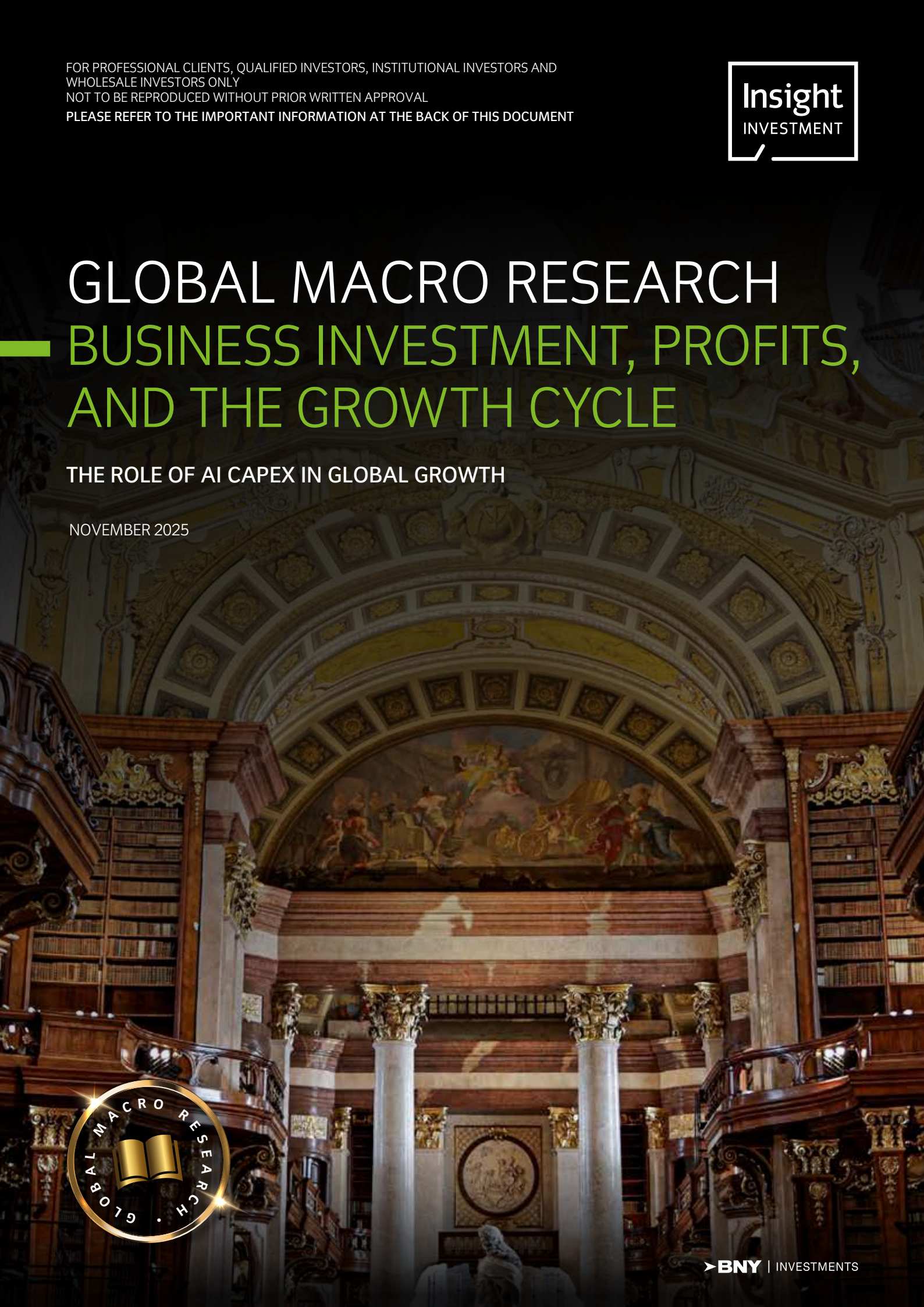
Insight INVESTMENT

GLOBAL MACRO RESEARCH
BUSINESS INVESTMENT, PROFITS, AND THE GROWTH CYCLE

THE ROLE OF AI CAPEX IN GLOBAL GROWTH

NOVEMBER 2025



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EXECUTIVE SUMMARY

Regular followers of our multi-asset process will recognise the central role we assign to the growth cycle in shaping the behaviour of risk assets. Within our asset-allocation regime framework, our assessment of global growth dynamics remains the most influential factor.

In this note, we explore the evolving role of business investment – particularly the recent surge in AI-related capital expenditure – as a key driver of global growth. We examine the intrinsic links between economic growth, corporate profitability, and investment activity, using the lens of US exceptionalism.

Historically, the US has consistently out-invested its global peers, a trend that has underpinned superior profitability. Today, US profit margins are at 70-year highs, largely propelled by the extraordinary returns of a handful of mega-cap technology firms. These 'hyperscalers' are at the epicentre of what is fast becoming a powerful secular tailwind for global growth: the AI capex boom.

While many investment booms end in bust, the sustainability of this one hinges on whether new technologies can deliver meaningful productivity gains and justify the scale of investment. That question will only be answered over time.

In the near term, however, the key issue is whether the capex surge itself can offset headwinds from US tariff policy and a weakening labour market. Much of the investment is flowing into semiconductors and hardware, particularly data centres. Unlike traditional manufacturing or commercial construction, data centres require fewer labour hours per dollar spent due to automation and prefabrication. Power supply may emerge as a critical bottleneck, but also presents a compelling medium-term investment opportunity.

We also highlight the growing vulnerability of US households to increasingly concentrated equity market exposure, which raises the risk of a reversal in the wealth effect that has, until now, supported consumption.

