

Financial Statement Analysis of the New Energy Vehicle Enterprise—BYD

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Abstract. With the increasingly severe global climate and energy issues, promoting the development of the new energy vehicle industry is becoming more and more important for governments around the world. As a leading new energy vehicle enterprise in China and even in the world, BYD plays an important role in the automobile market. This article selects BYD as the research object and analyzes the company's solvency ability, profitability, and growth based on its financial statement data from 2018 to 2022. By using horizontal comparative analysis and DuPont analysis, it is found that BYD has very excellent growth ability and good profitability, but it is weak in solvency ability and has potential liquidity risk. BYD should further enhance its profitability by increasing the profitability of its single vehicle in the future, and try to reduce its financial leverage as much as possible while maintaining its current high-speed growth trend to solve the problem of its weak solvency ability.

Keywords: New energy vehicles, BYD, financial statement analysis, DuPont analysis.

1. Introduction

As global climate issues and energy problems become increasingly severe, countries around the world are actively seeking countermeasures to solve the problems. Reducing carbon emissions and accelerating energy transformation are considered two important measures. As the world's largest development country and the second largest developing economy, China has paid great attention to climate issues and sustainable development issues. China will work to reach a carbon output peak before 2030 and achieve carbon neutrality before 2060, according to President Xi's 2020 "Dual carbon policy" announcement. Currently, with the rapid development of new energy vehicle technology and the gradual improvement of infrastructure such as charging, swapping, and hydrogenation [1], promoting the electrification of the automotive industry is an accessible breakthrough in solving the problems. The need to reduce greenhouse gas emissions and improve energy efficiency is also a constant focus of studies and research in the automotive industry, notably in China [2].

Throughout history, the automotive industry has played an important role in the Chinese economy. China became the world's top auto manufacturer in 2009, and it is making significant investments in the creation of new energy cars [2]. Although China's economy declined due to COVID-19 since 2020, with the virus gradually under control, China's economy began to recover recently. And the new energy vehicle industry also entered a stage of rapid development [3]. The China Association of Automobile Manufacturers said that in the first half of 2023, domestic auto production and sales in China reached 13.25 million and 13.24 million vehicles, respectively, with annual growth rates of 9.5% and 9.3%. And the production and sales of new energy vehicles have reached a record high, completing 3.79 million and 3.75 million respectively with a year-on-year growth of 42.4% and 44.1%. As a leading new energy vehicle manufacturer in China and even the world, BYD has played an important role in the industry. Analyzing BYD's company performance is of great significance for studying the future development of the new energy vehicles industry. So this article selects BYD as the research object, intending to find out BYD's financial characteristics and potential risks by analyzing its financial statements and providing suggestions for BYD and other new energy enterprises.

In the article, the author first briefly analyzes the current situation of the new energy vehicle industry. Then analyze BYD's solvency, profitability, and growth from the perspective of financial

statements. In the process of analyzing financial statements, the author used DuPont analysis, horizontal comparison, and vertical comparison to reflect the financial characteristics of BYD comprehensively and intuitively. Finally, conclude the advantages and shortcomings of BYD to provide some suggestions for the future development of the company.

2. Company Overview

BYD Co., Ltd (hereinafter referred to as “BYD”) was founded by Chuanfu Wang in 1995 and has grown into a group company with an annual income of more than 100 billion RMB. The headquarter of the company is in Shenzhen. The company's three main businesses are rechargeable batteries and photovoltaic business, mobile phone parts and assembly business, and automobile production business. In recent years, the automobile production business has gradually become BYD's most important business. According to the revenue breakdown by product categories in 2022, automobiles and related products, and other products contributed 76.57% of its entire sales, 28.34% year-on-year growth compared to last year.

