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Policy Drive and Market Competition: A Comparative Study on Financial Risks of New Energy Vehicle Companies

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Abstract

As China's new energy vehicle (NEV) industry shifts from policy-driven to market-oriented development, the financial sustainability of enterprises is undergoing new challenges. Existing research—largely centered on static financial indicators and the direct effects of subsidies—offers limited insight into firms' financial resilience in the post-subsidy era. This study adopts comparative analysis and cash flow evaluation to examine three leading firms—BYD, NIO, and XPeng—and uncovers notable differences in their financial performance. The results show that BYD benefits from economies of scale and efficient channel management, enabling strong operating cash flow and reduced reliance on external financing. In contrast, NIO and XPeng experience substantial cash burn, negative operating cash flow, and heavy dependence on financing activities, exposing vulnerabilities in their path toward sustainable profitability. Major risks identified include intensifying market competition, rapid technological iteration, and persistent policy uncertainty. The study concludes that improving internal operational efficiency and strengthening strategic financial management are essential for firms to thrive in an increasingly market-driven environment. It offers actionable recommendations for managers seeking to enhance financial stability and for investors assessing risk, thereby contributing to the sustainable development of the NEV industry.

Keywords: New Energy; Investment Income; Policy Support

1. Introduction

Against the backdrop of the global energy transition and China's "Dual Carbon" goals—carbon peaking and carbon neutrality—the new energy vehicle (NEV) industry has become a pivotal driver of green and low-carbon economic transformation. As China shifts from policy-driven growth to market-oriented mechanisms, the NEV sector is entering a critical transition phase characterized by both strategic opportunities and mounting uncertainties. However, this shift also exposes clear gaps in existing research. Current studies predominantly emphasize static financial

indicators or the direct effects of government subsidies, while insufficiently examining enterprises' financial resilience and adaptive strategies in the post-subsidy era.

The significance of this study lies in addressing these research gaps through a multidimensional analytical lens. Although the literature often asserts that "government subsidies are essential for NEV enterprises to achieve profitability," such conclusions overlook the evolving nature of financial risk management during marketization. Persistent challenges—negative operating cash flow, heavy reliance on external financing, and overdependence on policy support—indicate an urgent need to explore NEV firms' long-term financial sustainability and strategic adaptability.

This research contributes to both theory and practice. Theoretically, it constructs an integrated analytical framework that links policy dynamics, market competition, and financial performance, extending beyond traditional single-perspective analyses. Practically, the findings provide strategic guidance for enterprises seeking to strengthen financial stability and develop market-oriented growth models during the policy transition. For policymakers, the study offers evidence-based insights for optimizing industrial support systems and guiding the NEV industry toward healthier development.

Methodologically, this study conducts comparative and cash flow analyses of three representative enterprises—BYD, NIO, and XPeng—whose business models span integrated manufacturing (BYD), asset-heavy service ecosystems (NIO), and technology-driven agility (XPeng). This diversified case selection enables a nuanced understanding of how distinct strategic paths lead to divergent financial outcomes under similar market pressures, filling a gap in the literature that often treats NEV firms as a homogeneous group.

2. Industry Characteristics of New Energy Vehicle Companies and Financial Analysis Theory

2.1. Policy-driven promotion of industry transformation

China's major economy adopts technology-oriented incentive subsidy policies, implementing different subsidies by region: developed cities like Beijing and Shanghai are phasing out subsidies entirely; cities like Tianjin are maintaining the status quo; and less developed cities like Nanning and Lanzhou are increasing subsidies. Differentiated supply enhances competitiveness and allows for more rational resource allocation, which is more conducive to the development of new energy vehicle companies (Lin et al, 2025). Research shows that under a given subsidy policy, when the proportion of new energy vehicle-type consumers increases or the proportion of fuel vehicle-type consumers decreases, the ecological innovation level of new energy vehicle manufacturers will increase; compared to the no-subsidy situation, subsidies improve the ecological innovation level and profits of new energy vehicle manufacturers; under government subsidies, when the proportion of new energy vehicle-type consumers is large, the government should provide unit cost subsidies, otherwise, provide green technology investment subsidies.

Looking globally, the US "Inflation Reduction Act" supports the local battery industry chain with characteristics of full industry chain layout. The FEOC clause excludes Chinese companies from subsidies, leading to a sharp 15% drop in the market share of Chinese battery companies in the US market; the EU indirectly promotes the transformation of automobile companies through

legislation, banning the sale of fuel vehicles from 2035, prompting many automobile brands to innovate in the fuel vehicle track and set up trade barriers against China, imposing definitive countervailing duties for five years starting from 2024.

