

Research on Tesla's Market—Based on Porter's Five Forces and Ratio Analysis Model

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ABSTRACT

New energy vehicles are one of the most popular types of vehicles today, and Tesla is one of the leading companies. However, since new energy vehicles are still in their early stages, Tesla still has many strong competitors known and to come. This paper analyzes the financial aspects of Tesla's leading-edge compared to several other new energy vehicle companies in Yahoo Finance and analyzes Tesla's current or future strengths and threats in five areas. Tesla is compared with several other new energy vehicle companies through ratio analysis. Porter's five forces method is also used to analyze Tesla's strengths and threats in terms of the competitive ability to exist, competitors, the ability of potential competitors to enter, the substitution ability of alternatives, the bargaining power of suppliers, and the bargaining power of buyers. The conclusion is that Tesla is in the leading position in the new energy vehicle industry and has very good future momentum, especially it is Model 3 series cars are at the top of the sales list, but still threatened by many competitors and in the reconciliation relationship with buyers. And give Tesla the future policy to make recommendations that can make up for the lack of high-end car models as well as can continue to vigorously develop autonomous driving and artificial intelligence industry to open up industrial development.

Keywords: Tesla, Ratio analysis, Porter's Five Forces Model, Electrical vehicle

1. INTRODUCTION

Tesla is an American electric vehicle and energy company, that produces and sells electric vehicles, solar panels, and energy storage equipment. Tesla strives to provide every ordinary consumer with a pure electric vehicle within the scope of their consumption capacity; Tesla's vision is to "accelerate the global transition to sustainable energy." In the era of rapid development of electric vehicles, Tesla is still a leader in the market. However, with the increasing progress of the electric vehicle industry, more and more brands of new energy vehicles have emerged, and even veterans such as Mercedes-Benz and BMW have successively launched electric vehicle products, Tesla is facing strong competitive pressure. Under such circumstances, Tesla opens higher yet finishes lower. Most of the new products are more affordable and some feel more high-end than the new energy vehicles produced in China, and they are more professional in the electric vehicle industry than the veteran powerhouses. In this article, the paper mainly want to discuss the electric competitiveness of Tesla and other electric vehicle brands, including the veteran

powerhouse, as well as its future development potential and prospects by using ratio analysis of financial statements of several companies and Porter's Five Forces. Tesla's mega-factory is also leading the way in a new trend towards full machine automation, eliminating human error, and making Tesla more competitive and sustainable for the future. Elon Musk announced at the 2021 Shareholder Meeting that the company aims to increase production capacity at the Fremont Factory by 50% in the next couple of years[1]. Hoping such research can give Tesla more suggestions in the future and also predict the future development of Tesla and the new energy vehicle market.

2. RATIO ANALYSIS OF TESLA AND COMPETITORS FROM FINANCIAL STATEMENTS

A common way to evaluate financial statements is through ratio analysis. A ratio is a relationship between two or more numbers of the same kind. A financial ratio is a measure of the relative magnitude of two or more selected numerical values taken from a corporation's financial statements.

2.1 Comparing three companies' operating income

Comparing Tesla to NIO and XPEV, it's obvious to find that Tesla is far ahead of NIO and XPEV on the operating income or the EBT. Tesla's operating income is 3,212,000 thousand, NIO and XPEV are -3,333,301 thousand and -5,212,459 thousand. These two companies are even losing money.