BYD made its fortune in the rechargeable battery business and officially entered the automotive industry after acquiring Chuanqin Automobile in 2003 [4]. In March 2022, BYD stopped producing fuel-powered vehicles and fully developed new energy vehicles [5]. Currently, it has become one of the leading enterprises of new energy vehicles in China. BYD's market share of new energy vehicles in 2022 was 27%, up over 10% year over year, according to data from the China Automobile Association, and its dominant position in the sector is becoming more obvious.

BYD adheres to the development philosophy of "technology, quality, and responsibility" and places great emphasis on technological research and innovation capabilities [6]. In the field of new energy vehicles, BYD is currently one of the few commercial enterprises that simultaneously master core technologies such as new energy vehicle battery technology, vehicle manufacturing, and supporting Charging stations. BYD continues the characteristics of low cost, high strength, integrated, and open innovation in its business model, and its products are currently mainly aimed at the mid to low-end market [7].

3. Financial Ratio Analysis of BYD

3.1. Solvency Analysis of BYD

In the article, the author selects debt ratio, current ratio, and quick ratio to analyze the solvency of BYD, the data is shown in Table 1:

Table 1. The solvency ratio of BYD in 2018-2022

Solvency ratio	2018	2019	2020	2021	2022
Debt ratio(%)	68.81%	68.00%	67.94%	64.76%	75.42%
Current ratio	0.99	0.99	1.05	0.97	0.72
Quick ratio	0.76	0.75	0.75	0.72	0.49

Source: iFind

The debt ratio is calculated as total liability/total asset which measures a company's comprehensive solvency and reflects its capital structure. BYD's debt ratio declined slowly from 2018 to 2021 but rose over 75% in 2022. And by analyzing the change in the total asset and revenue from 2021 to 2022, it is obvious that BYD experienced a rapid expansion in 2022. And during the expansion, BYD used a higher financial leverage which caused the increase of debt ratio. This phenomenon is normal for a rapidly developing company, but it also needs to pay attention in case the company goes bankrupt.

The current ratio is calculated as current asset/current liability which measures how many current liabilities of a company is covered by its current asset. Normally, if a company's current ratio is greater than 2, it does not have a current risk. But it also depends on the industry the company is in.

According to Figure 1, the current ratio of BYD was lower than its competitor and industry median from 2018-2022 and declined apparently in 2022.

The quick ratio is calculated as (current asset-inventory)/current liability. It removed inventory that could not be quickly turned into cash in the short term from current assets and measured the company's short-term solvency more accurately than the current ratio. According to Figure 2, the quick ratio of BYD during 2018-2022 was far lower than its peer companies and the ratio is lower than 0.5 in 2022.

From the perspective of the debt ratio, current ratio, and quick ratio, BYD's solvency is weak, especially short-term solvency. This reflects a higher probability of BYD going bankrupt. If the situation continues in the coming years when BYD stops its rapid development, then it is a dangerous signal for the company.

