

# Quantitative Analysis of Tesla Inc. in the Context of the Covid-19

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## ABSTRACT

Value investing is one of the most pragmatic valuation techniques for investors to decisions based on real for business or industry in various periods, and it has proved to be successful in many practical applications such as the acquisition the company shares based on the exploration of its current operations and providing reliable information for shareholders and boards in the company. The purpose of this essay is to conduct a quantitative analysis of Tesla Ltd., particularly during the Covid-19 by analyzing financial statements, stock prices, and making multiple valuations. However, because since this is an innovative topic of research, there have been few studies on it. The essay presents the comprehensive overview of various ratios of financial statements of Tesla Inc. in both 2019 and 2020, followed by an in-depth analysis on estimating share prices and enterprise value, and then comparing the estimating value with the real value to determine whether these key figures of Tesla Inc. were overestimated or underestimated. The Multiple Valuation Method is used as the primary tool for valuation in this essay. By the end of the essay, the essay calculates whether the key figures of Tesla Inc. are overestimated or underestimated. Finally, clear justification, suggestions, and recommendations for future research topics about Coca-Cola Companies are made.

**Keywords:** Firm Value, Value Investment, Quantitative Analysis, COVID-19

## 1. INTRODUCTION

From 2019, the advent of a novel coronavirus (COVID-19) as a global pandemic has emphasized the significance of the environment-health-economic nexus. Hence, the COVID-19 pandemic outbreak is a public health problem with catastrophic health, environmental, and economic effects [1]. In China, one of the world's largest labour markets, by the end of February 2020, the urban employment rate had significantly decreased by nearly 16% from the previous years. Similarly, this indicates that total urban hours worked dropped by more than 30% between December 2019 and February 2020 [2]. During the Pandemic, one of the world's fastest-growing technology companies, Tesla Ltd., also presents significant opportunities and threatens for their products and corporate governance in these depressing times. Although Tesla Inc. started to record the annual profit in the annual financial statements in 2019 and it stated that it expected to be higher profits in the future, the main threat is the drop in profitability and liquidity as a result of lower consumer purchases during the Covid-19. What worries shareholders is Tesla's ability to convert the threats it faced into opportunities for the company to

grow and expand during the epidemic. However, Tesla's annual revenue not only did not fall during the epidemic but rose from around 22.1% to \$31,536 million in 2020, and it had a gross margin of 21%, which has never been achieved before. Consequently, it is worth making a quantitative analysis of why these financial data anomalies during the Pandemic.

At present, profitability is one of the most common measurements of the financial performance of the company, which is the company's ability to seek profit. Brigham and Houston [3] show that generating profits is the description of return on business investment. Firm value is a topic that captivates the interest of both executives and researchers around the world. Sucuahi and Cambarian [4] stated that profitability had a positive effect on the value of the business. Otherwise, researchers claimed that capital structure is also a kind of measurement to measure financial performance [5], and Pratiwi, Yudiaatmaja, and Suwendra [6] claimed that capital structure has a positive and direct impact on the firm.

The essay will be divided into four sections: introduction, data and method, results and discussions,

and conclusion. The introduction section will be split into the background, theoretical overview, and organization of the whole essay. The background of Tesla Inc., crucial financial data, and the method used for multiple valuations will be used in the data and method section. In terms of results and discussions, the essay elaborates on the financial situations, quantitative analysis, and future growth during the Covid-19. In the last part, the essay will present the conclusion for the essay, and finding limitations, and advise on further investigations on this topic. The essay will extract the changes in financial data of Tesla Inc. for the year before Covid-19 and the pandemic year. The financial ratios can be expressed in the essay. Then, the essay uses the multiple Valuation Method to predict whether Tesla Inc. is overvalued or undervalued in terms of share price and enterprise value during 2020. Despite some internal financial information and operations of Tesla being unknown, this essay provides the quantitative analysis of Tesla Inc. during the Covid-19 using the available external information.

