US Economics Analyst

Mid-Year Capex Outlook: After the Factory-Building Boom (Peng)

- Business investment appears to have grown at a healthy pace of about 4% in 2024H1. But with the factory-building boom catalyzed by CHIPS Act and IRA subsidies now past its peak, the office sector facing a supply glut, and uncertainty about trade and regulatory policy rising ahead of the elections, the capex outlook faces new doubts. In this week's *Analyst*, we argue that these three headwinds are manageable and that the capex outlook remains healthier than it might seem.
- Rapid increases in construction spending subsidized by the CHIPS Act and the IRA drove most of the capex growth in 2023 and 2024Q1, and data on new projects suggest that boost will soon turn into a drag because construction is peaking now and will begin to decline in 2024H2. We estimate that the resulting drag on manufacturing structures investment will subtract 1pp from overall capex growth in the next four quarters. However, we estimate that a gradual rise in equipment investment for these new factories should be large enough to offset most of that drag.
- The glut of office space presents another headwind for structures investment. The office vacancy rate is now at a two-decade high and likely to rise further, and this will deter investment for some time to come. But the drag on overall business investment growth is likely to be modest, worth about -0.1pp in 2024 and 2025.
- Policy uncertainty ahead of the November elections is another potential headwind to business investment. While recent management commentary has highlighted election-related uncertainty, the increase in a popular index of policy uncertainty has been moderate so far. Moreover, while policy uncertainty might discourage some investment, companies' recession fears have continued to abate, and this should at least partially offset the uncertainty hit.
- Not only are these three headwinds likely to be more limited than they at first appear, but we also see two meaningful tailwinds that should support capex growth. First, lending conditions for commercial and industrial loans have eased substantially since last year's regional bank crisis. Second, investment in data center facilities and hardware has nearly doubled in real terms since the launch of ChatGPT in 2022Q4, and we estimate that investment in infrastructure that supports AI technology will provide a 0.7pp boost to capex growth over the next

Jan Hatzius
+1(212)902-0394 | jan.hatzius@gs.com
Goldman Sachs & Co. LLC

Alec Phillips
+1(202)637-3746 | alec.phillips@gs.com
Goldman Sachs & Co. LLC

David Mericle
+1(212)357-2619 |
david.mericle@gs.com
Goldman Sachs & Co. LLC

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

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

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

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

Elsie Peng
+1(212)357-3137 | elsie.peng@gs.com
Goldman Sachs & Co. LLC

Jessica Rindels
+1(972)368-1516 |
jessica.rindels@gs.com
Goldman Sachs & Co. LLC

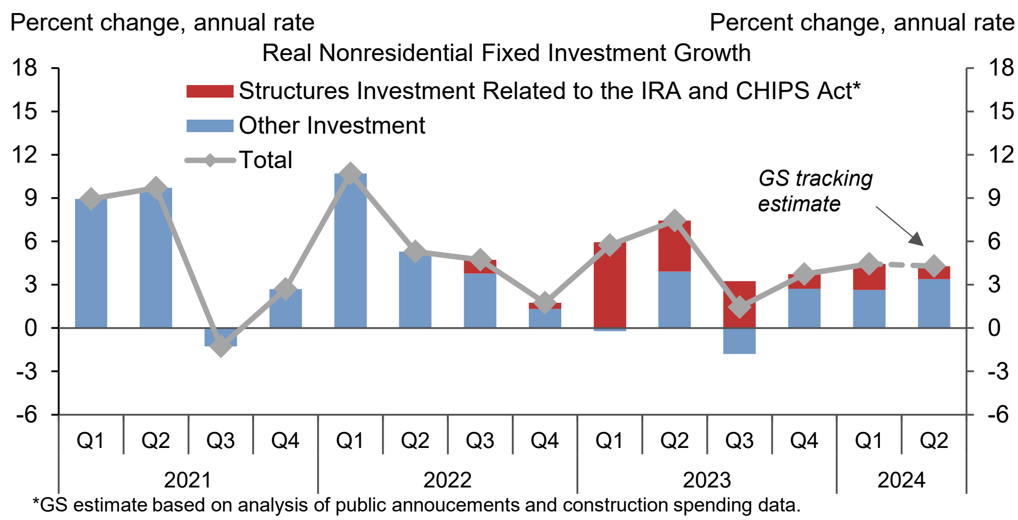
four quarters.

- Taken together, we expect business investment to grow 3.6% in 2024 and 5% in 2025 (Q4/Q4). Following today's capex update, we leave our GDP growth estimate unchanged at 2.5% in 2024H2 but increase our 2025 GDP growth by 0.2pp to 2.2% (Q4/Q4). Business investment will likely be one of the most sensitive parts of the economy to potential policy changes next year, and we will revisit the outlook after the upcoming elections.

Mid-Year Capex Outlook: After the Factory-Building Boom

Business investment appears to have grown at a healthy pace of about 4.4% in 2024Q1, and our tracking estimate suggests that business investment growth will also remain firm in Q2 (Exhibit 1). But with the factory-building boom catalyzed by the CHIPS Act and IRA subsidies now past its peak, the office sector facing a supply glut, and uncertainty about trade and regulatory policy rising ahead of the elections, the capex outlook faces new doubts. In this week's *Analyst*, we argue that these three headwinds are manageable and that the capex outlook remains healthier than it might seem.

