

Analysis of NVIDIA's Strategic Business Philosophy

Chuanzhi Gong *

Exeter University, EX4 4PY Exeter, UK

* Corresponding Author Email: cg771@exeter.ac.uk

Abstract. While many companies have been hit on different scales in recent years by the COVID-19 epidemic and global geopolitical conflicts, an analysis of NVIDIA's financial statements over the past few years reveals that NVIDIA is demonstrating its profitability at a phenomenal rate of growth. To explore the source of this profitability of NVIDIA, this paper analyses and suggests the growth of the company's profitability in these four years by analyzing NVIDIA's competitors and by using SWOT analysis on NVIDIA itself. The conclusion finds that NVIDIA has fully grasped the dividends brought by the AI era by taking advantage of its previously accumulated technological strengths. In conclusion, the investment prospects of NVIDIA Corporation are very bright, and investors can invest on the basis of a certain understanding of the relevant technological developments and market changes. At the same time, for NVIDIA's competitors, NVIDIA's success is not unrepeatable, so the recommendations set out in this paper are also inspiring to these semiconductor industry leaders.

Keywords: SWOT method, financial analysis, NVIDIA, investment feasibility, recommendations.

1. Introduction

In today's AI and gaming worlds, it's hard to get around the name NVIDIA to talk about their development, and in the semiconductor world, NVIDIA has become synonymous with technological development and innovation. When it was founded in 1993 by Jen-Hsun Huang, Chris Malachowsky, and Curtis Priem, it was hard to imagine that a small company whose main business was 3D graphics would grow into a multinational company with multiple fields of activity, and in fact, NVIDIA's real development began with the invention of the GPU in 1999. Unlike traditional industries, the field of Artificial Intelligence has not been around for long, but NVIDIA has an even greater advantage in Neural Networks (NN) through the technological advantages it has built up previously such as its development of the Jetson platform [1].

Recently, the semiconductor industry has been affected by geopolitical issues such as the US-China conflict and the Russia-Ukraine conflict, which have had an unprecedented impact on the industry's supply chain. Therefore, how NVIDIA can outperform other competitors and achieve excellence in this scenario is the focus of this paper. The study also aims to use the SWOT method to analyse NVIDIA's competitors and its more comprehensive.

2. Nvidia Current Situation and Financial Performance Analysis

2.1. Financial Analysis

From the history of NVIDIA's development since the outbreak of the new crown epidemic in 2020, its development has not been affected as traditional companies, but instead surpassed Intel to become the nation's highest market capitalization of the chip maker. Today NVIDIA's main business is divided into four areas: data centres, gaming, professional visualization, and automotive. The business report for the first quarter of fiscal year 2024 reflects the company's development in recent years, NVIDIA's revenue in the quarter was \$7.19 billion, up 19 per cent from the previous year. NVIDIA also generated a record \$4,284 million in revenue from its data centres, thanks to the company's mastery of artificial intelligence. And on the gaming front First-quarter revenue was \$2.24 billion, down 38% from a year ago and up 22% from the previous quarter (Financial Reports. n.d.) [2]. NVIDIA's enhancements in gaming image quality continue to leave many of its competitors in the dust. Its dominance in the gaming space can be seen in the 80 per cent share held by its discrete

graphics cards (Tencent. n. d.) [3]. In addition, in terms of professional visualisation, NVIDIA, although down year-on-year, is still up 31% YoY, while its partnership with Microsoft makes it impossible for investors to ignore its investment prospects in the future. Finally, in autonomous vehicles, NVIDIA grew by 114 per cent year-on-year to a record \$29.6 billion. Taken together, these record-breaking figures are a testament to NVIDIA's financial success and the technological advantages it has accumulated in the technology and semiconductor sectors.

2.2. Comprehensive Service Analysis

As mentioned earlier NVIDIA is currently divided into Data Centre, Gaming, Professional Visualisation and Automotive. The following section will analyse the achievements of its business aspects one by one.

