What could end the AI boom?

A historic wave of AI investment faces real-world constraints and shifting social dynamics—we spotlight the key factors that could determine whether the boom endures or a bubble bursts.

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KEY TAKEAWAYS

- **Unprecedented AI investment drives growth, but vigilance is warranted:** AI capital expenditure has surged at a record pace, outstripping previous tech booms. While financing remains robust, investors should monitor for signs of diminishing returns and potential overcapacity.
- **Physical bottlenecks are the new gatekeepers:** Energy supply, grid inefficiencies and skilled labor shortages are emerging as pivotal constraints on AI's expansion. Investors can position for growth by targeting companies that enable infrastructure development —such as power suppliers, data center specialists and raw material providers.
- **Social and political influence is building**: Public sentiment and regulatory shifts are increasingly shaping the AI landscape. Proactively monitoring these trends and adjusting strategies will be essential for navigating risks and capitalizing on emerging opportunities.

Introduction

Artificial intelligence (AI) has become a polarizing topic. On one side are those who see it as a world-changing technological revolution worth all the excitement driving an investment boom. On the other, many see just another hype-driven investment bubble. As the Private Bank's 2026 Outlook: Promise and Pressure notes, the ingredients for a market bubble are clearly present. But we think the risk that a bubble will form in the future is greater than the risk markets are at the height of one right now.

This follow-up expands on the question of the boom, particularly the exceptional levels of AI-related investment. While we believe the technology has the potential to be transformative, we think it is prudent to consider what could derail the AI boom, particularly in the context of emerging constraints.

To assess whether current levels of capex are likely to be sustainable, we developed a framework to monitor three limitations that could

slow the boom's progress:

- Financing limits and skepticism about the return on investment
- Physical infrastructure and resource limitations
- Social-political limitations, including public sentiment and regulatory pressures

While we focus here on the United States, if our framework is adapted to take other regions' particulars into account, it could be used to develop investment implications applicable to other economies as well.

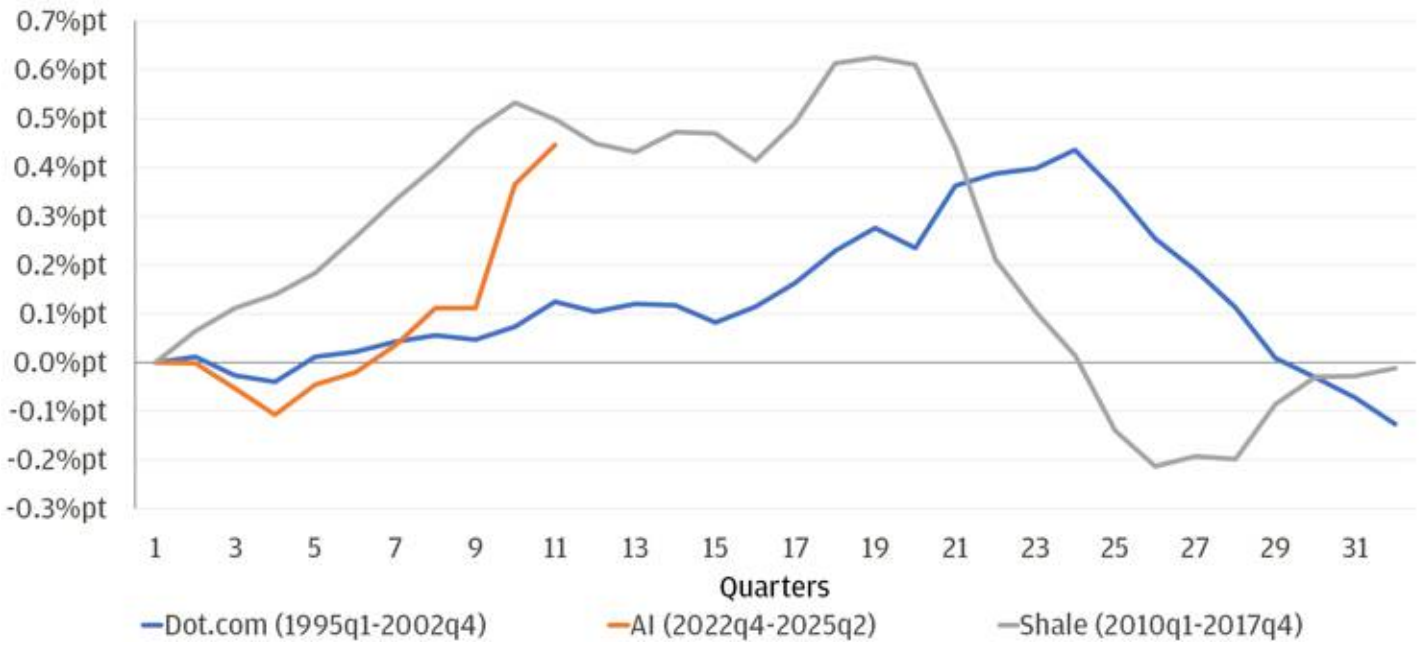
In the Postscript, we provide comments on how we view stock market valuations related to AI, although this is outside the scope of the limits framework discussed in this article.

The AI investment boom in context

Since the launch of ChatGPT in November 2022, AI capital expenditure (capex) as a share of U.S. GDP has increased at a rate comparable to the peak of previous bubbles, including the shale boom and the dot-com cycle—yet this time, the growth has occurred about three times faster (**Exhibit 1**). This rapid acceleration highlights the almost unprecedented scale of current AI investment—an investment ramp-up among the largest and fastest in history. Furthermore, looking ahead, AI-related capex is expected to grow an additional 30% over the next two years, effectively taking it above peak dot-com investment additions (**Exhibit 2**).

AI capex is nearing the peak impulses of previous capex booms

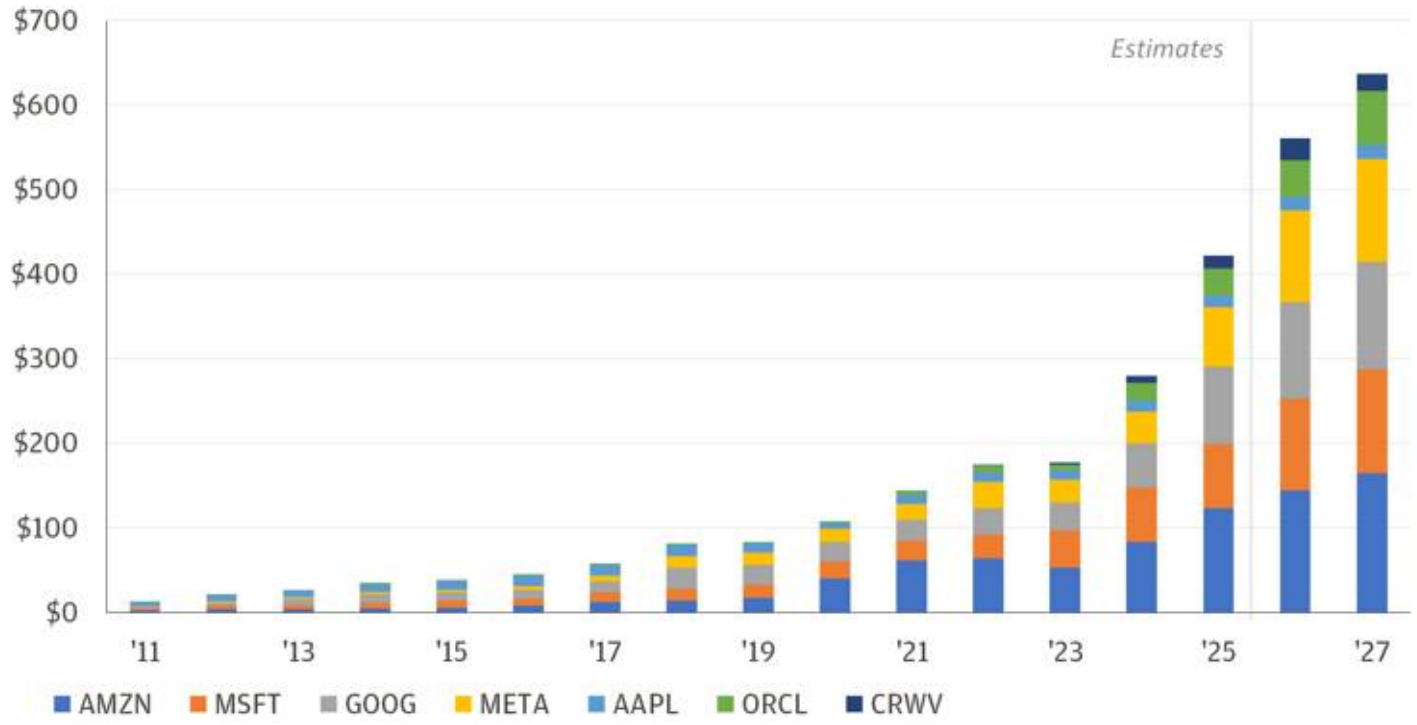
***Exhibit 1**: Change in AI capex as share of U.S. GDP*



Sources: Bureau of Economic Analysis, Haver Analytics. Data as of June 30, 2025. *Notes on chart: Dot-com capex calculated as sum of private fixed investments in communication structures and communication equipment; shale capex calculated as sum of private fixed investments in mining and oilfield machinery and mining exploration, shafts and wells. AI capex calculated as sum of private nonresidential fixed investments in data centers, information processing equipment and software.*

Significant AI-related capex is still in the pipeline

Exhibit 2: *Companies' calendar year capex spend, USD billions*



Source: Bloomberg Finance L.P. Data as of December 1, 2025.

