GW&K INVESTMENT MANAGEMENT

GLOBAL PERSPECTIVES

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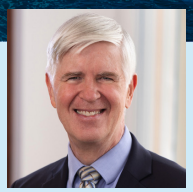

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THE $7 TRILLION QUESTION:
WHEN WILL AI INVESTMENTS START PAYING OFF?

HIGHLIGHTS

- The 2026 – 2030 period will be the crucial test for AI commercialization, as today's massive infrastructure investments must start generating returns or face potential write-downs.
- Extreme concentration in AI stocks creates amplified market risk, with Americans' equity exposure now exceeding dot-com era peaks just as portfolio performance becomes tied to a few companies' AI success.
- Diversification into value and international stocks trading at discounts may provide protection whether AI delivers transformative growth or disappoints relative to current valuations.

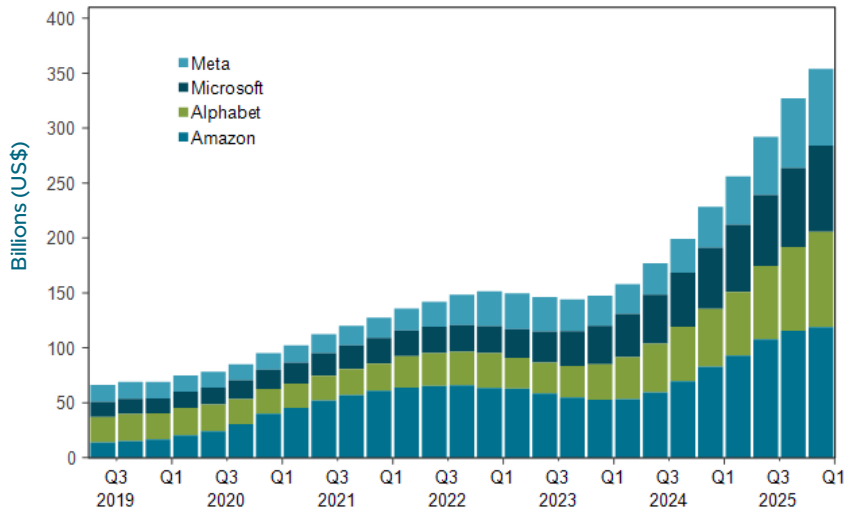
THE AI CAPITAL SPENDING BOOM HAS ACCELERATED

Corporate America has committed hundreds of billions to AI infrastructure. The timeline for returns will determine which companies thrive — and which face a reckoning.

The numbers are staggering (**Figure 1**). Amazon's annual capital expenditure is approaching $120 billion, while Meta's has surged to $70 billion. Microsoft and Google have each boosted annual capital expenditures toward the $80 – $90 billion range, driven largely by AI initiatives. Combined, these tech giants' AI-related capex has jumped an estimated $125 billion year-over-year, with analysts projecting global data center investment could approach $7 trillion by 2030.[1]

FIGURE 1

The AI Infrastructure Boom:
Capital Expenditures, Four-Quarter Trailing Sum



Sources: GW&K Investment Management, Bloomberg, and Macrobond.

Meta, Microsoft, Alphabet, and Amazon collectively grew their capital expenditures by $125 billion over the past year and are on track to invest nearly $350 billion in 2025.

For investors, one question towers above all others: When will these massive bets start generating returns that justify their scale? The answer will determine not just individual company fortunes, but the broader trajectory of corporate America and the global economy.

Unlike previous technology cycles, where timing was often measured in decades, AI's compressed development timeline means the payoff window could arrive much sooner — or the reckoning could come faster for those who've bet wrong. Understanding this timeline isn't just an academic exercise; it's the key to navigating what may be the largest capital reallocation in business history.

