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A Financial Analysis and Valuation of Electric Vehicle Companies

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Abstract: This paper examines the electric vehicle (EV) industry, with a particular focus on Tesla, NIO, and BYD. Tesla is a leading player thanks to its efficient operations and diverse product lineup, making it a preferred choice for investors. NIO, despite having a wide range of products, faces profitability challenges, which may discourage investors. BYD impresses with its consistent profitability and significant market share in China. Financial metrics such as net profit margin, operating margin, and asset turnover are analyzed to assess the performance and appeal of each company to investors. Tesla's operational efficiency, demonstrated by its strategically located Superfactories in major markets, reinforces its industry leadership. Its diverse product range and global market reach inspire investor confidence. On the other hand, NIO grapples with negative profit margins and limited production capacity, lessening its appeal to investors. BYD's steady profitability and considerable market share in China enhance investor confidence. Despite intense competition and market volatility, all three companies are poised to capitalize on the growing demand for EVs, driven by global sustainability efforts. In conclusion, Tesla and BYD appear as appealing investment prospects due to their profitability and market dominance, while NIO struggles to attract investors. Tesla's innovative production strategies and extensive market reach place it at the forefront of the EV industry, likely drawing more investors in the future.

Keywords: Electric Vehicle Industry, Financial Analysis, Valuation

1. Introduction

Since 2015, all member states of the United Nations have established 17 Sustainable Development Goals (SDGs) through discussion, aiming to counteract the damage and imbalance to ecosystems and humanity caused by climate change. Among them, SDG #7 emphasizes "affordable and clean modern energy." The United States aims to achieve carbon neutrality by 2050, while China, as a developing country, expects to accomplish this by 2060. Tesla, founded in 2003 and entering the car manufacturing industry in 2012, has ushered in a new era for the electric vehicle (EV) industry. With the success of Tesla and the alignment of the EV industry with the political agendas of various countries worldwide, the Chinese government introduced incentives such as "subsidies for electric vehicles and exemptions from purchase taxes" in 2016, further driving the development speed of domestic electric cars and enhancing consumer purchasing power. For example, "the production and sales volume of new energy vehicles have increased annually. From 2009 to 2022, the sales volume of new energy vehicles in China has grown from 5,294 units to 6.887 million units, maintaining the

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top position globally for nearly 8 years." Additionally, "from 2013 to 2022, the annual registration of new energy vehicle-related companies in China has surged from about 5,100 to 239,400, a 47-fold increase. As of early 2023, there were 605,800 new energy vehicle-related companies in China, with independent brands such as BYD, Xiaopeng, and NIO highly recognized by consumers." Therefore, with the support of national policies, the rapid development of new energy vehicles can accelerate the achievement of the country's carbon neutrality goals and avoid the reduction of carbon emissions from heavy industries.

Tesla, BYD and NIO are outstanding companies in the electric vehicle industry. Both Tesla and NIO target a similar market segment with their luxury electric cars. They aim to cater to environmentally aware, affluent consumers, tech aficionados, city residents, and car rental businesses with their top-tier electric vehicle offerings. Tesla has carved out a sizable market for itself, particularly in North America, Europe, and Asia, where its top-notch electric vehicles have been met with rave reviews. In contrast, NIO's primary sales are in mainland China, with a relatively small footprint in North America and Europe. The efficiency of Tesla's operations is truly remarkable. Its Super factories in Shanghai and Germany are primed to serve the major sales markets in Europe and China. Armed with cutting-edge artificial intelligence and automated assembly lines, these factories are both highly productive and adaptable. In 2023, they ramped up capacity by an impressive 35% [1]. The Model Y from Tesla was the world's best-selling car in 2023, with an annual sales figure of 1.23 million, marking a 64% uptick from 2022. This clearly underscores Tesla's standing as a crowd favorite and top seller in the global market. As one of Tesla's main competitors in the Chinese EV market, NIO. this company's products are very similar to Tesla's product positioning. The significant difference is between those who are fans of the sci-fi shape of NIO's cars and those who are supporters of China's national brands. Not only are they similar in terms of product positioning, their market performance is also very similar. But NIO is a company with some limitations when it comes to sales and brand influence. Because his products are mainly sold in mainland China, lack of global influence. BYD, one of Tesla's main competitors in mainland China and the world, is a company with remarkable features. First of all, it is the global influence of its products. BYD has more than thirty industrial zones around the world, and it is also the pillar of China's automobile export.

