Behind the ChatGPT hype: What generative AI means for investors

Equity Insights offers research and perspectives from Putnam’s equity team on market trends and opportunities.

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Going viral entered a whole new dimension with the introduction of ChatGPT late last year. In just six weeks, the artificial intelligence (AI) tool gained 100 million users — and a great deal of media attention. By comparison, the next-fastest adoption of an application was TikTok, which took six months to reach that 100-million milestone. Among the features that make ChatGPT so attractive is its ability to understand a search request and provide substantive, conversational answers to questions that may not have a single correct answer. The technology is known as generative AI, and it is powered by a large language model algorithm that can summarize massive quantities of data based on billions of parameters. To do this, ChatGPT and similar tools require immense computing power.

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The use cases for generative AI will be broad, and we expect it to be highly disruptive to many industries. In our view, business productivity will be one of the first areas to benefit over the next 12 to 24 months. But we are still in the early stages of a wave of investment in generative AI technology. Our team expects to be surprised and delighted by a wide range of innovations over the coming months and years. Open questions remain around data privacy, intellectual property rights, costs, and accuracy. This leads to uncertainty around the pace of adoption and the approach for many sectors and businesses. However, this does not change our enthusiasm for this technological advancement.

Compelling opportunities for investors

From an investing perspective, we believe the rapidly evolving generative AI technology presents compelling opportunities across a range of industries. Today, we are in the infrastructure investment phase of generative AI, so we are seeing the biggest impact on the infrastructure-exposed sectors such as semiconductors. Over time, we expect this to broaden to software, internet, and beyond. We also recognize there is much uncertainty — and sometimes unsettling speculation — about the longer-term consequences of AI. Investors must be flexible and open-minded, with the knowledge that implications for specific businesses will shift — positively or negatively, and sometimes significantly — over time.
While ChatGPT dramatically raised awareness of generative AI, the technology has been in development for years by many businesses. However, as ChatGPT demonstrated, the underlying technology has taken a huge step forward. Businesses now have the computing horsepower to enable these large language models to be trained with relative ease and provide users with extremely powerful productivity tools.

**Among the first to potentially benefit: Semiconductors**

The semiconductor industry has seen the earliest upward shift in fundamentals from generative AI. We expect the industry may continue to benefit, as semiconductors power the underlying servers that enable AI. Semiconductor content in AI servers today represents only about 3% of the total semiconductor market. However, this is increasing quickly as companies eager to participate in the generative AI opportunity are investing in servers to ensure they have the required computing capacity.

AI servers require 10 times the semiconductor content of traditional servers. A vital component of AI servers are GPUs — graphics processing units. Based on our analysis of GPUs required for initial ChatGPT training, we expect the total addressable market for GPUs — already large at an estimated $40 billion — to more than double in the next three years as generative AI is adopted across search, productivity tools, and creative workflows.

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**Hyperscalers: A potentially dominant force as AI demand grows**

The rapid pace of change in generative AI technology makes it challenging to identify possible winners, but one area of our focus is hyperscalers — large cloud service providers such as Microsoft, Amazon, and Google. These hyperscalers are spending aggressively now to ensure they are well positioned for a future led by generative AI. Based on the cost and infrastructure required to develop large language models, hyperscalers have the potential to dominate this market and may benefit from a growing wave of demand for generative AI tools and services.

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In other areas, we believe the near-term effects of generative AI are more limited. For e-commerce, we’re seeing early examples of plug-in software that enables consumers to interact with retailers in a more conversational way, like a concierge or personal assistant. Eventually, this technology could be built into consumer-facing websites. For e-commerce payments, AI could play a role as a fraud detection tool. For telecommunication companies, we see limited disruption, although they could benefit as bandwidth-intensive AI applications drive growth in data usage.
Areas of focus today

The potential investment opportunities from generative AI span multiple sectors and industries, but hyperscalers and semiconductors are key areas of focus.

Microsoft (MSFT). In our view, MSFT is a dominant hyperscaler at the forefront of generative AI, from both a technology and a brand awareness standpoint.

- We believe MSFT has several growth avenues related to generative AI.
- Azure, MSFT’s cloud computing platform, has seen a wave of new customers as well as growing demand from existing customers due to MSFT’s leadership in generative AI technology.
- Microsoft 365 Copilot is a soon-to-be-launched digital assistant powered by AI that will be an embedded feature in many of Microsoft’s existing applications, such as Office. We believe it could offer significant value for customers in terms of productivity gains, and it is likely to provide MSFT with increased pricing power across its products.

NVIDIA (NVDA). This semiconductor company is a leading supplier of GPUs, the accelerators needed to power generative AI. In our view, it has the right “mousetrap” at the right time.

- Investors have already recognized NVDA's potential, as it is trading at one of the highest multiples in the semiconductor industry. However, we cannot overlook the enormous opportunity generative AI brings to NVDA.
- NVDA was already generating $15 billion — about 50% of its total revenues — from AI demand, and we believe generative AI will act as an additional leg of the growth stool.
- One key advantage is the strength of NVDA’s parallel processors, which will be used for both model training and inference.

Advanced Micro Devices (AMD). A key competitor of NVDA, this company may be underappreciated as a strong alternative provider of the GPUs that power generative AI.

- We see potential in AMD’s MI300X AI accelerator chip. It could allow the company to participate in the full breadth of the GPU market, which has the potential to exceed the CPU market in size over the next 4 to 5 years. Only a small market share gain could be meaningful to AMD’s bottom line.
- We believe AMD is currently attractive from a valuation perspective, trading at just 20x fiscal year 2024 earnings per share.

Many open questions for investors

We believe generative AI is an unprecedented technology breakthrough, and many investors are rushing to identify potential winners and losers. In our view, this new AI landscape requires significant fundamental research and analysis and the flexibility to adjust to rapidly evolving new offerings and yet-to-emerge challenges.

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Putnam Global Technology Fund holdings as of 3/31/23: Advanced Micro Devices (3.97%), Microsoft (13.20%), NVIDIA (3.82%). Alphabet and Amazon were not held as of 3/31/23.
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