Analysis of BYD based on Financial Data

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Abstract. Out of environmental protection and long-term development needs, new energy automobiles have gradually received public attention and preference in recent years. The new energy automobile industry is developing rapidly, and many new energy vehicle enterprises are actively exploring the industry market to further deepen the development of new energy vehicles. In the world, the more famous enterprise is Tesla. In China, there the more famous enterprise is BYD. The article selects BYD to study and provides suggestions for the development of domestic new energy automobile enterprises. The article analyzes BYD's performance in terms of earnings, operations, liabilities, and development, mainly through BYD's financial data and a side-by-side comparison between BYD and Tesla. Compared with Tesla, BYD has a large gap in profitability, but has a strong development capability, and has the potential to catch up or even surpass Tesla's position in future development.

Keywords: Profitability; Operating capacity; Debt capacity; Development capacity.

1. Introduction

1.1. Background

For the sake of sustainable economic development, China has made the "Carbon Peaking and Carbon Neutral" policy (referred to as the "Double Carbon" policy), which is an important instruction for sustainable economic development in China. The policy advocates an environmentally friendly and low-carbon lifestyle, promotes the adjustment of China's energy structure, vigorously develops renewable energy, and saves the use of non-renewable energy. New energy automobiles are powered by electricity instead of fuel, saving the use of fuel which is a non-renewable resource. New energy vehicles can reduce carbon dioxide emissions, which are environmentally friendly and meets the needs of sustainable economic development. The new energy automobile industry is gradually receiving public attention. Famous automobile enterprises such as Volkswagen, SAIC, and GAC have launched new energy vehicle products. As a representative of domestic new energy automobile enterprises, BYD has attracted much attention from the public. BYD insists on taking new energy vehicles as its main business, pursues technological development and innovative development, and has made an outstanding performance in battery technology.

1.2. Related research

Jiao and Liu analyzed the new energy automotive market environment and found that the new energy automotive market has the phenomenon of slow market promotion and immature technology, using the theory of equilibrium and the theory of evolution to analyze the phenomenon respectively. The authors found that the essence of the phenomenon is market failure and system failure. The authors proposed that the government should use the methods of providing subsidies, purchasing compulsory, and improving infrastructure development to solve the problem of market failure, while the government should help the innovation system to operate and promote technological innovation to solve the problem of system failure [1]. Juan focuses on the new energy automotive market and finds the problem that the new energy automotive market lacks innovative power. Using the growth model and the horizontal comparison method, the author analyzed the situation of new energy automotive manufacturers how to do under the background of resource constraints and environmental pressure, compares the market share of traditional gasoline vehicles and new energy automobiles, and proposes solutions for the government to implement supportive policies to stimulate manufacturers'

innovation [2]. Feng and Xiong study the current situation that the market share of new energy automobiles is increasing and new energy automobile is gradually changing from policy-driven to market-driven under the background of China's "emission peak, carbon neutrality" policy. The authors find some questions such as fierce competition in the new energy automotive market, gradually decreasing government subsidies, and low self-sufficiency rate of key chips. According to the national data, the authors provided four suggestions from the perspective of new energy automotive manufacturers which are cooperation among enterprises, medium and long-term development layout, guaranteeing smooth flow up and down the supply chain, and responding to the national dual carbon policy [3].

Gan and Yang analyzed BYD which is the typical representative of a new energy automotive company in the context of the rapid development of the new energy automotive industry. With four aspects of the company's profitability, stability, security, and growth, as well as several profitability indicators, the authors further discovered the internal and external problems of BYD and combined them with data to give recommendations to improve profitability [4]. Jiang and Xu compared the respective strategic models of Tesla and BYD under the conditions of environmental uncertainty through case studies and horizontal comparisons. The authors found that Tesla has advantages in core algorithms, differentiated services, and careful supply chain management while BYD has advantages in battery technology, cost control, and supply chain self-research and self-production. Both Tesla and BYD have chosen platform-based assembly for parts assembly. Accordingly, the authors gave suggestions to strengthen corporate cooperation, promote corporate culture, and strengthen corporate image and value communication [5]. Zhang analyzes BYD which is a typical representative of new energy automobiles, using DuPont analysis and the cascading substitution method under the index factor analysis, based on the rapid development of the new energy automotive industry. The author analyzes the problems of high cost, low turnover, and slow capital reversal with BYD's data of equity, total asset turnover, return rate, and industry average, giving the solutions of cost control, professional management, zero inventory, and faster capital recovery [6].