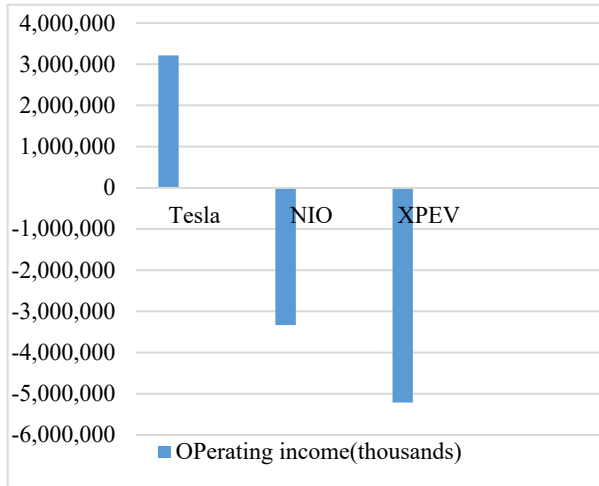


Figure 1. Operating income for three companies

2.2 Comparing three companies' earnings per share(EPS)

It's easy to find that Tesla's Debt Asset ratio is 0.255, and NIO and XPEV are 0.174 and 0.051 by the end of 2020. It shows that Tesla's ability to use external funds is relatively strong. But it shows that the proportion of assets acquired by Tesla through debt is high as well, so Tesla's debt repayment risk is relatively large.

Observing three companies' earnings per share(EPS), it's not difficult to find that only Tesla is positive in 2020 after 2019. In theory, a company that earns more EPS will have a relatively higher share price. Learning from the Internet, Tesla is also saying that although Tesla's revenue is increasing year by year, Tesla's net income has just turned positive in 2020. Observe the past EPS trends of the same company and its future growth should also be included in the assessment. Although it is said that when considering the stock price, the lower the current P/E ratio, the better, usually the "future growth" of profitability should also be considered. The stock price trend is usually proportional to the EPS trend. Using this as a benchmark, XPEV's EPS has been declining from 2018 to 2020, which can be understood as his stock price has been declining. And seeing NIO, its EPS has experienced very large volatility. Although it shows growth from 2019 to 2020, it has a very low data of -70.23 in 2018. On the other hand, Tesla, EPS has been improving steadily, which proves that its profitability is still excellent. Of course, EPS only reflects profitability,

but the profit in the income statement in accounting does not mean that there is an actual cash inflow. It must be combined with the numerical observations on the operating cash flow and free cash flow statements.

2.3 Building formula analysis from financial statement data

Build a simple profitability formula from Financial Statements that $y=x_1$ gross profit ratio+ x_2 operating profit ratio+ x_3 Net Profit Ratio+ x_4 Sales to Total Assets Ratio + x_5 ROA.

Measurement of Tesla's profitability in this study uses the gross profit ratio, EBIT, operating profit ratio, Net Profit Ratio, sales to Total Assets Ratio, Return on Assets (ROA)[2].

The gross profit ratio indicates the percentage of sales revenue that is left to pay operating expenses, interest on borrowings, and income taxes after deducting the cost of goods sold. The ratio is calculated as:

$$\text{Gross profit ratio} = \frac{\text{Gross profit}}{\text{Net sales}} \tag{1}$$

The operating profit ratio is a means to assess the relative levels of operating expenses.

$$\text{Operating profit ratio} = \frac{\text{Income from operations}}{\text{Net sales}} \tag{2}$$

The net profit ratio is the percentage of sales revenue retained by the corporation after payment of operating expenses, interest expenses, and income taxes.

$$\text{Net profit ratio} = \frac{\text{Net income}}{\text{Net sales}} \tag{3}$$

The calculation of the sales to total assets ratio helps to answer this question by

establishing the number of sales dollars earned for each dollar invested in assets. The ratio is calculated as:

$$\text{Total assets ratio} = \frac{\text{Net sales}}{\text{Average total assets}} \tag{4}$$

ROA is used to measure the bank's ability to make a profit overall[6]. ROA formula is:

$$ROA = \frac{\text{Income from operations}}{\text{Average total assets}} \tag{5}$$

Previous studies have explored a lot of the characteristics of profitability. The percentage of ROA, the operating profit ratio, and sales Total Assets Ratio will be higher. So their coefficient will be higher than other ratios. The final equation based on various literature focuses and studies will be $y=3$ gross profit ratio+ 3 operating profit ratio+ 2 Net Profit Ratio+ 4 Sales to Total Assets Ratio + 5 ROA.

