How long can Nvidia ride the capex boom?

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Big technology advancements occasionally catalyse whole industries to embark on massive capital expenditure (capex) programmes. These events involve powerful narratives that drive strong bull markets as capex spend is often extrapolated years into the future. But they tend to end abruptly, as in reality future capex is highly sensitive to changes in managements' growth assumptions. Nvidia is currently capturing a huge proportion of AI-related capex spending, which is expected to continue growing for many years.

Why are capex booms so powerful?

Capex booms are rare and dramatic events with huge market implications. Below, we provide more detail on two historic examples of capex booms: US railroads, and the technology, media and telecoms (TMT) bubble. They have the following in common:

- A new transformative technology with the potential to change the world.
- Key companies that benefit from the boom are rerated to enormous valuations.
- Index composition becomes concentrated into the key stocks.

The rapid rerating of affected stocks tends to take the whole market with them to highly elevated levels. Importantly, capex booms result in very rapid reported earnings growth. This is because the companies doing the selling (e.g. Cisco in the TMT boom) record the sales revenue, while the companies doing the spending capitalise the cost and depreciate it over many years. Consequently, the industry profit pool grows dramatically (while the free cash flow pool does not, but few investors seem to focus on this). The technological developments are validated by the rapid profit growth, creating a positive feedback loop and an immensely powerful narrative.

Two case studies from history

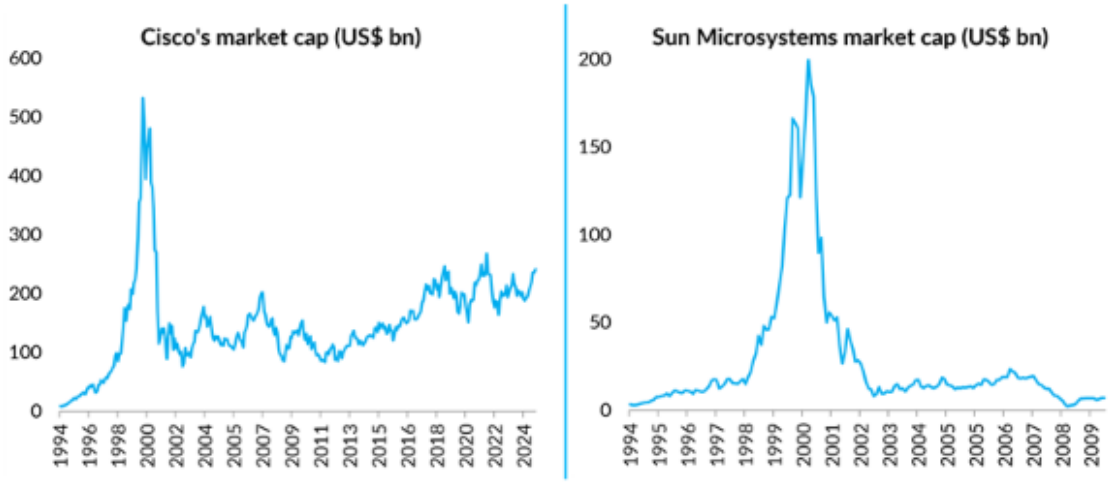
Case study 1: US railroads and Union Pacific

An early example is the railway boom in the US. The first major railroad was started in 1830 but the boom really accelerated during the 1850s and 1860s. It culminated in the completion of the first transcontinental line by Union Pacific in 1869. By 1870 the US had more railway mileage than any other country. Fears of over-capacity emerged during the 'Panic of 1873' and the 5-year recession that followed. Railway stocks that had driven the market on the way up then led the brutal bear market that followed. This was epitomised by Union Pacific (still listed today!), established in 1862 with the express purpose of building the first transcontinental railroad. Its high debt levels and fears of bankruptcy as ticket prices collapsed were key catalysts for the Panic of 1873. Only through the injection of massive additional capital did Union Pacific survive its tenth year.

