

Tesla's Acquisition of SolarCity: Analysis of Impact on Electric Vehicle Technology in New Energy Enterprises

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Abstract. With the risen of the electric vehicle industry, the requirement of the market for electric vehicle technology grows as well. The development of new energy plays an important role in electric vehicle technology development at present. As an influential company in electric vehicle and energy development, Tesla's action of acquiring SolarCity, which is the largest rooftop solar panel installation company in the US, attracted a large amount of attention in the field of new energy and is typical for analyzing the development of new energy and electric vehicle industry. This study takes the acquisition case as an example, based on the literature review method and empirical research method, to verify Tesla's overall ability improvement after acquiring SolarCity. Analyzing the acquisition case can show the positive impact of the acquisition behavior by new energy enterprises on the development of electric vehicle technology and provide effective guidance for the future acquisition behavior of new energy enterprises.

Keywords: Merger and acquisition analysis, new energy, electric vehicle technology, Tesla.

1. Introduction

With humans realizing the serious consequences using traditional energy brought to the environment, the world is paying more attention to sustainable energy [1]. Contemporarily, the world's new energy-generating model has achieved rapid development. Taking China as an example, the proportion of new energy power generation in China's total power generation has increased from 5% to 20.2% from 2012 to 2023 [2]. The proportion has increased significantly. At the same time, with the rise of the electric vehicle industry and the increasing demand for electric vehicle technology, the efficient application of new energy development in the field of electric vehicle technology has ushered in more possibilities.

The development of new energy vehicles can be traced back to a century and a half ago. In 1834, British inventor Thomas Parker made the first electric car in the world [3], and in 1881, French engineer Trouve assembled the first electric car powered by rechargeable batteries in the world. In the following decades, electric vehicles developed rapidly in the United States, Germany, France, the United Kingdom, and other countries [4]. Up to now, although new energy vehicles have achieved some technological achievements, techniques (e.g., the installation of electric energy storage devices, kinetic energy, and stability enhancement) are still technical difficulties that can promote the electric vehicle industry development [5]. Therefore, the impact of new energy on the further development of the electric vehicle industry needs to be further discussed. The breakthrough of new energy vehicle technology will bring many advantages from the perspective of reducing energy consumption and pollutant emissions, making new energy vehicles one of the most important road transportations in the future [6]. To take the leading status in making technological breakthroughs, worldwide new energy vehicle companies are actively looking for different ways to improve vehicle technology. Among them, the merger and acquisition of new energy enterprises is a good choice, which can improve the technological income of both companies [7].

To promote the development of new energy vehicle technology and provide a reference for the acquisition and development of new energy enterprises, this research takes the acquisition of SolarCity by Tesla as a case. To specific, this study conducts research from the aspects of profitability, operation ability, and research productivity, and summarizes the impact of the acquisition behavior of new energy enterprises on the development of electric vehicle technology. It is of guiding

significance to the acquisition behavior of new energy enterprises to promote the development of electric vehicle technology.

2. Case Descriptions

Tesla was founded in July 2003, mainly producing and selling electric vehicles, solar panels, and energy storage equipment. In 2008, it released its first car product, achieving the current market value of \$1.03 trillion. Tesla has been committed to promoting technological innovation through increased investment in research and development to provide users with high-performance and high-quality electric vehicle products. Founded in 2006, SolarCity is a company specializing in the development of home photovoltaic power generation projects in the United States, providing comprehensive solar energy services from system design and installation to financing and construction supervision. SolarCity was listed in December 2012, and its stock price peaked at 88.35 yuan per share in February 2014, then began to decline and encountered a major financial crisis in 2015. Facing the increasingly fierce market competition and financial pressure, SolarCity urgently needed to find a new way out.

However, due to the different opinions of Tesla shareholders on the benefit return of this acquisition and the concerns of regulators that the acquisition will cause monopoly, as well as Musk as Tesla CEO acquisition of SolarCity may involve affiliate Transaction, the acquisition is not smooth. Tesla eventually acquired SolarCity in 2016 for \$2.6 billion. It gives Tesla access to SolarCity's solar technology and market share, laying the foundation for the development of new energy vehicle technology.