Finally, we introduce a new cyclical growth indicator, constructed bottom-up from global sector PMIs. This tool aims to capture emerging secular trends and may serve as a valuable enhancement to our existing growth regime framework.

We explore this across four segments:

1. The historical link between investment, profitability, and growth cycles
2. The AI capex boom and its implications for global growth
3. Potential risks from an imbalanced economy
4. How we capture these dynamics in our regime framework

1 THE HISTORICAL LINK BETWEEN INVESTMENT, PROFITABILITY, AND GROWTH CYCLE

The intrinsic relationship between economic growth, corporate profitability, and business investment is clear. Higher levels of investment are associated with higher rates of economic growth and profitability. That in turn leads to the opportunity for additional re-investment, which in turn can drive further gains in growth and profitability. Investment is also an important 'swing factor' where changes in investment tend to lead to changes in the growth cycle – specifically falls in investment consistent with downturns. The current surge in IT-related capex looks set to be the latest test to this thesis.

Figure 1: The investment, profit and growth cycle link[1]

The clearest example of this feedback loop can be evidenced through the lens of US exceptionalism.

US exceptionalism – highlighting the role of investment

We discussed features that make the US economy unique in our note 'US exceptionalism at a crossroads'. From a big-picture perspective, the scale of the economy, its ample resources, affordable inputs, growth friendly government policy and regulation, dynamic capital markets and of course, the US dollar's 'exorbitant privilege' as the world's reserve currency, all play a part.

At a corporate level, a culture of innovation, a supportive ecosystem for startups and an attitude which encourages both the creation of new businesses and the closure of failing ones, thereby reallocating resources to more profitable enterprises, emphasise the efficient deployment of capital and the importance of return to shareholders. These forces combined have been a cornerstone of the US exceptionalism story.

Better growth, investment, and return on investment…

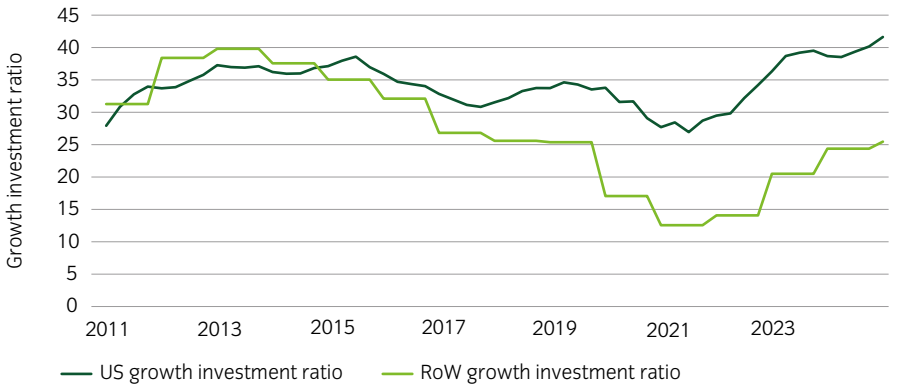
The result has been an economy that has outperformed most of its trading partners in recent decades. The US annualised growth rate in the past 20 years has averaged roughly 1.8% versus only 1% in the eurozone and UK and 0.3% in Japan.

What is interesting is the extent to which the expansion has been driven by capital expenditure – gross fixed capital formation (GFCF) – which grew at 2.4% versus 1.2% in the UK, 0.6% in the eurozone and -0.2% in Japan. Looking at investment from a bottom-up perspective we can also see that US companies tend to invest more than other countries.

[1] For illustrative purposes only.

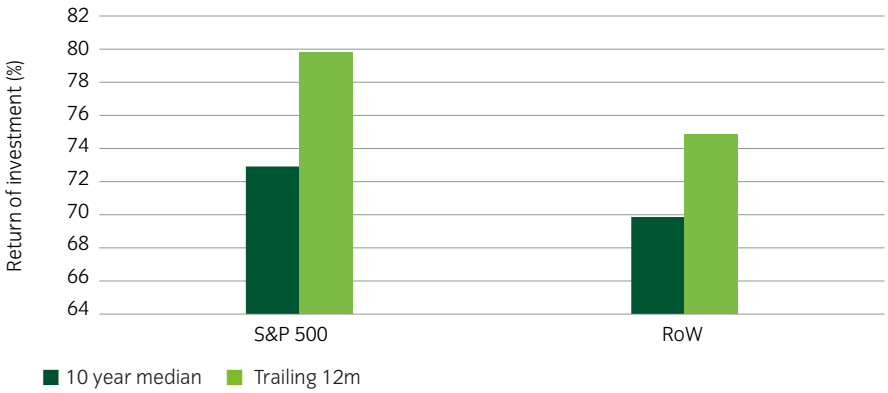
Figure 2 shows the 'growth investment ratio' calculated by Goldman Sachs. This shows capex (less depreciation) plus R&D as a percentage of cashflow from operations. The gap with the rest of the world has increased in recent years. The 'Magnificent Seven', the seven largest stocks by market capitalisation, are part of the story. They account for around 32% of the market capitalisation of the S&P 500 Index but Goldman Sachs estimates they account for 49% of overall growth investment spending by companies within the index[2].

Figure 2: US growth investment ratio is materially higher than the rest of the world[3]



US companies have invested more, then as Figure 3 shows, in aggregate, they have generated better returns on that investment. Once again, the US advantage has increased relative to its long-run (10-year) average over the last 12 months.