Case study 2: The TMT bubble

Jumping 127 years forward brings us to an event many of us experienced, the TMT bubble that ended in 2000. Here the massive capex bubble was focused on the 'plumbing' for the internet, with companies such as Cisco, Juniper Networks, Sun Microsystems and Intel selling the equipment, primarily to other IT businesses and the large telecom companies. Once again, the key companies involved grew earnings very rapidly and the market rated them at levels that anticipated that growth trend to continue for many years. Cisco's market cap exceeded US$ 500bn. Today, some 25 years later it is at half that level. Sun Microsystems reached US$ 200bn, and was acquired by Oracle in 2009 for just US$ 7bn. At the time, TMT stocks (including Cisco and Sun Microsystems) drove the whole market's performance.

Key equipment providers in the TMT Bubble



Sources: PSG Asset Management and Bloomberg

Narratives extrapolate capex booms

While the benefits of the technological advancement at the heart of the boom are invariably real, long-term beneficiaries tend to be society at large, rather than the shareholders in the companies at the heart of the boom. The powerful narrative around the technological change leads to extreme valuations which extrapolate recent growth trends for many years into the future. Anyone questioning the narrative is viewed as 'just not getting it' and out of touch with how the technology in question is changing the world. Unfortunately, capex booms have another characteristic: they end abruptly.

Capex is very volatile

Management teams tend to get caught up in powerful narratives as well, and announce very ambitious capex plans to support growth. However, most capex is discretionary.

Should growth expectations change, capex tends to be cut very aggressively. Often, the catalyst is an economic recession. For example, during the 2008 recession Microsoft cut capex by 45% from US$3.6 bn in December 2008 to US$ 2bn in June 2010 on a trailing 12-month basis. Over this period, Microsoft's sales were flat and the capex-to-revenue ratio dropped from 5.8% to 3.2%. Google's capex reduction during the 2008 recession was even more dramatic. Capex declined by 72% despite sales actually growing by 27% over the period. Google's capex-to-sales ratio dropped from 14% in June 2008 to just 3% in March 2010.

Significant capex reductions

Microsoft capex reductions	Change in T12 month	
	Capex	Sales
Jun 1998 to Mar 1999	-19%	19%
Jun 2001 to Jun 2002	-30%	12%
Dec 2004 to Jun 2005	-27%	3%
Dec 2008 to Jun 2010	-45%	1%

Google capex reductions	Change in T12 month	
	Capex	Sales
Jun 2008 to Mar 2010	-72%	27%
Jun 2011 to Jun 2012	-41%	28%
Mar 2015 to Jun 2016	-21%	21%

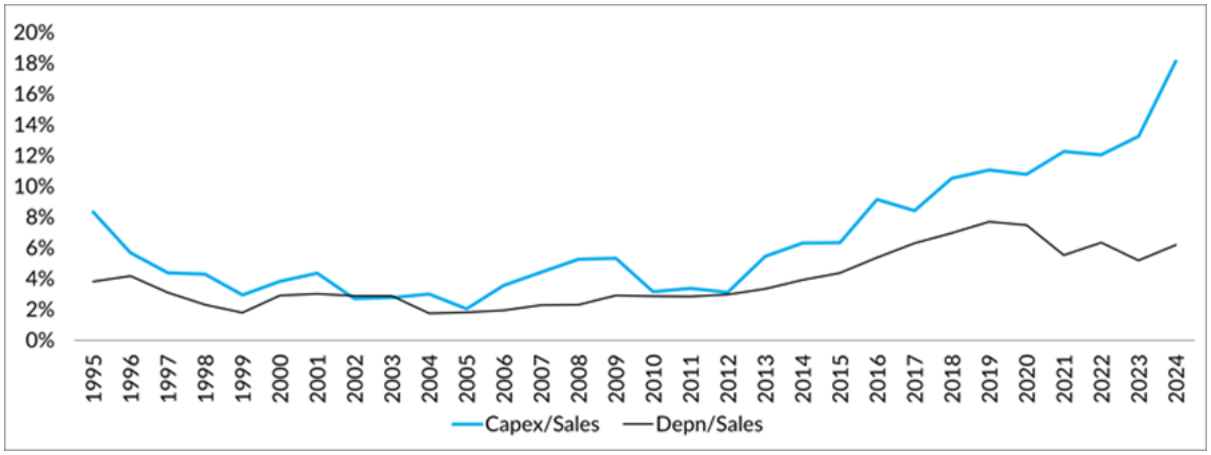
Sources: PSG Asset Management and Bloomberg

