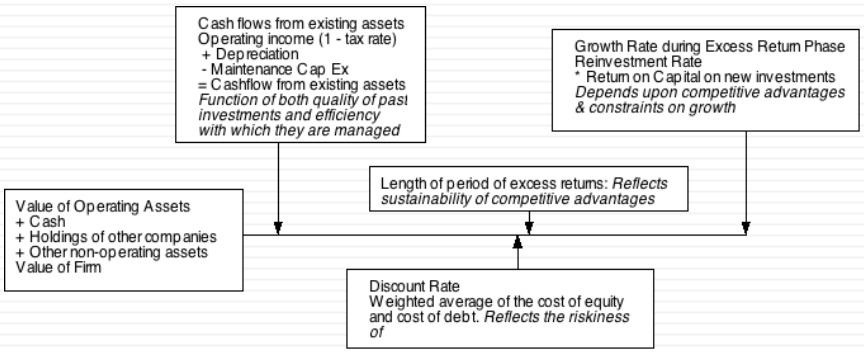
VALUATION: CLOSING THOUGHTS

Spring 2019
"It ain't over till its over"

Back to the very beginning: Approaches to Valuation

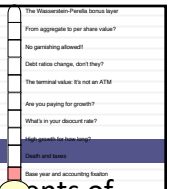
- **Discounted Cashflow Valuation**, where we try (sometimes desperately) to estimate the intrinsic value of an asset by using a mix of theory, guesswork and prayer.
- **Relative valuation**, where we pick a group of assets, attach the name "comparable" to them and tell a story.
- **Contingent claim valuation**, where we take the valuation that we did in the DCF valuation and divvy it up between the potential thieves (equity) and the victims of this crime (lenders)

Intrinsic Valuation: The set up



Dante meets DCF: Nine layers of valuation hell.. And a bonus layer..

Layer 1: Base Year fixation….



- You are valuing Exxon Mobil, using the financial statements of the firm from 2008. The following provides the key numbers:

Revenues	$477 billion
EBIT (1-t)	$ 58 billion
Net Cap Ex	$ 3 billion
Chg WC	$ 1 billion
FCFF	$ 54 billion

- The cost of capital for the firm is 8% and you use a very conservative stable growth rate of 2% to value the firm. The market cap for the firm is $373 billion and it has $ 10 billion in debt outstanding.

  a. How under or over valued is the equity in the firm?

  b. Would you buy the stock based on this valuation? Why or why not?

Layer 2: Taxes and Value

- Assume that you have been asked to value a company and have been provided with the most recent year's financial statements:

EBITDA	140
- DA	40
EBIT	100
Interest exp	20
Taxable income	80
Taxes	32
Net Income	48

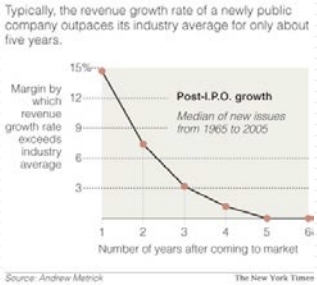
Free Cash flow to firm
EBIT (1- tax rate)
-(Cap Ex – Depreciation)
- Change in non-cash WC
=FCFF

- Assume also that cash flows will be constant and that there is no growth in perpetuity. What is the free cash flow to the firm?

a. 88 million (Net income + Depreciation)
b. 108 million (EBIT – taxes + Depreciation)
c. 100 million (EBIT (1-tax rate)+ Depreciation)
d. 60 million (EBIT (1- tax rate))
e. 48 million (Net Income)
f. 68 million (EBIT – Taxes)

Layer 3: High Growth for how long…

- Assume that you are valuing a young, high growth firm with great potential, just after its initial public offering. How long would you set your high growth period?
- < 5 years
- 5 years
- 10 years
- >10 years



Layer 4: The Cost of Capital

- The cost of capital for Chippewa Technologies, a US technology firm with 20% of its revenues from Brazil, has been computed using the following inputs:

Cost of equity = Riskfree Rate + Beta (ERP) + Small firm premium = **14%**
= 5% + 1.20 (5%) + 3%

Replaced current T.Bond rate of 3% with normalized rate of 5%

"Adjusted" Beta from Bloomberg

Both from Ibbotson data base, derived from 1926-2008 data
ERP: Stocks - T.Bonds (Arithmetic average)
Small firm: Smal stocks - Overall market

Cost of capital = Cost of equity (Equity/ (Debt + Equity)) + Cost of debt (1- tax rate) (Debt/ (Debt + Equity)
= 14% (1000/2000) + 3% (1-.30) (1000/2000) = **8.05%**

From above

Used market value of equity

Company is not rated and has no bonds. Used book interest rate = Int exp/ BV of debt

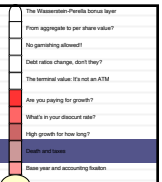
Used effective tax rate of 30%

To be conservative, counted all liabilities, other than equity, as debt and used book value.

