become self-sufficient in semiconductors."
– Richard Hill, former Chairman of the Board, Marvell Technology, former CEO and Chairman, Novellus Systems
*(Issue 118, May 1)*

"Four years ago, I joked that, should you ever find yourself in a situation where the robots are coming for you, just close the door. And it's still true that robots can't open doors… We are nowhere near achieving artificial general intelligence (AGI). Those who believe AGI is imminent are almost certainly wrong."
– Gary Marcus, Professor Emeritus of Psychology and Neural Science, New York University
*(Issue 120, July 5)*

"The potential for a miscalculation that turns the conflict into an all-out war remains significant; rational actors can make a strategic decision not to escalate and still become entangled in an escalatory spiral."
– Emile Hokayem, Director of Regional Security and Senior Fellow for Middle East Security, International Institute for Strategic Studies
*(Issue 124, December 5)*

**"Central banks can hold the line longer than many people believe. While I don't agree with YCC and think that negative interest rates don't make sense given the negative impacts of chronically low rates on capital formation, pension and banking systems, and the economy, I see no limit to the amount of JGBs the BoJ can buy. So, they can stick with the policy for a long time, even if it's not good policy."**
**– Rick Rieder, CIO of Global Fixed Income, BlackRock**
*(Issue 116, February 23)*

**"When a rapidly rising power threatens to displace a major ruling power, both become increasingly hostile toward the other… this is a classic Thucydidean rivalry… So, as I wrote in 2016: expect things to get worse before they get worse."**
**– Graham Allison, Professor, Harvard University, former US Assistant Secretary of Defense**
*(Issue 118, May 1)*

**"Over the next couple of years, the CRE problem won't just be an office problem—multifamily will almost certainly be an area of stress… all real estate assets will need to come to terms with the higher rate environment."**
**– Scott Rechler, Chairman and CEO, RXR**
***(Issue 122, October 9)***

"You can't solve every problem with higher capital and liquidity requirements. Amid huge demand for safe assets, not enough of them exist to back up all short-term debt."
– Gary Gorton, Professor, Yale School of Management
*(Issue 117, April 3)*

**"As often as I hear the phrase "amend and extend", I hear "amend and pretend." In many cases, financial creativity can be used to forestall the inevitable, but the inevitable ultimately happens."**
**– Boaz Weinstein, Founder and CIO, Saba Capital Management**
*(Issue 121, August 10)*

"We must dispense with the illusion that the Palestinian issue can be solved through economic or investment initiatives and return to the negotiating table on the basis of land-for-peace and the two-state solution, which is the only approach that would allow for a democratic Jewish state to peacefully and securely coexist alongside an independent Palestinian sovereign state."
– Edward P. Djerejian, former US Ambassador to Israel and Syria, former US Assistant Secretary of State for Near Eastern Affairs
*(Issue 124, December 5)*

**"Based on what I know, PE marks are more likely to rise than decline in 2023."**
**– David Rubenstein, Co-Founder and Co-Chairman, The Carlyle Group**
*(Issue 115, January 27)*

**"All told, we feel pretty good about the possibility of a soft landing… Many sources of disinflation that we expect are "freebies", in that they don't require substantial economic weakness to play out."**
**– Jan Hatzius, GS Chief Economist and Head of Global Investment Research**
*(Issue 115, January 27)*

"We're entering the era of what I think of as "Software 3.0"… companies don't need to collect nearly as much training data, which suddenly makes [generative AI] technology much more useful, accessible, and less expensive."
– Sarah Guo, Founder, Conviction, former General Partner, Greylock
*(Issue 120, July 5)*

"A supply shock only changes a relative price. Inflation is the phenomenon of all prices and wages rising together, which comes from the government inducing more demand in the face of a supply shock."
– John Cochrane, Senior Fellow, Hoover Institution at Stanford University
*(Issue 115, January 27)*

"It could easily take several years for the office market to stabilize, which is why I've referred to all this as a trainwreck in slow motion."
– Stijn Van Nieuwerburgh, Professor of Real Estate and Finance, Columbia Business School
*(Issue 122, October 9)*

**"The stress tests required under [Dodd-Frank], while valuable, were incorrectly thought to be more useful than understanding that we cannot predict where problems will come from and how they might evolve."**
**– Thomas Hoenig, former President, Federal Reserve Bank of Kansas City and former Vice Chairman, FDIC**
*(Issue 117, April 3)*

"Was the December [BoJ] shift actually the first step toward exit? I would say maybe it wasn't the first step, but perhaps preparation for the first step; I would think of it as the BoJ putting on its shoes."
*– Takatoshi Ito, former Deputy Vice Minister for International Affairs, Japanese Ministry of Finance*
*(Issue 116, February 23)*

*Note: All quotes came from interviews that appeared in GS Top of Mind reports in 2023.*
*Source: Goldman Sachs GIR.*

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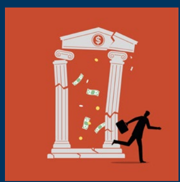
*Markets worried first about growth*



*but then sticky inflation, which meant that higher interest rates could be here for the duration.*

*This* ***higher-for-longer rate environment*** *came with consequences galore*



*Bringing bank panics,*

*corporate credit concerns,*

*and commercial real estate risks to the fore.*

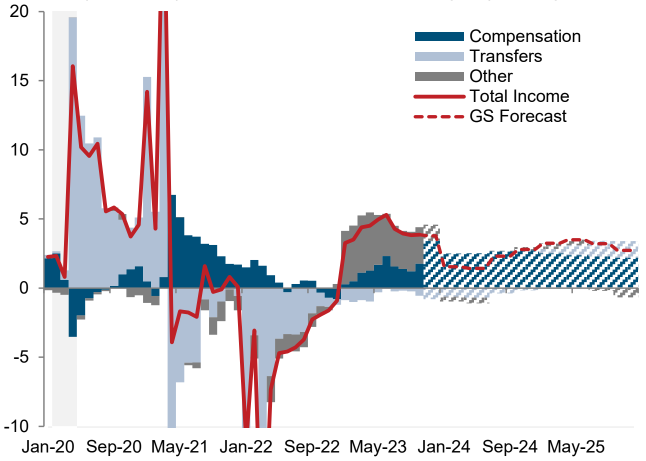
Pgs. 5-17

# Ample soft landing evidence (so far)

**"The title of our [2024] annual outlook report… is that the hard part is over. The reason why I think the hard part is over is that we have proof of concept that we can bring down inflation and rebalance the labor market without having to crush the economy and put the economy into recession, and I think we've seen that very clearly in 2023."**
**– Jan Hatzius, Chief Economist and Head of Global Investment Research, Goldman Sachs**
*(Bloomberg Odd Lots interview, December 2023)*

Real disposable personal income grew at a solid pace this year, as we expected, and we expect continued growth in 2024/25

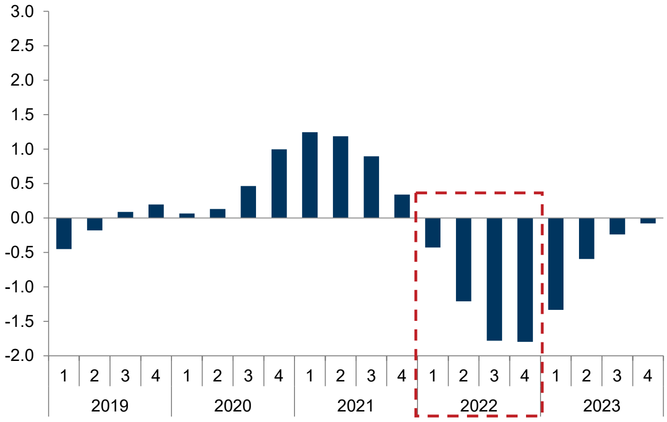
Real disposable personal income, % change, year ago




*Note: Light grey shading in early 2020 indicates NBER recession.*
*Source: Goldman Sachs GIR.*

We have long held that the lags from financial conditions on GDP *growth* are relatively short, meaning that the US economy bore the brunt of the 2022 tightening in financial conditions that year

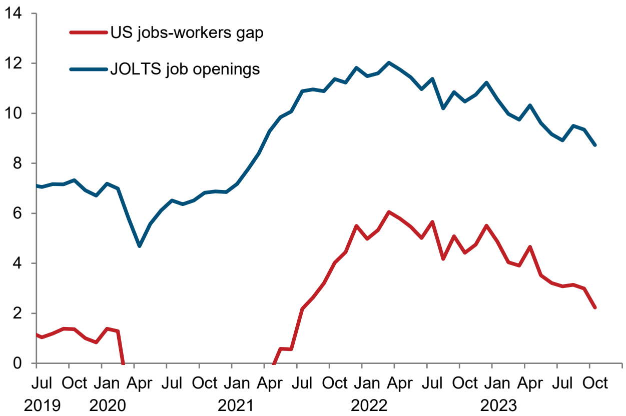
Real US GDP growth impulse from GS financial conditions index (FCI), 3-quarter centered moving average, pp




*Source: Goldman Sachs GIR.*

As we expected, the jobs-workers gap shrank mainly through a decline in job openings without a sharp rise in unemployment

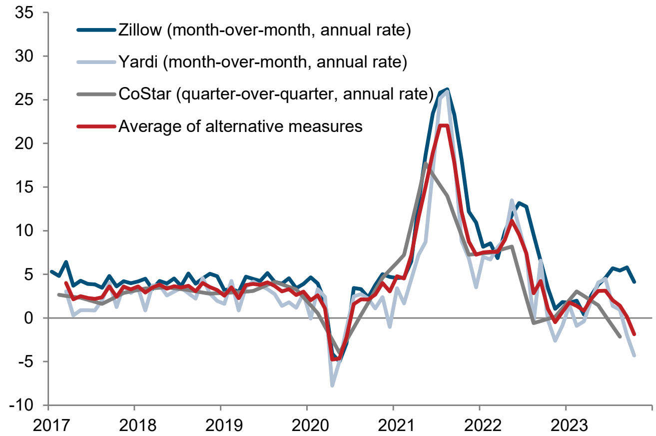
Millions




*Source: Department of Labor, Goldman Sachs GIR.*

The best alternative measures of new lease rent growth have generally continued to slow

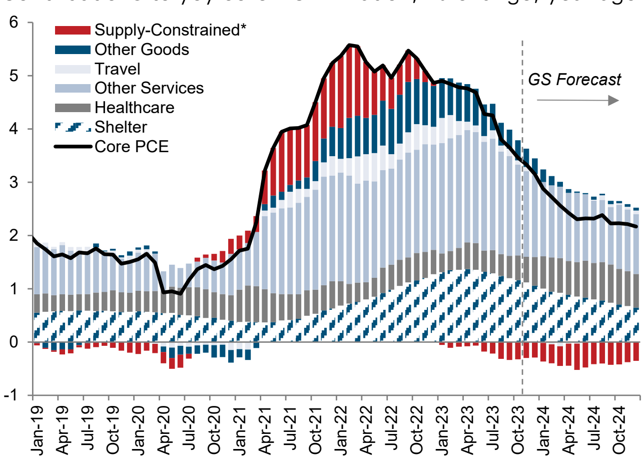
Sequential pace of alternative rent measures, % change, SA




*Source: Department of Commerce, Census Bureau, CoStar, Zillow, REIS, GS GIR.*

Core PCE inflation declined sharply this year, as we expected…

Contributions to yoy core PCE inflation, % change, year ago




**New, used, and rental cars, furniture, sporting equipment, household appliances, sports and rec vehicles, video, audio, photo, and info. equipment.*
*Source: Department of Commerce, Goldman Sachs GIR.*

…and we forecast core PCE inflation will decline further to 2.2% by YE24

GS core PCE inflation forecasts

| | | | GS Bottom-up Core PCE Forecast | | | |
|---|---|---|---|---|---|---|
| | | Oct 2023 | Dec 2023 | | Dec 2024 | |
| | Weight | YoY | YoY | Contribution to Change | YoY | Contribution to Change |
| **Core PCE** | **100.0** | **3.5** | **3.2** | **-0.3** | **2.2** | **-1.3** |
| **Core Goods** | **26.0** | **0.3** | **0.1** | **0.0** | **-1.2** | **-0.4** |
| New Vehicles | *2.4* | 1.9 | 0.6 | 0.0 | -1.7 | -0.1 |
| Used Vehicles | *1.5* | -7.1 | -6.2 | 0.0 | -6.6 | 0.0 |
| Household Appliances | *0.5* | -8.1 | -9.1 | 0.0 | -3.4 | 0.0 |
| Video, Audio, Computers | *2.5* | -6.8 | -5.9 | 0.0 | -9.1 | 0.0 |
| Recreational Vehicles | *0.7* | 0.3 | 0.9 | 0.0 | 1.0 | 0.0 |
| Jewelry, Watches | *0.6* | 3.0 | 0.1 | 0.0 | 0.8 | 0.0 |
| Clothing & Footwear | *3.1* | 2.5 | 2.2 | 0.0 | -0.1 | -0.1 |
| Pharma & Medical | *4.0* | 4.1 | 4.0 | 0.0 | 1.9 | -0.1 |
| Pets Products | *0.7* | 3.5 | 3.3 | 0.0 | 1.5 | 0.0 |
| Expenditures Abroad | *0.1* | 12.5 | 10.0 | 0.0 | 0.0 | 0.0 |
| Residual Core Goods | *10.0* | 0.6 | 0.4 | 0.0 | -0.6 | -0.1 |
| **Core Services** | **74.0** | **4.6** | **4.2** | **-0.3** | **3.3** | **-1.0** |
| Housing | *17.5* | 6.9 | 6.3 | -0.1 | 3.8 | -0.5 |
| Ground Transportation | *0.4* | 1.9 | 1.6 | 0.0 | 1.6 | 0.0 |
| Air Transportation | *1.2* | 2.2 | -1.9 | 0.0 | 0.0 | 0.0 |
| Food Services & Accommodation | *8.4* | 4.7 | 4.5 | 0.0 | 3.0 | -0.1 |
| Financial Services & Insurance | *8.1* | 4.6 | 4.2 | 0.0 | 3.2 | -0.1 |
| Medical Services | *18.4* | 2.6 | 3.0 | 0.1 | 3.3 | 0.1 |
| Foreign Travel | *1.5* | -1.9 | -2.8 | 0.0 | 2.7 | 0.1 |
| Residual Core Services | *18.5* | 5.2 | 4.5 | -0.1 | 3.2 | -0.4 |

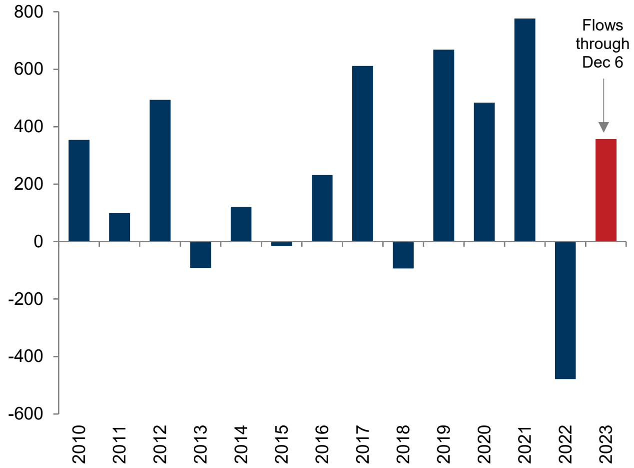
*Source: Goldman Sachs GIR.*

Special thanks to US economics team for charts.

# Bonds are back...

**Bond flows have turned positive this year after large outflows last year...**

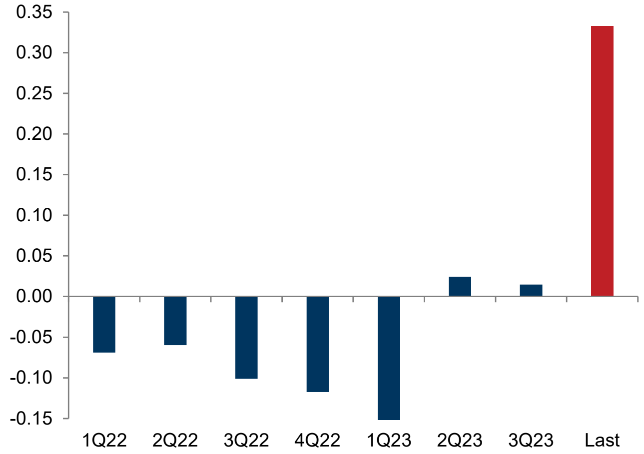
Global flows into bond funds, $bn




*Note: 2023 figure subject to revision.*
*Source: EPFR, Goldman Sachs GIR.*

**...as investors have increased their duration overweights, with the recent spike seemingly driven by some of the largest funds**

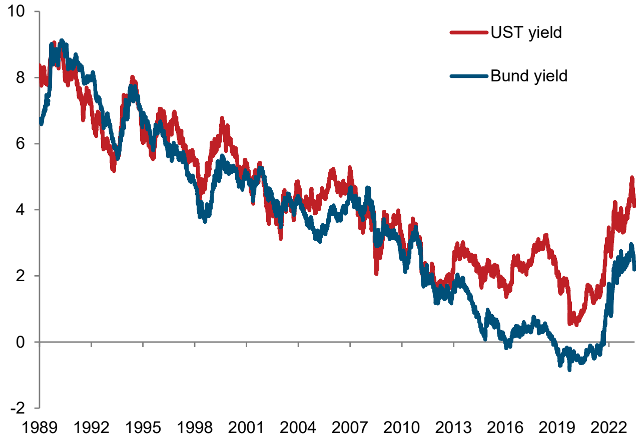
Asset-weighted duration beta (negative values indicate underweight duration bias vs. the Bloomberg Agg)




*Source: Goldman Sachs GIR.*

**The value proposition of bonds has increased further as yields continued to move higher over the course of this year...**

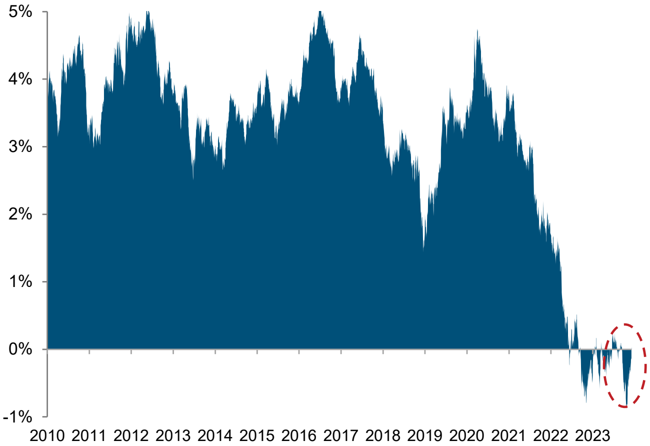
US Treasury and German Bund yields, %




*Source: Bloomberg, Goldman Sachs GIR.*

**...but cash has generally continued to outperform bonds, leaving it as the better alternative**

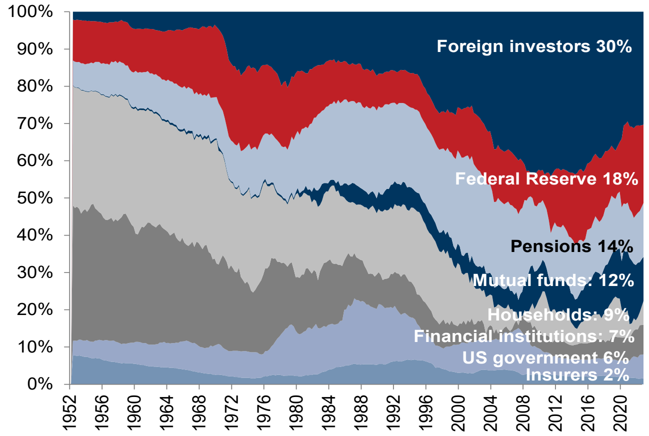
Performance of 10y vs. 3m UST




*Note: US 3m is 3m T-bills, which are used as a proxy for cash.*
*Source: Haver Analytics, Goldman Sachs GIR.*

**Foreign investors remain the largest owners of US Treasuries...**

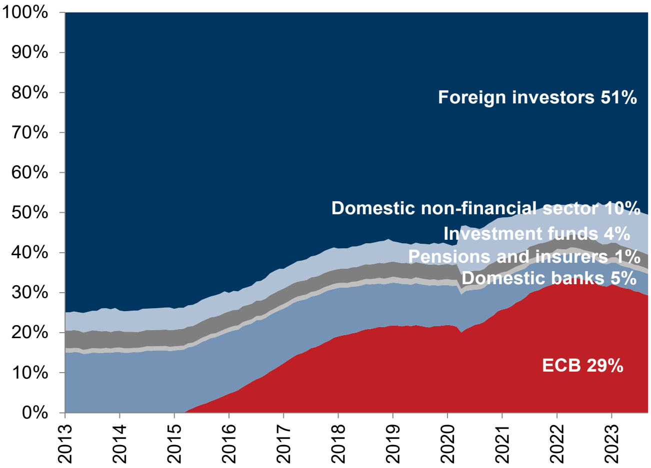
Ownership of US government bond market, %




*Source: Federal Reserve, Goldman Sachs GIR.*

**...as well as of German Bunds**

Ownership as a share of total debt securities outstanding

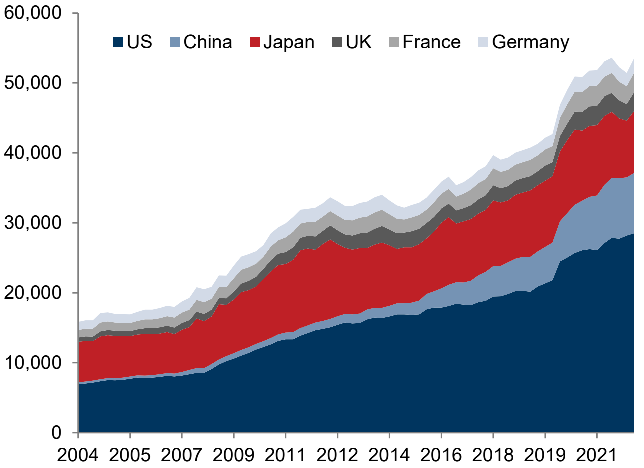



*Source: Bundesbank, Goldman Sachs GIR.*

# ...and JGBs are still in focus

The JGB market is the third largest sovereign bond market in the world

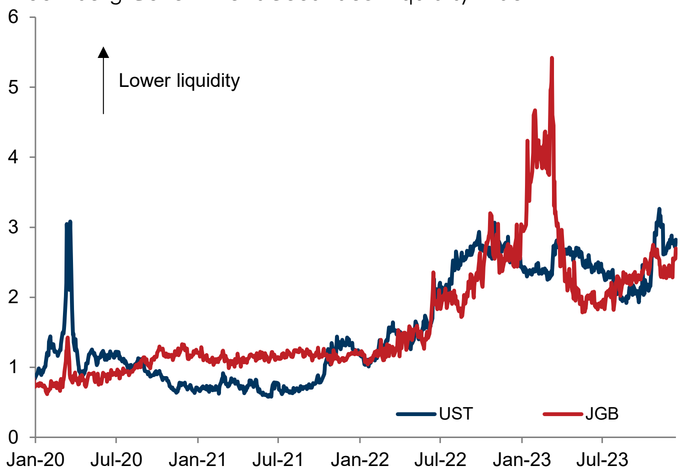
Government debt securities, $bn




Source: Haver Analytics, Goldman Sachs GIR.

Japanese bond market liquidity has recovered from poor conditions earlier in the year

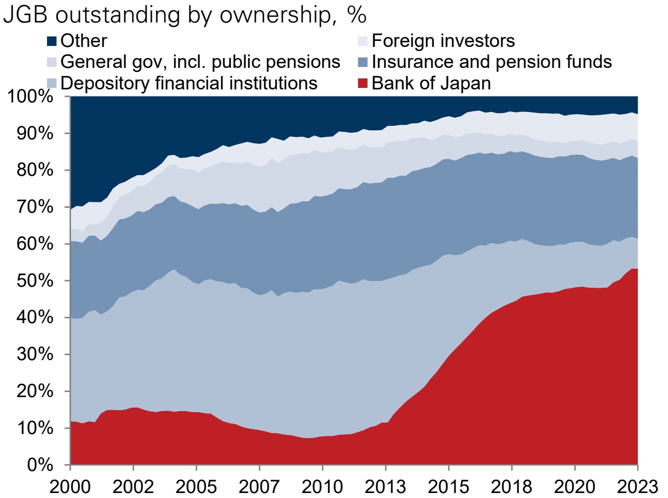
Bloomberg Government Securities Liquidity Index




Source: Bloomberg, Goldman Sachs GIR.

The BoJ owns roughly 50% of the JGB market and around 95% of bonds are held domestically

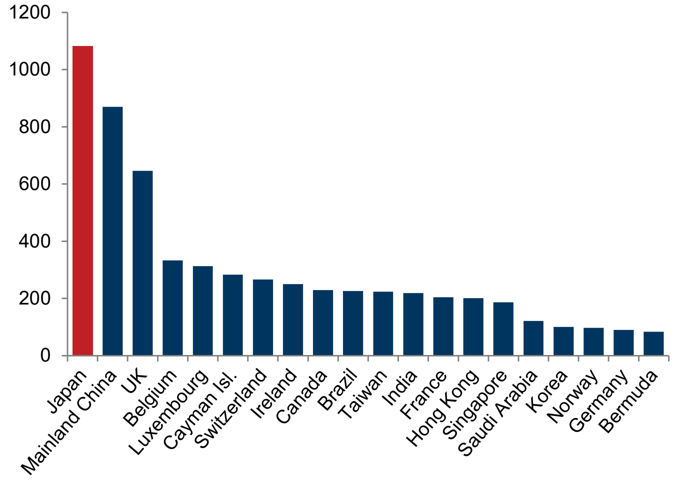
JGB outstanding by ownership, %




Source: Haver Analytics, Goldman Sachs GIR.

Japanese investors have been the biggest foreign investors into DM sovereign bond markets, including US Treasuries

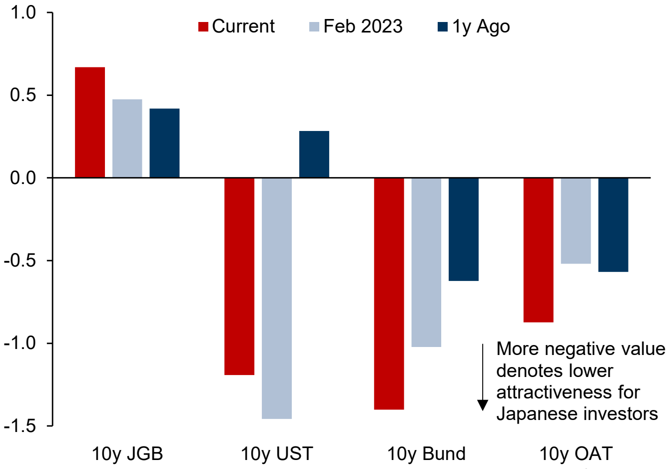
Major foreign holders of US Treasury Securities, $bn




Source: Haver Analytics, Goldman Sachs GIR.