The dangers of extrapolating a capex boom's historic spending many years into the future are clear.

Lessons for the current AI capex boom

This is more relevant than ever today, as we are in the midst of another capex boom. A good warning sign of a developing capex boom is large divergences between customer capex and depreciation expense. Below, we see a remarkable divergence in Microsoft's figures currently, both expressed as a percentage of sales.

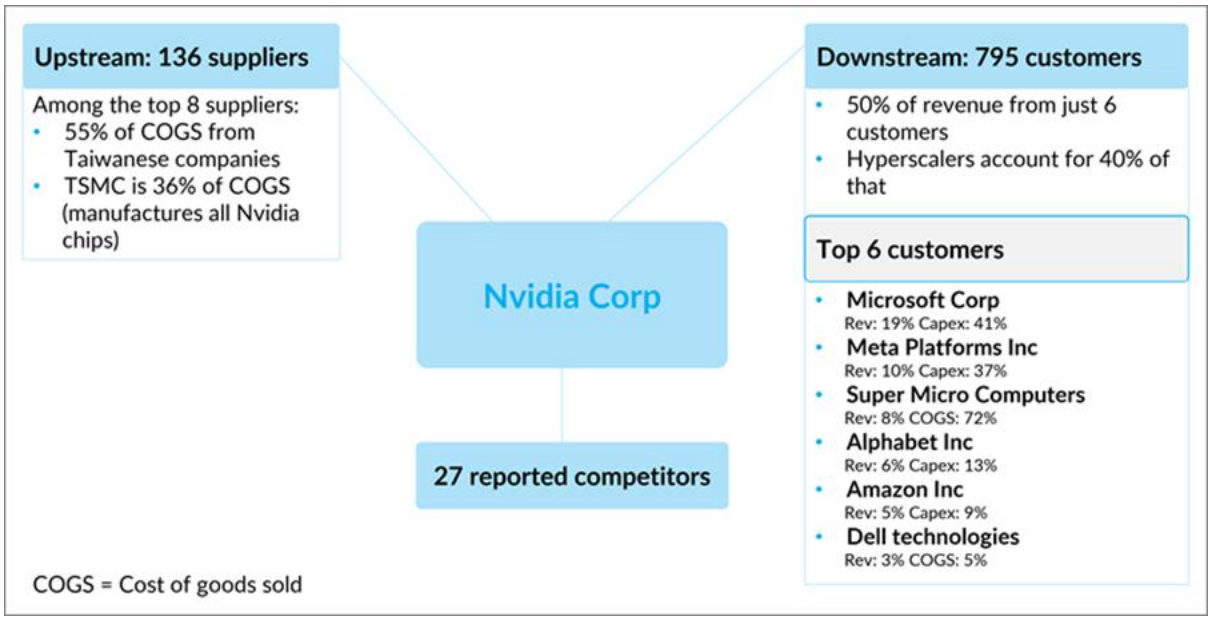
Microsoft's capex and depreciation to sales



Sources: PSG Asset Management and Bloomberg

Guidance provided by Microsoft management points to a doubling of their capex for 2025 from the 2024 level. A substantial portion of this capex is spent with one supplier, Nvidia. Bloomberg's Supply Chain analysis tool shows that purchases from Nvidia were an incredible 41% of Microsoft's total capex! On the other side of the equation, sales to Microsoft were 19% of Nvidia's total revenue. Sales to the four giant datacentre 'hyperscalers' (Microsoft, Meta, Google and Amazon) accounted for 40% of Nvidia's total revenue.