Han under the trend of new energy automobile development, analyzed the current situation of international new energy automotive industry development, adopting positioning theory and value chain theory. The author analyzed the innovative development of Tesla from three aspects of the product, customer development strategy, and marketing model, and gave suggestions on domestic new energy vehicle development to improve infrastructure support, strengthen core technology development, enhance government support, reduce cost and give play to brand effect [7]. Dong used SWOT and matrix analysis to compare and analyze the development status of BYD and Tesla with the similarities and differences of BYD's and Tesla’s internationalization paths in terms of products, target markets, entry modes, internationalization degree, and business performance. The author concluded that the internationalization path of Tesla is better than BYD's internationalization path, and gave suggestions on product matrix, target market selection, and entry mode selection for the internationalization path of domestic new energy vehicle enterprises [8]. Wang analyzed Tesla's international strategy, using the strategic 5P analysis proposed by Prof. Mintzberg and the new 5P analysis evolved on this basis. The author concluded that Tesla can make use of the resources of different regions, has a reasonable international strategy, and makes a reasonable layout according to local conditions. The author provided suggestions for China's new energy cars to develop the international market [9]. Cai analyzed the risks faced by BYD from three aspects: operation, investment, and finance, combined with BYD's financial statements and related financial ratios in the context of the rapid development of new energy automobiles. The author gave BYD suggestions to improve capital turnover, avoid over-investment, and improve its core competitiveness [10].

1.3. Objective

The article will analyze BYD's financial data from four aspects: profitability, operating capacity, debt capacity, and growth capacity, and analyze BYD’s strengths and weaknesses, studying BYD's performance in profitability, operation, debt, and development. The article will study the similarities

and differences between BYD and Tesla by comparing BYD's and Tesla's ROE and analyze the reasons for the differences through four aspects: profitability, operation, debt, and development.

2. Methods and data

Return on Equity, which is the percentage of a company's profit after tax divided by its net assets, reflects the level of return on shareholders' equity and measures the efficiency of a company's use of its capital. Generally speaking, the higher the value of the indicator, the higher the return on investment. The indicator reflects the ability of own capital to earn net income. The assets of the enterprise consist of two parts, one of which is the shareholders' investment. The other part is the funds borrowed and temporarily occupied by the enterprise. The appropriate use of financial leverage can improve the efficiency of the use of funds, too-much borrowed funds will increase the financial risk of the enterprise but generally can improve the profitability, too little borrowed funds will reduce the efficiency of the use of funds. Return on net assets is an important financial indicator to measure the efficiency of the use of shareholders' funds.

3. Results

3.1. Profitability

As shown in Table 1, BYD's five-year gross profit margin fluctuates around a range of 13%-19%, with an average gross profit margin of approximately 16% over the last five years. Net profit margin has fluctuated back and forth over the past five years, from 4.6% in 2017 to 1.8% in 2021. Net profit from sales is low, with no significant growth, and the overall profitability of BYD's business is currently weak.

Table 1. Profitability data

	2017.12.31	2018.12.31	2019.12.31	2020.12.31	2021.12.31
Return on equity	7.39	5.04	2.84	7.44	3.20
Gross profit margin	19.01	16.40	16.29	19.38	13.02
Operating profit margin	5.11	3.26	1.81	4.52	2.14
Net profit margin	4.64	2.73	1.66	3.84	1.84

As shown in Figure 1, BYD's research and development costs are increasing year by year. BYD invests a large amount of its revenue in research and development, The cost of research and development is huge which is the reason for BYD's low-profit margin. Nevertheless, BYD is still willing to invest a lot of money in research and development every year, insisting on innovation and development, deeply recognizing the power of science and technology, and strengthening battery charging technology and semiconductor production technology to improve its core competitiveness.