3. Analysis

3.1. Performance Analysis

Gross profit margin is the ratio of gross profit after sales revenue minus cost of sales to sales revenue, and sales net margin is the percentage of net profit to sales revenue. Through the analysis of gross profit margin and net profit margin on sales, the profitability of the company's products can be effectively measured. Table 1 shows the analysis of gross profit margin and net profit margin on sales from 2020 to 2023. From the trends of Tesla's gross profit margin and net profit margin indicators from 2020 to 2023 in Fig. 1, Tesla's gross profit margin from 2020 to 2022 has a small change, and there is a significant decline in 2023. The overall level is not very high, and there is a large room for market and profit improvement. The company's net profit rate on sales has risen significantly from 2020 to 2023, and although the increase in the previous year has stabilized, the overall trend is still good.

Table 1. Tesla 2020-2023 sales gross margin, sales net margin indicator analysis table

Index Year	2020	2021	2022	2023
Total revenue (billion)	315.36	538.23	814.62	967.73
Gross profit on sales (billion)	66.3	136.06	208.53	176.6
Net profit on sales (billion)	6.9	55.24	125.83	149.99
Gross profit margin (%)	21.02359	25.27916	25.59844	18.24889
Net profit margin on sales (%)	2.187976	10.26327	15.44647	15.49916

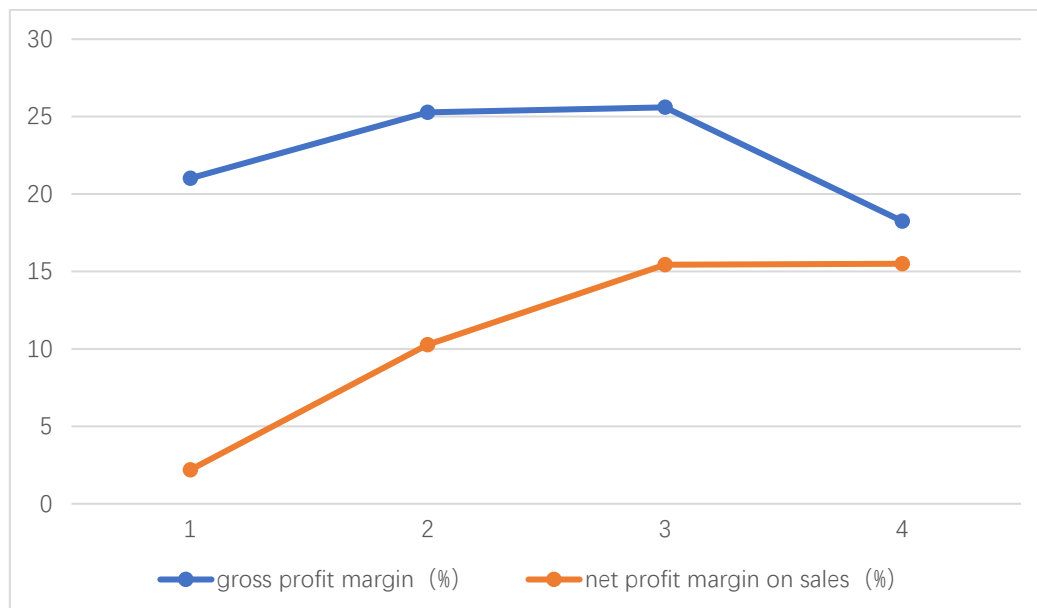


Fig. 1 Tesla's gross margin and net margin trend in 2020-2023.

Nowadays, BYD, NIO, and other new energy vehicle brands have sprung up, gained public attention, seized a certain market share, and had an impact on Tesla's gross profit margin and net profit margin in the previous year. The changes in Tesla's gross profit margin and net profit margin in recent years not only suggest that competition in the new energy vehicles field is becoming more intense but also prove that in such fierce competition, the acquisition behavior of enterprises plays an important role in maintaining the stable improvement of net interest rate. Return on equity refers to the percentage of net profit and average shareholders' equity, which is one of the important indicators to measure the profitability of a company. In this study, the return on equity is used to measure the improvement of Tesla's profitability, reflecting the promotion effect of the acquisition on the company's development. Table 2 shows the data on Tesla's return on equity from 2020 to 2023.