Figure 3: US return on investment is also much higher than the rest of the world[4]



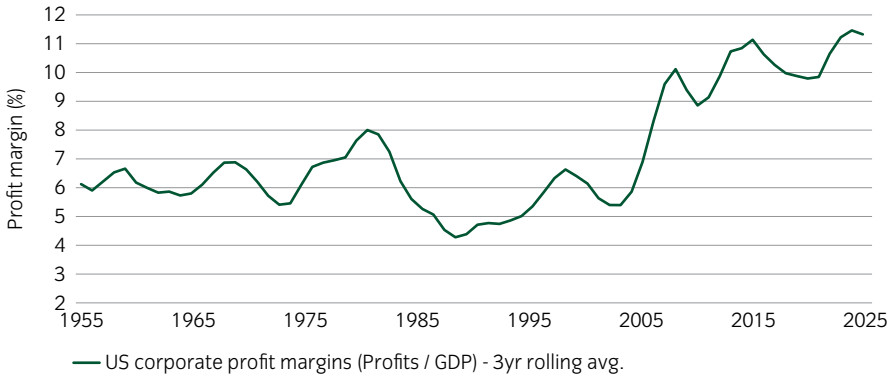
...which drive profitability

The result of both higher investment and higher returns from those investments is higher profit generation. Translating this into stock-market performance, it is clear that the well-documented outperformance of the US stock market, relative to the rest of the world, has been a function of superior earnings growth. The same is true of the tech-heavy NASDAQ Index versus the broader US market.

It is worth highlighting just how elevated corporate profitability has been in the US in recent years. As Figure 4 illustrates, profit margins expanded rapidly throughout much of the 21st century, with only a brief dip during the global financial crisis. Signs of moderation began to emerge heading into 2020, but the post-COVID recovery saw margins surge once again driven by unprecedented policy support, pent-up demand and savings, and the accelerated adoption of technology and remote working.

[2, 3, 4] Source: Goldman Sachs, published August 2025.

Figure 4: US profit margins stand at 70-year highs[5]



The sustainability of relative US earnings' outperformance, and the valuation premium that implies, are a subject for another time. But viewed in the context of the US historical experience of higher levels of re-investment, the starting point of record-high profits suggests a robust investment environment. High and expanding profit margins provide a backdrop where corporates are able to plan investment decisions with a higher level of confidence. Conversely, periods of margin contraction make the economy more vulnerable to shocks. This is because low or falling margins force companies to be more cautious when making both hiring and investment decisions.

High levels of economic uncertainty are likely to make both business and households delay investment decisions; this remains a risk given the US administration's erratic policy decisions on trade and other matters closer to home. That said, the focus of current investment spending is non-cyclical in nature. A large beneficiary of this profit expansion has been the handful of technology firms known as the Magnificent Seven. Several of these firms (known as the hyperscalers) sit at the heart of what is increasingly becoming a material secular tailwind for global growth: the AI capex boom.

2 THE AI CAPEX BOOM AND ITS IMPLICATIONS FOR GLOBAL GROWTH

The largest hyperscalers (Amazon, Microsoft, Google, Meta and Oracle) have started using the profits generated over the previous decade to ramp up capital expenditure to match the explosive growth in demand for AI and cloud computing. This acceleration in capex began in earnest 2023, but looks set to continue for the next five or more years, to meet a number of growing demands.

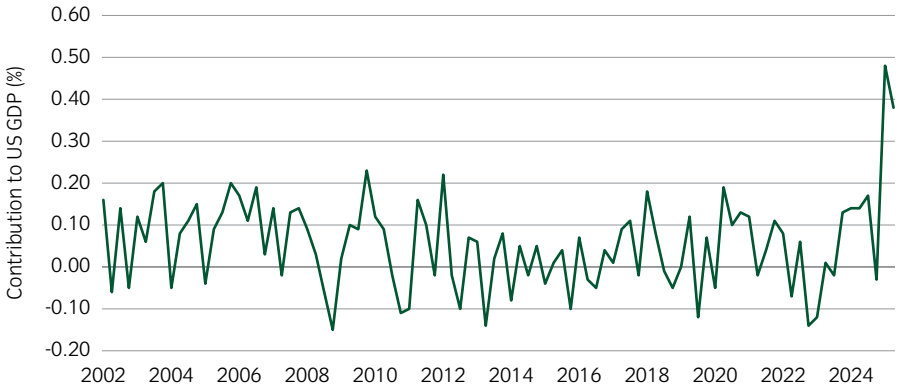
1. **AI infrastructure demands:** Training and inference of large AI models require massive compute power, which in turn demands high-performance GPUs, custom chips like Google's Tensor Processing Units (TPUs), and advanced networking. This drives investment in data centres, cooling systems, and power infrastructure, especially as AI workloads are energy-intensive.
2. **Surging AI adoption:** Enterprises and consumers are adopting AI tools at scale, creating demand for cloud-based AI services. Hyperscalers need to expand capacity to support AI-as-a-service, including large language models, copilots, and vertical-specific models.
3. **Data-centre expansion:** Hyperscalers are building new data centres globally, often in regions with favourable energy access or regulatory environments. Many are investing in on-site power generation (e.g. natural gas turbines, fuel cells) due to grid constraints and permitting delays.

[5] Source: Insight and Bloomberg. Data as at 30 September 2025.

Where does AI spending show up in GDP?

AI-related spending is increasingly influencing GDP growth statistics across four key areas: investment in equipment (such as semiconductors and IT hardware), structures (including data centres and power infrastructure), intellectual property (notably R&D and software), and net trade in AI-related goods and services. The effects of this investment wave are already visible in the data. According to Pantheon Economics, AI-related capex contributed approximately 0.5 percentage points to real US GDP growth in the first half of 2025. Without this boost, annualised growth would have been just 0.6%, compared to the reported 1.1%. As shown in Figure 5, investment in computers and peripheral equipment has accelerated markedly, with a tangible impact on growth.