Exhibit 1: Structures Investment Related to the IRA and CHIPS Act Continued to Boost Capex Growth Meaningfully in 2024H1 but Is Likely to Fade Soon

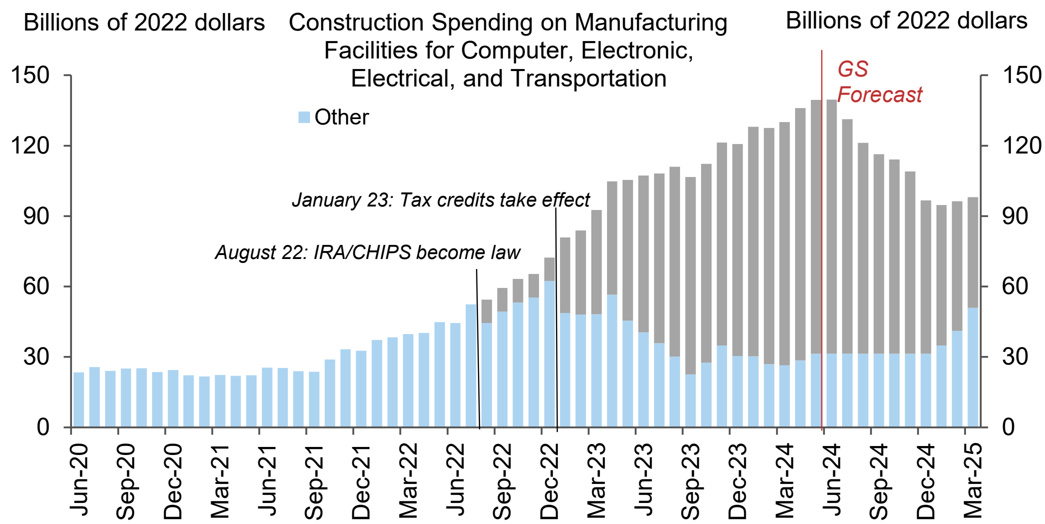


Source: Department of Commerce, Goldman Sachs Global Investment Research

Headwind #1: A Fading Boost From Subsidy-Driven Factory Investment Related to the CHIPS Act and IRA

Rapid increases in construction spending subsidized by the CHIPS Act and the IRA drove most of the capex growth in 2023 and 2024Q1. We update our prior analysis by incorporating data on new projects. Our analysis suggests that the boost to structures investment will soon turn into a drag, as the level of subsidized construction spending is peaking and will likely begin to decline in 2024H2 (Exhibit 2).

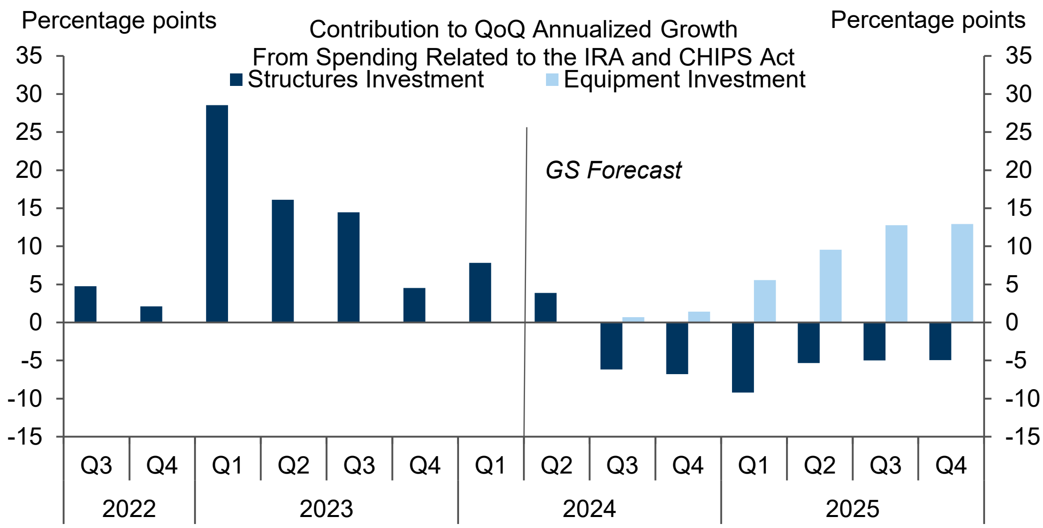
Exhibit 2: Data on New Project Announcements Suggest That Construction Spending on Manufacturing Facilities Related to the IRA and CHIPS Act Has Likely Reached Its Peak



Source: Department of Commerce, Jack Conness, Company data, Goldman Sachs Global Investment Research

We estimate that the resulting drag will subtract about 4.5pp from structures investment growth and 1pp from overall capex growth in the next four quarters (dark blue bars in Exhibit 3). However, with these factories being completed over time, we expect to see a gradual rise in equipment investment for these new factories. Industrial reports suggest that it takes about 2-3 years to build a manufacturing facility for the semiconductor or auto production in the US, and it may take even longer if firms face labor shortages and surging construction costs. For our baseline, we assume a 2-year lag between the start of equipment spending and the start of subsidized construction spending but note that the timing will be uncertain. With this timeline assumption, we estimate that the boost to equipment investment will contribute about 0.7pp to overall capex growth in the next four quarters, offsetting most of the drag from declining structures investment (light blue bars in Exhibit 3).

