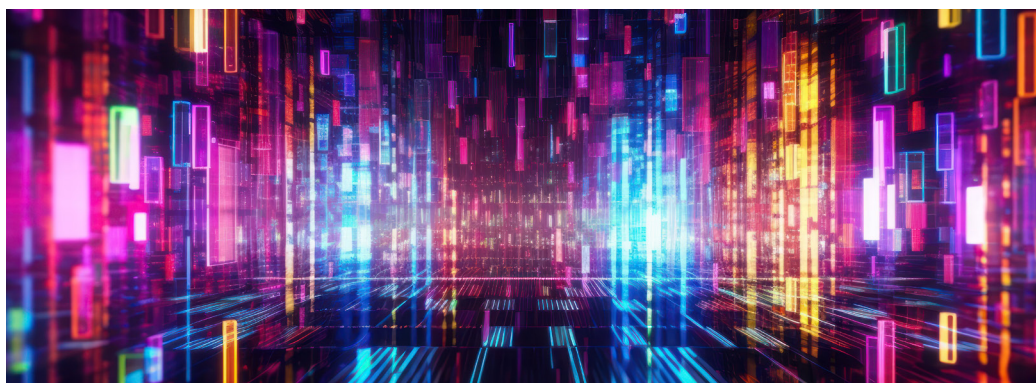


AI: Just another chapter for the boom-bust book, or can tech conquer all?

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This paper analyses the artificial intelligence (AI) investment boom and the potential for a much-forecast bust.

We ask three important questions:

1. How is AI investment funded? We consider whether it is self-funded through cash flow or debt.
2. What will be the business model post launch? We think three distinct revenue streams are likely: First, advertising revenue cannibalizing search engines; second, subscription revenues from B2B customers and B2C firms; third, utility-style cash flows, because once AI is embedded in a system, it is needed forever.
3. What is the competitive model? There is risk of oligopolistic competition, or collusion, which would invite the regulators' wrath.

Bubbles, booms and busts: The story is always the same and has always ended in busts. The story typically serves as a parable about greed and avarice, misplaced hopes and destroyed lives. It is not an urban myth; it is real and resonates and repeats across centuries: Dutch tulips in 1637; the South Sea Bubble of 1720; railway mania during the 1850s in the United Kingdom and during the 1860s/1870s in the United States; the 1929 Wall Street crash, so infamous that mentioning the year alone is a reminder to investors; the dot-com crash of 2001; and the global financial crisis (GFC) of 2008, which was so traumatic that we often fail to acknowledge the subprime mortgage boom that caused it. These are only the major events; between these notable examples are countless others of local and international importance, including in 1907, 1987 and others.

So, should we prepare for a new chapter of tears? Will the AI boom end in a bust?

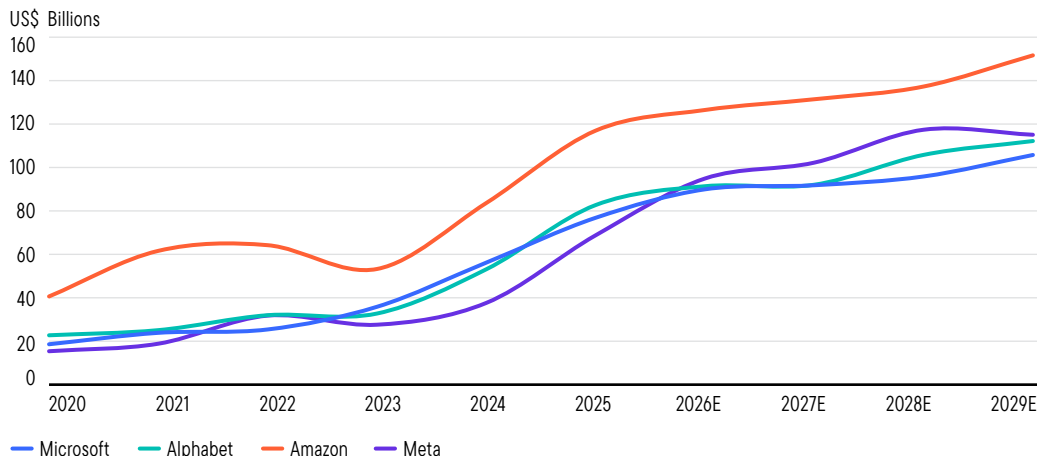
In this article we will assess the size of this boom, including whether it is truly big enough to change the world. Another critical question is its financing, given all of the earlier busts came from the weight of debt. And we will look at how AI generates revenues and profits.