Figure 5: Contribution to US GDP from computers and peripheral equipment has surged[6]



It's important to recognise that part of the surge in spending during H1 2025 may reflect front-loading ahead of anticipated tariffs. This complicates the interpretation of GDP data, particularly as a significant portion of AI infrastructure is imported, potentially overstating the net contribution to GDP in headline figures. Moreover, the Bureau of Economic Analysis (BEA) classifies semiconductor investment as an 'intermediate' good, which means its impact on GDP is understated in official statistics.

Goldman Sachs estimates that the measured contribution of AI to US GDP since 2022 is approximately $45 billion (0.2%), or around 0.1 percentage points on an annualised basis. However, when adjusting for revenue generated by US public companies exposed to the AI infrastructure buildout, they estimate the true impact to be closer to $160 billion (0.7%), or 0.3 percentage points annualised[7].

Additionally, there is likely a positive contribution from the wealth effect, as rising equity valuations – driven by AI-related optimism – have increased household exposure to the stock market. We explore this dynamic further in Section 3.

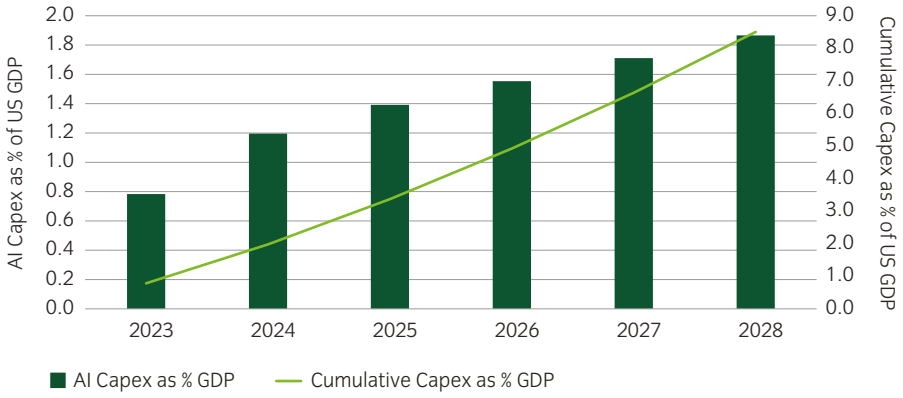
The outlook for capex presents a material tailwind for growth

The nuances of GDP measurement aside, the projected numbers for global capex should provide a meaningful tailwind for global growth. Figure 6 presents Morgan Stanley's projections for capex growth among the largest hyperscalers, alongside the cumulative investment expressed as a percentage of US GDP.

[6] Source: Insight and Bloomberg. Data as at 30 September 2025.
[7] Source: Goldman Sachs, published September 2025.

Figure 6: Expected capex from hyperscalers[8]

Year	Total capex (USD bn)	Year-on-year growth (%)	Cumulative capex (USD bn)	Cumulative capex as a percentage of GDP
2023	228	59%	228	0.8%
2024	348	52%	576	2.0%
2025	405	16%	981	3.4%
2026	452	12%	1,433	4.9%
2027	498	10%	1,931	6.7%
2028	543	9%	2,474	8.5%



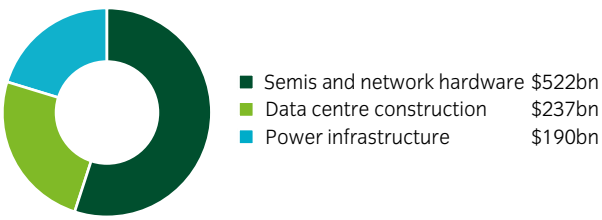
While these projections are dramatic, they should be viewed with a degree of scepticism. Insight's Credit Analysis Team notes that actual investment figures may be overstated due to duplicative project filings across multiple states. Even so, applying a conservative adjustment, such as a 50% reduction, still leaves us with capex estimates of sufficient scale to imply a meaningful impact on global growth.

To quantify the potential feedthrough to the global economy, we break down the projected capex into three primary categories: equipment, structures, and power. Barclays estimates that 50%-60% of spending will be directed towards semiconductors and networking hardware. The next largest allocation, 20%–30%, is expected to go into the construction of data-centre shells, encompassing land acquisition, build costs, and the 'grey space' infrastructure (which provides power, cooling, and structural support). The remaining 10%-20% is likely to be invested in power infrastructure, a segment we explore in more detail below.

Even after applying a substantial haircut to account for double counting, projected capex over the next three years still runs into the hundreds of billions of dollars across each category.

Figure 7: Estimated spending by capex category[9]

Capex component	Capex ratio	2025 Adj. Capex ($bn)	2026 Adj. Capex ($bn)	2027 Adj. Capex ($bn)	2028 Adj. Capex ($bn)	Total Capex ($bn)
Semis and networking hardware	55%	111.4	124.3	137.0	149.3	**522**
Data centre construction	25%	50.6	56.5	62.3	67.9	**237**
Power infrastructure	20%	40.5	45.2	49.8	54.3	**190**



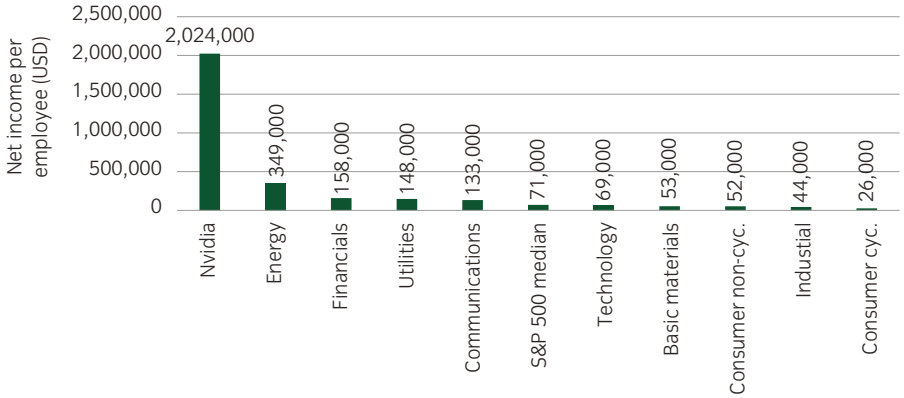
[8] Source: Morgan Stanley, September 2025.
[9] Source: Barclays, published September 2025.