Financing limits: Skepticism about the return on investment

The central metric with any investment is the expected return. The extraordinary scale of AI-related capex is driven by the widespread belief in significant future gains. The International Monetary Fund estimates AI could generate $7 trillion to $8 trillion in additional global GDP over the coming decade[1], which dwarfs estimates of cumulative AI-related capex by 2030 on the order of $3 trillion to $4 trillion[2].

As long as investors and enterprises believe the economic value created by AI will far exceed cumulative capex, AI will likely continue to attract massive investment. In a self-reinforcing cycle, capital continues to flow as long as projected returns remain credible, sustaining the investment boom, which generally rewards companies that promise further AI-related capex. Recently, however, we've seen a disconnect between ever-higher capex expectations and relative price performance. As capex levels grow, so too does the risk that investors will see diminishing returns to the next marginal dollar invested (**Exhibit 3**).

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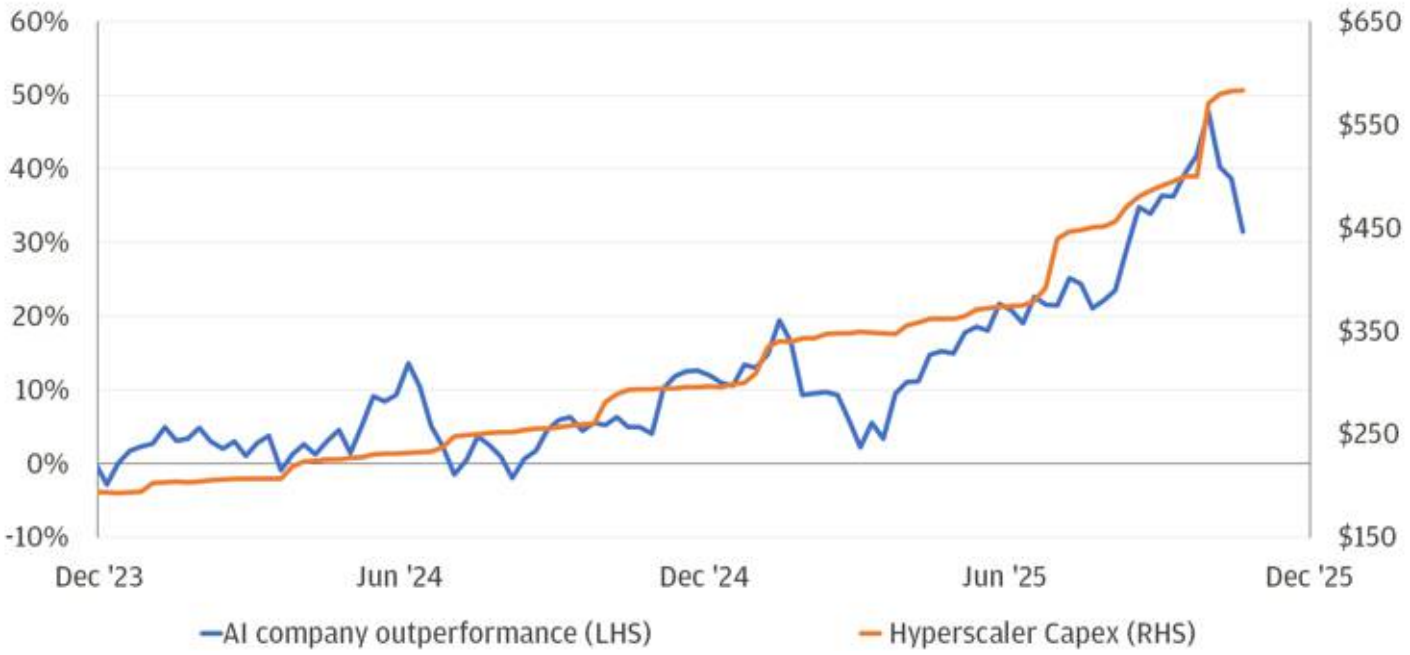
1. 1 "The Global Impact of AI: Mind the Gap," IMF Working Paper, April 2025.

2. "AI Capex—Financing the Investment Cycle: Implications of the Upcoming AI/Data Center Funding Surge," J.P. Morgan Investment Research, November 10, 2025.

Investors have rewarded AI Capex until recently

Exhibit 3: *Cumulative performance, AI stocks vs. S&P 500 and consensus estimates, 12-month forward capex for hyperscalers (billions)*



Source: Bloomberg. Data as of November 28, 2025. AI stocks proxied by Global X AI and technology ETF (AIQ). Consensus estimate is 24 month blended forward. Hyperscalers: Alphabet, Meta, Oracle, Amazon and Microsoft.

Signs of vulnerability: Commoditization risk

The $7 trillion to $8 trillion in additional global GDP that AI could generate over the next 10 years is a projection, not a guarantee. If enterprises struggle to integrate AI into their business models, or if the costs of automation and implementation prove higher than anticipated, value creation could fall short of those expectations. Should such a scenario begin to unfold, investors' calculation of the return on investment (ROI) equation would shift, potentially abruptly, leading to a sharp reassessment of capex appetite and market pricing.

Trying to time precisely when this reassessment might occur is impossible, yet signs are beginning to emerge, notably some relating to the difficulty of converting increased AI compute into sustainable enterprise revenues.

For example, OpenAI currently generates about $13 billion in annual revenue, with ambitious plans to scale above $100 billion in the coming years (**Exhibit 4**)[3]. Despite its rapid early growth, OpenAI projects it will lose money through 2029 due to significant investment costs.

3. OpenAI: Marching to the Beat of Its Own Disruption Drum," J.P. Morgan Investment Research, July 18, 2025.

OpenAI reported estimates of revenue and cash burn

Exhibit 4: *Total revenue and cash burn ($ billions)*

Sources: The Information, J.P. Morgan Securities. Data as of October 2, 2025. Cash burn projection not available for 2030.

A sign of vulnerability emerging: Roughly 75% of OpenAI's revenue today comes from consumer subscriptions rather than enterprise contracts[4]. As large language models (LLMs) become increasingly commoditized, consumer revenue may prove less sticky and more volatile than enterprise deals. Given the investment costs and difficulty of turning a profit, the risk is that LLMs will go the way of the Concorde aircraft—an amazing technological advancement, but too costly and resource-intensive to be profitable.

Market participants have been willing to give LLM providers the benefit of the doubt, expecting that current profit challenges don't foreshadow the longer-term trend, which may not even involve LLMs as the primary revenue drivers. Rather, many observers think a broader implementation of AI— including self-driving cars, automated factories and AI assistants—will produce profits later on[5].

The risk posed by China

Another risk to future profitability comes from Chinese AI companies that are pursuing a very different form of AI. Many of the top-performing AI models are free (or available at a very low cost compared to models elsewhere). Furthermore, China's models are open source (meaning the models' codes are available for anyone to use, share and/or modify) versus the closed-source, subscription-based offerings common among U.S. offerings. These open-source models can be self-hosted, so they are not only cheaper, but they also allow for

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4. Source: J.P. Morgan Investment Bank, "OpenAI, Marching to the Beat of Its Own Disruption Drum". Data as of September 30, 2024.