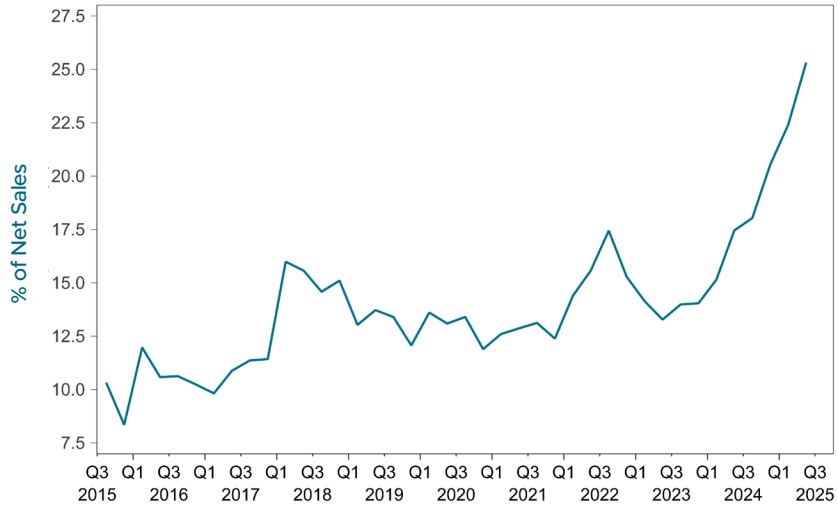
THE CURRENT INVESTMENT PARADOX

The immediate picture is unambiguous: AI spending is squeezing near-term operating margins across corporate America (**Figure 2**). Companies have tended to frame this issue carefully rather than address it head-on, but their disclosures hint at the strain. Google's CFO has pointed to incremental costs as the company integrates AI into search. Microsoft, for its part, has reported that its gross margin percentage has decreased, driven by the impact of scaling their AI infrastructure — implicitly acknowledging that heavy investment is weighing on short-term profitability even as it positions the firm for longer-term demand.

[1]Jeffrey Noffsinger, et.al., "The cost of compute: a $7 trillion race to scale data centers," *McKinsey Quarterly*, April 28, 2025.

FIGURE 2

Average Capital Expenditures to Sales for Alphabet, Amazon, Meta, and Microsoft



Sources: GW&K Investment Management, Bloomberg, and Macrobond.

Soaring AI-related capex is squeezing margins at the leading US hyperscalers as capex requirements are growing much faster than net sales.

The math is particularly stark for data center operators. Investor Harris Kupperman calculates that AI facilities coming online in 2025 will face roughly $40 billion in annual depreciation costs — primarily from expensive GPUs and specialized equipment that become obsolete quickly — while generating only $15 – $20 billion in revenue at current usage rates.[2] Even accounting for growth, these facilities would need to see ten-fold increases in utilization or pricing just to break even.

This isn't necessarily a sign of failure. UC Berkeley economist Brad DeLong argues that much current AI spending represents defensive insurance rather than profit-seeking investment.[3] Companies feel compelled to build AI capabilities to avoid being left behind, even when immediate returns are unclear. This dynamic mirrors the 1990s browser wars, where Microsoft gave away Internet Explorer for free to prevent Netscape from establishing dominance.