2. SWOT Analysis

Tesla's strength lies in its diverse product portfolio. The company offers high-tech, luxurious, and high-performance vehicles tailored to meet various customer needs. Currently, Tesla's four main models are Model 3, Model Y, Model X, and Model S. The Model 3 and Model Y are budget-friendly models, priced at $38,990 and $42,990 respectively in the United States. They come in different versions such as high-performance and long-range, giving consumers a wide array of choices. Meanwhile, the high-end Model S and Model X fall into the premium category, boasting superior performance and luxury. Overall, Tesla's offerings span sedans and SUVs, catering to most consumer preferences. Similarly, NIO's product portfolio is impressive. The company offers three categories, ET, ES, and EC, which include SUVs, sedans, electric sports cars, and mid-size SUVs. Like Tesla, they cater to various consumer needs for electric vehicles.

On the other hand, BYD's product range is even more diverse, with a unique touch of Chinese elements. Its main series, the Dynasty series, named after ancient Chinese dynasties, covers both sedans and SUVs. These vehicles are priced lower than Tesla and NIO's offerings, making them more accessible to a broader customer base. Lastly, their premium series, the Tang Wang, showcases BYD's advanced technology and unique styling.

Tesla, NIO, and BYD have Weighted Average Cost of Capital (WACC) values of 7.6%, 7.8%, and 6.6% respectively. This represents a challenging and uncertain investment climate that impacts

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their profitability and shareholder return. High financing costs can diminish a company's profits, potentially leading to unsustainable growth.

Despite this, there's a clear opportunity for all three companies as the global goal of achieving carbon neutrality aligns with the trend towards electric vehicles (EV). As sustainability progresses, EVs are appealing to a broader audience. Though the EV market is emerging and not yet saturated, its future appears promising despite uncertainties and challenges. However, intense competition in the industry poses a threat. Traditional automakers like Mercedes-Benz, Porsche, and BMW have also entered the EV market. These companies boast extensive manufacturing experience, supply chain technology, and global sales networks. These advantages are encroaching on the market share of Tesla, NIO, and BYD, heightening competition. The intense industry competition is driving automakers to accelerate their technological innovation. This need for continual development and launch of new technologies and products can also increase operating and R&D costs, thus squeezing profitability.

3. Financial Analysis

3.1. Liquidity

Table 1: Liquidity ratios of three companies.

	Current ratio	Quick ratio	cash ratio
Tesla	1.73	1.16	1.03
NIO	1.22	1.07	0.96
BYD	0.67	0.49	0.26

With a current ratio of 1.73 (see Table 1), Tesla demonstrates high efficiency and sufficient liquidity, indicating a strong ability to fulfill short-term debt. This suggests a sound financial position and a very low risk of defaulting on short-term debt. NIO shares similar characteristics.

In contrast, BYD's liquidity is limited compared to Tesla and NIO, indicating that its liquid funds are less than its liquid liabilities. This poses a significant risk of defaulting on short-term debt. While Tesla and NIO have assets to cover short-term obligations, BYD's liquid assets are significantly less than its liquid liabilities. It may need to sell inventory to cover these obligations, suggesting that most of BYD's assets may be illiquid.

Additionally, Tesla's cash ratio of 1.03 shows that it has enough disposable cash to pay its short-term obligations. NIO's cash and short-term debt amounts are roughly equivalent. However, BYD has only about one-quarter of the short-term debt amount in cash, indicating a high risk of short-term debt.

