

Analysis of the Growth Potential of the New Vehicle Industry

-- A Case Study of BYD

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Abstract: With the increasing environmental pollution, China has strengthened environmental protection and the development of new energy sources, leading to continuous improvements in the new energy vehicle industry. The rise in living standards and growing environmental awareness have driven significant growth in market demand. Since 2009, although China's new energy vehicle industry has made significant progress and achieved the world's largest market size, it has also become the most competitive market globally, where domestic brands face pressure from international companies. This study takes BYD as the research subject and, based on corporate growth theory, collects financial data to compare and analyze its growth alongside other listed new energy companies. The aim is to provide reasonable suggestions to help BYD maintain its competitive edge in the future, while enhancing the understanding of the significance of China's new energy vehicle industry and its financial trends.

Keywords: New Energy Vehicle Industry; Financial Indicators; Growth Analysis; BYD.

1. Introduction

BYD Company Limited is a comprehensive Chinese enterprise primarily engaged in the research, development, manufacturing, and sales of new energy vehicles and smart batteries. The company was established in 1995 in Shenzhen, Guangdong Province, where its headquarters remains today. Initially known for producing small household appliances, BYD later shifted its focus to the automotive industry. It began developing hybrid electric vehicles in 2003 and introduced pure electric vehicles in 2008. Today, BYD has become one of China's largest new energy vehicle manufacturers and has gained considerable influence internationally. Besides new energy vehicles, BYD is also involved in various other sectors, such as solar panels, LED lighting equipment, buses, logistics vehicles, and rail transit systems. In February 2024, BYD was the only Chinese automotive brand included in the 2024 Global 500 Most Valuable Brands list. Guided by its "Three Green Dreams" vision, BYD aims to address global environmental and economic issues caused by oil dependency through technological innovation, striving to benefit humanity and change the world.

2. Research Background

With the continuous development of China's economy, the increase in the number of motor vehicles has led to a rise in oil consumption and greenhouse gas emissions, severely damaging the natural ecosystem. Therefore, the development of new energy vehicles (NEVs) in China is imperative. By integrating technologies such as new energy, artificial intelligence, and big data, China's NEVs are transforming into mobile smart terminals. This plays a crucial role in optimizing China's energy structure, building a clean world, managing smart cities, and constructing a global community with a shared future.

The development of NEVs is an indispensable step for China to become an automotive powerhouse and a vital

means to address the country's harsh climate conditions and reduce the consumption of non-renewable energy. Since the State Council issued and implemented the Energy-Saving and New Energy Vehicle Industry Development Plan (2012–2020) in 2012, China has steadfastly pursued a green energy strategy and has made significant progress in the NEV industry, injecting major momentum into the global automotive industry transformation.

In the current era, new technologies such as 5G, artificial intelligence, and cloud computing are accelerating innovation and integration in the automotive, transportation, energy, and other sectors. A new technological revolution and industrial transformation are spreading globally, leading major automotive companies to increase their focus and investment in China. This has intensified competition in China's automotive market while also presenting more opportunities and challenges for domestic Chinese brands.

By the third quarter of 2022, China's NEV exports had already surpassed the total for the entire year of 2021, reaching 679,000 units for the full year of 2022. From January to September 2022 alone, China's automobile production-to-sales ratio reached 99.17%. This demonstrates that China has undoubtedly become a global leader in the NEV industry. As a leader in NEVs, BYD sold 730,000 vehicles in 2021, including 593,800 NEVs. In just one year, by 2022, its sales doubled, reaching 1.8635 million vehicles, surpassing Tesla to become the global leader in NEV sales. Undoubtedly, as a pioneer in China's NEV industry, BYD has become the primary subject of this study.

3. Research Significance

Although BYD is a leading enterprise in China's new energy vehicle (NEV) industry at the forefront of development, its financial condition faces significant pressure due to intense domestic and international competition and the impending phase-out of government subsidies. Issues such as weak solvency and inventory backlog hinder BYD's sustainable development. Analyzing its growth potential can

help identify the company's strengths and weaknesses, enabling it to leverage advantages and address shortcomings. By uncovering obstacles in its development and proposing targeted solutions, this study aims to support BYD in achieving long-term growth and strengthening its competitive edge in the fierce market competition. It is hoped that BYD will successfully pursue internationalization with "Quality Made in China," transforming from a national leader in both sales and technology into a global benchmark.

