Research on Financial Risk Assessment and Control based on New energy vehicle manufacturing industry

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Abstract

This paper analyzes the differentiated growth path and business strategy effect of new energy car manufacturing companies NIO, Xiaopeng and Lixiang. Starting with financial performance analysis, Z-Score model is used to analyze the yearly changes of X variable and Z value of the three companies based on their financial data from 2019-2023, and carry out financial capability analysis and financial risk assessment. In the market environment of intensified competition, this paper explores the common problems of new energy car making new power companies, improves the system of measures in order to help enterprises reduce financial risks, maintain stable operations, and provide a reference for many new energy automobile manufacturing companies.

1. Introduction

In 2020, the General Office of the State Council issued the "New Energy Vehicle Industry Development Plan (2021-2035)" (hereinafter referred to as the "Plan") to accelerate the high-quality development of China's automotive industry. The Plan points out that by 2025, the sales volume of new energy vehicles will reach about 20% of the total sales volume of new cars. By 2035, pure electric vehicles will become the mainstream of new sales vehicles, accounting for over 50% (General Office of the State Council, 2020).

Table 1. Sales of New Energy Vehicles in China

Year	***Sales Volume (10,000 units)***	***Year-on-Year Growth***
2019	120.6	-3.98%
2020	136.7	13.30%
2021	354.5	159.32%
2022	688.7	94.20%
2023	949.5	37.9%

As shown in Table 1, the sales volume of new energy vehicles in China has rapidly increased in the past five years. According to statistics from the China Association of Automobile Manufacturers, the cumulative

production and sales of automobiles in 2023 reached 30.161 million and 30.094 million units, with year-on-year growth of 11.6% and 12%, respectively. Among them, new energy vehicles continued to maintain rapid growth, with production and sales exceeding 9 million units and a market share of over 30% (China Association of Automobile Manufacturers, 2023). Under the premise of ensuring national energy security through industrial policies such as government procurement, automobile license plates, and consumer subsidies, China is moving towards an era of multi-energy structures and further realizing the green and low-carbon transformation of energy production and consumption patterns (Zhao & Wang, 2023).

In the process of rapid industry development, traditional automobile companies such as Geely, Changan, and Great Wall have gradually highlighted their advantages in scale, channels, manufacturing, sales, and other dimensions after experiencing continuous deepening of electrification transformation in the past few years, and have mastered the pricing power of new energy vehicles and the definition power of popular models (Liu et al., 2024). On the other hand, new forces in the field of new energy vehicle manufacturing are undergoing a large-scale reshuffle. Between 2020 and 2022, a total of 27 new energy vehicle industry chain companies in China went bankrupt or underwent bankruptcy reorganization, of which 17 were involved in vehicle manufacturing. For instance, in October 2023, WM Motor, which has over 110,000 users, announced bankruptcy reorganization due to operational difficulties. Similarly, in February 2024, Gaohe Automobile, targeting the high-end pricing market, announced a six-month shutdown (UBS China, 2024).

Since 2024, the Chinese new energy vehicle market has seen scenes of "price competition," "configuration competition," and "intelligent driving competition," with cross-border new forces such as Huawei and Xiaomi emerging one after another. The competition in each segmented market has become increasingly fierce. In the past few years of development, new energy vehicle companies represented by NIO, Xiaopeng, and Lixiang have gradually gained market recognition based on their innovation and market-leading capabilities. This article combines the differentiated growth paths and strategic effects of three companies, starting from financial performance analysis, to conduct financial capability analysis and financial risk research on them. In the fiercely competitive market environment, exploring the common problems of new energy vehicle companies, improving the system of measures to help enterprises reduce financial risks, maintain stable operations, and provide a reference for many new energy vehicle companies (Chen & Zhang, 2024).

1.1 Literature Review

The literature review represents the theoretical core of an article. In this section, we will discuss the purpose of a literature review. We will also consider how one should go about finding appropriate literature on which to base a literature review and how this information should be managed. Finally, we will answer four questions that first-time researchers often battle with when compiling a literature review. These questions are: which aspects should I include in a literature review? How should I go about synthesizing information in a literature review? How should I structure a literature review? What writing style should I use when compiling a literature review?