Less clear benefits for labour, and huge power requirements

One concern that remains front of mind for both market participants and policymakers is the softening of the labour market, particularly in the US. This raises an important question: how much of the current wave of AI-related investment will translate into net job creation?

It is reasonable to assume that the largest category of capex – semiconductors and hardware – will generate relatively few direct jobs. A simple yet illustrative measure of labour intensity in the semiconductor sector can be seen by comparing net income per employee. Nvidia[10], for example, generates approximately $2 million in net income per employee, compared to a median of around $71,000 across the S&P 500 Index. While this figure likely overstates the labour-light nature of semiconductor investment, it does underscore how concentrated the economic benefits are among a small group of primary beneficiaries.

Figure 8: Net income per employee of Nvidia is many times the median in other sectors[11]



The construction of data centres to house AI infrastructure is likely to have a more tangible impact on labour markets. A 2024 report commissioned by the State of Virginia[12] – widely regarded as the data centre capital of the world – found that a typical large facility (around 250,000 square feet) can employ up to 1,500 on-site workers during the construction phase, with many earning salaries in excess of $100,000 per year, excluding overtime. However, once operational, data centres are far less labour-intensive. Day-to-day operations typically require only around 50 employees, including facility managers, engineers, technicians, and maintenance staff. Notably, however, for every job created within a data centre, an estimated 3.5 additional jobs are generated in the surrounding state economy.

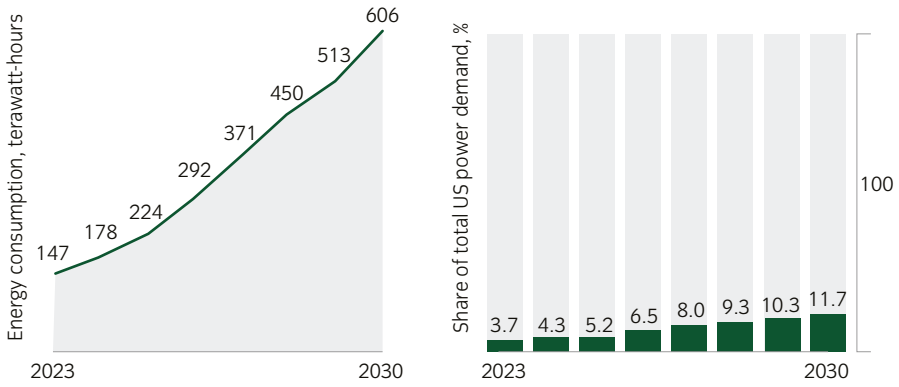
Perhaps the most significant macroeconomic impact will stem from the surge in power demand driven by AI infrastructure. Insight's Credit Analysis Team estimates that data-centre electricity consumption will rise from 147 TWh in 2023 to approximately 606 TWh by 2030, equivalent to 12% of total US electricity demand. This will necessitate an 8% increase in installed capacity (from 1,345 GW today) and an 11% uplift in overall generation.

Meeting this demand will rely heavily on dispatchable energy sources, particularly natural gas and nuclear. Natural gas plants, which cost around $1.5 billion per GW and consume nearly 5 million cubic metres of gas daily, will play a central role. Nuclear capacity is also expected to expand, with 2.3 GW added through reactor restarts and up to 8 GW from uprates, all within a one to five-year horizon.

[10] The mention of a specific security is not a recommendation to buy or sell such security.
[11] Source: Insight and Bloomberg. Data as at September 2025.
[11] Source: https://jlarc.virginia.gov/pdfs/reports/Rpt598-2.pdf

While renewables such as wind and solar will continue to grow, their intermittency and land requirements limit their ability to meet the 24/7 baseload demands of AI infrastructure. In response, midstream companies are investing billions in pipeline expansions, and hyperscalers are securing long-term power purchase agreements – including Amazon's 1.9 GW nuclear PPA, Meta's 4 GW RFP, and strategic investments in small modular reactors (SMRs).

Figure 9: Demand for power for data centres is expected to rise significantly in the US[13]

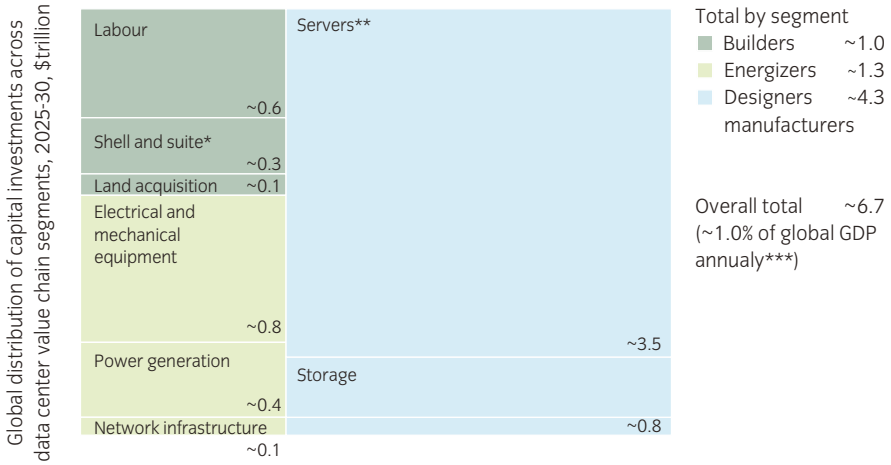


While US firms lie at the heart of this expansion, the growth impact should extend globally (see Figure 10).