5. Some observers, furthermore, may be expecting revenue to come through achieving artificial general intelligence (AGI), although we haven't heard a clear description of what that even means, how living standards would be improved by it, or how it would generate revenues.

customization and other benefits around data privacy and compliance that many companies favor. As these models are more widely adopted globally, they will likely create competitive pressure that could hinder the growth of U.S. subscription-based offerings.

Chinese models are also believed to be less resource-intensive. Although the difference is debatable, they require less computing power and energy. This may also pressure U.S. firms to invest in more efficient, cost-effective architectures to stay competitive, creating another pressure on the data center buildout. At a minimum, the rise of Chinese open-source models could force U.S. AI companies to adopt alternative approaches, rethink pricing or invest more directly in areas where closed/proprietary models have advantages.

As the saying goes, "when China walks into an industry, profits walk out the door." China's rise as an AI competitor could become a key constraint to future profitability and the continued AI buildout in the United States.

Financing capacity: Ample but not infinite

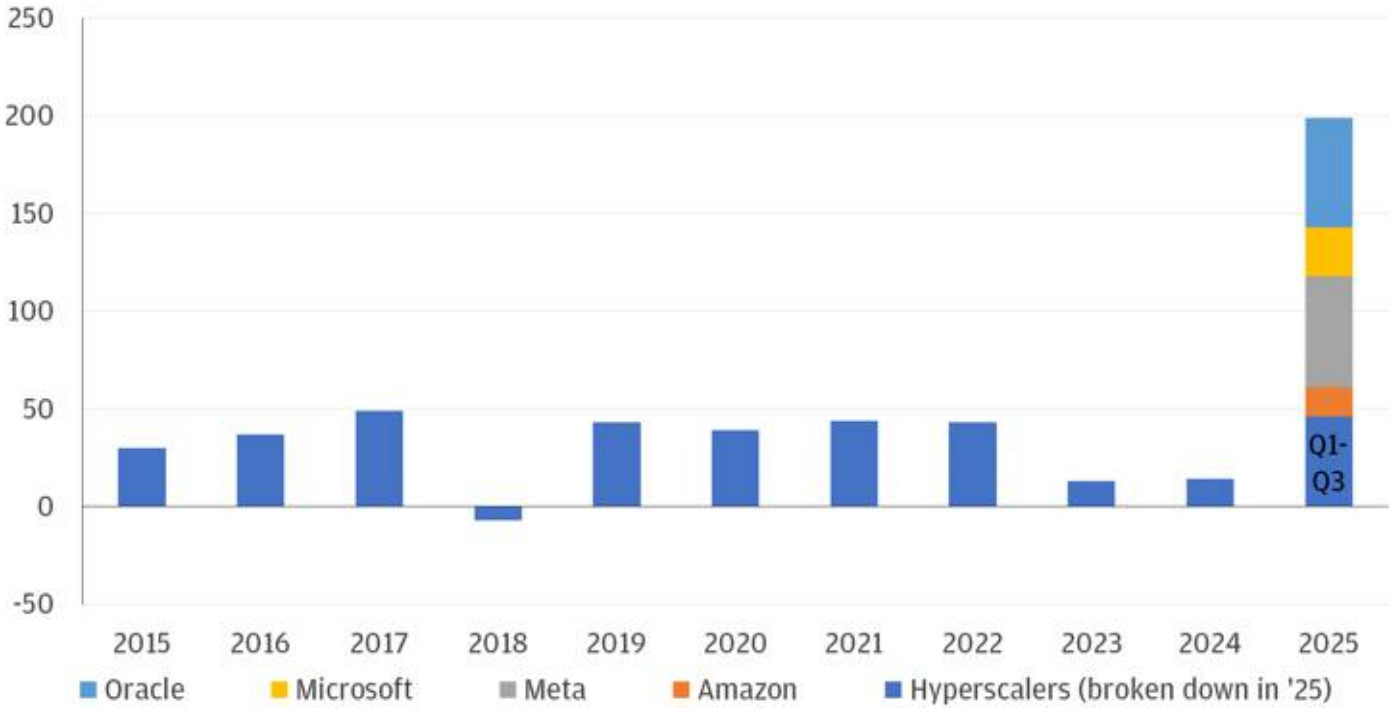
The corollary to the market's perception of future ROI is investors' willingness to fund further AI expansion. With many private AI startups burning through cash at high rates, willingness to continue funding these ventures is a key potential constraint. For now, investors seem confident that AI capex will likely continue to ramp up in 2026, given hyperscalers' expectations that they will realize strong returns on their investments. Although debt and equity issuance is starting to pick up to fund capex, the runway is long, and observers don't expect major financing limitations to emerge over the next year.

The hyperscalers (Alphabet, Meta, Oracle, Amazon and Microsoft) collectively hold over $350 billion in liquid assets and are projected to generate $725 billion in operating cash flow in 2026. Despite strong cash positions, these companies are increasingly issuing new debt to fund record levels of capex—both through public investment grade (IG) notes and private transactions.

Alphabet and Meta have led with large multi-tranche offerings, including Meta's $30 billion public bond sale, the largest U.S. corporate debt raise this year, and a $27.3 billion private credit note for a massive data center project. Meta is pioneering a mix of public and private funding, a trend expected to grow. Amazon recently completed a deal to raise $15 billion in the public debt markets, the company's first U.S. bond sale in three years (**Exhibit 5**).

Public AI companies face few constraints as they increasingly issue new debt to fund record capex

Exhibit 5: *Annual change in hyperscaler long-term debt (bonds, loans, leases—US$ billions)*

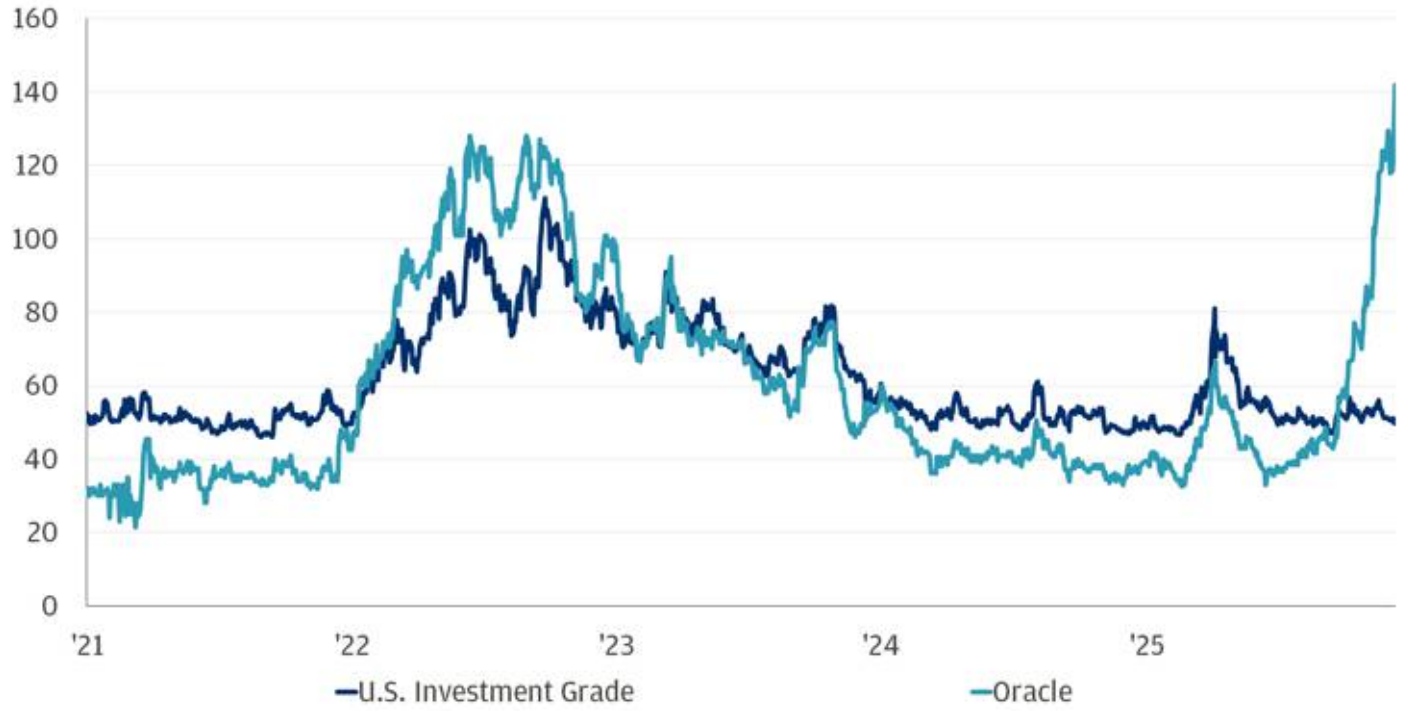


Sources: Bloomberg Finance L.P.; Michael Cembalest, "Eye on the Market." Data as of December 2025.