3.2. Solvency

Table 2: Solvency ratios of three companies.

	Interest coverage ratio	Debt to asset ratio	Debt to equity ratio
Tesla	64.93	0.403	0.68
NIO	-56.14	0.748	2.92
BYD	34.52	0.778	3.52

Both Tesla and BYD demonstrate strong capabilities to meet interest payments on their short-term debt, indicating a low risk of default, as Table 2 shown. This suggests that these companies have robust earning capacities and manageable debt levels. In contrast, NIO's negative figure illustrates

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that its earnings before interest and taxes (EBIT) is negative, indicating a high risk of default and significant losses.

The total debt to total assets ratio for Tesla is relatively low compared to the other two companies, suggesting a lower likelihood of financial distress. Meanwhile, NIO and BYD have larger ratios, indicating that most of their total assets are acquired through debt financing and they rely heavily on financing for operations. Their debt to equity ratios are quite similar, which is typical for the automotive manufacturing industry as it often relies on large amounts of debt to support research and development, operations, and production.

3.3. Profitability

Table 3: Profitability ratios of three companies.

	Profit margin	Operating margin	Asset Turnover
Tesla	31.5%	14.35%	1
NIO	-32.7%	-34.68%	0.5
BYD	4.82%	6.38%	1.07

As Table 3 shown, Tesla's profit margin is a significant 31.5%, marking a 107.78% increase year over year. This means that for every dollar of revenue Tesla generates, the company retains about 31.5 cents of net profit after deducting all expenses, including operating costs, taxes, interest, and other costs. This high net profit margin demonstrates Tesla's efficiency in cost control and profit generation in relation to its revenue. It points to robust profitability, potentially attracting investors and stakeholders. Moreover, Tesla's operating margin turned positive for the first time from June 2019 to now, rising from 0.08% to a peak of 17.2% in 2022. However, by April 2024, the operating margin has dropped to 14.35% [2]. This decrease could be due to various factors such as increased production costs, higher R&D expenses, changes in pricing strategy, or other operational challenges. Asset turnover is another crucial metric for investors. From 2019-2023, Tesla's asset turnover increased from 0.8 to a peak of 1.1 in 2022, but fell by 0.1 in 2023 [3]. Despite this, the overall change is relatively minor over these five years. Thus, the company appears to be efficiently leveraging its substantial capital investment to generate consistent revenues.

NIO Motors has the lowest net profit margin among the three companies, at -32.7%, up 10.6% from last year [4]. This indicates a net loss rather than a profit. Specifically, for every dollar of revenue generated, the company incurs a net loss of approximately 32.7 cents after considering all expenses including operating costs, taxes, interest, and other expenses. A negative net margin means that NIO's expenditures exceed its revenues, leading to a loss. This could be due to high operating costs, significant investment in research and development, depreciation, or other financial obligations outweighing the company's revenue. For investors and stakeholders, negative net profit margins raise concerns about a company's financial health and profitability. As per NIO's latest financial report and stock price, the company currently has an operating margin of -34.68%. By the end of 2022, the operating margin stood at -28.51%. The company's operating margins have consistently been negative from 2019 to 2023. This trend can be attributed to factors such as a high-cost structure, relatively low market share, competitive pressure, financial strain, and operational inefficiencies. Moreover, NIO's asset return has remained stable at 0.5 from 2019 to 2023. This stability is due to a year-on-year decrease in the company's total assets, likely because of significant debt issues, and a corresponding decrease in revenue. Overall, NIO's profitability is concerning and can negatively impact investor decisions.

