A Comparative Study on the Financial Performance of China's New Energy Vehicles: Taking BYD, SAIC Group and Li Auto as Examples

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Abstract. With the rapid development of the new energy vehicle industry, China has achieved significant market scale in this sector and has seen the emergence of representative companies. This study takes BYD, SAIC Group and Li Auto as examples to compare the differences in their financial performance from 2020 to 2024. The research results show that BYD has strong profitability and an improved asset utilization efficiency, but it is under liquidity pressure. The profitability of SAIC Group is showing a downward trend. Although the liquidity is stable, the financial risk is relatively high. However, Li Auto achieved a turnaround from losses to profits by relying on sales growth and reasonable leverage. The analysis of research and development intensity reflects the decisive role of innovation investment in financial performance. The significance of this research lies in analyzing and presenting the differences in financial performance among private leading enterprises, state-owned enterprises undergoing transformation, and new development forces, providing references for investors and policy makers.

Keywords: New Energy Vehicles, Financial Performance, BYD, SAIC Motor, Li Auto.

1. Introduction

Over the past decade, due to enterprises' innovation in technology, the global call for environmental protection and policy support, the new energy vehicle industry has experienced rapid development. Against the backdrop of global climate warming, new energy vehicles can significantly reduce carbon emissions and promote global sustainable development, thus becoming the development direction of the global automotive industry. China has emerged as a central driver of the global NEV market, where continuous policy support and strategic energy initiatives have fueled rapid growth [1]. Such measures encompass purchase subsidies, exemption from vehicle acquisition tax, and the provision of free license plates, all aimed at encouraging the adoption and diffusion of NEVs [2]. By 2024, the country’s NEV output reached around 12.888 million units, while cumulative sales totaled 12.866 million units, marking year-on-year increases of 34.4% and 35.5%, respectively [3]. Consequently, this rapid growth trend demonstrates China's significant influence in the global development of new energy vehicles, and also highlights the role of policy support in driving the industry's development. In the process of the green transformation of the automotive industry, China will provide important experiences and references for the transformation and development of the global automotive industry.

The existing literature generally indicates that the profitability and innovation capabilities of enterprises are the fundamental guarantees for the development of new energy vehicle enterprises. For instance, Li pointed out in his research that profitability is an important source of funds for the long-term development of enterprises as well as for research and innovation [4]. Furthermore, Chen et al. pointed out in their research that technological development and product innovation are decisive factors in different stages of the industry's growth [5]. In terms of financial structure and financial risk, the research results of some scholars indicate that the Current Ratio and Debt to Equity Ratio have a significant impact on Dividend Growth [6]. This demonstrates the importance of a stable financial structure for enterprises to withstand financial risks in the highly competitive market environment. Regarding the operational efficiency of enterprises, as a critical component of supply chain management in the NEV sector, inventory management functions to balance supply and

demand, enhance service quality on the demand side, and cope with uncertainties while achieving economies of scale [7]. As a result, the inventory turnover rate also proves critical at the profitability of enterprises. Overall, the existing studies have provided references for the development of the new energy vehicle industry from perspectives such as profitability, debt-paying ability, operational efficiency, and research and development innovation. However, most of these studies mainly focused on the entire automotive industry and did not pay attention to the financial differences among enterprises under different development models. China, as one of the largest automotive markets in the world, has three development models: private leading enterprises, state-owned enterprises, and new forces. However, there is a relative lack of research on the financial performance differences among these three types of development models, which limits the understanding of relevant enterprises and industry personnel regarding industry development and policy formulation.

Based on the above background, the main motivation of this study is to reveal the financial status differences of Chinese new energy vehicle enterprises under different development models, deepen the understanding of both enterprises and researchers regarding the development prospects, financial structure, and operational efficiency of new energy vehicles, and provide reference for investors as well as serve as a reference for policy makers. Therefore, this study focuses on BYD (a private leading enterprise), SAIC Motor (a state-owned enterprise in transition) and Liability Auto (a new force representative), and comprehensively analyzes their financial ratios in four different aspects from 2020 to 2024, namely profitability, debt-paying ability, operational efficiency and R&D investment, to reflect the diversified development models and financial differences of China's new energy vehicle industry.