Since the late 20th century, the outstanding contributions of NEVs in alleviating energy crises and protecting the environment have been gradually recognized. China took the lead in initiating research and development of NEVs, followed by the introduction of policies to promote their advancement. After three Five-Year Plan periods from 2001 to 2015, China's NEV industry has progressed beyond the formation stage of technology and supply chains and entered a growth phase. However, as product variety continues to expand, the percentage of the total addressable market (TAM) for NEVs is accelerating, potentially leading to market saturation, reduced sales growth, and intensified industry competition.

Additionally, the NEV industry faces challenges such as bottleneck areas including battery raw materials and automotive-grade chips, production costs exceeding selling prices, low capacity utilization rates, and relatively low penetration rates of commercial NEVs. This study not only analyzes BYD but also compares it with some of its peers, providing insights for other domestic NEV companies and the industry as a whole. By clarifying the current state and direction of the NEV industry, this research aims to guide China's NEV sector toward better development, enabling the entire industry to achieve high-speed growth and continuous optimization driven by multiple factors. Ultimately, it seeks to foster a future trend of greener, smarter, and more efficient growth.

4. Literature Review

4.1. Current International Research Status

The study of corporate growth theory began relatively early in foreign countries, initially explored by Adam Smith and Marshall, who explained enterprise growth through the division of labor and economies of scale. Over time, various analyses of growth have "blossomed" in diverse ways.

Myers and Turnbull (1977), in their study on the relationship between corporate debt and growth, concluded that companies with high debt ratios face higher risks of bankruptcy. If forced into liquidation, such companies would lose opportunities for sustainable growth. Therefore, when more development opportunities arise, enterprises tend to adopt more conservative financial strategies. They predicted a negative correlation between corporate growth and debt ratios. Additionally, the study highlighted several key factors influencing corporate growth, such as debt capacity, industry attributes, corporate management, and company size.

Kim (2011) also emphasized the importance of debt, arguing that internal funds and short-term debt are critical determinants of corporate growth, while exogenous financing has limited impact. In contrast, Yazdanfar Danish and Khalik Salman (2012) approached the topic from a different perspective, examining the role of short-term and long-term debt in promoting corporate growth. Using data from 12,101 small enterprises in Sweden, their results showed that retained

earnings significantly influence growth, short-term debt enhances growth, but long-term debt has limited promotional effects.

The relationship between corporate growth and factors beyond debt was also explored. Andrews and de Serres (2012) argued that intangible assets are key sources of innovation and productivity, analyzing how they impact corporate growth. Cefis, Ciccarelli, and Orsenigo (2007) studied the relationship between Gibrat's Law and corporate growth, finding that under Bayesian panel data methods, corporate growth rates and firm size do not converge to a common limiting distribution, indicating a certain correlation between growth rate and scale. Xia Ying (2013), in evaluating the growth of companies listed on China's Growth Enterprise Market, used ownership concentration and sustainable growth rate as proxy variables. The study found that major shareholders effectively reduce agency problems, and sustainable growth rate positively correlates with corporate growth.

The study most closely aligned with the growth aspects examined in this paper is the work by Jordan, Lowe, and Taylor (2010). Their research selected over 200 small and medium-sized enterprises in the UK as subjects, analyzing three consecutive years of financial data. They identified key factors significantly influencing corporate growth: from a financial perspective, profitability, development capability, and shareholder returns are crucial and positively correlated with growth, while income tax rates and operational risks show significant negative correlations with corporate growth.

4.2. Current Domestic Research Status

Regarding the issue of corporate growth, domestic scholars have also achieved significant research results.

Chen Xiaohong, Zou Xiangjuan, and Yu Jian (2005) employed empirical analysis methods to study the growth of small and medium-sized enterprises (SMEs) in China. They also utilized Grey Relational Analysis (GRA) and the catastrophe progression method to construct and analyze models. Compared to non-experimental conclusions, this model was validated for its effectiveness. Although this method can be quantified, it lacks universality due to its failure to account for variations across different industries. Moreover, as early as 1997, Cong Peihua's research suggested that the growth of listed companies is closely related to their industry, as well as to firm size and financial structure. Both studies highlight the important relationship between corporate growth and the industry in which a company operates.

In addition to empirical analysis, some scholars have established indicator systems and examined financial metrics to evaluate corporate growth. For example, Fan Bainan, Shen Rongfang, and Chen Demian (2011) used questionnaires to collect data on factors influencing the growth of venture enterprises and venture capital firms in China. Based on this, they developed a hierarchical evaluation index system for venture enterprise growth, though this method lacks empirical validation. Kang Linjie and Cao Zhaohui (2021) took pharmaceutical companies in Hebei Province as a case study and, from the perspective of financial statements, analyzed corporate growth through four dimensions: solvency, operational capability, profitability, and development capability.