Exhibit 3: We Expect a Gradual Increase in Equipment Investment for the New Factories to Largely Offset the Drag From Fading Structure Investment

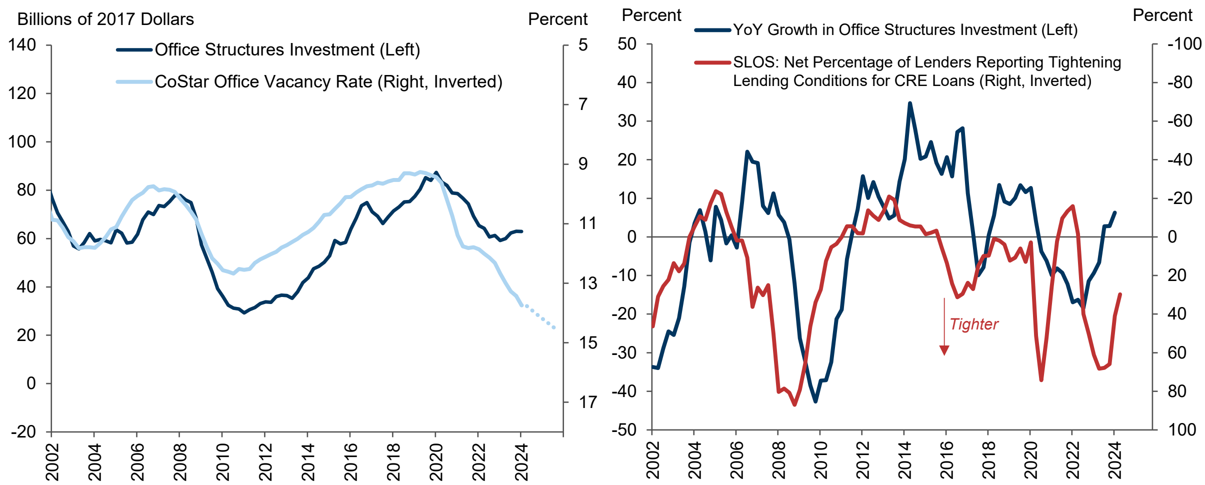


Source: Goldman Sachs Global Investment Research

Headwind #2: A Further Drag from Office Investment

The glut of office space presents another headwind for structures investment. The office vacancy rate has been increasing over the past three years and is now at its two-decade high (left-side of Exhibit 4). We expect the vacancy rate to rise further as more firms reduce their demand for office space when their current long-term leases expire. This will deter investment for some time to come. But in the near term, the easing in lending conditions for commercial real estate loans should offset some of the hit from a higher vacancy rate (right-side of Exhibit 4). Taken together, we expect office investment growth to slow to -4% (qoq ar) in coming quarters, contributing a modest -0.1pp drag on overall capex growth in 2024 and 2025. While the drag so far appears to be modest, we expect it to continue into 2026 and beyond.

Exhibit 4: The Rising Vacancy Rate Will Continue to Weigh on Office Capex, But the Recent Easing in Lending Conditions for Commercial Real Estate Loans Should Offset Some of the Hit



Source: Department of Commerce, CoStar, Federal Reserve Board, Goldman Sachs Global Investment Research

Headwind #3: Rising Election Uncertainty

Policy uncertainty ahead of the November elections is another potential headwind to business investment. Previous studies found that an increase in election uncertainty, as measured by the economic policy uncertainty index, is associated with a modest decline in business investment growth (Exhibit 5).

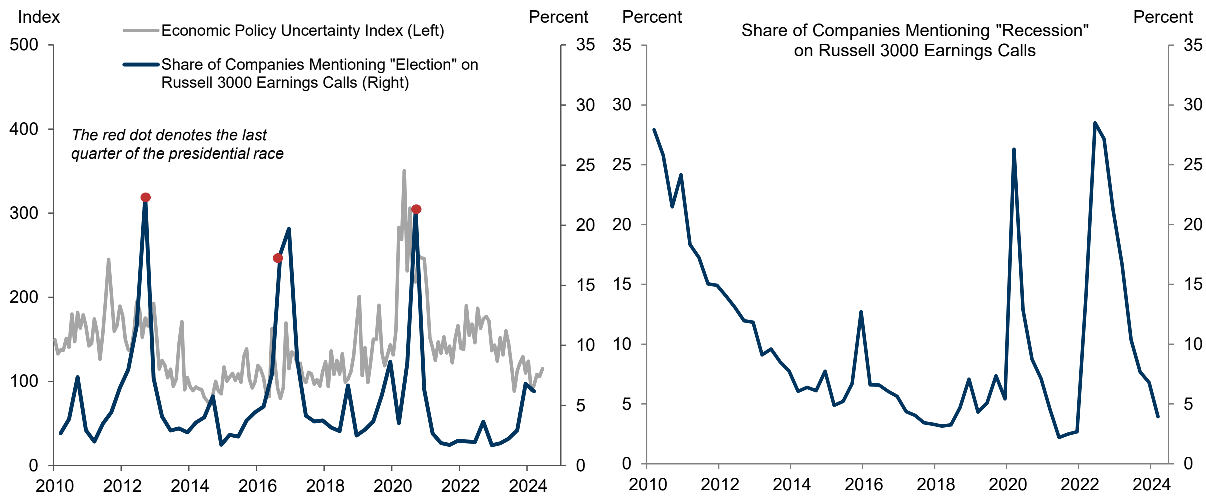
Exhibit 5: Previous Studies Found That an Increase in Election Uncertainty Is Associated With a Modest Decline in Corporate Investment