Foreign bonds are still relatively unattractive investments compared to JGBs as the cost of hedging FX exposure for Japanese investors has risen, though USTs have become somewhat less unattractive...

10y JGB yield compared to FX-hedged foreign bond yields for Japanese investors, %



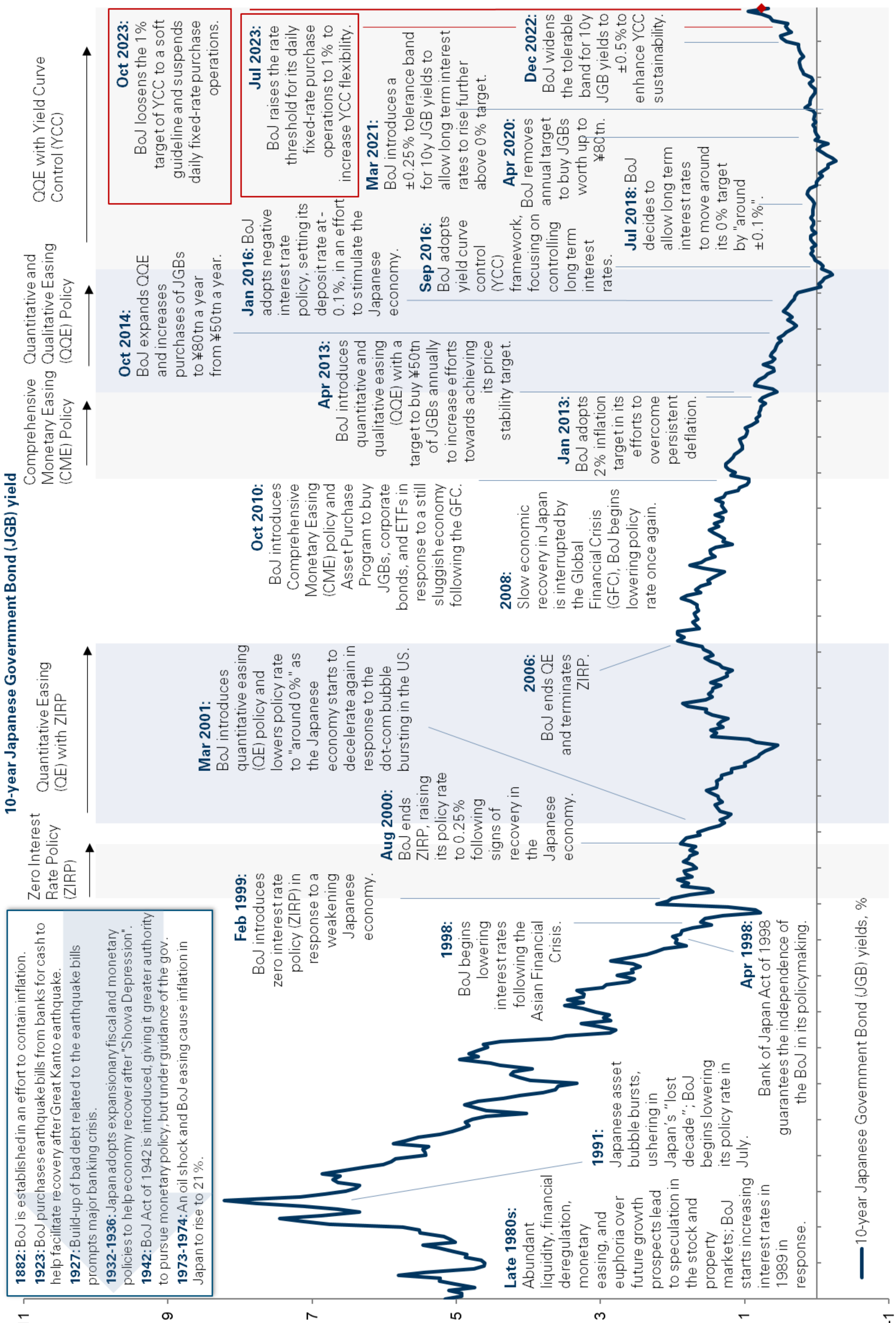

Note: FX-hedged yield assumes that JPY-based investors hedge their foreign currency risk by selling the foreign currency forward. Assumes 1y rolling hedge.
Source: Bloomberg, Goldman Sachs GIR.

...and Japanese investors have recently turned into net buyers of US Treasuries

Cumulative net acquisition of USTs by Japanese investors since 2016, ¥tn


Source: BoJ, Goldman Sachs GIR.

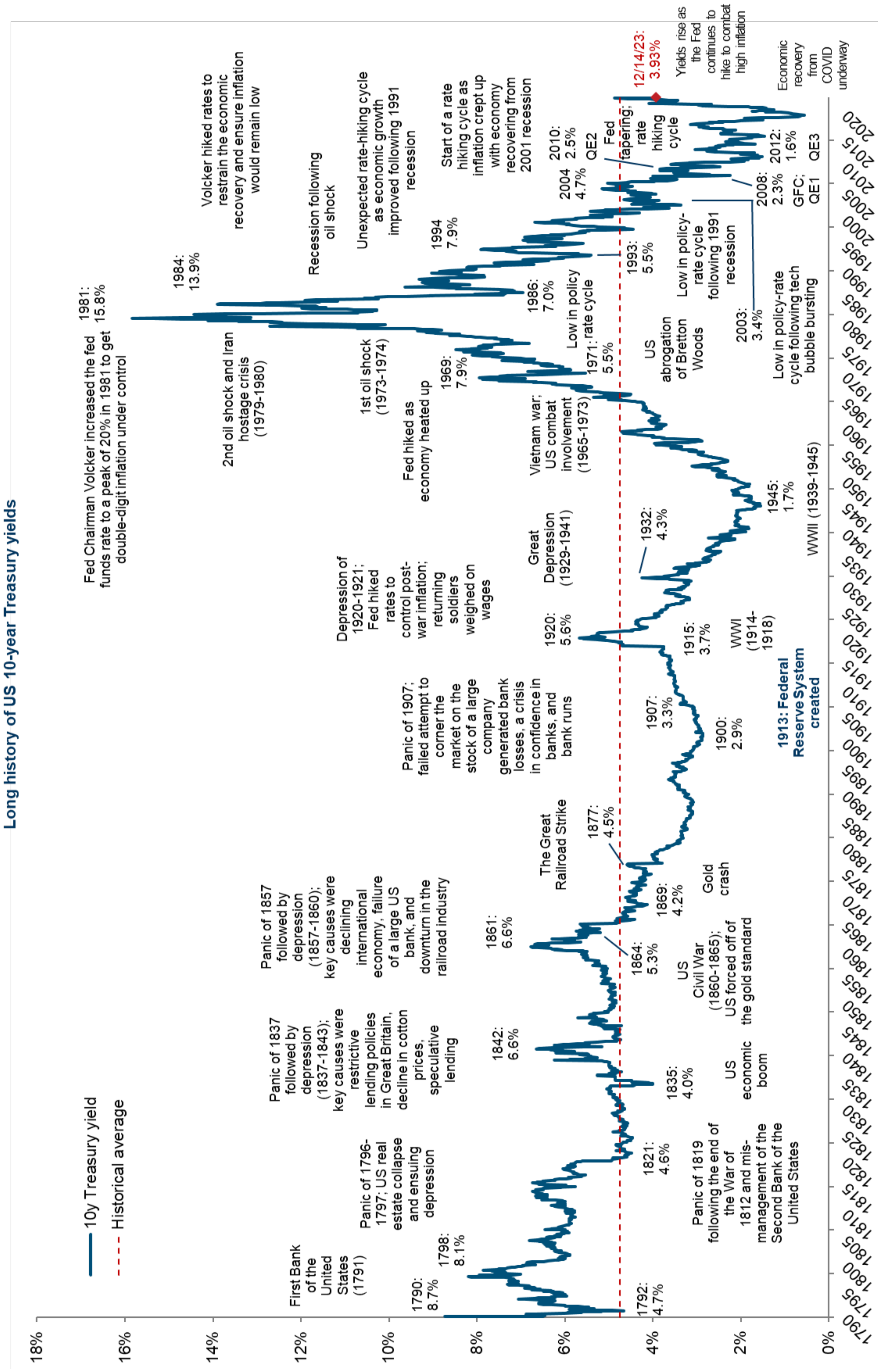
# JGB yields: higher, but still low




Source: Bloomberg, BoJ, Reuters, various news sources, Goldman Sachs GIR.

# UST yields: higher, but near average

**Long history of US 10-year Treasury yields**




Source: Global Financial Data, Inc., Federal Reserve Board, Haver Analytics, Goldman Sachs GIR.

# Higher-for-longer: banking tremors...

## Long history of US bank crises and banking regulation

### 1782-1913: "WILDCAT" BANKING AND FREQUENT CRISES

Recessions and bank panics occur frequently. Between the 1830s and 1864, bank regulation is extremely lax and varies widely by state. Thereafter, a dual system evolves, with regulation and chartering at the federal and state levels.

**1837:** Bank runs lead to failures of several banks over the following years.

**1819:** The Second Bank of the US calls in its loans. Many banks fail.

**1863-64:** The government faces new financing pressures during the Civil War. Congress establishes a single national currency. The Office of the Comptroller of the Currency is created to handle federal chartering, administer regular bank examinations, and collect data more frequently from banks.

**1857:** Overextension of banks to finance railroad construction. Hundreds of banks fail.

**1893:** Panic occurs after a railroad company declares bankruptcy.

**1913:** The Federal Reserve is established, with regulatory authority over national banks as well as any state banks that are members of the Fed.

**1907:** NYSE crashes, leading to a run on banks. Thousands of businesses fail.

1781 1791 1801 1811 1821 1831 1841 1851 1861 1871 1881 1891 1901 1911

**1782:** The first chartered US bank opens to help finance the Revolutionary War.

**1792:** Credit crisis leads to bank runs.

**1796:** Land speculation bubble bursts, businesses fail.

**1791-1811:** First Bank of the USA effectively serves as the country's first central bank. It holds gold and silver reserves and acts as a lender of last resort to state banks. In 1811, the bank's charter is allowed to expire amid political opposition to the perceived concentration of power at the federal level. Following a similar experience with another federal charter, banking is left entirely to the states.

**1873:** Reckless expansion during post-Civil War booms leads to broad bank failures.

**1901:** Stock market crashes after short selling of Northern Pacific Railroad.

**1907:** A failed attempt by speculators to corner the market on a mining company's stock leads to the collapse of the country's third-largest trust company and a massive bank panic. These events provide the impetus for establishing a central bank.

### 1913-1980: NEW RULES, RESTRICTIONS, REPORTING

Bank regulation becomes more rigorous, particularly in the wake of the Great Depression. The Fed's powers expand. Bank crises become far less frequent. Restrictions limit bank branching and activities, albeit with major loopholes.

**1929-39:** Great Depression. Stock market crashes and there are widespread bank failures.

**1956:** The Bank Holding Company (BHC) Act grants the Fed new powers to regulate BHCs and control their geographic expansion. BHCs are required to divest non-bank operations. However, banks exploit loopholes in the act until legislation closes them in 1970 and 1987.

**1966:** Interest-rate ceilings are applied to thrift institutions.

**1978:** International Banking Act applies domestic bank regulation to any foreign banks operating in the US.

1913 1918 1923 1928 1933 1938 1943 1948 1953 1958 1963 1968 1973 1978

**1927:** The McFadden Act allows national banks to establish branches in the state where they are headquartered, under states' terms for state banks. National banks often face resistance from states and local communities.

**1933-35:** The Glass-Steagall Act separates commercial and investment banking, grants the Fed additional powers, and establishes the Federal Deposit Insurance Corporation in an effort to prevent bank runs. Congress establishes the Securities and Exchange Commission. "Regulation Q" prohibits banks from paying interest on demand deposits and caps interest rates on deposits.[1]

**Late 1970s:** Regulators ease interest-rate ceilings on some deposits amid rising inflation and market interest rates. In 1980, Congress decides to phase out the ceilings over the course of several years.

### 1980S-PRESENT: REGULATORY SWINGS

Deregulation paves the way for the savings and loan (S&L) crisis. Relaxation of old rules enables industry consolidation. The 2008 crisis prompts a new wave of reforms. Along the way, regulation adjusts to increased securitization and globalization. In 2018, regulation eases again as parts of Dodd-Frank are rolled back.

**1994:** Riegle-Neal Act removes remaining restrictions on interstate banking/branching, opening the door for increased M&A.

**1999:** Gramm-Leach-Bliley Act removes the separation of commercial and investment banking established by Glass-Steagall.

**2004:** Basel II rules encourage banks to grow and diversify.

**2007-2008:** Global Financial Crisis (GFC). Subprime mortgage crisis. Bear Stearns bailout. Lehman Brothers failure.

**2017:** Treasury Department releases recommendations for regulatory rollback.

**2018:** Trump Administration rolls back parts of 2010 Dodd-Frank Act for small and medium sized banks.

1980 1985 1990 1995 2000 2005 2010 2015 2020

**Early 1980s:** Restrictions on interstate banking are relaxed. Thrift institutions, under pressure from asset-liability mismatch, are permitted to expand their activities. International debt crises prompt capital adequacy requirements.

**1986-96:** Falling property values trigger Savings and Loan crisis. Hundreds of institutions fail.

**Late 1980s-early 1990s:** Regulation is tightened again following the S&L crisis.

**1987:** The Fed eases Glass-Steagall by allowing some large commercial banks to underwrite securities.

**1988:** Basel I sets international capital standards.

**2000:** Commodity Futures Modernization Act removes most over-the-counter derivatives from regulation by the Commodity Futures Trading Commission.

**2010:** Basel III increases capital requirements and introduces new liquidity rules.

**2010:** Congress passes complex and far-reaching financial-market reforms under the Dodd-Frank Act.

**July 2023:** US regulators propose stricter bank capital rules known as "Basel III Endgame" to ensure the stability of large banks.

Denotes major bank panic/crisis

[1]These restrictions were aimed at encouraging banks to provide credit to their communities rather than invest it with larger banks. They also sought to prevent banks from competing up the rates paid on deposits, which was thought to encourage riskier activity to compensate for the hit to profits. The ban on paying interest on demand deposits remained in effect until 2011.

*Source: Dean Anderson, "Summing it Up: A Brief History of the Economy, Regulations and Bank Data," Federal Reserve Bank of Atlanta, December 6, 2016; FDIC; Federal Reserve History; compiled by Goldman Sachs GIR.*

## Short history of the 2023 regional banking crisis

### March 2023: Banking stresses emerge, regulators intervene

Banking stresses emerge in the US and Europe. Silicon Valley Bank (SVB) and Signature Bank fail after rapid runs on deposits. Federal regulators enact emergency measures to shore up the banking system.

**What's happened since:**
**Late April:** The Fed releases a report on SVB's failure that says banking supervisors failed "to take forceful enough action" to address SVB's problems. The FDIC releases a report faulting Signature Bank for poor management and insufficient risk policing.
**May:** Federal regulators seize First Republic Bank—making it the second-largest bank by assets to fail in the US after Washington Mutual's collapse in 2008—and announce the sale of most of its deposits and assets to JPMorgan Chase.
**July:** The Fed, OCC, and FDIC propose stricter bank capital rules in the US known as "Basel III Endgame" to ensure the stability of large banks.

**Feb 24:** KPMG gives SVB's parent company, SVB Financial, a clean bill of health for 2022.

**Mar 8:** Crypto bank Silvergate Capital announces that it plans to shut down operations and liquidate its assets after a run on deposits. SVB announces it will take a $1.8bn loss after selling some of its investments. SVB makes plans to raise $2.25bn through stock sales. Moody's downgrades SVB Financial shortly after.

**Mar 9:** SVB's stock crashes when the market opens. Shares of the four largest US banks also fall amid increased banking system concerns. Depositors at SVB begin rapidly pulling money out, attempting to withdraw $42bn throughout the day.

**Mar 10:** Shares of SVB are halted in the morning after a large premarket selloff. Shortly after, federal regulators announce they have taken control of SVB. At the time, SVB's failure marks the second largest bank failure ever in the US. FDIC announces that insured deposits would be available Monday, March 13.

**Mar 11:** Tech startups who had deposits at SVB scramble to find alternate funding sources for payroll and daily operations.

**Mar 12:** Signature Bank becomes the second bank to fail and is shut by regulators. Federal Reserve, US Treasury, and FDIC announce emergency measures to stem deposit outflows and stabilize the banking system, including protecting uninsured depositors at SVB and Signature Bank and creating the Bank Term Funding Program (BTFP).

**Mar 13:** President Biden tells the nation that the banking system is safe, trying to restore confidence in the financial system. Shares of First Republic Bank as well as other regional banks continue to slide amid fears of contagion. The Fed launches a review of SVB's failure.

**Mar 14:** Justice Dept and SEC reportedly begin investigations into SVB collapse. Shares of regional banks rally amid hopes that the banking crisis may be contained.

**Mar 15:** Credit Suisse shares fall sharply and CDS widens. Overnight, Credit Suisse announces it will access up to CHF50bn from the Swiss National Bank to bolster its liquidity.

**Mar 16:** US federal regulators announce that 11 banks have deposited roughly $30bn into First Republic Bank to shore up its liquidity. Federal Reserve data show that banks had borrowed $11.9bn from the BTFP. US Treasury Secretary Yellen says that the US banking system is "sound". ECB hikes rates by 50bp despite banking stress. ECB President Lagarde says the Euro area banking sector is resilient.

**Mar 17:** SVB's parent company, SVB Financial, files for Chapter 11 bankruptcy protection. Credit Suisse and First Republic shares continue to fall as concerns remain high.

**Mar 18:** UBS begins talks to take over Credit Suisse in a deal facilitated by Swiss regulators, including the SNB, Swiss Federal Department of Finance, and FINMA.

**Mar 19:** UBS agrees to take over Credit Suisse for over $3bn. The SNB announces up to CHF200bn of additional liquidity assistance to both UBS and CS to support the deal. As part of the deal, Credit Suisse's CHF15.8bn in AT1s bonds will be completely written down by FINMA. FDIC announces deal to sell 40 branches of Signature Bank.

**Mar 20:** First Republic Bank shares continue to decline despite the fresh inflow of deposits. CEOs of large banks discuss additional efforts to stabilize First Republic Bank.

**Mar 21:** First Republic Bank shares rise over 30% amid increasing optimism about the banking system. US Treasury Secretary Yellen says regulators could protect deposits at other banks if needed.

**Mar 22:** Fed raises rates by 25bp. Chair Powell says the US banking system is "sound and resilient" and that "all depositors' savings and the banking system are safe". Shortly after, US Treasury Secretary Yellen says she has "not considered or discussed anything having to do with blanket insurance or guarantees of deposits".

**Mar 24:** Investors spark a selloff in Deutsche Bank over sentiment contagion.

**Mar 27:** First Citizens acquires all of SVB's deposits, loans, and branches. FDIC agrees to provide First Citizens with a $35bn loan and share any losses or gains on SVB's commercial loans.

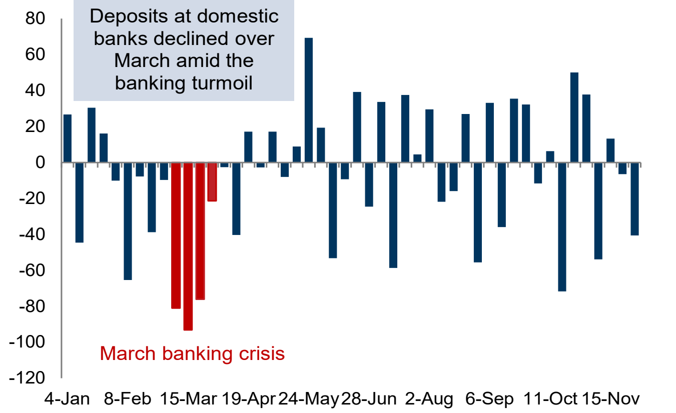
*Source: Wall Street Journal, various news sources, Goldman Sachs GIR.*

# ...have since subsided

Stress in the banking system has subsided since the turmoil in March—bank deposit outflows have stabilized from the large outflows seen in the peak weeks of stress and usage of Fed facilities has declined, though remains above the pre-March levels as banks use the facilities for inexpensive funding. And bank lending growth has stopped declining, although lending growth remains slower than it was before March.

### Deposit outflows at US banks have stabilized following the consecutive weeks of decline in March...

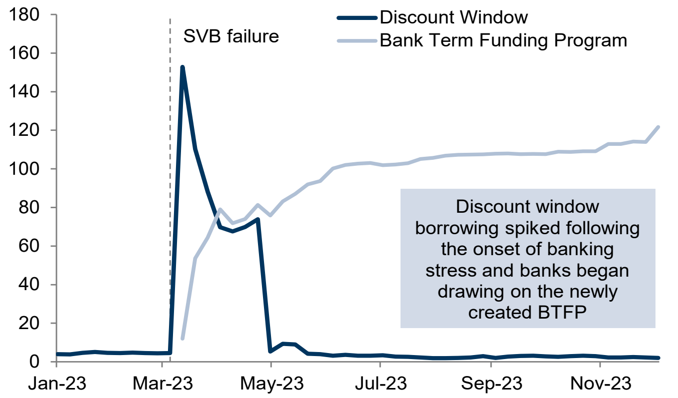
Weekly change in deposits at US banks, $bn




*Source: Federal Reserve, Goldman Sachs GIR.*

### Usage of the Fed's Discount Window has fallen back to near zero levels, although banks have continued to use the Bank Term Funding Program (BTFP)

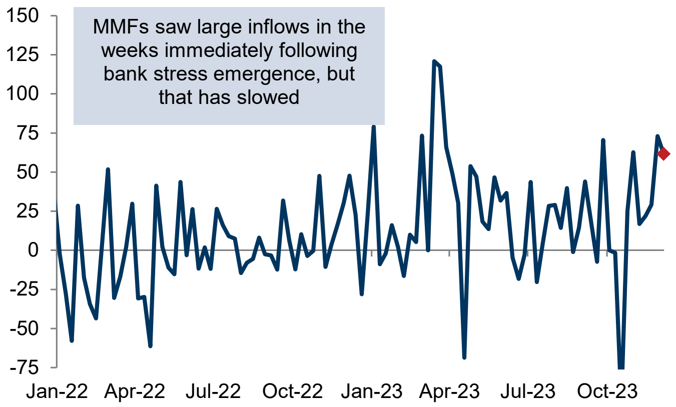
Federal Reserve facility usage, $bn




*Source: Federal Reserve, Goldman Sachs GIR.*

### ...and flows to money market funds—a likely destination for bank deposit outflows—has slowed...

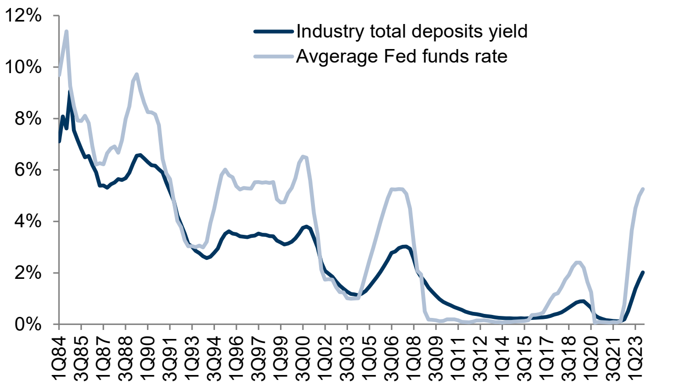
Money market fund (MMF) net flows, $bn




*Source: Morningstar, Goldman Sachs GIR.*

### Since the deposit outflows seen in March, banks have responded by paying higher yields on deposits to prevent renewed outflows

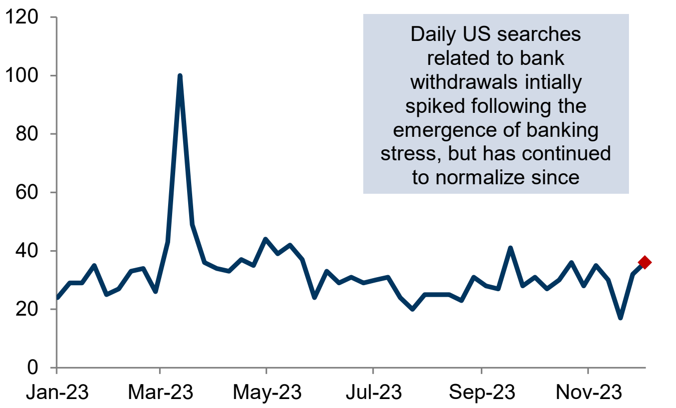
Deposit yield and Fed funds rate, %




*Note: Industry total deposits yield calculated based on US domestic deposit interest income. Data as of 3Q23.*
*Source: FDIC, Goldman Sachs GIR.*

### ...and internet searches for withdrawal-related words have declined to pre-banking stress levels

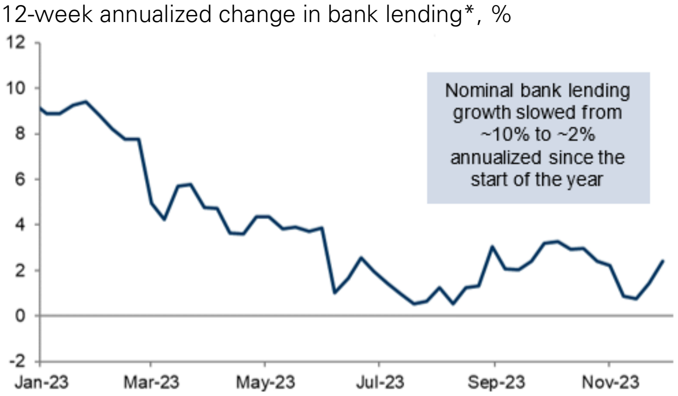
Daily US Google searches related to bank withdrawals, index




*Source: Google Trends (https://www.google.com/trends), Goldman Sachs GIR.*

### Bank lending growth has stopped declining, although lending growth remains slower than it was at the start of the year

12-week annualized change in bank lending*, %




**Sum of real estate, C&I, and consumer loans. The week of Mar 22 is adjusted by $60bn for divestment of loans from a bank in receivership to nonbank institutions that aren't included in the H.8. Mergers & acquisitions occasionally cause jumps.*
*Source: Haver Analytics, Goldman Sachs GIR.*

Special thanks to GS equity research analyst James Yaro, GS Chief US Economist David Mericle, and GS structured product strategist Vinay Viswanathan.