Xu Bo (2022) further selected 12 specific indicators, such as the equity ratio and accounts receivable turnover days, to assess the growth of listed companies in the logistics industry.

These companies were then ranked based on their total scores across these indicators. He Fengping (2008), applying the principle of difference, used time-series data of agricultural listed companies as initial input to establish a comprehensive evaluation index system. The study identified the growth potential of operating revenue as the primary driver of corporate growth.

5. Growth Analysis

5.1. Solvency Analysis

Table 1. BYD Company Limited Solvency Financial Indicators Table (2020-2022)

Indicators	2020	2021	2022
Current Ratio	1.049	0.970	0.722
Quick Ratio	0.754	0.717	0.485
Debt to Asset Ratio	67.94%	64.76%	75.42%

From the perspective of short-term solvency, BYD's current ratio continuously declined from 1.049 to 0.722, indicating a consistent downward trend between 2020 and 2022. Both current assets and current liabilities showed an upward trend. The quick ratio followed a similar pattern to the current ratio, with the most noticeable decline occurring in 2022, recording a year-on-year decrease of 32.35%. This can be attributed to BYD's strong focus on the research and production of new energy vehicles, which requires significant technological accumulation and substantial investment in R&D.

Overall, BYD's short-term solvency has shown a slight weakening trend. As a leader in the new energy vehicle industry, BYD has been continuously expanding its production scale, leading to an accumulation of inventory. Additionally, its monetary funds and tradable financial assets increased sharply over the three-year period, indicating that the company holds too many cash-like assets with low profitability. This suggests that although the company's cash assets are highly liquid, current liabilities have grown significantly faster than current assets. In 2022 alone, current assets increased by 44.97% year-on-year, while current liabilities surged by 94.59%. As a result, BYD's ability to repay short-term debts has weakened, posing relatively high short-term solvency risks.

However, in 2022, the sales of new energy vehicles doubled, and BYD surpassed Tesla to become the global leader in new energy vehicle sales. This has allowed the company to recover its cash flow, indicating that its short-term solvency is expected to improve effectively in the future.

In addition to short-term solvency, long-term creditors and owners are also concerned about a company's long-term debt repayment capacity. Generally, a corporate asset-liability ratio between 40% and 60% is considered appropriate. However, BYD's asset-liability ratio remained above 60% from 2020 to 2022, slightly decreasing at first before rising sharply to 75.42%. A high ratio indicates weaker solvency and greater financial risk. This situation largely stems from BYD's rapid expansion strategy. To maintain its technological leadership and secure a strong position in the future market, BYD has significantly increased investment in new energy vehicle and lithium battery production bases, as well as in technological research and development, since 2018. As a result, a large amount of borrowed capital has been allocated to these areas, making debt the dominant part of the company's capital structure.

5.2. Profitability Analysis

Table 2. BYD Company Limited Profitability Financial Indicators Table (2020-2022)

Indicators	2020	2021	2022
Gross Profit Margin	19.38	13.02	17.04
Net Profit Margin on Sales	3.84	1.84	4.18
ROE	7.43	3.73	16.14
ROA	3.03	1.60	4.49

BYD's financial data and indicators related to profitability from 2020 to 2022 are shown in Table 2. Looking at the three-year financial data, indicators such as gross profit margin, net profit margin, return on equity (ROE), and net profit margin on total assets all showed a trend of first decreasing and then increasing.

In 2021, BYD's profitability declined significantly. This was mainly due to the severe global pandemic, economic downturn, soaring prices of raw materials, and increasing cost pressures, which affected BYD's development and reduced its profitability. As a result, the company reported low profits despite high revenue. At this stage, BYD had not yet achieved a balance between market share and profitability. Instead, it chose to focus on capturing market share and pursuing rapid growth.

While expanding its production scale, BYD continued to launch vehicles with higher price points to cope with rising raw material costs and increasing expenses (such as employee compensation and after-sales service fees). At the same time, BYD independently developed and mastered its core technologies, enhancing its product competitiveness. All these efforts demonstrated BYD's ambition to secure a strong position in China's new energy vehicle industry and laid the foundation for improved profitability in the following year.

The year 2022 marked a major breakthrough for BYD, with its annual net profit exceeding the total of the previous five years. Key indicators such as gross profit margin, return on equity, net profit margin, and net profit margin on total assets all rebounded.

