DILUTION AND OPTIONS: THE MYSTERY OF SHARE COUNT

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Share Count Basics

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- Getting from the value of equity for a company to value per share, in old-time DCF, is obtained by dividing the aggregate value by the number of shares outstanding.
  - Value per share = Aggregate Value of Equity/ Number of Shares outstanding
- This works only if there are no other equity claims on the firm (options) and if all shares have equal claims (on voting and cash flows).

Three Problems

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1. Expected Dilution: When companies need to access capital markets in future years, to cover reinvestment and operating needs. To the extent that some or all of this new capital will come from new share issuances, the share count at these companies can be expected to climb over time.
2. Share based compensation: There are three issues that affect valuation. The first is whether the expense associated with stock based compensation should be added back to arrive at cash flows, since it is a non-cash expense. The second is how to adjust the value per share today for the restricted shares and options that have already been granted. Third, you have to decide how to adjust the value per share today for future grants of options or shares.
3. Shares with different rights (voting and dividend): If a company has voting and non-voting shares, and you believe that voting shares have more value than non-voting shares, the value per share will be different for different classes.

1. Expected Dilution

- An investor or analyst dealing with publicly traded companies in the 1980s generally valued more mature companies, since going public was considered an option only for those companies that had reached a stage in their life cycle, where profits were positive (or close) and continued access to capital markets was not a prerequisite for survival.
- In the 1990s, with the dot com boom, we saw the change in the public listing paradigm, with many young companies listing themselves on public markets, based upon promise and potential, rather than profits or established business models. That pattern of listing early has continued, and there are far more young companies listed in markets today.
- An investor who avoids these companies just because they do not fit old metrics or models is likely to find large segments of the market to be out of his or her reach.

Consequences

1. Many young companies lose money, as they focus their attention on building businesses and acquiring clientele.
2. Growth requires reinvestment, in plant and equipment, if you are a manufacturing company, or in technology and R&D, if you are a technology company.

- As a consequence, in a discounted cash flow valuation, you can expect to see negative expected cash flows, at least for the first few years of your forecast period.
- To survive these years and make it to positive earnings and cash flows, the company will have to raise fresh capital, and given its lack of earnings, that capital will generally take the form of new equity, i.e., expected dilution, which, in turn, will affect value per share.

The Right Response

- If you are doing a discounted cash flow valuation, the right response to the expected dilution is to do nothing.
- The aggregate value of equity that you compute today includes the present value of expected cash flows, including the negative cash flows in the up front years.
  - The latter will reduce the present value (value of operating assets), and that reduction captures the dilution effect.
  - You can divide the value of equity by the number of share outstanding today, and you will have already incorporated dilution.

Tesla: Dilution Effect

Year	Cost of Capital	Cumulated Cost of Capital	FCFF	Terminal Value	Present Value
1	8.29%	1.0829	$(3,163.27)		$ (2,921.00)
2	8.29%	1.1728	$(3,246.87)		$ (2,768.56)
3	8.29%	1.2700	$(3,060.06)		$ (2,409.42)
4	8.29%	1.3754	$(2,622.21)		$ (1,906.53)
5	8.29%	1.4895	$(2,309.58)		$ (1,550.62)
6	8.14%	1.6106	$(3,999.06)		$ (2,482.92)
7	7.98%	1.7391	$(2,882.39)		$ (1,657.40)
8	7.82%	1.8751	$ (864.44)		$ (461.02)
9	7.66%	2.0187	$ 1,995.79		$ 988.67
10	7.50%	2.1701	$ 5,420.67	$117,192.14	$ 56,501.72

		PV of CF: Yrs 1-8	PV - Only +ve CF
Value of operating assets =	**$ 41,332.91**	**$ (16,157.47)**	**$ 57,490.38**
- Net Debt	**$ 9,208.52**		**$ 9,208.52**
Value of Equity	**$ 32,124.39**		**$ 48,281.86**
/ Number of shares	**169.76**		**169.76**
Value per share	**$ 189.23**		**$ 284.41**
		CF Discount for dilution	-33.46%

An Alternative Approach

Issuance Price =	$ 200.00
Equity as % of capital =	88.06%
Expected Price Appreciation	9%

