NVIDIA's Investment Feasibility and Weighted SWOT Model

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Abstract. As one of the leading enterprises in the semiconductor industry, Nvidia has many advantages and opportunities in the development process, but there are also many threats and challenges. In financial analysis, investors' research on the company's financial statements will help them fully understand the company's operating conditions. This paper will take Nvidia as an example, and propose an improved weighted SWOT model by analyzing the company's annual report, financial authority data, relative valuation, local government policies, media news and other factors. The output result of the model will represent whether the company is worth investing. The conclusion of this paper is that the negative coefficient of feedback in the model shows that Nvidia is not a good investment object in the short term. After verification, the model can provide investors with more rigorous and scientific analysis methods to avoid impulsive investment.

Keywords: SWOT Model; Company Valuation; Financial Investment; Investment Feasibility; Nvidia.

1. Introduction

As a leading enterprise in the semiconductor industry, NVIDIA pioneered accelerated computing to meet challenges that could not be solved. The company's work in artificial intelligence and computer graphics is affecting games, medical care, transportation, and other aspects. There is a profound impact on society (NVIDIA, 2022). Therefore, the possible contributions of this paper are mainly in three aspects. First, there are few articles on the analysis of Nvidia's financial report data in the past. This paper attempts to discuss the feasibility of investing in corporation of the semiconductor industry from the perspective of investors in three modules: financial strategy, relative valuation and SWOT model. Secondly, this paper improves the weighted SWOT model, which provides a reference for the subsequent analysis of the development of other companies. Finally, the result should provide some enlightenment to investors, which can help them to look at the changes in the company's market value rationally and avoid impulsive investment. In addition, although individuals can also use the improved weighted SWOT model for analysis, this paper believes that individual investors will be affected by subjective factors, so the most ideal analysis model should be conducted by team units.

2. Corporate Strategy

2.1 Business Background

NVIDIA focuses on making use of its graphics processing unit architecture to facilitate game development and demand of 3D models. In addition, Nvidia has created platforms for scientific computing, artificial intelligence, AI, data science, autonomous vehicles, AV, robotics, augmented and virtual reality, AR and VR and provide technical support. Moreover, NVIDIA's platform strategy is to combine hardware and systems, software, algorithms, libraries, and services to create unique value for related services and markets, such as creating an automatic driving platform for the transportation industry, supporting robots for factories, and providing better visual effects for the film and game industries.

2.2 Financial Strategy

As an industry with continuous development and technological innovation, semiconductor enterprises are always facing fierce competition. However, Nvidia's business is not limited to the semiconductor industry. In fact, during the COVID-19 pandemic, people's use of Internet services has increased by 60%, and the use of information systems will continue in the same way for some time to come (Pandey & Pal 2020). Nvidia's business in data processing/computing also began to emerge as people's demand for online business surged. Therefore, Nvidia defines its industry as a large and important computing intensive field in its 2022 10-K annual report. This part will focus on the specific content of Nvidia's financial report.

First, according to "Nvidia Annual Report", The company's revenue statement (Unit: million) is shown in the figure:

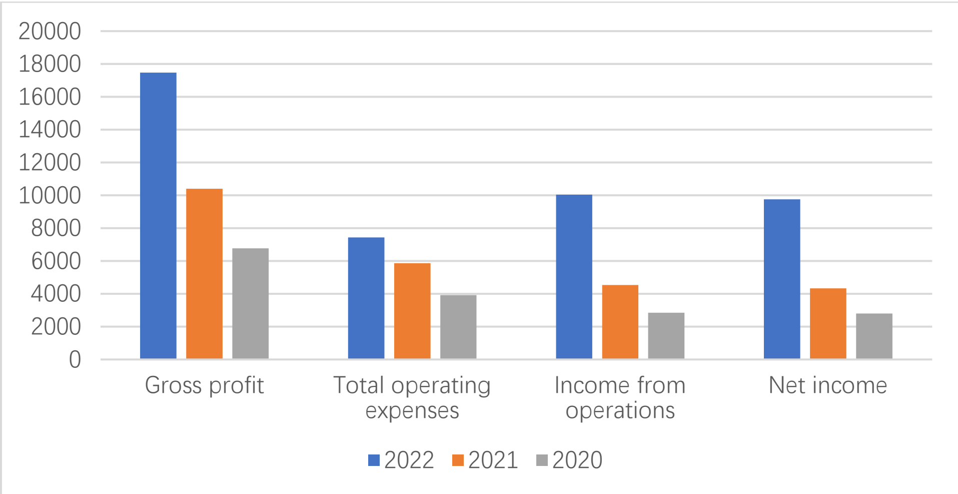

Figure 1. Nvidia's consolidated statements of income

Among them, Nvidia's net income consists of several components:

$$Net\ income = \ Income\ from\ operations + Other\ income\ net - Income\ tax$$

Then,

$$Income\ from\ operations = \ Gross\ profit\ \ - Total\ from\ operations$$

After determining the formula, the growth rate of each revenue/expenditure of the company is as follows:

Table 1. Nvidia's revenue and cost growth rate

Net income	9752	4332	2796
Growth rate	125.12%	54.94%	-32.48%
Total operating expenses	7434	5864	3922
Growth rate	26.77%	49.52%	16.48%
Income from operations	10041	4532	2846
Growth rate	121.56%	59.24%	-25.18%

In this table, Nvidia's net profit increased significantly compared with the past, reaching 125.12%. In contrast, the company's operating expenses grew very little, only 26.77% of the previous year, and the growth rate slowed to 0.5 times of the previous year. The conclusion of this part is that Nvidia's operating income is growing faster and faster, while the growth rate of operating expenditure is slowly declining. They are continuing to expand their business and reduce operating costs. The second place to be concerned is the balance sheet, because the balance sheet reveals the economic resources owned or controlled by the enterprise that can be expressed in currency.

In 2022, Nvidia's total assets are 44187 million, total liabilities are 17575 million, and total shareholders' equity are 26612 million. The growth trend is shown below:

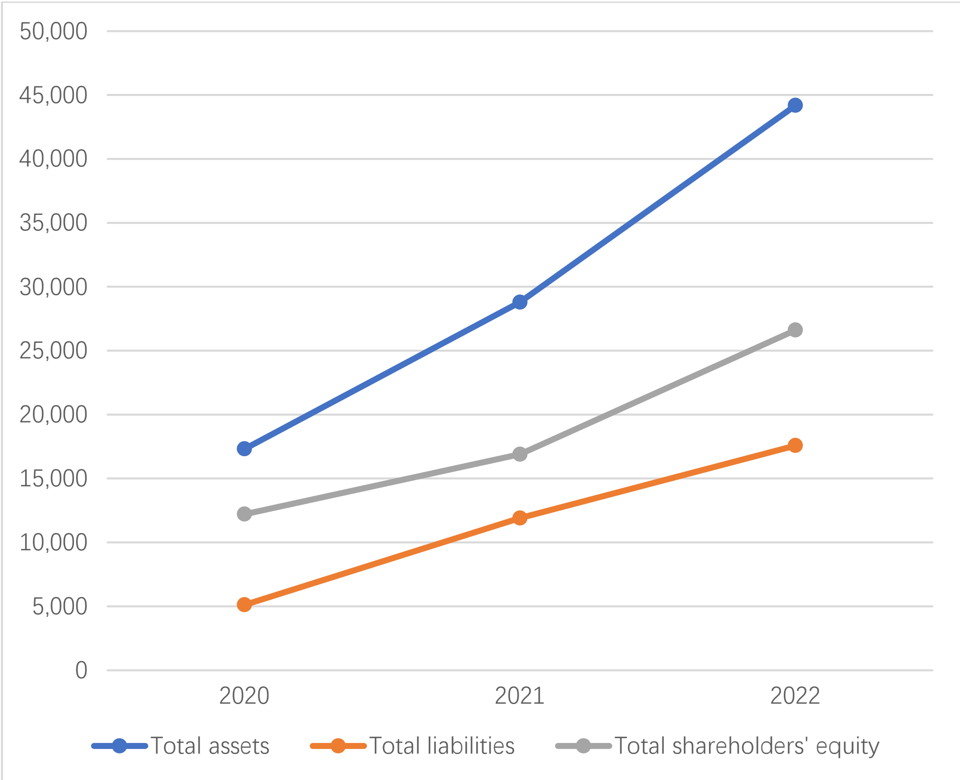

Figure 2. Nvidia's Balance sheet

The formular is:

$$Total\ assets = Total\ liabilities + Total\ shareholders'equity$$

Shareholders' equity is the amount invested by the owners of a company in its business. In general, Nvidia's assets, liabilities and equity increased by about 50% over the previous year, with shareholders' equity growing fastest. The higher ratio of shareholders' equity indicates that the amount of assets financed by shareholders is higher than the borrowed funds. This means Nvidia's financial position is stable, and it can be more flexible when the wave of economic or financial recession is coming.

