# Estimating Future New Energy Vehicle Market Through Industry Giants' Financial Status Quo

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**Abstract.** Nowadays, people health and ecosystem are seriously threatened by increasing the amount of carbon emission. In recent years, multinational presidents actively advocate and call to solve and reduce this problem. Moreover, in order to dispose of and control the vehicle exhaust emissions trouble, many young people pay more attention against to use new energy vehicles. The article uses Discounted Cash Flow (DCF) model and Weighted Average Cost of Capital (WACC) value which are based on important indications in 5 years financial statements of giants, i.e., BYD, Tesla, NIO, and LI, to analyze the global (especially China) new energy vehicle market status quo. According to the analysis, one discovers that WACC value of BYD and LI are much lower than other two brands NIO and Tesla. Therefore, the global new energy vehicle market has an optimistic trend of development can be deducted while sunrise companies can stabilize the Chinese market and enter to the foreign market.

**Keywords:** New energy vehicle; DCF model; WACC value.

## 1. Introduction

Global Warming has become an important obstacle in the sustainable developed society at present, and forming reasons can be concluded simply to excess carbon dioxide emit from fuel vehicle exhaustion. Nowadays, the level of carbon dioxide in atmosphere is already nearly 30% higher than ever in the past. Moreover, it has also led to a sharp rise in the global average temperature, causing some serious ecological issues such as the melting glacier caused a rise in sea level and coastal areas are flooded and lead people or other species cannot live [1]. In addition, solar radiation and volcanic eruption are both the considered effect results [2]. Meanwhile, it also affects human body health in the short term. For example, high temperature which is caused by abnormal weather will make the incidence rate of cardiovascular and respiratory diseases has been greatly increased. Hence, multinational presidents actively advocate and call the environmental protection concept that saving ecological resources. About the concept, new energy vehicle industries have been pushed to vertex in the whole economic market.

New energy vehicle which doesn't have a fixed definition can be divided into two different viewpoints. In a broad sense, it is fuel car, which includes hybrid electric vehicles; pure electric vehicles; fuel cell vehicles and so on. In another sense, it is a kind of new structure and comprehensive vehicles has new technology in both dynamic controlling and driving [3]. Many people thinks that new energy vehicles are only represent pure electric vehicles, but the answer is not accurate. It can be explained that the new energy vehicle market isn't origin in recent years because fuel vehicles began to prevail and develop as early as the 19th century, and pure electric vehicles have never been to the market. Contemporarily, the State Council has issued some plans to help the development of new energy vehicle industries. Such as upgrading and improving from models, function and so forth and the main idea of them are the entire green and high-quality development of vehicle industries are based on accelerating the construction of a strong automobile industries. At the same time, the reason of the central and state council also needs to pay more attention on the project because "staying committed to the path of green, low-carbon, and sustainable development, China is willing to work with international community to speed up innovations of new energy vehicle technologies and development of related industries, so as to make greater contributions to building a clean and beautiful world and a community with a shared future for humanity [4], that present Xi of China always

emphasizes the important belief. At the moment, the development of new energy vehicle industries has a relatively low speed. It experienced passengers' flow had grown by leaps and hounds at start, and also undergo a great fall in COVID-19. Although it ups and downs several times, it doesn't get a perfect market condition. As a result, the market still has advancing development trend with The Times along with positive develop conditions and prospect.

## 2. Data and Method

New energy vehicle market gradually become popular in recent years. At the same time, it is also becoming one of hottest choice in people purchasing. There are a series of giant among the market like BYD, Tesla, NIO, and LI. BYD is the longest-listed company in the group of giants which was founded in February 1995. However, BYD not only produce new energy vehicles, but also manufacture some extra domains such as rail transit, electrical, etc. [5]. In addition to, it was appeared to Hong Kong and A stock markets, and entered to European and other new energy vehicle markets and earned some extra supporting and income. Tesla is only one brand from the US which is set up in California in 2003. "Accelerating transformation of sustainable energy" is Martin Eberhard's and Marc Tarpenning's intentions. What's more, the last two brands are both the more popular and new smart electric vehicles. NIO and LI were established in 2014 and 2015, but markets which they list in are different that NIO was in American Stock Market and LI was in Hong Kong Stock Market. These two brands learn the experiences from the elder brands in the past to transform although they listed too late, they use the lower price and higher performance to gain many young people to purchase products and is also honored as "the highest cost performance new energy vehicles".