Year	*Cost of Capital*	*Cumulated Cost of Capital*	*FCFF*	*Expected Share Price*	*# Shares Issued*	*Adjusted FCFF*	*Terminal Value*	*Present Value*
1	8.29%	1.0829	$(3,163.27)	$ 218.00	12.78	$0.00		$ -
2	8.29%	1.1728	$(3,246.87)	$ 237.62	12.03	$0.00		$ -
3	8.29%	1.2700	$(3,060.06)	$ 259.01	10.40	$0.00		$ -
4	8.29%	1.3754	$(2,622.21)	$ 282.32	8.18	$0.00		$ -
5	8.29%	1.4895	$(2,309.58)	$ 307.72	6.61	$0.00		$ -
6	8.14%	1.6106	$(3,999.06)	$ 335.42	10.50	$0.00		$ -
7	7.98%	1.7391	$(2,882.39)	$ 365.61	6.94	$0.00		$ -
8	7.82%	1.8751	$ (864.44)	$ 398.51	1.91	$0.00		$ -
9	7.66%	2.0187	$ 1,995.79			$1,995.79		$ 988.67
10	7.50%	2.1701	$ 5,420.67			$5,420.67	$ 117,192.14	$ 56,501.72
# New Shares Issued					69.35			
Current share count					169.76			
Total Shares outstanding (including future share issues)					239.11			
Dilution effect					29.00%			
PV of Cash flows (only positive)								$ 57,490.38
- Net Debt								$ 9,208.52
Value of Equity								$ 48,281.86
/ Number of shares (including future share issues)								239.11
Value per share								$ 201.92

But never do this…

- Make a choice: You can either incorporate the present value of the negative cash flows into the value of operating assets today and use the current share count, in estimating value per share, or you can try to forecast expected future share issuances and divide the present value of only positive cash flows by the enhanced share count to get to value per share.
- But don't double count: **You cannot do both**, because you are then reducing value per share twice for the same phenomenon, once by discounting the negative cash flows and including them in value and then again by increasing the share count for the shares issued to cover those negative cash flows.

2. Share Based Compensation

- The use of share based compensation exploded in the 1990s due to two reasons.
  - The first was an ill-conceived attempt by the US Congress to put a cap on management compensation, while not counting options granted as part of that compensation.
  - The second was the dot com boom, where you had hundreds of young companies that had sky high valuations but no earnings or cash flows; these companies used options to attract and keep employees.
- Aiding and abetting these firm, in this process were the accountants, who chose not to treat these option grants as expensed at the time they were granted, and thus allowed companies to report much higher income than they were truly earning.

Consequences

- Drag on value per share: The first was the drag on per-share value created by past option and share grants to employees, with options, in particular, creating trouble, since they could create dilution, if share prices went up, but could be worthless, if share prices dropped.
- Future grants? The second was the question of how to factor in expected option and share grants in the future, since the value of these grants would be affected by expected future share prices. As with the dilution question, analysts faced a circular reasoning problem, where to value a share today, you had to make forecasts of the value per share in future years.

The Right Response

- Past option and share grants: In an intrinsic valuation, you should value these options first (using an option pricing model) and net the value out of the estimated value of equity, before dividing by the existing share count :
  - SBC Adjusted Value per share = (DCF Value of Equity - Value of Employee Options)/ Share count today including restricted shares
- Future grants: To the extent that a company is expected to continue to compensate its employees with options or restricted shares in future years, the most logical way to deal with these grants is to treat them as expenses in future years, and reduce expected income and cash flows.

Tesla: SBC Magnitude

	1st Quarter 2017	*1st Quarter 2018*
In Cost of Goods Sold	$ 10.03	$ 18.08
In R&D	$ 49.19	$ 61.11
In SG&A	$ 44.49	$ 62.45
Total SBC	$ 103.71	$ 141.64
As % of Revenues	3.85%	4.16%
Revenues	$ 2,696.30	$ 3,408.80

At the end of 2017, according to Tesla's 10K, the *company had 10.88 million options outstanding, with a weighted average exercise price of $105.56 and a weighted average maturity of 5.30 years and 4.69 million restricted shares.*

Tesla: Adjusting Value for Options & RSU

Year	*Cost of Capital*	*Cumulated Cost of Capital*	*FCFF*	*Terminal Value*	*Present Value*
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				Value of operating assets =	$ 41,332.91
				- Net Debt	$ 9,208.52
				Value of Equity	$ 32,124.39
				- Value of Equity Options	**$ 2,927.48**
				Value of Equity in common stock	**$ 29,196.91**
				/ Number of shares	169.76
				Value per share	$ 171.99

