AN ODE TO LUCK AND GOOD TIMING: REVISITING TESLA

Silence is golden!

My biggest adversary in investing = me!

- The biggest adversary that I face in both investing and valuation are the preconceptions and priors I bring into investment decision making, and no company epitomizes the dangers of bias more than Tesla.
- It is a company where there is no middle ground, with the optimists believing that there is no limit to its potential and the pessimists convinced that it is a time bomb, waiting to implode. I have tried, without much luck, to navigate both extremes in my valuations of the company since 2013 and have been found wanting by both sides.
  - For much of Tesla's life, I have pointed to its promise but argued that it was too richly priced to be a good investment, and during that period, Tesla bulls accused me of working for the short sellers.
  - When I bought Tesla in June 2019, arguing that the price had dropped enough (to $180) to make it a good investment. That decision led to a backlash from Tesla bears, who called me a traitor for abandoning my position.
- Luck was on my side, and the stock has not stopped rising since. When Tesla's earnings came out after close of trading yesterday (January 29th), I knew that I had to revalue the stock and reassess my position.

Tesla in June 2019

- It is astonishing, but it was just over seven months ago when the sky was full of dark clouds for Tesla, as a collection of wounds, some internal (Musk's tweet about "funding secured", production problems and others external (the trade war with China) pushed the stock price down almost 50% from its start of the year pricing.
- In a post in July 2019, I took a look at Tesla's travails and valued the company, with assumptions that I admitted were conservative, to arrive at a value of just over $190 per share

Tesla	Jun-19

A Teenage Phenom faces growing (up) pains!

Tesla will grow as a high-end auto company, deilivering $100 billion in revenues in year 10. In the face of stronger competition, Tesla's brand name and batter technology will allow it to deliver on profitability (with margins in the 75th percentile of auto firms) and raise enough capital to cover its large reinvestment needs for much of the next decade. While Tesla's operating risk will move towards average over time, its debt burden puts it at risk of default, and that risk has risen to 20%. There is a floor to operating value at $35-$40 billion, at which the firm will be attractive as an acqusition target to an auto or (more likely) a large tech firm. Overlying all of this is the danger that Elon Musk will put the company's potential at risk, by either over reaching on product offerings or committing financial malpractice.

The Assumptions

	Base year	*Years 1-5*	*Years 6-10*		*After year 10*	*Link to story*
Revenues (a)	$ 22,594	30.00%	2.26%		2.26%	
Operating margin (b)	1.98%	1.98%	10.00%		10.00%	
Tax rate	25.00%	25.00%	25.00%		25.00%	
Reinvestment (c)		Sales to capital ratio	2.00	RIR =	22.60%	
Return on capital	1.67%	Marginal ROIC =	24.53%		10.00%	
Cost of capital (d)		7.87%	8.00%		8.00%	