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
> Total Revenue	53,823,000	53,823,000	31,536,000	24,578,000	21,461.26
Cost of Revenue	40,217,000	40,217,000	24,906,000	20,509,000	17,419.24
Gross Profit	13,606,000	13,606,000	6,630,000	4,069,000	4,042.02
> Operating Expense	7,110,000	7,110,000	4,636,000	3,989,000	4,294.86
Operating Income	6,496,000	6,496,000	1,994,000	80,000	-252.84
> Net Non Operating Interest Inc...	-315,000	-315,000	-718,000	-641,000	-638.538
> Other Income Expense	162,000	162,000	-122,000	-104,000	-113.367
Pretax Income	6,343,000	6,343,000	1,154,000	-665,000	-1,004.74
Tax Provision	699,000	699,000	292,000	110,000	57.837
> Net Income Common Stockhold...	5,519,000	5,519,000	690,000	-862,000	-976.091
Diluted NI Available to Com Stock...	5,519,000	5,519,000	690,000	-862,000	-976.091
Basic EPS	-	-	0.74	-0.98	-1.14
Diluted EPS	-	-	0.64	-0.98	-1.14

Figure 2. Tesla Financial Statements [3]

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
> Total Revenue	36,136,423	36,136,423	16,257,933	7,824,904	4,951,177
Cost of Revenue	29,314,990	29,314,990	14,384,514	9,023,726	5,207,047
Gross Profit	6,821,433	6,821,433	1,873,419	-1,198,822	-255,876
> Operating Expense	11,317,736	11,317,736	6,481,064	9,880,367	9,339,737
Operating Income	-4,496,303	-4,496,303	-4,607,645	-11,079,189	-9,595,607
> Net Non Operating Interest Inc...	274,423	274,423	-259,111	-210,257	9,741
> Other Income Expense	247,196	247,196	-430,958	1,682	-31,068
Pretax Income	-3,974,684	-3,974,684	-5,297,714	-11,287,764	-9,616,937
Tax Provision	42,265	42,265	6,368	7,888	22,044
> Net Income Common Stockhold...	-10,572,309	-10,572,309	-5,610,790	-11,413,101	-23,327,867
Diluted NI Available to Com Stock...	-10,572,309	-10,572,309	-5,610,790	-11,413,101	-23,327,867
Basic EPS	-	-	-4.74	-11.08	-70.23
Diluted EPS	-	-	-4.74	-11.08	-70.23

Figure 3. NIO Financial Statements(NIO)[4]

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
> Total Revenue	20,988,131	20,988,131	5,844,321	2,321,219	9,706
Cost of Revenue	18,365,576	18,365,576	5,578,332	2,879,360	12,067
Gross Profit	2,622,555	2,622,555	265,989	-558,141	-2,361
> Operating Expense	9,201,960	9,201,960	4,559,725	3,222,433	1,692,277
Operating Income	-6,579,405	-6,579,405	-4,293,736	-3,780,574	-1,694,637
> Net Non Operating Interest Inc...	687,698	687,698	110,585	56,826	59,554
> Other Income Expense	1,054,601	1,054,601	1,452,389	32,076	236,257
Pretax Income	-4,837,106	-4,837,106	-2,730,762	-3,691,672	-1,398,827
Tax Provision	25,990	25,990	1,223	1	0
> Net Income Common Stockhold...	-4,863,096	-4,863,096	-4,889,729	-3,719,352	-2,254,867
Diluted NI Available to Com Stock...	-4,863,096	-4,863,096	-4,889,729	-3,719,352	-2,254,867
Basic EPS	-	-	-12.96	-8.76	-2.84
Diluted EPS	-	-	-12.96	-8.76	-2.84

Figure 4. XPEV Financial Statements (XPEV)[5]

The effect of the profitability formula on financial statements through such a fitting formula, we can learn that Tesla's earning power is very good and is stronger than the other two companies. Tesla is in the lead in all indicators, integrated is a great gain, but also affirms the growing strength of Chinese automakers, which will also bring great pressure on the development of Tesla[7].