In terms of details of the balance sheet, the growth rate of cash and cash equivalents was 1.35%, and the growth rate of marketable securities was 79%. However, there was no significant growth in intangible assets, so the growth rate of total current assets was 80% For debt, the largest increase was in long-term debt, which reached 84%. This may become a hidden danger in the future, but it is still lower than the increase of cash flow on the whole.

For Nvidia's revenue table divided by reportable segments, another interesting discovery is that Nvidia expanded its Compute and Networking business during the COVID-19 pandemic. In addition to the sales of NVIDIA Ampere architecture products, which originally had a strong development, which led to a 61% increase in graphics business, cloud computing services relying on this product also increased by 61%, which was only a negligible figure last year.

3. Industry Analysis

This part will compare the financial statements of several companies that are competitors of Nvidia horizontally to determine Nvidia's position and situation in the industry. In a large and important computing intensive field. Nvidia's Competitors include graphics processing, large Internet service companies, and suppliers of interconnection, switch and cable solutions. Then, this report will use the improved SWOT model to analyze it. This method adds the concept of coefficient to the original SWOT to determine the magnitude of each factor's impact on the company.

In the graphics processing business, Nvidia's main business is the development and sales of graphics processing units (GPUs). The most intuitive data should be the market value of enterprises in industries like NVIDIA, AMD, Intel and Broadcom. On the other hand, in addition to the semiconductor industry, Nvidia's data processing business has become the fastest growing part of the company's revenue, so Nvidia's competitors should also include Alibaba and Amazon. Because these companies, like Nvidia, are trying to expand their data processing business.

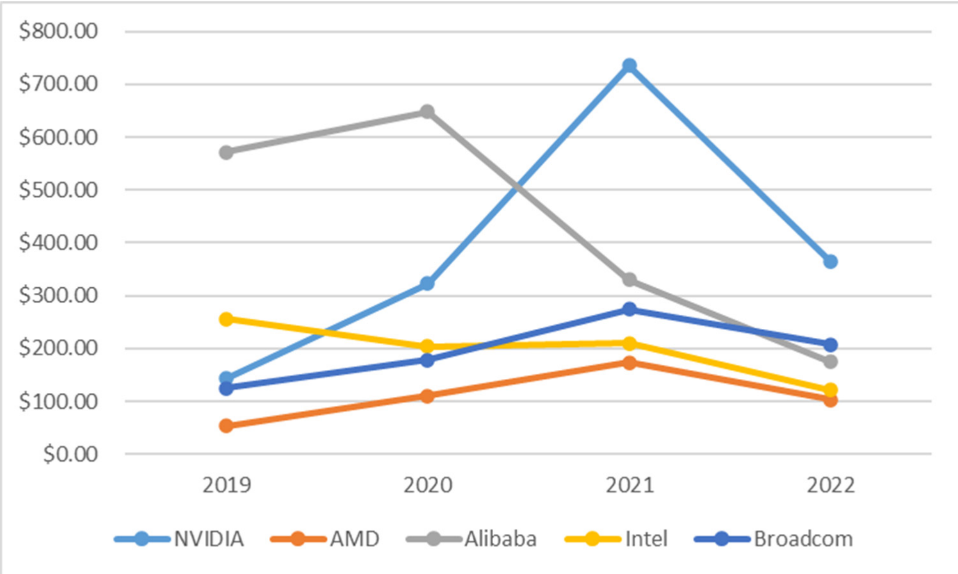

Figure 3. Market cap history of Industry

In 2022, all semiconductor industries are facing different degrees of recession, which can be found in the SOXX portfolio in this field.

Table 2. SOXX's revenue growth rate

Year	**2018**	**2019**	**2020**	**2021**	**2022**
Total Return (%)	**18.12**	**15.83**	**45.79**	**47.50**	**-27.84**

In this year, SOXX's return rate decreased by 27.84%. The P/E ratio at a low of 1.94. When the P/E ratio is lower than the average P/E ratio of 20-25, the target may provide good investment opportunities. This means that the semiconductor industry is at a low point and suitable for investment.