Figure 10: Expected growth in data-centre capacity[14]

Region	Data-centre capacity growth (expected compound annual growth rate, 2024-2030)	Estimated GDP impact
Global	23%	High
US	26%	Very high
China	16%	High
Europe	19%	Moderate
United Arab Emirates	100%	High
Saudi Arabia	117%	High

Figure 11: $6.7 trillion of capital expenditure will be cumulatively deployed in data centre infrastructure through 2030[15]



[13] Source: Global Energy Perspectives 2023, McKinsey, October 18 2023, McKinsey analysis.
[14] Source: Morgan Stanley, September 2025.
[15] Source: Goldman Sachs; S&P Capital IQ; McKinsey Data Center CAPEX TAM & Demand model; analyst reports; expert interviews. * Includes mechanical, electrical and plumbing.
** Including graphics processing units (GPUs) and central processing units (CPUs).
*** Global GDP: $106 trillion (2023).

Productivity impact remans the trillion-dollar question

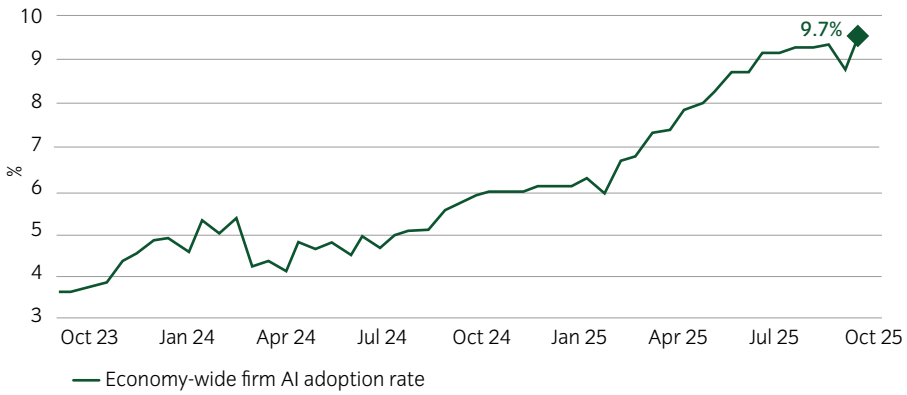
A central question for the medium and long term is how productive the current AI investment boom will ultimately prove to be. The scale and speed of expected capital expenditure, coupled with intense market enthusiasm, naturally invite comparisons to previous episodes of exuberance – most notably the late-1990s tech boom. Measuring AI's impact on productivity in real time is inherently difficult; as with past general-purpose technologies, the full story will only become clear with hindsight.

For now, the evidence remains mixed. A 2024 OECD report[16] describes AI as a "new general-purpose technology" with the potential to significantly enhance both economic productivity and societal wellbeing. However, it notes that productivity gains are currently concentrated in large firms, with adoption uneven across sectors and regions. Similarly, a Brookings Institution study[17] highlights early improvements in areas such as customer support, software development, and scientific research – particularly among less-skilled workers – but also flags risks around job displacement and a widening productivity-pay gap.

On the more cautious side, research from MIT's NANDA initiative[18] paints a less optimistic picture. Based on 150 executive interviews, a survey of 350 employees, and analysis of 300 public AI deployments, the study found that only around 5% of pilot programmes delivered meaningful revenue acceleration, with most initiatives stalling or having minimal impact on P&L. This echoes Robert Solow's famous 1987 remark: "We see computers everywhere but in the productivity statistics" – a reminder that the productivity gains from IT investment only became visible in the late 1990s, long after the initial hype.

AI may follow a similar trajectory to past general-purpose technologies like electricity and personal computing: slow to show up in the data, but ultimately transformative. Supporting this view, Goldman Sachs data[19] show that AI adoption among US firms currently stands at just 10%, suggesting we are still in the early innings of a much longer cycle.

Figure 12: AI adoption in the US economy[20]



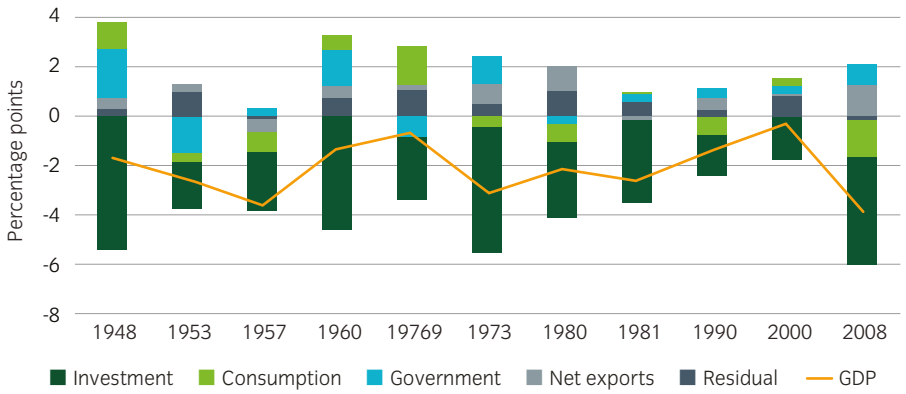
[16] Source: Goldman Sachs; S&P Capital IQ; McKinsey Data Center CAPEX TAM & Demand model; analyst reports; expert interviews.
[17] Source: https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/04/the-impact-of-artificial-intelligence-on-productivity-distribution-and-growth_d54e2842/8d900037-en.pdf
[17] Source: https://www.brookings.edu/articles/mapping-the-ai-economy-which-regions-are-ready-for-the-next-technology-leap/
[18] Source: https://nanda.media.mit.edu/
[19] Source: Goldman Sachs Global Investment Research, published August 2025.
[20] Source: Census Bureau, Goldman Sachs Global Investment Research.