Only after discussing these topics can we then draw a conclusion about whether the boom is sustainable or more likely to end in a bust.

How big is the AI revolution and how is it funded?

The speed of acceleration and the size of the capital expenditures (capex) are impressive.

Exhibit 1: Hyperscalers' Capex Growth Expected to Remain Strong

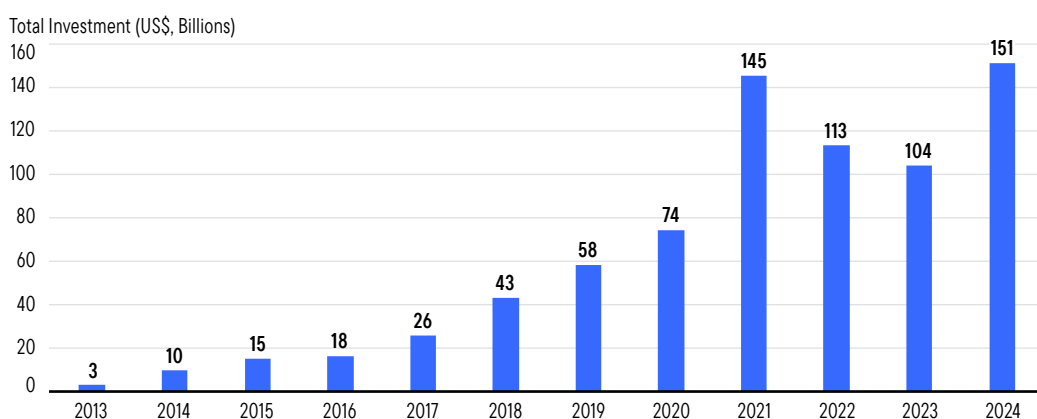


Sources: FactSet. For Microsoft, actual data is considered for the year 2025, as the company has a June year-end. E=Estimated. There is no assurance any estimate, forecast or projection will be realized.

This capex is not just for AI, but the extraordinary rise certainly is from AI, and it features vertical integration all the way to the energy-supply chain.

But what about non-quoted firms that are also participating? If we focus on private investments in AI rather than publicly traded and listed securities, we find a different trend: That investments are variable and, at best, flat since 2021. The real boom is in the public securities markets.