The purpose of a literature review is to "look again" (re + view) at what other researchers have done regarding a specific topic (Leedy & Ormrod, 2005). A literature review provides background and serves as motivation for the objectives and hypotheses that guide your own research (Perry et al., 2003).

A good literature review does not merely summarize relevant previous research. Instead, the researcher critically evaluates, re-organizes, and synthesizes the work of others (Leedy & Ormrod, 2005). Compiling a literature review is like making a smoothie: the end product is a condensed mix that differs from the individual ingredients. The key to a successful literature review lies in digesting information from different sources, critically evaluating it, and presenting conclusions concisely and logically.

First-time researchers often naively believe everything they read or are afraid to criticize the work of others. However, academic research is all about critical inquiry. Researchers must carefully read the most recent

available literature to identify gaps, inconsistencies, or controversies that may form the basis of their own research. Always show that you have considered an issue from several angles and are aware of the arguments for and against a specific point of view.

2. Research Methods

Since 2024, the Chinese new energy vehicle market has seen scenes of "price competition", "configuration competition", "intelligent driving competition", and cross-border new forces such as Huawei and Xiaomi have emerged one after another. The competition in each segmented market has become increasingly fierce. In the past few years of development, new energy vehicle companies represented by NIO, Xiaopeng, and Lixiang have gradually gained market recognition based on their innovation and market leading capabilities. This article combines the differentiated growth paths and strategic effects of three companies, starting from financial performance analysis, to conduct financial capability analysis and financial risk research on them. In the fiercely competitive market environment, exploring the common problems of new energy vehicle companies, improving the system of measures, in order to help enterprises reduce financial risks, maintain stable operations, and provide reference for many new energy vehicle companies.

3. Result and Discussion

3.1 Analysis of Company Business Strategy

NIO, Xiaopeng, and Lixiang have adopted differentiated growth paths and achieved different development results. NIO is positioned as a luxury car brand, with its main products including NIO ES8, ES6, EC6 and other electric SUV models. It has a high level of popularity and influence in the Chinese market, and has won the favor of consumers with leading technology, innovative design and high-quality all scenario services. Xiaopeng focuses on technological and intelligent automotive solutions, with flagship products including Xiaopeng G3, P7 and other models, meeting consumers' needs for environmental protection, high technology and convenience, and actively promoting the development of the new energy vehicle industry. Lixiang is committed to creating a highly comfortable driving environment, independently developing unique range extending systems, expanding product lines and user groups, and is the first profitable new force enterprise in the automotive industry in China. The overall sales volume of automobiles is the core focus of car manufacturers, and sales growth is the key to determining revenue growth. According to statistics, NIO, Xiaopeng, and Lixiang will achieve vehicle sales of 160000, 141600, and 376000 units respectively in 2023, with year-on-year growth rates of 30.66%, 17.26%, and 182.21%.

Table 2: Partial Profit Statements of NIO, XPeng, and Lixiang for 2023

Category	***NIO***	***XPeng***	***Lixiang***
Total Revenue (Billion CNY) Year-over-Year Change	556.18 +12.89%	306.76 +14.23%	1238.51 +178.48%
Cost of Sales (Billion CNY) Year-over-Year Change	525.66 +19.13%	302.25 +27.17%	963.55 +164.02%
Gross Profit (Billion CNY) Year-over-Year Change	30.52 -40.67%	4.51 -85.39%	274.97 +212.80%
Gross Margin (%) Year-over-Year Change	5.49% -47.44%	1.47% -87.22%	22.20% +14.37%