# ...but new bank regulation is on the way

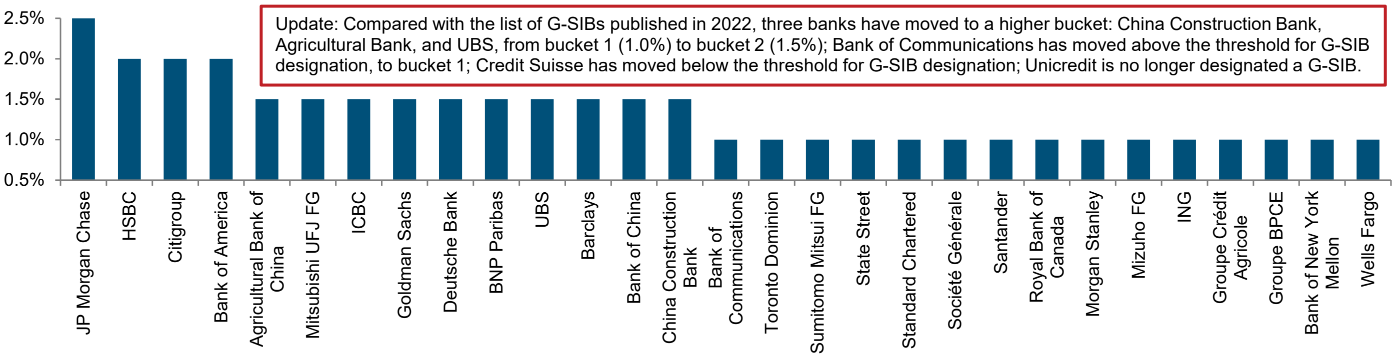
## Which US banks are subject to which regulatory requirements?

| Category | Category I | Category II | Category III | Category IV | Other |
|---|---|---|---|---|---|
| **Thresholds** | US G-SIBs | ≥$700bn in assets or ≥$75bn in cross-jurisdictional activity | ≥$250bn in assets or ≥$100bn in assets and ≥$75bn weighted short-term wholesale funding, nonbank assets, or off-balance-sheet exposure | $100bn to $250bn in assets | $50bn to $100bn in assets |
| **Banks** | BAC, BK, C, GS, JPM, MS, STT, WFC | NTRS | COF, SCHW, PNC, USB, TFC | ALLY, AXP, CFG, DFS, FITB, HBAN, KEY, MTB, RF | CMA, SNV, RJF, ZION |
| **Capital** | G-SIB surcharge | | | | |
| | TLAC | | | | |
| | Required to recognize elements of AOCI in regulatory capital | Required to recognize elements of AOCI in regulatory capital | May opt out of recognizing AOCI in regulatory capital **Under Basel III Endgame as currently proposed, the AOCI opt-out would be removed, and these banks would be required to recognize unrealized gains and losses in their AFS securities portfolio** | | May opt out of recognizing AOCI in regulatory capital |
| | Countercyclical capital buffer | Countercyclical capital buffer | Countercyclical capital buffer | **Under Basel III Endgame as currently proposed, these banks would be subject to the countercyclical capital buffer** | |
| | Advanced (except for US Intermediate Holding Companies) and Standardized Approach to calculating risk-based capital ratios **Under Basel III Endgame as currently proposed, the Advanced Approach would be substituted for an "expanded risk-based approach" to calculating risk-weighted assets** | | Standardized Approach to calculating risk-based capital ratios | Standardized Approach to calculating risk-based capital ratios | Standardized Approach to calculating risk-based capital ratios |
| | **Under Basel III Endgame as currently proposed, CET1 requirements would increase ~19% for Category I and II banks, and ~6% for Category III and IV banks** | | | | |
| | Stress Capital Buffer | Stress Capital Buffer | Stress Capital Buffer | Stress Capital Buffer | |
| **Stress testing** | Annual company run stress tests | Annual company run stress tests | Company run stress tests every other year | | |
| | Annual CCAR | Annual CCAR | Annual CCAR | CCAR every other year | |
| | Annual capital plan submission | Annual capital plan submission | Annual capital plan submission | Annual capital plan submission | |
| **Leverage** | Enhanced SLR | SLR | SLR | **Under Basel III Endgame as currently proposed, these banks would be subject to SLR** | |
| | US leverage ratio | US leverage ratio | US leverage ratio | US leverage ratio | US leverage ratio |
| **Liquidity** | Full LCR | Full LCR | Full LCR for banks w/ ≥$75bn weighted short-term wholesale funding, reduced LCR for <$75bn (85% of full) | Reduced LCR for banks with $50bn-$75bn in weighted short-term wholesale funding (70% of full LCR), no LCR for <$50bn | |
| | Full NSFR | Full NSFR | Full NSFR for banks w/ ≥$75bn weighted short-term wholesale funding, reduced NSFR for <$75bn (85% of full) | Reduced NSFR for banks with $50bn-$75bn weighted short-term wholesale funding (70% of full LCR), no NSFR for <$50bn | |
| | Resolution planning | | | | |

*Source: Federal Reserve, US Department of Treasury, Congressional Research Service, Goldman Sachs GIR (original published version here).*

## Which global banks are considered systemically important?

**Financial Stability Board/Basel Committee on Banking Supervision's Nov 2023 global list of G-SIBs by additional common equity capital requirement as a % of risk-weighted assets (effective beginning Jan 1, 2025).**

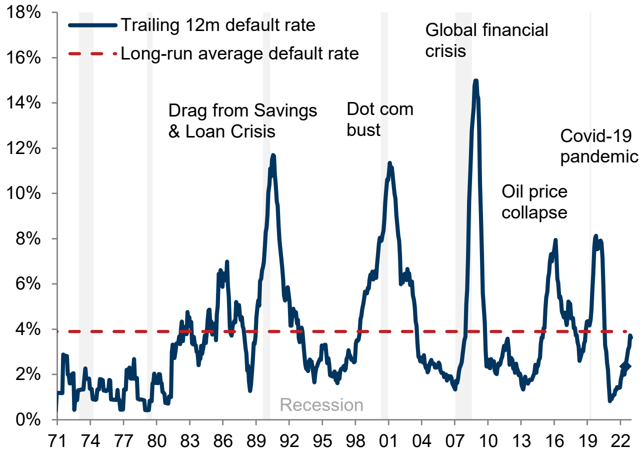



*Source: Financial Stability Board, Goldman Sachs GIR.*

# Higher-for-longer: credit still holding up

**Default rates among HY-rated US non-financial corporations have continued to rise and are now near historical averages**

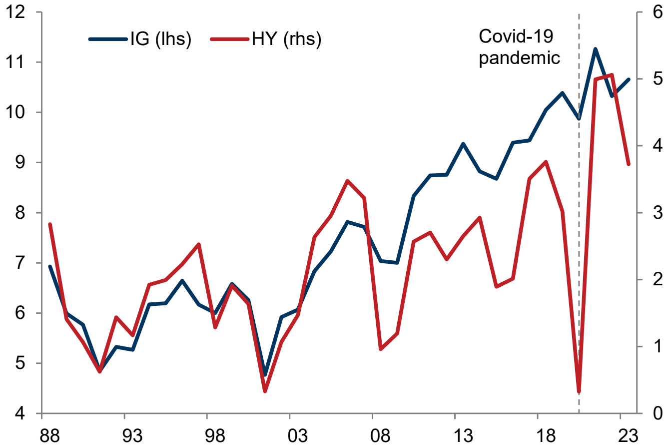
Issuer-weighted annual default rate for HY-rated US non-financial corporations, %




*Note: Default rate for IG-rated US non-financial corporations is 0%.*
*Source: Moody's, Goldman Sachs GIR.*

**Fundamentals for both US IG and HY bond issuers remain relatively healthy as net profit margins have increased over recent years…**

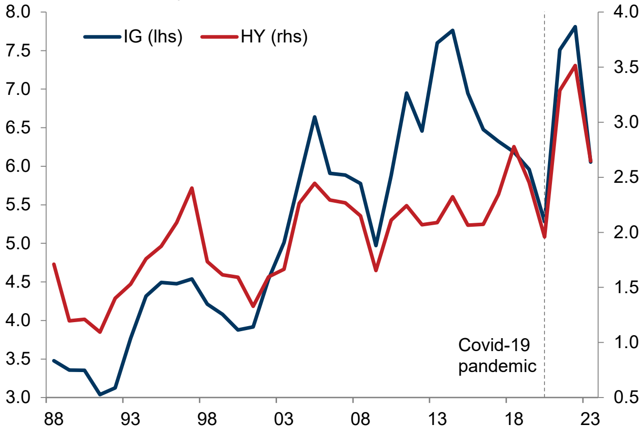
Net margins for the median HY and IG-rated US non-financial corporation, %




*Note: Data is annual, 2023 is as of Q3.*
*Source: FactSet, Goldman Sachs GIR.*

**…as have interest coverage ratios, although they have come down more recently**

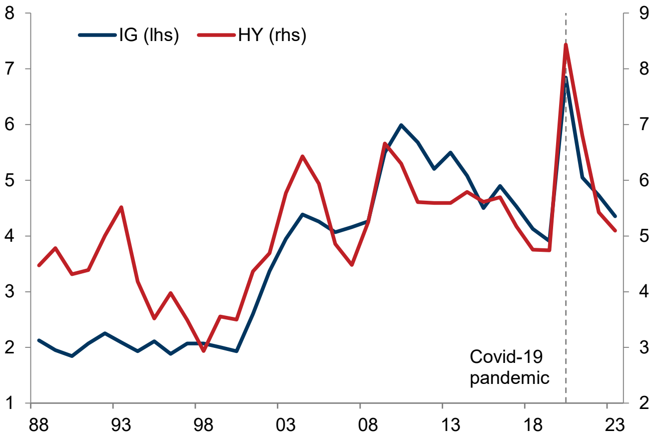
Interest coverage ratios for the median HY and IG-rated US non-financial corporation, %




*Note: Data is annual, 2023 is as of Q3.*
*Source: FactSet, Goldman Sachs GIR.*

**…and liquidity positions on balance sheets are still strong by historical standards, despite recent erosion**

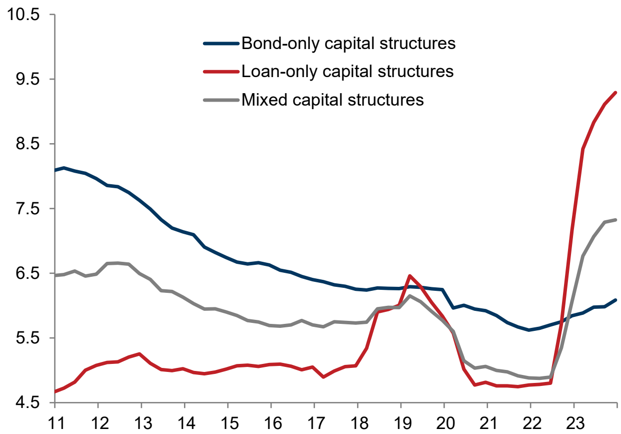
Cash-to-total assets ratios for the median HY and IG-rated US non-financial corporation, %




*Note: Data is annual, 2023 is as of Q3.*
*Source: FactSet, Goldman Sachs GIR.*

**However, we continue to see signs of distress in the leveraged loan market, which has seen a larger increase in interest expenses amid the higher rate environment…**

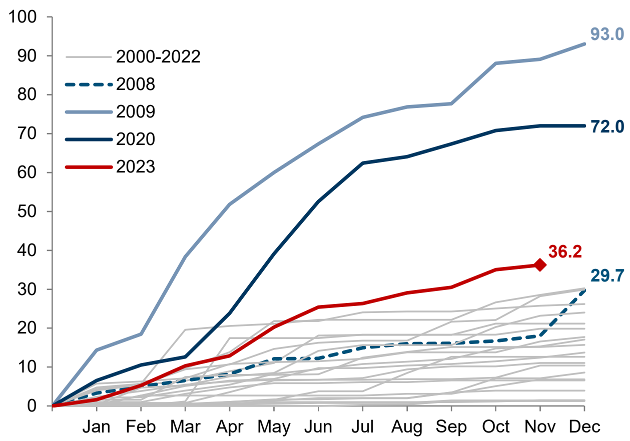
Weighted-average coupon for HY-rated USD bond and leveraged issuers by category of debt capital structure, %




*Source: Bloomberg, Goldman Sachs GIR.*

**…and 2023 is still on track to be the third most severe default year in history for leveraged loans, with the pace of defaults likely to remain elevated**

Cumulative notional value of defaulted loans by year, $bn



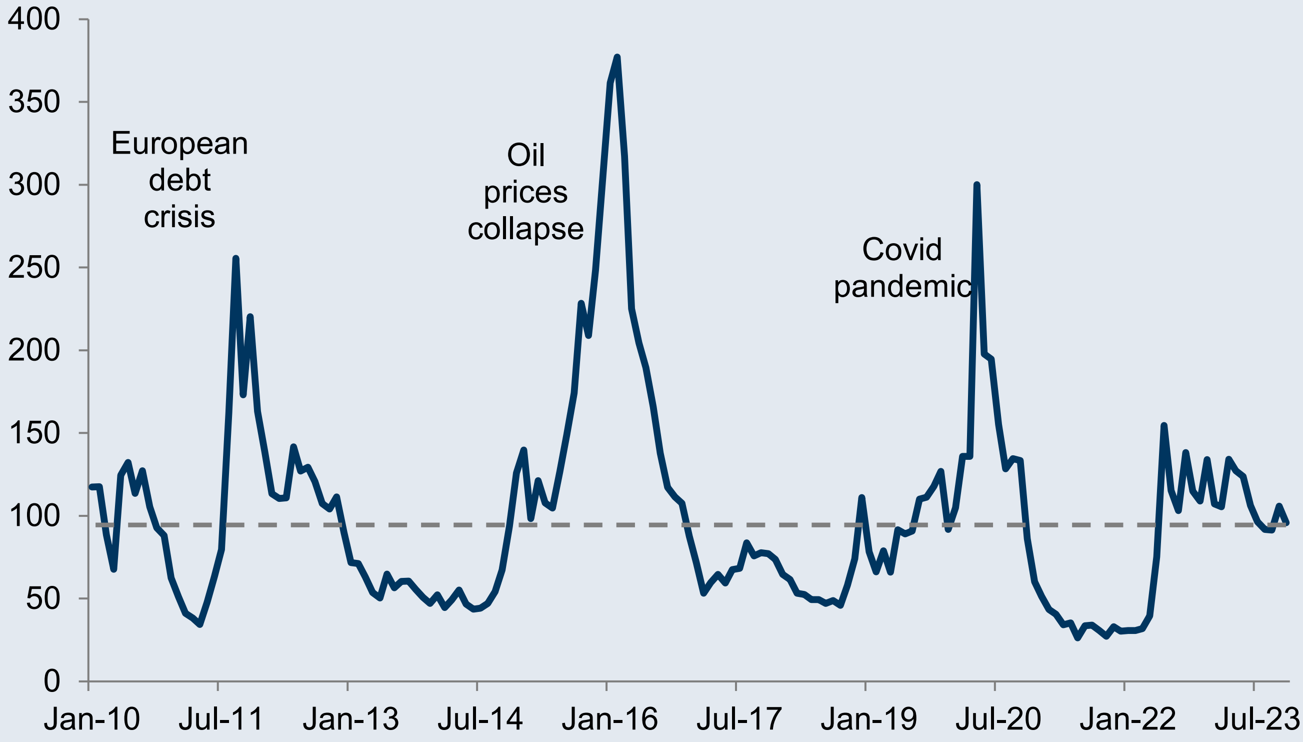

*Source: PitchBook LCD, Goldman Sachs GIR.*

Special thanks to GS credit strategists Sienna Mori and Spencer Rogers for charts.

# ...but leveraged loans still one to watch

**High-yield bonds continue to face distress levels in line with those of a typical late-cycle backdrop...**

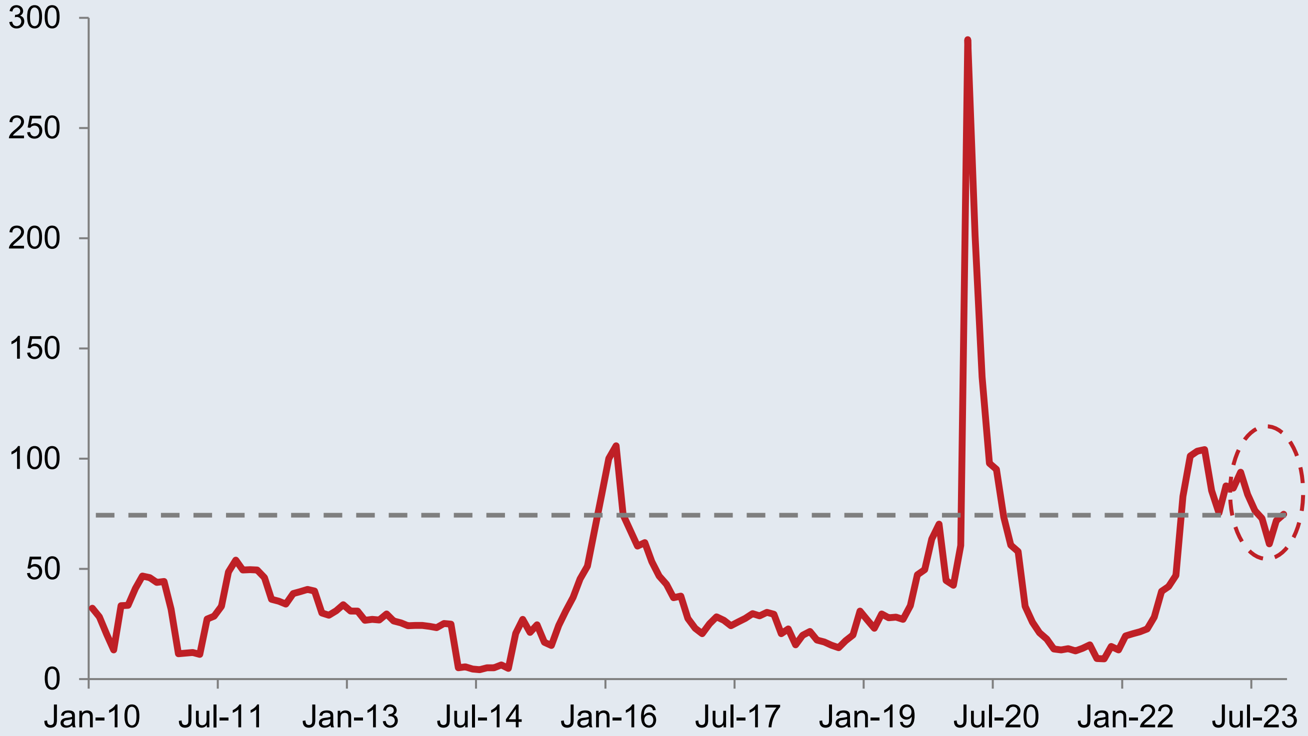
Aggregate face value of distressed high-yield bonds, $bn




*Note: Distressed bonds are classified as those trading at spreads >1000; data as of 11/30/2023.*
*Source: ICE BAML Distressed Index, Goldman Sachs GIR.*

**…while leveraged loan distress levels remain elevated relative to non-recessionary periods**

Total outstanding value of distressed leveraged loans, $bn



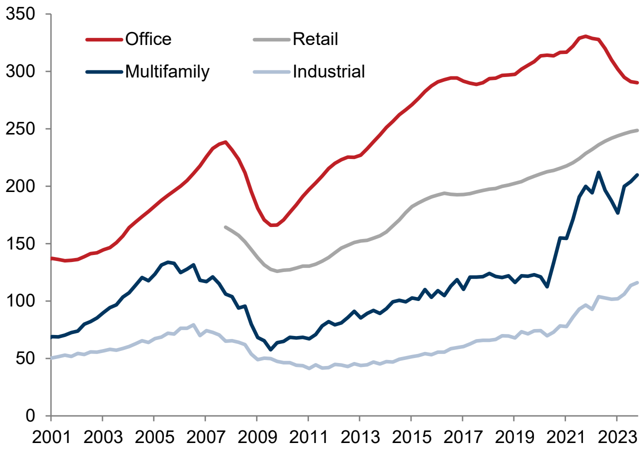

*Note: Distressed loans are classified as those trading at prices<80; data as of 11/30/2023.*
*Source: Pitchbook LCD, Goldman Sachs GIR.*

Special thanks to GS credit strategist Michael Puempel for data and guidance.

# Higher-for-longer: CRE still under stress

**While some sectors of commercial real estate (CRE) have held up relatively well, prices have fallen for the office sector...**

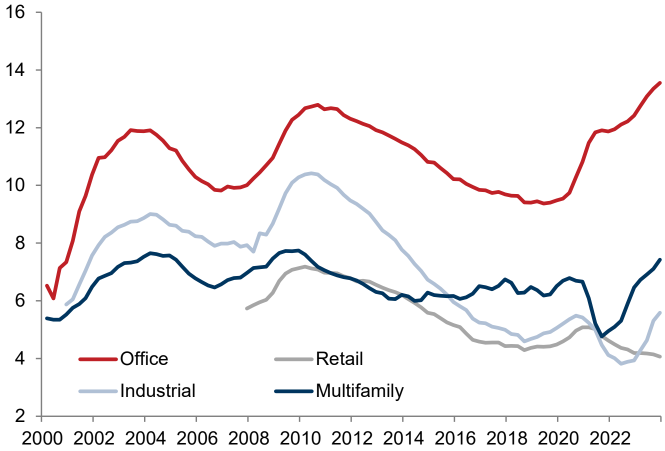
Median sales price per square foot by property type, $




*Source: CoStar, Goldman Sachs GIR.*

**...and vacancy rates have increased more for the office sector, with office vacancies above 25-year highs**

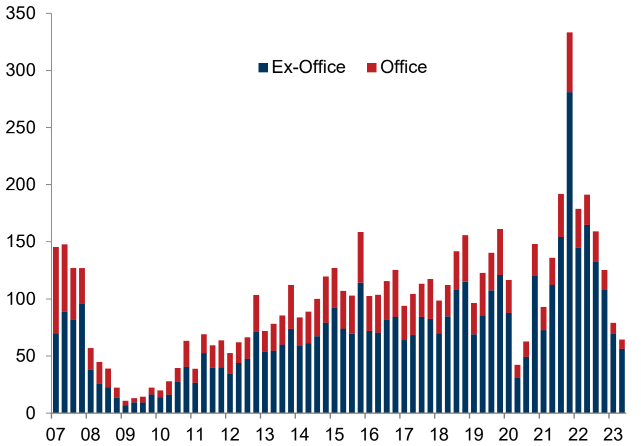
Vacancy rates by CRE sector, %




*Source: CoStar, Goldman Sachs GIR.*

**Overall CRE transaction volumes have contracted, with transaction volumes for office falling to multi-year lows...**

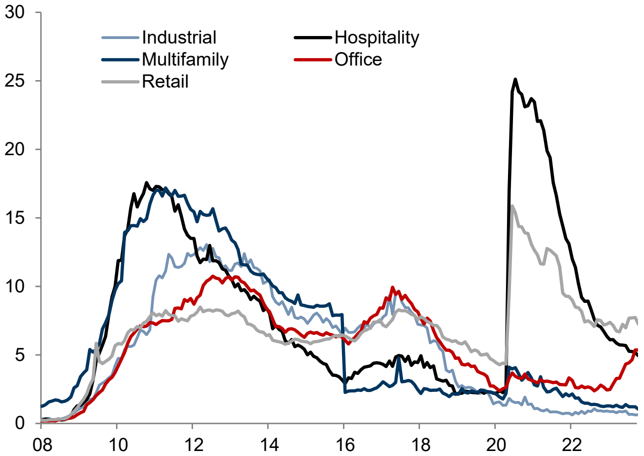
Total CRE transaction volumes, $bn




*Source: RCA, Goldman Sachs GIR.*

**...and delinquency rates have risen for office properties, while remaining contained for most other CRE property types**

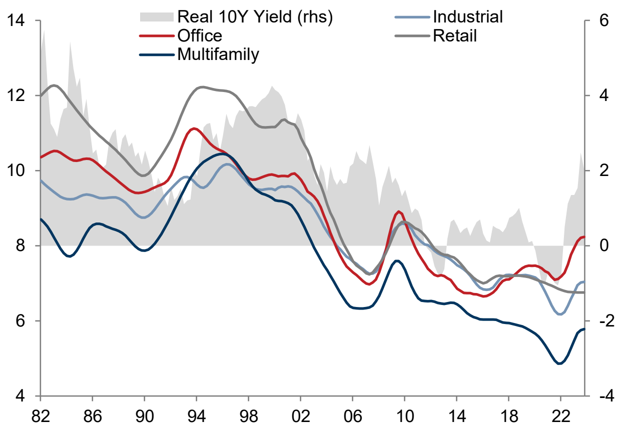
30+ day delinquency rates by property type, %




*Source: Trepp, Goldman Sachs GIR.*

**CRE valuations should continue to face pressure as cap rates have widened less than 10-year real yields**

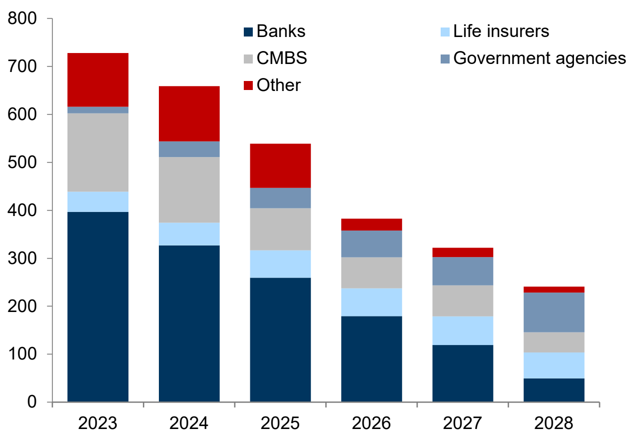
Modeled cap rates on all income-producing CRE by property segments vs. real 10-year inflation-indexed yield, %




*Source: Bloomberg, CoStar, Goldman Sachs GIR.*

**And refinancing needs for CRE borrowers are set to remain high, with roughly $1.2tn in maturities coming due over 2024 and 2025**

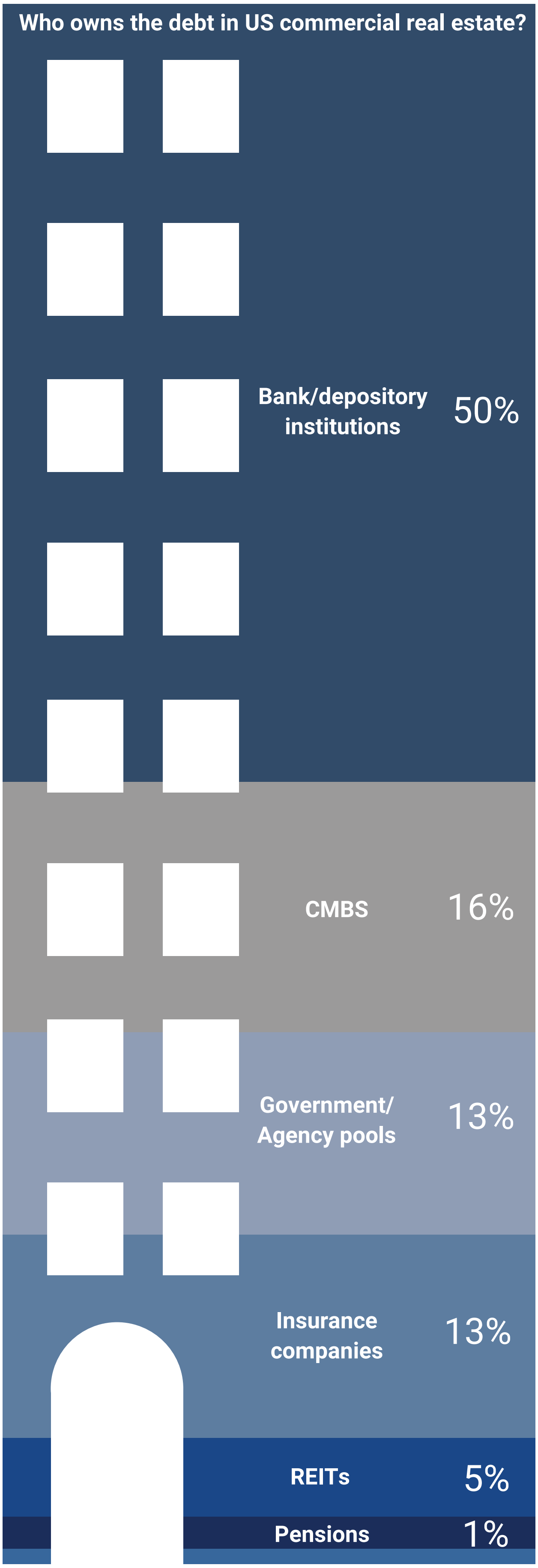
Annual maturity wall on CRE loans by lender group, $bn




*Note: Other includes credit companies, warehouses, and other investors.*
*Source: RCA, Goldman Sachs GIR.*

Special thanks to GS structured product strategist Vinay Viswanathan for charts.