3. ANALYSIS OF TESLA'S PORTER'S FIVE FORCES MODEL COMBINED WITH RATIO ANALYSIS

The Porter Five Forces Model was proposed by the American scholar Michael Porter in the 1980s. It is believed that whether it is a service or a production company, there are five forces in industry competition, namely, rivalry among existing firms, the threats of substitute products or services, the threats of new entrants, the bargaining power of suppliers, and the bargaining power of buyers. All five forces affect the decision-

making and formulation of corporate competitive strategies. Combined with Tesla's characteristics, the five powers at this stage are mainly reflected in the following aspects.

3.1 Rivalry among the existing firm

At present, there are also new energy vehicles such as BYD, NIO, XPEV in China, and classic Mercedes-Benz, BMW, and Audi internationally. There will only be more companies entering this industry. Mercedes-Benz even announced that from 2025, all its newly released model architectures will be pure electric platforms. Several brands made in China have a large overlap in customer groups with Tesla among new electric car enthusiasts, while veteran brands and Tesla have a large overlap in customer groups among higher-end customer groups. Because BYD has many cooperations with Chinese public travel services, it is bound to become a major competitive force for Tesla in China. XPEV and NIO are also encouraged by policies, its technology has been strengthened, and Tesla's sales have increased after being exposed to this year's "out of control" scandal.

3.2 Threats of substitute products or services

As a new type of automobile, electric vehicles are favored by consumers, while some new substitutes have appeared on the market. In the early stage of the development of electric vehicles, this is not just a crisis for Tesla, but also for the entire electric car industry. But as the leader in the electric car industry, Tesla Inc. must be the most threatened. Nissan's hydrogen energy vehicles were a major threat to his substitutes. However, from the perspective of the entire process of automobile electrification, whenever the progress of lithium batteries is slow, hydrogen fuel cell technology will be on the agenda. Whenever the progress of lithium batteries is faster than expected, no one pays attention to this technology. From some people's perspectives, traditional fuel vehicles are still their first choice. They prefer not to worry about running out of electricity or they like the roar of the engine. They don't need to worry about the uncertainty of new energy vehicles as a new thing. The hydrogen fuel cell is the technology of the future, but it will only belong to the future forever. Today, the performance improvement and cost reduction of lithium batteries are much faster than expected. From the perspective of the technical requirements of automobile electrification, hydrogen fuel cell technology is gradually becoming a tasteless one because it has many problems that need to be solved urgently.

3.3 Threats of new entrants

Although Tesla is one of the first companies to enter the new energy market, there are still many companies that have the potential to enter the market under the

circumstance of vigorously promoting electric vehicles all over the world. Therefore, if Tesla wants to achieve long-term development in the target market, it should not only focus on existing competitors but ignore potential entrants. It should pay close attention to the new forces in the market.

As the transportation industry involves many people's livelihood issues, the requirements for policy supervision and entry barriers are relatively high. However, with the development of new energy vehicles, policies strongly encourage their development. As a result of the continuous economic development and the emergence of new technologies and new ideas, once a new competitor has a newer experience, the advantages of technology and management will inevitably give Tesla strong competitive pressure.

3.4 The bargaining power of suppliers

Combined with reality, most of the new cars appeared in the market with lower prices, and the highest sales of Model3 have been declining. There is even news that Tesla will publish a cheaper model soon. With so much competition in Tesla, brand homogeneity is a significant issue. However, Tesla has used the pure visual Autopilot function on the US version of Model 3 /Y. Compared with the old model, it will no longer be equipped with millimeter-wave radar, reducing manufacturing costs and helping Tesla quickly achieve the commercialization process. Tesla has super factories in many places, which have realized large-scale machine automation, and can produce in large quantities with less manpower, reducing a lot of costs. Therefore, although Tesla's bargaining power is weak, it doesn't need to worry about that too much.