In 2021, many automakers were impacted by chip and battery shortages, and some even faced supply chain disruptions due to the pandemic. However, in 2022, BYD seemed unaffected by potential supply chain issues. While other automakers struggled with parts shortages, BYD maintained production and vehicle supply. This not only reduced costs and strengthened its bargaining power but also eliminated concerns about dependence on battery suppliers. Additionally, the company's ability to generate profits through sales improved significantly, proving the effectiveness of BYD's earlier focus on core technology development.

Moreover, due to its continuous expansion, BYD managed to lower per-unit costs, leading to sustained improvements in per-vehicle profitability. With its massive production scale, the company also received increased policy support from the government, including new energy subsidies, which rose from 5.9 billion yuan in 2021 to 10.4 billion yuan in 2022. These factors were the main reasons behind BYD's enhanced profitability.

5.3. Operating Capability Analysis

Table 3. BYD Company Limited Operating Capability Financial Indicators Table (2020-2022) (Unit: Times)

Indicators	2020	2021	2022
Receivables turnover ratio	3.678	5.580	11.30
Inventory turnover ratio	4.432	5.030	5.746
Total Assets Turnover	0.790	0.870	1.074

As shown in Table 3, BYD Company Limited's accounts receivable turnover rate, inventory turnover rate, and total asset turnover rate all demonstrated a steady upward trend. Notably, the accounts receivable turnover rate surged from 5.580 times in 2021 to 11.30 times in 2022. Based on data from the past three years, the ratio of accounts receivable to total operating revenue declined consistently, dropping from 26% in 2020 to 7.98% in 2022. This indicates that a higher accounts receivable turnover rate leads to faster collection of receivables, effectively reducing the risk of bad debts.

However, it is worth noting that the improvement in accounts receivable turnover has not strengthened BYD's short-term debt repayment ability. Instead, it has slightly declined. The reason lies in the company's high current liabilities, with operating liabilities making up the main part—over 60% for the past three years. At the same time, BYD's operating income has been growing year by year and remains relatively high, which also reflects the company's strong position downstream. Additionally, BYD masters core technologies, indicating that the company is actively expanding across the upstream and downstream segments of the industry chain, ensuring supply chain security—a sign of strong competitiveness.

A higher inventory turnover rate indicates stronger sales capability and less working capital allocated to inventory. Therefore, inventory turnover can be used to measure a company's sales performance and inventory utilization. BYD's inventory turnover rate has remained stable with an upward trend, suggesting that the growth in its inventory value is healthy. The total asset turnover rate follows a similar trend, reflecting the efficiency of the company's overall asset utilization. BYD's efficiency in using its assets for operations is improving, with faster capital turnover and continuously increasing sales capability.

Overall, BYD's operational capacity is strengthening.

6. Peer Comparison Analysis

This industry comparison primarily analyzes the profitability, operational capability, and debt-paying ability of BYD, GAC Group, and Great Wall Motors in 2022.

Table 4. Comparison of Solvency Ratios: BYD, GAC Group, and Great Wall Motors (2020)

Indicators	BYD	GAC	GWM
Current Ratio	0.722	1.620	1.124
Quick Ratio	0.485	1.404	0.890
Debt to Asset Ratio	75.42%	35.67%	64.82%

BYD's short-term solvency ratios are significantly lower than those of GAC and Great Wall, and its asset-liability ratio is also higher than the other two companies. The reason lies in BYD's rapid growth phase. Although its debt repayment ability is slightly weaker, its owners benefit more from leverage. In summary, based on the metrics, BYD's solvency—both long-term and short-term—currently lags

behind that of GAC and Great Wall.

Table 5. Comparison of Operational Capability Ratios: BYD, GAC Group, and Great Wall Motors

Indicators	BYD	GAC	GWM
Receivables turnover ratio	11.30	12.5	15.30
Inventory turnover ratio	5.746	9.934	6.094
Total Assets Turnover	1.074	0.639	0.761

Shifting the focus to operational capability, a horizontal comparison reveals that BYD's inventory turnover ratio remains around 5, which is significantly lower than that of Great Wall and GAC. This trend has persisted not only in 2022 but also in previous years.

BYD's inventory accounts for 32.85% of its current assets, compared to 20.77% for Great Wall and 13.47% for GAC. This indicates that BYD's lower inventory turnover is due to slower sales, higher inventory pressure, and longer conversion cycles.

Great Wall's accounts receivable turnover is much higher than the other two companies, while BYD ranks the lowest among the three. However, BYD's total asset turnover is relatively decent. Over the past four years, the gap in total asset turnover between BYD and its peers (GAC and Great Wall) has been widening.

