

A Study on Sustainable Energy from the Energy Crisis -- Tesla as an Example

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Abstract. This text explores the effect of Tesla on sustainable energy and how the company lead a green revolution in the automobile industry. With the Russia- Ukraine war, European countries are facing an energy shortage. Moreover, more and more Europeans are expecting a 'colder' winter this year due to soaring prices of gasoline. Electric vehicles, which produces fewer greenhouse emissions and air pollutants, became an considerable option for many under the influence of Tesla—and sales of Tesla vehicles also demonstrated this. For the past four years, Tesla revenue has increased by 120%, and the average wait time for the Model X ranges to over a year. We perform a company analysis of the Tesla's financial statements and draw a conclusion on whether Tesla is a good company, a good investment, or both by looking at its revenue growth, current ratio, profit margin, and price to earning ratio. Through trend analysis, Tesla showed strong strength in an increasing trend. With cross-sectional analysis across the automobile industry, we suggest investors to hold before they purchase a Tesla share.

Keywords: Tesla; energy crisis; sustainability; company analysis.

1. Introduction

With the imminent energy crisis and global warming, there has been increased public attention on the problem of sustainability. The Russia-Ukraine war drives gasoline prices to a historic high and that causes many Europeans to cut their energy usage, facing a potential blackout this winter.

As for the automobile industry, the introduction of electric vehicle may shed some light on the situation. A more environmentally friendly choice than traditional gasoline vehicle: fuel efficient, less pollutant and lower maintenance. Many auto company, such as Nissan and Ford, sense the emerging trend and start selling electric vehicle. However, nowadays people usually associate electric vehicle with one other company name—Tesla.

In 2022, customers of Tesla often have to join a waitlist to purchase the company's vehicle. The Demand for Tesla is at an all time high, it is estimated that the average wait time for a new model is around 4 months. With Model X, the most popular model, the wait time could went above a year. Despite the long wait time, customers are still prefer Tesla over similar products. This begs the question, what is the secret behind Tesla's success?

2. The Impact of Tesla on the Auto Industry

One of the largest reason why Tesla has succeeded while others have failed is the company's ability to manage under uncertainty. Whether or not to enter the electric vehicle industry was a challenging decision, and from Tesla's success now, Elon Musk has certainly made the right choice. In fact, a lot of Tesla's capabilities came from its CEO Elon Musk, a rather unconventional entrepreneur. He first started as the cofounder of Paypal, which is quite different from the auto industry. Despite this difference in background, Musk has proven himself being perfectly capable of playing to roles of salesman to customers and investors [1].

Tesla started small with about 80 employees from diverse industry yet with variety of expertise such as electronics, automotive, and software [2]. Together, the company brought different Tesla models to the market : The Model S, Model X, Model Y... Given the company name, Tesla, after the name of scientist Nikola Tesla, who invented the first induction motor. Tesla vehicles utilized

inductor motor to produce a four-pole magnetic field. In addition, the rotation speed of the induction motor could be adjusted base on the frequency of the AC Power supply, which allows Tesla to achieve precise speed control. Another benefits of electric vehicles is that it have no tailpipe emission [3]. Even accounting for the electricity used to charge Tesla vehicles, it still has a smaller carbon footprint than gasoline cars. In 2015, Tesla introduced their solar panels, aiming to create a complete energy and transportation ecosystem that is fully vertically integrated. In which the Tesla solar panels convert sunlight to energy and could be later used in Tesla vehicles [4]. This way, Tesla made their products more affordable and leads to the greatest environmental ebenfit possible [5]. The results are impressive—In 2020, Tesla customers helped accelerate the world’s transition to sustainable energy by avoiding 5 million metric tons of carbon dioxide emissions. Being a pioneer in the electric vehicle industry, Tesla has made a brand for itself — connecting its name with sustainability [6].

Yet another factor that lead to customer’s preference over other types of electric vehicle is the introduction of self-driving, known as the “Autopilot” features [7]. It works as a assistant to users driving in Tesla, which enables one to steer, accelerate and brake automatically within its lane. In addition, the autopilot suggests lane changes to optimize routes and make update adjustments. With eight cameras and sensor coverage, Tesla created 360 degrees of visibility that could navigate users through complex roads and parking spaces. For now, current autopilot features require active driver supervision and is not yet “fully autonomous”. However, with its developmental team, Tesla is working on achieving full self-driving capability through billions of miles of tests and regulatory approval.

Through the products Tesla offered, it provides a unique customer experience compared to other automobile manufacturers and it is almost impossible to compete with. It is often said that people are not buying vehicles when they buy Tesla, but they are buying “futuristic experience” [8].

