

## Is it a good choice to invest in Tesla?

Jiarui Zhang

School of Statistics and Mathematics, Yunnan University of Finance and Economics, Kunming,  
Yunan, 650000, China

angela@cas-harbour.org

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**Abstract.** As a brand of high-performance electric vehicles, Tesla has attracted more and more attention in recent years. However, no one knows what the development trend of Tesla is. Is it worth investing in Tesla? In this article, readers can know the company's future financial performance and what factors influence these results. Financial knowledge was applied to calculate and some known data was used to forecast Tesla's financial state. The conclusion is that investing in Tesla is a good choice.

### 1. Introduction

Tesla is an American electric vehicle company and an energy company. Promoting the world's transition to sustainable energy is Tesla's main assignment and purpose. With excellent entrepreneurial leadership and strong technical support, Tesla has made a lot of achievements. Tesla was shortlisted the 2018 Global Top 500 Brand and ranked 81<sup>st</sup> in December 2018. New energy vehicles have developed rapidly in recent years, so this paper wants to study whether Tesla is worth investing in, and the author hopes that this paper can give investors some useful advice.

### 2. FCF

Calculating future stock prices is the main method to measure whether Tesla is worth the investment, so that the author calculated the Free Cash Flow first. This part of cash flow was the maximum amount of cash available for allocation to enterprise capital providers without endangering the survival and development of the company.

The function formula of FCF:

$$\text{FCF} = \text{EBIT} - \text{Taxation} + \text{Depreciation} - \text{Changes in Working Capital} - \text{Capital expenditure}$$

So before calculating free cash flow, the calculator needs to know the company's EBIT (earnings before interests and taxes), taxation, depreciation, capital expenditure (Capex) and changings in working capital. Based on the data obtained, the EBIT is deducted from taxes, changings in net working capital and Net Capex.

The net working capital of an enterprise is also an index widely used to measure the financial risk of the enterprise. It will affect the ability of the enterprise to raise funds in debt. Net working capital is equal to current assets minus current liabilities, which reflects the amount of liquid assets financed by long-term liabilities. The last one is the capital expenditure, which refers to the expenditure of a enterprise on the acquisition of fixed assets and intangible assets and the loan interest expenditure related to them. These financial expenditures are also in charge of the firm and used to maintain or expand the company's business scope. And the Net Capex is equal to Capex minus depreciation. Depreciation is the part of value that is gradually lost and transferred to goods or expenses in the process of using fixed assets. It is also the fixed assets consumption which is amortized within the useful life due to the use of fixed assets in the process of production and operation. It is an accounting method for allocating the cost of tangible assets over their useful life, to explain the decline in value. Depreciation is only a cost analysis, not an asset valuation. It is neither a source of funds nor a use of funds. In fact, in some case, the calculation of FCF also need to remove the amortization. In this study, amortization is not involved, so the calculator do not need to consider it. By observing its free cash flow, the company's operation will be known. If free cash flows is abundant, companies can pay off debts, develop new products, buy back stocks and increase dividend payments. That is to say

companies can do more things that are good for them, and have more reserve funds to deal with unexpected situations.

### 3. Share price

Frist, the author assumed a tax rate of 21%, a discount rate of 12%, and a long-term growth rate of 2%. The increase of NWC and the increase of sales are needed to calculate the NWC margin. The increase of NWC is equal to the NWC of the next year minus that of the previous year. Here the author used Accounts Receivable+ Inventory- Accounts Payable to calculate NWC. Tesla's accounts on the Condensed Consolidated Balance Sheets for 2017 and 2018 were \$515,381,000 and \$949,022,000, respectively. The inventories for 2017 and 2018 were \$2,263,537,000 and \$3,113,446,00, respectively. And the accounts payable were \$2,390,250,000 and \$3,404,451,000, respectively. The author found that the increase of NWC was \$269,349,000. According to the table, the author could get the sales of \$8,534,752,000 in 2017 and \$17,631,522,000 in 2018 . And then the author calculated the increase of sales was \$9,069,770,000. The formula shows that the NWC margin is about 3%. The sales in 2017 and 2018 were \$8,534,752,000 and \$17,631,522,000, respectively. The author calculated the sales growth rate of 106.59% in 2018. The sales growth rate for the next decade are assumed. The date assumed by the author is shown in the table. The reason why the author assumed this is that Tesla is a leading enterprise in the electric vehicle industry. In the first years, Tesla was far ahead of other automobile companies both in technology and service. However, in the next few years, other electric automobile companies have gradually entered the market, with more and more brands available for customers to choose, and many enterprises are beginning to compete with Tesla. In competition, Tesla may no longer be the superior, such as in the price of the vehicle. These all have led to a slow growth in Tesla's sales. With the growth rate of sales, the author can get the sales from 2019 to 2029. Before investors calculate the annual EBIT, they need to estimate the operating expenses. Considering that Tesla needs to spend money to research and release new models constantly in response to competition from the same industry, the author assumed the operating expenses like this. The gross profit and operating expenses for 2017 and 2018 were known to the author. Then the author calculated the EBIT and the EBIT margin for 2017 and 2018. The EBIT margin from 2019 to 2029 were assumed by the author. Using the estimated EBIT margin, the EBIT from 2019 to 2029 were obtained.