## 2. DATA AND METHOD

Tesla Inc. (NYSE: TSLA) is one of the world's most valuable companies, which is originated in 2003 and established its headquarters in Austin, United States. In 2003, Tesla Inc. is the manufactures of electric vehicles and the clean energy company remains sustained high market share and company capitalization. Tesla Inc. dominated 71% of the United States electric vehicle market share in 2020 and this percentage increasing in recent years, partially for its newest vehicle product Tesla Model Y [7]. In 2008, Tesla Inc. produce its first product: Roadster, which became the first vehicle powered by batteries in the world. Then, Tesla Inc. produced different various products: Tesla Model S in 2012, Tesla Model X in 2015, Model 3 in 2017, and Model Y in 2020. The Tesla Model 3 is the best-selling plug-in fully electronic car in the world, and it became the first electronic vehicle to sell 1 million units globally [8]. Tesla's stock price nearly triples in a three-year period from 2019 to 2021. Tesla's success comes from its good corporate strategies during different company periods. The main business strategy for sales is the production of the high-priced and low-volume car first where the target customers are not too price-sensitive. For instance, Tesla Inc. produces expensive cars like Model S and Model X when the firm start-up. Then, the company gradually reduced the costs of batteries, thus enabling the high volume for more profits. However, Tesla Inc. changed its strategies to produce cheaper electronic cars for increasing volume. Tesla Inc. does not sell the vehicles through vehicle dealerships compared to other companies. Rather, the company sells the vehicles directly through their company-owned stores and websites. In addition, Tesla's owned stores are usually located in large shopping malls and galleries, which increases the attractiveness.

The financial situation of Tesla Inc. can be measured by the differences of the financial data between 2019 and 2020 from the profitability aspect and liquidity aspect to find the impact of the outbreak on Tesla Inc. For profitability, the essay will be examined the net profit margin, average financial leverage, and return on equity. In terms of financial health and liquidity, it will use the financial leverage and current ratio of the company. Meanwhile, the strategies used by Tesla Inc. to enhance the value of the company during the Covid-19 will also be discussed.

Firstly, the essay will choose three main competitors of Tesla Inc. based on similar capital structures and financial situations. A similar capital structure means that these companies have similar debt and equity situations during the year. The capital structure can be measured by leverage ratio, which can be formulated by the formula (1).

Secondly, it will present the P/E ratio and the EV/EBITDA ratio of each company in 2019, then calculate an average P/E Ratio and EV/EBITDA ratio of these different ratios. The Price-to-Earnings Ratio (P/E Ratio) measures the net book value of a share divided by the earnings per share which can be used to measure share price for the company in the next few years. Investors always believe that the higher P/E Ratio means that the company has a great growth prospect. Small companies always have a relatively low P/E Ratio in contrast to big companies. However, the P/E Ratio may mislead the investor to quote the shares of the company because of the high volatility and uncertainty of shares in the market. EV/EBITDA Ratio is another significant ratio to predict company growth prospects. It can be formulated as the enterprise value divided by earnings before interest, taxes, depreciation, and amortizations. It is an adjusted ratio to predict the enterprise value for the next year. An enterprise that has the higher P/E ratio and profitability means that it certainly has the high enterprise value. Otherwise, investors have a higher desire to invest in a company which obtains the higher EV/EBITDA ratio. Similarly, EV/EBITDA ratio may be hard to measure the cashflows in different situations.

Finally, the essay will use the average P/E Ratio multiple of the real earnings per share in 2019, and EV/EBITDA Ratio multiple the real EBITDA of Tesla Inc. in 2019. Then, it will initially determine whether the company's value and share price are undervalued or overvalued.

Formulas:

$$\text{Financial Leverage} = \frac{\text{Total Liabilities}}{\text{Total Shareholders' Equity}} \quad (1)$$

$$\text{P/E Ratio} = \frac{\text{Market Value per Share}}{\text{Earnings per Share}} \quad (2)$$

$$\text{EV/EBITDA Ratio} = \frac{\text{Enterprise Value}}{\text{EBITDA}} \quad (3)$$

$$\text{Net Profit Margin} = \frac{\text{Revenue} - \text{Cost}}{\text{Revenue}} \quad (4)$$

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Shareholders' Equity}} \quad (5)$$

