Research on the investment value of BYD based on SWOT, financial and valuation methods

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Abstract. Nowadays, the climate problem is severe, widely arousing global concern. Environmental protection has become a guide to action in people's daily life. Meanwhile, the international situation is relatively grim, various countries has begun to pay attention to the sustainable development issues and build new energy systems to guarantee energy security and stability. Therefore, the value and development of new energy vehicles have received widespread attention. This article takes BYD company as a case study, applying SWOT, financial and valuation analysis methods to do the specific analysis for the investment value of the new energy vehicle industry. Research shows that BYD company reveals the human resources and technical strength occupy an advantage. In addition, recent years, the rapid growth in sales has also brought good profit margin, indicating good future development potential. However, the imperfection of related supporting facilities, peer competition and relatively low solvency may bring threat to the future development of the enterprise. This article can help investors get a more comprehensive understanding BYD's investment value and development prospects, providing reference for their investment. It is also beneficial to the entire new energy industry to have a better understanding of the internal and external business and sales environment.

Keywords: BYD; SWOT; investment value.

1. Introduction

Presently, the problems of global warming and environment get tougher. With the increasing environmental awareness, low-carbon living is widely respected and practiced. In recent years, due to the international conflicts, the energy security is very important for the country's development. Therefore, clean and efficient new energy sources have been developed rapidly. The report of 20th National Congress of the Communist Party of China proposed to promote carbon peak and carbon neutrality to push forward China's reform and development of energy actively and steadily. Accelerating the construction and improvement of energy system, which is also compatible with China's active promotion of a community with a shared future for mankind and adherence to the green development [1].

Traditional fuel vehicles caused energy consumption and environmental pollution, making China actively promote the development of the automobile industry in the direction of new energy. To encourage more automobile companies to transform and standardize their development models in the direction of new energy, the government published relevant policies. In 2001, 2007, 2016, 2020, the "863 Plan", the "New Energy Vehicle Production Access Management Rules", the "Double Points" policy, the "New Energy Vehicle Industry Development Plan (2021-2035)" were issued respectively. These policies continue to regulate the development direction of China's new energy vehicle industry from dimensions of technological development, industry requirements and standards and industrial development. At the same time, in order to stimulate consumers' desire to buy, promoting consumption, and some subsidy policies were introduced as well. In 2023, the reduction and exemption policy for the purchase tax of new energy vehicles was extended and optimized. New energy vehicles purchased between January 1, 2024 and December 31, 2025 will be exempted from vehicle purchase tax of no more than 30,000 yuan per vehicle. New energy vehicles purchased between January 1, 2026 and December 31, 2027 will be exempted from vehicle purchase tax of no more than 15,000 yuan per vehicle [2]. These policies promote the China's new energy development in the way of stimulating consumption.

In order to solve “difficult charging”, the government vigorously supports the construction of high-quality charging infrastructure, including diversified charging location selection, efficient charging pile equipment, and economical charging costs. As of the end of January 2024, the cumulative number of charging infrastructure in China was 8.861million units, a year-on-year increase of 63.7% [3]. China has become the largest public charging infrastructure service system around the world, the number of public charging piles accounts for more than 50% of the global total [4]. Therefore, China has laid a solid foundation for the better development of new energy vehicles.

According to data from the China association of Automobile Manufactures, in 2023, China’s automobile sales was 20.094 million units, a year-on-year increase of 12%, of which new energy vehicles sales was 9.495 million units, ranking first in the world for 9 consecutive years, a year-on-year increase of 37.9%, and a market share of 31.6% [5]. In recent years, the new energy vehicles development trajectory can also see its good development momentum. In 2011, the sales volume of new energy vehicles was only 8,159, the production and sales volume of new energy vehicles exceeded 1 million in 2018, the output of new energy vehicles exceeded 10 million in February 2022, and the output of new energy vehicles exceeded 20 million in July 2023.It can be seen that China's new energy vehicle market is developing rapidly.