Effect of Policy Uncertainty on Investment		
Phillips and Krupa (2024)	Goldman Sachs Global Investment Research	a 10 point increase in economic policy uncertainty index leads to 0.6pp decline in business investment growth
Jens (2017)	Journal of Financial Economics	Investment rate declines by 0.1pp in the year of election
Gulen and Ion (2016)	Review of Financial Studies	a 10 point increase in BBD policy uncertainty index leads to a 0.16pp decline in investment rate (capex/total assets)
Baker, Bloom, and Davis (2015)	NBER Working paper	a 10 point increase in policy uncertainty index leads to a 0.03pp decline in investment rate
Julio and Yook (2012)	Journal of Finance	Investment rate declines by 0.3pp in election year
Average effect	10 points increase in policy uncertainty index leads to 0.2pp decline in business investment growth	

Source: Goldman Sachs Global Investment Research

But we think the drag from higher election-related uncertainty might be more modest than feared for two reasons. First, while recent management commentary has highlighted election-related uncertainty (dark blue line, left-side of Exhibit 6), the increase in the most popular index of policy uncertainty has been moderate so far (gray line, left-side of Exhibit 6). Our previous research found that election-related uncertainty has caused the economic policy uncertainty index to rise by about 10 points so far this year. This implies a modest 0.2pp drag on business investment growth, based on the average of prior estimates (Exhibit 5). Second, companies' recession fears have continued to abate since the end of last year (dark blue line, right-side of Exhibit 6), and our prior estimate suggests that this decline should offset half or more of the drag from higher uncertainty.

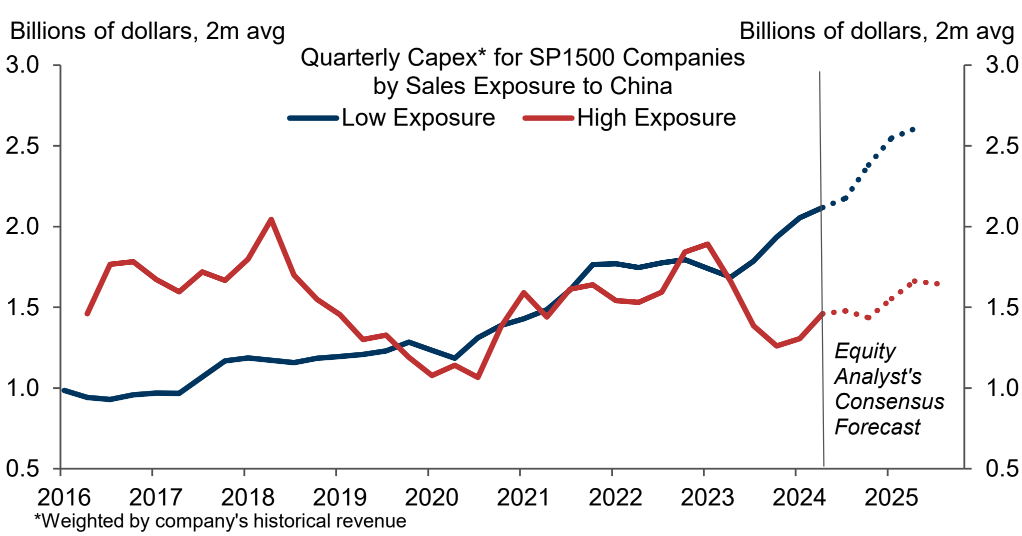
Exhibit 6: While Election-Related Policy Uncertainty Has Risen and Might Discourage Some Investment, Companies' Recession Fears Have Also Continued to Edge Down, Which Should Offset the Uncertainty Hit



Source: GS Data Work, policyuncertainty.com, Goldman Sachs Global Investment Research

However, we do see some downside risks to the capex outlook for companies with particularly high exposure to China if Mr. Trump wins the election and his new administration follows through on proposals to sharply raise tariffs on imports from China. Using company-level data, we find that companies with higher sales exposure to China reduced their capex sharply during Mr. Trump's first trade war, although they have also cut back their capex over the last year with President Biden in office and the starting level is already low.