In order to analyze the domestic and foreign new energy vehicles markets developed trends, the article compares NIO's, LI's, BYD's and Tesla's cash flow statements in financial statements data from 2018 to 2022 to finish market industries development state quo analysis. Right now, capital budget method can be divided into cash flow method and non-cash flow method according to whether the commercial paper holder pays a certain interest in order to obtain funds. Cash flow method is a widely used basic method of assessing the value of investment and it includes net present value, present value index and internal rate of return. Discounted cash flow method calculates the estimated expected value-added cash flows and the discount rate or capital costs, and the obtained value is the target company's internal value. It has certain relationship from the market price such as bonds, stocks and investors' decisions and judgements. Currently, this method has higher utilization rate in especially merger and acquire business, initial public offerings, and other series of decisional activities in some European and American countries. The key data used in the text are cash flow and profit statements and other relative data in the financial statements of BYD, Tesla, NIO, and LI between 2018 and 2022.

## 3. Results and Discussion

### 3.1. Giants' Financial Status

Discounted cash flow model analysis can be split into five steps, they are studying the target and determine key performance drivers, projecting free cash flow, calculating weighted average cost of capital, determining terminal value, and calculating present value and determine valuation. Researching the target company's background and current situation is the vital basic of finishing DCF model analysis. Then, the financial state quo of the target company provides a better background in this step. A company's financial state quo has a large relationship with liquidity ratio and quick ratio. Moreover, liquidity ratio is the ratio of the company's liquidity assets and liabilities, quick ratio is the ratio of the company's quick assets and liquidity liabilities. As liquidity ratio, the higher value, the better because it represents that the company has better abilities for debt capacity in the short run. On the contrary, it is weak. While as quick ratio that it equals to one is normal. If the value is too low,

the risk that the company repayment of liabilities will be higher. In contrast, if it too high, it will increase industries investment opportunity cost.

**Table 1.** Four companies' liquidity and quick ratio 2018-2022.

| Companies | Items(times) | 2022 | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|---|---|
| BYD | liquidity ratio | 0.722 | 0.97 | 1.049 | 0.99 | 0.988 |
| | quick ratio | 0.485 | 0.717 | 0.754 | 0.753 | 0.762 |
| Tesla | liquidity ratio | 1.53 | 1.38 | 1.88 | 1.13 | 0.83 |
| | quick ratio | 1.05 | 1.08 | 1.59 | 0.8 | 0.52 |
| NIO | liquidity ratio | 1.29 | 2.18 | 3.31 | 0.52 | 1.42 |
| | quick ratio | 1.11 | 2.11 | 3.23 | 0.43 | 1.25 |
| LI | liquidity ratio | 2.45 | 4.33 | 7.28 | 1.08 | 1.31 |
| | quick ratio | 2.2 | 4.19 | 7.04 | 0.97 | 1.31 |

According to Table 1, all four companies have preferable financial state quo from 2018 to 2022, especially LI. Because LI got the highest liquidity ratio and quick ratio. Moreover, BYD and Tesla have less fluctuations rather than NIO and LI. It can conclude that newly developing companies in new energy vehicles market have higher potential such as NIO and LI, and the market financial status are brilliant.