BYD, as a leading enterprise in China's new energy automobile industry. Its development momentum is good. Therefore, this paper takes BYD Company as an example to analyze the significance of China's development of new energy vehicles, and uses SWOT analysis, financial analysis, valuation analysis and other methods to judge the investment value of the enterprise.

In the existing research, relatively rich research has been carried out on new energy vehicles. For example, in terms of the significance of the development of new energy vehicles, Shen Hongping and others believe that it is conducive to expanding domestic demand and ensuring the employment rate of our country and stabilizing the economic market. The construction of automobile power is beneficial to our country. It is beneficial to promote the development of related industries and improve the vitality of industrial innovation. It is helpful to reduce our dependence on oil import and maintain our energy security [6]. On the analysis of the current situation of new energy vehicles, Guo Kun made use of SWO for analysis, believing that the development of new energy vehicles in China should first continue to increase subsidies and improve relevant policies as soon as possible. Secondly, foreign advanced technology should be combined with independent research and development innovation to create new energy vehicles with their own competitiveness. Finally, the construction of supporting infrastructure should be strengthened to lay the foundation for good development [7]. Chen Li also used SWOT method to analyze BYD, and believed that BYD should adopt three strategic perspectives of cost leadership, differentiation and centralization to find a suitable strategic positioning [8]. Some other studies use financial analysis to carry out related research. For example, Li Sifan used Dupont analysis method to conduct financial analysis of BYD Company from the perspectives of return on shareholders' equity, return on total assets, net operating rate, total assets turnover and average equity multiplier. They found that BYD's current financial situation has both advantages and disadvantages [9]. Ma Jiahui did the financial analysis from the solvency, operating capacity, profitability and other aspects [10]. In addition, some studies use valuation analysis. For example, GAO Lingling used the value assessment model of ESG factors and built an EVA model to study BYD's enterprise value assessment, and believed that the model was closer to the real market state, and the deviation rate between the valuation and the actual value would be reduced [11]. Zhang Tongqi used the technical means of FCFF and B-S model to evaluate the value of BYD, and came to the conclusion that the combined model of free cash flow model and real option model is suitable for BYD company valuation [12].

2. Method

2.1. SWOT Analysis

SWOT analysis was put forward by K. Andrews, professor of corporate strategic decision of Harvard Business School, in the 1960s. Due to its clear, concise and specific characteristics, SWOT analysis is widely used in various fields of management. Its biggest advantage is that it can analyze the core factors that can most affect the strategy.

SWOT analysis is mainly carried out from four aspects: Strengths, weaknesses, Opportunities and Threats in the external environment [13].

2.2. Financial Analysis

Financial analysis is mainly used to evaluate the financial condition of an enterprise. This paper mainly analyzes the financial status of BYD Company from the aspects of sales, profit rate and solvency. The sales situation mainly analyzes the sales situation of BYD enterprise from 2005 to 2022 and explores the overall sales track. Profit rate is an important indicator used to measure the profitability and profit level of enterprises, reflecting the income obtained by enterprises when selling goods or services. This paper will focus on the analysis of BYD's operating gross profit margin, operating net profit margin, operating profit margin and cost expense profit margin in 2018-2022, and then analyze the company's profit situation. Solvency refers to the ability of an enterprise to repay long-term debt and short-term debt with its assets, which is an important symbol reflecting the financial status and operating ability of an enterprise. According to the different time periods, it can be divided into short-term solvency and long-term solvency. Short-term solvency refers to the ability of an enterprise to repay its current liabilities with current assets, which reflects the ability of an enterprise to repay its daily maturing debts. This paper mainly analyzes it from the current ratio, in which the current ratio refers to the ratio of total current assets and total current liabilities. The formula is: Current ratio = total current assets ÷ total current liabilities ×100%. This paper mainly analyzes it from the asset-liability ratio, in which the asset-liability ratio refers to the ratio of total liabilities to total assets. The formula is: asset-liability ratio = total liabilities ÷ total assets ×100%.