Exhibit 7: Companies with Higher Exposure to China Reduced Their Capex During Mr. Trump's First Trade War and Could Reduce It Further If He Wins, but They Have Also Cut Back Over the Last Year with President Biden in Office and the Starting Level Is Already Low



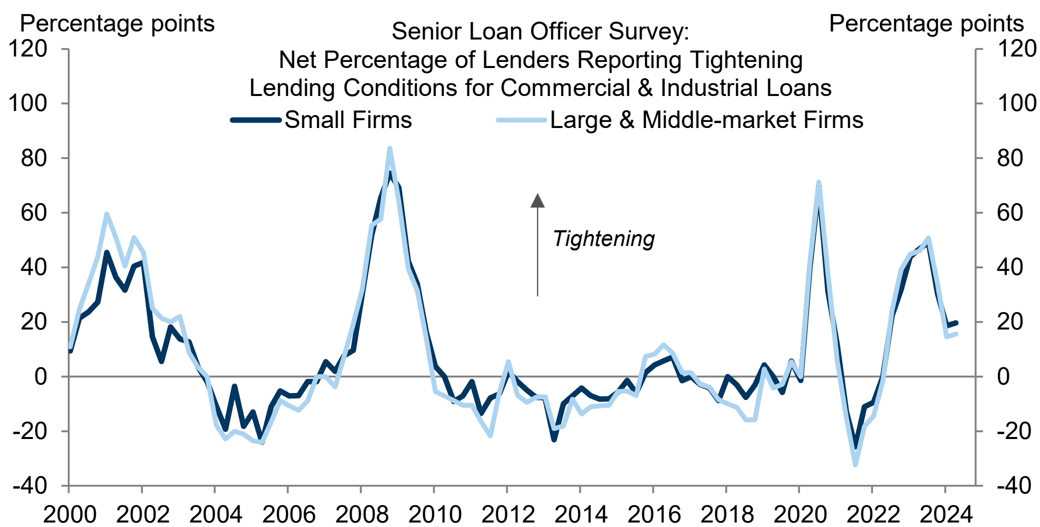
Source: FactSet, Goldman Sachs Global Investment Research

Two Tailwinds: The Easing of Lending Standards and Growing AI Investment

In short, the three headwinds discussed above are likely to be more manageable than they might at first appear. In addition to this, we also see two meaningful tailwinds that should support capex growth in coming quarters.

First, lending conditions for commercial and industrial loans have eased substantially since last year's regional bank crisis. The net percentage of lenders reporting tightening lending standards has declined from the peak of 50% at the end of 2023 to 20% today for both small and large firms. More normal access to credit should provide a modest boost to investment growth in 2024.

Exhibit 8: Lending Standards for Commercial and Industrial Loans Has Declined Sharply Since the Regional Bank Crisis in Spring 2023, Which Should Provide a Modest Boost to Investment in the Remainder of 2024



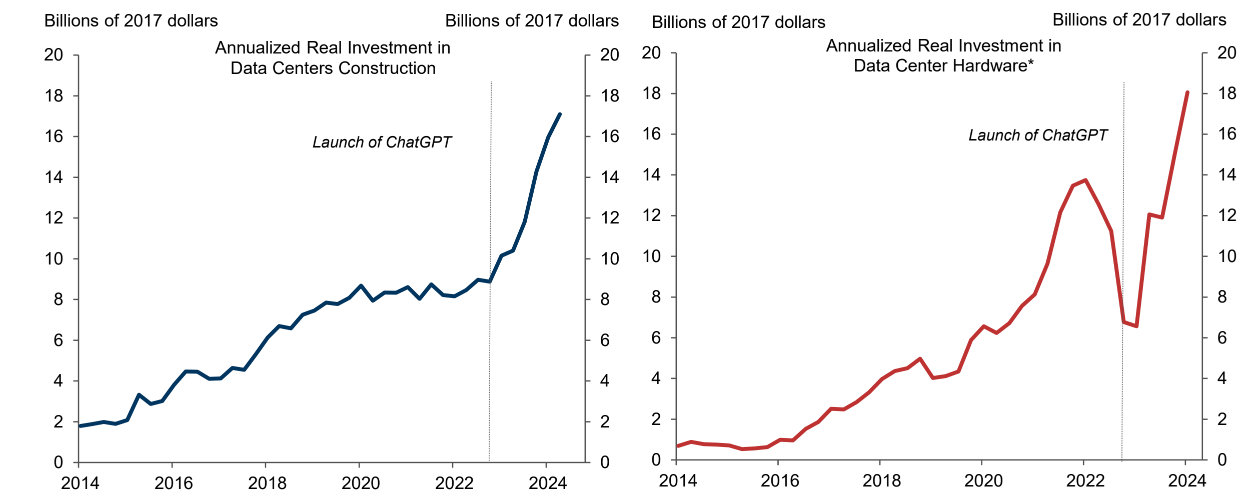
Source: Federal Reserve Board, Goldman Sachs Global Investment Research

Second, investment in data center facilities and hardware has soared since the launch of ChatGPT in 2022Q4.

It is challenging to track investment associated with AI and estimate how it may affect real investment growth in the US National Account because companies do not report investment specifically for AI technology and even when they do report, the investment amount is denoted in nominal terms.