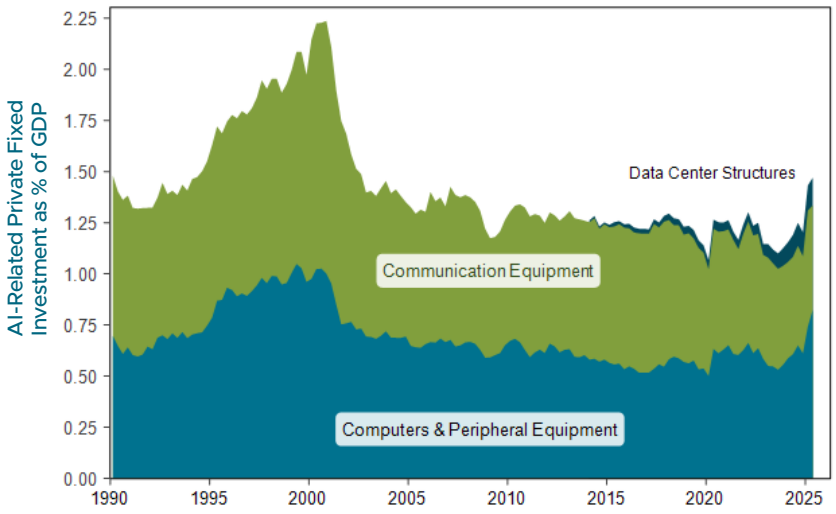
The defensive nature of current AI investment creates a particularly challenging environment for monetization. When tech giants can afford to offer AI features as loss leaders — subsidized by profitable core businesses — it becomes nearly impossible for standalone AI companies to charge premium prices for similar capabilities. OpenAI's ChatGPT, despite attracting roughly 700 million weekly active users, generates subscription and API revenue now running at a $12 – $13 billion annual pace.[4] Yet these inflows remain modest compared to the staggering infrastructure costs required to serve such scale. Analysts estimate OpenAI is burning about $8 billion annually, with compute expenses representing the majority of operating costs and profitability unlikely until later this decade.[5]

[2]Harris Kupperman, "Global Crossing Is Reborn…," *Praetorian Capital*, August 20, 2025.
[3]Brad DeLong, "The ROI Problem of AI: Dazzling Capabilities, But Powerful Market Incentives Blocking Bottom-Line Corporate-Profit Gains," *Grasping Reality Substack*, June 30, 2025.
[4]Reuters, "OpenAI hits $12 billion in annualized revenue, The Information reports," July 30, 2025.
[5]One example of a potentially transformative prospect for OpenAI's revenue is the firm's recent introduction of an "Instant Checkout" feature that will allow users in the US to make purchases directly through ChatGPT through an AI payment protocol co-developed with Stripe. See Jeremy Kahn, "OpenAI rolls out 'instant' purchases directly from ChatGPT, in a radical shift to e-commerce and a direct challenge to Google," *Fortune*, September 29, 2025.

However, one encouraging sign that the AI infrastructure buildout may still be in early days can be seen by comparing current spending trends versus those of the late 1990s internet and telecommunications boom. As a percentage of GDP, spending on communications equipment, computers and peripheral equipment, and data center structures is still well below the peak level recorded in the late 1990s (**Figure 3**). Data center structures are a new feature of the current AI infrastructure boom, with analysts projecting that the need for AI-related power-generating capacity will more than triple from current levels by 2030.

FIGURE 3

The AI-Related Spending Boom: Still Looks Modest Relative to the Late 1990s



Sources: GW&K Investment Management, BEA, and Macrobond.

Relative to US GDP, AI-related equipment spending is growing rapidly but has not approached the peak levels seen in the dot-com boom of the late 1990s.

THE MEDIUM-TERM COMMERCIAL TEST

The period from 2026 to 2030 represents the crucial testing ground for AI's commercial viability. By then, today's massive infrastructure investments will be largely complete and operational, creating pressure to monetize these assets. This timeline aligns with several potential catalysts that could transform AI from cost center to profit driver.

Enterprise adoption represents the most immediate opportunity. While consumer AI applications have captured headlines, the business market offers clearer paths to monetization. Companies are beginning to pay for AI-powered productivity tools, with early adopters reporting measurable time savings in coding, document analysis, and content creation. If these productivity gains prove scalable and sustainable, the enterprise software market could see rapid AI premium adoption.

Cloud providers are particularly well-positioned to capture medium-term returns. As enterprises increase AI workloads, these platforms can monetize their infrastructure investments through usage-based pricing. Early data suggests strong growth in AI cloud services, though current revenue remains a fraction of the capital being invested.

