

Tesla: A good company to invest in?

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Abstract. Tesla, as a world class company, has attracted more and more attention recently. As a non-traditional car company, its product development is the most attractive place. However, is the company a good choice to invest in? In this article, the author discusses the financial performances of Tesla, analyzes the influencing factors, and makes a prediction of its financial status in the future, thus gives the conclusion of whether Tesla is a company that worth to invest on.

1. Introduction

Tesla is an American electric vehicle and energy company, which is established by Martin Eberhard and Marc Tarpenning in 2003. The headquartered in California's Silicon Valley, Palo alto. It is focus on use the new energy and the environmentally friendly materials to produce their products, such as selling electric vehicles, solar panels, and energy storage equipment. After acquiring SolarCity, Tesla changed its name from Tesla Motors to Tesla Inc. The removal of the "Motors" in its name means a transition from a purely electric car company to an energy company. The CEO of the Tesla, Elon Musk, expressing Tesla efforts to provide every ordinary consumer with a pure electric vehicle within their consumption capacity [1].

2. Main characteristics

As a non-traditional car company, its product development is the most attractive place. From the product development history of Tesla, we can find that the technology development of Tesla. The competition pressure in the automobile market is very big, besides the influence of the brand, people also pay much attention to its safety. With the development of the times, people are becoming more and more aware of environmental protection, and new energy vehicles have become the focus of attention. And Tesla as one of a leaders of this area, also got a lot of potential customers.

"Now, investors center on Model 3 production ramp and gross margin achievement, new product introductions, and the cash generation of the business model." They believe continued new products equate to continued growth in TAM and Tesla's top-line revenue. The Tesla feels confident in its ability about the Model 3 launch because through the qualifying electrified vehicle sales from 2011 to 2016, it's the only one car company which is 100.0% all US sales. After, the Tesla will introducing new products, Model Y, based on Model 3. Then the company likely needs to build incremental capacity in order to produce the Model Y, to improve its productivity. The Tesla expects existing model refreshes to come every 8 to 10 years, compare with other similar companies, the speed of refresh seems too slow, but it needs to ensure its products have enough ability to competitive with other EV and fulfill the demand of humans. Of course, investors are more concerned about whether cash flow can be positive. The Tesla may rely on partners to produce its products to reduce the capital expenditure late. The through reducing the cost to give consumer more selections, occupy more market shares. That is because its high-tech value and high expectations for its future, have made its share price rise rapidly in the early days (but slowly during the development of new products), let it becomes the only independent manufacturer of pure electric cars to be listed in the United States [2].

3. Recent financial performance

First, we will use the balance sheet to analyze the current situation of Tesla. This table shows the change from 2013 to 2017, and we can see that the revenue growth was always keep a substantial increasing. The reason of it may be that Tesla published new products to attract consumers to buy its products. At the same time, as a leader in the new electric car industry, its products would have received a lot of attention when they were released, and through many promotions to raise its profile, the sales will increase by this way. Also, we can find revenue growth has a significant growth from 2015 to 2016. This is because during this period, Tesla introduced the Model S and sold it in different types and prices, and people can find the suitable one that they have enough ability to buy, expend the reach of the consumer community. Therefore, the number of sales will increase significantly. Then, Tesla acquired SolarCity in 2016, which means the Tesla will produce more clean energy, and through this way to increase its revenues. Now, to see gross margin, the change of it is not obviously, but in 2017, the gross profit was less than 20% in 2017, which means gross profit percentage of revenue was reduced. Then, try to compare the EBIT during these years, we can find all EBIT are negative and become worse and worse. Analyze by R&D and SG&A, Tesla spent a huge amount capital in both of areas. According to the information from Morningstar Equity Analyst Report, we can know that "A Shanghai plant will open in a few years and be wholly owned by Tesla," which means the productivity of Tesla will rise [3][4]. Also, it launched the new car in 2018: The Model 3, which means before the 2018, Tesla keep developing their products and do some research until they public the Model 3. There is all the reason which lead the R&D's spending become more and more. And the gross profit cannot cover the total spend of the R&D and SG&A. Then, consider about the increase in NWC, we can know that the results are all positive before in 2017, and the reason of why it becomes negative is that too much account payable or less receivable. The increase in NWC become negative, which means that the Tesla gets more cash inflow and this is a good trend to the company, they will not need to borrow money and help it to reduce debt.