The reasons that a company or industry can develop faster in limited time are internal and external drivers. As for internal, such as opening new facilities or stores, developing new products, improving operational and or working capital efficiency and so on. However, the external drivers are some examples like acquisitions, end market trends, macroeconomic factors or even legislative or regulatory changes. In current years, BYD has become a more popular new energy vehicle company around the world, it can summarize from internal and external drivers. Developing new technology in such as battery system that stores electricity to provide power to the vehicle, battery connectors and metallic plastic surface technology. Pushing out new products like a series of Qin, Han, Song, Yuan and Tang Dynasties Plus and seal and seagull DM-I that attracting a large number of young people to purchase new products from the company. At the same time, the brand's popularity reuse in the market began to soar. Expanding the scale of production and sales while increasing its share of the market products by the continuous expansion of global sales. The last one is that actively fulfill the corporate social responsibility. The aim of new energy vehicle development is reducing exhaust gas emission from fuel vehicles in order to reduce the global warming from carbon dioxide and protect the environment. Meanwhile, the other three companies have similar drivers, but differences are still exit. For Tesla, its creativity is walking in the forefront of the market. The better-quality production of Tesla in whole vehicle batteries possessing them constrain the customer by internal drivers. For LI, the customers groups are family customer and improve the sale systems and precise market positioning. For NIO, it has own unique intelligent system.

**Table 2.** BYD's FCF Transformation 2018-2022.

| BYD | Years | | | | |
|---|---|---|---|---|---|
| Items(hundred million) | 2022 | 2021 | 2020 | 2019 | 2018 |
| EBIT | 223.93 | 64.257 | 100.066 | 59.183 | 75.044 |
| T | 33.67 | 5.507 | 8.686 | 3.123 | 8.294 |
| EBIAT | 190.26 | 58.75 | 91.38 | 56.06 | 66.75 |
| D&A | 451.071 | 8138.48 | 7111.65 | 346.726 | 282.151 |
| CAPEX | 1562.39 | 794.9 | 681.85 | 633.3 | 571.24 |
| NWC | -925 | -52 | 52 | -10 | -14 |
| FCF | 3.941 | 7454.33 | 6469.18 | -220.514 | -208.339 |

The definition of free cash flow is that the cash flow is left after the reinvestment needs in the production process of the enterprise. During the period, the cash flow is a premise that doesn't affect the sustainable development of the company. Simply, it is the maximum cash flow generated after

the business activities and the interest for the payment. Meanwhile, it is also the only source of cash that can continuously provide financing liability creditors and shareholders to pay interest and profits. In essence, this deposit belongs to the double Ponzi state, is a kind of continuous dividend and interest [6]. The Free cash flow formula is

$$FCF = EBIT - T + D\&A - CAPEX - NWC \quad (1)$$

Here, FCF is free cash flow, EBIT is Earnings before interest and tax, T is Tax, D&A is Depreciation and amortization, CAPEX is Capital expenditures, NWC is Net working capital.

**Table 3.** Tesla's FCF Transformation 2018-2022.

| Tesla | Years | | | | |
|---|---|---|---|---|---|
| Items(hundred million) | 2022 | 2021 | 2020 | 2019 | 2018 |
| EBIT | 136.6 | 65.23 | 19.94 | -6900 | -3800 |
| T | 11.32 | 6.99 | 2.92 | 1.1 | 5800 |
| EBIAT | 125.28 | 58.24 | 17.02 | -6901.1 | -9600 |
| D&A | 37.47 | 29.11 | 23.22 | 21.54 | 20.6 |
| CAPEX | 57.04 | 60.22 | 62.92 | 64.77 | 65.53 |
| NWC | 142.1 | 73.9 | 124.7 | 14.3 | -16.86 |
| FCF | -36.39 | -46.77 | -147.38 | -6958.63 | -9628.07 |