# ...with banks still the most exposed




**Banks/depository institutions** include US-chartered depository institutions, foreign banking offices in the US, banks in US-affiliated areas, and credit unions. Thev own **50%** of all CRE debt.

**Commercial mortgage-backed securities (CMBS)** include asset-backed securities (ABS) and agency and GSE-backed mortgage pools. They own **16%** of all CRE debt.

CMBS loans are secured by a first-position mortgage on a commercial property. They are typically offered by commercial banks, conduit lenders, and investment banks, and once they are issued are packaged and sold to other investors, including asset managers, banks, hedge funds, and private equity firms.

Several different types of CMBS loans exist: (1) **Conduit**, which are diversified pools of mortgages on commercial properties; (2) **Single-asset, single-borrower** (SASB), which are secured by one large loan or a portfolio of assets owned by the same borrower; (3) **Agency**, which are CMBS and pass-through securities issued primarily by Fannie Mae or Freddie Mac and backed by multifamily mortgages; (4) **CRE collateralized loan obligations** (CLOs), which are pools of mortgages typically secured by transitional properties in need of short-term bridge financing. CRE CLOs are actively managed, and asset managers can add/remove loans from the portfolio during the reinvestment period.

**Government/Agency pools** include federal, state, and local governments, as well as government sponsored enterprises (GSEs). They own **13%** of all CRE debt. Federal, state, and local governments own 2%, and GSEs (who own only multifamily residential) own the remaining 11%.

**Insurance companies** include property-casualty and life insurance companies. They own **13%** of all CRE debt.

Commercial mortgages represent a significant portion of US insurers' investment portfolios, with life insurance companies owning the bulk of commercial mortgage loans held by insurance companies.

**Real Estate Investment Trusts (REITs)** own **5%** of all CRE debt.

A REIT is a company that owns and, typically, operates income-producing real estate or related assets. A REIT does not develop real estate properties to resell them, but rather buys and develops properties primarily to operate them as part of its investment portfolio. Two main types of REITs exist: (1) **equity REITs**, which invest in commercial properties and whose incomes are mainly generated from the rental incomes on their holdings; (2) **mortgage REITs**, which provide financing for income-producing real estate by purchasing or originating mortgages and earning income from the interest on these.

REITs registered with the SEC and publicly traded on an exchange are known as **publicly traded REITs**. SEC-registered but not publicly traded REITS are known as **non-traded REITs**. **Private REITs** are real estate funds or companies that are exempt from SEC registration and whose shares don't trade on exchanges.

**Pensions** includes private pension funds and state and local government employee retirement funds. They own **1%** of all CRE debt.

*Note: Debt ownership shares calculated based on Federal reserve Flow of Funds data by summing commercial mortgages and multifamily residential mortgages for each category; data as of 3Q23; data for REITs as of 2Q23, reflecting latest data available.*
*Source: Federal Reserve Board, Haver Analytics, various research sources, Goldman Sachs GIR.*

## 2

*Notable **political and geopolitical developments** also occurred,*

*Like rising US-China tensions, which makes more decoupling all but assured,*

*The US hitting its debt limit, which, as usual, set off a political fight,*


*And the Israel-Hamas war, which thrust the Middle East back into the spotlight.*

Pgs. 19-31

# US-China relations: on the mend?

**"We have to ensure that competition does not veer into conflict. And we also have to manage it responsibly—that competition. That's what the United States wants and what we intend to do."**
***- President Biden, November 2023***

**"China is ready to be a partner and friend of the United States... The fundamental principles that we follow in handling China-U.S. relations are mutual respect, peaceful coexistence and win-win cooperation."**
***- President Xi, November 2023***

"I've made clear with President Xi that we seek competition, not conflict... I'm committed to work with China where we can advance American interests and benefit the world... Make no mistake: as we made clear last week, if China threatens our sovereignty, we will act to protect our country. And we did."
*- President Biden, February 2023*

"We seek competition, but not conflict or confrontation... Everything that has happened in the last week and a half is, we believe, very consistent with our stated approach."
*- Kamala Harris, US Vice President, February 2023 on Chinese balloon incident*

"One of my greatest worries about the future is that we fall behind Communist China. The fact of the matter is—the danger posed by our dependence on China is dire."
*- Kevin McCarthy, US House Speaker, January 2023*

"We don't seek to block China from its role as a major power, nor to stop China—or any other country, for that matter—from growing their economy or advancing the interests of their people. But we will defend and strengthen the international law, agreements, principles, and institutions that maintain peace and security, protect the rights of individuals and sovereign nations, and make it possible for all countries—including the United States and China –to coexist and cooperate."
*- Antony Blinken, US Secretary of State, May 2022*

"The National Defense Strategy is clear-eyed about our main competitors. And that starts with the People's Republic of China... the PRC is the only country with both the will and, increasingly, the power to reshape its region and the international order to suit its authoritarian preferences. So let me be clear: we will not let that happen."
*- Lloyd Austin III, US Secretary of Defense, December 2022*

"Western countries, led by the U.S., have implemented all-round containment, encirclement and suppression against us, bringing unprecedentedly severe challenges to our country's development... In the face of fierce international competition, we must carve out new tracks for development, create new momentum and develop new strengths."
*- President Xi, March 2023*

"The Chinese and American economies have benefited from each other's development... China and the United States can and should cooperate, and there is great potential for Sino-US cooperation."
*- Li Qiang, Premier of China, March 2023*

"In this case the United States' perception and views of China are seriously distorted. It regards China as its primary rival and the most consequential geopolitical challenge... This is like the first button in a shirt being put wrong and the result is that the US-China policy has entirely deviated from the rational and sound track."
*- Qin Gang, Foreign Minister of China, March 2023*

"China will work with the US to find a way of promoting peaceful co-existence and mutually beneficial cooperation. We hope the US side will embrace a more open and inclusive approach when viewing China's development, work with us to manage differences in a spirit of equality and mutual respect, and adhere to the principles of coordination, cooperation and stability in bilateral ties."
*- Wang Yi, Director of the Office of the Central Foreign Affairs Commission, February 2023*

"China does not shy away from or fear competition, but we oppose using competition to define the entire China-US relationship."
*- Mao Ning, spokesperson for China's Foreign Ministry, February 2023*

Source: The White House, South China Morning Post, Various new sources, Goldman Sachs GIR.

# Old tensions resurfaced…

## Long history of US-China relations

### 1949-1970: EARLY TENSIONS WITH CHINESE COMMUNIST PARTY

The People's Republic of China (PRC) displaces the Nationalist government as the ruling party of Mainland China. The US sides with the Nationalist government, setting the stage for decades of tense US-China relations.

**1949:** The PRC is established by Mao Zedong after defeating the Nationalist government of Chiang Kai-shek. The US supports Chiang's government which has fled to Taiwan.

**1950s:** Korean War breaks out. US and China support opposite sides in the war and engage in military conflicts. US sends forces into the Taiwan Strait to prevent the PRC from reclaiming Taiwan.

**1954:** First Taiwan Strait Crisis. PRC amasses forces along the Taiwan Strait. The US intervenes to support the Nationalists in Taiwan to discourage the PRC from invading.

**1955:** US passes the Formosa Resolution of 1955 to further its commitment to defending Taiwan from threat of invasion by the PRC.

**1958-59:** Second Taiwan Strait Crisis. US intervenes by sending forces into the Taiwan Strait.

**1959:** US condemns China for human rights abuses following its response to the Tibetan Uprising.

**1960:** US President Eisenhower visits Taiwan, paying an official visit to Chiang Kai-shek.

**1964:** Vietnam War escalation. The US escalates its aid to South Vietnam while China begins to send more military assistance to North Vietnam.

**1965:** The US scales back economic aid to Taiwan, citing the growth and stability of Taiwan's economy.

**1969:** Conflict breaks out between China and the Soviet Union over their eastern border, motivating the Nixon Administration to improve relations with China to isolate the Soviet Union. The US Navy stops making regular patrols of the Taiwan Strait under the Nixon Doctrine.

**1970:** US and Chinese ambassadors begin meeting again for the first time in several years, however talks are suspended after the US launches Cambodian Campaign.

### 1971-1978: RAPPROCHEMENT

Tensions between the US and China begin to ease, and the two countries take steps towards full normalization of relations.

**1971:** China invites US table tennis team to visit Beijing. US Secretary of State Henry Kissinger makes a secret trip to China to meet with Premier Zhou Enlai. He makes a second public trip to make arrangements for US President Nixon to visit China.

**1972:** US President Nixon visits China and meets with Chairman Mao. The US and China sign the Shanghai Communiqué, setting the stage for an improving official relationship.

**1973:** US and China establish Liaison Offices in Beijing and Washington.

**1974:** The resignation of Nixon and declining health of Mao Zedong and Zhou Enlai delay progress towards full normalization of US-China relations.

**1975:** US President Ford visits China to discuss normalization of relations, although no progress is made.

**1976:** Deaths of Mao Zedong and Zhou Enlai further set back progress on US-China relations.

**1977:** US President Carter assumes office and sends US Secretary of State Vance to China to re-start negotiations on relationship normalization.

**1978:** After months of negotiations, the US and China issue a joint communiqué that establishes full diplomatic relations. The US agrees to recognize the PRC as the only government of China and ends official relations with the Nationalist government in Taiwan.

### 1979-2016: ESTABLISHMENT OF FULL DIPLOMATIC TIES

The US and China normalize diplomatic and trade relations, although tensions continue to flare periodically.

**1979:** US and China grant each other temporary most favored nation (MFN) tariff status. Deng Xiaoping visits the US.

**1983:** US and China establish US-China Joint Commission on Commerce and Trade to discuss bilateral trade issues.

**1984:** US President Reagan visits China and Chinese President Li visits the US, marking China's first formal head of state to visit the US.

**1989:** Temporary pause in bilateral relations following Tiananmen Square incident. US imposes economic sanctions on China.

**1992:** US-China relations resume following meeting of US President Bush and Chinese Premier Li at a UN conference.

**1996:** Third Taiwan Strait Crisis. PRC conducts military exercises and missile tests in the Taiwan Strait, prompting warnings from the US.

**1997:** Chinese President Jiang Zemin visits the US, the first state visit by a Chinese leader in over a decade.

**1999:** Accidental US bombing of the Chinese embassy in Belgrade.

**2000:** US passes US-China Relations Act of 2000, granting China Permanent Normal Trade Relations Status.

**2001:** China joins the World Trade Organization (WTO) after the US and China come to an agreement on conditions for entry. Later, tensions flare after a US intelligence plane collides with a Chinese jet.

**2009:** Presidents Obama and Hu launch the US-China Strategic and Economic Dialogue to discuss trade and other economic issues.

**2011:** US Secretary of State Hilary Clinton announces US "pivot" to Asia. US increases its military presence in Asia, which is met by Chinese criticism.

**2012:** US files complaint with WTO over China's restrictions on rare earth metals exports.

**2014:** US and China announce a joint climate initiative, both pledging to reduce carbon emissions.

**2015:** China develops multiple artificial islands in the South China Sea, despite US warnings.

*Source: US State Department, Council on Foreign Relations, Columbia University, PIIE, various news sources, Goldman Sachs GIR.*

# ...but Biden & Xi met face-to-face in 2023

### Short history of US-China relations

## 2017-2020: TRUMP-ERA TRADE WARS, ESCALATING TENSIONS

Trump Administration enacts Chinese tariffs, kicking off a tit-for-tat trade war that eventually ends with a Phase 1 trade deal. Political tensions continue to rise despite trade deal.

**2017**

**Apr 2017:** President Trump meets with President Xi for a two-day summit in Florida. Trump claims "tremendous progress" in the China relationship.

**May 2017:** US unveils an agreement with China to expand trade of products and services such as beef, poultry, and electronic payments.

**2018**

**Jan 2018:** US imposes "safeguard" tariffs on all imported washing machines and solar panels, including from China.

**Mar 2018:** The US releases an official report stating that China has conducted unfair trade practices relating to technology, intellectual property, and innovation. Trump orders 25% tariffs on steel imports and 10% on aluminum from all suppliers including China.

**Apr 2018:** The US bans the sale of components to Chinese tech company ZTE. China imposes retaliatory tariffs of up to 25% on many US products including airplanes and soybeans.

**Jul 2018:** US imposes 25% tariff on $34bn worth of Chinese goods. China retaliates with its own tariffs on $34bn worth of US goods. China criticizes the US for "trade bullying."

**Aug 2018:** US imposes 25% tariffs on $16bn worth of Chinese goods.

**Sep 2018:** US imposes 10% tariffs on $200bn worth of Chinese goods. China imposes tariffs on $60bn of US goods.

**Oct 2018:** US Vice President Pence says the US will prioritize competition over cooperation by using tariffs to combat "economic aggression."

**2019**

**Jan 2019:** US announces financial fraud charges against Huawei CFO, Meng Wanzhou.

**Jun 2019:** US raises tariffs from 10% to 25% on $200bn worth of Chinese goods.

**Aug 2019:** US labels China a currency manipulator after the yuan weakens significantly.

**Sep 2019:** US imposes 15% tariffs on $120bn worth of Chinese goods. China retaliates with tariffs on $75bn worth of US goods.

**2020**

**Jan 2020:** US and China sign Phase 1 trade deal that includes suspension of planned tariffs and a Chinese pledge to buy more US goods. US drops its designation of China as a currency manipulator.

**Jul 2020:** The US orders China to close its consulate in Houston, Texas, citing espionage and intellectual property theft. China retaliates by closing the US consulate in Chengdu.

**Nov-Dec 2020:** Trump continues to crack down on China during his last few weeks in office. US adds dozens of new Chinese companies to its trade blacklist, sanctions more Chinese officials, and bans US investments into companies with ties to the People's Liberation Army.

## 2021-PRESENT: EXPANDED US HARD LINE ON CHINA

Biden expands Trump-era hard line on China and tensions continue to escalate. US shoots down suspected Chinese spy balloon, igniting fresh concerns about the direction of the US- China relationship.

**2021**

**Mar 2021:** Biden Administration officials meet with Chinese officials for the first time, the meeting reflects disagreements on both sides. Biden Administration maintains Trump-era tariffs on Chinese imports and blacklists five Chinese companies, including Huawei, citing national security concerns.

**Jun 2021:** Biden expands Trump-era ban on US investment into Chinese firms with ties to defense or surveillance technology sectors. US Senate passes the Innovation and Competition Act of 2021 to compete with China. China passes the Anti-Foreign Sanctions Law to counter US and EU sanctions.

**Nov 2021:** Biden and Xi discuss "guardrails" to avoid conflict. The US and China sign a joint statement during UN climate summit agreeing to boost cooperation on combating climate change.

**Dec 2021:** Biden signs Uyghur Forced Labor Prevention Act, which bans all goods from Xinjiang in response to concerns about forced labor camps.

**2022**

**Feb 2022:** US imposes diplomatic boycott on Beijing Olympics over the Chinese government's human rights abuses. Chinese officials say the US is trying to "provoke confrontation."

**Mar 2022:** In a call with Xi, Biden threatens "consequences" if China provides military support to Russia.

**Aug 2022:** Then US House Speaker Pelosi visits Taiwan in a trip she says demonstrates US support for Taiwan. Mainland China retaliates by suspending climate talks with the US, cutting off military communication channels, and sanctioning Pelosi. Mainland China military conducts live-fire drills around Taiwan.

**Oct 2022:** US announces restrictions on exports of advanced computing chips and related equipment to China. The restrictions also apply to foreign companies that use any US-made tools and software. Chinese Foreign Ministry spokesperson says the US "will only hurt and isolate itself" with the restrictions.

**Nov 2022:** Biden and Xi meet in person for the first time during Biden's presidency. Both express a desire to ease tensions and agree to reopen communication channels.

**2023**

**Feb 2023:** US shoots down a suspected Chinese spy balloon and US Secretary of State Blinken cancels his trip to China. China condemns the US' actions, claiming the balloon was a civilian craft.

**Mar 2023:** Biden Administration reportedly to propose new legislation to curb the flow of US funding to Chinese technology. China announces a cybersecurity review of US chip maker Micron Technology.

**Apr 2023:** Taiwan leader, Tsai Ing-wen, meets with US House Speaker McCarthy in California. Mainland China condemns the visit and launches military exercises around Taiwan.

### What's happened since:

May 2023 | June 2023 | July 2023 | August 2023 | September 2023 | October 2023 | November 2023 | December 2023

**May 2023:** Chinese Foreign Minister meets with US Ambassador to China in the first high-level US-China meeting since the balloon incident.

**Jun 2023:** Blinken travels to Beijing and meets with Xi, they agree to continue further progress on the bilateral relationship.

**Jul 2023:** US Treasury Secretary Janet Yellen visits Beijing.

**Aug 2023:** Biden issues an Executive Order restricting US investments in certain Chinese tech and products. China places export restrictions on key metals used for chip production. US Secretary of Commerce Gina Raimondo visits China and meets with Chinese officials.

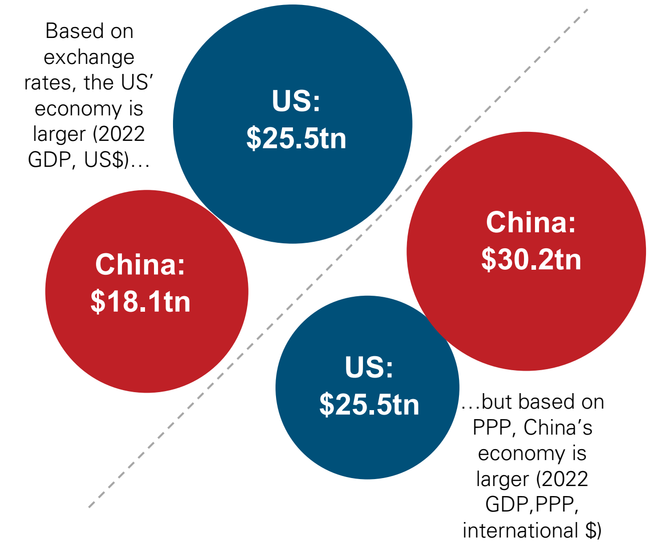
**Oct 2023:** US further tightens export controls on advanced chips to China.

**Nov 2023:** Biden and Xi meet in San Francisco amid the APEC Summit. Both highlight the importance of bilateral relations and agree to further cooperation in certain areas.

*Source: US State Department, Council on Foreign Relations, various news sources, PIIE, Goldman Sachs GIR.*

# US and China: two big economies...

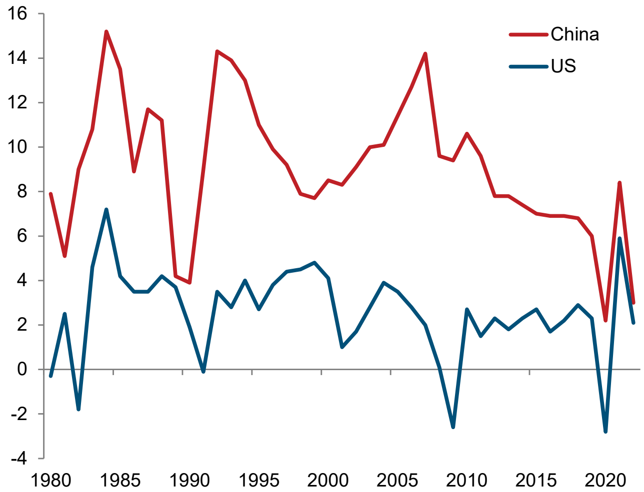
**The US', or China's, economy is larger, depending on measure**




Source: IMF, Goldman Sachs GIR.

**China grew faster than the US over the last several decades**

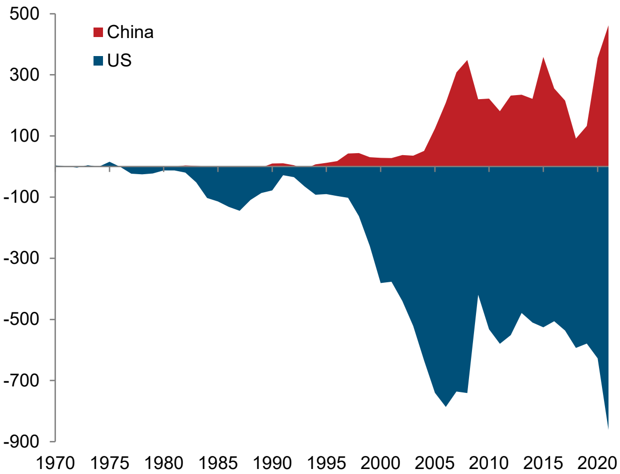
Real GDP growth, annual % change (through 2022)




Source: IMF, Goldman Sachs GIR.

**The US has long been a net importer, and China a net exporter**

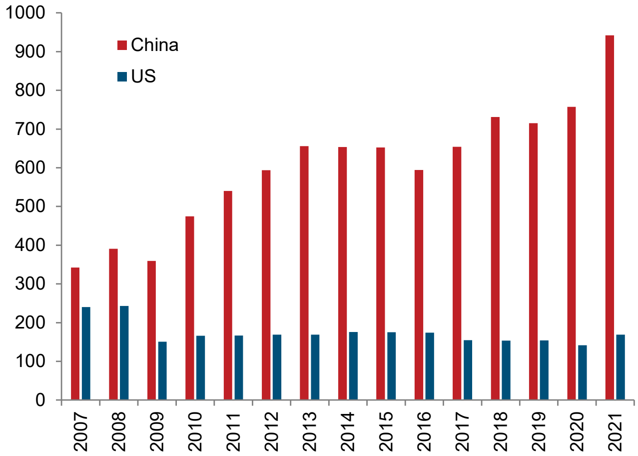
Trade balance (exports-imports), US$bn (through 2021)




Note: Includes both goods and services trade.
Source: World Bank, Goldman Sachs GIR.

**China exports significantly more high-tech products than the US**

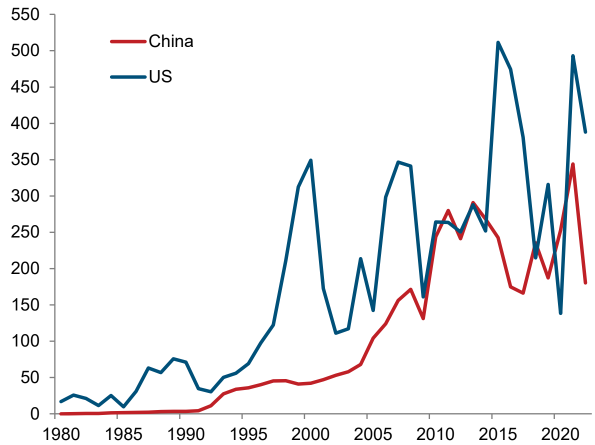
High-technology exports, US$bn




High-tech exports are products with high R&D intensity, such as aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.
Source: World Bank, Goldman Sachs GIR.

**The US was a larger recipient of foreign direct investment (FDI) than China in 2022, for the second consecutive year**

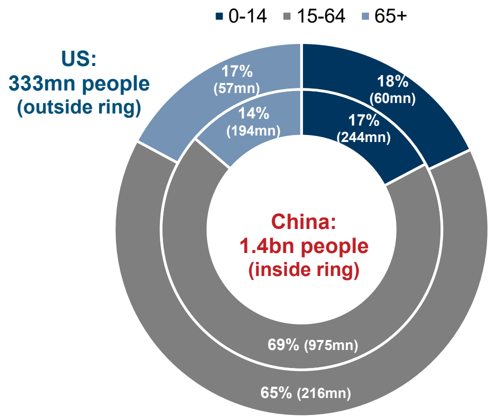
FDI net inflows (BoP, US$bn) (through 2022)




Source: World Bank, Goldman Sachs GIR.

**The demographic breakdowns of the US and China continue to look quite similar**

Population by age group, % of total population (2022) (total population in parentheticals)




Total population includes all residents regardless of legal status/citizenship.
Source: World Bank, Goldman Sachs GIR.