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Table 1. Historical FCF.

	2017	2016	2015	2014	2013
Revenue	\$11,758,751	\$7,000,132	\$4,046,025	\$3,198,356	\$2,013,496
Revenue growth	68%	73%	27%	59%	
Gross profit	\$2,222,487	\$1,599,257	\$923,503	\$881,671	\$456,262
Gross margin	18.9%	22.8%	22.8%	27.6%	22.7%
R&D	\$1,378,073	\$834,408	\$717,900	\$464,700	\$231,976
SG&A	\$2,476,500	\$1,432,189	\$922,232	\$603,660	\$285,569
EBIT	(\$1,632,086)	(\$667,340)	(\$716,629)	(\$186,689)	(\$61,283)
Taxes	\$31,546	\$26,698	\$13,039	\$9,404	\$2,588
EBIT - Taxes	(\$1,663,632)	(\$694,038)	(\$729,668)	(\$196,093)	(\$63,871)
Net investment	\$4,044,565	\$2,579,623	\$1,574,067	\$1,090,773	\$186,265
NWC	\$388,668	\$706,255	\$530,655	\$402,333	\$85,495
Increase in NWC	(\$317,587)	\$175,600	\$128,322	\$316,838	\$93,531
FCF	(\$5,390,610)	(\$3,449,261)	(\$2,432,057)	(\$1,603,704)	(\$343,667)

FCF, Y/Y	-56%	-42%	-52%	-367%	
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Finally, analyze from the perspective of FCF, we can use it to conclusion that the whole trend of it is decreasing. But the company feel confident in its ability to hit the 25% Model 3 gross margin target in 2018. And negative cash flow occurs when a company spends more money than it receives in a set time period. From Morningstar, the free cash flow of negative \$706.5 million compared with negative \$942 million in the first quarter and negative \$1 billion in the second quarter of 2017 and 5000/week yet most of these vehicles were likely not booked in revenue until the third quarter after delivery to consumer. So, FCF decreases show that decrease in available funds [3].

4. DCF Assumptions

When we are making predictions, we need to combine some of the influencing factors to analyze, remove uncertainties such as financial crises and trade wars. First of all, according to the actual sales in the Q1, 2018 and Q2, 2018, and forecast sales in Q3, 2018 and Q4, 2018, the total sales in 2018 will be 19,538 million [3].

Table 2. Actual Sale in 2018 & Estimated Sale for 2019.

Year	Q1 2018	Q2 2018	Q3 2018	Q4 2018	FY 2018
Actual/Estimate	Actual	Actual	Forecast	Forecast	
Sales, millions	3,409	4,002	5,757	6,370	19,538
Year	Q1 2019	Q2 2019			
Actual/Estimate	Forecast	Forecast			
Sales, millions	6,209	6,407			
Q/Q growth rate	82.1%	60.1%			

Tesla's revenue growth rate will decline in 2019, through looking up some of the information, we can know that the Model Y, allow it to bring to market in the late 2019 time period, with a production ramp in 2020. Then I guess people will be more interested in new products after Model Y is released in 2020, and the revenue growth rate may be higher at this time, while people may be more willing to buy new products when they know that new products are about to be released, so the revenue growth rate will go down in 2019. When the new product is released, it will attract customers to buy it and also get some potential customers. At this time, I think the revenue growth will be significantly improved. However, in the later stage, people are no longer interested in new products, and the revenue growth may continue to decline. Also, federal tax credit will start to phase out in January 2019, and people may use more higher price to buy the car of Tesla. However, as Tesla will launch new products in about 8 to 10 years, from 2018 to 2026, I predict that Tesla will launch new products again after Model Y, which will significantly increase its revenue growth rate. Therefore, if Tesla can't lower the price, the high prices may discourage people from buying, leading them to opt for other brands. In addition, I think the gross margin will reach 25% in 2026, before it is a modest increase or unchanged. Because when Tesla is becoming more and more famous, it will be from development to maturity. At this time, Tesla could achieve a bottleneck period. But the competition of other companies will also development at this time, could they will realize the high-tech research and development, during this period, and Tesla for basic fixed customer base. Then after that it's hard to go to improve gross margin [5].