However, the medium term also carries significant risks of overcapacity. If AI application rollouts prove slower than expected, the industry could face a glut of underutilized computing power by 2027. AI technologist Eric Koziol warns that translating AI capabilities into fully automated business

processes is far more complex than many assume. In most cases, AI can handle 80% of a task effectively, but the remaining 20% — edge cases, integration challenges, quality control — still requires human oversight.[6]

This "80% problem" could significantly delay ROI realization. If businesses end up layering expensive AI on top of existing processes without eliminating the underlying costs, the promised efficiency gains may prove elusive. Companies will need to fundamentally redesign workflows to capture AI's benefits, a process that typically takes years rather than months.

However, it's equally plausible that we're underestimating AI's trajectory by viewing it through the lens of past technologies. Unlike previous infrastructure buildouts, AI systems can improve themselves, and each capability breakthrough can compound into adjacent domains. The gap from 80% task completion to full automation may close faster than conventional implementation timelines suggest, particularly as AI tools become better at handling their own integration challenges.

The medium term will likely produce clear winners and losers. Cloud infrastructure providers with diversified revenue streams may achieve steady returns even if some AI applications disappoint. Meanwhile, companies that bet heavily on specific AI use cases without alternative monetization paths could face significant writedowns if adoption lags expectations.

Key indicators to monitor include AI feature adoption rates in enterprise software, utilization metrics for cloud AI services, and evidence of genuine productivity improvements in AI-heavy workflows.[7] Although it may be just a "blip," biweekly US Census data is beginning to show a slowdown in AI adoption for large firms. Companies that can demonstrate measurable business impact from their AI investments will likely see their valuations rewarded, while those making vague claims about AI transformation may face increasing skepticism.

LONG-TERM ECONOMIC SCENARIOS

Beyond 2028, the spectrum of possible outcomes widens dramatically, ranging from modest productivity improvements to economy-transforming breakthroughs. The most optimistic scenarios envision AI systems that function as "drop-in remote workers" — digital employees capable of performing knowledge work as effectively as humans.

Leopold Aschenbrenner, an AI researcher and investor, argues that achieving artificial general intelligence (AGI) by 2027 is "strikingly plausible."[7] If such systems materialize, the economic implications could be extraordinary. Companies might scale output without proportional increases in human payroll, potentially yielding dramatic productivity gains and competitive advantages.

Economist Tamay Besiroglu projects that advanced AI could trigger "explosive growth" — GDP growth rates many times higher than historical norms.[8] He assigns roughly 65% odds to this scenario occurring later this century, with about 25% probability of significant productivity gains materializing by the end of the 2020s. In such a world, even investments that appear expensive today could generate impressive returns.

[6]Eric Koziol, "The ROI Problem of AI: Understanding Issues on the Bottom Line," *Embracing Enigmas Substack*, June 29, 2025.
[7]Leopold Aschenbrenner, "Situational Awareness: The Decade Ahead," June 2024.
[8]Matt Clancy and Tamay Besiroglu, "The Great Inflection? A Debate About AI and Explosive Growth," *Asterisk Magazine*, June 2023.

It's worth emphasizing that these optimistic scenarios aren't merely about incremental gains — they contemplate a fundamental phase shift in economic growth. If AI systems can genuinely augment or replicate high-skilled knowledge work at scale, the productivity implications could dwarf previous technological revolutions. Unlike electrification or computerization, which primarily amplified existing human capabilities, advanced AI could potentially automate the process of innovation itself, creating a recursive cycle of improvement that accelerates scientific discovery, drug development, and technological progress across virtually every domain.

Mainstream economists like Philippe Aghion and Simon Bunel offer a more conservative projection, estimating AI could add roughly one percentage point to annual productivity growth over the next decade.[9] While meaningful, this represents incremental rather than revolutionary improvement — more akin to how computers and the internet gradually enhanced business efficiency rather than instantly transforming entire economic structures.

The long-term outlook also depends heavily on how AI capabilities evolve. Current large language models excel at text generation and analysis but struggle with complex reasoning and real-world interaction. Breakthroughs in areas like robotics, scientific research, or autonomous systems could unlock entirely new categories of economic value. Conversely, if AI development hits fundamental limitations or diminishing returns, the most grandiose predictions may prove unfounded.