2.2.1. Gaming.

In the early years of NVIDIA's development its main source of revenue was gaming [4]. Since then, the gaming aspect has been supported by NVIDIA as a core business. NVIDIA has also partnered with game studios such as CD PROJEKT RED and Game Science to further expand its presence in the gaming space, which is further enhanced by its leading-edge discrete graphics technology. However, after the COVID-19 outbreak in 2020, gaming revenues began to fluctuate, due to two main factors: firstly, the outbreak caused many gamers to reduce their investment in gaming equipment and the logistics of the outbreak were severely impacted, which led to a sharp decline in the sales of discrete graphics cards [5]. Secondly, the outbreak also caused many game studios to be unable to work properly, which in turn affected the quality of many games. These two factors caused many gamers to reduce their investment.

2.2.2. Data Centre.

As the share of gaming revenue declined, NVIDIA also began to gradually shift its strategic goals to data centres and Automotive. And that has led to even more growth for NVIDIA. For data centres, NVIDIA is mainly talking about its leadership in GPUs translating into demand from customers who are using AI for production [6]. NVIDIA's continuous release of new GPUs has given it a leading edge in data centre operations.

2.2.3. Automotive

And in the field of automotive, 2024 NVIDIA announced partnerships with established carmakers such as Volvo, Mercedes-Benz, and Kia, as well as technical support regarding AI for emerging Robotaxis such as deeproute, didi, and others. In autonomous cars NVIDIA's Omniverse platform is undoubtedly the first choice for many manufacturers who want to attract younger customers with AI but don't have the technology to do so themselves.

2.2.4. Professional Visualisation

For Professional Visualisation NVIDIA's Professional Visualisation solutions are being used by a wide range of production staff in many related fields, covering a wide range of industries from film, architecture, engineering and design. And by linking with data centres, Professional Visualisation has the power to drive displays like no other competitor.

3. Competitors that NVIDIA Faces

As the semiconductor sector grows, so more investors are choosing to focus on companies with strong innovation, effective supply chain strategies, and a strong foothold in key technology areas. So, NVIDIA is facing an increasing number of competitors. The five main competitors it faces are AMD, Intel, TSMC and Micron [7].

3.1. AMD

AMD is known as a semiconductor company for its pioneering work in microprocessors, graphics processors, and related technologies. The company was founded in 1969, and despite its long decline, under the leadership of its current CEO, Lisa Su, it now serves as a formidable competitor to NVIDIA in the semiconductor industry and is innovating in the areas of high-performance computing, graphics, and visualisation technologies. AMD's acquisition of Xilinx in 2022, a leader in adaptive computing, has enabled the company to further broaden its product range and potential markets. AMD is also a leader in discrete graphics cards, alongside NVIDIA.

3.2. Intel

Founded in 1968 and headquartered in Santa Clara, California, Intel is an established multinational technology company and a leading manufacturer of computer processors and other semiconductor products. Intel is known for its technology in the field of the CPU, and the company also does more than just the CPU, including integrated graphics, memory, and networking hardware, which gives Intel the ability to cater to a wide range of computing needs, from consumer electronics to enterprise servers. As one of the giants of the semiconductor industry, Intel's innovations have driven many technological advances over the decades, contributing significantly to the growth of the desktop, laptop, and server markets. At the same time, in recent years, to maintain its position in the semiconductor industry, Intel still invests a large amount of money each year in research and development of new technologies. However, Intel's marketing in recent years has also made many customers dissatisfied with it.

3.3. TSMC

Founded in 1987, TSMC is a leading independent global semiconductor foundry headquartered in Hsinchu, Taiwan. As a pioneer in the dedicated semiconductor foundry industry, TSMC's primary business is the manufacture of a wide range of integrated circuits (ICs) for customers around the world, while TSMC also serves key industries such as computing, consumer electronics, automotive, and telecommunications. TSMC's current business model focuses on providing semiconductor manufacturing services across the entire integrated circuit (IC) manufacturing spectrum, including advanced process technologies and wafer production. As a renowned foundry in the global chip space, TSMC's advanced chip manufacturing technology has attracted many customers, such as Samsung, Huawei, OPPO, and other mobile handset manufacturers. TSMC also uses its strong financial position to continue to invest in research and development. But increasingly complex geopolitics are also affecting the company's future.