Now let's think about R&D. Because a Shanghai plant will open in a few years and be wholly owned by Tesla, increase capacity in certain places. This means that the expenditure of Tesla on R&D will only increase year by year. However, during this period, it is still possible for Tesla to create some new products, improve the quality of original products, or gain more revenue by increasing the price of electric vehicles, so as to gain more benefits. Therefore, its EBIT is likely to increase year by year. But EBIT as a percentage of sales is unlikely to be more than 10%. Take the BMW, for example, according to their 2017-2018 issued by the financial statements, the BMW in this aspect also to reach

10.1%. The highest then I think compared with BMW, Tesla as a new company, it does not have the capacity to beyond the established companies. And BMW is already has a certain customer base, and the technology development is quite rapid also. Some customers may be more reliable BMW rather than Tesla. Well, the tax rate is going to stay somewhere between 15% and 30%, so I'm going to assume it's going to be 25% for a couple of years.

In the balance sheet, net investment is equal to the capital expenditure. I predict the net investment continues to increase, the main reason is that the company will have invested heavily in R&D to ensure that oneself can continue to research and development of new products. From Morningstar Equity Analyst Report, we can know that capital expenditures of nearly \$2.5 billion in 2018 and \$4 billion in 2019 [3]. At the same time to ensure there is enough machine to produce these products, this would be included in the PP&E, result in their spending more money. However, its PP&E growth rate will be fixed for a period of time. Looking at the data of previous years, I guess that its PP&E growth rate will increase significantly one year before each new product launch, because of equipment procurement. Therefore, I predict that the PP&E growth rate will also rise significantly in 2025.

The increase in NWC will be affected by these factors and improve, so as to make the cash outflow of the Tesla become more numerous. The reason why I set the percentage of NWC as a fraction of sales at 10% is that, compared with other car manufacturers, most of them are around this number. At the same time, according to the calculation results, if NWC as a fraction of the smaller the percentage of the sales, stock price will get higher, and vice versa. The reason for this inverse relation is that higher net working capital requirements increase cash outflow and therefore lower the free cash flow and the stock price.

According to all previous predictions, the calculated result of FCF is increasing year by year, indicating that Tesla has a large amount of surplus cash, because the value of EBIT minus Tax is also continuously increasing. It is estimated that Tesla will have more available funds after that, so it can reduce the risk of shortage of funds caused by the shortage of FCF.

Table 3. Projection on FCF.

	2026	2025	2024	2023	2022	2021	2020	2019	2018
Revenue	\$323,672,809	\$258,938,247	\$199,183,267	\$147,543,161	\$105,387,972	\$72,681,360	\$48,454,240	\$31,260,800	\$19,538,000
Revenue growth	25.00%	30.00%	35.00%	40.00%	45.00%	50.00%	55.00%	60.00%	66.16%
Gross profit	\$80,918,202	\$62,145,179	\$45,812,151	\$32,459,495	\$23,185,354	\$15,263,086	\$10,175,390	\$6,252,160	\$3,907,600
Gross margin	25.00%	24.00%	23.00%	22.00%	22.00%	21.00%	21.00%	20.00%	20.00%
R&D	\$4,847,890.34	\$4,215,556.81	\$3,665,701.58	\$3,187,566.59	\$2,771,797.03	\$2,410,258.29	\$2,095,876.77	\$1,822,501.54	\$1,584,783.95
SG&A									
EBIT	\$32,367,280.90	\$25,893,824.72	\$19,918,326.71	\$11,803,452.86	\$6,323,278.32	\$2,907,254.40	\$969,084.80	-\$937,824.00	-\$1,563,040.00
EBIT (% of sales)	10.00%	10.00%	10.00%	8.00%	6.00%	4.00%	2.00%	-3.00%	-8.00%