**Table 4.** NIO's FCF Transformation 2018-2022

| NIO | Years | | | | |
|---|---|---|---|---|---|
| Items(hundred million) | 2022 | 2021 | 2020 | 2019 | 2018 |
| EBIT | -156.4 | -44.96 | -46.08 | -110.8 | -95.96 |
| T | 0.551 | 0.4227 | 0.06368 | 0.07888 | 0.2204 |
| EBIAT | -156.951 | -45.3827 | -46.14368 | -110.87888 | -96.1804 |
| D&A | 20.39 | 39.94 | 16.17 | 23.52 | 15.85 |
| CAPEX | 219.16 | 104.59 | 52.961 | 56.483 | 50.013 |
| NWC | 133 | 344.4 | 322.3 | -45.71 | 35.77 |
| FCF | -488.721 | -454.4327 | -405.23468 | -98.13188 | -166.1134 |

**Table 5.** LI's FCF Transformation 2018-2022.

| LI | Years | | | | |
|---|---|---|---|---|---|
| Items(hundred million) | 2022 | 2021 | 2020 | 2019 | 2018 |
| EBIT | -36.55 | -10.17 | -6.693 | -18.59 | -11.31 |
| T | -1.27 | 1.686 | -0.2285 | 0 | 0 |
| EBIAT | -35.28 | -11.856 | -6.4645 | -18.59 | -11.31 |
| D&A | 12.14 | 5.904 | 3.21 | 1.164 | 0.605 |
| CAPEX | 120.226 | 52.495 | 31.623 | 34.689 | 23.194 |
| NWC | 396.2 | 402.7 | 270.81 | 3.86 | 5.45 |
| FCF | -539.566 | -461.147 | -305.6875 | -55.975 | -39.349 |

Many companies haven't not yet developed from a stable industry in the market because new energy markets are just started. Summaries from Table 2, Table 3, Table 4 and Table 5, BYD had rose and fall by a wide margin, Tesla had steadily straight up, NIO and LI were in opposite direction growth. Weighted average cost of capital is that the capital derived from some kind of fundraising method is a percentage of the company's basic total, and the capital raised is the cost of capital for the company. However, the funds are not fully used by the company because it needs to spend a series of one-time costs in the process such as handling fee, guarantee premium, agency bank issuing fee. If the company is high risk investment, the value of occupied rate of fund will be higher. In contract, lower risk lower value [7]. The WACC calculation formula is

$$WACC = (Rd \times (1 + t)) \times \left(\frac{D}{D+E}\right) + Re \times \left(\frac{E}{D+E}\right) \quad (2)$$

Here, WACC is weighted average cost of capital, Rd is cost of liabilities, Re is cost of capitals, T is marginal tax, D is market value of liabilities, and E is market value of capitals. During calculation of WACC value, estimating liabilities and equities costs are big problems. The liabilities cost of a company is illustrated in their credit files. If the company had a bad operation with excess liabilities cost, it would cause the financial cleaning costs. Equities cost or stock costs illustrate the company is compensation for ordinary shareholders' equity and investment risks. It has a formula that:

$$Re = Rf + beta\ L \times (Rm - Rf) \quad (3)$$

**Table 6.** Giants' equity cost calculation in 2022.

| 2022 | Items | | | |
|---|---|---|---|---|
| Company | Risk-Free Rate | beta | market risk premium | equity cost |
| BYD | 2.25% | 1.44 | -9.91% | -0.12 |
| Tesla | 14.40% | 2.25 | 3.47% | 0.222 |
| NIO | -49.71% | 2 | 0.36% | -0.49 |
| LI | -4.68% | 0.57 | 18.50% | 0.059 |

**Table 7.** WACC values of Giants in 2022

| 2022 | Items | | | | |
|---|---|---|---|---|---|
| Company | Rd | t | D | E | WACC |
| BYD | 16.14 | 0.31 | 0.7542 | 5.71 | 1.783 |
| Tesla | 33.53 | 0.62 | 0.4426 | 4.02 | 3.546 |
| NIO | -49.71 | 0.3 | 0.7128 | -8.89 | 3.813 |
| LI | 6.88 | 1.75 | 0.5225 | 1.64 | 1.726 |

Through Table 6 and 7, it can be deducted that LI and BYD both had lower WACC values. Lower WACC values means that company values have maximum development and incomes will grow in step with it. What's more, they also have lower risk when the market influences. So that it fits to the risk averse. Moreover, other two companies Tesla and NIO are belonged to some risk lovers' choices.