However, there are limits. When Oracle came to the market with the third-largest corporate debt raise in the United States in September 2025, the market demanded a higher yield for that debt than the broader market, signaling a perception of greater default risk (**Exhibit 6**). Oracle remains an outlier, however, relative to the other hyperscalers, with about three times more debt on its balance sheet than it expects to generate in profits in 2026. The other hyperscalers are expected to generate more profit next year than they have debt on their balance sheets.

Oracle's credit default swap spread has widened rapidly

***Exhibit 6**: 5-year U.S. credit default swap spreads*



Source: Bloomberg Finance L.P. Data as of December 12, 2025.

Another potential limit could affect the private AI startups. Public companies face few financing constraints. But many private AI companies (such as OpenAI) rely on a constant flow of private financing. Any shift in perceptions of their potential future profitability could cause this financing to dry up. This is important because the flow of funds from private capital into AI startups, which pay the hyperscalers for computing capacity, is important to the overall data center buildout.

At the macro level, it seems too early to sound the alarm on the growth of unsustainable debt building up to finance AI companies' capex. A crucial indicator to watch will be the Flow of Funds data published by the Federal Reserve, tracking total net equity and debt issuance for the entire business sector (private and publicly listed companies, normalized relative to sales). As **Exhibit 7** shows, this indicator has been a historically reliable predictor of bubble-like dynamics, capturing the dot-com boom and bust cycle and even the so-called "mini" bubble and bust of 2020–22.

For now, it is not flashing alarm signals: Total business sector equity and debt issuance has not been rising aggressively relative to sales. But in the coming years, a potential risk is that continued monetary policy easing could result in accelerated growth in capital markets financing activity.

Business sector equity and debt issuance are currently low relative to sales

Exhibit 7: *Total business sector equity and debt issuance (four-quarter moving average normalized relative to sales, %)*

Note: Grey shading indicates period of recession. Sources: Federal Reserve Board, Haver Analytics. Data as of June 30, 2025.

In summary

Financing remains a material but not currently binding constraint. While the current wave of AI investment is underpinned by strong ROI expectations and ample financing capacity, any emerging signs of revenue pressure, or challenges to creating sustainable value, would warrant close attention. The AI sector's future will depend on its ability to translate technological advances into durable, diversified profits.

Physical limits: Infrastructure and human resources as potential roadblocks

AI's rapid adoption has significantly increased infrastructure demands in the United States. The shift from general cloud computing to specialized AI workloads has triggered an unprecedented boom in data center construction. However, this growth is increasingly constrained by physical limitations. The pace of the AI expansion won't necessarily be dictated solely by companies improving software or algorithmic ability, but rather by other frictions: the limited capacity of energy generation, transmission and specialized labor.

Energy and grid capacity: A meaningful bottleneck

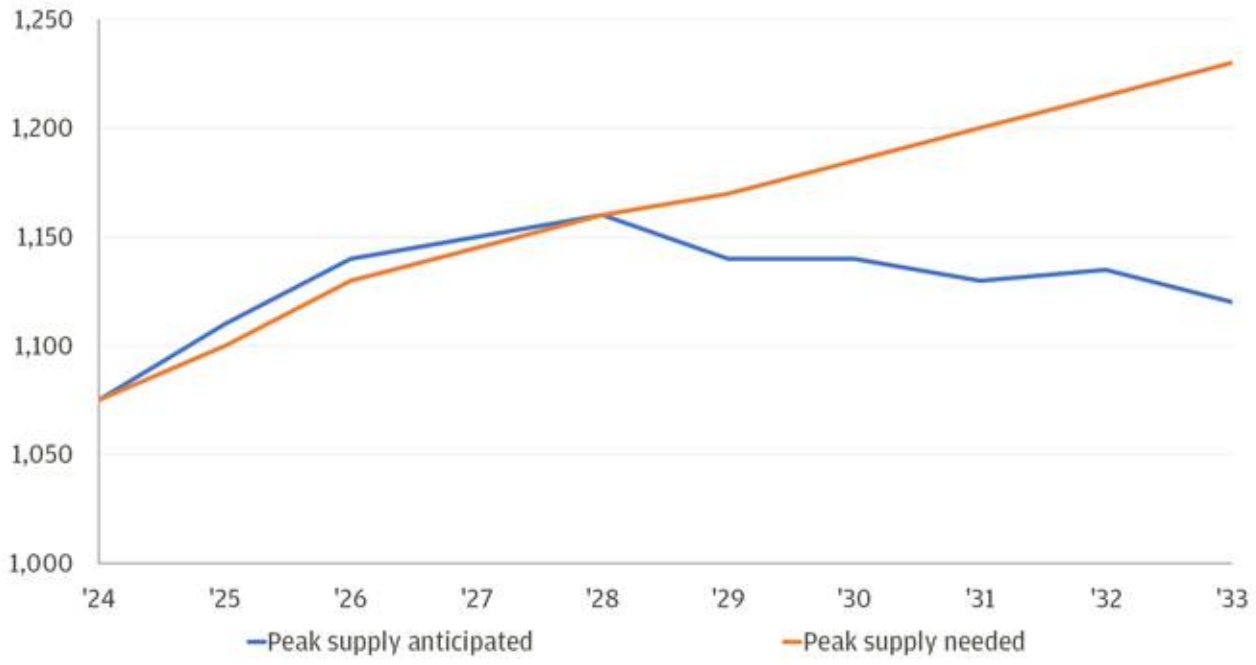
Data centers are massive energy consumers. They're filled with powerful computers running nonstop, generating significant heat and requiring extensive cooling, both of which drive up electricity use. Data centers are the largest driver of expected U.S. power demand growth through the end of the decade— expected to add over 150 TWh[6], roughly enough to power all of Argentina's electricity for a year.

This is a stark demand surge after near-zero growth in power demand over the last two decades. Forecasts estimate demand will outstrip supply in the United States by 2028, and that by 2033 the shortfall may be about 175 GW, enough to power 130 million homes (**Exhibit 8**).

Power supply is a binding constraint, driven by the supply of power equipment and the inefficiencies of the electricity grid. We will take these each in turn.

Power demand estimates continue to rise along with data centers' needs

Exhibit 8: *U.S. power supply, GW*



Sources: Bloomberg New Energy Finance, DC Byte; J.P. Morgan Wealth Management Solutions. Data as of December 2025.

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6. A terawatt hour is a massive electrical energy unit equal to one trillion watt hours.

- **Supply of power equipment**

Despite a rising share of electricity generation from renewables, the majority of electricity consumed by U.S. data centers is generated from natural gas, given its reliability. Natural gas is expected to remain the largest source of electricity for U.S. data centers through 2035, according to the International Energy Agency. Renewables continue to face intermittency issues, and it can take 10-plus years to build a new nuclear power plant[7].