BYD's net profit margin is 4.82%. Over the long term, BYD's net profit margin is projected to grow at 2% per year, rising from 4% in 2022 to 6% in 2023 [5]. This is a substantial figure for a large

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car company with various models and styles. Given the considerations for R&D, production lines, manufacturing, assembly, raw material supply chain costs, and warehousing costs for different models, BYD's ability to support this large expense while maintaining a stable net margin increase bolsters investor confidence and enhances the company's overall competitiveness. For the year ending 2023, BYD reported annual revenue of 602,315 million CNY, with operating income of 38,412 million CNY. The operating margin stands at 6.38%. While this might appear surprising for such a large car company, it also highlights the company's broad sustainable profitability, which extends beyond car manufacturing. Furthermore, BYD's financial analysis report reveals that the most recent available assets turnover rate is 1.07 in 2022 [6]. The total asset turnover ratio of BYD Co. has increased from 0.65 in 2019 to 1.07 in 2022. This indicates that BYD has successfully navigated the negative supply and demand shock and supply chain crisis brought on by the pandemic. The high and increasing asset utilization rate demonstrates efficient use of assets and significant returns on large-scale asset investments.

Generally, the profit margin and operating margin of Tesla are the most pronounced, which means this company has robust profit-making and operation capacity, which enables it to improve the strong confidence and higher expectations of this firm from investors and the public. For asset turnover, the data from BYD and Tesla indicate the companies' investments have favorable and profit returns. However, the data from BYD shows the highest asset turnover within the three companies. Conversely, the data shows the profit-making capacity of NIO is inadequate compared to BYD and Tesla.

4. Valuation

The efficiency of Tesla's operations is truly remarkable. Its super factories in Shanghai and Germany are primed to serve the major sales markets in Europe and China. Armed with cutting-edge artificial intelligence and automated assembly lines, these factories are both highly productive and adaptable. In 2023, they ramped up capacity by an impressive 35% [7]. The Model Y from Tesla was the world's best-selling car in 2023, with an annual sales figure of 1.23 million, marking a 64% uptick from 2022. This clearly underscores Tesla's standing as a crowd favorite and top seller in the global market.

In terms of production capacity, NIO is the most constrained among the three, possessing only one factory, and it doesn't compare in size to Tesla and BYD. NIO's manufacturing capacity is also restricted, as it combines its technology with that of local Chinese traditional automaker, Jianghuai Automobile. Despite investing over $10 billion in EV technology innovation and R&D, NIO continues to lack autonomy and must depend on partnerships.

According to data released by the China Association of Automobile Manufacturers, domestically, BYD commands a remarkable 31.72% share, significantly surpassing Tesla's 7.75% in China [8]. Its exponential growth year over year underscores the profound affection BYD enjoys among locals, testament to its robust market reception and immense potential [9].

In conclusion, Tesla and BYD have better expectations in the future to investors and are favored by investors, due to their profit-making capacities, and high market occupancy [10]. However, the current situation of NIO is less advantageous to investors, because the feedback and audience degree are less competitive compared to the other two companies. Additionally, Tesla has outstanding productivity in the EV market, which is showcased in a Super factory that is all around each main market area to meet the demands of market areas. Therefore, the success of the most popular EV car company of 2023 would give Tesla a higher reputation and bring more potential investors

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5. Conclusion

In conclusion, examining Tesla, NIO, and BYD reveals the dynamic nature of the electric vehicle industry. Tesla's innovative production methods and diverse products reinforce its market dominance and attractiveness to investors. While NIO offers a wide range of vehicles, its profitability challenges and production constraints may deter investors. Conversely, BYD's consistent profitability and significant market presence in China make it a solid investment choice.

Despite their varying levels of success and challenges, all three companies could benefit from the rising global demand for electric vehicles due to increasing environmental concerns. However, Tesla and BYD stand out in terms of profitability, market dominance, and investor confidence. Tesla's revolutionary manufacturing techniques and extensive market reach promise ongoing success and investor interest. The industry's evolution will be shaped by these companies' performance and strategic decisions, influencing future investment opportunities within the sector.

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