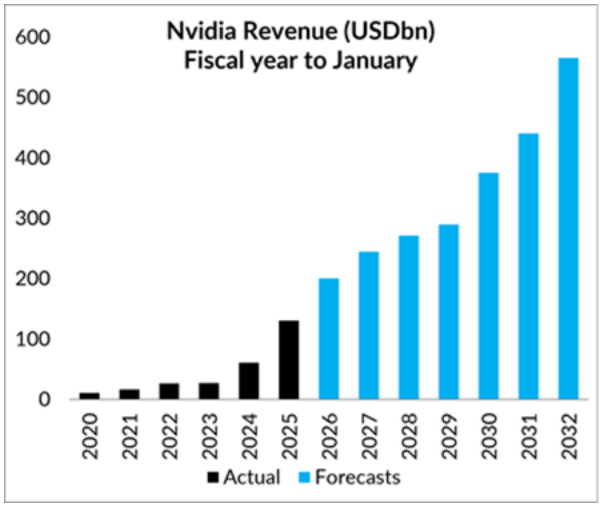
Nvidia's supply chain analysis

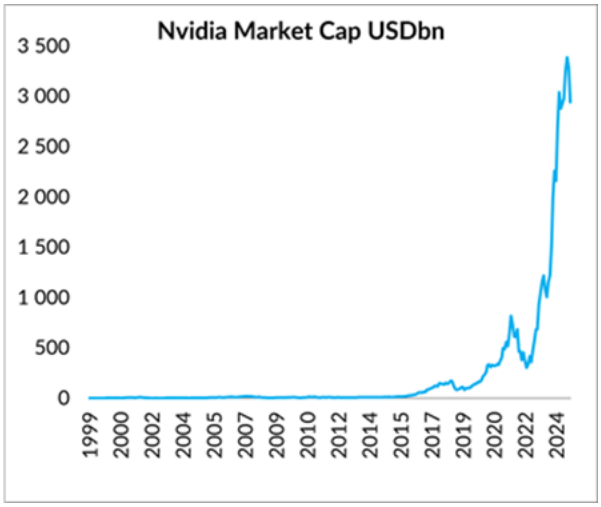


Sources: PSG Asset Management and Bloomberg

Historic capex booms have ended badly for shareholders in the key companies. The catalyst seems to be capex declines, with customer budgets sharply reduced if anything changes managements' growth outlook. We see little evidence that the current AI capex boom will play out any differently.

Nvidia revenue consensus forecasts and market cap





Sources: PSG Asset Management and Bloomberg

When history rhymes

The current AI capex boom has all the elements we have seen in other historic examples. At the core is a significant technological advancement, with the potential to change how the world works. Nvidia's rapid revenue growth validated the already-compelling AI narrative, and recent capex growth is now being extrapolated many years into the future. The key beneficiaries of the narrative have dramatically rerated: Nvidia has a market cap of US$3 trillion and is trading at 25x F2025 sales compared to 3.2x for the S&P500 Index.

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A word of caution

The key participants in the AI capex boom are very large index components. We believe most of them, while large companies, are highly risky investments at the current earnings levels and ratings. It is always difficult to assess shorter-term share price movements, and these prices may well go up even further. Therefore, we use long-term valuations as our yardstick for assessing risks and prefer to be more cautious when these signals appear. Investors should ensure their global equity exposures are not only in benchmark-hugging portfolios. We build our portfolios bottom-up from our best ideas and are not benchmark cognisant. In the current environment, we believe our portfolios can provide valuable diversification benefits for our clients.