# ...that remain closely linked

**The US and China are one of each other's main trading partners and the value of US exports and imports to and from China has steadily risen over the last two decades**

Trade in goods and services between the US and China, $bn


*Source: US Bureau of Economic Analysis, Goldman Sachs GIR.*

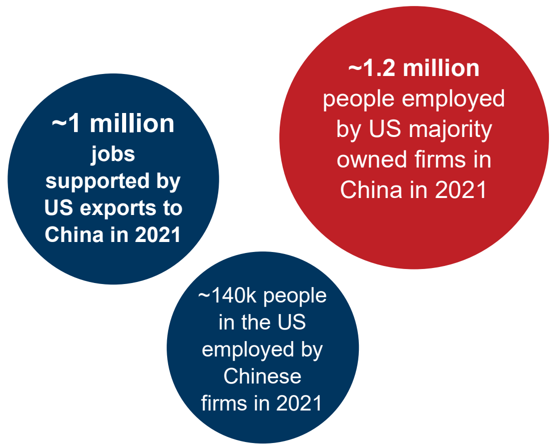
**US agricultural exports to China reached a record high in 2022 and the US imported large amounts of electronic equipment and machinery from China**

US exports and imports of goods to/from China in 2022

| US Main Imports of Goods from China | $bn | % of total imports from China |
|---|---|---|
| Electrical, electronic equipment | 145.8 | 27% |
| Machinery, nuclear reactors, boilers | 112.7 | 21% |
| Toys, games, sports requisites | 42.8 | 8% |
| Chemicals | 35.0 | 7% |
| Furniture, lighting signs, prefabricated buildings | 29.7 | 6% |
| Plastics | 26.4 | 5% |
| Total imports from China | 536.8 | |
| **US Main Exports of Goods to China** | **$bn** | **% of total exports to China** |
| Agricultural products (ex. livestock, forestry, and marine products) | 38.2 | 25% |
| Chemicals | 25.7 | 17% |
| Medical equiptment, Pharmaceutical products | 20.2 | 13% |
| Electrical, electronic equipment | 16.0 | 10% |
| Machinery, nuclear reactors, boilers | 14.9 | 10% |
| Oil and gas | 11.0 | 7% |
| Total exports to China | 153.8 | |

*Source: U.S. Census Bureau Trade Data, Goldman Sachs GIR.*

**Jobs in the US and China rely on their trading partnership and expansion of US and Chinese multinational corporations**




*Source: US-China Business Council, Burea of Economic Analysis, Rhodium Group, Goldman Sachs GIR.*

**A large number of US companies derive a significant portion of their revenues from China...**

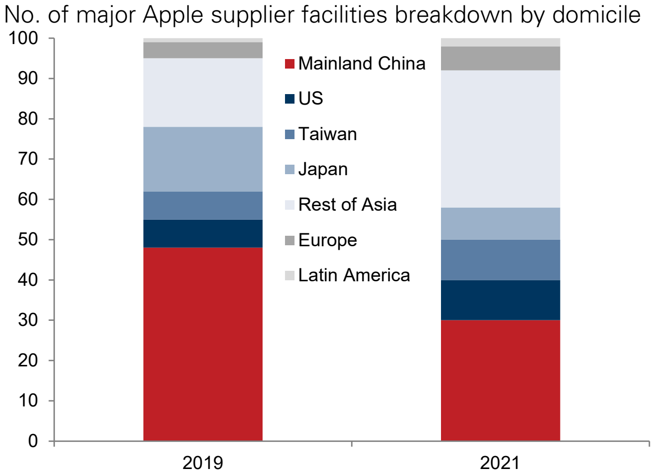
Selected US companies' revenue exposure to China in 2022

| | Share of revenues from China | Revenue exposure to China ($mn) |
|---|---|---|
| **Qualcomm** | 64% | 28,119 |
| **Texas Instruments** | 49% | 9,844 |
| **Marvell Technology** | 42% | 2,486 |
| **Broadcom** | 35% | 11,621 |
| **Applied Materials** | 28% | 7,254 |
| **Intel** | 27% | 17,125 |
| **NVIDIA** | 26% | 7,111 |
| **Tesla** | 22% | 18,145 |
| **Apple** | 19% | 74,200 |
| **Nike** | 17% | 7,547 |

*Source: Company 10k filings, Goldman Sachs GIR.*

**...and rely on manufacturing facilities in Mainland China, though recently some have tried to diversify their supply chain away from Mainland China given increased geopolitical tensions**

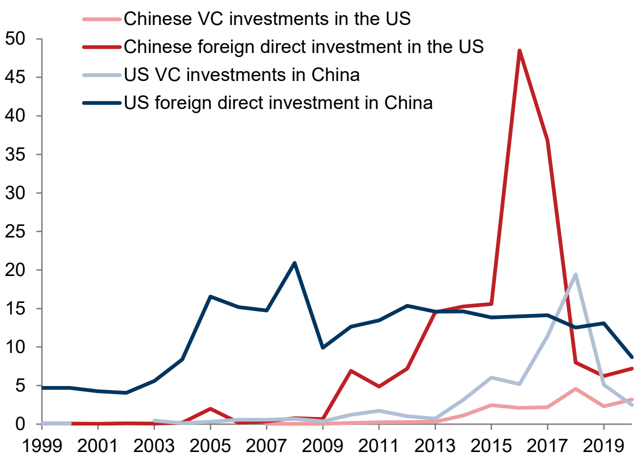
No. of major Apple supplier facilities breakdown by domicile




*Source: Apple, Goldman Sachs GIR.*

**...and investment flows between the US and China have also decreased in recent years as bilateral tensions have escalated**

US-China investment flows, $bn

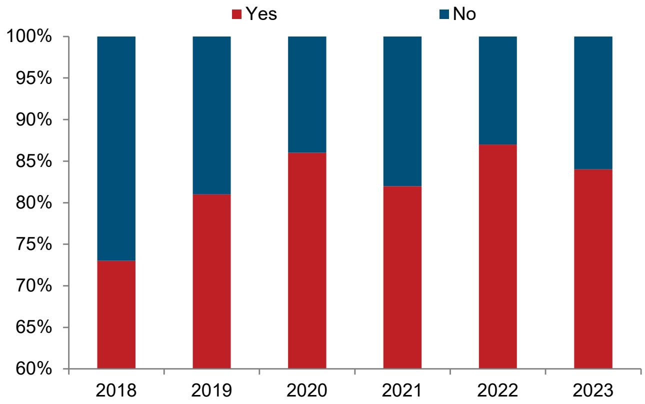



*Source: Rhodium Group, Goldman Sachs GIR.*

# But US-China sentiment...

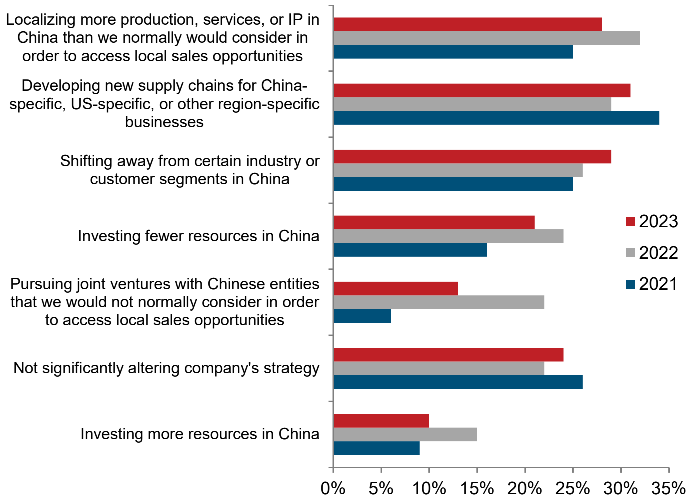
## US companies doing business in China continue to be affected by US-China tensions...

% of member companies that responded yes/no to the question "has your company's business with China been affected by US-China tensions?" (2018-22) and "have US-China tensions impacted your business in China?" (2023)



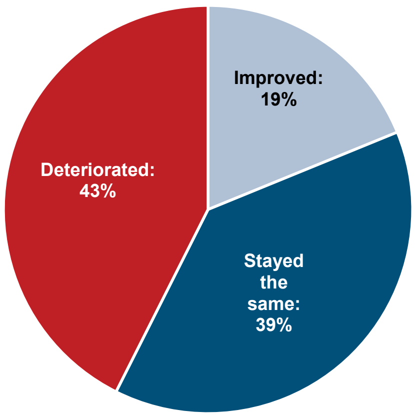

## ...and many have continued to respond by altering their strategies

% of member companies that reported taking each action "due to the impact of tensions"



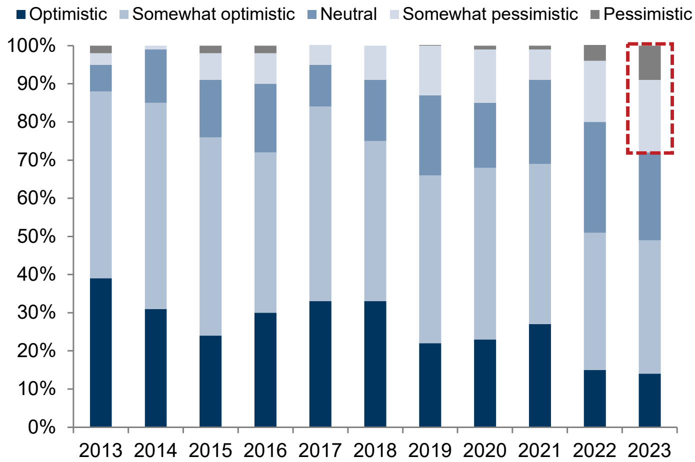

## Around 40% of US companies say the business climate in China has deteriorated over the last year...

% of member companies that gave each answer to "over the last 12 months, China's business environment has..."



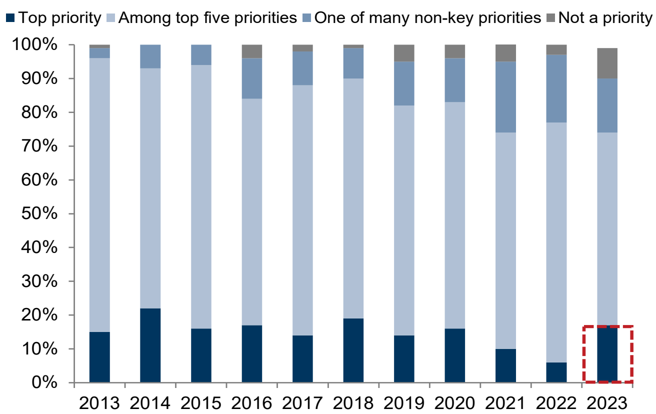

## ...and more firms have become pessimistic on the five-year outlook

% of member companies on their view of the "five-year outlook for business in China"



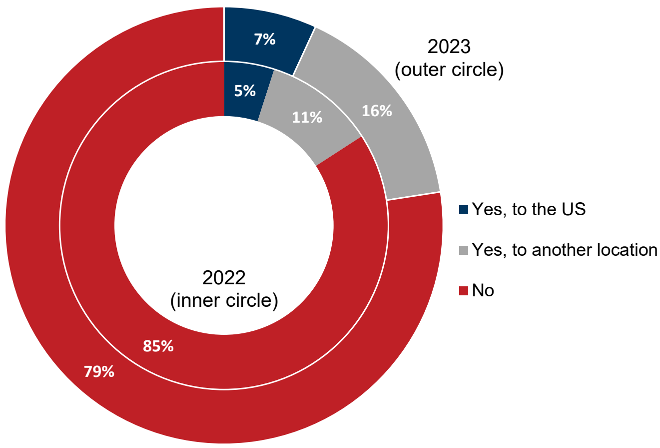

## More companies have reported that China is a top priority in their company strategy...

% of member companies on how "China's prominence in overall company strategy" has evolved




## ...though more firms have or are planning to move operations out

% of member companies answering each to "has your company moved or does it plan to move any operations out of China?"

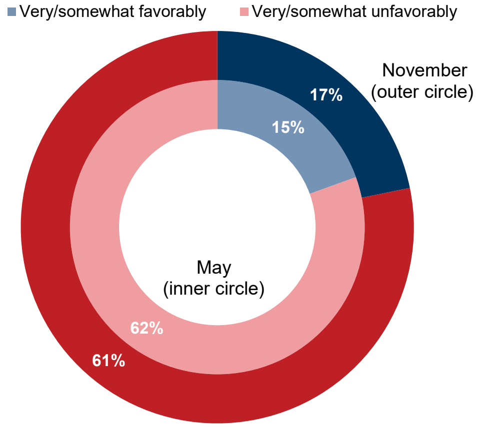



*Source for all exhibits: US-China Business Council's 2022 Member Survey conducted in June 2022 and 2023 Member Survey conducted in June-July 2023; survey draws from a pool of 117 member companies; majority of respondents (2/3) have operated in China for more than 20 years.*

# ...remains mutually unfavorable

## A large majority of Americans continue to view China unfavorably...

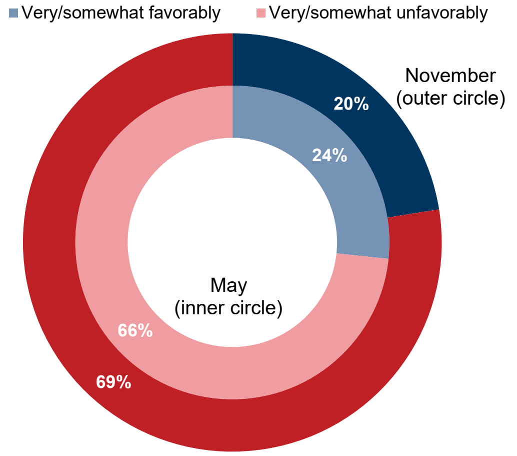
Shares indicating how US respondents view China (May 1 and November 1 2023 data)




*Source: Morning Consult's US-China Relations Barometer, Goldman Sachs GIR.*

## ...as do a large majority of Chinese

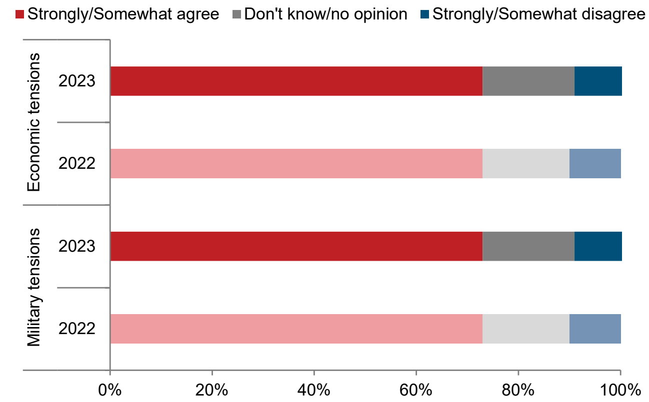
Shares indicating how Chinese respondents view the US (May 1 and November 1 2023 data)




*Source: Morning Consult's US-China Relations Barometer, Goldman Sachs GIR.*

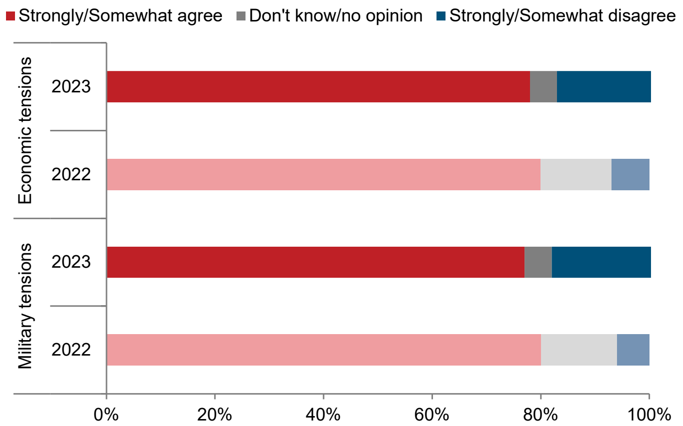
## A majority of Americans continue to believe that the US and China should work together to reduce bilateral tensions...

US share reporting that the US and China should work together to reduce the below tensions (2022 figures from survey conducted 11/2-11/3/22, 2023 figures as of Oct 23)



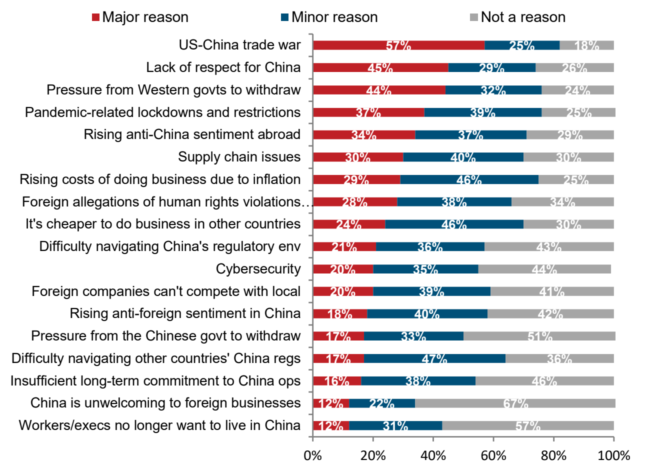

## ...as do a majority of Chinese, though share who disagree has risen

China internet-using share reporting that the US and China should work together to reduce the below tensions (2022 figures from survey conducted 11/2-11/6/22, 2023 figures as of Oct 23)




## Chinese consumers view foreign companies' decisions to exit China as being primarily driven by geopolitical considerations...

China internet-using share reporting why they believe foreign companies are exiting China (survey conducted 6/1/-6/6/22)

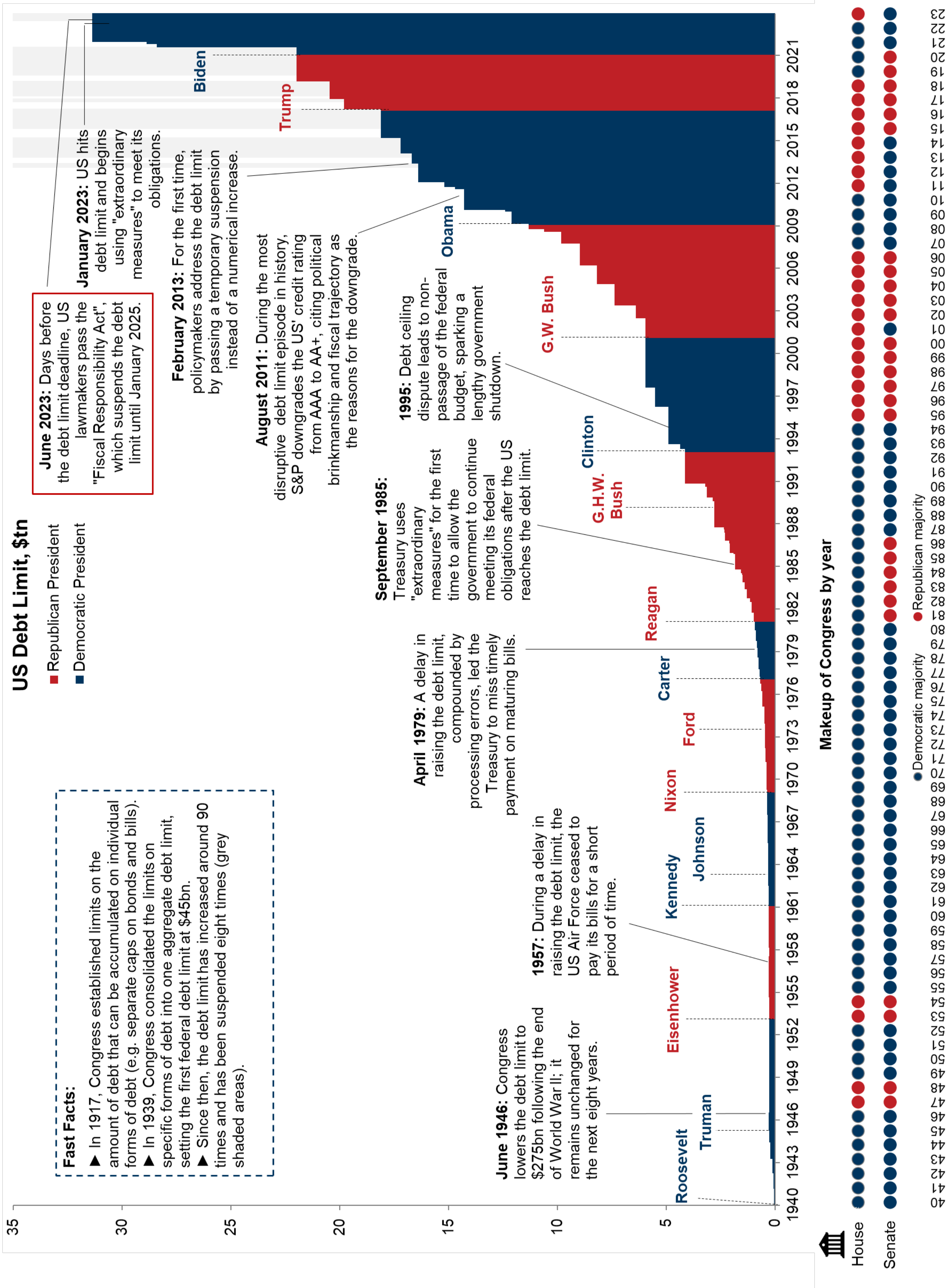



## ...yet other factors trump geopolitical considerations as the main drivers of Chinese demand for foreign goods and services

China internet-using share reporting the importance of each when choosing to buy foreign goods/services (survey conducted 6/30-7/6/22)


*Source for charts 3-6: November 2023 and December 2022 Morning Consult Survey on the state of US-China relations (survey among representative samples of roughly 1k adults in each country), Goldman Sachs GIR.*

# US debt limit debacle postponed…



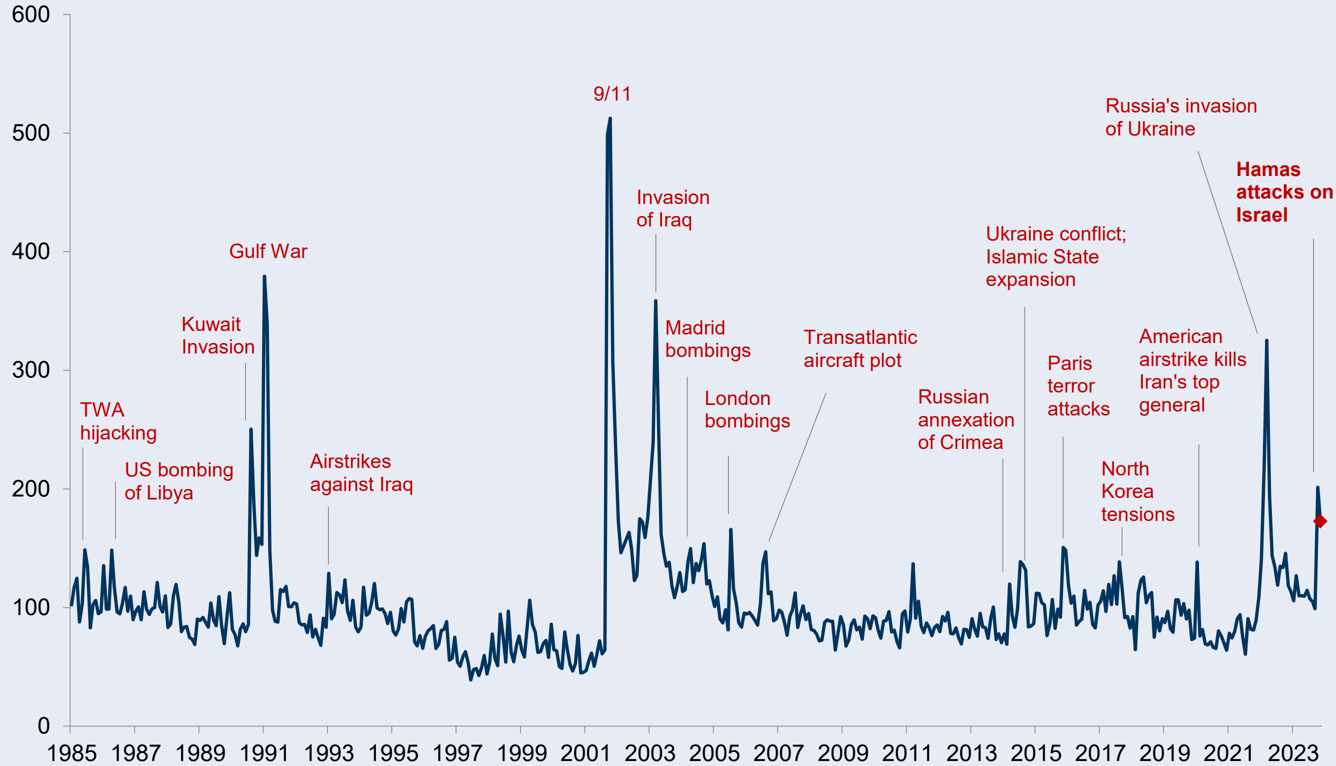

*Note: Grey bars indicate periods when the debt ceiling was suspended.*
*Source: Bipartisan Policy Center, Haver Analytics, White House History, US Senate, Goldman Sachs GIR.*

# ...but global geopolitical risk has risen

*Geopolitical tensions, which take many different forms, are difficult to measure. One proxy for assessing the geopolitical environment is the news-based Geopolitical Risk Index developed by economists from the Federal Reserve Board.*

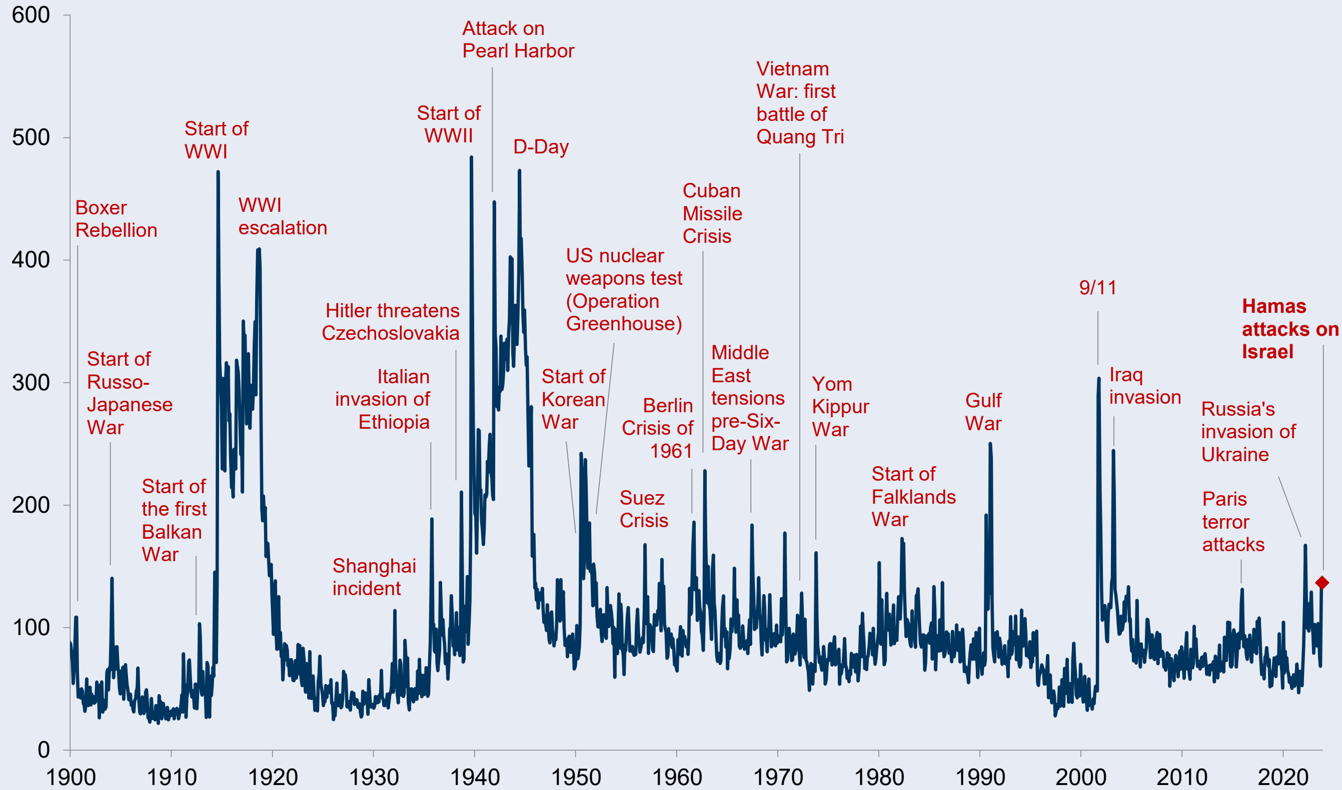
## 1985-Present

Geopolitical Risk Index, 2019=100




## 1900-Present

Geopolitical Risk Index, 2019=100




*Note: The index from 1985 on counts the number of articles in 11 US, UK, and Canadian newspapers mentioning phrases related to geopolitical tensions. The index from 1900 on performs the same analysis using the archives of three newspapers, the New York Times, the Wall Street Journal, and the Financial Times. The choice of newspapers for both indices imply a measure of geopolitical risk as covered by the Anglo-Saxon press. See here for more information.*

*Source: Dario Caldara & Matteo Iacoviello, Federal Reserve Board, Goldman Sachs GIR.*

# ...as the Israel-Hamas war continues...

**1916**

**1916:** Great Britain and France issue the **Sykes-Picot Agreement**, which splits up the Middle East region between them and delineates its borders, including Palestine's. The Agreement is implemented in 1919.