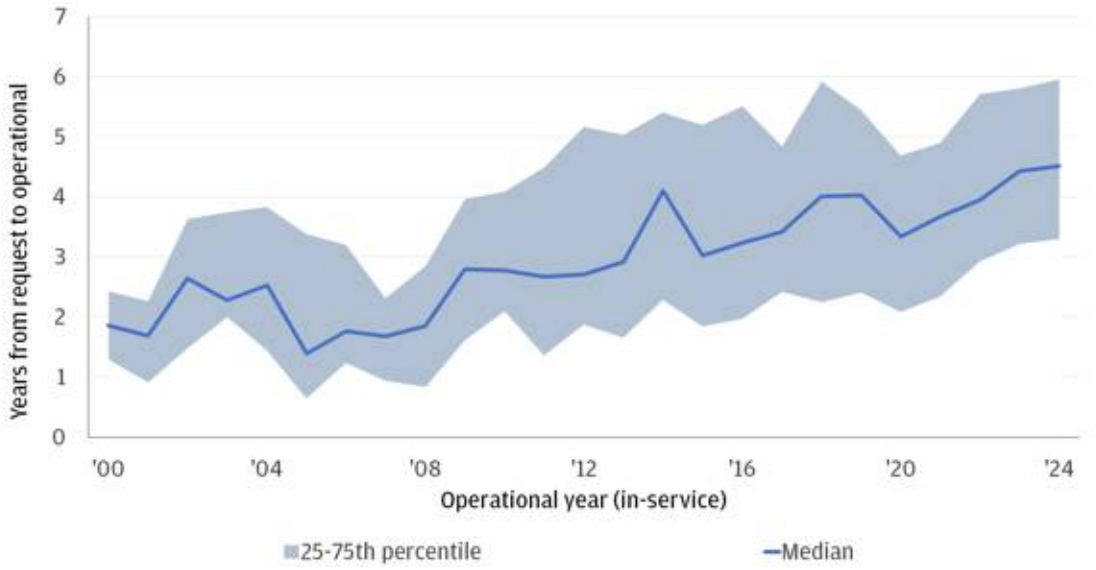
Natural gas production also faces extended lead time: Even though the United States has the highest natural gas production in the world, manufacturers of turbines for new gas-fired power plants are now quoting five to seven years for delivery because of a components shortage. Data centers' energy capacity is impacted by these capacity limits, whether they source that power from the grid or build their own generator plants onsite.

- **Inefficiencies of the electricity grid**

Data centers have increasingly built their own onsite power generators. Yet, the majority of data centers still rely on the electricity grid. The typical power project built in 2024 took nearly five years from interconnection request to commercial operations, compared to two years in 2015 and less than two years in 2008 (**Exhibit 9**). Even once a data center is connected, how much power can move is capped by the number of transmission lines. Transmission line growth has been nearly nonexistent over the last few years, markedly below Department of Energy targets.

Wait times to bring capacity online are increasing

Exhibit 9: *Duration from interconnection request to operation*



Source: Lawrence Berkeley National Laboratory. As of August 31, 2025.

7. Source: IEA. "Plant Vogtle Unit 4 begins commercial operation". Published May 1, 2024

The combination of these energy supply bottlenecks and grid inefficiencies could put about one-fifth of the global data center buildout at risk[8].

The impact on prices

When demand exceeds supply, it pushes up prices. This is already evident in PJM, the largest power grid in the United States, which supplies electricity to homes and businesses from New Jersey to Illinois—the region home to the world's greatest concentration of data centers. The increase in demand from data centers is acutely seen in PJM power prices, which rose 833% for contracts covering 2025/2026[9]. Such higher prices are a positive for independent power producers and unregulated utilities that can raise spot prices—unlike regulated utilities that must go through regulatory bodies to raise their prices.

The skilled labor deficit

Data center construction and maintenance requires a skilled labor force: specialized electricians, engineers and HVAC technicians. With data center demand set to continue rising, the industry is likely to face persistent shortages across these skilled trades. The Center for Strategic and International Studies estimates a skilled labor deficit of from 63,000 to 140,000 workers by 2030, above expected baseline jobs growth for these industries[10].

These deficits aren't easily fixed. Training electricians and HVAC technicians takes a four-to-five-year minimum. Complex, high-voltage data centers need additional specialization, further prolonging training.

The current U.S. administration identified this expected labor shortage in its July 2025 AI Action Plan, which recommends expanding workforce training and apprenticeships for AI-related infrastructure jobs. The recommendations are a step in the right direction, but new programs will likely take time to develop. In the near term, this skilled labor deficit could delay projects from meeting rapid construction timelines.

In summary

Despite the impressive buildout of AI infrastructure so far, physical limits are increasingly likely to be the main constraint holding back the pace of future development. In the short term, if these limitations put the brakes on the buildout, they may for a time assuage investors' worries about overcapacity. However, addressing these bottlenecks will be essential for sustaining the long-term growth of the AI ecosystem.

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8. Source: IEA, Energy and AI. As of April 2025

9. https://www.pjm.com/-/media/DotCom/about-pjm/newsroom/2024-releases/20240730-pjm-capacity-auction-procures-sufficient-resources-to-meet-rto-reliability-requirement.ashx

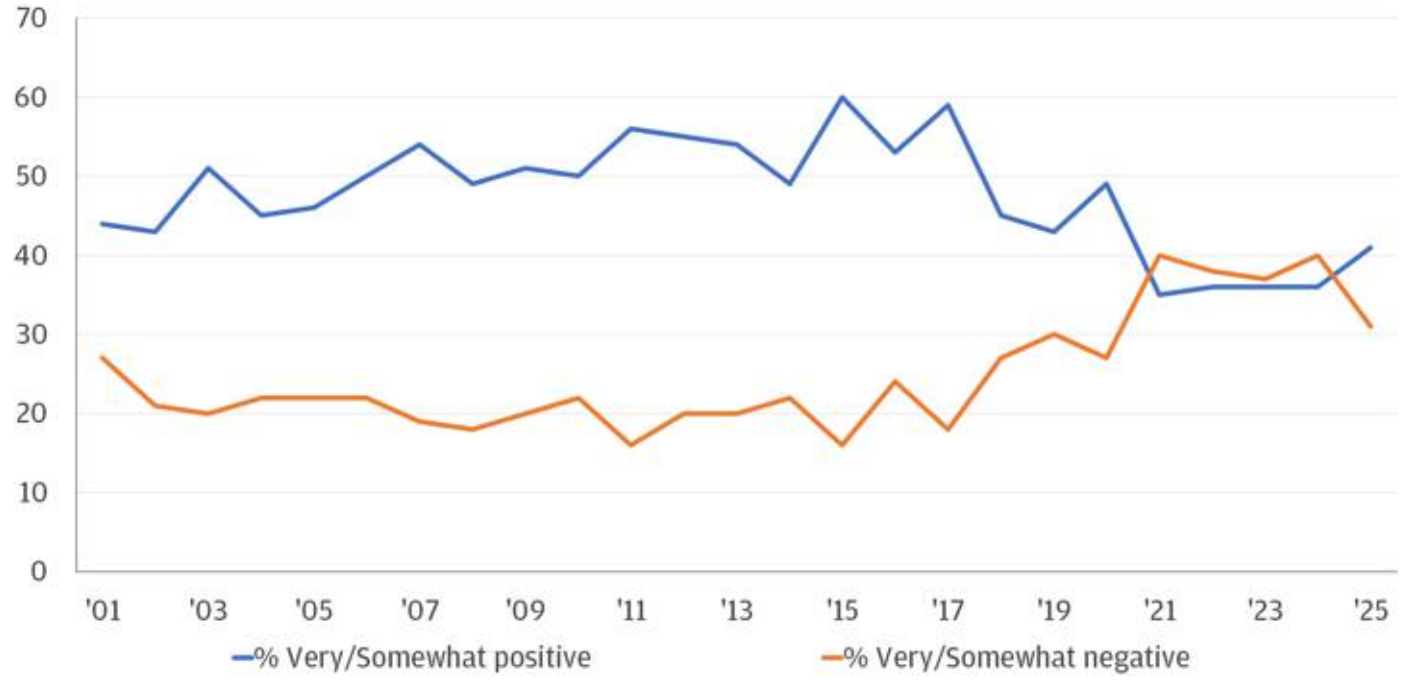
10. https://www.csis.org/analysis/genais-human-infrastructure-challenge-can-united-states-meet-skilled-trade-labor-demand?secureweb=prime#h2-appendices- The CSIS analyzed three scenarios: High case of adoption (second industrial revolution); mid case (PC revolution); low case (dot-com).

Social limits: Voter anxieties around AI proliferation

Although social and political pressures are harder to quantify, they may significantly influence AI's future trajectory. Social limits are likely to manifest faster if public opinion surrounding AI-related industries is negative, and today these industries are already viewed with rising skepticism. Polls conducted from the 2000s to the 2010s showed positive net approval for U.S. internet companies ranging from 20% to 30%. But public opinion has downshifted meaningfully over the past few years to a net approval closer to 10% now (**Exhibit 10**).

Public support for U.S. internet companies has fallen over the past decade

Exhibit 10: *Positive and negative opinion of internet industry (%), 2001–25*



Source: Gallup. Data as of August 2025. Survey results based on approximately 500 respondents asked whether their "overall view of the internet industry is very positive, somewhat positive, neutral, somewhat negative or very negative."