3.4. Micron

Founded in 1978, Micron Technology is a global semiconductor industry leader headquartered in Boise, Idaho, specializing in the development and manufacture of memory and storage solutions. As one of the three major players in the memory market, Micron plays a key role in driving technological advances that improve the performance and efficiency of electronic devices. Micron's research and development in technology is also part of the support that has enabled it to become a leader in the mobile hard drive segment. Similarly, Micron is facing new challenges in the face of complex global geopolitics and challenges from cheaper goods from China.

4. The Many Challenges NVIDIA Has to Face.

4.1. Challenges From Competitors

In the third quarter of the fiscal year 2024 earnings report, NVIDIA mentioned that the game market still has a leading edge, but with the major companies investing in the semiconductor market, NVIDIA's advantage is likely to be weakened, as more and more game manufacturers now see

NVIDIA as the first option for cooperation. Manufacturers are also paying attention to the discrete graphics technology from AMD. While NVIDIA is still a certain disadvantage in many technologies, its long-term, more expensive pricing makes many manufacturers begin to accept AMD. Although AMD still has a certain disadvantage in many technologies, NVIDIA's long-term, more expensive pricing makes many manufacturers begin to accept AMD. At the same time, in terms of GPUs, Intel has also begun to strengthen its own products to compete with NVIDIA for market share. In Intel's eyes, NVIDIA's expansion will not stop after the acquisition of ARM's data centres. And both Nvidia and Intel have invested huge amounts of money in AI in the hope of beating each other. And facing Amazon, Microsoft, Alibaba, and other services carried out in the field of cloud computing and AI, NVIDIA is also gradually adjusting its business.

4.2. Facing the Challenges Posed by Macroeconomics

People may be less interested in companies like NVIDIA that are innovating in technology when the world economy is in a state of exhaustion, while customers will be more interested when the world economy is healthy and growing. In addition, as a large technology innovator with a global supply chain, NVIDIA is inevitably affected by geopolitics, such as when the U.S. and China had a trade dispute and the U.S. government began to impose tariffs on graphics cards and other electronics imported from China, and NVIDIA, along with other related technology companies, began to push for the government to initiate exemptions for these electronics [8]. In addition to these tariffs and trade impacts, NVIDIA has also had to file for possible supply chain issues such as problems with key components and problems with shipping. Therefore, NVIDIA's decision-makers have to consider the impact of these supply issues and make timely filings.

5. SWOT Analysis

5.1. Strengths

In terms of advantages, NVIDIA's main advantage is their core technology. Since its inception in 1999, NVIDIA has been in the image of a wealth of experience and technology. In the discrete graphics market, NVIDIA has always been in the absolute leading position, and AMD, as NVIDIA's main competitors in the discrete graphics market at the technical level, is far inferior to NVIDIA. In addition, NVIDIA's discrete graphics cards are superior in performance to those of other manufacturers. At the same time, NVIDIA is also accelerating the development of its new graphics cards. They have acquired several companies with expertise in other technologies, which allows them to expand their own technological reserves and is thus more conducive to the development of new. For example, in 2020, NVIDIA completed the acquisition of Mellanox Technologies, which allows NVIDIA to better develop its business in the data centre. After the acquisition of these companies, NVIDIA will be able to develop more quickly and can also continue to allow the market to accept more high-tech technology, to lead the pace of the market. For example, NVIDIA's development of GPUs for the semiconductor industry is of great significance to the product, and as a pioneering GPU maker, NVIDIA also has a far-reaching impact on the market and accelerates the research and development of other manufacturers. progress. Through acquisitions and continuous own technology reserves, NVIDIA has a technical advantage in the long run.