**1917:** Great Britain issues the **Balfour Declaration** in support of a Jewish homeland in Palestine.

**1922:** The League of Nations issues Great Britain a mandate to establish a Jewish homeland in Palestine.

**1926**

**1929:** Arab Muslims and Jews clash in Jerusalem over their prayer rights at the Wailing Wall, known to Muslims as al-Buraq.

**1936**

**1936: The Arab Revolt** breaks out in Palestine in protest of Great Britain's support of the Zionist movement. The Revolt lasts until 1939.

**1937:** The British-organized Peel Commission issues a report recommending the partition of Palestine into Jewish and Arab states in an effort to solve the ongoing conflict. The partition plan is accepted by the majority of the official leadership of the Zionist movement. The Arab side rejects it.

**1938:** The British government assembles a team to propose a new partition plan. The Woodhead Commission concludes that two independent states would be impracticable.

**1939: Great Britain abandons its support for a Jewish state in Palestine** in the MacDonald White Paper, which calls for the establishment of a Palestinian state within 10 years and establishes a ceiling for Jewish immigration to Palestine.

**1946**

**1947:** The UN General Assembly votes in favor of the partition of Palestine into Jewish and Arab territories. The day after it does so, fights break out between Jewish and Arab groups.

**1948: The British Mandate in Palestine ends** amid escalating violence from both sides. The following day, Israel's first prime minister David Ben-Gurion declares the **independence of the state of Israel** in the part of Palestine given to the Jewish people by a UN Special Committee. Syria, Egypt, Lebanon, and Jordan invade Palestine the next day, kicking off the **Israeli War of Independence**, which ends in 1949.

**1956**

**1956:** Egyptian President Gamal Abdel Nasser announces **Egypt's nationalization of the Suez Canal**. Great Britain, France, and Israel attack Egypt in response, but withdraw following pressure from the US and Soviet Union.

**1960:** Iraq, Iran, Kuwait, Saudi Arabia, and Venezuela form the Organization of the Petroleum Exporting Countries (OPEC).

**1964: The Palestine Liberation Organization (PLO) is founded** during the Arab League Summit in Cairo.

**1966**

**1967:** Israel carries out preemptive strikes against Egypt and Syria following rising regional tensions, kicking off the **Six-Day War**, during which Israel occupies the West Bank, Gaza, East Jerusalem, Golan Heights, and Sinai Peninsula. Following the war, the UN Security Council adopts Resolution 242 calling for Israeli withdrawal from the occupied territories in exchange for peace.

**1972:** Iraq and the Soviet Union sign a 15-year Treaty of Friendship and Cooperation.

**1973:** Egypt and Syria launch a surprise attack against Israel in a bid to reclaim territory lost in the Six-Day War, kicking off the **Yom Kippur War**. Two weeks later, UN Security Council Resolution 338 is adopted, which calls for direct negotiations between Israel and Arab states.

**1976**

**1977:** Egyptian President Anwar al-Sadat becomes the first Arab leader to visit Israel. He officially recognizes the state of Israel during his visit, paving the way for the **1979 Egypt-Israel Peace Treaty.**

**1978: Israeli Prime Minister Menachem Begin and Sadat negotiate at Camp David**, with US President Jimmy Carter mediating. The meeting results in the first peace accord between Israel and an Arab neighbor. Under the accord, Israel will return control of the Sinai to Egypt while retaining the Gaza Strip. In exchange, Egypt recognizes Israel and establishes full diplomatic negotiations with it.

**1979: The Iranian Revolution** overthrows the Shah, a staunch ally of the West, and installs exiled cleric Ayatollah Ruhollah Khomeini as supreme leader of the theocratic state. The US and regional powers oppose the revolution, and, in November, 52 Americans are taken hostage in the American embassy in Tehran by Iranian students, who demand the return of the Shah to stand trial for crimes. In December, the **Soviet Union invades and occupies Afghanistan** in a war that will last a decade.

**1980:** Iraq invades Iran, kicking off the **Iran-Iraq War** that will last for eight years.

**1981: Sadat is assassinated** by Islamic terrorists on October 6 during the annual victory parade held in Cairo that celebrated the day Egyptian soldiers crossed the Suez Canal in 1973.

**1982:** Israel completes its withdrawal from Sinai in April. In June, Israel invades Lebanon to drive out the PLO, which has been using the country as its base for operations against Israel.

**1983:** The US Embassy in Beirut is bombed by Iranian-backed militants, killing 63 people. The US mediates an agreement between Israel and Lebanon under which Israeli forces will leave Lebanon in a phased withdrawal.

**1986**

**1986: The Iran-Contra Affair**—during which the US under President Ronald Reagan provided arms assistance in exchange for the return of hostages in Lebanon—comes to light.

**1987:** The **First Intifada** begins after an IDF truck collides with a car, killing four Palestinian workers. Palestinians carry out protests and riots.

**1988: The Palestine National Council (PNC) declares a Palestinian state**, which includes land that has been under Israeli occupation since the Six-Day War, in November. In December, the PLO recognizes the state of Israel and calls for negotiations. A US-PLO dialogue begins shortly after, ultimately leading to the 1991 Middle East peace conference in Madrid.

**1989:** Osama bin Laden founds the al-Qaeda network.

**1990: Iraq invades Kuwait.** A US-led coalition forms against Iraq's presence, kicking off the **Persian Gulf War** that ends the next year.

**1993:** Israeli Prime Minister Yitzhak Rabin and PLO Chairman Yasser Arafat sign the **Oslo Accords** under US President Bill Clinton. The Accords outline the initial terms of a process for a two-state solution and establish the Palestinian National Authority (PNA) in the West Bank and Gaza.

**1994:** Israel and the PLO agree on the initial implementation of the Oslo Accords in May in the **Gaza-Jericho Agreement**, which includes an Israeli military withdrawal from 60% of Gaza and the West Bank town of Jericho. In July, Rabin and Jordanian King Hussein sign a declaration ending the 46-year official state of war between the two nations.

**1995**

**1995:** Arafat and Rabin sign the Taba Agreement, also known as **Oslo II**, in September to expand Palestinian self-rule in Gaza and the West Bank, as well as allow Palestinian elections. In October, Qatar becomes the first Gulf nation to have normalized economic relations with Israel. On November 4, **Rabin is assassinated** by an Israeli extremist opposed to the Oslo Accords.

Source: Council on Foreign Relations, PBS, NPR, various other news sources, Goldman Sachs GIR.

1996

**1996: The first Palestinian elections take place.** Arafat is elected president of the PNA.

**1998:** Israeli Prime Minister Benjamin Netanyahu and Arafat sign the **Wye River Memorandum**, which outlines a plan for further Israeli withdrawal from the West Bank.

**1999:** Israeli Prime Minister Ehud Barak and Arafat sign an agreement restating both sides' commitment to the full implementation of all agreements reached since the first Oslo Accords.

**2000:** Israel hands over some territory in the West Bank to the Palestinians in March, which completes the transfer agreement reached at Wye River. In May, Israel withdraws from the security zone in Lebanon. In July, **Barak and Arafat negotiate at Camp David** with Clinton mediating. They fail to reach an agreement on final status issues around Jerusalem, borders, and security. Clinton publicly blames Arafat for the failure. In September, the **Second Intifada** erupts following Likud leader Ariel Sharon's visit to the area around the Al-Aqsa mosque in Jerusalem.

**2001: On September 11, al-Qaeda carries out terrorist attacks against the US** by crashing planes into the World Trade Center and Pentagon, resulting in the deaths of 3,000 Americans.

**2002:** US President George W. Bush refers to Iran as part of an "axis of evil", along with North Korea and Iraq, in January. In April, Israel launches military raids against the PNA and terrorists in the West Bank in response to a rise in Palestinian suicide bombings. In September, the Roadmap—a phased peace plan aiming to settle the Israeli-Palestinian conflict—is introduced by the US, EU, Russia, and the UN. Little practical progress is made on implementation.

**2003: US forces invade Iraq** in March. They will remain there until 2011. In December, Sharon, now the Israeli Prime Minister, proposes a **disengagement plan from the Gaza Strip** that will require the uprooting of two dozen Israeli settlements. Disengagement officially begins in August 2005 and concludes later that month.

2006

**2006: Second Lebanon War begins**, sparked by Hizbullah's cross-border raid from Lebanon into Israel.

**2008:** Israel begins a ground military invasion in Gaza in December following a years-long barrage of rockets and missiles from Hamas. Israel unilaterally ends the operation in January 2008 following the signing of a Memorandum of Understanding between the US and Israel.

**2012:** Israel launches an aerial military operation in Gaza targeting Hamas and Palestinian Islamic Jihad (PIJ) leadership following increased rocket attacks from Gaza. A ceasefire facilitated by Egypt and the US is reached within a week.

**2013:** Iran and the P5+1—the five permanent members of the UN Security Council plus Germany—sign an initial nuclear agreement, which provides Iran with some sanctions relief.

**2014:** Israel launches a military operation in Gaza in response to attacks on civilian centers. Shortly after the operation begins, Israel sends ground forces into Gaza to destroy Hamas infrastructure. The conflict lasts 50 days until an open-ended ceasefire is reached. Later that year, the **Yemen Civil War begins** when Iranian-linked Houthi forces take over the capital city and government, prompting a direct intervention by Saudi forces the following year.

**2015:** Iran, the P5+1, and the EU reach an agreement on Iran's nuclear program known as the **Joint Comprehensive Plan of Action (JCPOA).**

2016

**2018:** US President Donald Trump announces that the **US will withdraw from the JCPOA** and mounts a sanctions campaign to exert maximum pressure on Iran.

**2019:** Two oil tankers are attacked near the Strait of Hormuz in June, a month after four commercial ships are damaged in the area. The US blames Iran and announces the deployment of 1,000 additional troops to the Middle East in response. In September, Saudi Aramco oil facilities are attacked by drones, causing a sharp rise in oil prices. Houthi rebels claim responsibility, though the US and Saudi Arabia blame Iran.

**2020:** Trump and Netanyahu announce a new US plan for Israeli-Palestinian peace in January, which is never implemented. In the same month, the **US military assassinates Qasem Soleimani**, head of the Iranian Revolutionary Guard Corps Quds Force, in a drone strike. In September, **the Abraham Accords are signed between Israel, the UAE, and Bahrain**, as part of which the UAE and Bahrain recognize Israel's sovereignty and establish diplomatic relations with it.

**2021: Sudan signs the Abraham Accords Declaration** in January, though it does not sign the corresponding document with Israel. In May, Hamas and PIJ begin launching rockets and missiles into Israel, leading Israel to target Hamas and PIJ sites throughout Gaza. A ceasefire facilitated by Egypt, Qatar, and the US is announced 11 days later.

**2022:** The US, Bahrain, Egypt, Israel, Morocco, and the UAE establish the Negev Forum, a regional cooperation framework aimed at deterring Iran.

**2023:** In March, Saudi Arabia reportedly seeks assurances from the US to establish normalized relations with Israel.

## October 2023 - Present: Current conflict

**October 7, 2023: Hamas launches a surprise attack on Israel**, killing over 1,200 Israelis and taking hundreds of hostages. The next day, Israel formally declares a state of war.

**October 17:** An explosion occurs outside of the al-Ahli hospital in Gaza, kicking off anti-Israel and anti-American protests across the Arab world.

**October 18:** US President Joe Biden arrives in Israel, expressing support for Israel and the "legitimate aspirations of the Palestinian people".

**October 20:** Israeli Defense Minister Yoav Gallant lays out the three phases of the war, saying that Israel will create "a new security regime in the Gaza Strip" after Hamas is eliminated.

**October 28:** Netanyahu announces that Israeli forces have entered the Gaza Strip in what he calls **Israel's "second war of independence"**.

**November 3:** Hizbullah leader Hassan Nasrallah delivers remarks on the Israel-Hamas war, proclaiming that the time for a regional war isn't here yet.

**November 14:** The IDF enters the Al-Shifa hospital complex in Gaza, releasing footage that it claims proves the site was being used by Hamas militants.

**November 19:** Houthi rebels seize the *Galaxy Leader*, an Israeli-owned ship, off the western coast of Yemen.

**November 22: Israel and Hamas agree to a deal** that would allow the release of at least 50 hostages over the course of a four-day pause in fighting. Israel also agrees to release 150 Palestinian prisoners as part of the deal.

**November 24:** Hamas releases a first group of 24 hostages. Israel releases 39 Palestinian prisoners.

**November 25:** Hamas releases a second group of 17 hostages and Israel a second group of 39 Palestinian prisoners.

**November 26:** Hamas releases a third group of 17 hostages and Israel a third group of 39 Palestinian prisoners. Suspected Houthi rebels seize an Israeli-linked ship, the *Central Park*, in the Gulf of Aden.

**November 27:** Hamas releases a fourth group of 11 hostages and Israel a fourth group of 33 Palestinian prisoners. **Israel and Hamas agree to extend the four-day truce** by two days.

**November 28:** Hamas releases a fifth group of 12 hostages and Israel a fifth group of 30 Palestinian prisoners.

**November 29:** Hamas releases a sixth group of 16 hostages and Israel a sixth group of 30 Palestinian prisoners. A US warship shoots down a Houthi drone in the Red Sea.

**November 30:** Hamas releases a seventh group of eight hostages and Israel a seventh group of 30 Palestinian prisoners.

**December 1:** The truce formally ends, and the IDF resumes its military operation.

**December 3:** IDF spokesperson Rear Admiral Daniel Hagari says that the IDF continues to extend its ground operations across all of Gaza. Pentagon says that a US destroyer and three commercial ships in the Red Sea came under attack. Houthi forces claim responsibility.

## What's happened since?

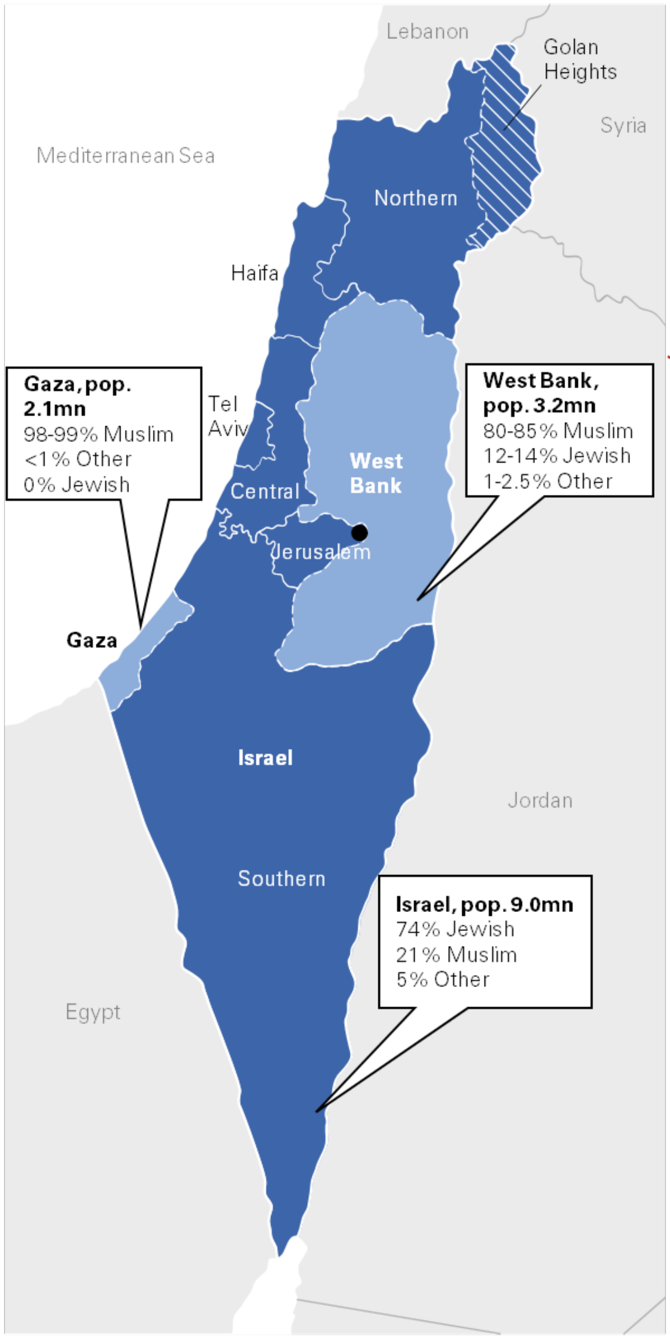
**December 5:** IDF reports that its soldiers have reached the center of Khan Younis, the largest city in southern Gaza.

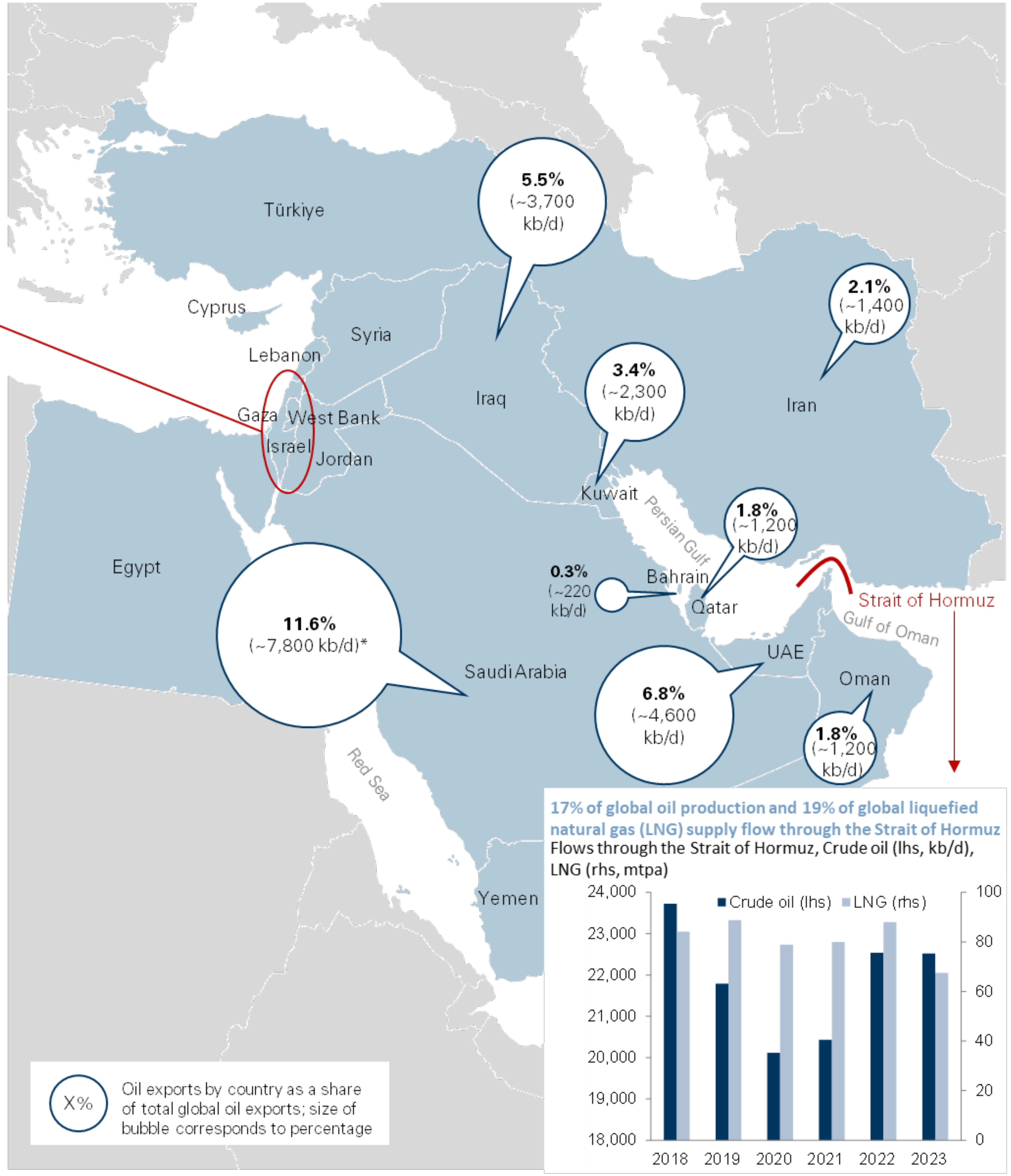
**December 8:** US vetoes a UN Security Council resolution calling for an immediate ceasefire in Gaza; 13 members vote in favor, and UK abstains.

**December 11:** Houthi forces claim responsibility for missile attack on Norwegian tanker in the Red Sea.

**December 12:** Israel informs US it has begun to "carefully test out" flooding Hamas tunnels in Gaza with seawater. The same day, the UN General Assembly votes to demand an immediate ceasefire in Gaza.

# ...with escalation potentially impacting oil



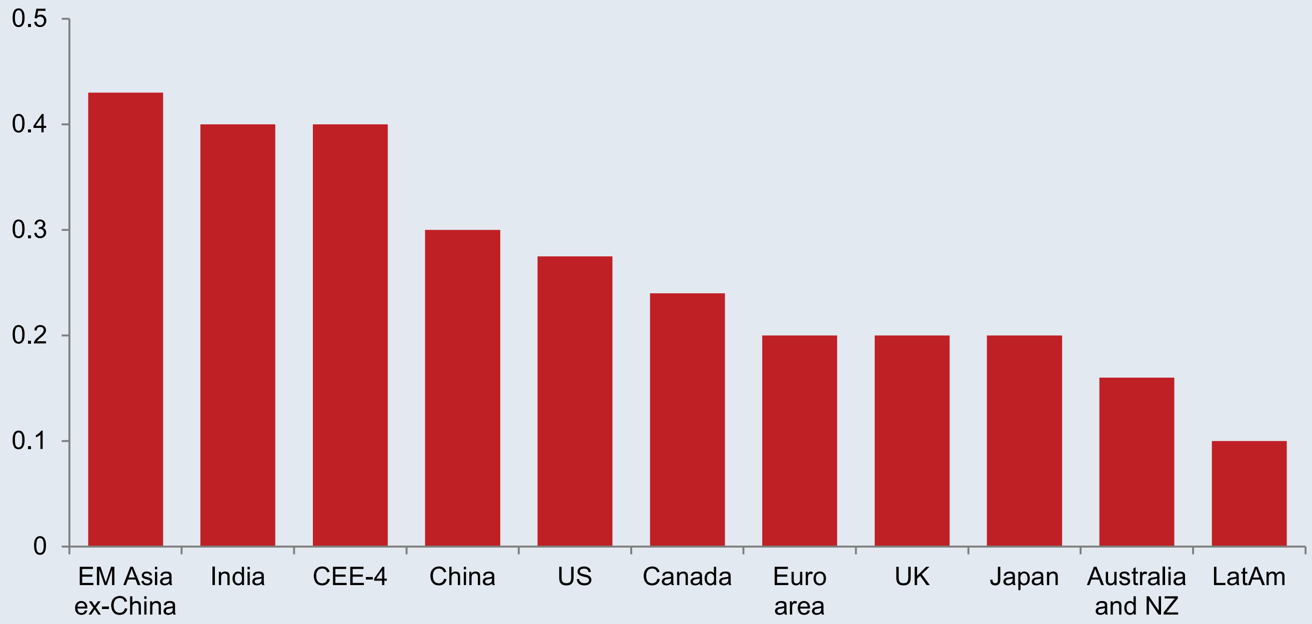

Note: In 2019, the US became the only country (besides Israel) to officially recognize the Golan Heights as being under the sovereignty of Israel. Outside of that, it is internationally recognized it as a Syrian territory. Population figures are 2023 estimates from the CIA's World Factbook. *Minority of Saudi Arabia oil exports flow through the Red Sea.
Source: CIA's World Factbook, Getty Images, Kpler, Goldman Sachs GIR.
Special thanks to GS Commodity Strategists Callum Bruce and Daniel Moreno for the chart.

# ...with severe economic impacts

GS GIR economists estimate the impact a $10/bbl rise in Brent crude oil prices would have on inflation and GDP growth across major economies and regions. Their key findings are below.

