

## A focus on- The cost of Training AI and NVIDIA's Market Cap Boom

Artificial Intelligence (AI) has once again been one of the main talking points in financial markets this week, with NVIDIA becoming the 2nd most valuable company in the world after the launch of a new advanced chip saw their value surpass that of Apple's. While NVIDIA's meteoric rise has surprised many, the growth in Artificial Intelligence (AI) modelling in the past two years has not been. Since the launch of Chat GPT 3 in late 2022, AI large language modelling has grown at an exponential pace, backed by companies such as NVIDIA and AMD who produce the chips needed to create these models. However, as models become more advanced and their ability to reason and solve problems also improves, so too does the cost of training these models. When it comes to the actual costs of training, these are determined by the amount of hardware needed, the time it takes to train the model and the hardware's utilisation rate. In 2017, the estimated cost of training the Transformer AI model, created by Google, was \$930. Fast forward to 2023, the estimated cost of training the new Chat GPT 4, the successor to the famous Chat GPT 3, is \$78.4mn dollars. However, this figure is dwarfed by Google's Gemini Ultra, also created in 2023, which has an estimated training cost of \$191.4mn. Over time models will become even more advanced, the training costs are likely to increase, thus benefiting not only the creator of the model, but the companies who are making the hardware and software needed to power them.

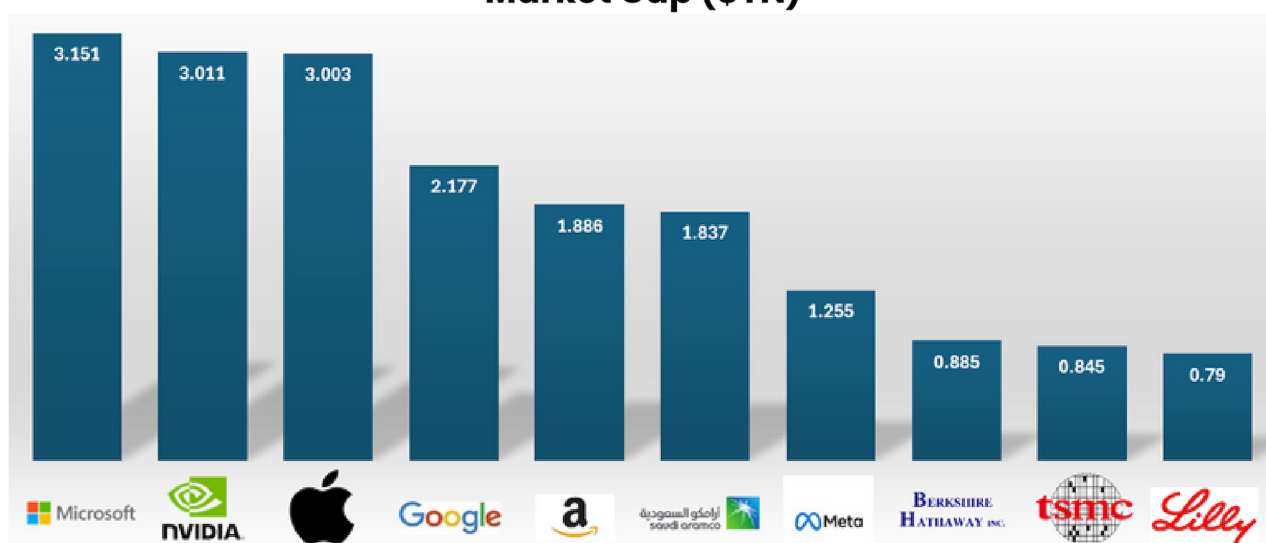
### **Artificial Intelligence Models Training Costs (\$)**



Source – Seaspray Private (Data from Visual Capitalist)

The surge in Nvidia's market value is a remarkable feat, as on the 10th of June 2023 NVIDIA's market cap stood at \$957.62bn, meaning the company has added just over 2 trillion in market cap in just over a year. The below chart illustrates the top 10 companies in order of market cap. Of the 10 companies listed the US accounts for 8, with the two non-US companies being Saudi Aramco, the Oil giant, with a market cap of \$1.837tn and Taiwan Semiconductor Manufacturing Company (TSMC), the largest manufacturer of semiconductors in the world, with a market cap of \$845bn. Eli Lilly, the US healthcare and pharmaceutical company ranks 10th, and along with Warren Buffet's Berkshire Hathaway and Aramco are the only companies not directly involved in the technology industry.

### Market Cap (\$TN)



Source – Seaspray Private

Finally, to put this all into perspective the below chart highlights the sheer power of the US in market cap terms, based on the country of origin. What we can see is that by combining the companies above in the US it amounts to \$16.158tn in market cap.

### Sum of Market Cap (\$TN) by Country – Top 10



Source – Seaspray Private