2. Methodology

The core of evaluating financial performance lies in financial ratio analysis, which involves analyzing the ratios in four aspects: profitability, debt-paying ability, operational efficiency, and research and development investment. This research method is widely applied in the fields of finance and accounting, enabling an in-depth exploration of an enterprise's operational performance and financial risks from various perspectives. The methodology of this study is mainly divided into three steps: Firstly, the annual financial reports and related ratios of three companies from 2020 to 2024 were collected. The data mainly came from Bloomberg and the annual reports disclosed on the company's official website. Second, based on the calculation formulas of each ratio, the corresponding financial ratios are calculated. Thirdly, conduct a horizontal comparison of the financial indicators of the three companies over the past five years, and conduct a comparative analysis of the financial differences among different enterprises under different development models. These steps ensure the comparability of the research and the reliability of the data sources.

Model Construction and Financial Indicators:

2.1. Profitability Ratios

Profitability represents the extent to which a firm can generate earnings over a specific time frame [8].

ROA = Net Profit / Total Assets

ROE = Net Profit / Shareholders' Equity

Operating Margin = Operating Profit / Total Revenue

2.2. Liquidity and Solvency Ratios

A liquidity ratio is a financial metric that evaluates a firm’s capacity to meet its debt obligations. It is typically expressed as the proportion of current assets to current liabilities [9].

Current ratio = Current assets / Current liabilities

Solvency denotes a firm’s capacity to fulfill its long-term commitments, encompassing both interest payments and the repayment of principal debt [10].

D/E ratio = Total debt / Total Shareholder's Equity

2.3. Efficiency Ratios

The total asset turnover ratio evaluates the efficiency with which a firm utilizes its assets to produce revenue [11].

Asset turnover = Total Revenue / Average Assets

The inventory turnover ratio, defined as cost of goods sold divided by average inventory, reflects how rapidly a company sells its inventory [12].

Inventory turnover= Cost of sales / Average inventory

2.4. Research and Development Investment

R&D intensity represents the proportion of a firm's research and development spending relative to its total revenue [13].

R&D intensity = R&D expenses / operating income

3. Financial Ratio Analysis

The calculation results of four types of financial ratios for the three companies over the past five years are presented in tables.

3.1. Profitability Analysis

Table 1. Profitability ratios. Data from Bloomberg

Profitability ratios	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto
Return on Assets (%)	2.14	2.31	-0.66	1.23	2.67	-0.65	4.21	1.69	-2.71	5.12	1.41	10.18	5.50	0.17	5.25
Return on Common Equity (%)	7.43	8.02	—	3.96	9.19	-0.91	16.12	5.83	-4.68	24.02	4.99	22.29	26.02	0.58	12.26
Operating Margin (%)	6.49	2.03	-7.08	3.00	1.90	-3.77	4.89	1.41	-8.07	5.81	1.45	5.98	6.36	0.99	4.86

The success of new energy vehicle development depends largely on a firm's ability to maintain profitability, invest in research and development, and manage risks effectively. Among these factors, profitability serves as the foundation, since without sufficient profits, continued R&D and risk resistance cannot be sustained [4]. This provides evidence that maintaining strong profitability is not only the fundamental guarantee for innovation and research and development of companies in the new energy vehicle industry, but also a key condition for remaining competitive in the continuously growing emerging markets. Therefore, this study conducted a detailed analysis of the profitability of the three companies. Table 1 compares the changes in ROA, ROE and Operating Margin of BYD, SAIC Motor and Li Auto from 2020 to 2024.

The data reveals that BYD's ROA rose from 2.14% in 2020 to 5.50% in 2024, showing a stable growth trend. SAIC Motor's ROA, on the other hand, dropped from 2.31% in 2020 to 0.17% in 2024, showing a gradual downward trend. Although Li Auto's ROA was negative from 2020 to 2022, indicating that it was in a loss-making phase during that period, it rapidly rose to exceeding 10% starting from 2023 and stabilized at 5.25% in 2024, achieving a significant reversal.