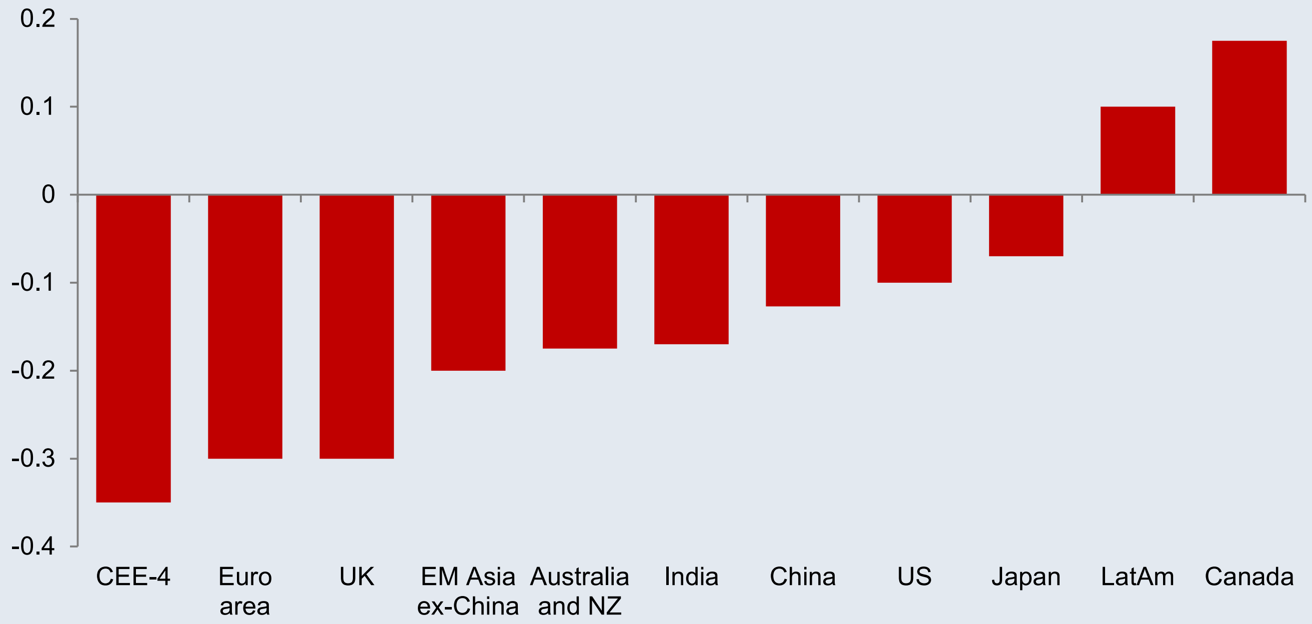
**A $10/bbl increase in oil prices would have moderate impacts on inflation, with generally larger impacts across EMs than DMs...**

Effect of a $10/bbl increase in Brent oil prices on headline inflation, pp




**...as well as modest negative impacts on growth, though net oil exporters such as Canada and some Latin American economies would see a positive impact**

Effect of a $10/bbl increase in Brent oil prices on GDP, %




*Notes and source: Figures and methodology originally published in Joseph Briggs and Devesh Kodnani's "Global Economics Analyst: The Boost to Global Growth and Inflation from China's Reopening", February 2, 2023. Impacts on China inflation and GDP come from Jonathan Sequeira's "Potential Impact of Tighter Oil Supply on Emerging Asia", February 23, 2022.*

3

*Amid all that, two **longer-term** questions attracted heated debate:*

*Can US economic and asset outperformance continue?*

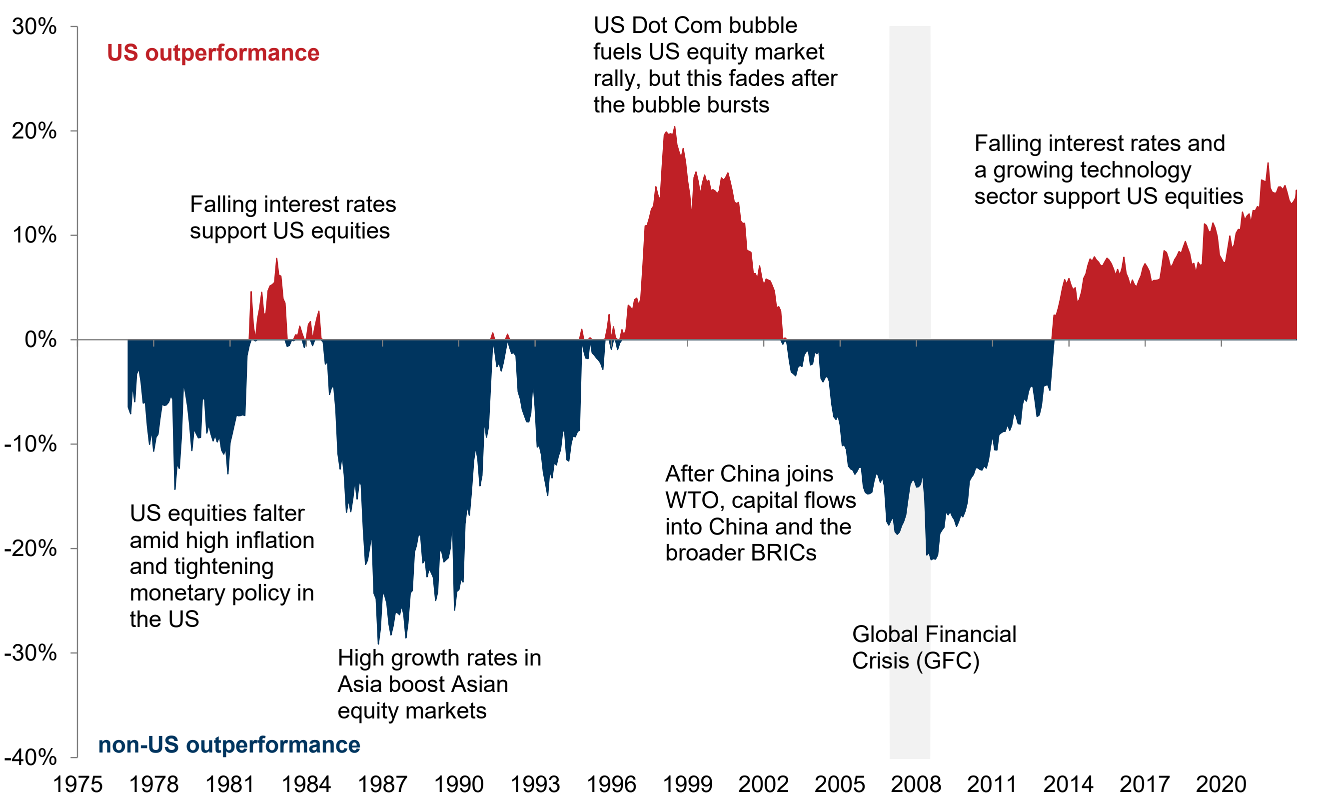
*And is the potential of generative AI really that great?*

Pgs. 33-38

# The pendulum swung toward US assets

**While US equities have outperformed non-US equities over the past decade, historically, the performance of US versus non-US equities has rotated over time**

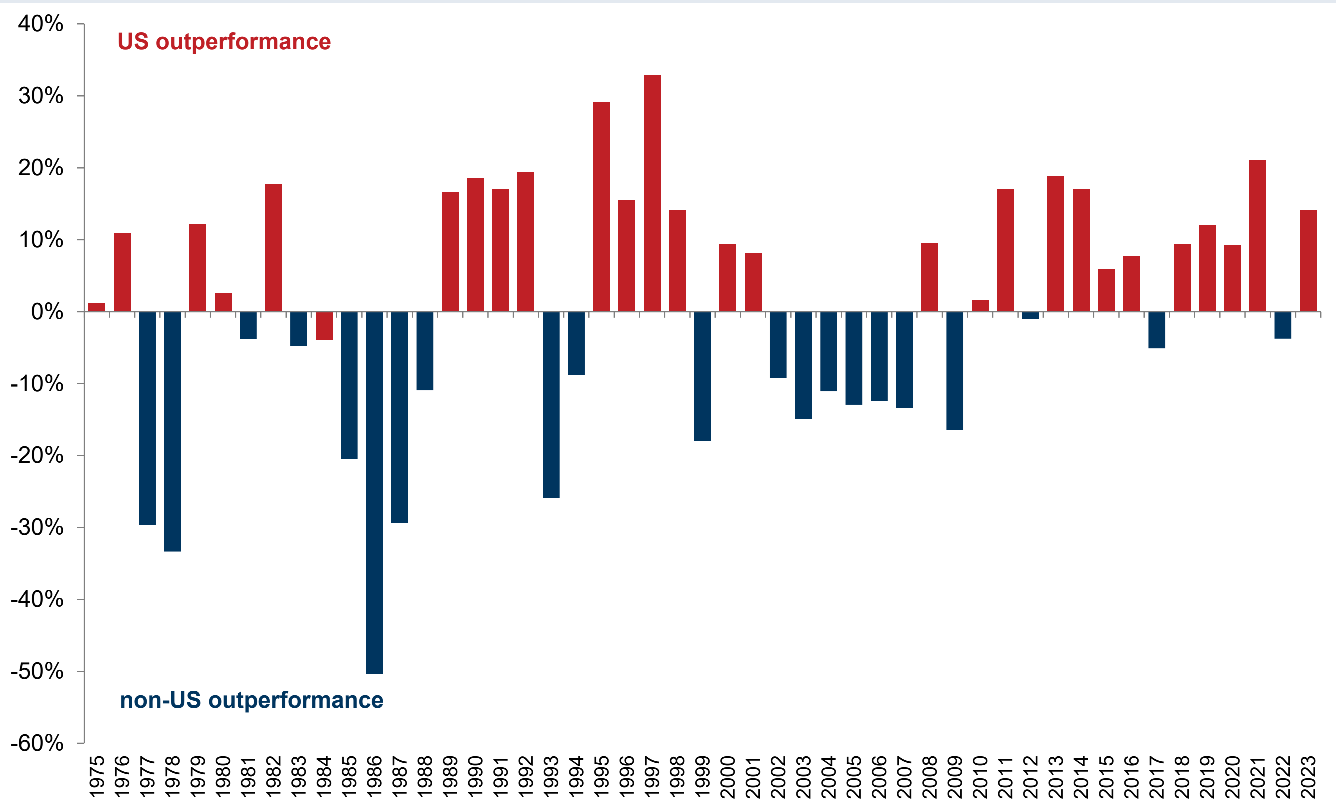
5-year rolling average of annualized monthly relative return of S&P 500 vs. World ex. US equity index (Worldscope), %




Source: Bloomberg, Worldscope, Goldman Sachs GIR.

**On an annual basis, US equities have outperformed non-US equities in most years since the end of the Global Financial Crisis (GFC)**

Annual relative return of S&P 500 vs. World ex. US equity index (Worldscope), %

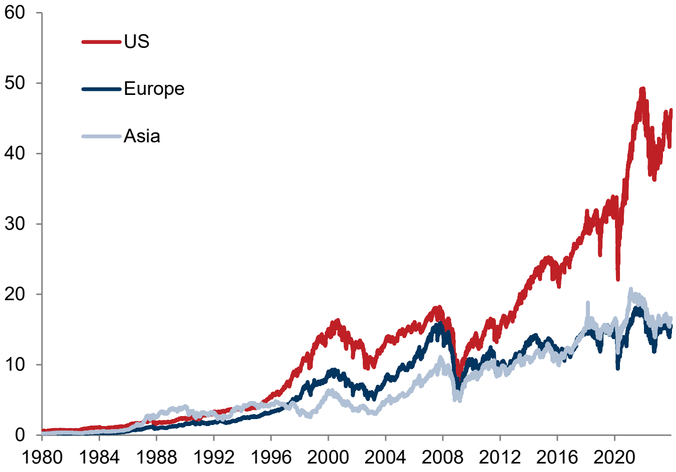



Source: Bloomberg, Worldscope, Goldman Sachs GIR.

# ...though there is more to the story

### The US' market cap eclipses that of other major regions...

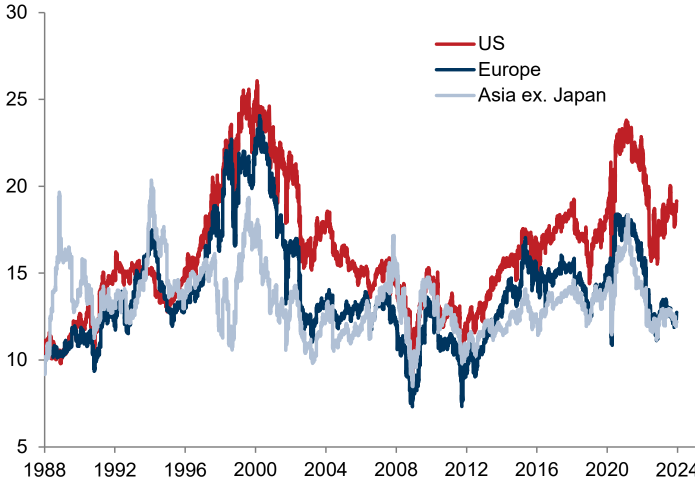
Market capitalization, $tn




*Source: Datastream, Goldman Sachs GIR.*

### ...and US equities trade at a significant premium to other markets...

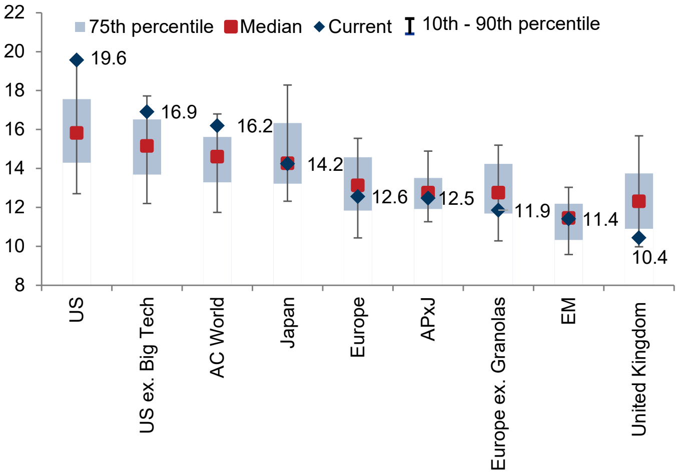
12m forward P/E ratio




*Source: Datastream, Worldscope, Goldman Sachs GIR.*

### ...and trade near the top of their historical valuation range

12m P/E multiple

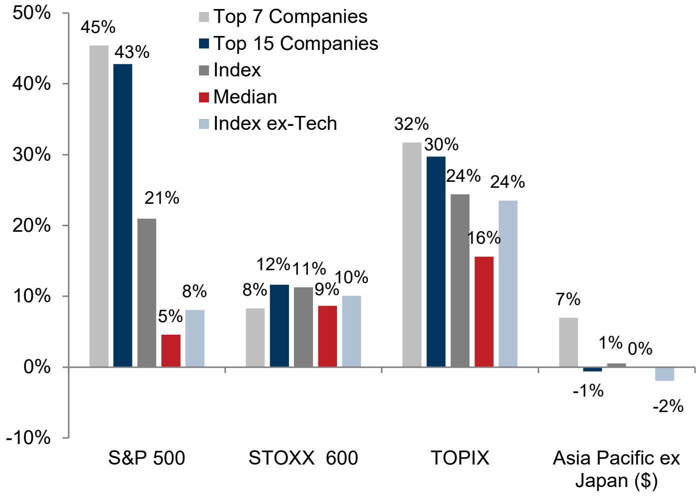



*Note: Granolas are 11 of the largest European companies by market cap—GSK, Roche, ASML, Nestle, Novartis, Novo Nordisk, L'Oréal, LVMH, AstraZeneca, SAP, and Sanofi.*

*Source: FactSet, Goldman Sachs GIR.*

### However, much of the recent US equity exceptionalism is driven by a handful of big companies

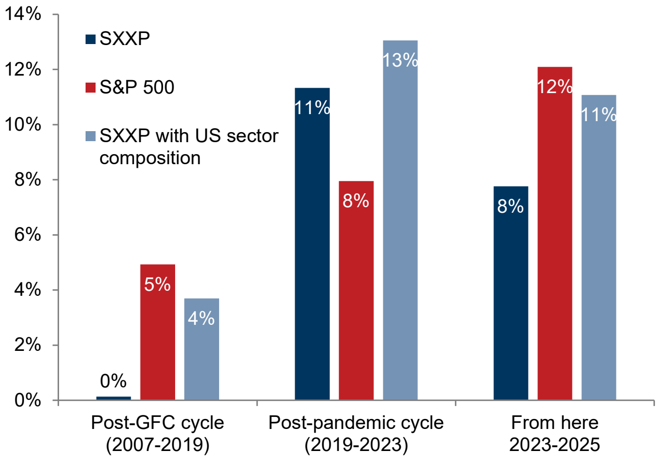
Year-to-date price return (in local currency terms, in $ for Asia Pacific ex. Japan)




*Source: Datastream, STOXX, Goldman Sachs GIR.*

### And on net, Europe has outgrown the US in the post-pandemic cycle

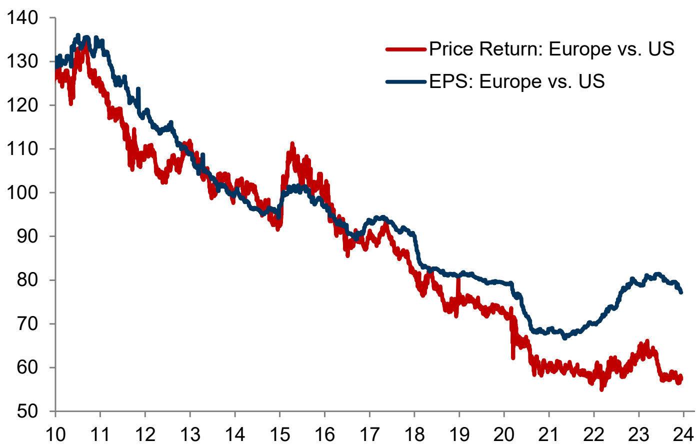
Annualized EPS growth, %




*Source: Goldman Sachs GIR.*

### And overall since 2020, Europe has outperformed on improvement in its earnings

Price return performance and 12m forward EPS, STOXX 600 vs. S&P 500 (in local currency terms)

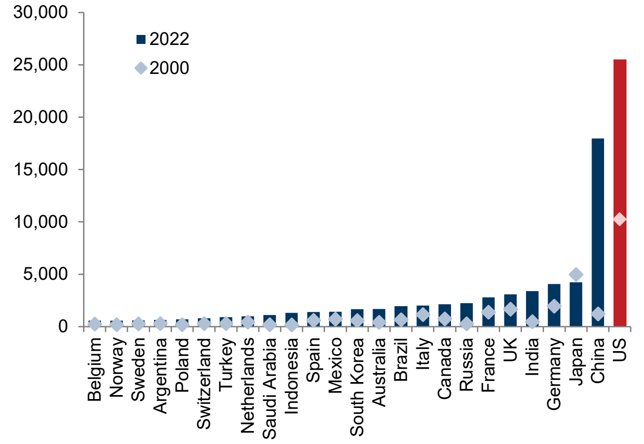



*Source: Datastream, STOXX, Goldman Sachs GIR.*

# The US remains well positioned…

The US has long had the highest GDP in the world, and it has more than doubled since 2000, marking the second largest GDP growth after China…

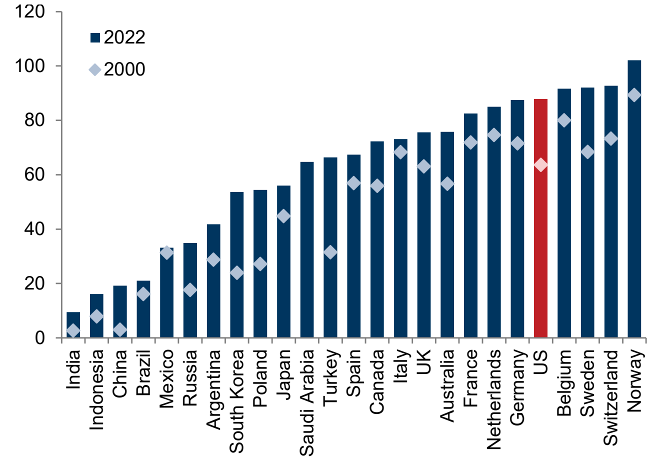
Nominal GDP, $bn




*Source: The World Bank, Goldman Sachs GIR.*

…as well as high levels of labor productivity, which has increased by close to 40% since 2000

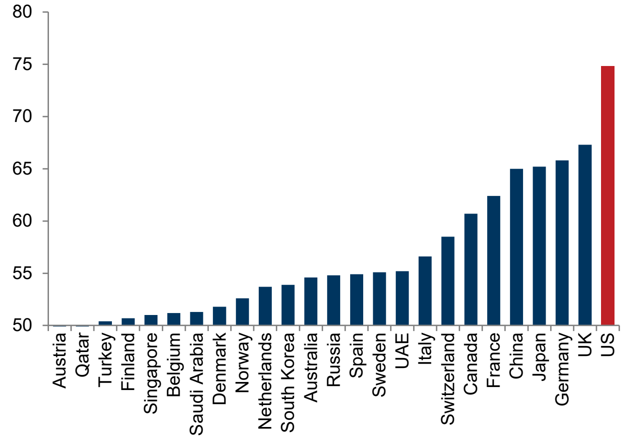
Labor productivity (GDP per hour worked in 2022 USD*)




**Converted using purchasing power parity.*
*Source: Conference Board, Goldman Sachs GIR.*

The US has a large global influence, ranking number one in global soft power…

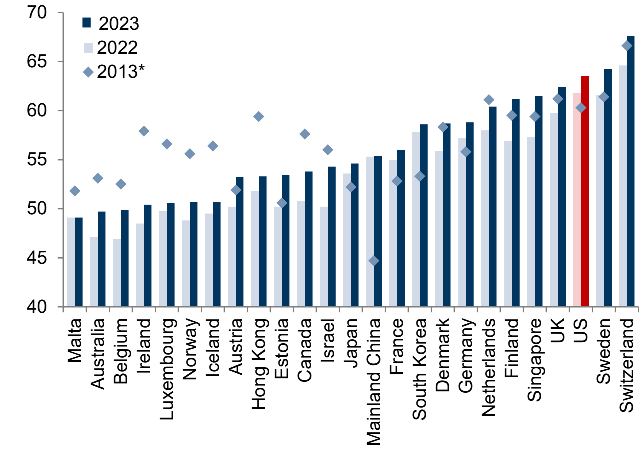
Global soft power index




*Note: The Global Soft Power Index incorporates a broad range of measures to assess nations' presence, reputation, and impact on the world stage. Data for 2023.*
*Source: Brand Finance, Goldman Sachs GIR.*

…and the US ranks high in global innovation, although the US' ranking in the Global Innovation Index fell from second to third this year

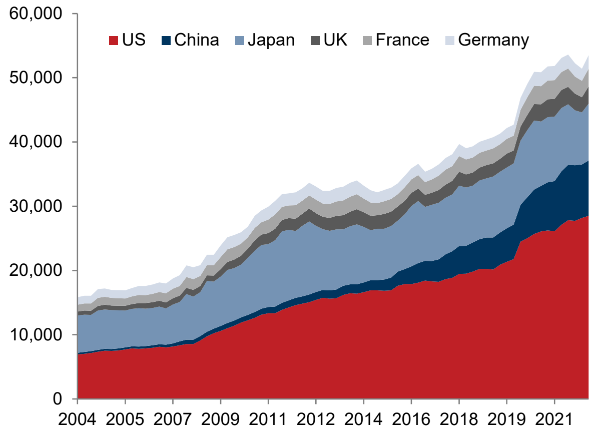
Global Innovation Index




**Index begins in 2013.*
*Note: Indicates an economy's capacity for and success in innovation, measured by innovation input (elements of the economy that enable and facilitate innovative activities) and innovation output (the result of innovative activities within the economy).*
*Source: Global Innovation Index, Goldman Sachs GIR.*

The US also has the largest sovereign bond market in the world and it has grown by over 450% since 2000…

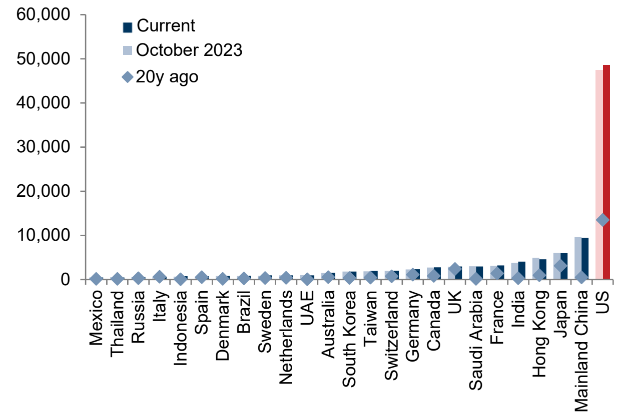
Government debt securities, $bn




*Source: Haver Analytics, Goldman Sachs GIR.*

…and the largest equity market capitalization in the world, which has grown by over 250% in the last 20 years and is now almost five times larger than that of the next largest market

Total equity market capitalization per economy, $bn

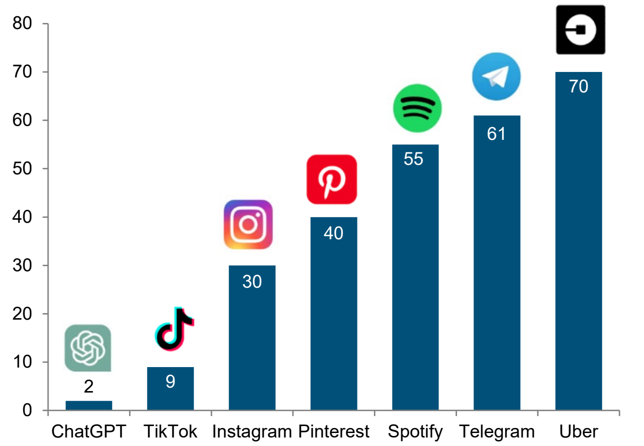



*Source: Bloomberg, Goldman Sachs GIR.*

# ...especially as the AI craze continues...

## After its launch in November 2022, OpenAI's ChatGPT became the fastest application to surpass 100mn users

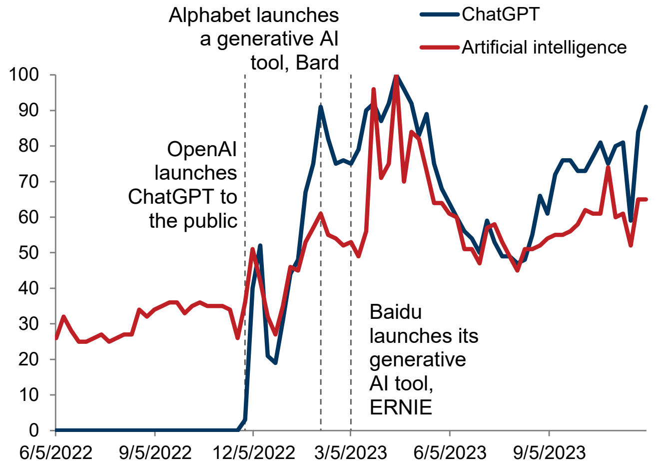
Number of months taken to surpass 100mn users




Source: Company data, Yahoo Finance, Goldman Sachs GIR.

## And following ChatGPT's launch, interest in artificial intelligence increased and remains high

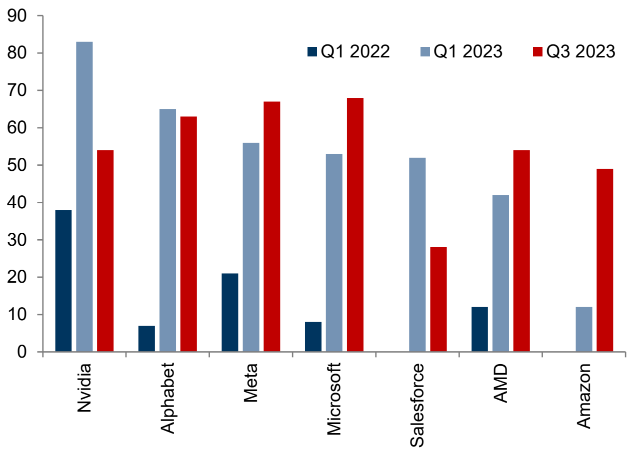
Google search trends




Source: Google Trends (https://www.google.com/trends), Goldman Sachs GIR.