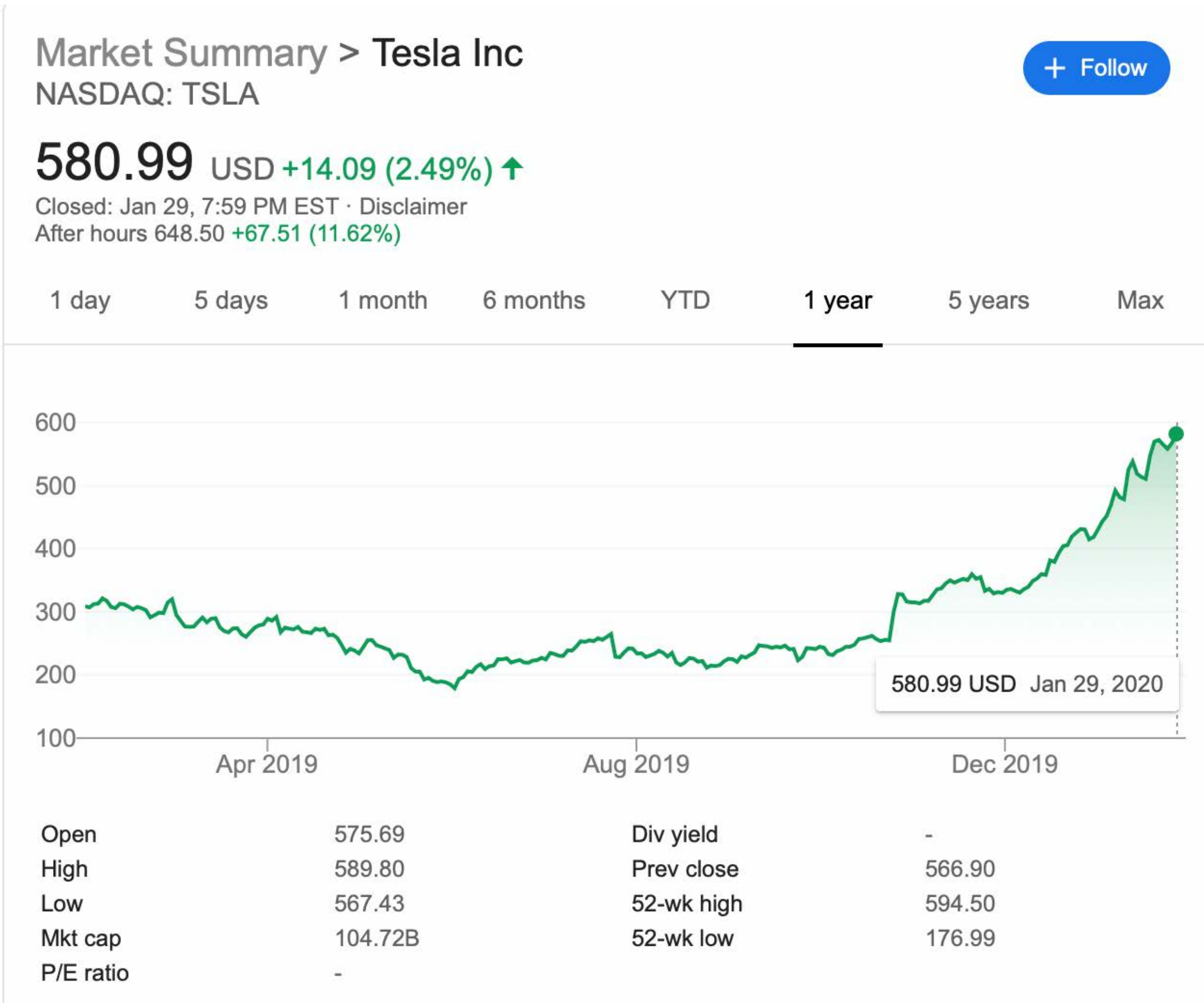
The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 29,372	3.58%	$ 1,053	$ 1,053	$ 3,389	$ (2,337)
2	$ 38,184	5.19%	$ 1,981	$ 1,981	$ 4,406	$ (2,425)
3	$ 45,821	6.79%	$ 3,112	$ 3,112	$ 3,818	$ (706)
4	$ 54,985	8.40%	$ 4,616	$ 3,751	$ 4,582	$ (831)
5	$ 65,982	10.00%	$ 6,598	$ 4,949	$ 5,498	$ (550)
6	$ 76,837	10.00%	$ 7,684	$ 5,763	$ 5,428	$ 335
7	$ 86,752	10.00%	$ 8,675	$ 6,506	$ 4,958	$ 1,549
8	$ 94,869	10.00%	$ 9,487	$ 7,115	$ 4,058	$ 3,057
9	$ 100,379	10.00%	$ 10,038	$ 7,528	$ 2,755	$ 4,773
10	$ 102,647	10.00%	$ 10,265	$ 7,699	$ 1,134	$ 6,564
Terminal year	$ 104,967	10.00%	$ 10,497	$ 7,873	$ 1,779	$ 6,093

The Value

Terminal value	$ 106,156	
PV(Terminal value)	$ 49,594	
PV (CF over next 10 years)	$ 2,461	
Value of operating assets =	$ 52,055	
Adjustment for distress	$ 5,206	Default probability (based on rating) = 20.00%
- Debt & Mnority Interests	$ 14,658	
+ Cash & Other Non-operating assets	$ 2,198	
Value of equity	$ 34,389	
- Value of equity options	$ 805	32 million options (CEO package & convertibles), deep out of the money right now.
Number of shares	176.42	
Value per share	$ 190.36	Stock was trading at = $185.50

The story since…



Why?