5.2. Weakness

NVIDIA has been criticised for its relatively high cost, which is further compounded by a high price that consumers find difficult to accept. For example, its newly released discrete graphics card, the GTX 4090 card, costs \$1,299. But with only two established discrete graphics card manufacturers, NVIDIA and AMD, consumers are forced to look to the more technologically advanced NVIDIA. However, when NVIDIA's price is out of the range of consumers for discrete graphics cards, consumers will quickly change their target to AMD, which offers a better price/performance ratio, while NVIDIA's increasing operating costs are a hidden weakness, so when financial problems occur,

NVIDIA will likely cut costs or lay off employees. Finally, in the face of the semiconductor industry continuing to evolve, although NVIDIA has now transformed its main business into data centres, gaming, professional visualisation, and automotive, in the face of other deeper integrated technology companies, NVIDIA's products are still lacking in diversity, which may make them face competitive pressure in certain areas or markets.

5.3. Opportunity

In 1965, Gordon Moore put forward the famous Moore's Law, which states that the number of circuits integrated on an integrated circuit chip doubles every 18 months. However, with the development of semiconductor technology, it has become progressively more difficult for today's products to satisfy this law. Meanwhile, the invention of GPUs has not only led to new advances in computing power but has also expanded new markets. The global economy is now focused on the development of artificial intelligence, which cannot be achieved without advances in GPU and CPU computing power, so customer demand for related hardware such as GPUs has reached record levels. Meanwhile, when it comes to emerging fields such as autonomous driving, the development of such businesses cannot be carried out without the support of chips and data centres, so governments are also introducing their own policies to encourage related enterprises to carry out R&D and investment. NVIDIA can seize the opportunities presented by the market and government policies for further development and application.

5.4. Threat

With the COVID-19 epidemic and the intensification of geopolitical conflicts, NVIDIA faces threats.

Due to the emphasis on antitrust and given NVIDIA's market share in the semiconductor industry, an acquisition of the company would face restrictions from the government and other competitors, which would affect NVIDIA's technological advancement as well as technological exchanges within the industry.

NVIDIA is not the only company expanding its scope of business as technology develops, and companies such as AMD and Intel are also launching new products and services outside of their long-established scope of business. For example, Intel has invested heavily in data service centres. The outbreak of the Russian-Ukrainian war has also forced tech companies such as NVIDIA to re-adjust their supply chains and re-examine the market.

5.5. Suggestion

In summary, this paper makes the following recommendations for the development of NVIDIA Corp:

Firstly, monitor the market competition situation by monitoring the market and adjusting the relevant market strategies and behaviours in a timely manner to avoid being regarded as monopolistic or anti-competitive.

Second, try to enrich the diversity of its own suppliers to ensure that it can switch to an alternate supplier in time when a problem occurs with one supplier.

Third, establish a more diversified market structure to diversify geopolitical risks and pay more attention to appropriate intelligence to avoid possible risks.

6. Conclusion

In conclusion, with the development of the economy, technology, and society, new industries like semiconductors are flourishing with a dynamism that cannot be brought about by the traditional industries. NVIDIA, as a leader in its industry, has demonstrated this characteristic, so this paper hopes to summarise how such dynamism can be generated by analyzing the company. In the beginning of this paper, we introduced the development history of NVIDIA and analysed the status

and achievements of its main business. It then goes on to discuss the underlying reasons for its success by comparing it to its main competitors in the industry. Finally, it analyses NVIDIA's strengths, weaknesses, opportunities, and threats through SWOT analysis and makes relevant recommendations. The recommendations are centred around reaching out to more diverse suppliers to avoid supply chain problems, monitoring market developments to avoid antitrust investigations, and obtaining intelligence on hotspots to diversify geopolitical risks. As a leader in the semiconductor industry, NVIDIA, the company analysed in this paper, has drawn conclusions that are also relevant to other start-ups.

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