The next step was to calculate the FCF for the next ten years. Based on the tax rate and the annual sales, the author worked out the EBIT minus Tax and the increase of NWC. The Net Capex is equal to Capex minus Depreciation. According to the data of Tesla's forms, the author calculated the Net Capex for 2018 directly. The investors also need to predict the Net Capex margin for the next 10 years and use the Net Capex margin to compute the Net Capex from 2019 to 2029. Therefore, it is easy to get the annual FCF.

Table 1(In thousand). Free Cash Flow

	2017	2018	2019	2020	2021	2022	2023
Sales	\$8,534,752	\$17,631,522	\$26,976,229	\$37,766,720	\$50,985,072	\$66,280,594	\$82,850,742
Sales growth rate		106.59%	53.00%	40.00%	35.00%	30.00%	25.00%
Operating expenses	\$3,854,573	\$4,430,094	\$4,704,200	\$4,980,400	\$5,347,800	\$5,645,000	\$5,800,780
EBIT Margin	-19.12%	-2.20%	2.00%	3.50%	7.00%	9.00%	10.00%
EBIT	-\$1,632,086.00	-\$388,073.00	\$539,524.57	\$1,321,835.20	\$3,568,955.05	\$5,965,253.44	\$8,285,074.23
Tax=EBIT*t	-\$385.90	-\$44.42	\$40.36	\$70.63	\$141.26	\$181.62	\$201.80
EBIT*(1-t)	-\$3,371,645.74	-\$388,073.00	\$352,630.44	\$617,103.27	\$1,234,206.54	\$1,586,836.98	\$1,763,152.20
Increase in NWC		\$272,903.10	\$280,341.20	\$323,714.74	\$396,550.56	\$458,865.65	\$497,104.45
Net capex margin		2.19%	3.50%	4.60%	5.00%	3.70%	5.10%
Net Capex		\$199,674.00	\$327,064.73	\$496,362.61	\$660,917.60	\$565,934.30	\$845,077.57
FCF			\$259,143.01	\$998,049.83	\$3,172,263.23	\$5,506,206.17	\$7,787,767.97
	2024	2025	2026	2027	2028	2029	
Sales	\$99,420,891	\$115,328,233	\$130,320,904	\$140,746,576	\$146,376,439	\$150,767,732	
Sales growth rate		16.00%	13.00%	8.00%	4.00%	3.00%	

Operating expenses	\$6,230,280	\$6,498,720	\$6,719,300	\$7,045,080	\$7,209,708	\$7,409,800
EBIT Margin	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
EBIT	\$9,942,089.07	\$11,532,823.32	\$13,032,090.36	\$14,074,657.58	\$14,637,643.89	\$15,076,773.20
Tax=EBIT*t	\$201.80	\$201.80	\$201.80	\$201.80	\$201.80	\$201.80
EBIT*(1-t)	\$1,763,152.20	\$1,763,152.20	\$1,763,152.20	\$1,763,152.20	\$1,763,152.20	\$1,763,152.20
Increase in NWC	\$497,104.45	\$477,220.28	\$449,780.11	\$312,770.17	\$168,895.89	\$131,738.79
Net capex margin	4.90%	5.90%	3.10%	4.30%	5.10%	5.80%
Net Capex	\$811,937.27	\$938,533.21	\$464,772.78	\$448,303.91	\$287,123.01	\$254,695.00
FCF	\$9,444,782.82	\$11,055,401.25	\$12,582,108.45	\$13,761,685.62	\$14,468,546.20	\$14,944,832.61

After the calculation of FCF, there were four steps to find the stock price. The first step was to treat 2018 as zero year, rank 2019 to 2029 from 1 to 11, and convert each year's FCF to year 0. Here the author used her estimated discounted rate. The second step was to work out the terminal value and convert it to year 0. The third was to compute the enterprise value, which was equal to the sum of discounted FCF1 to FCF11 plus discounted terminal value. And the last step was to work out the equity value and the share price. Equity value is equal to enterprise value plus cash minus debt, so the share price can be easy to calculate.