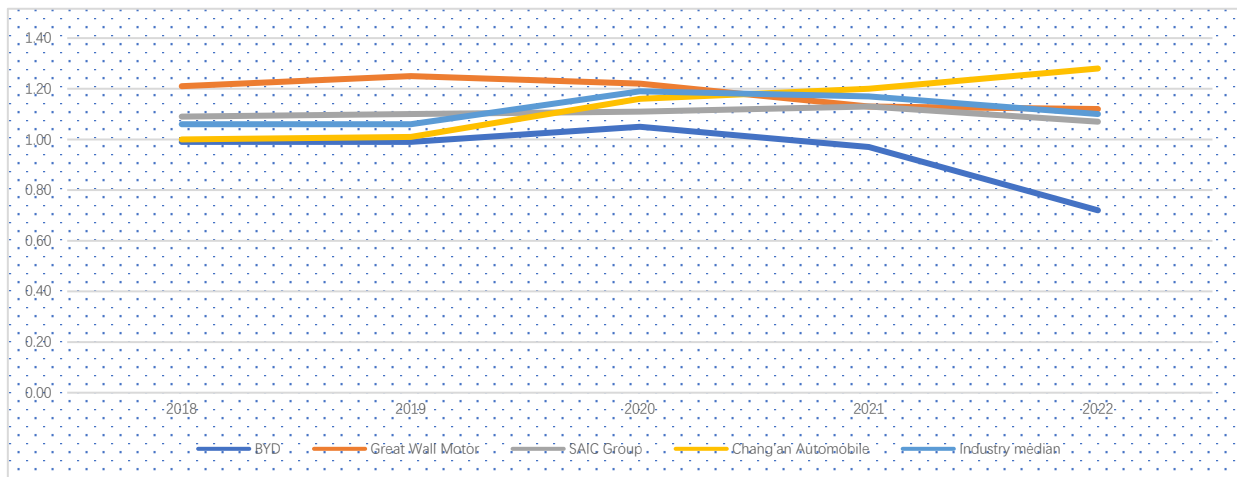


Figure 1. Current ratio peer comparison (Source: iFind)

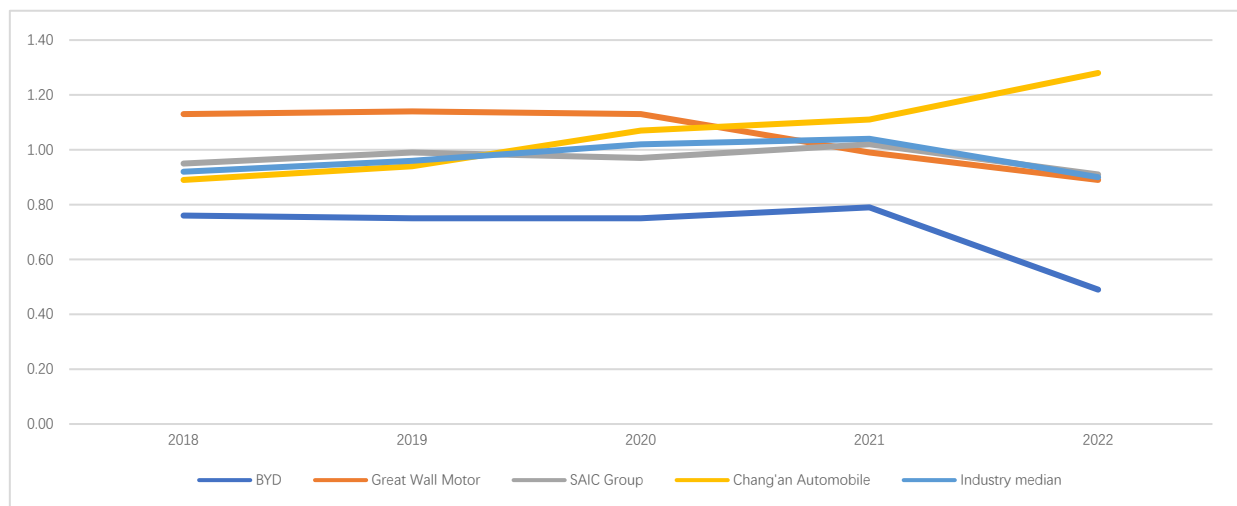


Figure 2. Quick ratio peer comparison (Source: iFind)

3.2. Profitability Analysis of BYD

This article used DuPont analysis to analyze BYD's profitability. The DuPont analysis was proposed by Pierre DuPont and Donaldson Brown of the United States. The focus is to decompose the return on net assets into the product of net profit margin, total assets turnover, and equity multiplier, to analyze the business performance of enterprises more thoroughly [8]. The calculation is as follows:

$$\begin{aligned}
 \text{ROE} &= \text{net income/equity} = \text{net income/sales} \times \text{sales/total assets} \times \text{total assets/equity} \\
 &= \text{net profit margin} \times \text{total assets turnover} \times \text{equity multiplier}
 \end{aligned}
 \tag{1}$$

The profitability indicators of BYD are showed in Table 2:

Table 2. The profitability indicator of BYD in 2018-2022

Indicators	2018	2019	2020	2021	2022
ROE(%)	5.05	2.88	7.45	4.01	16.13
NPM(%)	2.73	1.66	3.84	1.84	4.18
ATO	0.70	0.65	0.79	0.87	1.07
EM	3.38	3.49	3.49	3.27	3.83

Source: iFind

ROE reflects a company's ability to generate value and profits through its net assets [4]. The ROE of BYD from 2018 to 2022 shows an upward trend and experienced a leap in 2022 with a year-on-year increase of 302.24%. As shown in Figure 3, from 2018 to 2021, the ROE of BYD was around 5%, slightly higher than the industry median except in 2021. But as a leading automobile company in the industry, the profitability of BYD is slightly weak as many of its main competitors have a higher ROE, such as Great Wall Motor and SAIC Group. In 2022, the profitability of BYD has been greatly improved and enhanced. Its ROE surpassed that of Great Wall Motor, Changan Automobile, and SAIC Motor, and had the highest ROE in the automobile manufacturing industry. The ROE reflected that the comprehensive profitability of BYD improved apparently during its rapid expansion in 2022 which is a very good signal to its shareholders.

The net profit margin is calculated as net income/sales which reflect how much profit a company gain by realizing a unit of sales. The higher profit margin reflects the stronger profitability of the company's products in the market. As shown in Figure 3, the net profit margin of BYD is relatively stable, slightly above the industry median expected in 2021. This reflects that the profitability of a single automobile of BYD is not strong in the market. But combining BYD's highest and still increasing market share in the Chinese new energy vehicle market, sacrificing its profit margins of a single vehicle may be an efficient means to quickly seize market share in an emerging market such as new energy vehicles. In addition, according to Table 2, the year-on-year growth rate of BYD's net profits margin from 2021 to 2022 is 127.17% which contributed to BYD's rapidly increased ROE in 2022.

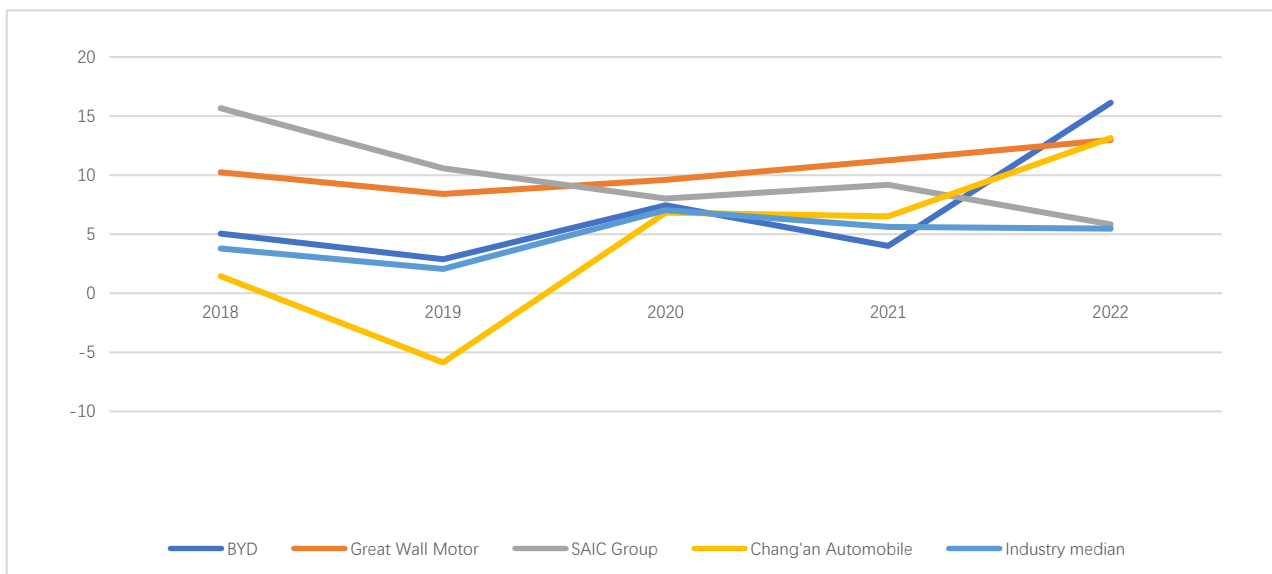


Figure 3. ROE(%) peer comparison (Source: iFind)