Overall, BYD's operational capability is weaker, but it has been improving in recent years. Future performance in this area is expected to surpass that of its industry peers.

Table 6. Comparison of Profitability Ratios: BYD, GAC Group, and Great Wall Motors (2022) (Unit: %)

Indicators	BYD	GAC	GWM
Gross Profit Margin	17.04	6.99	19.37
Net Profit Margin on Sales	4.18	7.32	6.01
ROE	16.14	7.93	12.66
ROA	4.49	4.65	4.58

Profitability is a crucial financial capability for enterprises. The Return on Total Assets (ROA) of BYD, Great Wall, and GAC remained relatively similar. Great Wall and BYD were closely matched in terms of gross profit margin, though BYD still slightly lagged behind Great Wall. However, BYD's Return on Equity (ROE) stood at 16.14%, significantly outperforming the other two companies, while its net profit margin was lower than that of both GAC and Great Wall. This indicates that although BYD "took the lead" in 2022, its overall profitability still has room for growth.

7. Shortcomings

7.1. Weak Solvency

Based on the above analysis, it can be seen that BYD Company Limited has relatively weak solvency. The main reason for this is its strategic choice to rely on operating liabilities in order to capture market share, expand its scale, and enhance its market competitiveness.

Furthermore, the cash inflows generated from BYD's financing activities primarily come from borrowing, indicating that the company faces relatively high financing costs. In addition, BYD has been significantly increasing its investments—for instance, its trading financial assets grew by 233,600 times year-on-year in 2021.

7.2. High Inventory Pressure

BYD is experiencing an inventory backlog. Although the company's sales have surged, its inventory scale has also expanded significantly. With the support of national policies, new energy vehicles (NEVs) are no longer in short supply in the market, and consumer demand has subsequently declined. Moreover, the prices of NEVs across the market have plummeted, triggering a wave of price reductions. As a result, BYD is facing intense competitive pressure from industry peers.

7.3. Reliance on Government Subsidies

According to data, government subsidies for BYD's new energy vehicles reached 5.867 billion CNY in 2021. However, the company's actual net profit attributable to shareholders that year, after deducting these subsidies, was only 782 million CNY. Looking further back, BYD received 1.678 billion CNY in government subsidies in 2020, while its net profit attributable to shareholders for the same period was 4.234 billion CNY.

In other words, BYD relied heavily on government subsidies prior to 2022. Although the company received 10.438 billion CNY in financial subsidies in 2022, it also achieved high profits that year, indicating a decreasing dependence on government support. As 2022 marked the final year of new energy vehicle subsidies, the discontinuation of such subsidies is expected to impact BYD's profitability to some extent in the future.

8. Suggestions

8.1. Enhancing Solvency and Optimizing Asset Structure

BYD's initial strategic approach was to "prioritize scale before profitability." Now that it has achieved a massive scale, the company should temporarily slow its expansion policies and reduce its operational liabilities. At the same time, it should diversify its financing sources instead of focusing solely on borrowing. Alternatives such as issuing bonds or bringing in investors could help lower financial costs. These steps would reduce debt pressure and minimize the risk of financial distress. Moreover, BYD's persistently high debt-to-asset ratio indicates a clear need to optimize its asset structure.

8.2. Reducing Inventory Backlog and Accelerating Inventory Turnover

Inventory backlog not only affects solvency but also impairs operational capabilities. Therefore, one of the key objectives is to sell accumulated products as soon as possible:

Firstly, although BYD's products are competitive in terms of quality and pricing, its brand influence remains relatively weak. The company should focus on building a stronger brand image and solidifying its brand foundation.

Secondly, it is crucial to actively conduct market research to gain deeper insights into customer preferences and demands. At the same time, product quality should not be overlooked, as it plays a vital role in enhancing customer loyalty.

Finally, understanding both the market and competitors is essential for success. While learning about customers, BYD must also closely monitor competitors' moves, stay sensitive to market trends, and promptly respond to any changes. By adapting appropriately while maintaining its unique

characteristics, the company can strengthen its market position.

8.3. Controlling Labor Costs and Reducing Reliance on Government Subsidies

BYD has mastered core technologies and possesses its own upstream resources, which has helped reduce costs to some extent. However, its labor costs have continued to rise without decline, negatively impacting the company's profitability. To address this, BYD should invest in intelligent equipment to reduce the number of replaceable positions and promote the adoption of artificial intelligence. This would not only cut labor costs but also improve work efficiency. By doing so, BYD can expand its profit margins, ensuring that even without government subsidies, the company can generate higher profits in the future.

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