Table2(In thousand). Discounted FCF

	0	1	2	3	4	5
FCF		-\$181,181.52	\$224,172.46	\$1,762,006.33	\$3,687,750.27	\$5,203,026.61
Discount factor		0.89	0.80	0.71	0.64	0.57
Discounted FCF		-\$161,769.21	\$178,708.91	\$1,254,161.30	\$2,343,631.97	\$2,952,337.03
	6	7	8	9	10	11
FCF	\$6,545,208.64	\$7,695,176.94	\$9,380,798.49	\$10,357,905.42	\$11,107,719.77	\$11,524,217.03
Discount factor	0.51	0.45	0.40	0.36	0.32	0.29
Discounted FCF	\$3,316,006.39	\$3,480,907.25	\$3,788,747.18	\$3,735,164.53	\$3,576,388.48	\$3,312,937.02

Table3(In thousand). Share Price

	0
Sum of discounted FCF 1-11	\$27,777,220.85
Terminal value (V11)	
Discounted Terminal Value	\$33,791,957.56
Enterprise Value	\$61,569,178.40
Cash	\$3,600,000.00
Debt	¥9,400,000.00
Equity Value	\$55,769,178.40
SHO (shares outstanding)	172000
Price	\$324.24

From the table above, it can be seen that the stock price is \$324.24.

#### 4. Sensitivity analysis

When the long-term growth rate and discount rate were 2.0% and 12%, the stock price calculated by the author was \$324.24. At this point, the author analyzed the stock price by changing the values of long-term growth rate and discount rate. As is shown, with the increase of discount rate, the share price has fallen significantly, and when the discount rate is the lowest, the stock price is the highest. Assuming that the discount rate is fixed, the share price rises slowly with the increasing long-term growth rate. When the long-term growth rate is 2.5%, the investment benefit is the highest.

**Table 4. The relationship of long-term growth rate, discount rate and the stock price**

stock price		long-term growth rate					
		2.0%	2.1%	2.2%	2.3%	2.4%	2.5%
Discount rate	10%	450.74	454.83	459.02	463.32	467.73	472.27
	11%	379.99	382.93	385.95	389.03	392.18	395.41
	12%	324.24	326.42	328.64	330.91	333.23	335.59
	13%	279.35	281	282.67	284.38	286.12	287.9
	14%	242.56	243.83	245.11	246.42	247.75	249.11
	15%	211.96	212.95	213.95	214.97	216.01	217.06

Therefore, sensitivity analysis shows that the long-term growth rate and discount rate have a significant impact on stock prices. According to our estimates, the growth rate is 2%, the discount rate is 12%, and the stock price is higher than the current price. That is to say, it is wise to invest in Tesla.

### 5. Super Factory in Shanghai

Tesla started the construction at the beginning of this year. After that the Premier of the State Council of China and the CEO of America Tesla met in Zhongnanhai on January 9th. The main content of this talk was that China had liberalized the proportion of foreign capital in China's new energy automotive industry and would work hard to promote the construction of new energy vehicles in China[1]. At the same time, Elon Musk also delivered a speech in Shanghai. The Tesla super factory built in Shanghai would be Tesla's fourth largest factory in the world and the first super factory in Asia at this stage. The construction of the super factory in Shanghai is the key to Tesla's performance in Chinese market and the key to whether Tesla could continue its rapid growth in 2019[2]. When the factory is completed, it will be mainly responsible for Tesla's whole vehicle manufacturing and battery production. The automobiles produced by Shanghai factory will be mainly supplied to the Chinese market[1]. As we all know, China has a population of 1.3 billion, so there will be a great demand in the Chinese market. In addition to building factories in China to produce new energy vehicles, Tesla will also develop the leasing business of new energy vehicles. It is estimated that in China the annual compound growth rate of automobile financing lease will retain above 50% from 2019 to 2020[2].

Another important point is that China's electric vehicles development index is the first in the world.. Therefore, if Tesla works hard to promote Chinese market, it will certainly bring huge profits. Besides, the period of pickup will be shortened for Chinese customers, bringing more convenience to old and new customers, which will increase the sales in China. In this respect, Tesla is worth investing in.

In addition, new energy is attracting people's attention and national political support. The first is the loan policy for the purchase of new energy cars, which has greatly relieved people's pressure to buy cars. Although the national new energy subsidy policy in 2018 is quite different from that in 2019, and the government subsidies have been cancelled, the state still has certain subsidies[3]. Second, it brings convenience to people. As is known to all, air pollution in Beijing, Tianjin and other cities in China is serious. In order to effectively control air pollution, some cities have implemented the policy of car tail number restriction. However, owners of new energy vehicles will not be restricted by car tail numbers. This policy has brought benefits to new energy vehicles. Moreover, China has raised the standards of new energy, insisting on supporting the excellence and strength. As a key enterprise of new energy, Tesla will surely be supported by government. From the above advantages of Tesla, it can be seen that the super factory will bring great benefits to Tesla when it is built.

### 6. Conclusions

Based on the above analysis and discussion, the author has come to the conclusion that Tesla is a potential company and worth the investment. The share price calculated by the author is significantly higher than the current stock price. When Tesla's super factory is built in Shanghai, it will affect the

whole Asian market, and sales of electric cars and other products produced by Tesla will be increased greatly. Moreover, Tesla is still preparing to release new models, so it will attract the attention of consumers once again. I believe Tesla will get better and better. It is hoped that there will be some adjustment in the price of automobiles in the future, because the prices of Tesla's automobiles are higher than those of other companies. Lower price will be more suitable for mass consumers.

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