Moreover, the P/E ratios of Nvidia and AMD are 37.94 and 36.83 respectively, which is much higher than the P/E ratio of 1.90 of the indexes composed of American listed stocks in the semiconductor industry. A higher P/E ratio represents a better market performance of the stock, but investment risk will also rise, and the stock price may be overestimated. For investors, the lower the P/E ratio, the more space for investment.

For the balance sheets of major companies, AMD's debt growth is special, because the current part of the company's long-term debt has increased from zero to 312 million. This refers to the amount of long-term debt that needs to be repaid within a year, such as mortgage loans. This is a challenge to the company's solvency. Although AMD's cash flow also increased by 59%, its debt increased by 75% (AMD 2022). As a competitor of Nvidia, the company's situation is not optimistic. Although Intel's long-term debt is gradually decreasing, its total debt is still three times of its assets, and the difference is supported by Additional pay in capital (Intel 2022). This means that the company is constantly selling new shares to recover funds, resulting in a continuous decline in share prices. For Alibaba, the reduction of short-term investment and real estate has brought significant cash flow to the company, which has led to a slight decrease in the company's total assets and almost the same change in liabilities (Alibaba 2022). Finally, the situation of Broadcom is like that of Alibaba. There is no improvement or regression, but the current port of long-term debt has decreased significantly (Broadcom 2022). This means that the company's cash pressure will drop next year. At the same time, Nvidia also has the burden of $110 billion of senior notes outstanding (Nvidia 2022).

In addition, there are some news in the industry for reference recently, such as the supplier EVGA and Nvidia stop cooperating. The company also believes that Nvidia provides its Founders Edition graphics card at a lower price than EVGA products, thus weakening its competitiveness (Dinsdale 2022). In addition, with the increasing demand for high-end chips from the Metauniverse, this is an opportunity for the semiconductor industry (Arti 2022). At the same time, Nvidia is also actively cooperating with new energy vehicle brands, such as Xpeng and Volvo (Burke 2021). The Economist

The last part needs to pay attention to the policies in the industry. The uncertainty of the Federal Reserve's continuous interest rate increase led to the overall decline of the NASDAQ index (Samantha 2022), because the rise in interest rates made investors more inclined to deposit their money in the bank rather than take it out for investment. Secondly, due to the war between Russia and Ukraine, Nvidia and many western companies stopped their business in Russia (Kan 2022). Meanwhile, the U.S. government ordered Nvidia to restrict the sale of some high-end chips to China (McGregor 2022).

4. SWOT Analyzes

After completing the analysis of the industry and financial strategy, the report will rate the collected data in order to establish the SWOT model. Although SWOT analysis is widely used as a strategic planning tool, it does have its limitations. For example, some capabilities or factors of an organization can become strengths and weaknesses at the same time, and how to determine the impact of each factor. Therefore, the improved model will give all factors a weight for investors who can focus on more important factors.

The rating rules need to follow some regulations, first, the debt ratio rating. Many investors want a company's debt ratio between 0.3 and 0.6. From a purely risk perspective, a debt ratio of 0.4 or lower is considered better, while a debt ratio of 0.6 or higher is more difficult to borrow money (Ross 2022). Nvidia's figure is 0.45, which is slightly higher, so it is rated as Level 1 in the risk. The impact of policies on the industry is often large, so it is generally 4-5 levels. Finally, the information obtained through the news field belongs to 1-4 levels of content, because the news is uncertain and false (Brand et al. 2022), but the company's abnormal earnings will be affected by the news (Alves & Silva 2020). This also includes the company's own news, such as Nvidia's announcement of the upcoming new products may cause the company's share price to rise (Andrew 2022). After collecting enough items, establish a chart to determine whether the positive factors of the company are greater than the negative factors.

This is just an example of a personal project. For a single investor, there is a potentially effective relationship between investor sentiment and total stock returns (Mbanga et al. 2019). In addition, investors in different industries may have different behavior patterns. For example, in the emerging era of e-commerce, its corresponding investors were younger, more unconstrained and impulsive (Hunter&Kemp 2004). Therefore, Therefore, this paper believes that the ideal improved SWOT should be obtained by a professional analysis team through anonymous voting to eliminate the impact of individual subjective factors on the model weight. In addition, every factor that may affect the company's value should also be calculated in detail. For instance, how much of Nvidia's total sales were accounted for by the businesses that were shut down due to the Russian Ukrainian war. This will provide more rigorous data support for model weights.