## 4. Limitations and Prospects

Currently, new energy vehicles market has become more popular, the purpose of its own creation is reducing hazard to the environment by exhaust vehicle emission. New energy vehicles not only have a certain position in the Chinese market, but also entering in foreign markets. The reason of it in foreign markets are no popular is because range of new energy vehicles cannot be supported to the vast terrain, lack with the infrastructures of it, the price of fuel is not too higher, export fee with transportation etc. Facing with the series of problems, domestic new energy companies have already to change. During examples of Giants, BYD and Tesla had been exported and already gained a certain attention rate. Also, it has a trend to occupy the foreign market. In October 2022, BYD showed car models with Tang, Han and Yuan Dynasties Plus series in the 89th Paris International Motor Show. When the time comes, many factories made agreements with BYD with infrastructures [8]. In addition to, BYD had different stock market with other three, so it had different market pressure.

## 5. Suggestions and Implications

Looking through the sale of BYD and Tesla, foreign new energy market has already been opened. Sunrise companies like NIO and LI can gradually develop the European and American markets. There are some methods like corporation with infrastructure companies to increase sales, reducing sale prices to attract passengers. Moreover, the companies like BYD had already been exported through the promotion of products and opening new brands to open the high-end automobile market and can develop more supporting industries and diversified operations [9]. Chinese government is also pay

more attention on new energy vehicles. In 2023 National holiday, the charging capacity of new energy vehicles in the national expressway service area reached 19.04 million KWH. This year, China has increased its support for new energy vehicles 90% of China's expressways have covered charging piles and infrastructure by 25%, improving people's travel convenience and helping car owners ease the range anxiety of new energy vehicles [10].

## 6. Conclusion

To sum up, with steady development of the market, BYD and LI have stable development with lower risks and match with risk averse, but NIO and Tesla have high risk development fit with risk lovers. BYD and Tesla are two companies' examples entering European and American markets early with different risk level. This can be obtained that domestic new energy vehicles have some passenger's flow in the market. Some newly and development companies like NIO and LI are still influenced, they can stabilize the domestic market of new energy while targeting a series of demands in the European and American markets. At present, the main purpose of the production of new energy vehicles is to reduce the carbon emissions of fuel vehicles to achieve conservation and environmental protection, and maintain this concept has a positive and considerable development for the future development for the future development of the European and American markets.

## References

[1] Fang H. Analysis of the Causes and Crisis of Global Warming. MATEC Web of Conferences, November 2023.

[2] Tang X, Xue H, Ta C, Wang Z. Implications of global warming for environmental protection. Chinese and Foreign Entrepreneurs, 2018: 235.

[3] Sidi C. Analysis of the new energy vehicle industry. Economic Outlook, 2019: 14.

[4] Liu H. Another programmatic document on the layout of "new energy vehicles" new energy automobile industry. China Quality Miles Travel, 2020: 1.

[5] Zhao Y. SWOT Analysis of BYD Auto. Financial News, 2019: 88.

[6] Xie D. Ten Questions about Free cash flow Creativity. Finance and Accounting Monthly, 202: 6.

[7] Zhang C. Cash flow Statement Analysis. Science and Technology Economic Market, 2015: 181.

[8] Chinese new energy vehicles in Europe. Automotive Maintenance Technician, 2023: 1.

[9] Hui M. Growth Analysis of New energy Automobile industry: Taking BYD as an example. Modern Marketing (Academy Edition), 202: 3.

[10] Eastern space-time, CCTV13, 2023, 10(4).