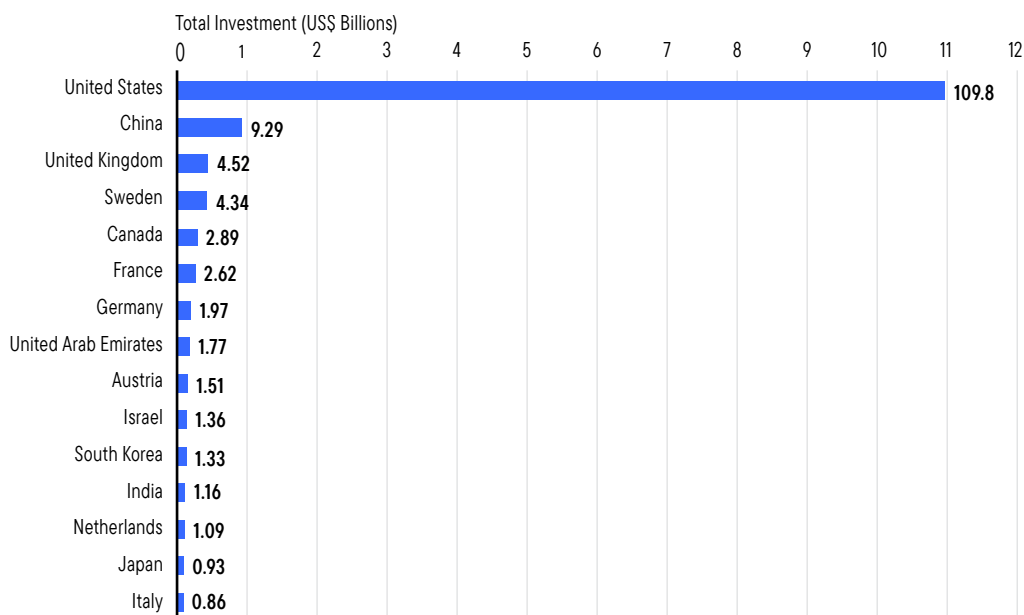
Exhibit 2: Global Private Investment in AI, 2013-2024



Sources: Quid and Artificial Intelligence Index Report 2025. Nestor Maslej, Loredana Fattorini, Raymond Perrault, Yolanda Gil, Vanessa Parli, Njenga Kariuki, Emily Capstick, Anka Reuel, Erik Brynjolfsson, John Etchemendy, Katrina Ligett, Terah Lyons, James Manyika, Juan Carlos Niebles, Yoav Shoham, Russell Wald, Tobi Walsh, Armin Hamrah, Lapo Santarlasci, Julia Betts Lotufo, Alexandra Rome, Andrew Shi, Sukrut Oak. "The AI Index 2025 Annual Report," AI Index Steering Committee, Institute for Human-Centered AI, Stanford University, Stanford, CA, April 2025. The AI Index 2025 Annual Report by Stanford University is licensed under Attribution-NoDerivatives 4.0 International.

It is instructive that almost all of this private investment is in the United States.

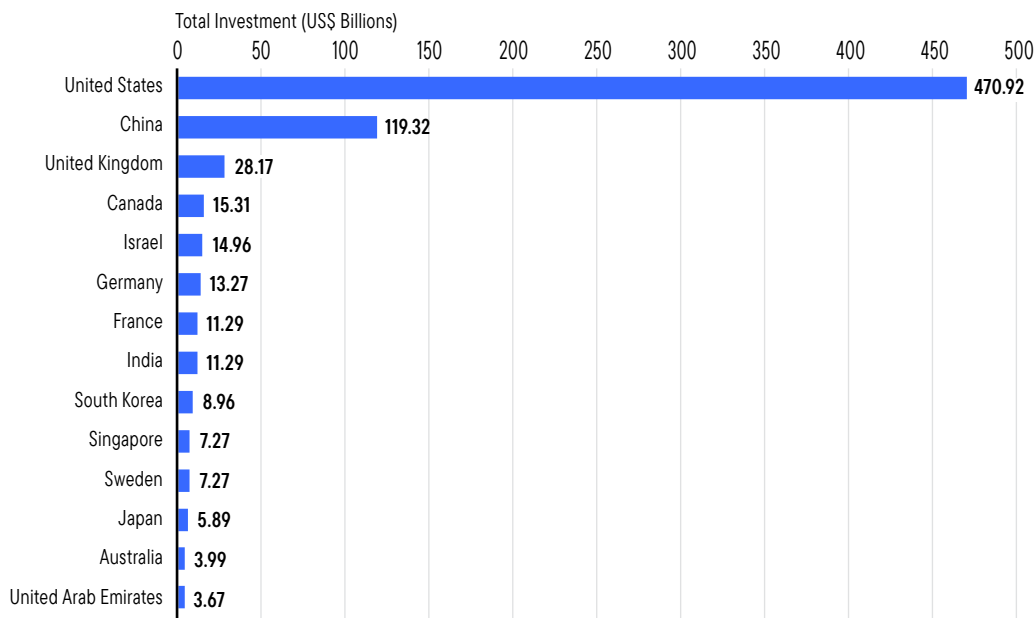
Exhibit 3: Global Private Investment in AI by Geographic Area, 2024