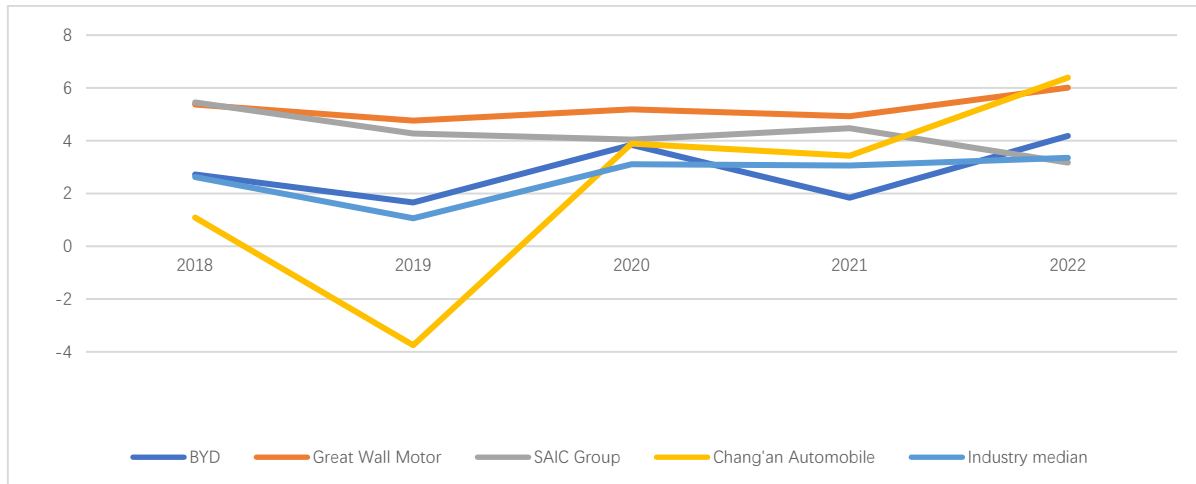


Figure 4. NPM(%) peer comparison (Source: iFind)

The total asset turnover is calculated as sales/total assets which measure the efficiency of a company in utilizing its total assets. Referring to Figure 5, the total assets turnover of BYD was increasing from 2018 to 2022 and exceeded the industry median since 2021. It reflected that BYD is gradually improving its asset operation efficiency in recent 5 years which contribute to its increase in ROE.

The equity multiplier is calculated as total assets/total equity which measure the financial leverage of a company. Referring to Figure 6, the equity multiplier of BYD was increasing overall. High financial leverage is an outstanding feature of BYD, in all 5 years, BYD had the highest equity multiplier among its competitors and the whole automobile manufacturing industry. But using high financial leverage is a double-edged sword. Moderate leverage will bring positive effects to the enterprise and increase its value, however, excessively using leverage will exacerbate the financial pressure on enterprises to repay principal and interest on time in the short and long term [9]. Until now, BYD used the leverage very well and successfully expand its ROE through leverage above 4 in 2022, but it also adds a potential risk to the company.

In conclusion, BYD’s comprehensive profitability has significantly improved and by using DuPont analysis, it is mainly attributed to the improvement in asset operation efficiency and financial leverage. The profitability of the single vehicle of BYD is relatively stable.