THE CONCENTRATION CHALLENGE

The AI investment timeline creates both opportunities and risks that require careful portfolio construction. The compressed timeframe means traditional value investing approaches may miss rapid shifts in competitive dynamics, while momentum strategies risk buying into unsustainable hype cycles.

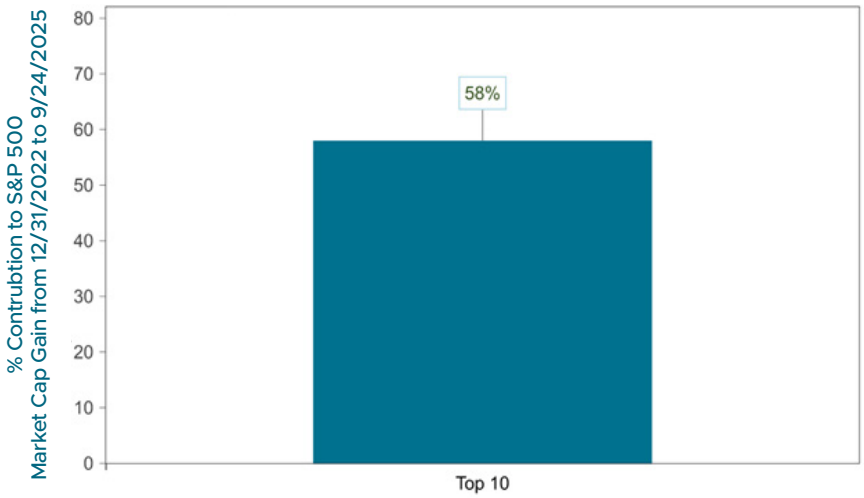
A prudent approach might involve a "barbell" allocation: combining relatively safe infrastructure plays with selective bets on potential breakthrough applications. Semiconductor companies, cloud providers, data center operators, and electrical utilities represent the "picks and shovels" of the AI gold rush — likely to benefit regardless of which specific AI applications succeed. Meanwhile, smaller positions in AI-native companies or traditional firms with compelling AI transformation stories could capture outsized returns if the optimistic scenarios unfold.

One challenge for investors is the extent to which the gains and risks of the AI boom have been concentrated in a handful of superstar companies. Since 2022, the top 10 stocks (mostly AI-centric giants) have accounted for over half (58%) of the S&P 500's increase in market capitalization (**Figure 4**). The top 10 alone make up nearly 40% of the entire S&P 500's value (**Figure 5**). These same few firms also represent an outsized portion of corporate earnings and capital spending. In fact, the collective capex of the so-called "Magnificent 7" has surged from roughly 10% to 30% of total S&P 500 capex in the past six years, reflecting an immense bet on AI by only a handful of players (**Figure 6**). Importantly, these firms are funding this surge largely from ongoing cash flows, unlike many dot-com era companies that had little or no free cash flow.

[9]Philippe Aghion and Simon Bunel, "AI and Growth: Where Do We Stand," Policy Note, June 2024.

