ARTICLES

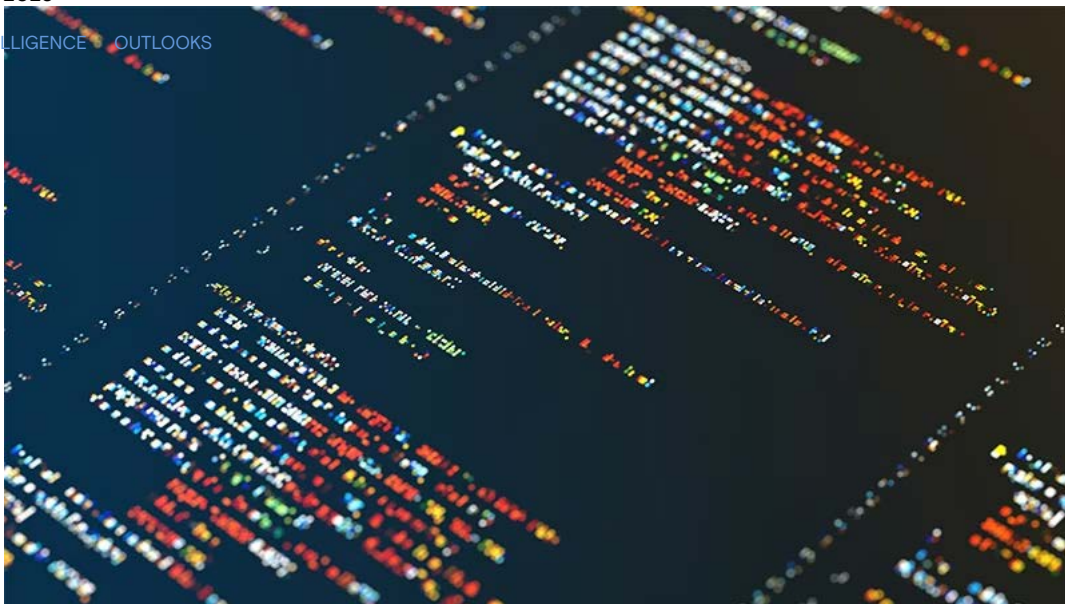# AI investment forecast to approach $200 billion globally by 2025

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Topic: ARTIFICIAL INTELLIGENCE   OUTLOOKS

Innovations in electricity and personal computers unleashed investment booms of as much as 2% of U.S. GDP as the technologies were adopted into the broader economy. Now, investment in artificial intelligence is ramping up quickly and could eventually have an even bigger impact on GDP, according to Goldman Sachs Economics Research.