Two new datasets help to overcome these challenges. First, Census recently started to report construction spending for data centers. The left-side of Exhibit 9 shows that while investment in data centers had been gradually increasing before the pandemic, it has increased by over 80% since the launch of ChatGPT. Second, using data center GPU units sold by Nvidia, AMD, and Intel, we construct a series that tracks data center hardware investment in real term. This new series suggests that annualized real investment in hardware equipment for data centers has likely reached 18 billion dollars in 2024Q1, 175% higher than the level recorded in 2020. While some companies may have also increased their software spending, our Global Economics team's recent AI tracker suggests that the aggregate spending on software that supports AI technology still appears to be in line with its pre-ChatGPT trend.

Exhibit 9: Investment in Data Center Construction and Hardware Equipment for Data Centers Has Soared Since the Launch of ChatGPT in 2022Q3

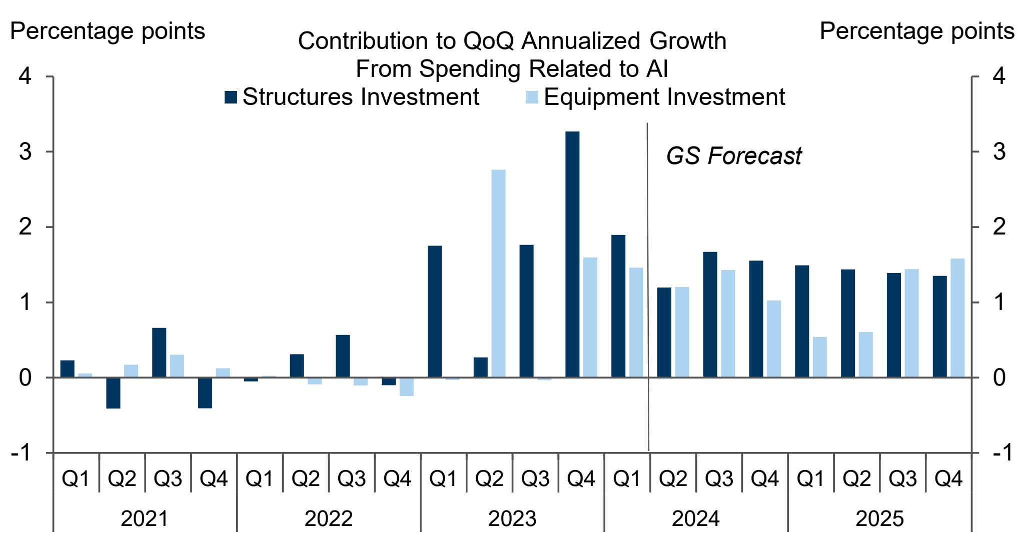


*Constructed using units of GPU sold for data centers by Nvidia, AMD, and Intel, scaled to Nvidia's 2017 data center revenue.

Source: Census Bureau, Company data, Goldman Sachs Global Investment Research

We estimate that investment in infrastructure directly associated with data center construction and hardware equipment provided a 0.8pp boost to capex growth in 2023 and will continue to boost capex growth by 0.7pp over the next four quarters, with a slightly stronger boost to structures investment in the near term, consistent with our Global Economics team's view that the near-term AI investment will focus on building infrastructure.

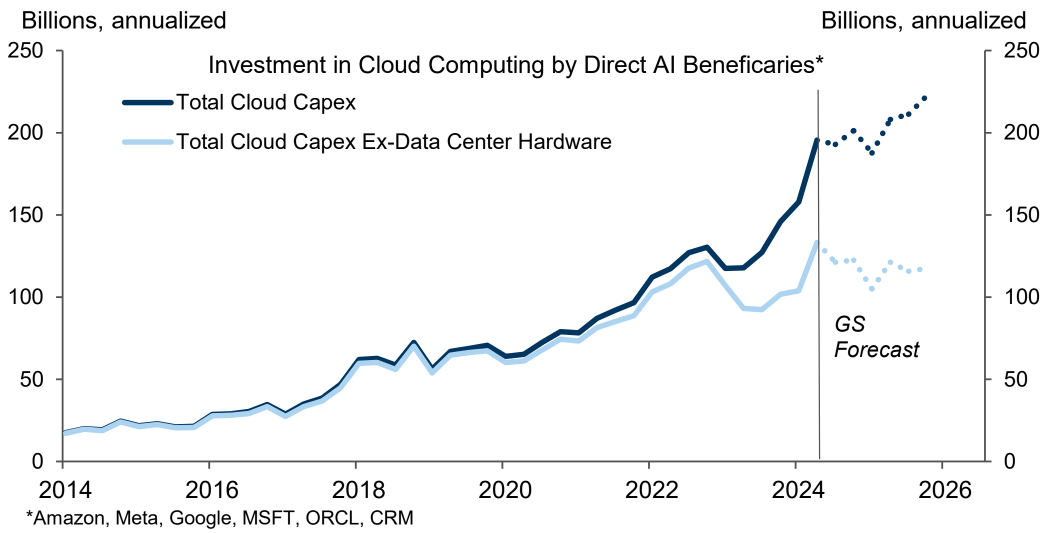
Exhibit 10: We Expect Spending on Infrastructure That Supports AI Technology to Provide Boosts to Both Structures and Equipment Investment