In addition, BYD's ROE rose from 7.43% to 26.02% in 2024 and continued to increase from 2022 to 2024, demonstrating a significant enhancement in its shareholder return rate. Meanwhile, SAIC Motor's ROE still shows a significant downward trend, dropping from 8.02% to 0.58%, with a sharp decline in the return on shareholders. The ROE of Li Auto was also negative from 2020 to 2022, but it significantly increased to 22.29% in 2023 and remained at 12.26% in 2024, demonstrating the enhanced profitability of emerging forces.

Finally, BYD's Operating Margin is relatively stable, basically remaining at approximately 5%. The Operating Margin of SAIC Motor dropped from around 2% to less than 1%, indicating a continuous decline in its profitability. The Operating Margin of Li Auto has been turning positive since 2023 and is expected to reach approximately 5% in 2024.

Based on the analysis, we can conclude that BYD has had the strongest profitability during these five years and it has been steadily improving. Especially after 2022, its ROE has exceeded 20%, demonstrating its competitiveness and leading position in China's new energy vehicle industry. However, SAIC Motor's profitability has continued to decline, indicating that its transformation in the era of new energy development has been hindered and its traditional advantages have weakened. Li Auto has experienced a clear turning point from loss to profit. Since 2023, it has demonstrated strong profitability and become a representative among emerging forces. However, it still needs to maintain the sustainability of this profit trend.

Technological research and development, along with product innovation, significantly influence every stage of an industry's development, from its emergence to its maturity [5]. This is fully reflected in the comparison of the profitability of the three companies. BYD has enhanced its product competitiveness and cost advantage by continuously increasing its investment in research and development. In contrast, SAIC Motor's continuous decline in profits reflects its deficiency in technological innovation, which has weakened the effectiveness and competitiveness of its transformation. The profit reversal of Li Auto also reflects the significant role of innovation. Through product innovation, successful R&D has been successfully transformed into profit growth.

3.2. Liquidity and Solvency Analysis

Table 2. Liquidity& Solvency Ratios

	2020			2021			2022			2023			2024		
Liquidity& Solvency ratios	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto
Current Ratio	1.05	1.11	7.28	0.97	1.13	4.33	0.72	1.07	2.45	0.67	1.13	1.57	0.75	1.18	1.82
D/E ratio (%)	81.12	89.48	7.09	40.99	63.31	19.09	20.72	76.32	27.14	33.86	83.46	22.36	21.56	79.09	22.92

A firm's liquidity indicates its capability to meet immediate financial obligations [6]. The debt-to-equity ratio represents one of the principal leverage or solvency indicators [6]. Solvency ratios are designed to assess whether a company can cover its debts if it were to be liquidated [6]. Therefore, the liquidity ratio focuses on the short-term debt-paying ability of an enterprise, while the solvency ratio reflects its long-term financial risk. The combination of the two can more comprehensively present the financial situation of an enterprise. Table 2 compares the current ratios and D/E ratios of BYD, SAIC Motor, and Li Auto from 2020 to 2024 to reflect the differences in liquidity and debt-paying ability among the three companies.

BYD's current ratio is between 0.67 and 1.05, indicating its relatively weak ability to repay short-term debts. This might be due to the fact that a large amount of funds has been invested in research and development and fixed assets have been used for rapid expansion, resulting in insufficient current assets. In comparison, SAIC Motor's current ratio is between 1.10 and 1.20, which is relatively stable and remains within a reasonable range. This reflects that its capital structure is relatively stable, and the risk of short-term debt repayment is relatively low. The current ratio of Li Auto was as high as 7.28 in 2020 and then gradually declined to 1.82 in 2024. This suggests that it initially raised a large amount of funds and had a relatively low efficiency in capital utilization. However, as its business expanded and investment in production and research and development increased, its liquidity gradually dropped to a reasonable range.