3.5 The bargaining power of buyers

Nowadays, the electric vehicle industry has developed more maturely in some cities. There are many car choices, and customers can choose electric cars or traditional fuel cars. With the increasing number of electric vehicle products from other brands and the gradual improvement in cost performance, consumers have more and more choices. For Tesla, the bargaining power of consumers is getting higher and higher.

4. DISCUSSION

However, Tesla, a company developing electric vehicles, has been criticized for its environmental concerns. The German super factory near Berlin has been blocked by environmental concerns and has been the subject of serious complaints by two local environmental groups to the German Ministry of the Environment in Brandenburg for environmental impact and high water consumption.

Another point is that carbon emission targets have commercial value. Carbon neutrality is not only a business but also a century-long plan for the development of all mankind. Some authorities point out that if human beings continue to produce and live according to the current carbon emission standard without moderation, the global average temperature may rise by about 6 degrees Celsius by 2100. Tesla's sloppy emissions disclosure is a stain on an impressive record. A company that thrives on the power of the sun shouldn't have to hide its operational footprint in the shadows. And since Tesla has a large number of spare carbon credits in its name, Musk takes them and sells them to companies that have excess carbon emissions. By selling carbon credits, Tesla earned \$1.58 billion in operating income in 2020, more than twice the annual net profit.

Carbon neutrality has developed differently in each country. U.S. President Joe Biden campaigned on reducing emissions as his top priority, promising aggressive reduction targets. An environmental rule for auto companies in 11 federal states requires local automakers to sell a certain percentage of zero-emission vehicles by 2025, and if they fail to do so, they must buy credits from energy companies like Tesla or face more penalties from local regulators. Tesla has pledged to help China achieve its goals of reaching peak carbon by 2030 and carbon neutrality by 2060.

5. CONCLUSION

In terms of financial statements, Tesla's sales volume still ranks first. Based on Porter's five forces model analysis, Tesla still has many strong competitors and the threat of many new competitors. If Tesla wants to develop in the target market, it must strive to research the five-force model. Not only that but a full range of research should also be conducted on the needs of customers. As a high-tech industry, Tesla has always been at the forefront of the industry and is now vigorously developing the autonomous driving and AI industries.

Tesla is intelligent in that it is not only engaged in the electric car industry but has gradually extended the autonomous driving industry to AI technology. Elon Musk wants Tesla to be seen as much more than an electric car company. On Tesla's AI Day, Tesla Bot was unveiled, which is trained by chip Dojo. At the AI Day event, many of the speakers noted that Dojo will not just be a tech for Tesla's "Full Self-Driving" (FSD) system, it's an impressive advanced driver assistance system that's also definitely not yet fully self-driving or autonomous. This powerful supercomputer is built with multiple aspects, such as the simulation architecture, that the company hopes to expand to be universal and even open up to other automakers and tech companies.

As a major global automotive market, China should be a strategic market for Tesla. Tesla needs to continue to

increase its efforts in the Chinese market. Tesla's challenge lies in the rise of new Chinese brands and potential competitors, such as Apple, Xiaomi, etc. The participation of smart players will pose a greater threat to Tesla. Liu Kun, a China partner of Reese Strategic Positioning Consulting, said that Musk's strategic intention is to subvert fuel vehicles, so Tesla will continue to expand the mass price market. Here is another question. The downward extension will dilute and obscure Tesla's high-end perception. Tesla may no longer represent high-end electric vehicles. Therefore, there is a strategic opportunity for the high-end market to establish another purer high-end electric vehicle brand. This article still analyzes Tesla's current strengths and weaknesses at the surface level in terms of financial statements and company model, and there is still relatively little deeper analysis of Tesla. It can also be analyzed in the context of Tesla's many product sales and production cases. Future research may focus more on Tesla's other industries. Tesla is now more than an electric car company, it is a modern great integrated technology company.

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