Baillie Gifford™

Long Term Global Growth

Monthly Reflections: NVIDIA – chipping away at success

August 2023

Jaws dropped earlier this year when NVIDIA announced it was expecting its next quarter revenues to suddenly surge to $11bn – more than 50 per cent higher than Wall Street estimates. In August, it stunned the market again when it reported that its revenue in the quarter had, in fact, surpassed its own forecasts, reaching over $13bn – a doubling from the year prior. The resultant rise in share price has catapulted NVIDIA's market capitalisation into the $1tn club, making it one of the most valuable companies in the world.

Clues to NVIDIA's meteoric ascent were already apparent in 2016 when we were conducting our original research on the company. At that time, graphics processing units (GPUs) were specialised, niche chips used mainly for graphics-intensive processes, notably gaming. Our investment thesis was predicated on the likelihood that the GPU market leader, NVIDIA, would benefit from growth in industries such as virtual reality and autonomous driving, for which we believed graphics and image recognition would undoubtedly matter. However, by pushing ourselves to be more optimistic, our blue-sky case in 2016 also led us to posit that GPUs' "ability to quickly process tasks in parallel makes them ideally suited to deep learning".

Full disclosure: We didn't pretend to understand the full range of possible outcomes for deep learning and artificial intelligence (AI) back then (nor do we today). We frankly didn't know if we were reading too much science fiction or being too conservative. But it did seem likely that if an explosion in AI were to occur, it would presumably require a massive amount of computing power. Per our investment process, we therefore outlined a potential upside scenario whereby NVIDIA's GPUs – which could perform calculations hundreds of times faster than other chips – might take at least a fraction of the resulting market.

This scenario began to play out in the years that followed. By 2020, half of NVIDIA's profit came by selling GPUs into massive data centre networks to perform ultra-high-end computing tasks, such as deep learning, which simulates the ways the human brain processes data. It was now widely recognised that GPUs happened to be much better at this kind of job than other chips. NVIDIA started to view itself as an AI business with a gaming segment, not the other way around. By late 2021, the share price had risen five-fold since our first purchase five years earlier.

Within months, however, investor confidence in global equity markets had crumbled when faced with rising inflation, geopolitics, deglobalisation and the spectre of economic slowdown. NVIDIA's share price halved from its 2021 peak. But when reviewing our investment thesis in summer 2022, something much more troubling was on our minds: the potential death of Moore's Law.

Moore's Law states that the number of transistors on a chip doubles every two years, meaning the speed and capability of computers will increase exponentially while costs will decline over time. This phenomenon has underpinned the vast progress in computing over the past several decades, from smartphones to cloud computing to cryptocurrency to ecommerce and much more. Thanks almost singlehandedly to the innovations of another LTGG holding, the lithography equipment manufacturer ASML, there fortunately still appears to be a path to achieving exponential growth in computing power by fitting ever more transistors onto chips. But it seems that this will not come at the same, or lower, cost.

Jensen Huang, NVIDIA's founder and CEO, therefore, believes that the future of computing will shift away from dependence on the engineering of the individual chip towards system configuration. Systems, it should be said, designed by NVIDIA. These systems help to address soaring demand from AI applications for dramatically faster computer processing. One upside scenario for NVIDIA from here is that it adapts its business model from dominating the GPU market to bundling systems for entire data centres, along with much of the software. As per our original 2016 research, virtual reality and autonomous driving remain compelling growth avenues, too. There will likely be others.

At the time of writing, NVIDIA's share price has not only recovered from its 2022 nadir; it has powered upward to new highs. This begs the inevitable question: is its future value now fully priced in? We don't think it's anywhere close. Society is still early in digitisation, and it is still lacking in machine intelligence. AI is undeniably the next phase of computing. NVIDIA has a proven track record of taking genuinely long-sighted existential bets, which have positioned the company at the heart of the AI development ecosystem in terms of both hardware and software. Moreover, with the advent of powerful AI, the machine is now capable of something new. It can perform cultural commentary, creation, programming, teaching, customer service, and more – with superhuman performance and on demand. It can deliver a whole new quantum of growth by enabling new types of mineral recovery, robotics, energy generation and therapeutic treatments. Trying to define NVIDIA's total addressable market and model its growth, therefore, feels dangerously unimaginative and somewhat futile.

Let's look at it another way. If NVIDIA can deliver 30 per cent annual top-line growth for the coming decade, it could achieve a $5tn market capitalisation. If one assumes the US economy grows by around 4 per cent per annum during that period, NVIDIA would, therefore, be worth 1.7 per cent of the US GDP by 2033. That might sound outlandish, but Apple is already worth 1.7 per cent of US GDP. GE and IBM were each 1.2 per cent in 2001 and 1990, respectively.

Growth is likely to remain lumpy. The share price is likely to remain volatile. In periods when we feel that near-term market euphoria is overdone, we will be minded to trim – just as we have done on average once per year since our initial purchase, recycling the proceeds into other holdings. However, looking to the long term, we believe NVIDIA's potential upside could be vast in ways one cannot yet appreciate. That is rare and hugely exciting.

Performance

Annual past performance to 30 June each year (net %)

	2019	2020	2021	2022	2023
LTGG Composite	0.1	56.4	61.7	-48.9	24.2
MSCI ACWI	6.3	2.6	39.9	-15.4	17.1

Annualised returns to 30 June 2023 each year (net %)

	1 Year	5 Years	10 Years	Since Inception*
LTGG Composite	24.2	9.9	15.9	11.6
MSCI ACWI	17.1	8.6	9.3	7.8

*Inception date 29 February 2004.

Source: Baillie Gifford & Co and MSCI. US Dollars.

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