2.2. Capital investment promotes technological innovation

Government investment: Local governments provide financial support to new energy vehicle companies by establishing investment funds. For example, Zhejiang Province's New Energy Vehicle Industry Fund has a total scale of 7 billion yuan, focusing on the entire new energy vehicle industry chain; Jiangsu Province's Strategic Emerging Industry Mother Fund has a total scale of 50 billion yuan, cooperating with districted cities and provincial enterprises to establish industrial special funds, including a 2 billion yuan Suzhou New Energy and Intelligent Cockpit Industry Special Mother Fund. Tax incentives: China continues the policy of exempting new energy vehicles from purchase tax, which to some extent reduces the purchase burden on consumers and indirectly supports the development of new energy vehicle companies. It also provides tax subsidies for the R&D and innovation of new energy vehicle companies, encouraging enterprises to increase investment in technology R&D. China has lifted the restrictions on the foreign equity ratio in new energy vehicle companies, promoting technological innovation development through Sino-foreign cooperation and exchange.

2.3. Tight supply chain leads to cost sensitivity

The supply of upstream battery raw materials such as lithium, cobalt, and nickel is concentrated. Companies like Ganfeng Lithium and Tianqi Lithium provide lithium salt products to many global battery manufacturers. Fluctuations in raw material prices significantly impact enterprise costs. Midstream power battery suppliers like CATL and BYD provide battery products for many new energy vehicle companies. In motors and motor controllers, companies like Inovance Technology and Founder Motor have strong competitiveness. Downstream consumers are relatively price-sensitive. Although new energy vehicles have policy incentives, their prices remain high with low cost-effectiveness. Issues like battery degradation and low second-hand value retention also exist. Enterprises need to balance cost control and product cost-effectiveness.

2.4. Market competition

The market competition is fierce, showing a "two leaders + multiple strong players" competitive landscape. In 2024, Tesla and BYD together accounted for 55% of the global market share. Traditional automotive giants like Volkswagen and Toyota are increasing their investment in the new energy vehicle field. Emerging carmakers like NIO, XPeng, and Li Auto are rapidly rising with innovative business models and flexible market strategies. Furthermore, tech giants like Huawei, while not manufacturing cars themselves, are deeply empowering car companies, intensifying industry competition. In the global market, the Chinese market contributes over 50% of global sales. The European market has seen significant growth driven by policy incentives. In the US market, Tesla holds a large share, indicating regional competition.

3. Case Analysis of New Energy Vehicles

3.1. Huge R&D investment

According to available data, in the first half of 2025, BYD's R&D investment reached 30.9 billion RMB, a year-on-year increase of 53%.This figure is nearly double the net profit for the same period (15.5 billion RMB). According to data from the China Listed Companies Association, the average R&D investment growth rate for all market listed companies is only 3.27%. BYD's R&D growth rate far exceeds the industry average. Furthermore, BYD's debt ratio is as high as seventy percent. Additionally, NIO lost 20.7 billion, with R&D spending of 10.7 billion; XPeng lost 10.4 billion, with R&D spending of 5.3 billion.

Table 1. Financial index

Financial index	BYD	NIO	X-PENG	Comparative interpretation
Vehicle gross profit margin	20.2%	9.5%	-1.6%	BYD's ， notably high gross profit margin,which surpasses that of competitors including the cost-competitive Tesla (approximately 17%), demonstrates its strong profitability in vehicle sales. In sharp contrast, XPeng operates at a loss per vehicle sold.
R&D Expense Ratio	4.8%	19.2%	17.6%	There is a stark contrast in R&D intensity: NIO and XPeng's R&D expense ratios triple or quadruple that of BYD, highlighting the heavy investments required for them to compete on technology.
SG&A Expense Ratio	6.5%	23%	20.8%	stark contrast in operational efficiency is evident: BYD's SG&A expense ratio is only about one-third of NIO's and XPeng's, underscoring its far more disciplined cost management.
Core Operating Profit Margin	5.0%	-34.8%	-37.8%	BYD delivered a solid operating profit, whereas NIO and XPeng faced heavy operating losses.

3.2. BYD's excellent financial performance

BYD's excellent financial performance and market competitiveness, behind which is a set of efficient internal management system as a support. A special study for BYD pointed out that the company by optimizing the channel management, effectively solve the problem of working capital management, significantly improve the efficiency of cash flow(2025)This finding is consistent with the findings of this study that BYD is able to demonstrate greater financial resilience in the post-subsidy era by maintaining a relatively robust cash flow amid its massive research and development inputs and capacity expansion.