2.3. Valuation analysis

Valuation analysis is mainly used to evaluate the intrinsic value of a company to give specific investment recommendations, including absolute valuation method, relative valuation method and other valuation methods. This paper mainly focuses on the relative valuation method, from the P/E ratio, P/E ratio of earnings growth and market valuation of BYD Company’s development in the past year.

P/E ratio. The P/E valuation method is calculated as follows: P/E = stock price/earnings per share.

Price-to-earnings ratio to earnings growth. The Price-to-earnings ratio to earnings growth is calculated as PEG= P/E/earnings per share compound growth over the next three (or five) years.

Price Cash Flow Ratio. The formula for calculating PCF is: PCF = market capitalization/net cash flow from operating activities.

3. Results and Discussion

3.1. SWOT analysis results

3.1.1. Strengths

1. Clear market positioning. BYD enterprise development ideas are clear, with a clear and successful market positioning. First of all, fully grasp the consumer psychology and purchase needs of low-end customers, the appearance of the atmosphere, the right price and good service to meet the needs of the public for car purchase elements. After establishing the brand image, gaining a good

reputation and occupying a large market share, I began to study high-end products to expand the brand audience and consumer market.

2. Reasonable cost control strategy. In the automobile manufacturing industry, many domestic manufacturers will directly adopt the more mature production mode of foreign countries, that is, to buy automated production lines and parts for assembly, and do not have their own innovative technology. BYD adopts the world's unique vertical integration strategy to independently complete the design and manufacturing of products, which maximizes the use of resources, effectively reduces the intermediate links of suppliers, saves costs, and creates a cost-effective advantage of products [14].

3. Excellent corporate culture and talent composition. BYD enterprise has been listed in the forefront of the global new energy vehicle field, always uphold the concept of "technology is king, innovation is based", and maintain a high level of technology research and development investment. Up to February 18 this year, the company has more than 90,000 R&D engineers, the global cumulative patent application more than 48,000 hectares, authorized patents more than 30,000 hectares, an average of 27 patents per day, patent authorization 15, and won 4 patent awards.

4. Diversification of financing channels and Stable financial position. From 2002 to 2016, Samsung Electronics provided BYD with an investment of 3 billion yuan, while Guo Lian Securities, Jiu Yi Capital’s undisclosed large investment and public offering provided financing of 1.422 billion yuan and 1.637 billion Hong Kong dollars, respectively.

3.1.2. Weakness

1. Battery barrier problem. The main technical barriers of new energy vehicles focus on the driving force, and the selection of driving force focuses on the electric power driving force, therefore, the battery has become the most important part of new energy vehicles. However, the battery is greatly affected by the environment, climate, user habits, etc., so its battery life and charging problems are problems that every new energy vehicle company needs to face and overcome, and therefore it has become a major problem that is difficult to break through in the global new energy vehicle industry.

2. The complete degree of supporting facilities is low. New energy vehicles are powered by electricity, so charging is basic for maintaining their normal operation. However, car charging has a large demand for electricity, so it is impossible to use mobile power for convenient charging, so it is necessary to establish a separate charging site, which will increase the cost to a certain extent, and considering the sustainability of long-distance travel, Finding the right place to spend time charging will undoubtedly affect consumers' travel convenience and increase the psychological burden, thus reducing the demand for such cars. At the same time, China's level of improvement of such infrastructure is not high, the construction of charging pile sites is not evenly distributed, and there is fewer charging equipment in rural areas or economically underdeveloped areas, so car sales also show the situation of regional distribution.

3. BYD sells in limited regions. At present, although BYD automobile has been in the global field of new energy vehicles, but its consumer market is mainly in China, foreign markets are still occupied by other new energy vehicle brands, the international market is difficult to open, indicating that the enterprise in the sales strategy planning, technical level, brand awareness and other aspects are still lacking.