FIGURE 4

Top 10 Stocks Contribution to Market Cap Gain Since December 31, 2022

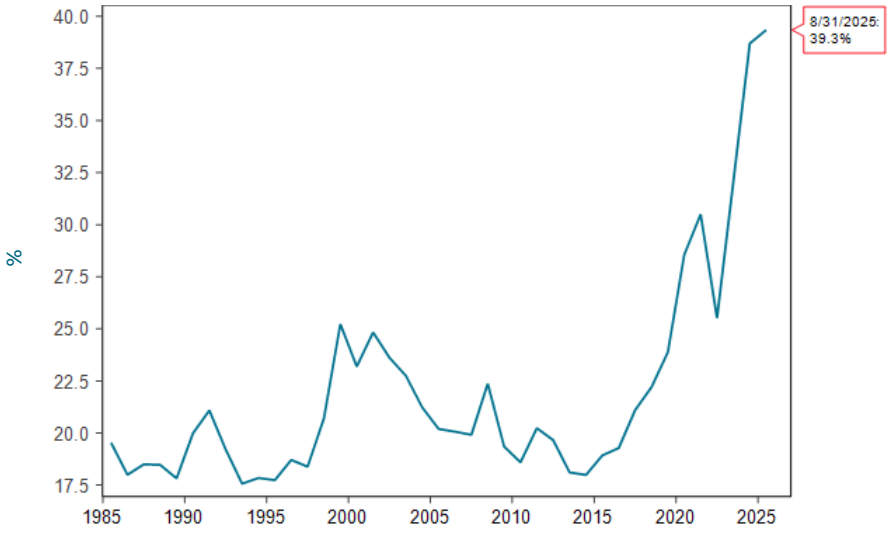


Note: Top 10 stocks are Nvidia, Microsoft, Apple, Amazon, Alphabet, Meta, Broadcom, Tesla, Oracle, and J.P. Morgan.
Sources: GW&K Investment Management, Bloomberg, FactSet, S&P 500 Global, and Macrobond.

S&P 500 returns have been highly concentrated with the top 10 stocks having contributed 58% to the market's gain since 2021.

FIGURE 5

Increasing Market Cap Concentration: Percentage Weighting of Top 10 S&P 500 Holdings (1985 – 2025)

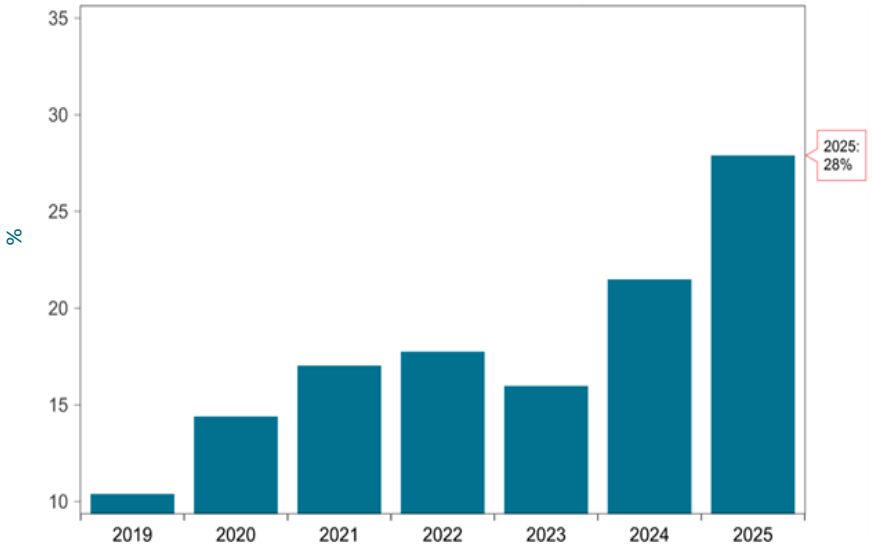


Sources: GW&K Investment Management, FactSet, S&P Global, and Macrobond.

Another indication of the market's high degree of concentration is that the top 10 stocks in the S&P 500 now account for nearly 40% of the market's total value.

FIGURE 6

Magnificent 7 Share of S&P 500 Capex



Note: "Magnificent 7" refers to Alphabet, Apple, Amazon, Meta, Microsoft, Nvidia, and Tesla.
Sources: GW&K Investment Management, FactSet, and Macrobond.

An immense bet on AI has been made by a handful of players, as the Magnificent 7's share of S&P 500 capex has surged from around 10% in 2019 to nearly 30% in 2025

This extreme concentration means that portfolio performance for almost all investors in US equities is now heavily tied to the fortunes of a few companies. Market risk is correspondingly amplified: if the AI leaders stumble or if sentiment sours, the impact will cascade through indices and portfolios far more than if risk were evenly spread.