Sources: Quid and Artificial Intelligence Index Report 2025. Nestor Maslej, Loredana Fattorini, Raymond Perrault, Yolanda Gil, Vanessa Parli, Njenga Kariuki, Emily Capstick, Anka Reuel, Erik Brynjolfsson, John Etchemendy, Katrina Ligett, Terah Lyons, James Manyika, Juan Carlos Niebles, Yoav Shoham, Russell Wald, Tobi Walsh, Armin Hamrah, Lapo Santarlasci, Julia Betts Lotufo, Alexandra Rome, Andrew Shi, Sukrut Oak. "The AI Index 2025 Annual Report," AI Index Steering Committee, Institute for Human-Centered AI, Stanford University, Stanford, CA, April 2025. The AI Index 2025 Annual Report by Stanford University is licensed under Attribution-NoDerivatives 4.0 International.

The prominence of the United States is nothing new, as we can see by looking at a longer time frame.

Exhibit 4: Global Private Investment in AI by Geographic Area, 2013-2024 (Sum)



Sources: Quid and Artificial Intelligence Index Report 2025. Nestor Maslej, Loredana Fattorini, Raymond Perrault, Yolanda Gil, Vanessa Parli, Njenga Kariuki, Emily Capstick, Anka Reuel, Erik Brynjolfsson, John Etchemendy, Katrina Ligett, Terah Lyons, James Manyika, Juan Carlos Niebles, Yoav Shoham, Russell Wald, Tobi Walsh, Armin Hamrah, Lapo Santarlasci, Julia Betts Lotufo, Alexandra Rome, Andrew Shi, Sukrut Oak. "The AI Index 2025 Annual Report," AI Index Steering Committee, Institute for Human-Centered AI, Stanford University, Stanford, CA, April 2025. The AI Index 2025 Annual Report by Stanford University is licensed under Attribution-NoDerivatives 4.0 International.

It is hardly surprising, therefore, that in 2024 the United States produced 40 notable language models, China produced 15, and Europe, just three.¹

This shows that the development of AI, the investment in AI and, therefore, the reward and risk of AI are all centered on the United States, whether that investment is in public or private securities.

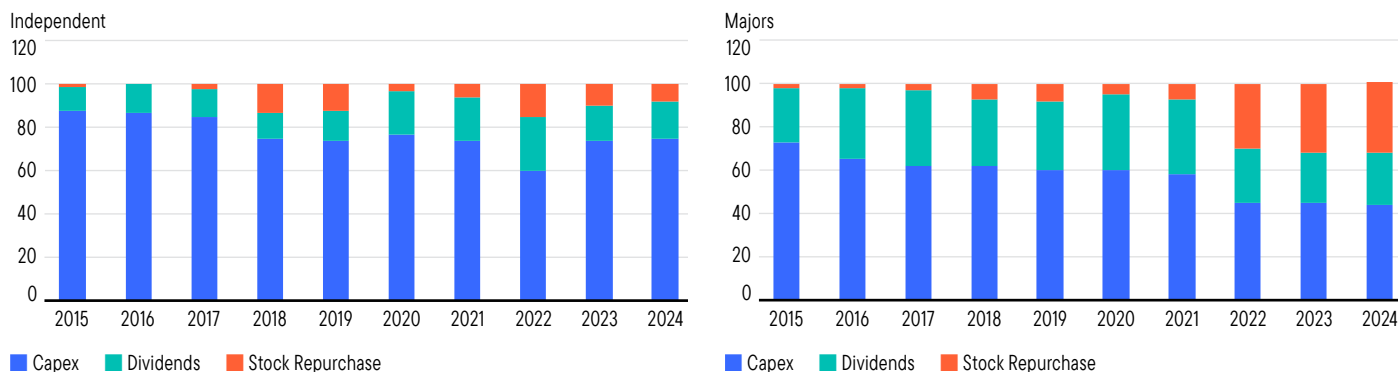
But the public companies, not the private sector, are driving the growth in AI. The investment levels of public companies dwarf those of the private sector.