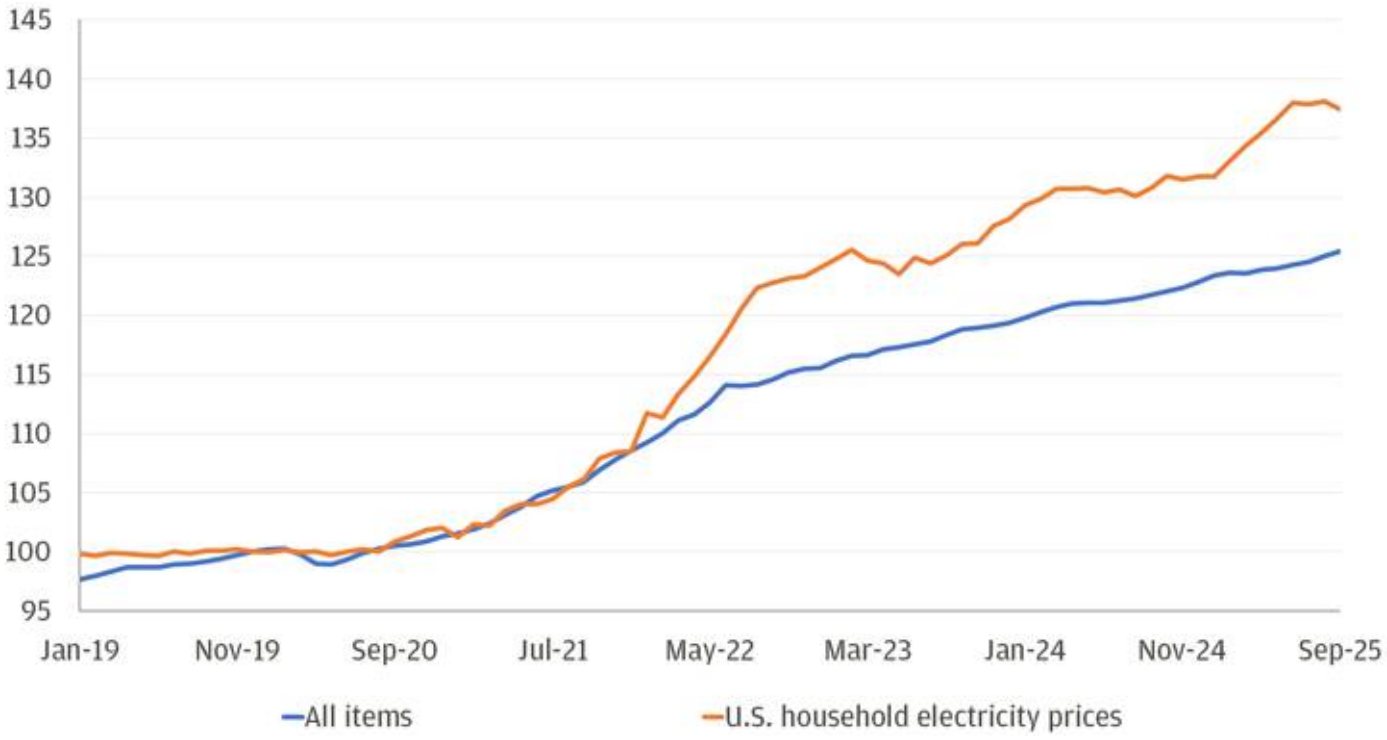
Data centers construction meets local opposition

With the U.S. public already disenchanted with the major tech companies, we see potential near-term and longer-term social limits to the AI boom.

The near-term limit is tied directly to rising electricity prices. Data center electricity demand is not the only reason U.S. electricity prices are rising, but they are an easy target. Nationwide, household electricity prices are up nearly 40% from the beginning of 2020 (**Exhibit 11**). And while electricity costs remain a small share, on average, of overall personal expenditures (1.2% as of August 2025), consumers are likely to experience sticker shock at the pace of household electricity inflation.

U.S. household electricity prices have surged up about 40% since 2020

Exhibit 11: *CPI, Indexed where December 2019 = 100*



Sources: Bureau of Labor Statistics, Haver Analytics. Data as of September 30, 2025. Index: December 2019 = 100.

Indeed, in Virginia, the state with the largest number of data centers, higher electricity prices were a focal point in the November 2025 gubernatorial race. Governor-elect Abigail Spanberger won in part with clear promises that "it's important that the brunt of data centers not be put on ratepayers and, in fact, that they pay their own way and their fair share."

We've also seen notable examples of constituents blocking new data center construction. Residents of St. Charles, Missouri, successfully defeated a proposed 440-acre data center project by CRG, the development arm of construction firm Clayco. In Caledonia, Wisconsin, Microsoft canceled plans for a large data center due to resident complaints, and in Indiana, Google withdrew a proposed data center. In each case, citizens' pushback voiced concerns about water usage, higher electricity prices, data centers' noise, and the potential pollution of surrounding soil, wildlife and neighborhoods.

To be sure, these companies will likely be able to find other locations, but it's important to recognize that data centers are not universally popular. For now, we still see these social challenges as being more localized, with a limited impact on the broader AI ecosystem buildout.

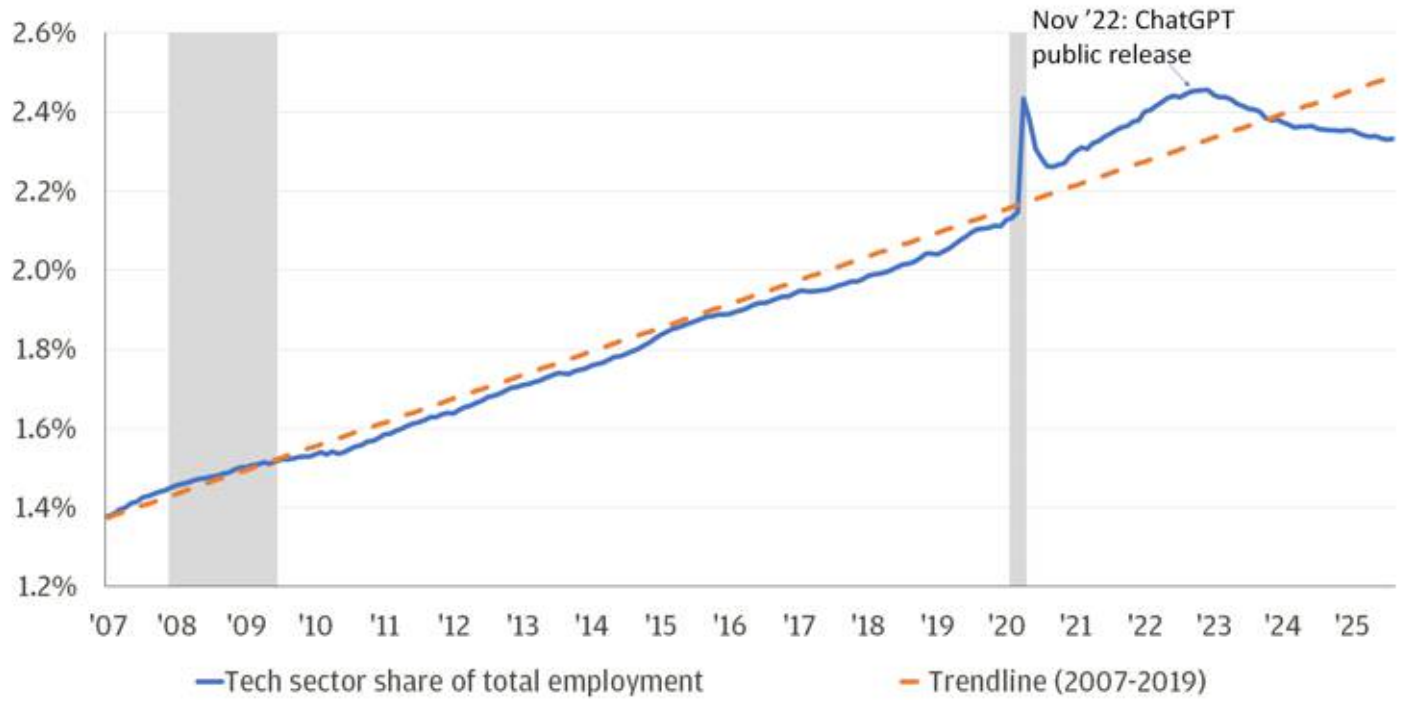
The salience of AI's labor market impact

Over time, we think concerns around how AI could impact the labor market will likely become a more salient political question. Thus far, AI has had little explicit macro impact, although the tech sector shows some signs of disruption. Tech employment, as a share of total private

employment, fell below its 2007–19 trend—a reversal that occurred around 2022 when ChatGPT was released. Importantly, tech employment as a share of total private sector employment is only slightly over 2% (**Exhibit 12**), so for now, it is a micro rather than a macro dislocation. But politics is often more about perception than reality.