Source: Goldman Sachs Global Investment Research

The boost from AI on real business investment growth may remain moderate in the near term. With interest expenses and financing costs remaining high in the near term, AI-focused companies appear to have temporarily reduced their other investment, offsetting some of the boost from AI infrastructure (Exhibit 11). In addition, while we continue to forecast strong nominal spending and revenue growth from AI-focused firms, some of these increases may reflect margin expansion and price gains, so the effect from AI-related investment on the real economy may remain small. Nevertheless, we believe that investment in AI technology will pose substantial upside risks to the capex outlook in the long run.

Exhibit 11: AI-Focused Companies Appear to Have Temporarily Reduced Their Other Investment, Offsetting Some of the Boost from AI Infrastructure



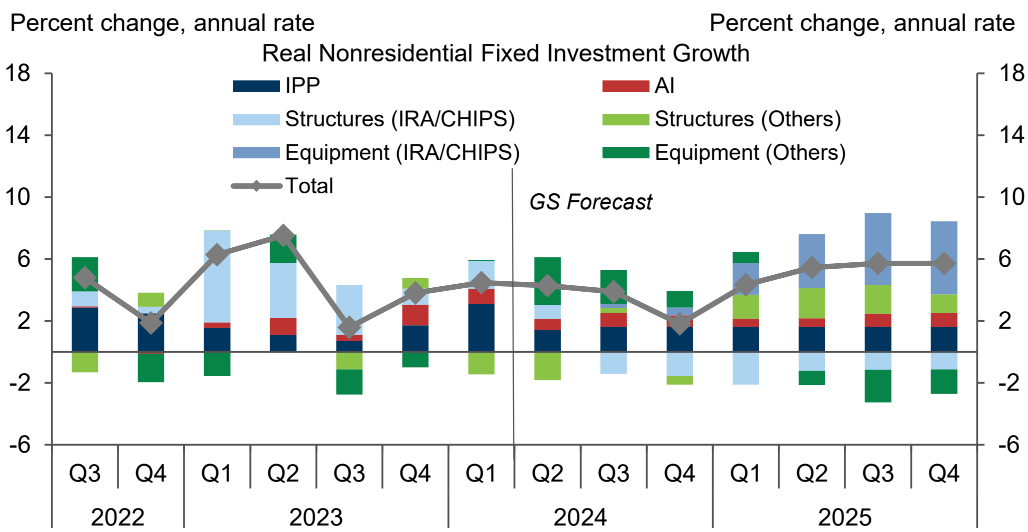
Source: Company data, Goldman Sachs Global Investment Research

Capex Outlook

Taken together, we estimate that business investment will grow 3.6% in 2024 and 5% in 2025 (Q4/Q4), reflecting drags from fading factory and office investment but boosts from equipment for the new factories, lower financing costs, and AI. The updated capex outlook implies that our GDP growth remains unchanged at 2.5% in 2024H2 but increases by about 0.2pp to 2.2% in 2025 (Q4/Q4).

Business investment will likely be one of the most sensitive parts of the economy to potential policy changes next year, and we will revisit the outlook after the upcoming elections.

Exhibit 12: We Expect Capex to Grow 3.6% in 2024 and 5% in 2025 (Q4/Q4), Reflecting Drags From Fading Factory and Office Investment but Boosts from Equipment for the New Factories, Lower Financing Costs, and AI



Source: Goldman Sachs Global Investment Research

Elsie Peng

The US Economic and Financial Outlook

THE US ECONOMIC AND FINANCIAL OUTLOOK
(% change on previous period, annualized, except where noted)