3.1.3. Opportunities

1. Government’s policy support. In recent years, in order to implement the concept of green development, create a low carbon society, help global environmental governance, the state vigorously support the new energy industry and introduced many related policies, for new energy vehicle enterprises, created a good external business environment, is conducive to increasing the enthusiasm of production and innovation, and develop the overall technical level of new energy vehicles in our country; For consumers, tax relief and partial preferential policies can effectively stimulate consumer demand, open up the consumer market and increase sales.

2. Consumer groups are large and residents are becoming more aware of environmental protection. China's population base is large, with the continuous development of the economy, the consumption power of residents is also increasing, therefore, the number of potential consumers. At the same time, residents' environmental awareness will also affect the choice of car purchase to a certain extent, making the demand for new energy vehicles continue to increase, and BYD, as a leading enterprise in China's new energy vehicle market, sales will increase accordingly.

3. Charging facilities continued to be improved. In order to further solve the charging problem of new energy vehicles, the development of the charging facility network in the urban public service field funded by the government has basically taken shape, and the charging equipment has basically adapted to the development needs of new energy vehicles. Priority is given to the establishment of public charging devices in airports, subway stations, commercial streets, parking lots, residential areas and other occasions with high charging demand, which greatly solves the problem of "difficult charging".

3.1.4. Threats

1. Rising raw material prices. In recent years, the price of battery-grade lithium carbonate and lithium iron phosphate in power battery raw materials has risen sharply, especially the price of battery-grade lithium carbonate has exceeded 500,000 yuan per ton. The rapid growth of raw material prices will lead to an increase in battery manufacturing costs, and the profits and production of new energy vehicle companies will also be seriously affected [15].

2. The threat of conventional oil vehicles. For general consumers, new energy vehicles are emerging products, and their technical maturity, safety features, ease of use, and maintenance are not as good as traditional oil vehicles. Although people's environmental awareness will affect the choice of car purchase, there will still be many consumers choose traditional oil vehicles under comprehensive consideration.

3. Competition among peers. More and more car companies began to develop new energy vehicles, if you want to maintain competitiveness, you need to strengthen the development of technology, performance and other aspects on the basis of price advantage, which puts forward higher requirements for the development of car companies. In addition, many foreign new energy vehicle brands occupy the consumer market in China, and are more favored by consumers because of their longer development history and higher financing and technical level. These are important factors for BYD enterprises to choose effective investment strategies.

3.2. Results of financial analysis

3.2.1. Sales Situation

According to BYD enterprise data, car sales of BYD from 2005 to 2022 are shown as followed: 20,000 in 2005, 60,000 in 2006, 100,000 in 2007, 170,000 in 2008, 448,000 in 2009, 520,000 in 2010, 449,000 in 2011, and 420,000 in 2012 470,000 units in 2013, 370,000 units in 2014, 380,000 units in 2015, 412,000 units in 2016, 355,000 units in 2017, 500,000 units in 2018, 451,000 units in 2019, 416,000 units in 2020, 730,000 units in 2021 and 1.869 million units in 2022. As can be seen from Figure 1, during 2005-2020, car sales of BYD showed a fluctuating upward trend, and the overall growth rate was slow, but during 2020-2022, car sales of BYD increased rapidly, even exceeding one million. It can be seen that the future development trend of the enterprise is so benign, and the development potential is great [5].

Fig. 1 BYD's car sales from 2005 to 2022 (unit: 10,000 vehicles).

3.2.2. Profit Margin

As can be seen from Table 1, the operating gross profit margin of BYD was generally maintained at about 15% from 2018 to 2022.But if you want higher profits, you should also look at the company's operating net profit rate and operating profit margin. Although compared with 2018, both the operating net profit rate and operating profit margin in 2022 have increased, they have also experienced a relatively large reduction, which shows that the company's profit level is unstable in the past five years, but the situation has improved after 2022.The five-year cost margin of BYD has gradually improved. Therefore, overall, although operating margin of BYD is higher, its cost expenses and the increase in the number of shares issued also lead to slow earnings growth.