- Return to growth: In the middle of 2019, Tesla's growth seemed to have run out of steam and there were some who believed that its best days were behind it. In the two quarters since, Tesla has shown signs of growth, albeit not at the breakneck pace that you saw it grow, earlier in its life.
- Operating improvements: In the second half of the year, Tesla seemed to be paying attention to its weakest link, focusing on producing and delivering cars, without drama, and even running ahead of schedule on new capacity that it was adding.
- Radio Silence: I know that this will sound petty to Musk fans, but Elon Musk, has always been a mixed blessing for the company. While his vision has been central to building the company, he has also made it a practice, to create diversions that take people's attention away from the story line. The last six months have been blessedly free of distractions, allowing investors to focus on the electric car story.

A Pricing Feedback

- While price and value are driven by different factors, in the case of Tesla, there is a feedback effect from price to value because of (a) its high debt obligations and (b) its need for more capital to fund its growth.
  - As stock prices rise, the debt obligation becomes less onerous for two reasons. First, some of it is convertible debt, at high enough stock prices, it gets converted to equity. Second, Tesla’s capacity to raise new equity at high stock prices gives it a fall back that it can use, if it chooses to pay down debt.
  - By the same token, the number of shares that Tesla will need to issue to cover its funding needs, as it grows, will decrease as the stock price rises, reducing their dilution effect on value.
- There is a negative feedback effect, as well. When the stock price rises, the options outstanding at the company (32 million to Musk & others) become a bigger drain on value.

Change in Base Year Numbers

	Jun-19	Jan-20
Revenues ($ million)	$ 22,594.00	$ 24,578.00
Operating income ($ million)	$ (134.20)	$ (69.00)
Operaring Margin	-0.59%	-0.28%
Invested Capital ($ million)	$ 15,110.60	$ 13,523.00
Cash and Marketable Securities	$ 2,198.00	$ 6,514.00
Number of shares outstanding =	176.42	177.00

Change in Forecasts

	Jun-19	Jan-20
Revenue growth rate for next 5 years =	21.94%	25.00%
Revdnues in year 10 ($ million)	$ 102,647	$ 125,565
Target pre-tax operating margin	10%	12.00%
Sales to capital ratio	2.00	3.00 for yrs 1-5 2.00 thereafter
Riskfree rate	2.26%	1.75%
Initial cost of capital	7.87%	7.00%
Steady state cost of capital	8.00%	7.40%
Probability of failure	20.00%	10.00%

Tesla

Silence is golden!

With the wind behind its back, Tesla has consolidated its hold on the electric car market and will continue to grow that market, at the expense of conventional car makers. Pushing its production towards 2 million cars by 2030, it will also be able to deliver higher margins than conventional auto companies in steady state. The rise in its market capitalization has reduced its cost of capital and the chance of failure. Wgile Tesla will be able to invest less than other auto companies to add to capacity, its need to ramp up production will require more capital, creating negative cash flows in the near years. While other revenue sources (green energy, driverless cars in ride sharing) will supplement revenues, it will remain at its core an electric car company.

The Assumptions

	Base year	*Years 1-5*	*Years 6-10*		*After year 10*	*Link to story*
Revenues (a)	$ 24,578	25.00%	1.75%		1.75%	Growth in EV market & Tesla's early mover advantage work in its favor.
Operating margin (b)	1.60%	1.60%	12.00%		12.00%	Continued economies of scale & brand
Tax rate	25.00%	25.00%	25.00%		25.00%	Global tax rate
Reinvestment (c)		Sales to capital ratio	3.00	RIR =	17.50%	Capacity build up allows for less reinvestment in the near years.
Return on capital	1.59%	Marginal ROIC =	34.86%		10.00%	Cost of entry will limit competition.
Cost of capital (d)		7.00%	7.40%		7.40%	Moves to median company cost of capital