Research and Development Expenses (Billion CNY) Year-over-Year Change	134.31 +23.95%	52.77 +1.18%	105.86 +56.14%
Selling, General and Administrative Expenses (Billion CNY) Year-over-Year Change	128.85 +22.28%	65.59 -1.93%	97.68 +72.43%
Net Financial Expenses (Billion CNY) Year-over-Year Change	4.04 +21.10%	-9.91 -7.01%	0.86 -18.89%
Operating Profit (Billion CNY) Year-over-Year Change	-226.55 +44.84%	-108.89 +25.09%	73.21 +294.63%
Net Profit (Billion CNY) Year-over-Year Change	-207.20 +43.52%	-103.76 +13.53%	118.09 +681.06%

3.2 Financial Performance Analysis of the Company

As shown in Table 2, in 2023, all three companies of "Weixiaoli" achieved sales revenue growth, with sales revenue of 55.618 billion yuan, 30.676 billion yuan, and 123.851 billion yuan respectively, a year-on-year increase of 12.89%, 14.23%, and 178.48%. Among them, Lixiang Automobile achieves high synergistic effects in product, research and development, supply manufacturing, and sales delivery. With the increase of research and development expenses and the structural layout of flat and systematic research and development, Lixiang's technological strength in the fields of intelligence and electric energy is gradually improving. In 2023,Lixiang's annual revenue exceeded 100 billion yuan, with a net profit of 11.809 billion yuan, becoming the third new energy vehicle company in the world to achieve profitability after Tesla and BYD.

According to statistics, for automobile companies, the gross profit margin is usually between 10% and 20%. In 2023, the ideal gross profit margin is 22.20%, exceeding the industry average. However, NIO and Xiaopeng's gross profit margins have significantly decreased, showing a financial characteristic of "increasing production without increasing profits". They will continue to incur losses in 2023, with net profits of -20.72 billion yuan and -10.376 billion yuan, respectively. From 2019 to 2023, NIO and Xiaopeng have accumulated losses of over 55 billion yuan and 30 billion yuan respectively. The weak profitability is mainly due to the common characteristics of new energy vehicle companies that focus on research and development expenses and sales expenses. During the process of business expansion, the increase in R&D expenses is due to the cost of supporting the expansion of product portfolio and technology, the number of R&D technical personnel, and the increase in R&D personnel salaries. At the same time, due to the increase in rental expenses caused by the expansion of sales and service networks, as well as the increase in sales department employees and salaries, new energy vehicle companies bear higher sales costs, and the economies of scale have not been released. In 2023, the research and development expenses of all three companies are showing an upward trend. Among them, NIO's R&D expenses account for as much as 24.15% of its revenue, far exceeding the industry average. NIO is developing its battery swapping business at full speed. According to statistics, as of the beginning of 2023, a total of 2326 charging stations and 13663 charging piles have been built, with a cost of approximately 100000 yuan per charging pile; In 2023, NIO will build 1035 new battery swapping stations, with a cost of approximately 3 million yuan per station and a total investment of over 3 billion yuan. The large-scale construction of battery swapping stations by NIO has further exacerbated its loss situation.

Table 3: Partial Cash Flow Statements of NIO, XPeng, and Lixiang for 2023

Category	***NIO***	***XPeng***	***Lixiang***
Net Cash Flow from Operating Activities (Billion CNY) Year-over-Year Change	-13.82 +64.26%	9.56 +111.61%	506.94 +586.88%
Net Cash Flow from Investing Activities (Billion CNY) Year-over-Year Change	-108.85 -204.82%	6.31. -86.98%	-0.12 +99.72%
Net Cash Flow from Financing Activities (Billion CNY) Year-over-Year Change	276.63 +1811.41%	80.15 +33.50%	1.85 -96.71%
Net Increase in Cash and Cash Equivalents (Billion CNY) Year-over-Year Change	154.66 +223.51%	95.88 -211.38%	509.11 +412.96%

As shown in Table 3, the net increase in cash and equivalents of NIO and Xiaopeng in 2023 was mainly driven by fundraising activities such as new stock issuance and new loans, while Lixiang benefited from the growth of operating activity performance and the realization of core profits. From the perspective of cash holdings and cash structure, since 2018, the three companies have actively expanded and successively gone public in the United States to obtain more financing space. As of the end of 2023, NIO, Xiaopeng, and Lixiang have cash and cash equivalents balances of 32.935 billion yuan, 21.127 billion yuan, and 91.329 billion yuan, respectively, indicating sufficient cash reserves.