Taxes	\$8,091,820.23	\$6,473,456.18	\$4,979,581.68	\$2,950,863.22	\$1,580,819.58	\$726,813.60	\$242,271.20	-\$234,456.00	-\$390,760.00
Tax rate	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
EBIT-Taxes	\$24,275,460.68	\$19,420,368.54	\$14,938,745.03	\$8,852,589.65	\$4,742,458.74	\$2,180,440.80	\$726,813.60	-\$703,368.00	-\$1,172,280.00
Net investment	\$3,797,013	\$3,451,830	\$3,138,027	\$2,852,752	\$4,000,000	\$4,000,000	\$4,000,000	\$4,000,000	
PP&E, net	\$41,767,145	\$37,970,132	\$34,518,302	\$31,380,274	\$28,527,522	\$24,527,522	\$20,527,522	\$16,527,522	\$12,527,522
PP&E growth rate	10%	10%	10%	10%	16%	19%	24%	32%	25%
NWC	\$32,367,281	\$25,893,825	\$19,918,327	\$14,754,316	\$10,538,797	\$7,268,136	\$4,845,424	\$3,126,080	\$1,427,319
NWC as a fraction of sales	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	7.3%
Increase in NWC	\$6,473,456	\$5,975,498	\$5,164,011	\$4,215,519	\$3,270,661	\$2,422,712	\$1,719,344	\$1,698,761	\$1,038,651
FCF	\$14,004,991.32	\$9,993,040.37	\$6,636,706.98	\$1,784,318.57	-\$2,528,202.46	-\$4,242,271.20	-\$4,992,530.40	-\$6,402,128.51	-\$4,710,931.49
FCF, Y/Y	40%	51%	272%	171%	40%	15%	22%	-36%	13%
Discounted FCF	\$5,474,898	\$4,336,245	\$3,196,626	\$953,970	-\$1,500,365	-\$2,794,515	-\$3,650,495	-\$5,196,111	-\$4,244,082

5. DCF Model

We will predict the stock price and market value of equity. We have predicted the change value of FCF in the these years, and then we will calculate DCF through this, which is the present value of future FCF. Then compute the terminal value and discount it to present value. My model implies that the current DCF value of Tesla's stock price is \$235.40. This is significantly lower than the current market price of \$380, which makes Tesla's stock to be overvalued. Through the calculation process, I can guess how each aspects can affect the stock price. In the first place, while revenue is getting high, but its cost will also increase. Due to the large number of overhead and R&D expenditure company create new model, and according to the report analysis net investment will continue to increase, leading to net cash outflow. Finally calculated total FCF, the conclusion is negative, so that the company has been losing money in respect of working capital [3].

Table 4. Estimation on Equity Value and Stock Price.

WACC (r)	11%
Terminal growth rate	2%
FCF from 2018 to 2026	-\$5,877,373
Terminal value	\$55,919,557
Enterprise Value	\$50,042,184

Cash balances	\$2,236,424
Long-term debt	\$9,513,390
Other long-term liabilities	\$2,607,458
Equity Value	\$40,157,760
Number of shares outstanding	170,593,144
Stock price	\$235.40

Finally, we according to the FCF to calculate NPV, so you can know the FCF and terminal value after the value now. According to the result of the first form that: when the growth rate constant, discounted rate, the greater the NPV of the smaller values, because the denominator increases. When the growth rate of larger but discounted rate unchanged, its NPV result get bigger, because the denominator decreases. Therefore, it can be concluded that NPV will change according to the change of growth rate. When the growth rate reaches the maximum and the minimum rate is the minimum, the value of NPV is the maximum. At this time, the project is the best and the investment benefit is the highest, and vice versa. (The coarse-grained data is the result of the previously assumed data)

Table 5. Sensitivity Analysis on Equity Value.