Table 2. Tesla's return on equity 2020-2023

Index Year	2020	2021	2022	2023
Shareholders' equity (net assets)	222.25	301.89	447.04	626.34
return on equity (%)	3.104611924	18.29806	28.14737	23.94706

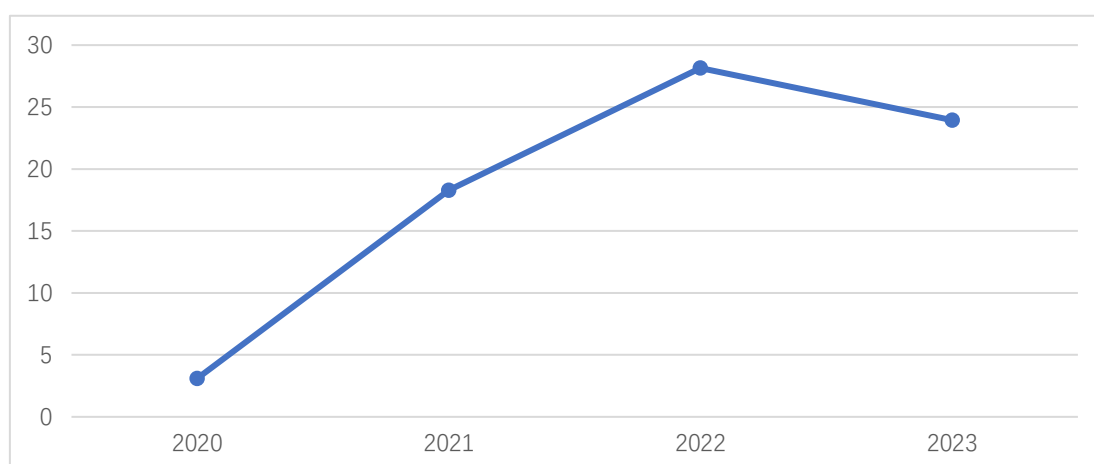


Fig. 2 Tesla's return on equity 2020-2023.

From the changing trend in Fig. 2, from 2020 to 2023, the return on equity rose first and then fell. It reached a peak of 28.147% in 2022, but the overall level of return on equity is not high from the percentage value in Table 2. The significant decline in the return on equity in 2023 is the same as the reason for the change in the gross profit margin, mainly due to the impact of the fierce market

competition on the income-generating capacity and profitability of companies. However, it is not difficult to find that the return on equity in 2023 is still greatly improved compared with 2020, which is attributed to the continuous improvement of Tesla's business model and technical level after the acquisition of SolarCity.

3.2. Operating Ability

The accounts receivable turnover ratio represents the time it takes for an enterprise to convert the rights of accounts receivable into cash, reflecting the realization efficiency of the company. By analyzing this data, one can measure the strength of the enterprise's operating ability. Table 3 lists the turnover rate of Tesla's accounts receivable from 2020 to 2023. From the data in Table 3 and the changing trend in Fig. 3, the number of days of Tesla's accounts receivable turnover rate from 2020 to 2023 has a small fluctuation range, but it shows a downward trend, indicating that Tesla's recovery time of receivable accounts is gradually shortened, the use efficiency of liquid capital is gradually improved, and the risk of bad debts is reduced. It can be seen that the acquisition behavior of enterprises can improve the company's mastery of accounts, reduce the turnover ratio of accounts receivable, and further improve the company's ability to collect funds for accounts receivable.

Table 3. Tesla accounts receivable turnover rate for 2020-2023

Index Year	2020	2021	2022	2023
accounts receivable turnover (%)	14.39	13.22	12.68	11.93