Table 1. Comparison of BYD's operating net profit margin and other indicators (unit: %).

	2018	**2019**	**2020**	**2021**	**2022**
Gross operating margin	16.4	16.29	19.38	13.02	17.04
Operating net profit margin	2.73	1.66	2.7	1.41	3.92
Operating margin	3.26	1.81	4.52	2.14	5.08
Cost to expense margin	3.58	2.02	4.86	5.08	5.51

3.2.3 Solvency

(1) Short-term solvency

The current ratio of BYD Company in 2018-2022, although there are small fluctuations, generally showing an upward trend. It can be seen from Table 2 that after 2020, the company's current ratio grows faster, mainly because the growth rate of the company's current assets is greater than that of its current liabilities after 2020. Generally, in order to maintain the safety of business operations, the current ratio needs to be kept within a certain range, and the international community believes that it should be greater than 2. With the increase of the current ratio, the solvency of the enterprise is also enhanced, which means that the security level of the company is higher. Although the current ratio of BYD is less than 2, its growing solvency is increasing. Relevant data also give that the reference current ratio of the automotive industry is 1.1, so the current radio of BYD has advantages compared with the same industry, indicating that the enterprise has a good short-term debt repayment ability [16].

(2) Long-term solvency

For enterprises, a higher debt ratio means a higher asset-liability ratio. At this time, the main body of liabilities is long-term liabilities, which will increase the debt burden of the company and lead to financial risks. However, if the value of shareholders' equity is higher than liabilities, that is, the asset-liability ratio is reduced, which means that the assets of the company are more stable, and the financial risks of creditors will also decrease. It can be seen from Table 2 that the asset-liability ratio of BYD Company from 2018 to 2022 is relatively high, reaching the highest point of 75.42% in 2022, indicating that the company's long-term debt ability is weak, which is related to the increase of liabilities caused by the company's eagerness to expand in recent years, so its financial risk is relatively high.

Table 2. BYD's solvency indicators from 2018 to 2022.

	2018	**2019**	**2020**	**2021**	**2022**
Current Ratio (%)	1.33	1.50	1.44	1.76	2.13
Debt-to-asset ratio (%)	68.81	68.00	67.94	64.76	75.42
Current assets (100 million)	833.8	847.1	932.7	1644.9	2831.1
Current liabilities (100 million)	333.6	338.7	419.4	937.6	1783.6

3.3. Valuation Analysis

Table 3. BYD's valuation analysis indicators for the past year.

	2023/4/28	2023/5/31	2023/6/30		2024/1/31	2024/2/29	2024/3/29
PE	37.35	37.03	37.70	……	17.33	19.41	19.68
PEG	0.31	0.30	0.31		0.20	0.23	0.23
PCF	5.20	5.15	5.24		3.37	3.77	3.48

3.3.1. Price/Earnings Ratio (PE)

It can be seen from the combination of Table 3 and Figure 2 that the PE of BYD Company is relatively high, which may reflect that the current market value of BYD Company is too high and the market risk is high. But to a certain extent, it also shows that investors recognize the potential of the company and believe that there are investment opportunities. In addition, the PE value has shown a decreasing trend in the past year, which can reduce the possibility of enterprises being overvalued to a certain extent [17].