NPV	Discount Rate							
Growth rate	9.00%	9.50%	10.00%	10.50%	11.00%	11.50%	12.00%	12.50%
0.50%	\$63,797,423	\$57,098,118	\$51,202,382	\$45,986,062	\$41,348,807	\$37,208,649	\$33,497,999	\$30,160,651
1.00%	\$68,455,021	\$61,089,364	\$54,645,685	\$48,974,616	\$43,956,820	\$39,495,837	\$35,512,874	\$31,942,962
1.50%	\$73,733,632	\$65,579,516	\$58,494,083	\$52,295,231	\$46,839,361	\$42,011,744	\$37,719,643	\$33,887,302
2.00%	\$79,766,330	\$70,668,354	\$62,823,530	\$56,006,507	\$50,042,184	\$44,792,484	\$40,147,087	\$36,016,817
2.50%	\$86,727,135	\$76,484,169	\$67,730,238	\$60,181,692	\$53,621,809	\$47,882,195	\$42,830,053	\$38,359,284
3.00%	\$94,848,075	\$83,194,726	\$73,337,903	\$64,913,568	\$57,648,888	\$51,335,401	\$45,811,126	\$40,948,326
3.50%	\$104,445,549	\$91,023,708	\$79,808,286	\$70,321,427	\$62,212,911	\$55,220,258	\$49,142,913	\$43,825,039

Table 6. Sensitivity Analysis on Stock Analysis.

Stock Price	Discount Rate							
Growth rate	9.00%	9.50%	10.00%	10.50%	11.00%	11.50%	12.00%	12.50%
0.50%	\$316.03	\$276.76	\$242.20	\$211.62	\$184.44	\$160.17	\$138.42	\$118.86
1.00%	\$343.34	\$300.16	\$262.39	\$229.14	\$199.73	\$173.58	\$150.23	\$129.30
1.50%	\$374.28	\$326.48	\$284.94	\$248.61	\$216.63	\$188.33	\$163.17	\$140.70
2.00%	\$409.64	\$356.31	\$310.32	\$270.36	\$235.40	\$204.63	\$177.40	\$153.19
2.50%	\$450.44	\$390.40	\$339.09	\$294.84	\$256.38	\$222.74	\$193.12	\$166.92
3.00%	\$498.05	\$429.74	\$371.96	\$322.58	\$279.99	\$242.98	\$210.60	\$182.09
3.50%	\$554.31	\$475.63	\$409.89	\$354.28	\$306.74	\$265.75	\$230.13	\$198.96

The second explains the rate of growth and discounted rate impact on share price. Because share

price is computed based on the enterprise value, sensitivity analysis in stock price closely mimics sensitivity analysis of the enterprise value. Results show that our assumptions on terminal growth rate and the discount rate significantly affect share price. For example, if discount rate is at 9% versus our baseline case of 11%, the share price is \$409.64, which makes it larger than the current market value. At the same time, we believe that Tesla's cost of capital is around 11% percent, than therefore we are confident in our current estimate of the stock price [3].

6. Conclusion

By analyzing Tesla's financial performance in the past and building a DCF model, I believe that Tesla currently is not a good investment. Our current negative views are due to its continued developing and research (even during downturns in the economic cycle), Tesla is likely to add more debt if total sales don't meet expectations as a result. But now, people begin to slowly to accept the new products, and gradually realize the importance of new energy for the protection of the environment. Wait until the future, when Tesla realize their aim: as soon as possible, Tesla launched mass market acceptance of electric vehicles in the market, to accelerate the sustainable transportation, and raise the level of science and technology, can use lower cost to produce electric cars. Tesla, as a car company that uses new energy sources as vehicle power, may have a better development.

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