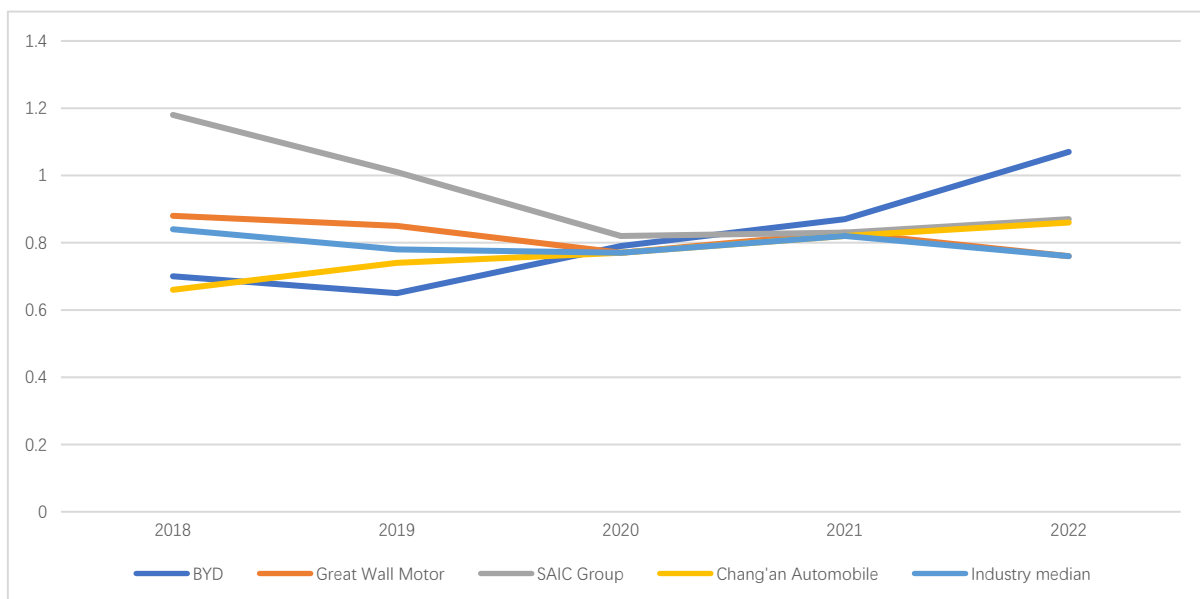


Figure 5. ATO peer comparison (Source: iFind)

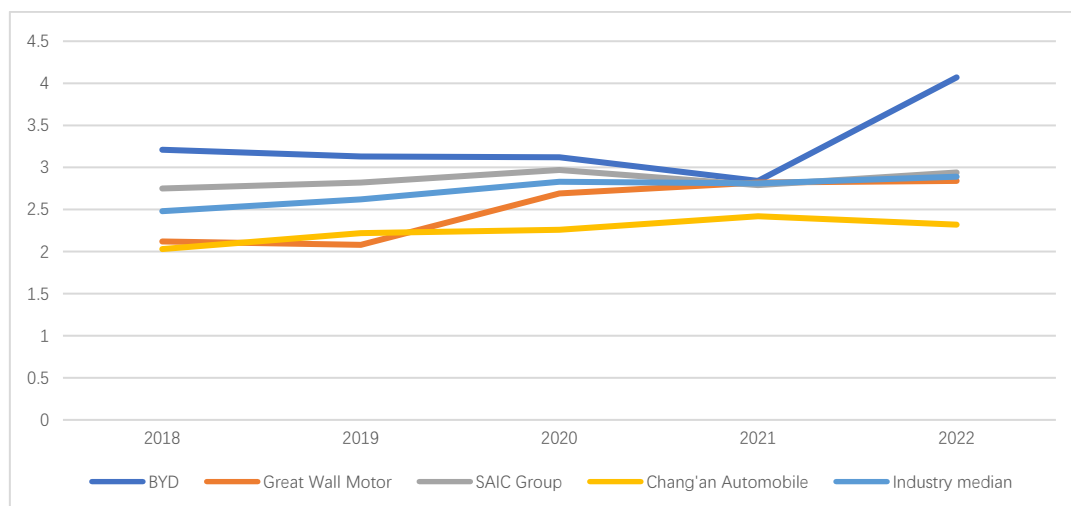


Figure 6. EM peer comparison (Source: iFind)