To make some sense of the size of this investment boom, we need a comparison: Only one other industry has ever come close to this colossal spend: oil and gas. IEA data shows that after the peak spend in 2015 of US\$900 billion, the consistency of oil and gas expenditure has been remarkable at around US\$500 billion to US\$600 billion per year.²

The oil and gas industry has recently been financing these investments from cash flow. At the same time, banks have been withdrawing from the financing of fossil fuels production, preferring to finance renewables.³ Even at the peak in 2015, oil companies were covering their capex from cash flows. Today, the focus of major oil and gas firms is as much on buybacks and dividends as it is on capex.

Exhibit 5: Capital Expenditure and Overall Cash Utilization

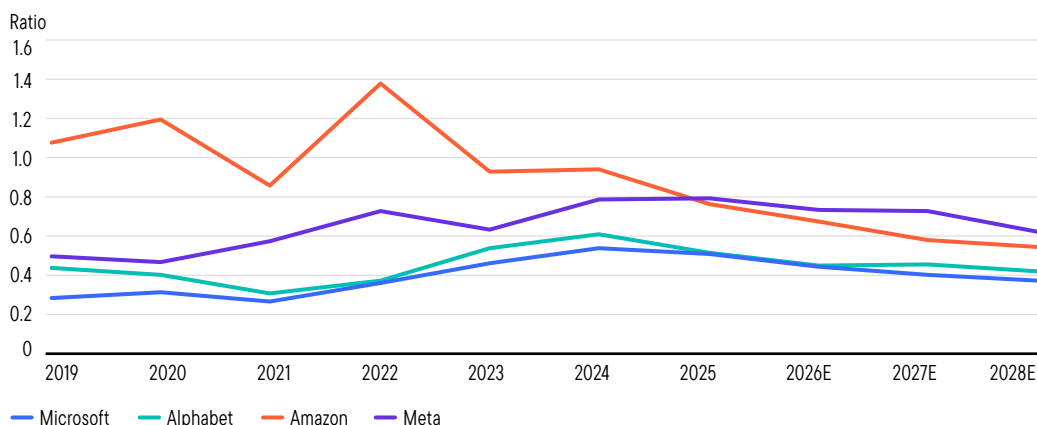
Oil and Gas Company Capital Expenditure, Dividends by the Majors in 2024 Comprised Less Than Half of Their Cash Utilization



Sources: IEA analysis; Bloomberg. Includes 133 listed oil and gas companies with significant upstream activity.

The four hyperscalers have taken the same approach with capex—they are using their cash flow to invest in AI.