Table 2. BYD's excellent financial performance

Year	R&D Investment	Revenue	R&D-to-Revenue Ratio	Trend
2019	56.3	1277	4.4%	The company's R&D investment is substantial in absolute terms, its ratio (to revenue) is at a healthy level, and it is in a phase of continuous technology pipeline building.
2020	74.7	1565	4.8%	In response to market changes, the company has slightly increased its R&D intensity to prepare for future technological breakthroughs.
2021	106.3	2161	4.9%	With the new energy vehicle market surging, R&D investment has surpassed the 10-billion-yuan mark for the first time, while maintaining a stable ratio to revenue.
2022	202.2	4240	4.8%	R&D investment nearly doubled, but revenue grew even faster (also doubling), keeping the ratio stable. This demonstrates remarkable efficiency in the investment.
2023	395.7	6023	6.6%	R&D investment nearly doubled again, and its proportion of revenue increased significantly, marking the company's entry into a phase of "high-intensity

3.3. The trend of BYD's R&D Investment and its Proportion of Revenue Over the Past Five Years

BYD's R&D investment trajectory over the past five years vividly demonstrates the "flywheel effect" in a technology-driven enterprise. During 2019–2020, the company focused on steady technological accumulation, with consistent R&D spending laying the groundwork for subsequent product launches. This foundation enabled the introduction of several blockbuster models, which in turn drove a rapid surge in revenue and profits between 2021 and 2023. The resulting increase in internal cash flow allowed BYD to further expand its R&D investment capacity, as reflected in the marked rise in its R&D-to-revenue ratio in 2023. These new technological advancements are expected to reinforce BYD's competitive position and fuel the next cycle of expansion—forming a self-reinforcing loop in which technology drives growth, and growth increasingly feeds back into technology.

3.4. Problems Analysis

3.4.1. Financial Level

These drawbacks are directly reflected in the enterprise's financial statements, affecting its financial health and the safe operation of the capital market. Enterprises will face huge losses and

deteriorating profitability. According to accounting standards, R&D expenditures must be expensed as incurred, reducing current profits. This directly leads to the risk and dilemma of continuously increasing expenses while profits may decrease. Even with rapid revenue growth, key profitability indicators such as net profit and net profit margin can look very poor. This is one of the fundamental reasons why companies like NIO and XPeng have been unable to achieve profitability for a long time. Simultaneously, R&D is a huge cash-consuming activity. Current R&D investment directly leads to operating cash outflows. The main business's own "blood-making" ability is severely insufficient and cannot generate positive operating cash flow. For the enterprise to survive continuously, it must rely on external "blood transfusions," including: Multiple secondary stock offerings, diluting the equity of original shareholders. Increasing loans and bond issuances, bringing heavy interest burdens and debt repayment risks.

3.4.2. Operational Management Level

These drawbacks affect the internal operational efficiency and strategic execution of the enterprise. First is the uncertainty of return on investment. R&D investment does not equal market success. Expensively developed technologies or products may not be recognized by the market or may be quickly surpassed by competitors. This leads to low efficiency of fund usage, where huge investments fail to translate into expected economic benefits and market share, dragging down the overall return on assets (Wang & Tong, 2016). At the same time, managing a large R&D team and complex project pipelines places extremely high demands on the enterprise's organizational capabilities. This can easily lead to departmental silos, internal resource consumption, and project delays. It may result in decreased R&D efficiency, with a high average cost per patent or technological achievement.

3.4.3. Macro-level Drawbacks in Strategy and Market

These drawbacks relate to the enterprise's long-term position in the industry. Risk of betting on a technological path: Industry technology routes have not yet converged. Enterprises betting huge sums on one technological path is like a high-stakes gamble. If they bet on the wrong direction, most of the upfront Investment may become sunk costs, causing the enterprise to fall behind completely in the technological competition.

Over-reliance on government subsidies: To support high R&D, enterprises will vigorously seek various government research subsidies and industrial support funds. This may lead the enterprise's R&D direction to revolve around "policy" rather than the "market." The profit model is fragile, and the quality of profits is not high (Wu & Li, 2018; Li, 2025). Once subsidies are reduced, the true profitability will be severely tested.

In summary, behind the high investment is a gamble on future policy trends and the competitive advantage of their own products. Therefore, enterprises should place long-term development and technological innovation in equally important positions (Liu & Zhang, 2022). They can no longer rely solely on the government. They need to combine investment innovation with their own characteristics, showcasing the unique technical advantages and product features of their enterprise to consumers to secure their support.

3.5. Cash Flow Analysis Method

Operating Activities: BYD has the highest operating income, mainly due to its diverse business layout and efficient cost control. Vertical integration and platform strategies give it significant cost advantages in the NEV field, indicating strong self-value creation capability in its core business. XPeng is next, with smaller losses that could be improved by enhancing operational performance. NIO is last, with its main business showing a negative figure, possibly due to excessive R&D investment, high vehicle production costs, and intense market competition, causing the company to continuously consume cash during operations (Li & Zhang, 2023).