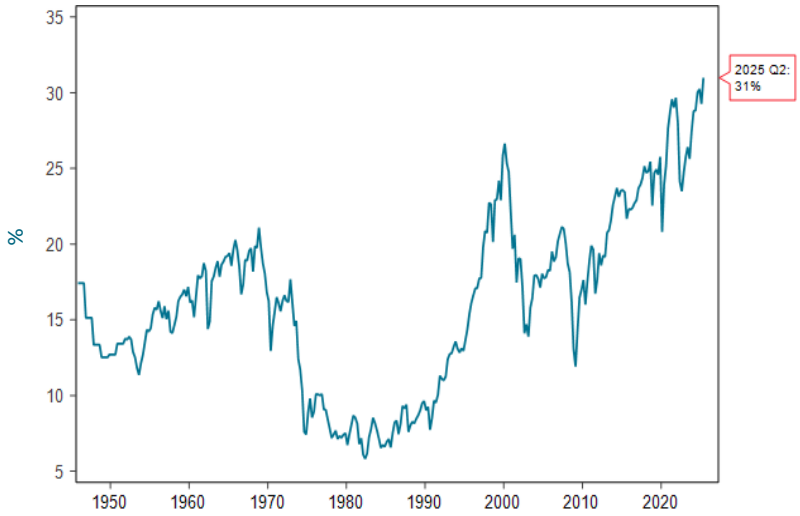
THE ECONOMIC FEEDBACK LOOP

There is a growing recognition that the AI boom's financial feedback loop cuts both ways. On one hand, soaring stock prices for AI-driven firms have fueled further capex and even a real economic upswing. AI-related expenditures on chips, data centers, and power infrastructure have contributed an estimated 40% of US GDP growth over the past year, a staggering contribution given that AI still constitutes only a few percent of total output. This investment frenzy has positive knock-on effects today: it boosts construction, tech manufacturing, and hiring in related fields.

High valuations also create a wealth effect — Americans' equity exposure (at 31% of household assets) now even exceeds the dot-com era's peak of 27% — which has buoyed consumer spending, especially among affluent households who benefited most from the stock surge (**Figure 7**). In effect, the AI boom has become a significant engine of growth and consumption in the economy.

FIGURE 7

Post-War Record High: US Equity Holdings as a % of Household Assets



Sources: GW&K Investment Management, Federal Reserve, and Macrobond.

Households' exposure to the stock market has never been so high, with American households' equity holdings accounting for 31% of their total assets, eclipsing the 27% figure posted at the peak of the 1999 dot-com boom.

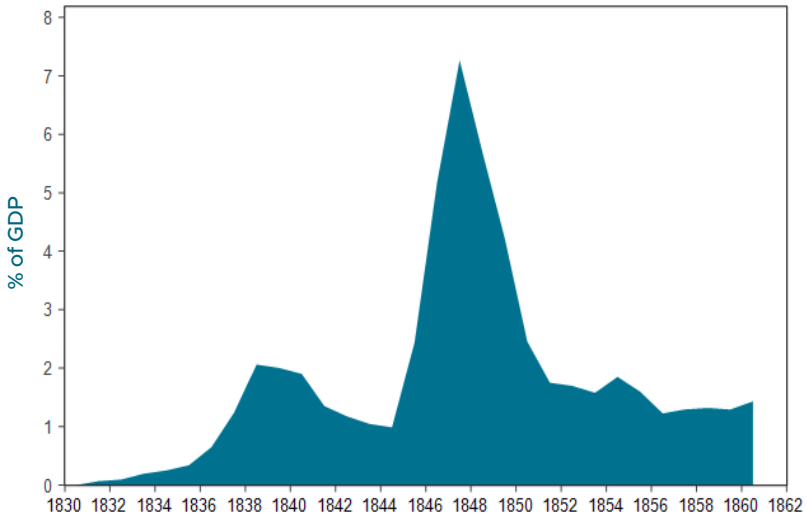
Yet this dynamic also creates vulnerability. If AI stocks were to fall sharply, perhaps due to disappointing earnings or signs that the technology isn't delivering promised returns, the wealth effect could reverse. Consumer spending would likely retreat, corporate capex plans might be scaled back, and the very real economic benefits from AI investment could evaporate quickly.

