Investing in the Era of Artificial Intelligence

It's been another strange six months for investors – banking wobbles, inflation and a lacklustre Chinese economy have all weighed on investment returns. Perhaps it is in part due to these headwinds that the recent performance of those companies with links (however tenuous) to Artificial Intelligence (AI) has been so striking.

While AI has been around in various forms for over half a century, the latest burst of enthusiasm began in November of last year, with the release of ChatGPT (GPT stands for Generative Pre-Trained Transformer, in case you were wondering). While ChatGPT was created and maintained by the AI research and development laboratory OpenAI, it has the financial backing of tech giant Microsoft – in January this year, the company announced a new multi-billion-dollar investment in its partnership with OpenAI, one that will see the latter benefit from Microsoft's super-computer capabilities for its research. In return, Microsoft became OpenAI's exclusive cloud services provider and is rumoured to be preparing to challenge Google's search engine supremacy by integrating ChatGPT within its own search engine, Bing.

No company share price better demonstrates the recent market frenzy than Nvidia. For those unfamiliar, Nvidia is the market-leading manufacturer of graphical processing units (GPUs), computer chips that render graphics and images by performing rapid mathematical calculations. Originally focussed on gaming, the company has rapidly acquired market share in the automotive and data centre sectors. It was the latter that attracted so much attention when it reported its quarterly results back in May, with revenue from its data centre division jumping 18% versus the previous quarter. Nvidia execs confirmed the spectacular results were specifically due to demand from the AI sector. Somewhat paradoxically, overall revenue was down year-on-year, with revenue from its gaming division falling 38%. Investors, however, were undeterred – Nvidia's stock surged 26% in just one day, breaking the US intraday record in the process. At the time of writing, the company's share price is up 200% year-to-date, compared to the index return of 12%.

Recent enthusiasm may be well-founded. Nvidia's flagship AI GPU, the A100, retails at roughly $10,000 per chip. The supercomputer Microsoft purchased for OpenAI to train ChatGPT uses 10,000 of these chips. Nvidia now forecasts Q2 revenue of $11 billion, smashing prior analyst expectations of $7.2 billion.

A new dawn?

The concept of AI is not new. Neural networks, which form the foundation of chatbots like ChatGPT, were first introduced in 1965. With that in mind, an investor might reasonably ask, why now?

The recent explosion in AI advancements has been driven by the convergence of several powerful forces, leading to innovation and opportunity on a previously unimaginable scale. Underlying everything is the Law of Accelerating Returns, more commonly known as Moore's Law. Named after Intel co-founder Gordon Moore, it states that the number of transistors on a microchip will double approximately every two years, resulting in an exponential increase in computing power. While some experts believe this rate will eventually slow, Moore's Law has been an accurate predictor of computing power for almost six decades. This rapid increase has facilitated the development of AI at a previously unimaginable rate. According to OpenAI, the computing power used for AI training has doubled every 3.4 months since 2012, allowing modern AI systems to analyse and manipulate truly colossal quantities of data.

ChatGPT, like other generative AI systems, acquires its 'knowledge' by using data scraping, an automated process that collects data from a variety of online sources such as news articles and scientific journals. The growth in global data is truly staggering. According to the International Data Corporation (IDC), in 2018 the total volume of stored data was 22 zettabytes (22 trillion gigabytes). By 2025, this is expected to rise to 175 zettabytes. Supercomputer-backed AI is uniquely positioned to digest and make sense

of this ever-growing resource.

The cost to train an AI system has also fallen dramatically. GPT-4, the language model behind ChatGPT, is up to ten times cheaper per 1,000 words of output versus its predecessor, GPT-3. Over the past five years, the cost of training AI models has declined by an almost unbelievable 99.5%, driven primarily by advancements in hardware such as GPUs. Lower training costs allow researchers to work with larger models and ever more complex algorithms, pushing ever further the boundaries of what AI can achieve.

Implications for investors

You might not realise it, but AI is already impacting your life in a myriad of ways. Do you unlock your phone using face recognition? It's AI that scans the features of your face and determines whether the person it 'sees' is you. Social media uses AI to tailor what you see on your feed, while digital voice assistants such as Amazon Alexa (other brands are available) use natural language processing to return answers to you. Thinking of getting a flu shot this autumn? Its AI that determines the likely onset of flu season, and which strains are likely to arise.

I could go on, but the point is that AI is now firmly ingrained in our day-to-day lives – so perhaps its time investors took note. Aside from the staggering recent share price performance of companies like Nvidia, there are longer term implications. In May, dozens of AI experts, including the heads of OpenAI and Google Deepmind (another AI research laboratory), warned that AI could lead to the extinction of humanity. Whilst an extreme scenario, firms such as Amazon, Google and Microsoft recently committed to managing the risks associated with the rapid development of AI. Back at the less shocking (and more realistic) end of the spectrum, a recent study by OpenAI predicted that AI could replace nearly half of all tasks currently performed by workers in the US in just a few years. Industries such as web development, content creation and legal work are often flagged as being vulnerable to the impact of AI, but in practice the list of AI-compatible tasks (particularly those requiring data manipulation and/or numerical analysis) is long and ever growing.

As with every technological leap, there will be winners and losers, but aside from obvious 'pure plays' like chip-makers, predicting which side of the fence a company will fall is difficult to predict. The ability to adapt has long been cited as a key characteristic of a successful business. The rapid development of AI has made this trait more valuable than ever.

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