Meanwhile, the D/E ratio of BYD decreased from 81.12% in 2020 to 21.56% in 2024, indicating a reduction in the company's reliance on debt and a healthier capital structure. However, the D/E ratio

of SAIC Group remained at a relatively high level throughout these five years, approximately between 70% and 90%, suggesting a greater reliance on debt and greater financial pressure. The D/E ratio of Ideal Auto remained at a low level, ranging from 7.09% to 27.14%, with a relatively stable capital structure. This also indicates that Ideal Auto relies on equity financing for support and has less reliance on debt.

From this analysis, it can be concluded that BYD has a relatively high short-term debt repayment pressure, but its capital structure is gradually improving and optimizing, and the financial risk is decreasing. Although SAIC has relatively stable liquidity, it is facing high debt levels and a decline in profitability, and thus has significant potential financial risks in the future. In the early stage, Ideal Auto had relatively abundant funds, strong liquidity and low debt. Subsequently, as it gradually expanded, its liquidity became more stable, and its debt repayment ability was overall stronger than that of the other two companies.

3.3. Efficiency Analysis

Table 3. Inventory Turnover and Asset Turnover

	2020			2021			2022			2023			2024		
Efficiency ratios	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto
Inventory Turnover	4.43	10.70	10.10	5.03	10.97	15.94	5.75	9.04	8.67	5.88	7.05	14.09	6.15	6.35	15.25
Asset Turnover	0.77	0.84	0.41	0.87	0.85	0.55	1.07	0.78	0.61	1.03	0.75	1.08	1.06	0.64	0.94

Table 3 presents the changes in Inventory Turnover and Asset Turnover for BYD, SAIC Motor, and Li Auto from 2020 to 2024, reflecting the operational efficiency of the three companies.

BYD's inventory turnover remained between 4.43 and 6.15, which was relatively stable overall, reflecting its relatively balanced inventory management level. However, its overall inventory turnover was lower than that of SAIC and Li Auto, indicating that although its inventory turnover was stable, its efficiency was not high. The inventory turnover of SAIC Motor dropped from 10.70 in 2020 to 6.35 in 2024, showing a clear downward trend. This implies that due to the company's setbacks in its new energy transformation, problems such as sales pressure and inventory buildup have gradually emerged and intensified. The inventory turnover of Ideal Automobile has shown an overall upward trend, ranging from 10.10 to 15.25. A higher inventory turnover indicates that a company can sell goods more quickly, which enhances operating profit and ultimately boosts net income [12]. Therefore, this also reflects its strong sales capabilities and its ability to remain competitive in the industry.

The asset turnover of BYD has gradually increased from 0.77 to 1.07, indicating an improvement in its asset utilization efficiency. This demonstrate that as BYD expands its scale, its sales revenue growth is gradually outpacing the expansion of its assets. The ratio of SAIC Motor, however, dropped from 0.84 to 0.64, indicating that although its asset size is large, its revenue growth is insufficient, and the efficiency of asset utilization is gradually declining.

3.4. R&D Intensity Analysis

Table 4. R&D intensity

	2020			2021			2022			2023			2024		
	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto	BYD	SAIC Motor	Li Auto
R&D intensity	0.97	0.80	-1.72	1.24	1.36	-3.29	0.89	2.00	-1.88	1.14	1.58	1.43	1.07	2.37	1.58

Table 4 presents the R&D intensity of BYD, SAIC Motor and Li Auto from 2020 to 2024. Within the new energy vehicle market, the intensity of Research and Development (R&D) serves as a crucial metric for evaluating a company's ability to achieve rapid growth and expand its market share [14]. Therefore, analyzing the R&D intensity of the three companies can reveal the differences in their innovation strategies and the future competitive potential.