4.1 Strengths

- Level 1:

  - Nvidia in 2022 Patent 300 ® List ranked 163 (HARRITY 2022)
- Level 2:
  - Excellent net income growth
  - Substantial asset growth
- Level 3:
  - Top GPU products coming soon
  - Cooperation with new energy vehicle industry
- Level 4:
  - NVIDIA holds 90% of the market share in the field of supercomputer accelerators, and cloud data centre has become Nvidia's largest business (Jennewine 2021).
- Total: 19

4.2 Weaknesses

- Level 1:
  - High operating costs caused by the company's offices in more than 50 locations around the world
- Level 2:
  - $110 billion of senior notes outstanding
  - Supplier EVGA and Nvidia stop cooperating
- Level 3:
  - The reform of Ethereum has reduced the demand for high-end chips
  - Losses caused by US dollar appreciation and foreign exchange fluctuation
- Level 4:
  - The continuous interest rate increases of the Federal Reserve led to the overall decline of the NASDAQ index
  - Stop sales to Russia due to Russia Ukraine war
- Total: 19

4.3 Opportunities

- Level 2:
  - Excellent net income growth
  - Substantial asset growth
- Level 3:
  - Market opportunities brought by new product sales
  - Cooperation with new energy vehicle industry
- Level 4:
  - Metaverse's demand for high-end chips
  - The government's green drive provides an opportunity for the U.S. state and federal governments to purchase Nvidia products (MacPhail 2022)
- Total: 18

4.4 Threats

- Level 1:
  - High P/E ratio
- Level 2:
  - Legal and policy implications in different countries or regions
  - The irregular supply of new products has led to fluctuations in the sales volume over a period.
- Level 3:
  - Losses caused by US dollar appreciation and foreign exchange fluctuation
- Level 4:
  - The reform of Ethereum has reduced the demand for high-end chips

- Level 5:
  - The US government has restricted the company from selling some advanced chips to China
- Total: 17

$$Sum: (Strengths + Opportunities) - (Weaknesses + Threats) = 19 + 18 - 19 - 17 = 1$$

According to the data, the final trend chart is as follows:

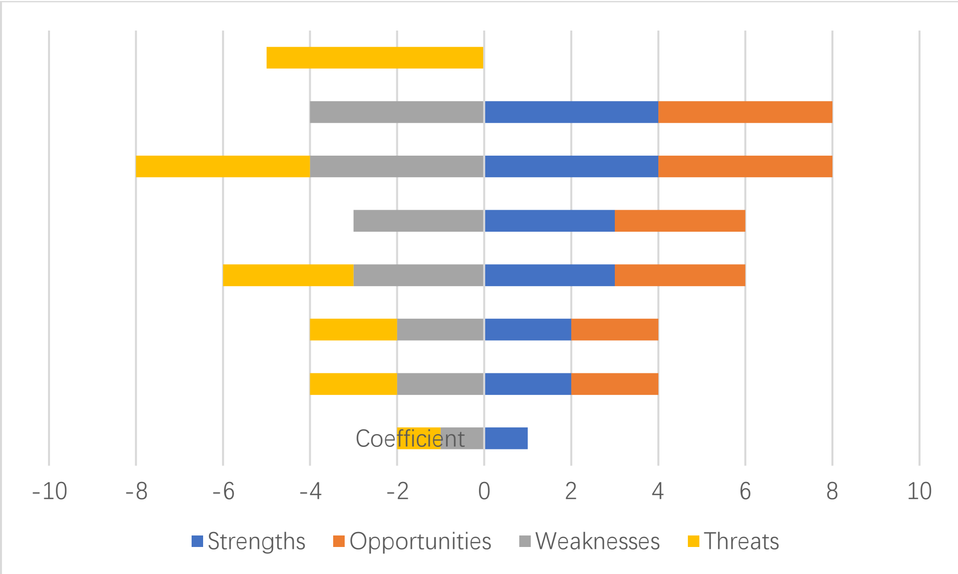

Figure 4. Improved SWOT model of Nvidia

The final coefficient of the model is 1. The higher the positive coefficient, the more influential the company's advantages and opportunities are than its weaknesses and threats, and it is worth investing.