	2022	2023 (f)	2024 (f)	2025 (f)	2026 (f)	2027 (f)	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2024 Q2	2024 Q3	2024 Q4
OUTPUT AND SPENDING														
Real GDP	1.9	2.5	2.5	2.2	2.1	2.0	2.2	2.1	4.9	3.4	1.4	1.8	2.7	2.2
Real GDP (annual=Q4/Q4, quarterly=yoy)	0.7	3.1	2.0	2.2	1.9	2.0	1.7	2.4	2.9	3.1	2.9	2.9	2.3	2.0
Consumer Expenditures	2.5	2.2	2.1	2.2	2.0	2.0	3.8	0.8	3.1	3.3	1.5	1.4	2.5	2.5
Residential Fixed Investment	-9.0	-10.6	3.6	0.4	2.8	2.4	-5.3	-2.2	6.7	2.8	16.0	-4.5	-4.0	0.0
Business Fixed Investment	5.2	4.5	3.8	4.3	4.5	3.6	5.7	7.4	1.5	3.8	4.4	4.3	3.8	1.8
Structures	-2.1	13.2	3.6	-0.8	3.0	3.0	30.3	16.1	11.2	10.9	3.4	-2.9	-3.1	-7.7
Equipment	5.2	-0.3	3.2	7.8	5.6	3.2	-4.1	7.7	-4.4	-1.1	1.6	9.9	8.1	5.4
Intellectual Property Products	9.1	4.5	4.5	4.0	4.3	4.5	3.8	2.7	1.8	4.3	7.7	3.5	4.0	4.0
Federal Government	-2.8	4.2	1.4	0.0	0.0	0.0	5.2	1.1	7.1	2.4	-0.2	0.5	0.0	0.0
State & Local Government	0.2	4.0	3.6	1.1	1.0	1.0	4.6	4.7	5.0	6.0	3.0	3.2	1.0	1.0
Net Exports ($bn, '17)	-1,051	-928	-989	-1,004	-1,020	-1,012	-935	-928	-931	-919	-960	-1,034	-986	-977
Inventory Investment ($bn, '17)	128	44	76	80	60	60	27	15	78	55	29	101	87	87
Nominal GDP	9.1	6.3	5.0	4.3	3.9	4.1	6.3	3.8	8.3	5.1	4.5	4.5	4.6	4.0
Industrial Production, Mfg.	2.7	-0.5	0.8	3.7	3.6	3.3	0.3	0.0	-0.5	-1.5	-0.5	3.1	3.6	3.5
HOUSING MARKET														
Housing Starts (units, thous)	1,552	1,421	1,384	1,453	1,529	1,545	1,369	1,455	1,380	1,481	1,407	1,382	1,369	1,377
New Home Sales (units, thous)	637	666	687	768	776	810	636	698	682	646	664	662	692	730
Existing Home Sales (units, thous)	5,087	4,101	4,084	4,237	4,290	4,546	4,317	4,187	4,020	3,880	4,200	4,055	3,997	4,084
Case-Shiller Home Prices (%yoy)*	7.5	5.1	3.8	4.4	4.9	4.9	2.3	-0.2	2.5	5.1	6.4	5.8	4.3	3.8
INFLATION (% ch, yr/yr)														
Consumer Price Index (CPI)**	6.4	3.3	2.9	2.5	2.2	2.2	5.7	4.0	3.6	3.2	3.2	3.2	2.9	2.9
Core CPI **	5.7	3.9	3.1	2.7	2.3	2.3	5.5	5.2	4.4	4.0	3.8	3.4	3.3	3.1
Core PCE** †	4.9	2.9	2.6	2.1	2.0	2.0	4.8	4.6	3.8	3.2	2.9	2.6	2.6	2.6
LABOR MARKET														
Unemployment Rate (%)^	3.5	3.7	4.0	3.9	3.8	3.8	3.5	3.6	3.8	3.7	3.8	4.1	4.0	4.0
U6 Underemployment Rate (%)^	6.5	7.1	7.2	7.1	7.0	7.0	6.7	6.9	7.0	7.1	7.3	7.4	7.2	7.2
Payrolls (thous, monthly rate)	377	251	199	100	75	75	305	274	213	212	267	177	175	175
Employment-Population Ratio (%)^	60.1	60.1	60.1	59.9	59.8	59.6	60.4	60.3	60.4	60.1	60.3	60.1	60.1	60.1
Labor Force Participation Rate (%)^	62.3	62.5	62.5	62.3	62.1	61.9	62.6	62.6	62.8	62.5	62.7	62.6	62.6	62.5
Average Hourly Earnings (%yoy)	5.4	4.5	3.9	3.4	3.2	3.2	4.6	4.6	4.5	4.3	4.2	3.9	3.7	3.7
GOVERNMENT FINANCE														
Federal Budget (FY, $bn)	-1,376	-1,695	-1,800	-1,900	-1,900	-2,050	--	--	--	--	--	--	--	--
FINANCIAL INDICATORS														
FF Target Range (Bottom-Top, %)^	4.25-4.5	5.25-5.5	4.75-5	3.75-4	3.25-3.5	3.25-3.5	4.75-5	5-5.25	5.25-5.5	5.25-5.5	5.25-5.5	5.25-5.5	5-5.25	4.75-5
10-Year Treasury Note^	3.88	3.88	4.25	4.10	4.10	4.10	3.48	3.81	4.59	3.88	4.20	4.36	4.25	4.25
Euro (€/$)^	1.07	1.11	1.05	1.15	1.15	1.15	1.09	1.09	1.06	1.11	1.08	1.07	1.07	1.05
Yen ($/¥)^	132	141	154	130	125	120	133	144	149	141	151	161	158	154

* Weighted average of metro-level HPIs for 381 metro cities where the weights are dollar values of housing stock reported in the American Community Survey. Annual numbers are Q4/Q4.
** Annual inflation numbers are December year-on-year values. Quarterly values are Q4/Q4.
† PCE = Personal consumption expenditures. ^ Denotes end of period.
Note: Published figures in bold.
Source: Goldman Sachs Global Investment Research.

Source: Goldman Sachs Global Investment Research

Disclosure Appendix

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We, Jan Hatzius, Alec Phillips, David Mericle, Spencer Hill, CFA, Ronnie Walker, Manuel Abecasis, Tim Krupa, Elsie Peng and Jessica Rindels, 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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