Table 4 presents the R&D intensity of BYD, SAIC Motor and Li Auto from 2020 to 2024. The R&D intensity of BYD has remained relatively stable, ranging from 0.97 to 1.36, but the overall figure is relatively low. This reveals that it has consistently maintained a certain level of R&D investment, but as sales increase, the intensity of R&D is diluted. The R&D intensity of SAIC Motor has gradually increased from 0.80 to 2.37. This indicates that it has been gradually increasing its investment in R&D during the process of transitioning to new energy. Early R&D spending brings high returns, but further investment often faces technical and market barriers, causing diminishing benefits [15]. Green technology's complexity raises costs and lengthens cycles, reducing efficiency [15]. Therefore, judging from the decline in its profitability, the R&D investment has not effectively translated into performance. The R&D intensity of LI Auto was negative from 2020 to 2022. This was due to the company being in a loss state during that period, indicating that it made significant investments in R&D but in an unstable manner in its early stages. After 2023, the figure stabilized at around 1.5, indicating that it has gradually achieved profitability. This also shows that it has driven its profitability and rapid growth through research and development, and has captured significant market share

4. Limitation & Future

Although this study provides reference value for new energy vehicle enterprises and policy makers, there are still some limitations. Firstly, the time frame of this study is limited to the recent five years, from 2020 to 2024. Such a short time span is insufficient to fully and accurately reflect the long-term strategic and financial performance changes of the new energy vehicle industry. If the time span for data analysis can be extended, it will enable a more profound understanding of the long-term development trends of this industry and the sustainability of its financial performance. In addition, the research subjects of this article only included three companies: BYD, SAIC Group and Ideal Motors. Although they are representative and can reflect the financial differences under different development models, they still overlooked enterprises such as NIO, XPeng, and Tesla China that hold significant positions in the Chinese market. Therefore, it lacks certain universality. Thirdly, the financial indicators analyzed in this research mainly focus on profitability, debt-paying ability, operational efficiency and R&D investment, and fail to cover more comprehensive indicators such as growth ability, market valuation, and ESG. Finally, the research method mainly involves the analysis of financial indicators and horizontal comparison and does not use more complex methods such as causal analysis or regression models to support the research results, thus failing to deeply reveal the influence of other variables or factors on financial performance.

Given these limitations, future research can make targeted improvements to address each specific limitation. Firstly, increase the sample size of the research and include more new energy vehicle enterprises as research subjects, such as NIO, XPENG, Tesla China, etc., and even the performance of multinational companies like Toyota and Volkswagen in the field of new energy, to enhance the breadth and applicability of the research. Secondly, extend the time span of data analysis in order to

conduct a more comprehensive and systematic study of the long-term effects of policy changes, global industrial competition, innovation development, and other factors on the financial performance of enterprises. In addition, more comprehensive measurement indicators should be adopted, such as ESG evaluation, enterprise innovation ability, market share, brand value, etc. Instead of merely focusing on financial performance, non-financial indicators should also be included to assess the overall performance of the enterprise. In terms of research methods, more complex models and analytical tools such as regression analysis and machine learning can be employed to obtain more profound research outcomes. Finally, future research could compare Chinese new energy vehicle enterprises with those from other countries, highlighting the differences in development based on different national development policies and varying levels of technological and innovation capabilities. Such more in-depth and extensive research can help investors, policymakers and enterprises make more informed decisions in such a highly competitive market environment.

5. Conclusion

This study focused on three companies: BYD, SAIC Group, and Ideal Motors. It conducted a comparative analysis of the financial performance of new energy vehicle enterprises in China under different development models. The research results show that there are significant differences among these three companies in terms of profitability, debt-paying ability, operational efficiency and research and development investment. Although BYD is a leading company among private enterprises, its profit level has been steadily increasing, and the asset utilization rate has improved to some extent, it still faces liquidity pressure. As a state-owned enterprise, SAIC Group maintains overall stable liquidity. However, its profits and operational efficiency have declined, and it also faces high debt repayment pressure. All these are manifestations of its transformation being hindered. As a new force, Ideal Auto has gradually moved from initial losses to achieving profitability. Its financial structure is reasonable, and the financial risks are low. However, the sustainability of its development still requires further study. The research results on the key indicator of R&D intensity underscore the pivotal role of innovation in influencing a company's financial performance. However, there are still differences among different development models. Overall, this study has expanded the research on the financial performance of China's new energy vehicle industry, providing an academic reference for investors, policymakers, and company executives to gain a deeper understanding of the industry's financial performance

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