AI investment is likely to grow in the next three years

Private AI investment (dotted lines show GS revenue projections*)
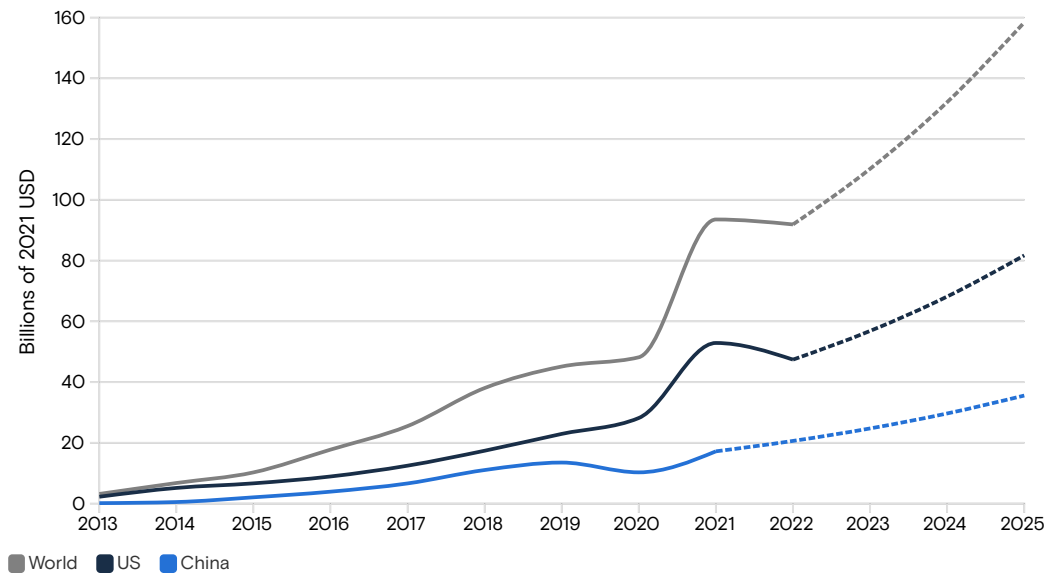
Source: Stanford Institute for Human-Centered Artificial Intelligence, Goldman Sachs Research •
*Average of GS Research 2022-2030 revenue growth estimates for Microsoft Azure, NVIDIA, Google Cloud, and Amazon Web Services (when available)
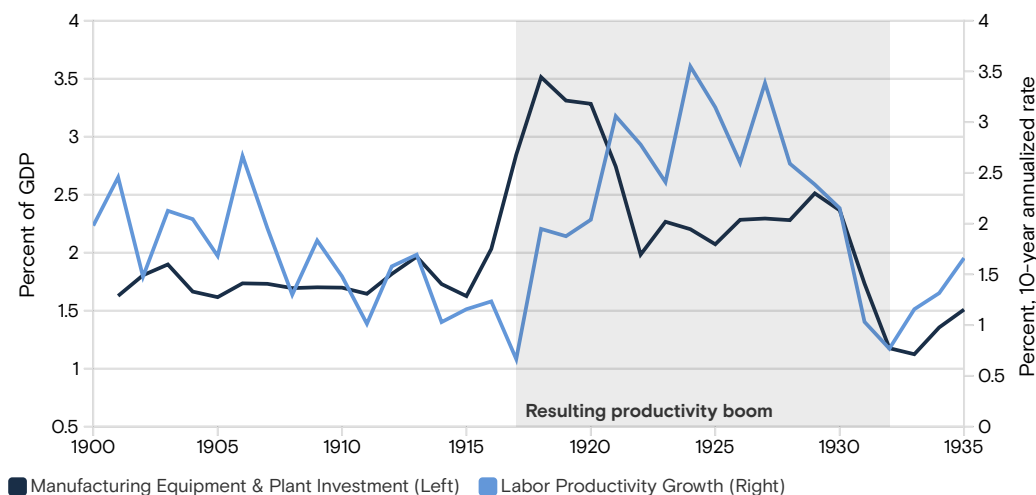
Goldman Sachs

Generative AI has enormous economic potential and could boost global labor productivity by more than 1 percentage point a year in the decade following widespread usage, Goldman Sachs economists Joseph Briggs and Devesh Kodnani write in the team's report. But for large-scale transformation to happen, businesses will need to make significant upfront investment in physical, digital, and human capital to acquire and implement new technologies and reshape business processes. Those investments, which could amount to around $200 billion globally by 2025, will probably happen before adoption and efficiency gains start driving major gains in productivity.

← →
Previous tech-driven productivity booms, such as electricity, have been driven by large investment cycles

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Electricity: Investment and labor productivity around the development of previous milestone technologies

Source: Haver Analytics, Census Bureau, US Bureau of Labor Statistics, Goldman Sachs Research

Goldman Sachs

AI-related investment is climbing from a relatively low starting point and will likely take a few years to have a major impact on the economy, Briggs and Kodnani write. The U.S., meanwhile, is positioned as the market leader in AI technology, and American companies will likely be relatively early adopters, according to Goldman Sachs Research. While a similar effect could also play out in other AI leaders (such as China), the investment impact will likely be smaller and more delayed.

Over the longer-term, AI-related investment could peak as high as 2.5 to 4% of GDP in the U.S. and 1.5 to 2.5% of GDP in other major AI leaders, if Goldman Sachs Research's AI growth projections are fully realized.

While the timing of the AI investment cycle is hard to predict, business surveys suggest that it's likely to start having an investment impact in the second half of this decade, with earlier adoption by larger firms in information and professional, scientific, and technical services.

And even though it will take time for AI to boost productivity, market interest in AI has already increased rapidly, with more than 16% of companies in the Russell 3000 mentioning the technology on earnings calls, up from less than just 1% of those firms in 2016. Roughly half of that spike came after the release of ChatGPT in the fourth quarter of 2022. Our economists' previous research has shown that such mentions tend to predict increases in company-level capital spending.