3.3 Financial Risk Analysis of "Weixiaoli" under Z-score Model

The Z-score model was proposed by scholar Edward Altman in 1968, which assigns different weights to five core indicators and calculates the weighted average value to obtain the numerical value. The Z-score model is used to analyze and predict financial risks, bond default risks, and bankruptcy risks of enterprises, conveying warning signals to prevent bond defaults and bankruptcies. This model mainly focuses on the company's asset liability status, profitability, and debt paying ability, and standardizes these indicators to compare companies of different sizes and industries. The Z-score model is commonly used to predict the likelihood of a company going bankrupt. A lower Z-score indicates that the company may face bankruptcy risk, while a higher Z-score indicates that the company's financial condition is relatively stable. The Atman Z-score model is a model used to predict the risk of corporate bankruptcy, mainly applicable to the manufacturing, wholesale and retail, and financial services industries, as these three industries typically have high balance sheet leverage ratios, and the Z-score model is calculated based on balance sheet data. Because new energy vehicles belong to publicly traded manufacturing companies, this article selects the Atman Z-score model as the calculation basis.

The formula is as follows:

$Z=1.2X_1+1.4X_2+3.3X_3+0.6X_4+0.999X_5$

where

X_1=(current assets - current liabilities)/total assets

X_2=(surplus reserves+undistributed profits)/total assets

X_3=(total profits+financial expenses)/total assets

X_4=(total number of shares × stock price)/total liabilities

X_5=operating income/total assets.

Table 4: Z-score Model Criteria for Financial Condition Assessment

Z-value Range	***Assessment Result***
$Z \leq 1.81$	Bankruptcy zone, financially unstable, high financial risk
$1.81 < Z \leq 2.675$	Grey zone, relatively unstable financial condition, significant financial risk
$2.675 < Z \leq 2.99$	Safer zone, relatively stable financial condition, lower financial risk
$Z > 2.99$	Safe zone, stable financial condition, low financial risk

X_1、X_2、X_3、X_4、X_5 are independent variables, and Z is the dependent variable. This article uses the Z-value model to calculate the size of the financial risk of Lixiang automobile, as shown in Table 4.

From the data in Table 6, it can be seen that the value of X1 continues to decrease from 2021 to 2023, indicating poor asset liquidity and liquidity of Lixiang Automobile; The values of X2 and X3 will show negative values from 2019 to 2022, and will not show positive values until 2023, indicating that Lixiang Automobile has achieved breakeven in 2023; X4 was at a relatively high level in 2020, indicating that Lixiang Automobile has received a large amount of financing in the stock market and the stock market price is high; The continuous increase of X5 from 2019 to 2023 indicates that the sales level of Lixiang Automobile is relatively high.

Table 5 : Specific Index Meanings and Calculation Formulas of Z-score Model

Indicator	***Description***	***Calculation Formula***
X1	Reflects the company's debt-paying ability, measures the liquidity and turnover capacity of the company's assets	Operating Capital / Total Assets
X2	Reflects the company's profitability, measures the company's accumulated profits	Retained Earnings / Total Assets
X3	Reflects the company's profitability, positively correlated with the company's profit-making ability	Earnings Before Interest and Taxes (EBIT) / Total Assets

X4	Reflects the company's debt-paying ability and capital structure, measures the extent of stock price decline when the company is insolvent	Market Value of Equity / Total Liabilities
X5	Reflects the company's operational capability, measures the ability of the company's assets to generate revenue	Sales Revenue / Total Assets