3. Company Analysis of Tesla

In this section, we will perform company analysis of Tesla. Over the past four years, Tesla showcased a strong trend in increase automotive sales, as shown by the trend analysis below. From 2018 to 2021, Tesla has a 120% increase in revenue compare to a relative steady growth rate of the auto industry in teh United States. The increase in revenue demosntrates that Tesla is expanding its business to more customers.

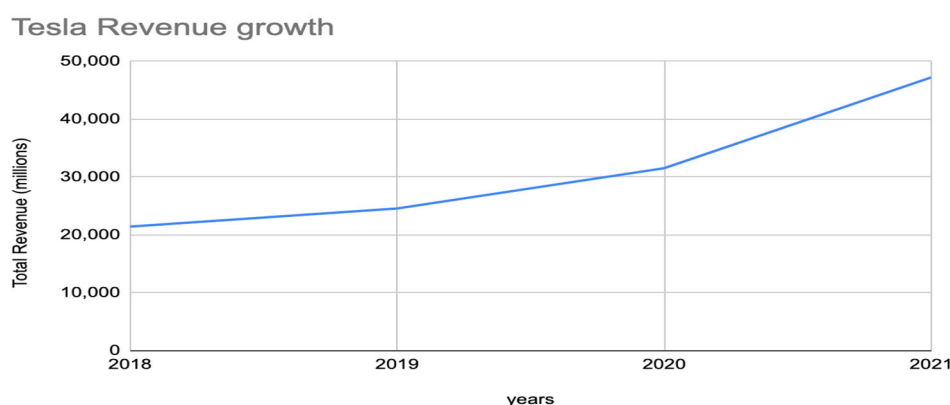


Fig. 1 Tesla Total Revenue from 2018 to 2021

Then, we analyze the riskness of Tesla in regards to the company’s solvency. First, we look at Tesla’s current ratio, which is a liquidity ratio that will mesure Tesla’s ability to pay obligations that are due within a year. It is calculated by dividing its current assets by current liabilities and that a current ratio of 1.5 to 3 is usually indicating that the company has great financial health. Overall, Tesla showcases an increasing trend in current ratio and above 1, which indicates that the company is at least solvent within the short term. Note that in 2021, the current ratio of Tesla decreased from 1.87 to 1.37, down by 0.5. This is in fact not due to a decrease in current assets but a increase in

current liabilities. In fact, Tesla's current assets increased from 14,248 millions in 2020 to 19,704 millions in 2021. A possible explanation for this increase in short term debt is Tesla fueling its expansion by leveraging debt in 2021 which is showcased in Tesla reporting 87% increase in 2021 deliveries.

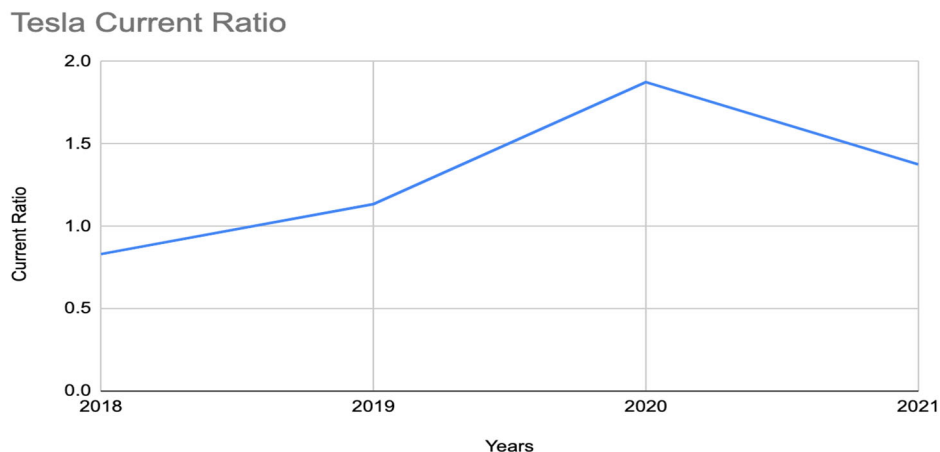


Fig. 2 Tesla Current Ratio from 2018 to 2021

Then, we analyze the profitability of Tesla. Specifically, by looking at the company's profit margin ratio, which is calculated by the company's net income divided by its sales revenue. Overall, Tesla demonstrates an increasing trend in its profitability as shown by the chart below. From 22.9% in 2018 to 30.8 % in 2021. The profit margin ratio represents the percentage of sales that has turned into profits. Between 2015-2020, the average profit margin for major automotive companies worldwide was around 7.5%. Clearly, Tesla demonstrates its profitability well above its industry average.