3.3. Growth Analysis of BYD

For the analysis of BYD's growth ability, the article selects indicators such as operating revenue growth rate, total asset growth rate, net profit growth rate, and research&development investment. The growth ability indicators of BYD are shown in Table 3:

Table 3. The growth indicator of BYD from 2018 to 2022

Growth indicators	2018	2019	2020	2021	2022
Sales growth rate(%)	9.25	0.55	2.75	47.14	66.97
Total assets growth rate(%)	22.79	-1.78	22.59	38.02	96.20
Net profits growth rate(%)	-27.67	-40.42	183.83	-34.03	346.48
R&D investment growth rate(%)	36.22	-1.35	1.60	24.20	90.31

Source: iFind

According to Table 3, the sales and total assets showed an upward trend from 2018 to 2022 and experienced leapfrog growth in 2021 and 2022. This may be due to the increased acceptance of new energy vehicles, resulting in a significant increase in the overall sales of new energy vehicles. Data from the National Bureau of Statistics of China and the China Association of Automobile Manufacturers show that 3.68 million and 7.22 million new energy cars were sold in China in 2021 and 2022, respectively, with annual growth rates of 146% and 98%. The net profits growth rate of BYD was volatile, increased apparently in 2020 and 2021, but also has a negative growth rate in 2018, 2019 and 2021. The R&D investment growth rate of BYD was consistent with its sales which reflects its emphasis on R&D. Due to the strong technological driving force in the new energy vehicle industry, the level of research and development investment determines the possibility of the company continuing to lead the market in the future.

In summary, BYD has strong growth potential. With the increasing trend of replacing traditional fuel vehicles with new energy vehicles in the future, BYD is expected to maintain rapid growth in total assets and sales. And when it stops using low prices to seize market share, the net profits growth rate will be more stable.

4. Suggestion

4.1. Suggestion for solvency

BYD should appropriately control its high financial leverage and increase the proportion of its current assets to alleviate the high debt repayment pressure. The low solvency may lead to an increase in financing costs, further suppressing profit margins.

4.2. Suggestion for Profitability

At present, BYD's asset operation efficiency is the highest in the industry, and if it can continue to maintain it, it will have strong competitiveness. BYD should actively reduce its higher equity multiplier after its growth rate slows down to prevent a liquidity crisis. The best breakthrough for BYD to improve its profitability in the next stage is to gradually improve the profit margin of sales by increasing the price of its new energy vehicles.

4.3. Suggestion for Growth

Through vertical comparative analysis of BYD's growth ability indicators, the author found that BYD already had very strong growth in recent 5 years, and it is good for the company to continue a high-speed growth. The stagnation of sales growth in 2021 and 2022 may be due to the decrease in government subsidies for new energy vehicles and the impact of COVID-19. To maintain a high growth speed, BYD should continue its R&D investment as there are still some problems for new energy vehicles such as short battery life and battery waste [10].

5. Conclusion

According to the analysis of BYD's Financial statement, BYD gradually entered a rapid development stage from 2018 to 2022, and its total assets, sales, and profitability increased significantly from 2021 to 2022. But it also exposes the problem of its weak solvency and the potential financial risk of using excessively high financial leverage. Through horizontal comparison with its competitors, BYD still has room for improvement in the profitability of a single vehicle. Increasing the selling price of bicycles or launching more high-end models may become effective means to further enhance profitability. Through the analysis of this article, this research predicts that BYD will continue to stabilize its leading position as a domestic new energy vehicle enterprise in the future and is likely to expand overseas business.

Finally, this article does not consider BYD's performance in the international new energy vehicle market. In the future, researchers can compare BYD with competitors in the international market, such as Tesla and Toyota, to further analyze its market performance and provide suggestions for competition and development in the international market.

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