The sharp increase in the Z-value of Lixiang Automobile in 2020 is mainly due to the sharp increase in stock market value, which is mainly due to the capital market's optimism about the future development prospects of new energy vehicle enterprises and the pursuit of investors. In 2022, the Z-value decreased to 1.666, indicating an unstable financial situation. According to financial data, Lixiang Automobile's net loss for 2022 was RMB 2.03 billion, an increase of more than five times compared to RMB 322 million in 2021; In 2022, the operating loss reached 3.65 billion yuan, an increase of nearly 2.6 times year-on-year. The reason for the decline is due to various factors, with the main reason being the innovative product layout of Lixiang Automotive. Lixiang suddenly announced that it will discontinue production of Lixiang ONE and launch its replacement product L8, which has caused dissatisfaction among existing car owners. Factors such as Lixiang ONE's price reduction and existing car owners' rights protection have led to a significant decline in sales of Lixiang ONE in the third quarter. Due to the replacement demand, the price of Lixiang ONE has dropped by 20000 yuan, which has caused dissatisfaction among old car owners and led to a significant decline in sales in the third quarter of 2022, resulting in a decrease in Z-value. In 2023, the Z-value of Lixiang Automobile has rebounded, mainly due to the fact that the annual sales of the three models of Lixiang L series exceeded 100000 units in the first half of 2023, steadily increasing and leading the gap among new energy car companies.

Table 6: Financial Risk Forecast Results of Li Auto using the Z-model

Indicator	***2023***	***2022***	***2021***	***2020***	***2019***
X1	0.291	0.458	0.651	0.745	0.041
X2	0.000	-0.102	-0.110	-0.178	-0.598
X3	0.073	-0.025	-0.002	-0.005	-0.254
X4	0.759	1.364	5.041	8.987	0.929
X5	0.863	0.523	0.437	0.260	0.030
Z-value	1.908	1.666	4.080	6.279	-1.040

Table 7: Financial Risk Forecast Results of NIO Automobile using the Z-model

Indicator	*2023*	*2022*	*2021*	*2020*	*2019*
X1	0.107	0.138	0.416	0.590	-0.313
X2	-0.773	-0.726	-0.671	-0.945	-3.177
X3	-0.174	-0.149	-0.048	-0.097	-0.774
X4	1.353	2.146	11.808	58.798	1.727
X5	0.420	0.473	0.400	0.278	0.505
Z-value	-0.298	0.416	6.885	34.621	-5.837

From Table 7, it can be seen that the value of X1 has continuously decreased from 2020 to 2023, indicating that NIO's liquidity and asset liquidity have deteriorated. The values of X2 and X3 show negative values from 2019 to 2023, indicating that NIO has not yet achieved a turnaround from losses to profits. The value of X4 rapidly increased to 58.789 in 2020, indicating that external investors had high expectations for NIO's revenue growth, leading to a sharp rise in stock market value. The highest transaction price per share was 57.2 yuan, resulting in a sharp increase in X4 value. However, the sharp decline in X4 value in 2021 indicates that some investors have lost confidence in NIO's investment and sold heavily, resulting in NIO's lowest transaction price per share in 2021 being 27.52 yuan, nearly doubling its market value.

During the period of 2019-2023, NIO's Z-value has been decreasing year by year from 2020, and in 2023, it showed a negative value below 1.81, indicating that the company is facing serious financial risks. In 2020, the sharp increase in NIO's Z-value was mainly due to the strong support of national policies and the optimistic outlook of the capital market on the future development prospects of new energy vehicles. A large number of investors pursued the stock, resulting in a sharp increase in the company's market value. However, in recent years, NIO has been unable to turn losses into profits due to factors such as lower than expected sales scale and unreasonable capital structure control, which has brought great uncertainty to its future market value. At the same time, the main reason for the significant decrease in Z-value in 2021 compared to 2020 is the sharp decline in NIO's stock price in 2021. The capital market has been questioning NIO's overvaluation, and investors have serious disagreements. The massive sell-off by investors resulted in the total market value of the company evaporating by billions of yuan. When facing enormous market pressure, NIO has also attempted multiple rounds of financing through bonds and other means, but is still on the brink of "technological bankruptcy", with unstable financial conditions and significant financial risks.