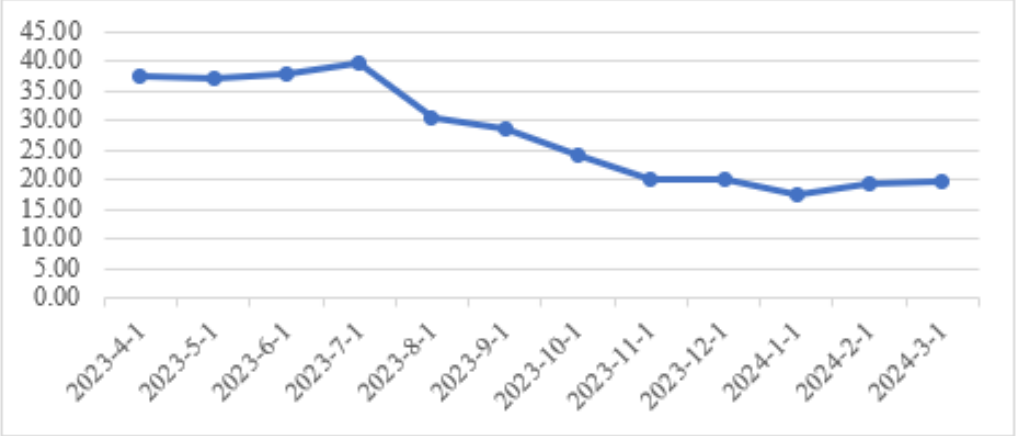

Fig 2. BYD’s PE in the past year.

3.3.2. Price-to-earnings ratio to earnings growth (PEG)

Combined with Table 3 and Figure 3, it can be seen that the PEG value of BYD Company in the past year is relatively stable and between 0.25-0.3, which is far less than 1, and is in an undervalued state. Therefore, the company's stock has good development potential and investment value.

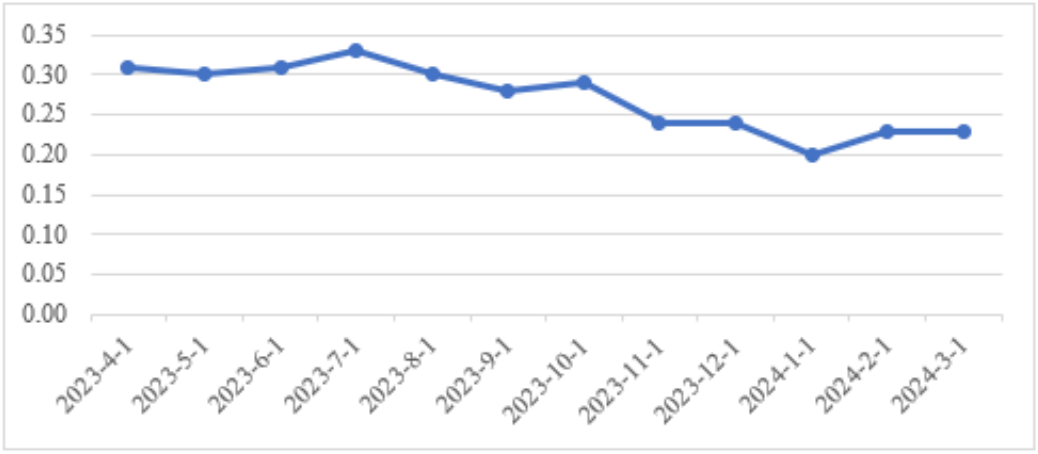

Fig. 3 BYD’s PEG in the past year.

3.3.3. Price Cash Flow Ratio (PCF)

Combined with Table 3 and Figure 4, it can be seen that from April to July 2023, the market cash rate shows a gradual growth trend, increasing from 5.20 to 5.52, which may mean that the company's

financial situation has problems and the investment risk has increased. But then the market rate has generally shown a downward trend, which shows that the company's cash flow situation is gradually improving, and the operating pressure will be reduced.