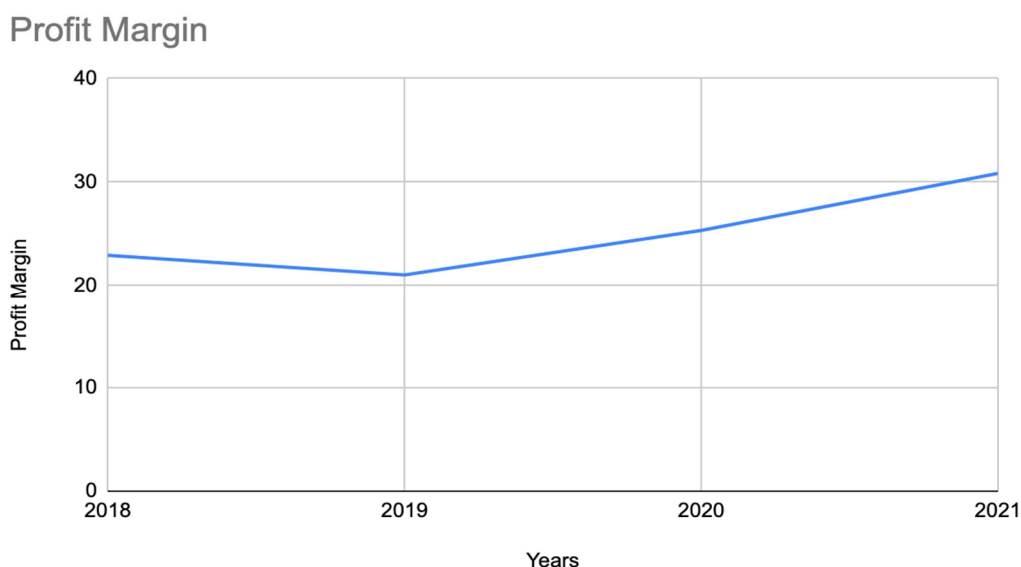


Fig. 3 The Profit Margin of Tesla from 2018 to 2021

Finally, we will like Tesla's price-to earnings ratio to determine whether the company is overvalued or undervalued. A good company doesn't always mean a good investment. The P/E ratio allows investors to determine the relative value of a company's share to industry average. A high P/E ratio usually indicates the company's stock is overvalued and investors expect potential high growth rates [9, 10]. While the average P/E ratio for auto industry is around 3.83, Tesla's P/E ratio reached 42 in 2021.

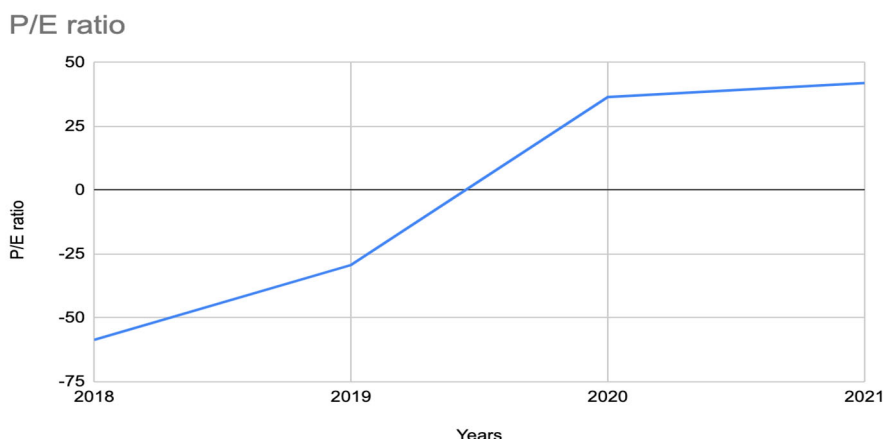


Fig. 4 The Price-to Earnings Rati of Tesla from 2018 to 2021

4. Conclusion

Tesla today is acknowledged as one of the pioneer technology company that concerns climate change and developing sustainable energy. Its focus on environmental issues, safety, and innovation made its electri vehicles immensely popular. Challenging norms and traditional ideals, Tesla redefined the kinds of cars on the market and demonstrated that a new era is coming.

Through Company Analysis, Tesla showed a strong increasing trend in its revenue, sales and profitability in the past four years. However, a good company doesn't always mean a good investment. Compared to its competitors in the auto industry, Tesla seems a bit overvalued as its P/E ratio is well above average. My suggestion to investors is to take a wait a see attitude before Tesla's stock price drop to a desirable level.

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