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (6)$$

### 3. RESULTS DISCUSSION

For the profitability, in 2020, the net revenue of Tesla Inc. increases to \$31,516 million compared to the revenue of \$24,578 million in 2019. Although most companies were trapped in financial crisis coronavirus-related problems, Tesla Inc. achieved unpredictable increases because of excellent product sales strategies during the Covid-19. The company's R&D spending grew from \$700 million in 2015 to about \$1.5 billion in 2018. However, Tesla's R&D spending declined by about 8% to \$1.34 billion in 2019. The company's R&D revenue is mainly used to improve the quality and range of batteries in its electric vehicles [9]. The profitability of Tesla Inc. presents excellent financial data in 2020 compared to the prior year as Table 1 shows. The net profit margin measures how much net income or profit is generated as the percentage of revenue. In 2020, the net profit margin had increased approximately 5.7% compared to 2019 because that is the first year for Tesla Inc. to make its book revenue be positive in 2020 and its increasing net revenue during the year. For the return on equity (ROE), it is a financial measurable statistic that is calculated by dividing net income by shareholders' equity. The net income in the formula is the dividends that are paid before common shareholders and paid after preferred shareholders and interest to lenders. ROE is regarded as a measure of a company's profitability and efficiency in generating profits. Like the net profit margin, ROE of Tesla Inc. had increased nearly 20% during a year, which means the company had more dividends paid to their shareholders in 2020. Overall, the Covid-19 had minimal or even no influences on Tesla Inc. because of two inferred reasons. The main reason is that Tesla Inc. established the Shanghai super factory began in 2019. This factory not only increased Tesla's

production by expanding the Chinese market, improved profitability but also significantly reduced transportation costs and labor costs. Another reason is that Tesla's sales strategy differs from that of traditional car manufacturers are resulting in less impact during the Covid-19. Tesla did not invest in advertising and marketing on TV media, but it focused on the celebrity effect, which enabled less costs during Covid-19 and nice brand images [10]. In terms of debts and liquidity, although the long-term liabilities of Tesla Inc. had significantly decreased to 8 billion in 2020 from 10 billion in 2019, the numerous short-term loans and note payables had increased approximately 25% during the Covid-19. total liabilities of Tesla Inc. had a substantial increase from 28 billion in 2019 to 30 billion in 2020. Meanwhile, the tax payables and tax provisions had increased steadily corresponding to increasing productions during the pandemic. For liquidity, Tesla Inc. still maintains a good liquidity position and cash to repay its obligations. The free cash flow can be measured from three different activities: investing activity, operating activity, and finance activity. The net cash flows used for investing activity had increased to \$3,132 million in 2020 compared to \$1,436 million in 2019 because that Tesla Inc. is not only a car manufacturer but also a technology company aiming to find the cleanest energy to reduce pollution. The Research and Development costs had increased significantly corresponding with increased net cash used by investing. The net cash flows provided by operating activities had doubled during the year because the net income turns positive from negative in 2019 for the first year. The net cash provided from financing activity had an increase of almost 9 times compared to 2019 because of the high volume of shares issued by Tesla Inc. to finance the funds for investment. As a result, the free cash flows had increased to \$2,701 million in 2020 compared to \$968 million in 2019. The current ratio measures the ability of Tesla to repay the short-term obligations, and a lower current ratio means a higher risk of default for the company. As Table 1 shown, the current ratio had increased from 1.13 to 1.88 during the Covid-19 year, which means Tesla had more current assets to repay the immediate short-term obligation in 2020.

**Table 1.** Analysis of profitability and liquidity of Tesla Inc.

Profitability	Net Profit Margin	-3.51%	2.19%
	Return on Equity	-14.94%	4.78%
Liquidity	Current Ratio	1.13	1.88
	Financial Leverage	5.18	2.35

**Table 2.** The Debt/Equity ratio for Tesla Inc. and its competitors

	Debt/Equity Ratio in 2020
Tesla Inc.	2.35
BYD Co Ltd	3.53

General Motor Co	5.22
Ford Motor Co	8.71
Li Auto Inc	1.22

**Table 3.** P/E ratio and EV/EBITDA for peer group

	2019		2020	
	P/E Ratio	EV/EBITDA Ratio	P/E Ratio	EV/EBITDA Ratio
Tesla Inc	—	39.30X	1,341.58X	173.78X
BYD Co Ltd	36.51X	21.02X	147.33X	55.17X
General Motor Co	5.96X	12.87X	18.67X	7.63X
Average Ratio	21.2X	16.9X	83X	31.4X