From Table 8, it can be seen that the Z-value of Xiaopeng Motors has been consistently below 1.81 since 2022, indicating an unstable financial situation and significant financial risks. The Z-value of Xiaopeng Motors reached its peak of 5.997 in 2020, indicating a safe zone, stable financial condition, and low financial risk. In 2021 and 2022, the Z-value continued to decline. Although the Z-value in 2021 decreased compared to 2020, it still remained in a safe zone; However, by 2022, the Z-value had dropped to 0.568, indicating a relatively unstable financial situation and significant financial risks. By observing the changes in X-value of Xiaopeng Motors, it is not difficult to find that X4 has the greatest impact on the decline of Z-value in 2022 and 2023. On the one hand, the current new energy vehicle market has entered a stage of stock competition. With limited users and the emergence of intelligent competitors such as Huawei, Xiaopeng Motors, as a car company that focuses on intelligence, has no competitive advantage in the fiercely competitive new energy vehicle market. Taking 2021-2023 as an example, Xiaopeng Motors' R&D investment was 4.114 billion yuan, 5.215 billion yuan, and 5.277 billion yuan respectively. Within three years, Xiaopeng Motors' R&D investment exceeded 14 billion yuan. However, due to the failure to achieve expected returns in vehicle sales, Xiaopeng Motors suffered annual

losses, with a loss of nearly 10.4 billion yuan in 2023. From the stock price trend, it can be seen that the capital market continues to reduce its holdings of Xiaopeng Motors, resulting in serious financial risks.

Through the previous analysis, it was found that the internal financial risk points of the three automobile companies "Weixiaoli" are mainly concentrated in areas such as insufficient profitability, weak asset liquidity and liquidity. As representatives of new energy vehicle manufacturing enterprises, the main problems that "Weixiaoli" and its three automobile companies are currently facing in their development stage are to achieve and maintain a break even point and control financial risks. Relying solely on the benefits accumulated by the brand, the three "Weixiaoli" cars still rank among the forefront of new energy vehicle companies, and investors are optimistic about the development prospects of the new energy vehicle industry. However, if they fail to reach a break even point, it is likely to undermine investors' confidence, causing a continuous decline in stock prices, leading to a decline in market valuation of the companies, and triggering financial risks. Since 2022, the Z-values of the three automobile companies "Weixiaoli" have all been below 2.675, still facing severe financial risks, and their financial situation is not optimistic. At the same time, the new energy vehicle market is gradually becoming saturated in the external environment. The new generation of car manufacturers represented by "Weixiaoli" not only face fierce competition from domestic and foreign large car companies, but also pressure from upstream and downstream enterprises in the industry chain. How to fully utilize funds, obtain investment financing, develop core competitive products, and occupy a larger market share has become an issue that cannot be ignored by new energy vehicle companies.

4. Conclusions

4.1 Improve the investment system and enhance the efficiency of fund utilization

With the passage of time, the investment and financing enthusiasm of the new energy vehicle industry has begun to decline to some extent, and at the same time, enterprises may also face greater challenges in terms of capital flow. How to achieve sustained and stable investment returns for enterprises has become one of the problems that many new energy vehicle companies need to solve[Error! Reference source not found.].

According to the financial risk assessment results based on Z-score in the previous text, the asset liquidity and liquidity of the three automotive companies "Weixiaoli" have gradually declined in recent years. This indicates that there are deficiencies in the company's liquidity management, and all three companies of "Wei Xiaoli" have certain debt repayment pressure. At the same time, the three companies of "Wei Xiaoli" have not achieved the expected results in terms of activating funds and controlling costs. Therefore, new energy vehicle enterprises should establish a sound financial management framework, optimize the supply chain, manage the procurement and production costs of raw materials, reduce inventory backlog, improve accounts receivable management level and inventory turnover rate, thereby releasing occupied funds, enhancing liquidity, strengthening the management of funds and budgets, increasing the number of cooperative enterprises, in order to avoid risks caused by relying on a single supplier, and thus improve their ability to cope with risks.