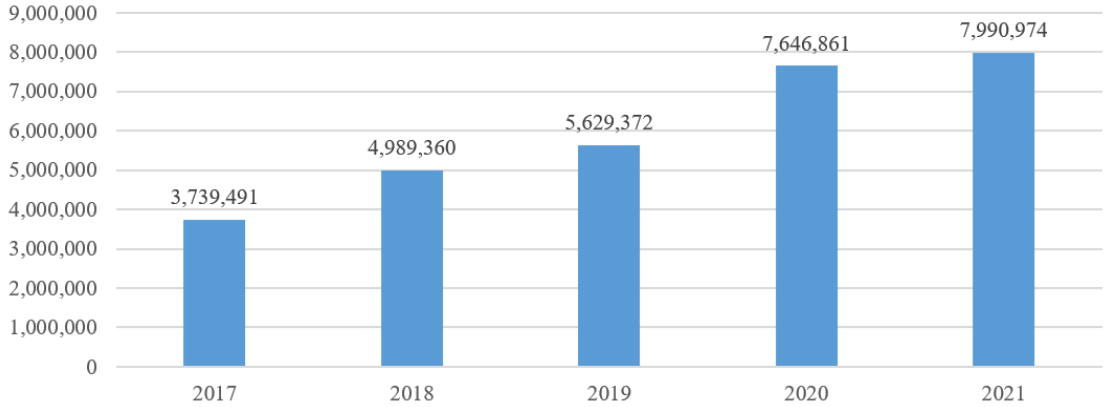


Fig 1. Research and development costs

3.2. Operating capacity

As shown in Table 2, the inventory turnover ratio is relatively stable. BYD products are so popular in the market that their inventory is less and the inventory turnover cycle is shorter. BYD is committed to inventory management to reduce inventory and actively liquidate and reduces storage, transportation and other related costs. At the same time, BYD also strives to avoid the problem of excessive inventory backlog, advocating the operation of production as sales. At present, there are more orders for BYD cars on the market, and the production and sales rate of BYD's new energy automobiles is maintained at about 100% on average.

Table 2. Operation data

	2017.12.31	2018.12.31	2019.12.31	2020.12.31	2021.12.31
Turnover of accounts receivable	2.26	2.57	2.74	3.68	5.58
Inventory turnover ratio	4.61	4.71	4.12	4.43	5.03
Total asset turnover ratio	0.66	0.70	0.65	0.79	0.87
current asset turnover ratio	1.17	1.19	1.15	1.43	1.56

3.3. Debt service capability

As shown in Table 3 and Figure 2, the current ratio is 0.97 and the quick ratio is 0.72 in 2021, both of which are high. both the current ratio and the quick ratio have remained in the same lower range fluctuating in the last five years, indicating the company's weak short-term solvency and high short-term debt service risk.

Table 3. Debt service capability

	2017.12.31	2018.12.31	2019.12.31	2020.12.31	2021.12.31
Current ration	0.98	0.99	0.99	1.05	0.97
Quick ratio	0.79	0.76	0.75	0.75	0.72
Operating cash flow ratio	6.07	10.74	13.65	42.65	38.22
Equity ratio	197.04	220.58	212.52	211.88	183.74