5. Valuation

This section will use the relative valuation method to determine whether Nvidia is undervalued or overvalued in the industry. The table is as follows, all data are from Yahoo Finance and annual financial report:

Table 3. Industry relative valuation

Valuation	P/E ratio	EV/EBITDA
Nivida	53.36	42.88
AMD	46.85	20.94
Alibaba	34.31	1.98
Intel	9.40	5.26
Broadcom	22.37	13.29
Average	33.26	16.87
EPS | EBITDA	0.51	0.68
Valuation	16.96	11.45

$$Result: 16.96 < 53.36$$
$$11.45 < 42.88$$

The price to earnings ratio of stocks refers to the price of each stock market divided by the earnings per share, which is usually used as an indicator of whether stocks are cheap or expensive. Enterprise value/EBITDA is a common valuation multiple used to determine the fair market value of the company. According to the calculation results, Nvidia's current value is seriously overestimated. This should be considered a Level 4 threat.

Finally, according to "Yahoo Finance 2022", this report will compare the beta indicators of five companies. Beta (β) is a measure of the volatility or systemic risk of a security or portfolio relative to the entire market (usually the S&P 500 index). Stocks with beta values higher than 1.0 can be interpreted as more volatile than the S&P 500 index (Kenton 2022).

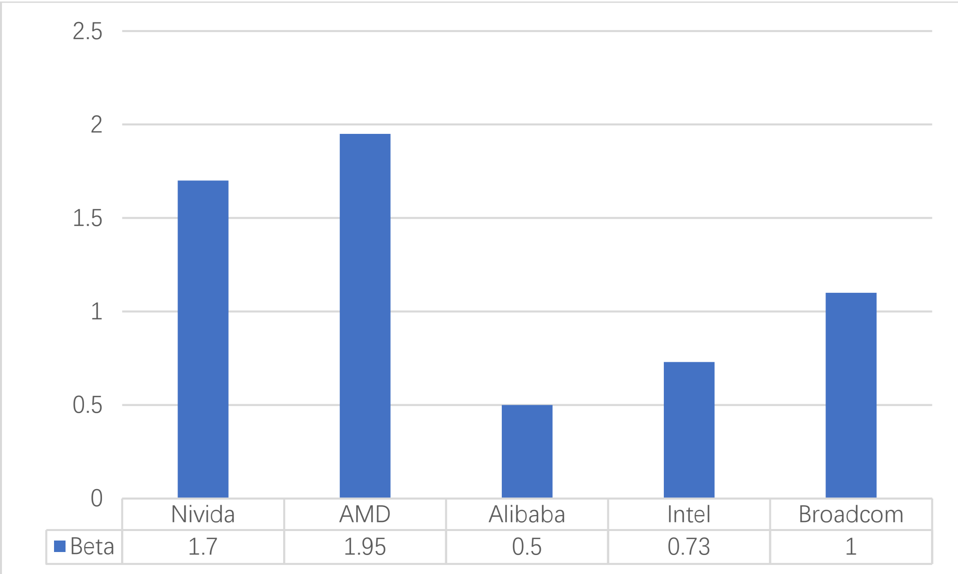

Figure 5. Industry Beta comparison

According to the results, Nvidia's stock fluctuates greatly, second only to AMD, which is judged to be one of the reasons why it is not suitable for investment. This should be considered a Level 3 threat.

Combined with the newly added relative assessment results, the weight of some threats in the SWOT model has increased significantly, and the new weight should be updated to the following values:

$$SWOT\ weight: (Strengths + Opportunities) - (Weaknesses + Threats)$$
$$= 19 + 18 - 19 - 24 = -6$$

6. Conclusion

This paper collects and analyzes NVIDIA's business strategy, annual financial report, market value growth rate, P/E ratio, EBITDA, policy impact, media news and other relevant information, providing sufficient and effective parameters for the improved weighted SWOT model. The output of this model is a negative coefficient caused by more risks. Therefore, the report concluded that Nvidia's threats and weaknesses outweighed its strengths and opportunities. Nvidia is not suitable for investment at present.

Finally, the weighted SWOT model shown in this paper still has room for further improvement. As mentioned above, anonymous voting is conducted in the analysis team to eliminate the impact of individual subjective factors on weight assignment. This paper believes that this model can give inspiration to the future investment method to encourage impulsive investors to more rigorously and scientifically analyze whether a company should be invested.

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