This section has chosen the peer group of Tesla Inc. by the similar capital structure of its main competitors, which can be calculated by the similar financial leverage. Companies with a lower level of total liabilities and a higher level of the net book value of equity mean that investors are willing to invest more funds. Therefore, a similar capital structure can reflect the debt situations of a company as the measurement to make multiple valuations. Based on the financial leverage ratio shown in Table 2, Tesla Inc had slightly leveraged by debts during the Covid-19, and the BYD Co Ltd and General Motor Co had the most similar leverage ratios compared to other competitors. Table 3 compares the different P/E Ratio and EV/EBITDA Ratio for Tesla, BYD, and General Motors in both 2019 and 2020. The P/E ratio of Tesla Inc. in 2019 was nil because 2020 is the first year that Tesla made a profit. Tesla Inc. maintains the highest P/E ratio compared to other competitors in 2020 as its sales volumes and market shares had accumulated to be much than others. Otherwise, the high P/E ratio means that the investors of Tesla Inc. are bullish about the future growth of the company. In other words, the investors are satisfied with the bullish trends of share prices and profitability. Both the P/E ratio and EV/EBITDA ratio had significantly increased for those three companies from 2019 to 2020 except the EV/EBITDA ratio of General Motor Co. One of the main explanations for this abnormal decrease is that China is one of most sales countries that had significant purchase power from three companies. Tesla increased the sales in China by constructing the super production factory in 2019, and BYD is the domestic electric car brand in China that maintain excellent sales during the pandemic. BYD maintains sales by its good brand identity and relatively cheap domestic prices compared with Tesla in China. However, although General Motor issued some strategies for Covid-19, its sales of electronic car in China seems not as popular as its competitors. Table 3 also presents the average P/E ratio to determine whether the share

price of Tesla Inc. has been underestimated or overestimated. According to financial figures, there was no sense of measurement of the share prices because the real earnings per share of Tesla were negative. In 2020, the real earnings per share are \$0.64, and the estimated share price of Tesla is  $\$0.64 \times 83X = \$53.12$ , and the share price in financial reporting of Tesla Inc. was \$16.70. The share price of Tesla has been overestimated for 2020. The investors still believe that Tesla Inc. is positioned for strong growth in the second year of Covid-19 because of the perfect financial performance during the year. The average EV/EBITDA ratio has also been shown in Table 3 to measure whether the enterprise value of Tesla had been underestimated or overestimated. By using the average EV/EBITDA ratio multiple the EBITDA, the estimated enterprise value in 2019 can be calculated as  $16.9X \times \$2174M = \$36,741M$  but the real enterprise value was \$84,790. A similar calculate process can be used to estimate the enterprise value of Tesla in 2020, the estimated result is \$132,634 million but the real enterprise value of Tesla Inc. in 2020 was \$678,080 million. Although the enterprise value of Tesla was underestimated in both years, it can infer that Tesla Inc. had incredible growth which cannot be predicted by data aspect. Otherwise, the perfect company strategies during the Covid-19 were also contributed to Tesla's fast growth in recent years.

#### 4. CONCLUSION

At the start of 2020, the terrible impact of the virus swept the world. As a result, this essay aims to make a quantitative analysis of Tesla Inc. in the context of pandemics during these two years. This paper used multiple valuation methods to determine whether the share price and enterprise value of Tesla Inc. were underestimated or overestimated during 2019 and 2020. Otherwise, the essay uses some key financial ratios to

measure the effects of Covid-19 on the profitability and liquidity of Tesla Inc.

Although some reported financial figures were affected by Covid-19 in the first quarter of 2020, Tesla Inc. turned this situation in the rest of the year and even creates the new highest sales volumes and net income in this year. The P/E ratio of the company maintains a strong increasing trend which means investors have an optimistic attitude on the future growth of the company. Meanwhile, the underestimated EV/EBITDA ratio also presents the company is going through a phase of rapid growth which cannot be simply interpreted by financial data. In addition, the newest financial statements of Tesla Inc. also present positive financial data both in terms of profitability and liquidity.

However, the research methodology of this article also has some shortcomings. For example, P/E and EV/EBITDA are ratios that just consider the explicit data of the company instead of accurate and implicit information. In the future, it can be inferred that Tesla Inc. can improve its profitability and liquidity by amount. Because of the relatively decent and stable data compared to its peer companies based on the multiple valuation methods in the essay, investors can confidently and safely invest their money in the Coca-Cola Company.

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