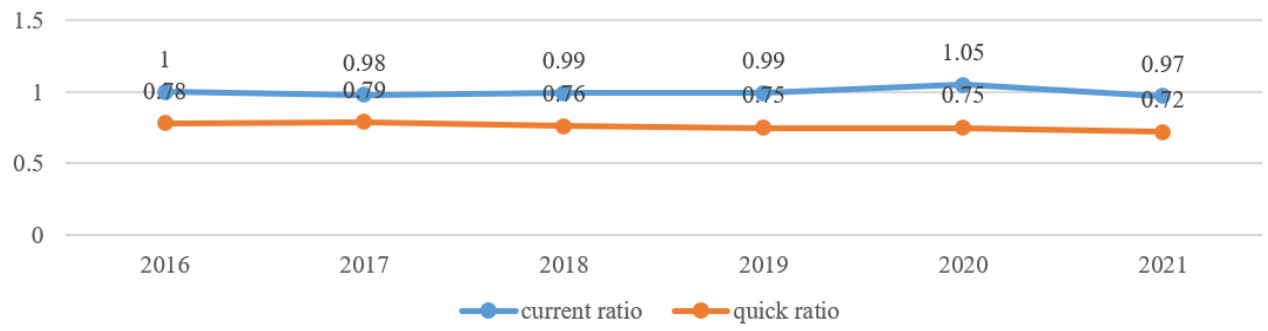


Fig 2. Short-term liquidity

BYD's asset-liability ratio is in a reasonable range of 40%-70%, with an interest-bearing debt ratio of 16.07% in the latest period. BYD's total asset-liability ratio has a stable trend and is at a reasonable level. The company's interest-bearing liabilities do not account for a high proportion, and the long-term debt service risk is not significant.

Although the operating cash flow ratio is gradually increasing, the overall operating cash flow ratio is low. BYD's operating cash flow is low, and most of the funds are used for research and development.

3.4. Development capability

As shown in Table 4, total revenue grew from 105,915 million in 2017 to 216,142 million in 2021, representing a five-year CAGR of 16.80%. The main growth rate comes in 2021, with 38.02% year-

on-year growth. With the future expansion of the new energy automobile market, BYD's operating revenue growth has been stable at over 20% in recent years. BYD's operating income growth is relatively stable and operating income growth is strong. On the other hand, BYD's development is also closely related to the prospect of the new energy automobile market. Both the net asset growth ratio and total asset growth ratio grew exponentially in 2021, once again proving BYD's strong development capability.

Table 4. Development capacity

	2017.12.31	2018.12.31	2019.12.31	2020.12.31	2021.12.31
Net assets growth ratio	7.31	0.35	2.83	0.20	67.16
Total assets growth ratio	22.77	9.25	0.55	2.75	47.14
Operating revenue growth ratio	2.36	22.79	-1.78	22.59	38.02
Net profit growth ratio	-19.51	-31.63	-41.93	162.27	-28.08

3.5. ROE analysis

As shown in Figure 3, BYD's and Tesla's ROE are showing a fluctuating upward trend. The gap between BYD and Tesla ROE in the middle is gradually decreasing, comparing the data of BYD and Tesla in the last five quarters. According to the calculation of ROE, ROE is the result of multiplying the return on total assets and the equity multiplier. Therefore, an increase in debt will lead to an increase in return on assets.