A Sloppy Alternative: The Treasury Stock Approach

- In the treasury stock approach, you value options at exercise value, and the value of equity per share in this approach can be written as follows:
  - Treasury Stock Value per share = (DCF value of equity + Exercise Price * # Options outstanding) / (Share Count today + Options Outstanding)
- In the case of Tesla, using the exercise stock approach would yield the following value per share:
  - Treasury Stock Value per share (Tesla) = ($32,124 + $105.56 * 10.88) / (169.76 + 10.88) = $184.19
- The analysts who use this approach often justify it by arguing that option pricing models can yield noisy estimates, but even the worst option pricing model will outperform one that assumes that options trade at exercise value.

But never this..

- Fully Diluted Shares: The first is to just adjust the share count for options outstanding and make no other changes. In this "fully diluted" approach, you are counting in the dilution that will arise from option exercise but ignoring the cash that will come into the firm from the exercise.
  - Fully Diluted Value per share = DCF value of equity / (Share Count today + Options Outstanding)
  - With Tesla, for instance, this approach would yield the following:
    - Fully Diluted Value per share (Tesla) = $32,124/ (169.76 + 10.88) = $177.83
- Add back SBC: The second and even more indefensible practice is to add back share based compensation to earnings to get to adjusted earnings. The rationale that is offered for doing so is that share based compensation is a non-cash expense, a dangerous bending of logic, since it allows companies to use in-kind payments (shares, services) to evade the cash flow test. Carried into future forecasts, this will inflate future earnings and cash flows, pushing up estimated value.

3. Shares with Different Rights

- Founders and families who take their companies public have always wanted to have their cake and eat it too, and one way in which they have been able to do so is by creating different share classes, usually built around voting rights.
- In the United States, shares with different voting rights were rare for much of the last century, primarily because the New York Stock Exchange, which was the preferred listing place for companies, did not allow them.
- The tech boom of the 1990s changed the game, by making the NASDAQ, which had no restrictions on shares with different voting rights, an alternative destination, especially for large technology companies.
- The floodgates on shares with different voting rights opened up with the Google listing in 2004, and the Google model, with shares with different voting rights, has become the default model for many of the tech companies that have gone public in the last decade.

Consequences

- Change will become difficult: The first is a corporate governance effect, since changing management becomes much more difficult, and that can affect how you value and view badly managed firms.
- Units are not equal: The second is a unit problem, since a voting right share and a non-voting right share represent different equity claims and cannot be treated as having the same value. Thus, you can no longer divide the aggregate value of equity by the total number of shares outstanding.

The Right Response

- Build in difficulty of change into value: When valuing the firm, you have to incorporate the fact that changing management is going to be more difficult to do in your estimates.
- Allocate unit value: You will have to make a judgment on how much of a premium you would expect the voting shares to trade at, relative to non-voting shares, in one of two ways.
  - Use the 5-10% premium for voting shares, found in studies.
  - Use intrinsic valuation models to estimate the premium, which I describe in my paper on valuing control.
  - Value per non-voting share = Aggregate Value of Equity/ (# Non-Voting Shares + (1+ Voting Share Premium) # Voting Shares)
- For example, if the value of equity is $210 million, there are 50 million non-voting shares and 50 million voting shares and the voting share premium is 10%, your value per non-voting share will be:
  - Value per non-voting share = 210/ (50+ 1.1*50) = $2.00/share
  - Value per voting share = $2.00 (1.10) = $2.20/share

Final Thoughts

1. Aggregate versus Per-share numbers: Given how dilution and options can play havoc with share count, it is better to use aggregate than to use per share numbers, in valuation and in pricing.
2. When SBC is rampant, control for differences: If the use of restricted stock and options vary widely across sector, you need to control for those differences when comparing pricing in the sector.
3. Don't use SBC adjusted earnings: Adjusting earnings and EBITDA, by adding back stock based compensation, is an abomination, used by desperate companies and analysts to show you that they are making money, when they are not even close.
4. With forward multiples, check on and control for dilution: Analysts, when valuing young companies, often divide today's market capitalization or enterprise value by expected revenues or EBITDA in the future.