Market interest in AI has increased dramatically
Share of companies mentioning AI on Russell 3000 earnings calls
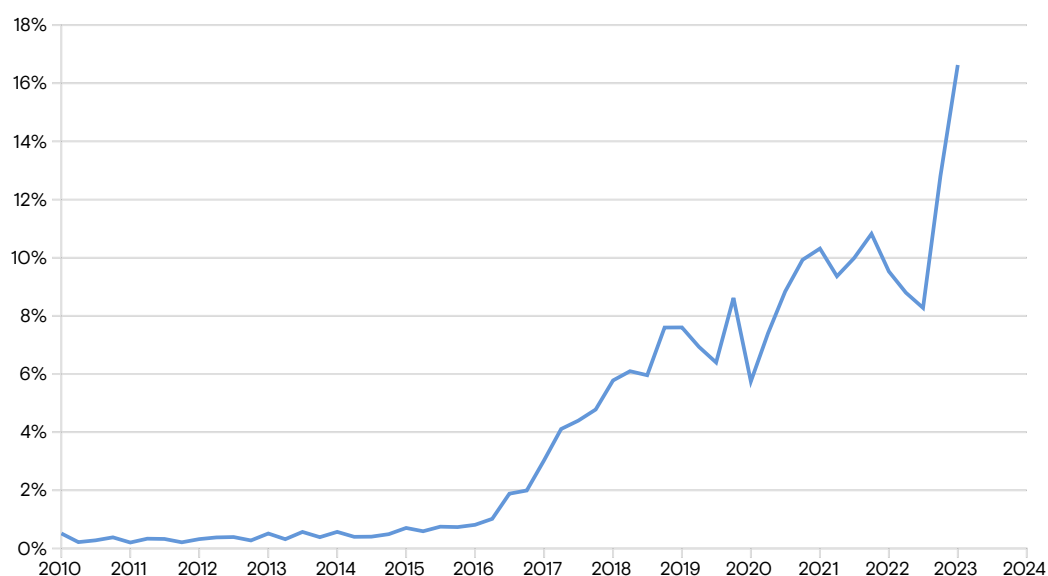

Source: GS Data Works, FactSet, Goldman Sachs Research

Goldman Sachs

Incorporating that information, along with our equity analysts' revenue growth projections for key AI-exposed businesses, Goldman Sachs Research estimates AI investment could approach $100 billion in the U.S. and $200 billion globally by 2025. "Despite this extremely fast growth, the near-term GDP impact is likely to be fairly modest given that AI-related investment currently accounts for a very low share of U.S. and global GDP," Briggs and Kodnani write.

AI investment is expected to be concentrated in four key business segments: companies that train and develop AI models, those that supply the infrastructure (for example, data centers) to run AI applications, companies that develop software to run AI-enabled applications, and enterprise end-users that pay for those software and cloud infrastructure services. Our economists expect AI investment to largely come from hardware investment to train AI models and run AI queries, as well as increased spending on AI-enabled software.

AI-related investment could peak at more than 2% of GDP, while software investment persists

