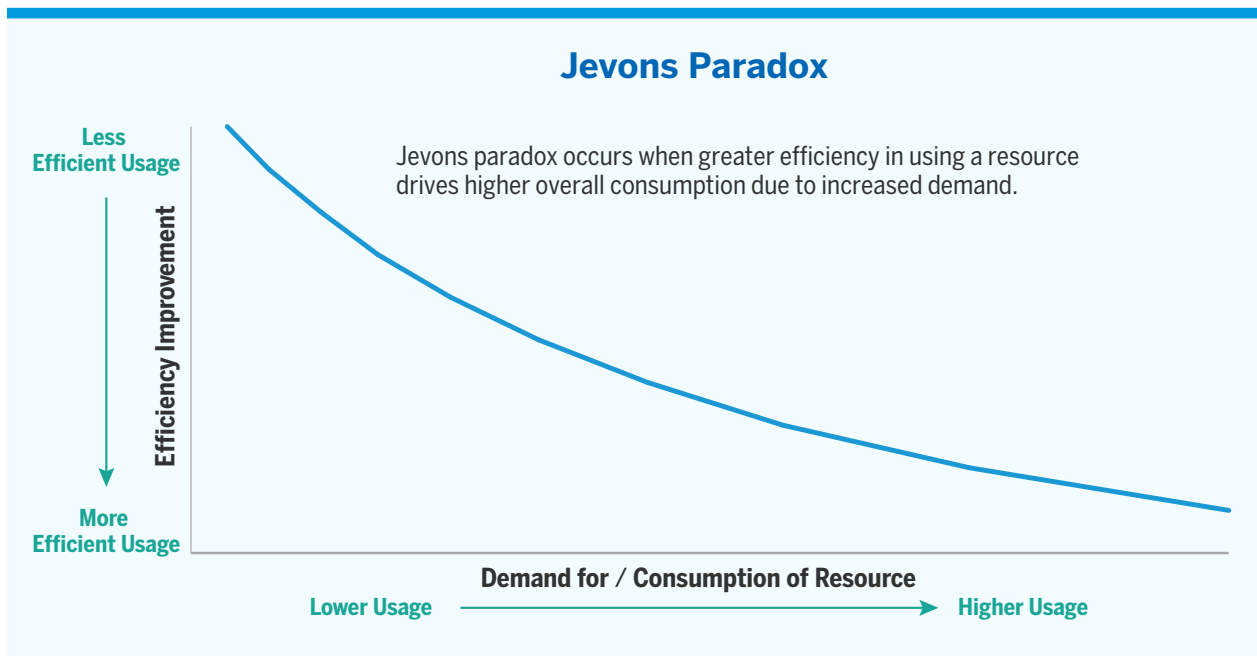# The AI Investment Paradox

Recently, there has been concern that artificial intelligence (AI) software is becoming significantly more efficient and may reduce spending on related hardware used to train AI models. While cheaper AI training may benefit AI adopters, does this signal a slowdown in capital investments in AI enablers? Or could it create new opportunities for both AI enablers and adopters?

Jevons Paradox

Jevons paradox occurs when greater efficiency in using a resource drives higher overall consumption due to increased demand.

Less Efficient Usage

Efficiency Improvement

More Efficient Usage

Demand for / Consumption of Resource

Lower Usage → **Higher Usage**

- AI training involves teaching a model with large datasets to identify patterns—similar to studying for an exam. For training to occur, an enormous amount of data is processed using networked GPUs to generate trillions of parameters that help models interpret and generate content. Inference, on the other hand, is when the trained model makes predictions or decisions, requiring speed and real-time capabilities for applications like autonomous driving, fraud detection, and robotic process automation.

- While the cost of training AI models may fall due to innovative techniques, we believe this may be encouraging for both AI enablers and adopters over the long-term thanks to a phenomenon called Jevons paradox. The concept, shown in the chart above, states that as resource usage efficiency improves, demand for that resource often increases, leading to higher overall consumption. For example, during the Industrial Revolution, steam engines became more efficient and consumed less coal per unit of power; however, these efficiency gains stimulated widespread industrial growth, which ultimately increased aggregate coal consumption. Jevons paradox demonstrates that efficiency gains can have unintended consequences, spurring increased utilization of the very resources they are meant to conserve.

- As the cost of AI training falls, we believe the development cycle for improved models may accelerate, potentially increasing the pace of AI adoption, which in turn may lead to an acceleration in inferencing (see Alger Breaking Views - DeepSeek). Accordingly, we believe that much of the value in AI workloads may shift from training to inference as consumers and enterprises utilize more AI applications. While training will still be a significant part of AI workloads, particularly for proprietary data, we believe this shift necessitates scalable network infrastructure for handling real-time data streams, and efficient cooling and power systems to sustain data center performance.

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