The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$ 30,723	3.68%	$ 1,132	$ 849	$ 2,048	$ (1,199)
2	$ 38,403	5.76%	$ 2,213	$ 1,660	$ 2,560	$ (900)
3	$ 48,004	7.84%	$ 3,764	$ 2,823	$ 3,200	$ (377)
4	$ 60,005	9.92%	$ 5,953	$ 4,465	$ 4,000	$ 464
5	$ 75,006	12.00%	$ 9,001	$ 6,751	$ 5,000	$ 1,750
6	$ 90,270	12.00%	$ 10,832	$ 8,124	$ 7,632	$ 492
7	$ 104,442	12.00%	$ 12,533	$ 9,400	$ 7,086	$ 2,314
8	$ 115,983	12.00%	$ 13,918	$ 10,438	$ 5,770	$ 4,668
9	$ 123,406	12.00%	$ 14,809	$ 11,107	$ 3,711	$ 7,395
10	$ 125,566	12.00%	$ 15,068	$ 11,301	$ 1,080	$ 10,221
Terminal year	$ 127,763	12.00%	$ 15,332	$ 11,499	$ 2,012	$ 9,486

The Value

Terminal value	$ 167,901		
PV(Terminal value)	$ 84,402		
PV (CF over next 10 years)	$ 12,988		
Value of operating assets =	$ 97,390		
Adjustment for distress	$ 4,869	Probability of failure =	10.00%
- Debt & Mnority Interests	$ 14,708		
+ Cash & Other Non-operating assets	$ 6,514		
Value of equity	$ 84,326		
- Value of equity options	$ 8,822		
Number of shares	177.00		
Value per share	$ 426.58	Stock was trading at =	$581.00

Breaking down the value change

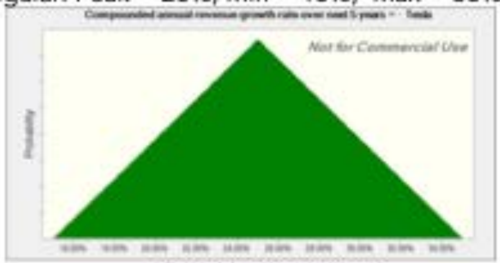
	Value/Share	*Change in Value*	*% of total change*
June 2019 Value per share	$190.36		
Lower cost of capital	$237.04	$46.68	21.71%
Higher revenue growth	$291.66	$54.62	25.41%
Higher margin	$399.85	$108.19	50.33%
Drop in failure probability	$426.24	$26.39	12.28%
Change in net debt	$446.45	$20.21	9.40%
Reassessed option value	$405.34	($41.11)	-19.12%
Total		$214.98	100.00%

What now?

- I went into this valuation wanting to hold on to Tesla for a little while longer, partly because it has done so well for me but mostly because if I can hold on for a few months, I will save a lot in taxes.
- This desire may be driving the optimism in my assumptions, but even with those optimistic assumptions, my value per share of $427 was well below the closing price of $581 at the end of trading and even further below the $650 that Tesla was trading at in the after-market, after the earnings release.
- I could raise my end year revenues to $200 billion (plausible in a market this size) and give Tesla an 18% operating margin (perhaps by calling it a tech company) and arrive at a value of $ 1,168 per share, but that to me is pushing the limits of possibility, and one reason why I hold back on simple what-if analyses.