## Company management focus on opportunities from AI also increased and remains high

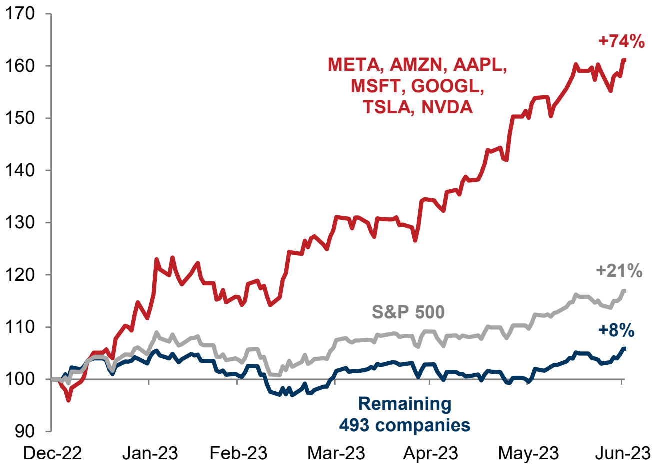
Mentions of "AI" in selected companies' earnings calls




Note: Includes mentions of "AI" in analyst/journalist questions.
Source: Company data, Statista, Goldman Sachs GIR.

## Mega-cap tech stocks have rallied sharply year-to-date, outperforming the broader S&P 500 index, driven by optimism about the potential benefits to companies from AI...

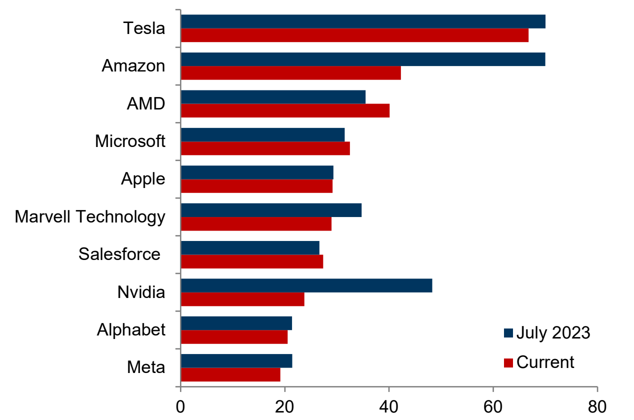
Indexed returns, 12/31/2022=100




Source: FactSet, Goldman Sachs GIR.

## ...and some AI-related stocks continue to trade with high price-to-earnings multiples

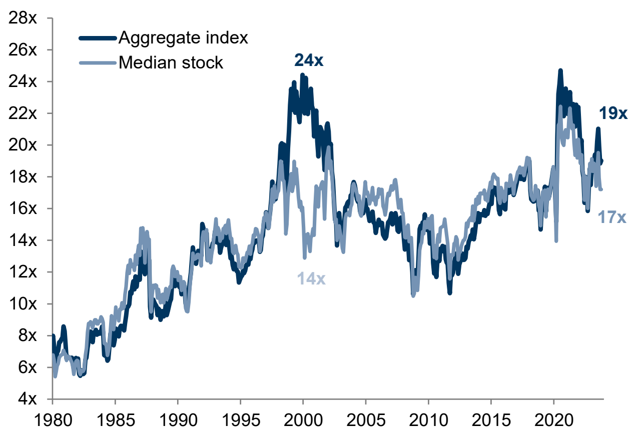
NTM P/E multiple




Source: Bloomberg, Goldman Sachs GIR.

## However, the key beneficiaries of AI adoption have not pushed aggregate index valuation to the extreme level of the Dot Com Boom

Aggregate vs. median S&P 500 NTM P/E dislocation




Source: Compustat, Goldman Sachs GIR.

# ...amid more developments in the field

**Artificial intelligence (AI) through the decades**

**1950s:** The birth of AI. Alan Turing explores the possibility of machine intelligence and develops the Turing Test to test a machine's ability to show intelligent behavior.
**1960s:** Enthusiasm about AI spreads and funding pours into the field, leading to the development of the first AI chatbot, ELIZA.
**1970s:** Enthusiasm and funding for AI wanes as the technology fails to live up to optimistic expectations, leading to an AI winter.
**1980s:** The rise of machine learning revives focus on AI.
**1990s-2000s:** With the emergence of the internet, big data, and increased computational power, AI innovation expands rapidly.
**2010s-present:** AI becomes mainstream as big tech companies begin integrating AI technology into their products.

**2009** Google begins developing driverless cars.

**2010** Microsoft launches Kinect for Xbox 360, the first gaming device that can track human body movement using a 3D camera and infrared detection.

**2011** IBM's Watson, a natural language processing computer, competes on Jeopardy! and wins first place.

**October 2011** Apple introduces Siri, a voice assistant that uses AI to understand natural language.

**July 2012** Google introduces its virtual assistant, Google Now, the precursor to its Google Assistant.

**June 2012** Google researchers train a large neural network of 16,000 processors to recognize images of cats.

**June 2014** Chatbot "Eugene Goostman" is considered to have passed the Turing Test with one third of judges believing Eugene is human.

**November 2014** Amazon launches its virtual assistant, Amazon Alexa.

**January 2015** Elon Musk, Stephen Hawking, and Steve Wozniak, among others, sign an open letter requesting a ban on the development of autonomous weapons and calling for research into the societal risks associated with AI.

**December 2015** OpenAI Inc. is founded by Elon Musk, Sam Altman, Greg Brockman, Ilya Sutskever, Wojciech Zaremba, and John Schulman, among others, as a non-profit research company to advance AI technology in a way that benefits society.

**March 2016** Google DeepMind's AlphaGo, a computer program that plays the board game Go, defeats Go champion Lee Sedol.

**February 2016** Hanson Robotics debuts a humanoid robot named Sophia, who can "see" via image recognition, make facial expressions, and communicate using AI.

**June 2017** The Facebook Artificial Intelligence Research lab trains two chatbots to communicate with each other. The chatbots diverge from human language and create their own language to communicate with each other.

**June 2017** Google researchers publish a paper called "Attention is All You Need," which introduces the concept of transformers models, the breakthrough technology behind generative AI models like ChatGPT and DALL-E.

**January 2018** Alibaba develops an AI model that performs better than humans in a Stanford University reading and comprehension test.

**May 2018** Google introduces Google Duplex, a service to allow an AI assistant to book appointments over the phone.

**February 2020** Microsoft introduces Turing Natural Language Generation (T-NLG), a generative language model which, at the time, is the largest language model ever.

**June 2020** OpenAI releases GPT-3, a language model that generates text through a pre-trained algorithm and produces language tasks almost indistinguishable from humans.

**January 2021** OpenAI announces DALL-E, an AI model that generates images from text.

**May 2021** Google introduces the Language Model for Dialogue Applications (LaMDA), a large language model developed to generate human-like responses in conversation.

**August 2022** Stability AI releases Stable Diffusion, a text-to-image AI tool that generates images based on text descriptions.

**November 2022** OpenAI publicly debuts ChatGPT, a breakthrough generative AI tool that can generate long-form human-like responses based on text inputs. ChatGPT surpasses one million users in five days.

**January 2023** Microsoft announces substantial multi-year investment in OpenAI.

**February 2023** Alphabet announces its own generative AI tool, Bard, which is powered by LaMDA.

**June 2023** Nvidia reaches $1tn market value as its stock increases sharply on AI driven optimism

**What's happened since?**

**July 2023:** The Biden Administration announces that it has gotten voluntary commitments from AI developers including Google, Amazon, Meta, Microsoft, Anthropic and OpenAI, to develop AI in a safe and secure manner. Google, Microsoft, OpenAI and Anthropic announce that they are starting a new industry group which will work with policymakers to promote safe AI development.
**September 2023:** Amazon announces it will invest up to $4bn in AI start-up Anthropic as it seeks to establish a larger footprint in AI development.
**November 2023:** Sam Altman, CEO of OpenAI, is removed by the board, only to be reinstated days later after OpenAI employees threaten to quit without him. Artificial intelligence software is used to isolate John Lennon's voice from an old demo to produce a new Beatles song.

*Note: This does not constitute an exhaustive list of all AI-related developments.*
*Source: Forbes, digitalwellbeing.org, Penn State University, YourStory, Goldman Sachs GIR.*
Special thanks to GS equity research analysts for help with the timeline. Original version published in *Americas Technology: Generative AI – Part I: Laying out the investment framework*

# For those who still don't know what AI is!

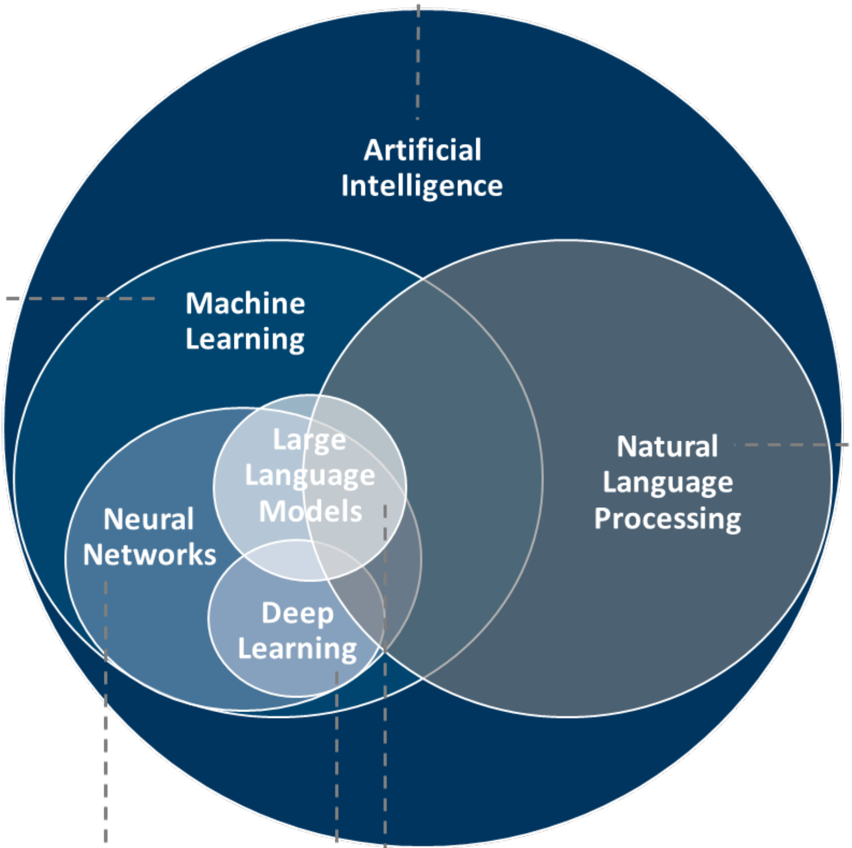
**Artificial intelligence (AI) is the science of creating intelligent machines. AI is a broad concept that encompasses several different subfields, including machine learning, natural language processing, neural networks, and deep learning.**

**Artificial intelligence (AI)** is the broadest term used to classify machines that mimic human intelligence. There are three main categories of AI: artificial narrow intelligence, artificial general intelligence, and artificial super intelligence. Artificial narrow intelligence is considered "weak AI", which is trained to perform specific tasks, like voice or image recognition. Artificial general and super intelligence are considered "strong AI", which has cognitive abilities equal to/greater than those of humans. No practical examples of strong AI exist today.

**Generative AI** is a type of AI system that generates text, images, and other content in response to natural language prompts.

**Machine learning** is a subfield of AI that focuses on developing models and algorithms to help computers improve their performance through experience. Large amounts of data are fed into a computer, which then discovers patterns in that data and uses it to make predictions and decisions. There are three major types of machine learning models: (1) supervised machine learning, which uses labeled datasets to train models, (2) unsupervised machine learning, which uses algorithms to analyze unlabeled datasets, and (3) semi-supervised machine learning algorithms, which sits between the first two.

**Transformer models** are machine learning models designed to process sequences of elements. The premise of the model is an attention mechanism, which enables the model to learn and understand the relationship between words in a sentence.




**Natural Language Processing (NLP)** is a subfield of AI focused on giving computers the ability to understand text and spoken word in a similar manner to human beings. NLP uses computational linguistics combined with statistical, machine learning, and deep learning models to enable computers to understand human language. It does so using two techniques: (1) syntactic analysis, which identifies the structure and relationship between words in sentences, and (2) semantic analysis, which focuses on the meaning of the words and their context in the sentence. Google Translate is one example of NLP technology in the real world; chatbots like Siri and Alexa also rely on NLP.

**Neural networks** are a subfield of machine learning. They are mathematical models inspired by the human brain structure. Each neuron, or node, of the network takes an input, performs a computation, and creates an output. If the output of any individual node is above a specified threshold value, the node is activated and sends data to the next layer of the network. One of the best-known neural networks is Google's search algorithm.

**Large language models (LLM)** are a type of machine learning model that are trained on large amounts of unlabeled data using self-supervised learning or semi-supervised learning to perform NLP tasks. LLMs use deep neural networks to generate outputs. ChatGPT is the most well-known example of an LLM.

**Deep learning** is neural networks with three or more layers. Deep learning differs from "classical" machine learning by the type of data it works with and methods by which it learns. While machine learning algorithms leverage more structured, labeled data to make predictions, deep learning doesn't necessarily require a labeled dataset, and it's less dependent on human interaction. Deep learning is used in many applications, such as speech recognition and autonomous driving.

*Source: IBM, Goldman Sachs GIR.*

Special thanks to GS equity research analysts for graphic. Original version published in *Americas Technology: Generative AI – Part I: Laying out the investment framework*.

# Summary of our key forecasts

## GS GIR: Macro at a glance

### Watching

- **Globally,** we expect real GDP growth of 2.6% yoy in 2024, reflecting tailwinds from strong real household income growth, a recovery in manufacturing activity, and a start to rate cuts as inflation cools. We expect global core inflation to fall back toward 2% by the end of 2024 as core goods inflation continues to decline, shelter inflation falls further, and the supply-demand balance in the labor market continues to improve.
- **In the US,** we expect real GDP growth of 2.0% in 2024 on a Q4/Q4 basis, reflecting easing financial conditions amid a start to Fed rate cuts and strong real disposable income growth. We continue to see a below-consensus 15% probability of entering a recession over the next 12 months. We expect core PCE inflation to decline to 2.2% by Dec 2024, reflecting disinflation from the advanced stage of rebalancing in the labor, housing rental, and car markets. We expect the unemployment rate to decline to 3.6% in 2024 and remain there for the next few years.
- **We believe the Fed's** hiking cycle is complete and that the Fed will remain on hold at the current Fed funds rate range of 5.25-5.5% until the first 25bp cut in March 2024, after which we expect 25bp cuts in May and June followed by quarterly cuts until the terminal rate range reaches 3.25-3.5% in September 2025, though the pace will ultimately depend on how financial conditions respond. On balance sheet policy, we expect the Fed to slow the pace of balance sheet runoff in 4Q24 and to finish runoff in 1Q25.
- **In the Euro area,** following a period of stagnation in 2H23, we expect real GDP growth to increase to 0.7% yoy in 2024, reflecting a pickup in real disposable income, a start to ECB rate cuts, and an improvement in manufacturing activity, which should more than offset the building headwind from fiscal policy. We expect core inflation to slow further to 1.9% yoy by December 2024, reflecting continued declines in services inflation and normalizing wage growth.
- **We believe the ECB's** hiking cycle is complete and that the ECB will remain on hold at 4.00% until the first rate cut in April 2024, after which we expect rate cuts to proceed at a 25bp/meeting pace until the policy rate reaches 2.25% by early 2025, although we see some risk that the ECB begins cutting in March and accelerates the pace to 50bp in April.
- **In China**, we expect real GDP growth to slow to 4.8% yoy in 2024 as China continues to face several growth headwinds, including a prolonged property downturn, though we expect a material offset from a step up in policy easing and pick up in investment growth. We expect policy easing to be front-loaded and growth momentum to be stronger in the first half of 2024. Over the longer term, we maintain our cautious view on China's growth outlook given deteriorating demographics, property and local government deleveraging, and global supply chain de-risking.
- **WATCH WAR IN THE MIDDLE EAST AND DETERIORATING DM PUBLIC DEBT PROFILE**. Continued maritime trade disruptions from the war in the Middle East, especially if it escalates to interrupt trade through the Strait of Hormuz, could lead to significant increases in energy prices that would likely lower global growth, on net. The deteriorating public debt profile in DMs is a growing concern, though we think markets will remain patient unless next year's US elections bring the possibility of fresh unfunded fiscal expansion.

*Goldman Sachs Global Investment Research.*

### Growth





*Source: Haver Analytics and Goldman Sachs Global Investment Research.*
*Note: GS CAI is a measure of current growth. For more information on the methodology of the CAI please see "Improving Our Within-Month CAI Forecasts," Global Economics Comment, Mar. 06, 2023.*

### Forecasts

**Economics**

| GDP growth (%) | 2023 GS (Q4/Q4) | 2023 GS (CY) | 2023 Cons. (CY) | 2024 GS (CY) | 2024 Cons. (CY) |
|---|---|---|---|---|---|
| Global | 2.8 | 2.7 | 2.9 | 2.6 | 2.6 |
| US | 2.8 | 2.5 | 2.4 | 2.3 | 1.2 |
| China | 5.6 | 5.3 | 5.2 | 4.8 | 4.5 |
| Euro area | 0.2 | 0.5 | 0.5 | 0.7 | 0.6 |

| Policy rates (%) | 2023 GS | 2023 Mkt. | 2024 GS | 2024 Mkt. |
|---|---|---|---|---|
| US | 5.38 | 4.50 | 4.13 | 3.68 |
| Euro area | 4.00 | 3.00 | 2.50 | 2.25 |
| China | 1.70 | 1.64 | 1.60 | 1.75 |
| Japan | -0.10 | 0.18 | 0.00 | 0.35 |

**Markets**

| Interest rates 10Yr (%) | Last | E2023 | E2024 |
|---|---|---|---|
| US | 3.91 | 3.90 | 4.00 |
| Germany | 2.02 | 2.15 | 2.00 |
| Japan | 0.71 | 0.70 | 0.90 |
| UK | 3.63 | 3.80 | 3.75 |

| FX | Last | 3m | 12m |
|---|---|---|---|
| EUR/$ | 1.09 | 1.08 | 1.12 |
| GBP/$ | 1.27 | 1.28 | 1.35 |
| $/JPY | 142 | 145 | 140 |
| $/CNY | 7.10 | 7.15 | 7.05 |

| Commodities | Last | 3m | 12m |
|---|---|---|---|
| Crude Oil, Brent ($/bbl) | 77 | 80 | 80 |
| Nat Gas ($/mmBtu) | 2.49 | 2.55 | 3.25 |
| Copper ($/mt) | 8,455 | 8,400 | 10,000 |
| Gold ($/troy oz) | 2,032 | 2,065 | 2,175 |

| Credit (bp) | | Last | 4Q23 | 1Q24 |
|---|---|---|---|---|
| USD | IG | 100 | 101 | 98 |
| | HY | 336 | 363 | 350 |
| EUR | IG | 150 | 157 | 150 |
| | HY | 395 | 417 | 405 |

**Equities**

| S&P 500 | E2023 GS | E2023 Cons. | E2024 GS | E2024 Cons. |
|---|---|---|---|---|
| Price | 4,800 | – | 5,100 | – |
| EPS | $224 | $221 | $237 | $245 |
| Growth | 1% | 0% | 5% | 11% |

| Returns (%) | 12m | YTD | E2023 P/E |
|---|---|---|---|
| S&P500 | 8 | 22.9 | 21.7x |
| MXAPJ | 7 | 2.0 | 14.6x |
| Topix | 14 | 23.3 | 16.2x |
| STOXX 600 | 5 | 12.1 | 13.3x |

| Consumer | 2023 CPI (%, yoy) | 2023 Unemp. Rate | 2024 CPI (%, yoy) | 2024 Unemp. Rate |
|---|---|---|---|---|
| US | 4.1 | 3.8 | 2.9 | 3.6 |
| Euro area | 5.4 | 6.6 | 1.9 | 6.7 |
| China | 0.3 | – | 0.5 | – |

| Wage Tracker 2023 (%) | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| US | 5.1 | 5.0 | 4.4 | 4.4 |
| Euro area | – | – | – | – |
| China | – | – | – | – |

*Source: Bloomberg, Goldman Sachs Global Investment Research. For important disclosures, see the Disclosure Appendix or go to www.gs.com/research/hedge.html.*

**Market pricing as of December 15, 2023**

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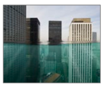
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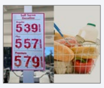
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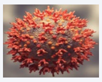
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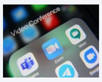
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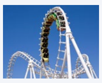
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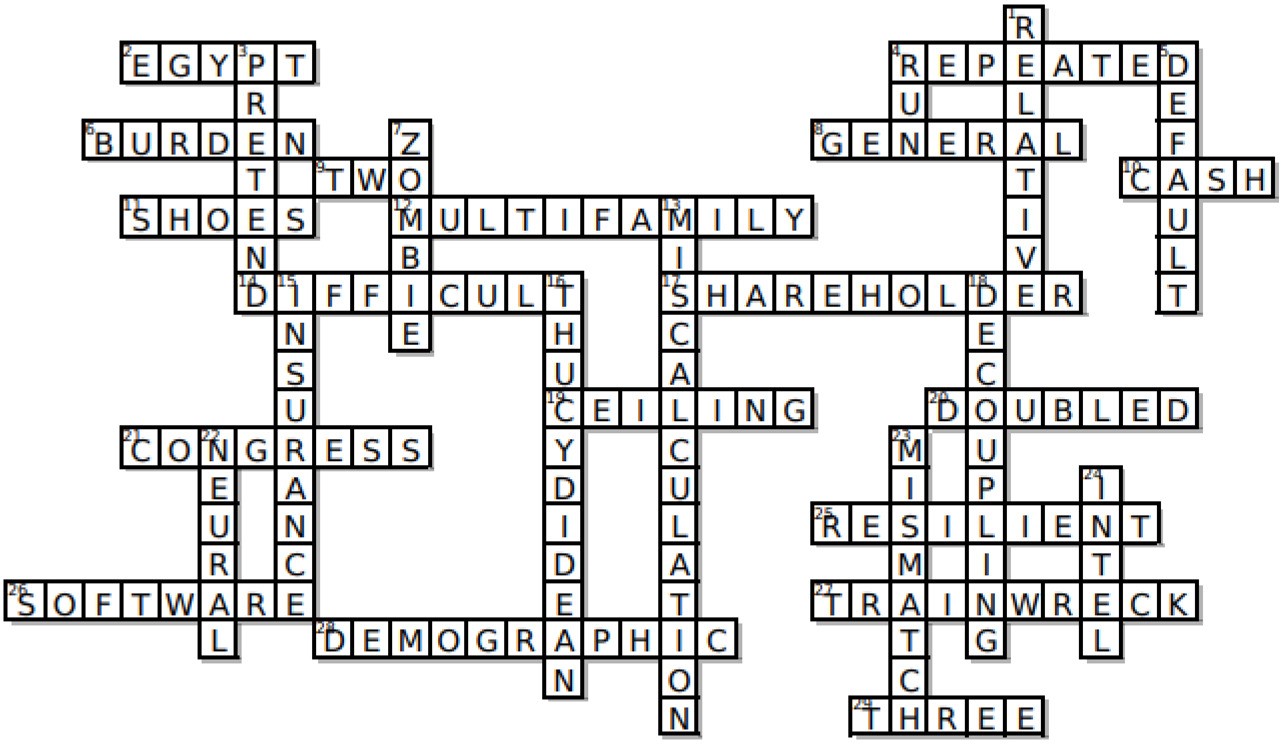
# Puzzle solutions

### Crossword from pg. 2 of this report:



# Glossary of GS proprietary indices

## Current Activity Indicator (CAI)

GS CAIs measure the growth signal in a broad range of weekly and monthly indicators, offering an alternative to Gross Domestic Product (GDP). GDP is an imperfect guide to current activity: In most countries, it is only available quarterly and is released with a substantial delay, and its initial estimates are often heavily revised. GDP also ignores important measures of real activity, such as employment and the purchasing managers' indexes (PMIs). All of these problems reduce the effectiveness of GDP for investment and policy decisions. Our CAIs aim to address GDP's shortcomings and provide a timelier read on the pace of growth.

*For more, see our CAI page and Global Economics Analyst: Trackin' All Over the World – Our New Global CAI, 25 February 2017.*

## Dynamic Equilibrium Exchange Rates (DEER)

The GSDEER framework establishes an equilibrium (or "fair") value of the real exchange rate based on relative productivity and terms-of-trade differentials.

*For more, see our GSDEER page, Global Economics Paper No. 227: Finding Fair Value in EM FX, 26 January 2016, and Global Markets Analyst: A Look at Valuation Across G10 FX, 29 June 2017.*

## Financial Conditions Index (FCI)

GS FCIs gauge the "looseness" or "tightness" of financial conditions across the world's major economies, incorporating variables that directly affect spending on domestically produced goods and services. FCIs can provide valuable information about the economic growth outlook and the direct and indirect effects of monetary policy on real economic activity.

FCIs for the G10 economies are calculated as a weighted average of a policy rate, a long-term risk-free bond yield, a corporate credit spread, an equity price variable, and a trade-weighted exchange rate; the Euro area FCI also includes a sovereign credit spread. The weights mirror the effects of the financial variables on real GDP growth in our models over a one-year horizon. FCIs for emerging markets are calculated as a weighted average of a short-term interest rate, a long-term swap rate, a CDS spread, an equity price variable, a trade-weighted exchange rate, and—in economies with large foreign-currency-denominated debt stocks—a debt-weighted exchange rate index.

*For more, see our FCI page, Global Economics Analyst: Our New G10 Financial Conditions Indices, 20 April 2017, and Global Economics Analyst: Tracking EM Financial Conditions – Our New FCIs, 6 October 2017.*

## Goldman Sachs Analyst Index (GSAI)

The US GSAI is based on a monthly survey of GS equity analysts to obtain their assessments of business conditions in the industries they follow. The results provide timely "bottom-up" information about US economic activity to supplement and cross-check our analysis of "top-down" data. Based on analysts' responses, we create a diffusion index for economic activity comparable to the ISM's indexes for activity in the manufacturing and nonmanufacturing sectors.

## Macro-Data Assessment Platform (MAP)

GS MAP scores facilitate rapid interpretation of new data releases for economic indicators worldwide. MAP summarizes the importance of a specific data release (i.e., its historical correlation with GDP) and the degree of surprise relative to the consensus forecast. The sign on the degree of surprise characterizes underperformance with a negative number and outperformance with a positive number. Each of these two components is ranked on a scale from 0 to 5, with the MAP score being the product of the two, i.e., from -25 to +25. For example, a MAP score of +20 (5;+4) would indicate that the data has a very high correlation to GDP (5) and that it came out well above consensus expectations (+4), for a total MAP value of +20.

## Disclosure Appendix

### Reg AC

We, Allison Nathan, Jenny Grimberg, and Ashley Rhodes, 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.

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