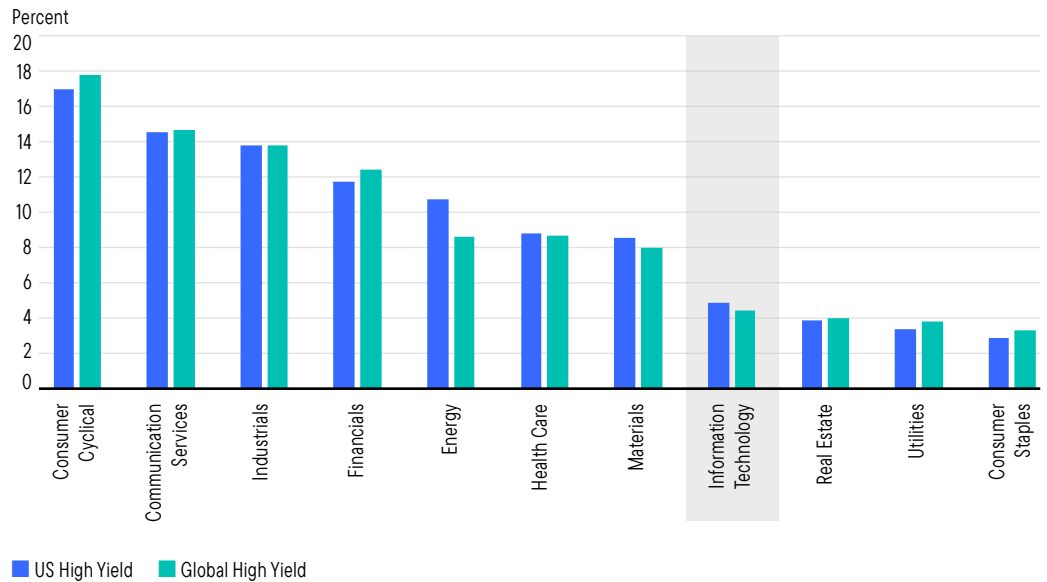
Exhibit 6: Capex as a Percentage of Cash Flow



Source FactSet. E=Estimated. There is no assurance any estimate, forecast or projection will be realized.

It is clear that debt-fueled risk is not the case today with AI. If it were, we would see a sharp growth in AI corporate debt, but when we examine the US and global high-yield indexes, we find relatively small shares: Technology as a whole represents around 7% of US high yield and 5% of global debt, ranking it as just the sixth-largest sector, behind energy.

Exhibit 7: Market Value of High Yield Debt as % of US and Global High Yield, 2025



Source: MSCI. As of October 31, 2025. The MSCI USD High Yield Corporate Bond Index is designed to serve as a measure of performance of the credit markets. They aim to represent relative performance at various levels of the investment process. The MSCI Global HY Corporate Bond Index measures the performance of global high-yield corporate bonds across major currencies and markets. Indexes are unmanaged and one cannot invest directly in an index.

Could there be a change from here? Do potential AI competitors such as Oracle need to compete and get to scale very quickly by issuing debt? And while markets do not yet appear to have recognized that this is the first industrial revolution financed from cash flow rather than debt, that is not the end of the story. While debt has been the typical cause of a boom cycle ending in bust, it is still important to examine the outlook for cash-flow financing.

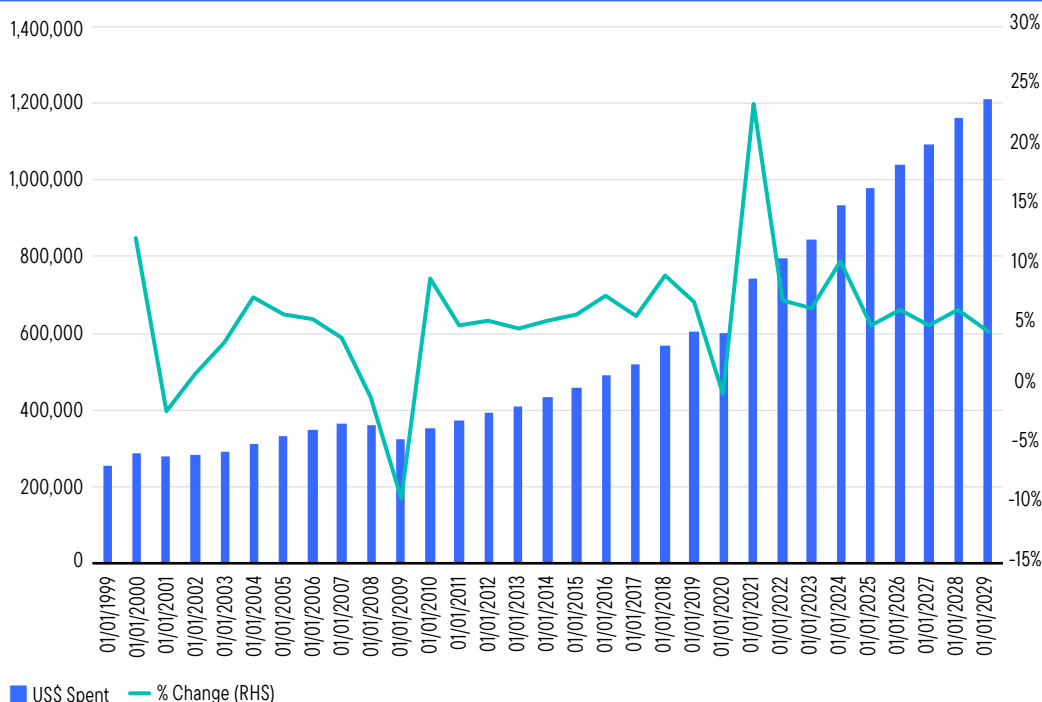
The business model after the AI revolution