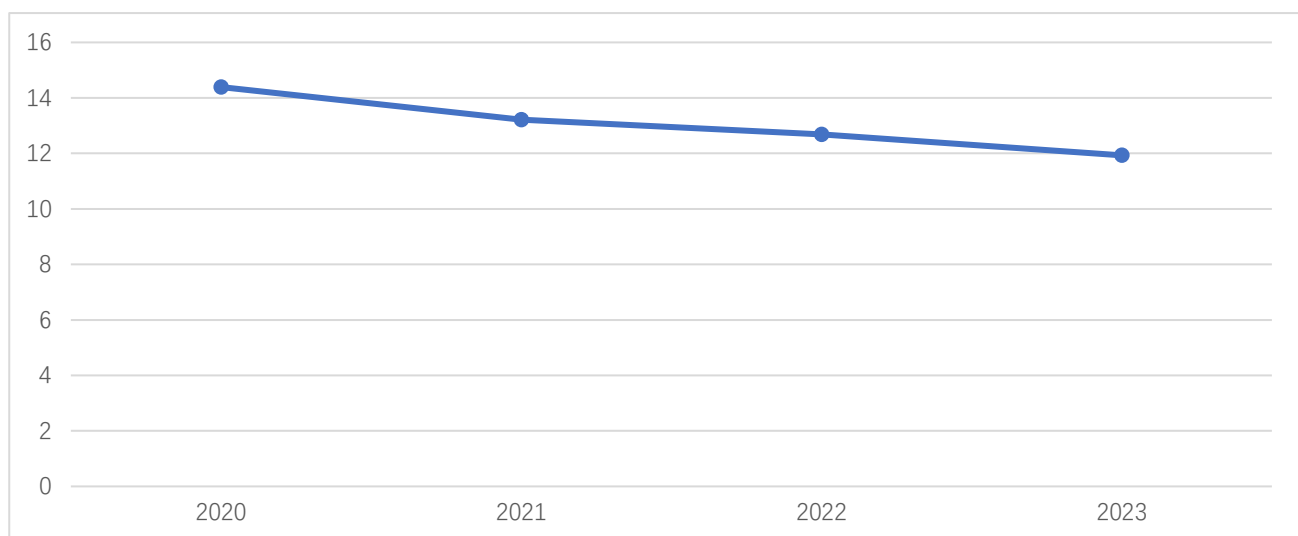


Fig. 3 Tesla accounts receivable turnover rate for 2020-2023.

3.3. Research Productivity

From the perspective of the patent application, after Tesla acquired SolarCity, research productivity has been significantly improved. According to Tesla's patent applications by referring to existing literature, Tesla began to apply for patents in the second year of its establishment and obtained 28 patents during 2006 and 2007 [8]. Then, Tesla ran into a shortage of cash, and there was no significant breakthrough in the number of patent applications. However, after the acquisition of SolarCity, Tesla has gained significant advantages in acceleration and mileage parameters. Tesla Model series electric cars can accelerate in 3.1 seconds when they complete 0-100 km/h acceleration, and electric trucks can accelerate in less than 3 seconds [9]. In 2020, Tesla applied for a new battery patent that would increase the car's battery life to four times the mainstream electric vehicle battery life standard [9]. It can be seen that Tesla has continuously improved its research and development capabilities after the acquisition of SolarCity and has a technological competitive advantage over other enterprises.

4. Suggestions and Implications

Tesla owes \$3 billion in debt for the acquisition. In the future, Tesla can use the advantages of new energy technologies and markets after the acquisition to promote the future development of electric vehicle technology. First, to maximize advantages, Tesla can focus on the integration of advantages in new energy after the acquisition and combine SolarCity's solar technology with Tesla's battery energy storage technology to improve the electric vehicle's endurance mileage and charging efficiency, so as to promote the development of electric vehicle technology. Secondly, Tesla can strengthen market research and brand promotion, make use of the unique advantages after acquisition combine the preferences of consumers to carry out online and offline cooperative promotion, and expand the brand market [10]. In addition, with the expansion of Tesla's enterprise scale after the acquisition, the company is faced with more expensive management costs and higher management difficulties, for which Tesla can import advanced information management systems to optimize decision-making and strengthen the construction of enterprise information security.

5. Conclusion

In summary, with the rise of the development trend of new energy, the competition in the field of electric vehicles is becoming more and more fierce, and all enterprises are looking for new roads to achieve better development. This study takes the acquisition of SolarCity by Tesla as a case, analyzes the data changes in various aspects caused by the acquisition of Tesla from three dimensions of profitability, operation ability, and research productivity, extracting the impact of the acquisition behavior of new energy enterprises on the development of electric vehicle technology. Although the acquisition of new energy enterprises may lead to short-term liabilities, thus affecting the financial support for the development of electric vehicle technology, in the long run, the acquisition of new energy enterprises plays a positive role in improving electric vehicle technology through technology integration, providing financial support for electric vehicle technology research and development through expanding the market, and promoting the popularization of electric vehicle technology through cost control.

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