3 POTENTIAL RISKS FROM AN IMBALANCED ECONOMY

The recent softening in the US labour market presents the most immediate risk to the growth outlook, primarily because employment underpins consumption, which remains the largest component of GDP. If labour market conditions continue to deteriorate, it is unlikely that capital expenditure alone could offset a broader downturn. That said, investment has historically acted as a key swing factor in the growth cycle, and given the scale of capex outlined above, it should continue to provide some support.

Economic contractions have consistently been driven by sharp declines in investment. A breakdown of growth dynamics during recessionary periods (see Figure 13) highlights the pivotal role of business investment in driving downturns. In every post-war US recession, falling investment has been the largest negative contributor to GDP during contraction phases. As such, shifts in corporate investment intentions remain a critical indicator to monitor.

Figure 13: Falling investment has been the key driver in every post-war recession pre-COVID[21]



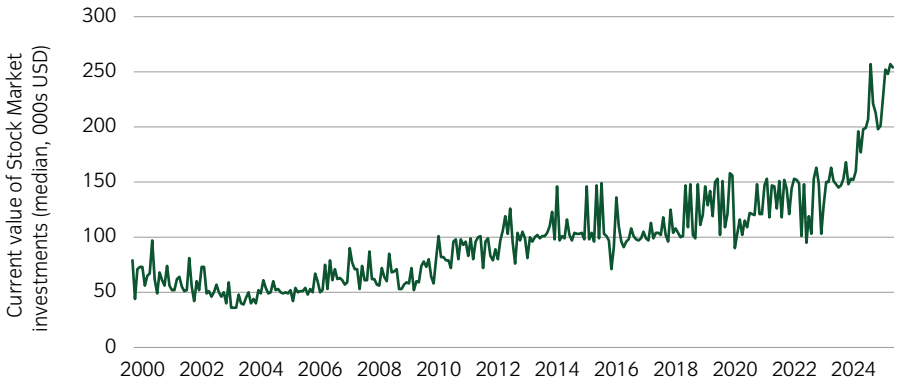
As highlighted earlier, the impact of AI-related capital expenditure on labour markets is far from straightforward. Despite their vast physical footprint and immense power consumption, data centres operated by firms like Google and Microsoft typically require only 50 to 200 core staff, a fraction of the workforce needed for traditional industrial facilities of comparable size. However, labour demand during the construction phase is significantly higher, and a more meaningful employment boost may come from the power infrastructure buildout, as discussed above.

Looking further ahead, the long-term implications of AI for labour demand remain highly uncertain. A September 2024 IMF report[22] found a modest net decline in employment in US regions with higher AI adoption compared to those with lower adoption. The negative effects were unevenly distributed, and concentrated in manufacturing and low-skill services, among middle-skill workers, non-STEM occupations, and individuals at both ends of the age spectrum. The report also noted that men were more adversely affected than women.

In the short term, the most visible economic boost from AI has come via positive wealth effects. Gains in US tech stocks – particularly the Magnificent Seven – have significantly supported consumption among wealthier households, who account for the bulk of US consumer spending. According to Oxford Economics[23], household expenditure increases by approximately $0.14 for every $1 of equity wealth gained, and this dynamic has contributed to roughly one-fifth of US consumption growth since late 2019. While this has underpinned consumer resilience in recent years, it also introduces a clear vulnerability: any material decline in tech stocks or broader equity markets could pose a significant drag on spending.

[21] Source: Insight and Bloomberg. Data as at 30 September 2025.
[22] Source: https://www.imf.org/en/Publications/WP/Issues/2024/09/13/The-Labor-Market-Impact-of-Artificial-Intelligence-Evidence-from-US-Regions-554845
[23] Source: https://www.oxfordeconomics.com/resource/us-wealth-effects-are-packing-a-larger-punch-than-ever/

Figure 14: US consumption has been supported by the 'wealth effect' from rallying stock markets, but this presents risks[24]



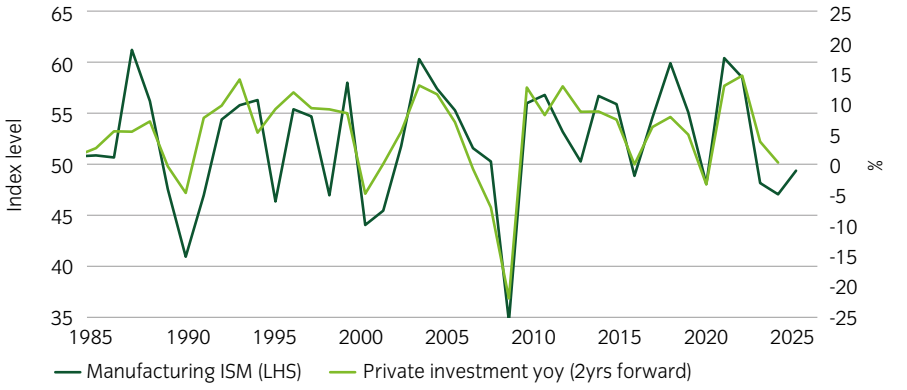
4 CAPTURING THESE TRENDS IN OUR REGIME FRAMEWORK

The key question is how best to capture the impact of this investment trend within our existing regime framework. One of our preferred tools is the purchasing managers' index (PMI), which reflects the health of both manufacturing and service sectors. We track 38 monthly country and regional PMI releases, with a deliberate overweight to manufacturing – even though it accounts for only around 10% of GDP. This is because manufacturing PMIs offer deeper insight into global trade dynamics, exhibit greater cyclicality, and have historically shown a stronger correlation with swings in corporate profitability.