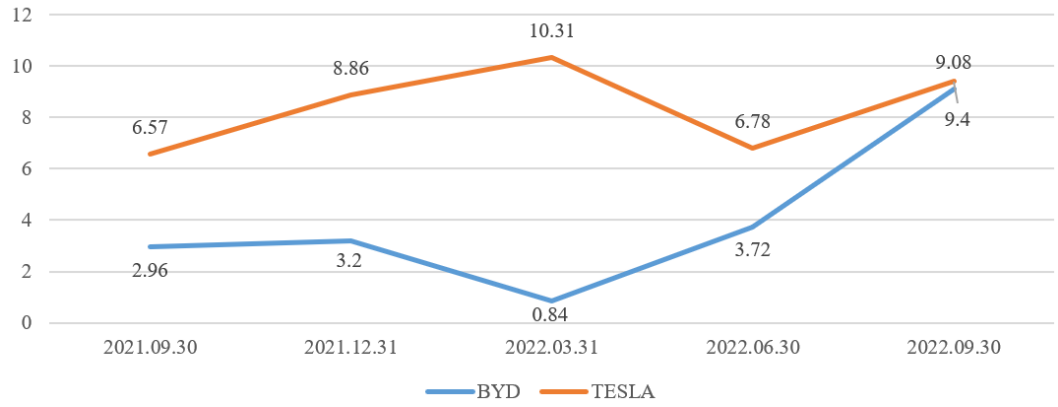


Fig 3. ROE quarterly data

As shown in Figure 4, BYD's asset-liability ratio has been increasing year by year which is one of the reasons for BYD's rising ROE. BYD increases the leverage ratio and thus increases the return on net assets ratio. Although the ROE rises, BYD also faces greater debt risk. In contrast to Tesla, Tesla's debt ratio has instead declined and remained at a stable level overall. Tesla is more likely to increase its ROE through the increase in total net asset margin instead of increasing the leverage ratio.

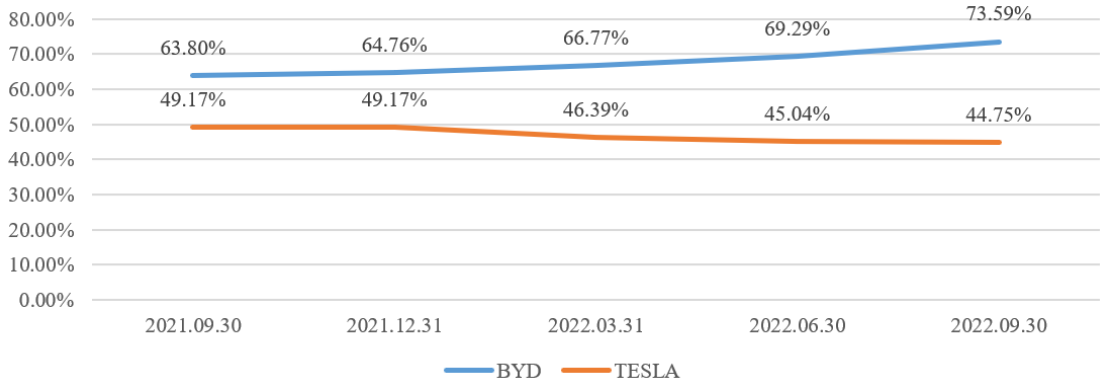


Fig 4. Asset-liability ratio

4. Discussion

The huge cost of R&D investment is undoubtedly one of the reasons for BYD's weak profitability. BYD focuses on investing in research and development every year. In terms of core technology, BYD has an advantage in battery manufacturing and semiconductor production. The technological advantage of battery manufacturing makes BYD stand out from many automobile industries in China and take a place in the new energy automobile market. New energy automobiles are different from traditional gasoline automobiles. New energy automobiles rely on battery power to start rather than gasoline. BYD has top technology in battery manufacturing to meet the market demand for new energy automobiles and has a greater advantage compared to other new energy automobile companies. Therefore, BYD has a larger domestic market share of new energy. At the same time, BYD has its own semiconductor production. Semiconductor applications accelerate the development of automotive intelligence, which is conducive to BYD's further education in automotive intelligence. On the other hand, domestic new energy automobile enterprises generally face the problem of semiconductor chip shortage. BYD has its own semiconductor without chip shortage concerns. Therefore the problem of semiconductor chip shortage doesn't hinder enterprise car production.

In terms of operation, BYD's inventory turnover ratio in recent years is 4.58, which is a fast inventory turnover to achieve the goal of production for sales. BYD has its own supply chain, which can ensure the smooth upstream and downstream flow of the product supply chain and provide the possibility of self-production and self-marketing. BYD's supply chain management adopts a vertical management strategy to achieve the optimal allocation of resources while maximizing the self-sufficiency rate and maintaining a self-sufficiency rate of over 50%.

Overall, BYD is currently a growing company, slightly lacking in profitability and debt capacity, but with strong development and operational capacity.