Investing Activities: All are negative. BYD enhances market competitiveness by increasing R&D and capacity expansion. Although it consumes a lot of cash in the short term, it is beneficial for the company's development in the long run. NIO invests heavily to provide a better customer experience. XPeng has a smaller investment scale, focusing funds on key areas.

Financing Activities: XPeng is optimal. The difficulty of financing in the capital market has increased for XPeng, which needs to expand diversified financing channels to meet the capital needs of enterprise development. NIO has more current liabilities than current assets, and negative shareholder equity, indicating high reliance on external financing and relatively high financial risk. BYD has a complete financial structure and strong ability to control risks reasonably.

Table 3. Comparative Analysis Results

Enterprise	Cash Flow Type	2024 Core Data	Summary of Key Features
BYD	Operating Cash Flow	Net amount of 133.5 billion yuan	Extremely strong "blood-making" capability from core business, covering all expenditures
	Investing Cash Flow	Continuously negative (specific figure not disclosed)	Supported by operating cash flow, no external financing needed
	Financing Cash Flow	Low demand	Interest-bearing liabilities account for only 6.9%, with cash reserves of 154.9 billion yuan
NIO	Operating Cash Flow	Net amount of -78.492 billion yuan	Complete "blood loss" from core business, no independent blood-making capability
	Investing Cash Flow	Net amount of -49.585 billion yuan	Heavy cash burn (battery swap stations + R&D), supported by financing
	Financing Cash Flow	Net amount of 1.772 billion yuan (13.58 billion yuan in H1 2025)	Heavily reliant on equity financing, with an asset-liability ratio of 87%

XPeng	Operating Cash Flow	Net amount of -2.012 billion yuan (net loss of 9.688 billion yuan excluding technology transfer fees)	Still in "blood loss", but free cash flow exceeded 4 billion yuan in Q4 2024, showing improvement
	Investing Cash Flow	Net amount of -1.255 billion yuan	Controllable cash burn scale, focusing on R&D and production capacity optimization
	Financing Cash Flow	Net amount of 669 million yuan	Relies on financing but with low demand, less pressure than NIO

4. Conclusions and Suggestions

4.1. Conclusions

Market Competition Risk: The new energy vehicle market competition is increasingly fierce. BYD occupies a large market share with its scale advantages and diversified product layout, squeezing new forces like NIO and XPeng. With many companies entering the market, the market share and profitability of all three companies face challenges.

Technology Iteration Risk: The technology in the new energy vehicle industry updates rapidly. The commercialization competition of cutting-edge technologies like solid-state batteries is intensifying, which may impact the technological advantages of existing enterprises. Continuous innovation is necessary to maintain technological competitiveness, otherwise, they may be eliminated by the market.

Policy and Regulatory Risk: The new energy vehicle industry is greatly affected by policies, which may adversely affect the production, sales, and cost control of enterprises. Furthermore, differences in policies and regulations in overseas markets also bring uncertainty to the overseas expansion of the three companies.

4.2. Suggestions for Managers

To address Market Competition Risk: Managers should strengthen market research, accurately grasp changes in consumer demand, and adjust product strategies promptly. For example, NIO can leverage its high-end brand image to further optimize product positioning and highlight differentiated competitive advantages.

To address Technology Iteration Risk: Continuously increase R&D investment and establish efficient R&D teams and innovation mechanisms. BYD can, while maintaining existing technological advantages, actively explore cutting-edge technologies like solid-state batteries.

To address Policy and Regulatory Risk: Establish policy research teams to keep abreast of changes in policies and regulations and prepare responses in advance. In overseas expansion, deeply study the policies and regulations of target markets and operate compliantly.

4.3. Suggestions for Investors

To address Market Competition Risk: Investors should pay attention to changes in the company's market share and its ability to adjust competitive strategies. For BYD, focus on the market response to its diversified product layout.

To address Technology Iteration Risk: Companies should continue to increase research and development input and establish efficient research and development teams. It is worth noting that innovation efficiency is inextricably linked to the industrial environment. Research shows that the spatial agglomeration of strategic emerging industries can significantly promote knowledge spillovers and collaborative innovation, thereby improving overall output efficiency. Therefore, enterprises should actively integrate into regional industrial clusters and utilize the agglomeration effect to accelerate technological breakthroughs.

To address Policy and Regulatory Risk: Understand the degree of impact of policy and regulatory changes on the enterprise. Investors can pay attention to the flexibility and adaptability of the enterprise in responding to policy changes, as well as its exposure to policy risks in overseas market expansion.

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