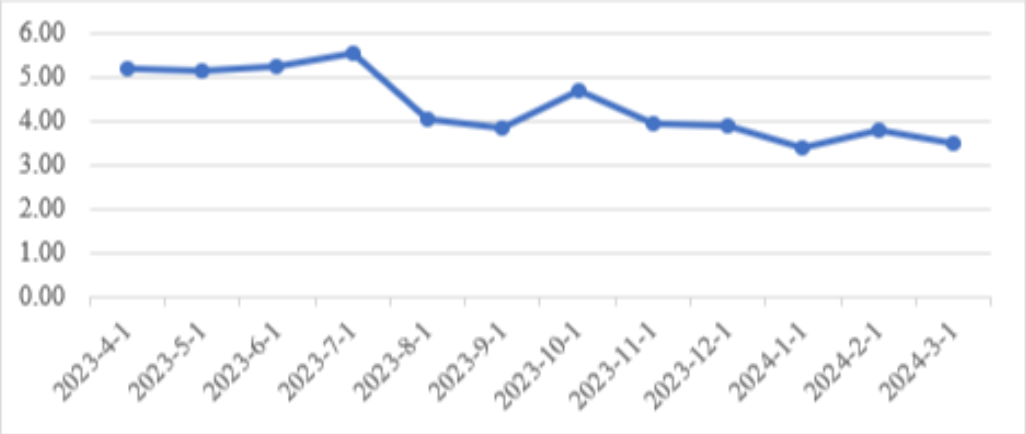

Fig. 4 BYD's PCF in the past year.

4. Conclusion

This paper uses SWOT analysis to analyze the advantages and disadvantages of BYD's development of new energy vehicles. After that, the financial analysis shows that although BYD has shortcomings in repayment ability, which is mainly due to the sharp increase in liabilities caused by the company's eagerness to expand in the rising stage, BYD has a good momentum of development in recent years from the perspective of sales volume and profit margin, with a fast growth rate of sales volume and high operating profit margin, but the operating cost of the company is constantly rising. It may also affect corporate profits in the future. Finally, the valuation analysis is carried out, and the three indicators of BYD Company's price-earnings ratio, price-earnings ratio relative to earnings growth ratio and market capitalization ratio in the past year are analyzed. Although a high price-earnings ratio may mean that the company is overvalued, it also slowly declines and is very close to the normal level of 20. At the same time, the PEG value and PCF value are combined. In general, the company is developing towards better development potential, more favorable investment value, more stable cash flow situation and less operating pressure, so the company's future development prospects are relatively good, with long-term investment value.

The conclusions of this paper have three main implications. 1. Although BYD is a leading enterprise in the new energy automobile industry, its technological development level is still relatively low compared with other enterprises. Therefore, in terms of scientific and technological research and development, the company should formulate reasonable development strategies to improve operational efficiency. In addition, we should pay attention to the cultivation of talents, carry out targeted research, and strengthen the core competitiveness. 2. BYD's long-term solvency is insufficient. Although its operating income has been rising in recent years, excessive debt will affect the company's operating safety and investors' confidence in investment. With the continuous improvement of China's new energy system construction, the state's financial subsidies may be reduced accordingly, and the company's financial stability will be affected to some extent. While companies should seize the opportunity to develop their scale, they should also develop a sound growth strategy and not rush to success. 3. At present, the main sales market of BYD's new energy vehicles is still China. In the future, BYD should actively expand foreign markets and improve its revenue level. 4. Improve infrastructure construction. At present, the main existence of new energy vehicles is the charging problem, and many new energy vehicle companies have their own exclusive charging facilities or power change equipment to provide endurance services for buyers. BYD can also carry out independent charging facilities construction, specifically for its brand of new energy

vehicles, which can not only improve customer satisfaction, promote sales, but also better study the problems of their own product charging and timely adjustment.

Although this paper has made an in-depth analysis of the investment value of BYD from various aspects, the analysis mainly focuses on the company's fundamentals and market valuation, without technical analysis of the stock, and lacks comparison with other companies in the same industry. Therefore, the existing limitations should be taken into account and more factors should be comprehensively considered when making investment decisions in the future. We also hope that there will be more analysis of the technical aspects of the stock and comparisons with other companies in the industry in the future.

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