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The Carlyle Compass



By **Jason Thomas**

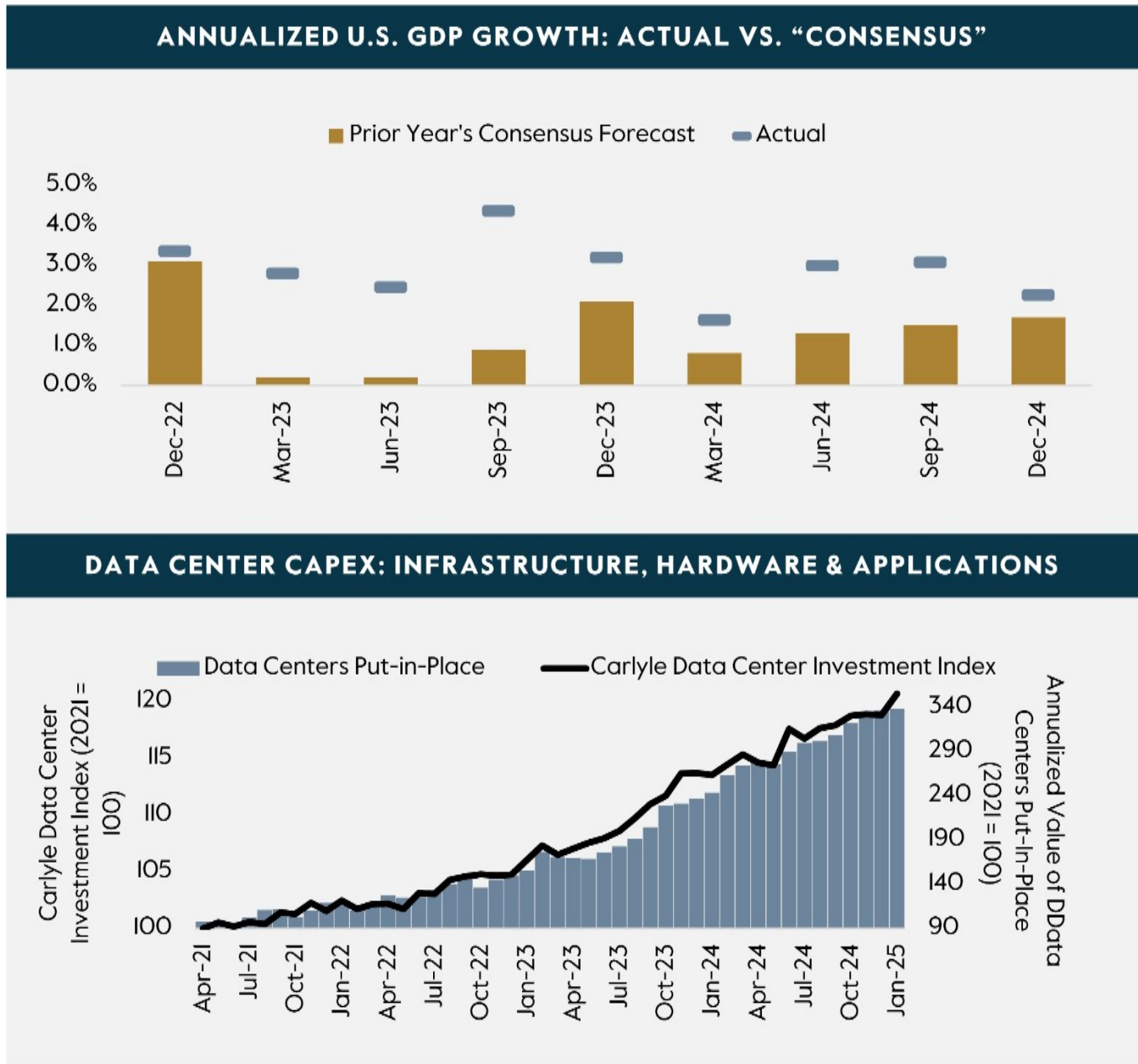
February 4, 2025

Welcome back to **The Carlyle Compass**, your weekly newsletter that brings together the latest research and market insights from our global team.

Jevons or Dixit?

Since the advent of ChatGPT in November 2022, U.S. GDP growth has exceeded prior years' "consensus" expectations by an average of 1.5%—one of the largest and most sustained periods of outperformance in recent history. Enthusiasm for the technology and its downstream applications set off a staggering capex boom that allowed the economy to shrug off an interest rate shock that many expected to trigger recession (Figure I).

Figure 1: AI Investment Shock Explains Much of U.S. Outperformance



Source: Carlyle Analysis of Portfolio Company Data; Federal Reserve, Bureau of Economic Analysis, January 2025. There is no guarantee any trends will continue.