The tech sector makes up a small portion of total U.S. employment, but AI impact notable

Exhibit 12: *U.S. employment in tech sector (%), 2007–25*

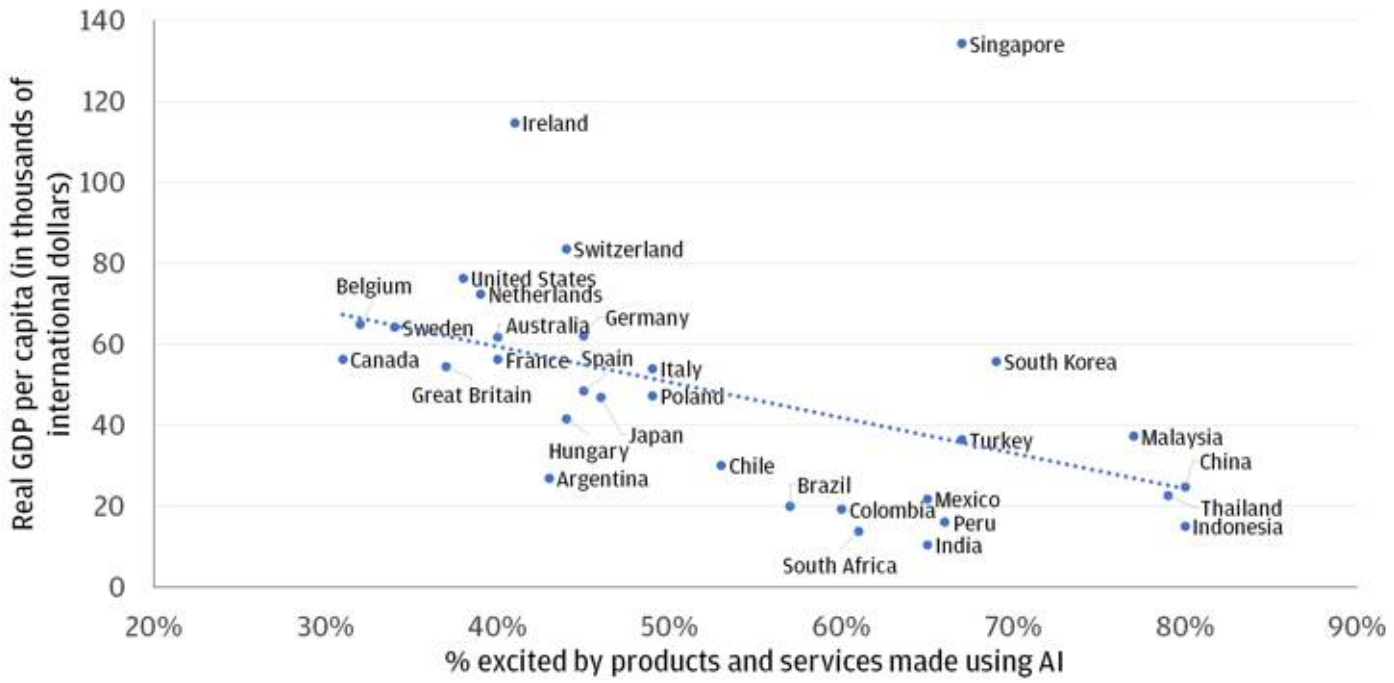


Sources: Goldman Sachs, Haver Analytics. Data as of August 31, 2025. Tech refers to the software publishers, data processing and related, web search and related, and computer systems design subsectors.

A recent Ipsos poll found that the excitement around the goods and services produced by AI is relatively low in developed market economies versus in emerging market economies (**Exhibit 13**). This makes sense: Developed market economies have larger high-skill services workers, and therefore potentially more to lose from a technology that promises to make human labor in many of those fields redundant.

Residents of wealthier countries tend to be less excited by products and services created using AI

Exhibit 13: *Real GDP per capita (in thousands of international dollars) vs. % of people polled excited by AI-produced products and services*



Sources: Haver Analytics, Ipsos. Data as of April 2025. Survey results for China are as of 2024. Base: 23,216 online adults under age 75 across 30 countries interviewed March 21–April 4, 2025.

Already, responding to percolating constituent concerns, U.S. Senator Josh Hawley and Senator Richard Blumenthal have proposed legislation that would, among other goals, monitor AI-related risks to national security, individual rights and worker protections.

Constituents' worries that AI-related economic disruptions will hit the labor market and increase inequality—and the prospect of raising taxes on the corporate winners of the AI race—will likely become salient political topics in the 2026 midterm elections and beyond.

In Summary

In the near term, social limits on AI are not likely to be as consequential as physical and human resource limits. But especially given that public sentiment toward the large tech companies pushing the AI revolution is already unfavorable, these matters should be monitored.

We view these potential social and political limits as likely to worsen over time, and we expect discussions about them will become more common on the campaign trail in the coming years. AI proliferation may mark this as an era with the most immense technological and human progress potential in history, but we can expect to pass through social anxiety and pushback—as in other periods of profound technological change.

Investment Implications

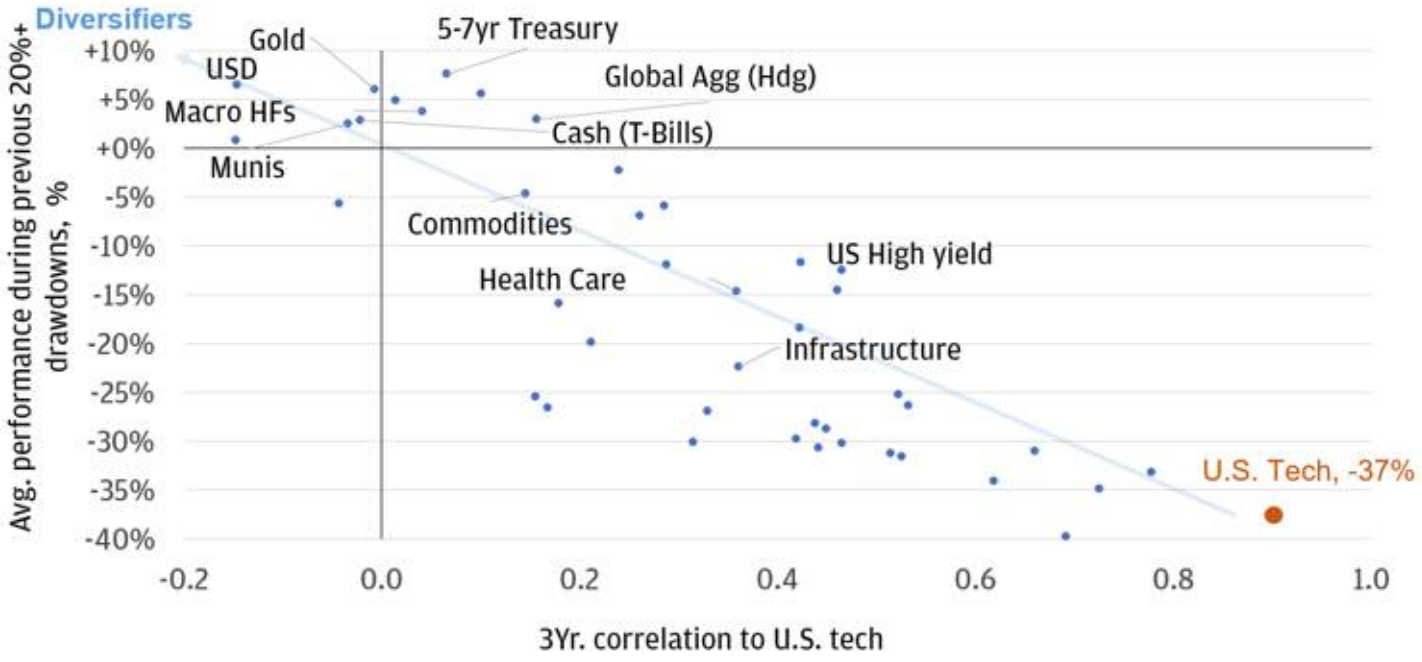
The pace and breadth of the AI buildout across the United States is likely to be governed by limits imposed by investors, physical resources and voters. At the moment, we see few meaningful financing constraints that would swiftly reverse the major tech companies' AI capex intentions. The same can be said for near-term social constraints.