In terms of technology, Tesla has an advantage in intelligent driving technology. Tesla's intelligent driving system is more complete. The owner can use the auto-summon function on the phone to let the car come to the owner automatically. During driving, all the functions of the car can be controlled through the driving panel. At present, Tesla's smart driving technology is the most advanced in the world. Tesla's other technology is driverless technology which is remarkable around the world.

In terms of operational marketing, Tesla's operational marketing strategy has been effective. Tesla has a clear brand positioning which is producing high-end automobiles. Its products naturally correspond to the wealthy class. The strong purchasing power of the customer is the basis of Tesla's high revenue. On the other hand, high net-worth customers will naturally bring better word-of-mouth publicity which could enhance Tesla's brand value through the celebrity effect.

In contrast, BYD's operational marketing strategy positions the target group to the middle and lower classes, covering a wide range. In terms of price, BYD products are affordable and meet the requirements for car prices of middle-class families and white-collar people who are just out of society. BYD's gross profit margin per car is small and the overall profit level is not high. As a result, BYD has increased its revenue mainly by selling more at lower margins and expanding its production scale. In recent years, BYD has expanded its production scale and gradually started to bring the scale effect, resulting in higher operating profits.

As a mature company, Tesla undoubtedly has a greater advantage in terms of profitability and cash. Tesla's advanced intelligent system technology and high-end brand positioning make Tesla a top international car brand. As a growth company, BYD has a better performance in terms of growth capacity and operational capability. BYD's mature battery technology and production of semiconductors are BYD's core competencies, making BYD stand out among many domestic new energy automobile companies. Although BYD is slightly lacking in profitability, its strong growth capability provides good opportunities for BYD's future development.

5. Conclusion

The article examines BYD's financial data in four areas: profitability, debt service, operations, and growth and compares the ROE of BYD and Tesla, as well as the advantages and disadvantages of each. The article found that BYD, as a growing company, has good development and operational capabilities. BYD has the potential to further develop international markets and compete with Tesla in the future. BYD should adhere to the investment in research and development, insisting on innovation and development to improve its core technology capability. In marketing, BYD should keep up with fashion trends to attract more young people. Meanwhile, BYD could try to develop high-end products to attract high-net-worth customers to improve profitability.

References

[1] Le, J., & Liu, P.. (2016). A study on the policy framework of market cultivation in the new energy automobile industry in China. International Conference on Logistics. IEEE.

[2] Zhang, J.. (2011). R&d for environmental innovation and supportive policy: the implications for new energy automobile industry in china. Energy Procedia, 5(1), 1003-1007.

[3] Feng H.&Xiong Z X.Opportunities and Development Strategies of New Energy Vehicle Industry under the Background of "Double Carbon"[J]. Decision and Information,2022(5):68-76

[4] Gan X M&Yang X P.Analysis of BYD's profitability in the context of new energy[J]. Old brand marketing,2022(10):121-123

[5] Jiang B B&Xu B L.Research on marketing strategies of new energy vehicle companies under environmental uncertainty--a comparison of BYD and Tesla[J]. China Business Journal,2022(2):37-40

[6] Zhang Q. Profitability Analysis of BYD Company - Based on DuPont Analysis and Index Factor Analysis[J]. International Business Finance and Accounting,2022(8):82-85. DOI: 10.3969/j.issn.1673-8594.2022.08.023.

[7] Han F. (2018). Analysis of Tesla's strategic positioning and profitability model (Master's thesis, Beijing University of Posts and Telecommunications). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD201802&filename=1018096428.nh

[8] Dong X J. (2020). A Comparative Study on the Internationalization Path of New Energy Vehicles BYD and Tesla (Master's thesis, Jiangxi University of Finance and Economics). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202002&filename=1020976534.nh

[9] Wang M D. (2021). Study on Tesla's internationalization strategy (Master's thesis, Shandong University). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202201&filename=1021033186.nh

[10] Cai Y D. Risk analysis of BYD based on financial ratios[J]. Cooperative Economy and Technology, 2022(15):143-145. DOI: 10.3969/j.issn.1672-190X.2022.15.055.