INVESTMENT STRATEGY IN AN UNCERTAIN TIMELINE

History suggests that technology arms races can overshoot in the short term, leading to bubbles and shakeouts, yet also lay the groundwork for long-term transformation. The analogy of the railway boom is apt: UK investors in the 1840s built more track than the traffic could support and many went bust, but the rails they laid became the veins of the Industrial Revolution (**Figure 8**). Likewise, we may see some AI investments flounder, even as cumulative AI progress pushes the economy into a new epoch of productivity a few years down the line.

FIGURE 8

History Lesson: UK Railway Investment (% of GDP, 1830 – 1860)



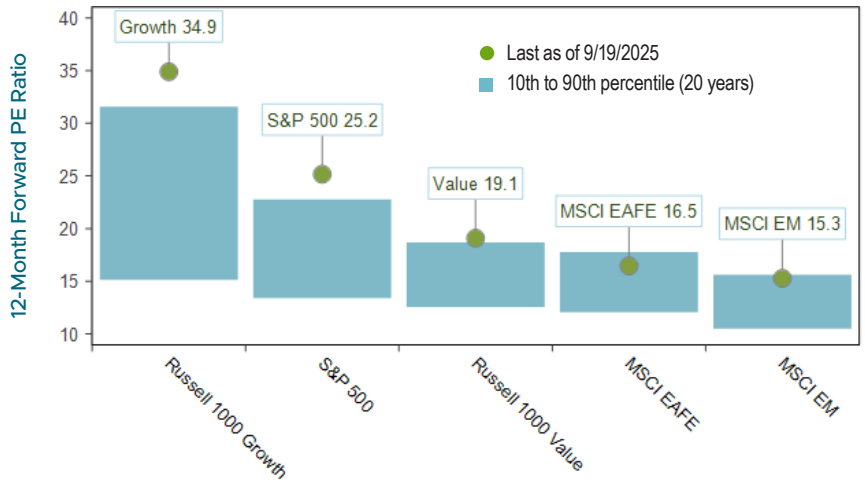
Sources: GW&K Investment Management, Andrew Odylzko, and Macrobond.

Transformative infrastructure booms have not always worked out well for investors, as UK investors experienced during the railway boom of the 1840s when more tracks were laid than traffic could support.

For investors, the best protection is to diversify modestly away from the AI hype, while maintaining significant exposure in case it turns out that the boom is still in its early innings. Destinations for diversification could be toward bonds or toward US value stocks and international stocks, which trade at significant valuation discounts to the high-flying growth stocks (**Figure 9**).

FIGURE 9

Expensive Growth, Cheaper Value, and International: Forward PE Ratios vs 20-Year Historical Ranges



Sources: GW&K Investment Management, Bloomberg, and Macrobond.

To avoid excessive AI concentration risk and valuation risk in US growth and large cap indexes, investors may consider diversifying

As Vanguard's chief economist, Joe Davis, recently argued, if the rising AI tide lifts all boats in the form of a productivity-led surge in global growth, profitable smaller companies and international companies should prosper.[10] If AI fails to generate the ROI that its current promoters anticipate, cheaper but profitable firms outside of the AI frenzy should be relatively solid performers and less subject to multiple compression than richly valued AI superstars. A modest increase in fixed income exposure, he notes, would also shift a meaningful share of portfolio returns to income generation rather than price appreciation.

The $7 trillion question of whether AI investments pay off for investors is likely to be one of the key issues for investors in coming years. Prudent risk management must recognize that multiple and widely divergent scenarios are possible. As Harry Markowitz, the father of modern portfolio theory once said, "diversification is the only free lunch in investing." There is probably no better time to heed his wisdom than during these exciting times.

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[10]Joseph H. Davis, *Coming Into View: How AI and Other Megatrends Will Shape Your Investments,* John Wiley & Sons, 2025.