In 2026, physical constraints—particularly in the power sector—will likely be the primary factors regulating the pace of AI expansion. Therefore, we recommend focusing on companies that build and support AI infrastructure, such as electricity suppliers, data center equipment manufacturers and raw material providers. We include in this category firms that generate and supply electricity, manufacture electrical and cooling equipment, provide data center services and supply critical raw materials.

Should AI ROI expectations drastically shift resulting in a weaker market outlook, investors might find safety in sectors least correlated to U.S. technology stocks, namely healthcare (**Exhibit 14**). At the extreme, if the AI boom unravels completely, investors could hedge with long-duration core fixed income, macro hedge funds and gold.

Diversification from U.S. technology companies

Exhibit 14: *Average performance during drawdowns vs. 3-year correlation to U.S. Tech*



Source: Bloomberg Finance, L.P. Uses weekly returns for S&P 500 Info Tech drawdowns. Average drawdown includes 2000, 2008, 2018, 2020, 2022 and 2025. Real Estate and Infra equity are missing 2000 drawdown data.

Postscript

Valuation limits: How high is too high?

The dot-com bubble was marked by excessive investment that ultimately led to a capacity hangover and a macroeconomic recession. However, overinvestment wasn't the only thing that burst the bubble. It also popped when stock market valuations reached unsustainable levels. At their peak in late 1999 and early 2000, technology stocks—and the broader market—became so detached from realistic earnings potential that a collective sort of psychological clarity about the absurdity of market prices emerged among investors.

Are current valuations approaching unsustainable levels? While technology stocks and the broader S&P 500 are expensive, they remain well below the 1999–2000 dot-com extremes.

P/E ratios

We begin with the price-earnings (P/E) ratio of the S&P 500, based on trend earnings. The current P/E at publishing, 27.1x, is near the 95th percentile of historical data to the mid-1930s. Today's ratio was last breached at the end of 2021 when the market traded at 28.8x, just before the Fed-induced bear market of 2022.

Yet this P/E measure remains considerably below the dot-com bubble peak of just under 37x, in Q1 2000 **(Exhibit 1)**.

U.S. equity valuations are elevated, but below the dot-com peak

Exhibit 1: *Current S&P 500 P/E based on trend earnings (multiple)*

Sources: Haver Analytics, Standard & Poor's. Data as of October 1, 2025. HP filter used to calculate trend earnings.

Considering interest rates and the equity risk premium

Adjusted for inflation, interest rates are significantly lower today than in the early 2000s when the dot-com bubble burst. The real 10-year interest rate was nearly two percentage points higher in Q1 2000 than it is now, according to the Federal Reserve Bank of Cleveland. As a result, the equity risk premium (ERP), which compares the earnings yield (inverse of the P/E multiple) to risk-free interest rates, is less stretched than the P/E multiple.

Currently, the ERP is at the 72nd percentile of expensiveness, relative to history (using real interest rate data since the early 1980s). The ERP is still firmly in positive territory, unlike at the peak of the dot-com boom **(Exhibit 2)**. A positive ERP makes sense: It is compensating investors for taking on the additional investment risks associated with equities—risks not inherent in government debt securities (e.g., earnings volatility, corporate governance risks, business cycle exposure and the potential for default).

The ERP is below its long-run average but still positive

Exhibit 2: *Equity risk premium (%)*

Sources: Cleveland Federal Reserve, Haver Analytics, Standard & Poor's. Data as of October 1, 2025.

The ERP is useful for assessing the level of earnings growth required to justify current valuations. The ERP is currently around 2.1%–2.2%, compared to a long-run average of about 3%. To return the ERP to its historical average, earnings would need to grow by approximately 21.5%. This is more than double the past decade's average trend earnings growth of about 10%. That would be a high hurdle, though not an impossible one.

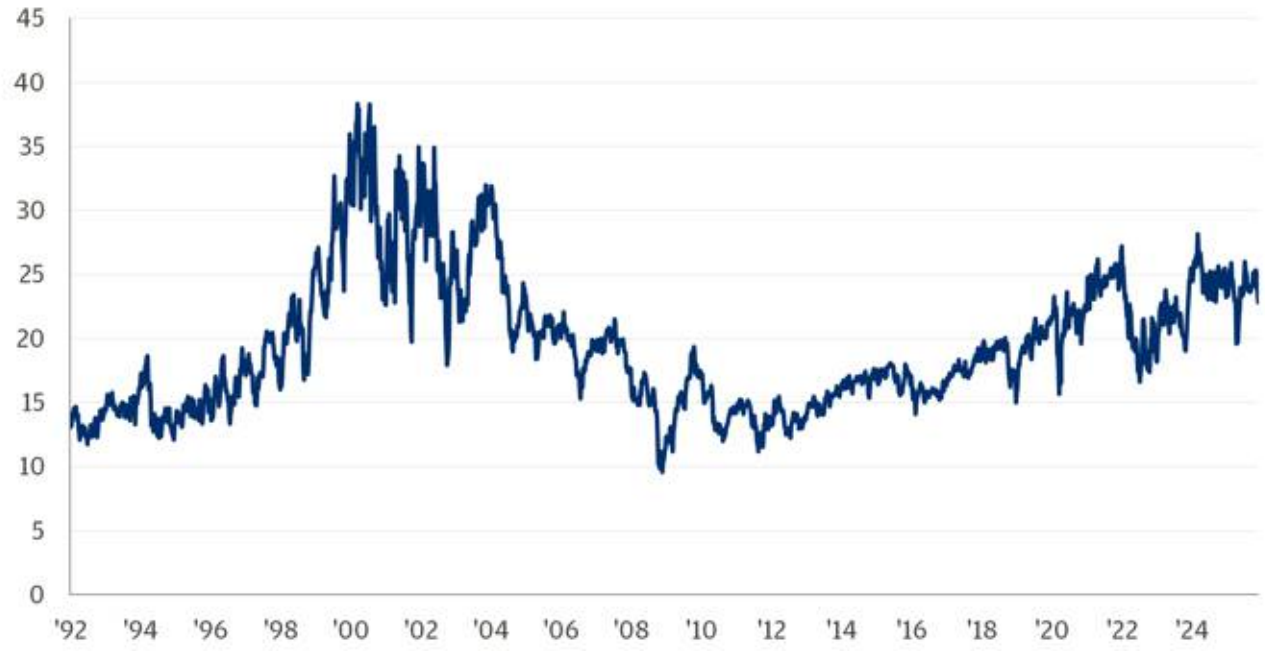
Moreover, this ERP analysis is highly sensitive to interest rates. If the market is anticipating that rates will drop even lower, this decreases the earnings growth required to justify current valuations. For example, the 10-year real rate at publishing time was 1.6%, down from about 2% a year ago. If real rates fell below 1%, minimal (to no) earnings acceleration would be needed to bring the ERP back to its long-run average. Recent trend earnings growth of 10% would suffice. Conversely, if real rates rose above 2%, the earnings hurdle would become much higher, and a market correction would be more likely to ensue.

Median tech stock valuations

Lastly, when comparing current technology stocks valuations to those during the dot-com peak, data shows the sector is expensive, yet remains far from the extremes of the dot-com bubble (whether one considers trailing or forward earnings). Notably, the median technology company valuation is less stretched than the sector overall **(Exhibit 3)**. That's because the largest and most profitable companies are driving up the sector's average valuation[11].

Median tech valuations today are far from dot-com extremes

Exhibit 3: *S&P 500 Information Technology sector 12m forward median P/E, x*



Sources: NDR. Data as of November 21, 2025.

In Summary

The AI-driven rally has made stocks expensive, but they are not wildly unrealistic, nor are today's P/E ratios' implied earnings unachievable. However, equity valuations remain highly sensitive to interest rates, and a rise in rates is a key risk to the sustainability of current market valuations.

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11. The research firm NDR employs an ERP framework for tech sector forward return projections. According to this, current valuations would be associated with 10-year forward annualized returns of about 8.5%, which would be on the low side of history but well above the negative forward returns implied for dotcom valuations

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