4.2 Multi directional financing provides guarantee for fund supply

The three automobile companies "Wei Xiaoli" mainly achieve financing through issuing stocks, bank loans, issuing bonds, and government subsidies. The operational characteristics of new energy vehicle enterprises are "large initial investment, uncertain returns, and long capital recovery cycle". Enterprises need to ensure that they can carry out mass production and delivery according to the established plan, and provide a series of services, which requires a stable source of funds. But with the reduction of government subsidies for new energy vehicles in 2023, companies should not only maintain their current financing model, but also actively seek other feasible financing models. For example, convertible bonds can be chosen for issuing bonds, which have lower costs, stronger flexibility, and can appropriately avoid debt repayment pressure for companies. Issuing bonds can also adjust the company's asset liability ratio and lower financing risks; At the same time, enterprises can choose to finance their fixed assets through leasing to reduce their financial pressure. Adopting a financing strategy that combines multiple financing methods to reduce financial risks and improve the capital structure of enterprises.

4.3 Increase R&D investment and master core competitiveness

Based on the previous analysis, the retained earnings to total assets ratio (X2) of the three companies is not positive, which affects the Z-value. Therefore, companies should pay attention to the improvement of short-term profits. For the new energy vehicle industry, research and development level constrains core competitiveness. The improvement of research and development level represents the uniqueness and irreplaceability of its products, which will quickly gain recognition from consumers and enhance brand awareness. With the gradual maturity of the new energy vehicle market, more and more car companies are entering the market, and market competition will become more intense. Developing more intelligent and automated technologies is an important way for new energy vehicle companies to enhance competitiveness and achieve profitability.

At the same time, batteries are the core technology of new energy vehicles. Currently, the three companies of "Weixiaoli" are significantly inferior to BYD in battery research and development, and still lack independent research and development in energy. At the same time, due to the significant increase in the raw materials of ternary lithium batteries for new energy vehicles, cobalt and nickel, as well as lithium resources, are crucial for battery performance. However, despite China being the dominant force in the global new energy vehicle market, many key raw materials are highly dependent on imports. China's nickel resources are limited, with cobalt reserves accounting for only 8% of the world's total. Lithium resources are also quite scarce, with import dependence rates as high as 80%, 90%, and 70%, respectively. This has led to the inability of enterprises to effectively control costs, which has brought significant financial risks to the company. From the above, the three companies of "Weixiaoli" should strengthen the planning and management of their R&D departments to accelerate the development of technological achievements. Increase annual R&D funding and allocate a portion of the funds to the construction of upstream industrial chains, in order to achieve "production and sales integration" and value chain expansion, improve investment systems, enhance capital utilization efficiency, and increase economic benefits.

4.4 Increase publicity investment and expand market share

By increasing publicity investment, consumers' awareness and understanding of new energy vehicles can be enhanced, thereby stimulating consumer demand. Enterprises can enhance their brand awareness and competitiveness in the market, increase brand exposure, shape brand image, establish the image of new energy vehicle brands in terms of environmental protection, technology, innovation, etc., thereby expanding market share. Enterprises can continuously introduce advanced technologies, research and develop new materials, new energy technologies, intelligent driving systems, etc., in order to maintain technological leadership and improve product competitiveness. And currently, Lixiang Auto's main models are Lixiang MEGA, Lixiang L9,L8, NIO currently has 5 models on the market, including ET9, ES8, ES6, ES7, and ET5, while Xiaopeng Motors focuses on the X9, G6, G9, and P7 models. For the entire new energy vehicle market, the three companies have relatively few and single models. In the fierce market competition, the three companies of "Weixiaoli" should establish close cooperative relationships with suppliers, partners, research institutions, etc. through continuous innovation, build an innovation ecosystem, promote technology sharing, resource integration, and innovation cooperation, and accelerate the research and commercialization process of new products. Create unique product features and advantages to meet the diverse needs and preferences of consumers, and increase the market share and profitability of the product.

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