Supporting this approach, research from the McKinsey Global Institute[25] highlights that US manufacturing drives 20% of capital investment, 35% of productivity growth, 60% of exports, and 70% of business R&D expenditure.

When we examine the longest available PMI time series – the US ISM Manufacturing PMI – we observe a clear lead-lag relationship with private business investment. As shown in Figure 15, the ISM Manufacturing PMI tends to lead changes in investment by approximately two years, reinforcing its value as a forward-looking indicator within our regime framework.

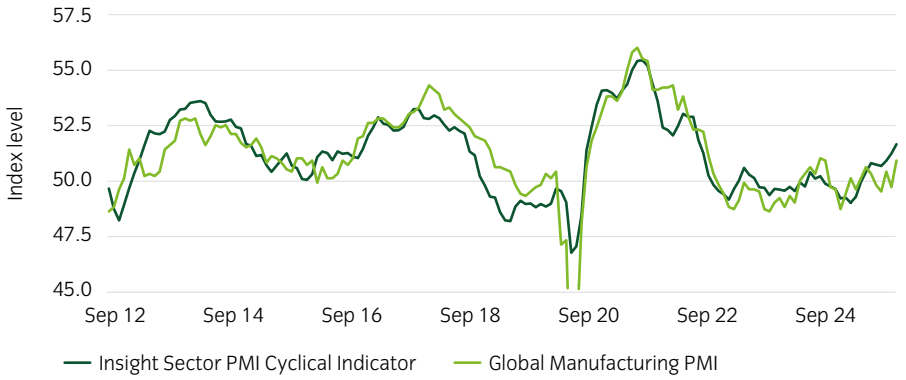
Figure 15: The US ISM Manufacturing PMI typically leads private investment[26]



[24] Source: Insight and Bloomberg. Data as at 30 September 2025.
[25] Source: https://www.mckinsey.com/capabilities/operations/our-insights/delivering-the-us-manufacturing-renaissance
[26] Source: Insight and Bloomberg. Data as at 30 September 2025.

We have also found that looking at sector-level PMI data can provide additional insight into global growth dynamics. To do this we first split the data into those sectors which have the highest beta to the more forward-looking components of the PMI (future output, new orders and output) and those with the with the lowest beta. The high-beta sectors include technology equipment, industrials and machinery and equipment. The low-beta sectors include healthcare, food and insurance. We then take the difference between the two to produce an indicator that closely maps the global manufacturing PMI. While this does not offer a strong lead on the PMI, it currently suggests a smoother recovery path in growth is under way.

Figure 16: The Insight Sector PMI Indicator has historically been a good indicator of global manufacturing activity[27]



CONCLUSION

The extraordinary surge in AI-related investment, underpinned by record-high profit margins, should act as a meaningful tailwind for both US and global growth. Early signs of this impact are already visible: AI capex contributed approximately 0.5 percentage points to US GDP growth in the first half of 2025. Forward-looking projections for hyperscaler spending across semiconductors, data-centre infrastructure, and power systems suggest a multi-year investment wave worth hundreds of billions of dollars annually. Even after accounting for front-loaded tariff effects and measurement distortions, AI capex appears well-positioned to buffer growth against mounting headwinds from trade policy and a weakening labour market.

However, the net employment benefits are likely to be concentrated in data-centre construction and the power infrastructure buildout, while the longer-term productivity payoff remains uncertain. Historical analogies – from the late-1990s IT boom to earlier general-purpose technologies – remind us that transformative gains often emerge only after a prolonged lag. In the meantime, rising concentration in US equity markets introduces a significant vulnerability: any sharp correction could materially undermine the wealth effect that has supported consumption, particularly among higher-income cohorts.

To navigate these dynamics, our regime framework now incorporates a bottom-up PMI-based indicator that blends high-beta sectors (e.g. technology equipment, industrials) with low-beta sectors (e.g. healthcare, food, insurance) to track both cyclical and secular forces. Early readings suggest a smoother global manufacturing recovery than headline PMIs alone would imply.

As AI capex continues to accelerate, monitoring shifts in corporate investment intentions, profit margins, and PMI differentials will be critical to anticipating the next inflection point in the global growth cycle.

[27] Source: Insight and Bloomberg. WHERE MODEL OR SIMULATED RESULTS ARE PRESENTED, THEY HAVE MANY INHERENT LIMITATIONS.

CONTRIBUTORS

Matthew Merritt
Head of Multi-Asset Strategy Group

Jonathan Crone
Portfolio Manager
Multi-Asset Strategy Group

Michael Ford
Co-Deputy Head
Multi-Asset Strategy Group

Steve Waddington
Co-Deputy Head
Multi-Asset Strategy Group

Zacharias Bobolakis
Senior Portfolio Manager
Multi-Asset Strategy Group

Jenny Pham
Portfolio Manager
Multi-Asset Strategy Group

Shantanu Tandon
Portfolio Manager
Multi-Asset Strategy Group

Stephanie Chan
Portfolio Manager
Multi-Asset Strategy Group

Christopher Broadley
Portfolio Manager
Multi-Asset Strategy Group

Vladimir Sovetkin
Portfolio Manager
Multi-Asset Strategy Group

Kristin Qi
Portfolio Analyst
Multi-Asset Strategy Group

Andy Burgess
Deputy Head of Investment Specialists
Multi-Asset Strategy Group

FIND OUT MORE

Institutional Business Development
businessdevelopment@insightinvestment.com

Consultant Relationship Management
consultantrelations@insightinvestment.com

European Business Development
europe@insightinvestment.com

Australia Business Development
insightau@insightinvestment.com

company/insight-investment

www.insightinvestment.com

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