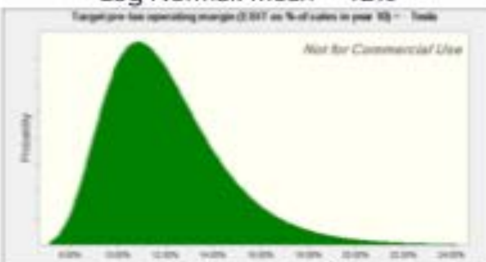
Revenue Growth

Triangular: Peak = 25%, Min = 15%; Max = 35%



Operating Margin

Log Normal: Mean = 12%

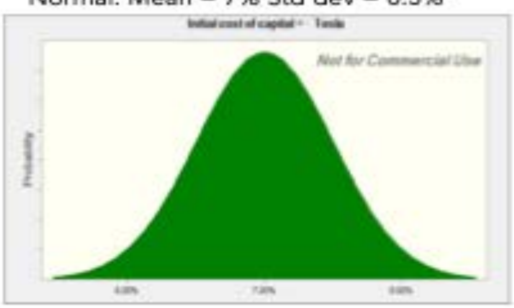


Sales to Capital

Unirform: Min =1.00 Max = 3.00

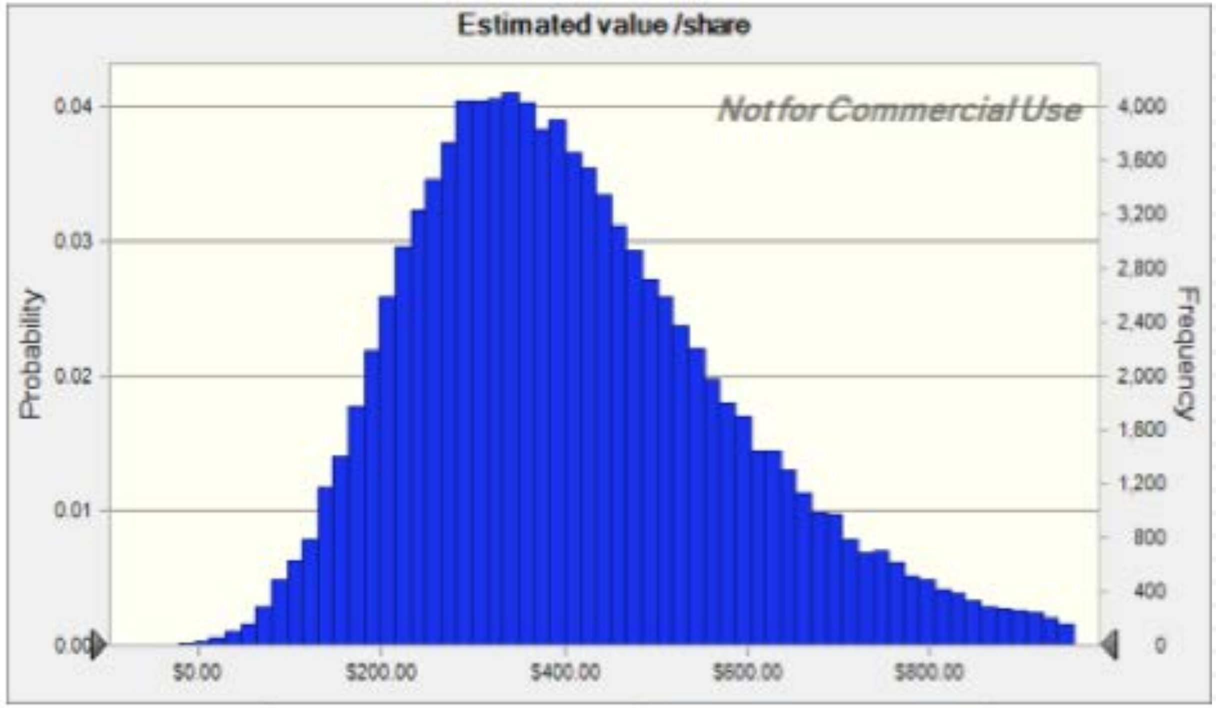
Cost of Capital

Normal: Mean = 7% Std dev = 0.5%



Tesla Value/Share in January 2020

Across 100,000 Simulations



Percentile	Value/Share
0%	$(72.19)
10%	$204.43
20%	$259.31
30%	$303.11
40%	$344.69
50% (Median)	$387.48
60%	$433.37
70%	$487.46
80%	$557.31
90%	$667.21
100%	$2,173.56

A Postscript

- My decision: Holding on to the hope that I could defer my sale of Tesla until June (to qualify for long term capital gains), I looked at buying puts to protect my capital gains, but that pathway is an expensive one at Tesla, given how much volatility is priced into the options. Reluctantly, I just sold my Tesla holdings at $640 this morning, and as with my buy order in June, I don't expect immediate or even near-term gratification.
- No regrets: In fact, the momentum is strong, and the mood is deliriously good, implying that Tesla's stock price could continue to go further up and away. I am not tempted to stay longer, because I came to this market to play the investing game, not the trading game.
- A separation, not a parting: I will miss the excitement of having Tesla in my portfolio, but I have a feeling that this is more a separation than a parting, and that at the right price, Tesla will return to my portfolio in the future.