Stylized US AI investment cycle, percent of GDP
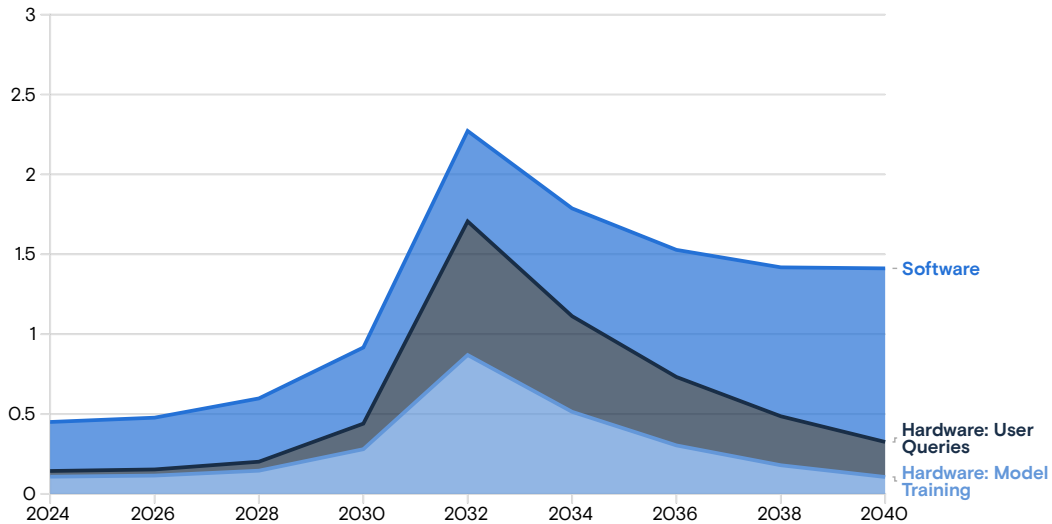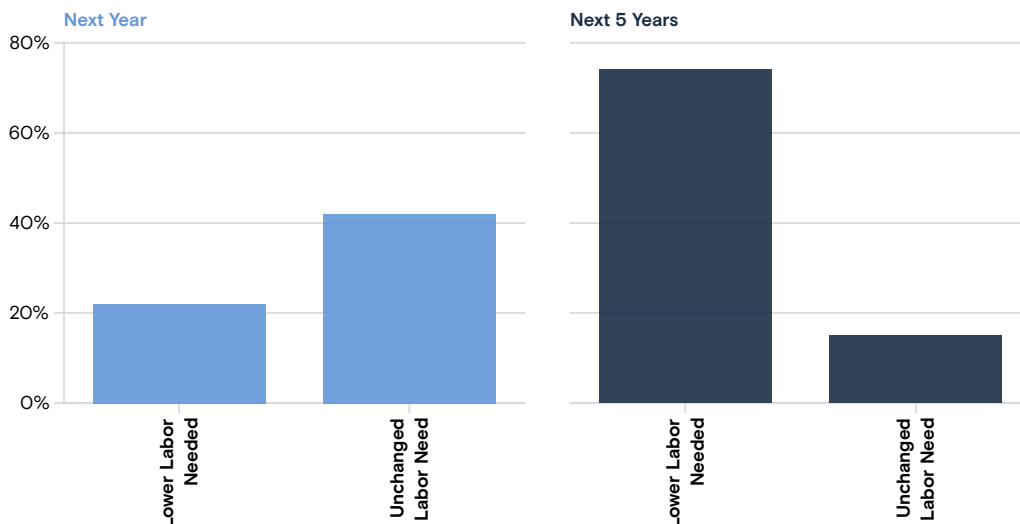

Source: Goldman Sachs Research

"While AI investment thus far has been focused on model development, a substantially larger hardware and software push will likely be required for generative AI to scale," Briggs and Kodnani write.

In the meantime, there are signs of early AI adoption in a few industries, even as Goldman Sachs Research expects the broader macro effects are still a few years off. Previous breakthroughs in technology show it's hard to predict when adoption will increase enough to meaningfully nudge the economy. The productivity effects of the electric motor and personal computer only showed up in the macro data once about half of U.S. businesses had adopted the technology.

CEO surveys suggest slow adoption at first and widespread adoption in second half of decade

Fortune 500 CEO survey: share who expect AI to impact company headcount
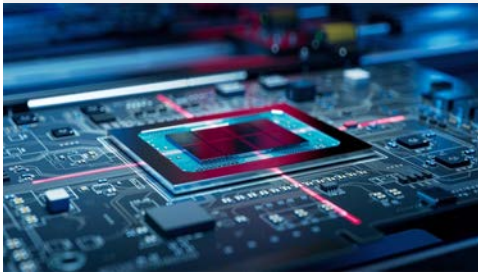

Source: KPMG, Gartner, Fortune, Goldman Sachs Research

In the 2021 American Business survey, only 4% of US firms reported using AI in their business processes. Likewise, CEO surveys show less than a quarter expect generative AI will impact their company or lower their labor needs over the next one to three years. That said, a significant majority

expect to have adopted AI over a three- to 10-year horizon. If those timelines are correct, then AI adoption would likely start having a meaningful impact on the U.S. economy sometime between 2025 and 2030.

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The emergence of generative artificial intelligence (AI) is moving much more quickly than previous technology waves. It took years for companies to find the right mix of on-premises and cloud-based computing seen in today's hybrid cloud, for example. But Goldman Sachs Chief Information Officer Marco Argenti expects we are already on the cusp of a hybrid AI ecosystem that will help companies exploit the opportunities generative AI presents.

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As fears over inflation and interest rates start to moderate, the case for taking on more risk may be rising. Christian Mueller-Glissmann, who heads asset allocation research in Goldman Sachs Research, and Alexandra Wilson-Elizondo, co-chief investment officer of the multi-asset solutions business in Goldman Sachs Asset Management, explain their outlooks for asset classes and portfolio strategies.

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TOPIC: **ARTIFICIAL INTELLIGENCE**

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