Much of this investment is premised on insatiable demand for computing capacity. By 2027, the cost of training new models [could be 10x to 100x greater](#) than the \$100 million needed

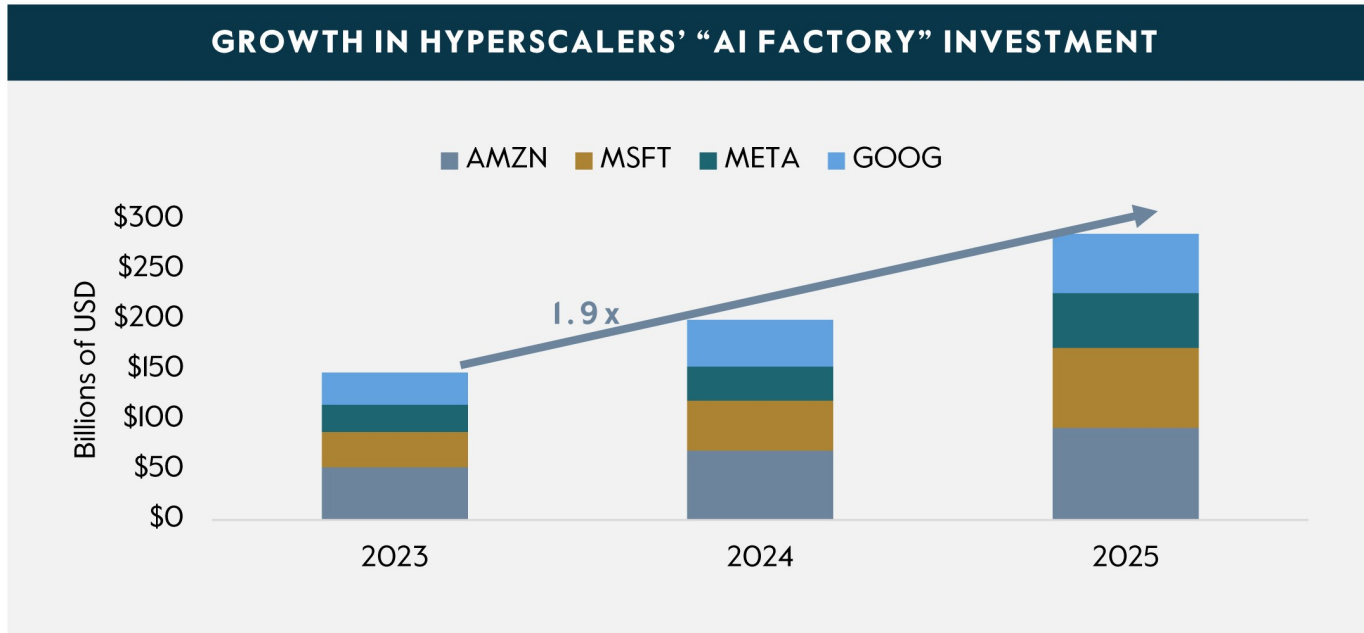
for ChatGPT. If verified, the [DeepSeek breakthrough](#) implies that costs of training and inference could move by roughly the same magnitude—but in the opposite direction.

As AI executives quickly [explained](#), these are precisely the sorts of [efficiency gains](#) that have accelerated resource consumption in the past, implying that demand for GPUs, computing power, and data center capacity will grow more rapidly from here.^[1] It's no leap of faith to expect capex to rise as capital becomes more productive. But this presupposes that existing spending has come in proportion to its expected return. What if some of the spending to-date has been [designed to deter competitive entry](#)?

Massive upfront costs serve as an important barrier to entry, with the number of competitors in a market inversely related to its capital intensity. If the entry cost in the market for foundational and generative AI models [is understood to be \\$100 billion](#), it's not likely to involve many players. More investment today can shape expectations in ways that mean less competition tomorrow.

Were DeepSeek's innovations [really unknown](#) to the top AI researchers in the U.S.? Or have U.S. companies intentionally prioritized model size over model efficiency? To [Chinese observers](#), whose access to computing power has been constrained by export controls, "the way the United States uses GPUs is too extravagant." But why be parsimonious when you have the resources at hand to forge a dominant position in the industrial ecosystem of the future (Figure 2)?

Figure 2: Is AI Capex Scaled to Deter Competitive Entry?



Source: Carlyle Analysis; Bloomberg, January 2025. There is no guarantee any trends will continue.

Irreversible investments made on the basis of inherently speculative demand forecasts always introduce the risk of overcapacity. But that’s especially true when those investments are scaled to deter would-be commercial competitors, as observed in the late-1990s telecom buildout. The internet hardly fizzled(!), but exponential growth in data transmission and online transactions were not sufficient to insulate the economy from trillions of dollars in losses during its initial stage of maturation.

I. Commonly known as Jevons Paradox. For example, efficiency gains in the generation of the heat necessary to manufacture steel generate “feedback effects” where steel becomes more profitable to produce, and more fuel is ultimately consumed in its production. The same logic has been used to argue fuel efficiency standards for autos prove self-defeating, as the resulting decline in the cost of traveling one mile increase the number of miles traveled.

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