Determining how businesses will evolve following this buildout has profound implications for the outcome of AI and its longevity. When the United Kingdom built railroads between 1835-1860, debt financed the boom. George Hudson, the so-called Railway King, had to flee his creditors in 1859, and his empire of railroads and docks collapsed. The same happened in 1873 in the United States, when the failure of J. Cooke and Co., which had financed 75% of the Northern Pacific Railroad, triggered the “Long Depression.” The physical assets that debt had built survived, but the lenders did not. The effect on the wider economy was profound. The collapse of J. Cooke and the 2008 GFC, sparked by worthless subprime mortgage bonds and financial engineering, had similar enduring effects.

The competitive model

The final criticism of the Fab Four hyperscalers (Microsoft, Meta, Alphabet and Amazon) is that their cash flows derive from advertising, and advertising is hugely cyclical. But advertising is also changing. The move from blunt billboards and tedious TV ads to precisely targeted, data-driven product placement has lowered the cyclicity of the advertising industry. This is visible in the long-term development of ad spending. It is only cyclical in extreme times. In fact, it has become a stream of constant, growing expenditure.

Exhibit 8: Global Advertising Growth
Magna Global Total Advertising



Source: Global end of year forecast. WPP. 2024. Chart includes projections for the years 2025–2029.

As WPP wrote, “The advertising industry is hurtling through a rapid evolution brought on by the pervasive use of AI.” Clearly, AI threatens the revenue models of two of the four hyperscalers, but two others will have a mix of revenues and see this as an opportunity.

Unlike search engines, social media and online programming, AI will not just rely on consumer and advertising spend for its revenues. The opportunity is to turn the “app” into a necessity in the functioning of your business. In this respect, the model is similar to that of Microsoft, as a subscription-based B2B or B2C model.

To justify a purchase, the productivity gains must outweigh the costs. But after achieving the expected productivity gains, the software becomes a vital pillar of production, and its longevity and pricing power could be underestimated.

To illustrate the potential revenue-generation power of AI, let’s consider the macro picture. In the US economy, salaries account for around 53% of the US\$12.3 trillion gross domestic product (GDP). If AI could produce cost savings of just 5%, that is US\$600 billion per annum, of which some part would go to the provider of this service. Evidence from the Stanford AI survey suggests that 20% of the employment market is already re-organizing with AI, with an additional 40% to follow.

In his July paper, “[The AI productivity boom that no one is talking about](#),” Jonathan Curtis, CIO of the Franklin Equity Group, cites banks, insurance, accounting, software and sales-force gains.

The Upwork Research Institute concluded that AI triples productivity on one-third of tasks. In their research, they found that the “Work Innovators” had 30% lower operating costs, increased cash flow and lower debt to equity. In other words, they are less likely to fail. AI is delivering a significant competitive advantage to startups already.⁴

Overseas growth

So far we have focused on the opportunity in the United States, but what is clear is that the potential revenue stream extends beyond the United States to other regions, and in particular to Europe. The Stanford AI report makes it clear that AI is a US invention and investment is focused within the United States but omits to point out that revenues come from around the world. Europe has failed to develop its own AI industry and thus to remain competitive, and it must “import” it from the United States.

In Europe, wages represent between 47%-55% of a country's GDP.⁵ GDP for the EU is US\$19.9 trillion.⁶ If wages are 50% of GDP, this is a potential market of US\$9.9 trillion. We can exclude government employees at 18% of the workforce⁷, and we can estimate that there is a potential market of over US\$8 trillion for the US providers. A 5% share of this market would be US\$400 billion. Then, we would halve this total, as gains are shared between subscribers and the AI provider, and the result is still US\$200 billion per year flowing to the United States. Also, these numbers exclude the United Kingdom, which could add another US\$70 billion using the same metrics as above.

So, the dual revenue stream is clearly in place, but there is one further risk: Oligopolistic competition could cause a race to extremely low prices as firms try to take market share. Here we see the telecommunications industry cited as a case in point: Multiple competitors re-invested in new and more expensive technology and earned lower profits as oligopolistic competition rules played out. But the analysis breaks down because telecoms was a regulated industry. The regulators forced both heavy investment and oligopolistic competition on the companies, who often used debt to fund that capital expenditure. For far too long, overcapacity plagued the industry, while companies had low pricing power and faced restrictions on merging. Regulators were looking after consumers, who were happy, although companies made no money, and investors gave up.

With AI subject to less regulation, more rational market behavior is likely. Investors will look for pricing discipline, and if they do not find it, they could force mergers to remove capacity.

So, the key question is how to price this service in order to generate revenues to cover investment costs. We clearly have three markets: 1) the advertising and social media market; 2) the business efficiency market; and 3) the general browsing, information and consumer market. Each of these markets will command different prices based on the intensity required. It is possible that older, slower models would be available at a cheaper price to the consumer, while the B2B segment will require a premium agreement, with faster speeds, greater agility and a need to be more reliable. The advertising market will likely continue to be data-driven, with those replacing and replenishing their models needing to achieve greater effectiveness for campaigns and, thus, achieve greater pricing power.

Conclusion

Cash, rather than debt, is driving the AI revolution, putting it on a sounder financial footing, with less likelihood of going bust than similar revolutions of the past. But financial strength could still lead to price competition. We believe this would most likely be in the B2C area. The best potential is in subscriptions for B2B services.

The AI revolution is unregulated and has three streams of revenue. We might see the creation of a series of monopolies—or at best duopolies—for business users and advertisers, while the consumer will have slightly more choices.

Premium pricing may well attract other suppliers but only into limited parts of the chain, we believe, such as energy or data centers.

The key competitive advantage will remain not just the language model's ability to update, refresh, re-learn and improve, but the ability to store and deliver a reliable service. That requires size and financial strength to create client confidence.

As productivity and profitability gains become apparent, more businesses will need to invest in AI, thus growing revenue. The tougher it becomes, the faster revenues could grow. This will most likely lead to a stream of consolidation across a wide range of sectors and industries.

Endnotes

1. Source: The 2025 AI Index Report. Quid and Stanford HAI.
2. Source: "World Energy Investment 2025", International Energy Agency.
3. Ibid.
4. Source: "Work Innovators. A Playbook for Innovation in an Uncertain World." upwork.com. October 29, 2024.
5. Source: Euro indicators. Eurostat. June 2025.
6. Source: Facts and Figures on the European Union. European Union. Accessed November 17, 2025.
7. Source: Share of government employment. Eurostat. October 21, 2025.

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