The Correct Cost of Capital for Chippewa

Input	*What was used...*	*What should have been used...*
Riskfree Rate	Corrected treasury bond rate = 5%	Actual treasury bond rate = 3%
Beta	Bloomberg adjusted beta = 1.20	Sector average adjusted beta = 1.60 (Based on small cap companies in sector)
Equity Risk Premium	Ibbotson premium =5%	Updated implied ERP = 6.5%
Other adjustments to cost of equity	Small cap premium = 3%	No small cap premium Country risk adjustment = $Lambda_{Brazil}$ * Brazil CRP = 0.26*6.77% = 2.28%
Cost of equity	5%+ 1.2 (5%) + 3% = 14%	3% + 1.6 (6.5%) + 2.28% = 15.68%
Cost of debt (pre-tax)	3%	3%+6% (based on synthetic rating)=9%
Tax rate	Effective tax rate =30%	Marginal tax rate = 40%
Cost of debt (after-tax)	3% (1-.3) = 2.1%	9% (1-.4) = 5.4%
Debt ratio	Book ratio: Liabilities=50% Equity=50%	Market ratio: Interest bearing debt = 30%; Equity= 70%
Cost of capital	14% (.5) + 2.1% (.5) = 8.05%	15.68% (.7) + 5.4% (.3) = 12.60%

Layer 5: The price of growth..



- You are looking at the projected cash flows provided by the management of the firm, for use in valuation

Year	Current	1	2	3	4
Growth rate		10%	10%	10%	10%
Revenues	$100.00	$110.00	$121.00	$133.10	$146.41
EBIT (1-t)	$30.00	$33.00	$36.30	$39.93	$43.92
+ Depreciation	$15.00	$16.50	$18.15	$19.97	$21.96
- Cap Ex	$18.00	$19.80	$21.78	$23.96	$26.35
- Chg in WC	$3.00	$3.30	$3.63	$3.99	$4.39
FCFF	$24.00	$26.40	$29.04	$31.94	$35.14

- What questions would you raise about the forecasts?

Layer 6: The "fixed debt ratio" assumption

- You have been asked to value Hormel Foods, a firm which currently has the following cost of capital:
  - Cost of capital = 7.31% (.9) + 2.36% (.1) = 6.8%
- You believe that the target debt ratio for this firm should be 30%. What will the cost of capital be at the target debt ratio?
- Which debt ratio (and cost of capital) should you use in valuing this company?

Layer 7: The Terminal Value

- The best way to compute terminal value is to

a. Use a stable growth model and assume cash flows grow at a fixed rate forever

b. Use a multiple of EBITDA or revenues in the terminal year

c. Use the estimated liquidation value of the assets

- You have been asked to value a business. The business expects to $ 120 million in after-tax earnings (and cash flow) next year and to continue generating these earnings in perpetuity. The firm is all equity funded and the cost of equity is 10%; the riskfree rate is 3% and the ERP is 7%. What is the value of the business?
- Assume now that you were told that the firm can grow earnings at 2% a year forever. Estimate the value of the business.

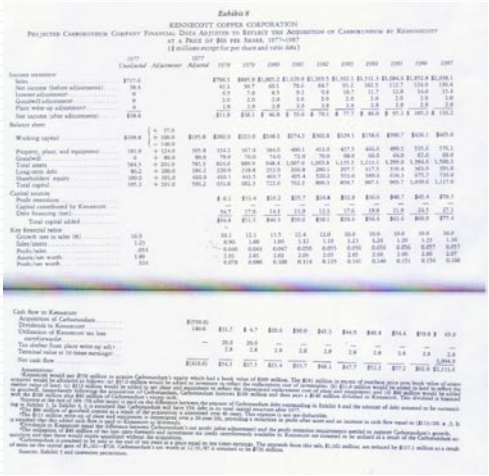
Layer 8. From firm value to equity value: The Garnishing Effect…

- For a firm with consolidated financial statements, you have discounted free cashflows to the firm at the cost of capital to arrive at a firm value of $ 100 million. The firm has
  - A cash balance of $ 15 million
  - Debt outstanding of $ 20 million
  - A 5% holding in another company: the book value of this holding is $ 5 million. (Market value of equity in this company is $ 200 million)
  - Minority interests of $ 10 million on the balance sheet
- What is the value of equity in this firm?
- How would your answer change if you knew that the firm was the target of a lawsuit it is likely to win but where the potential payout could be $ 100 million if it loses?

Layer 9. From equity value to equity value per share

- You have valued the equity in a firm at $ 200 million. Estimate the value of equity per share if there are 10 million shares outstanding..
- How would your answer change if you were told that there are 2 million employee options outstanding, with a strike price of $ 20 a share and 5 years left to expiration?

Layer 10. The final circle of hell…

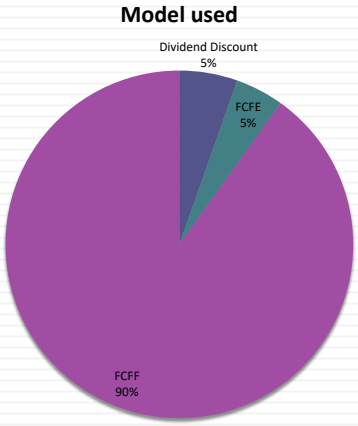


	Cost of Equity	Cost of Capital
Kennecott Corp (Acquirer)	13.0%	10.5%
Carborandum (Target)	16.5%	12.5%

YOUR NUMBERS/FINDINGS

"The truth shall set you free".

The Models You Used in DCF Valuation



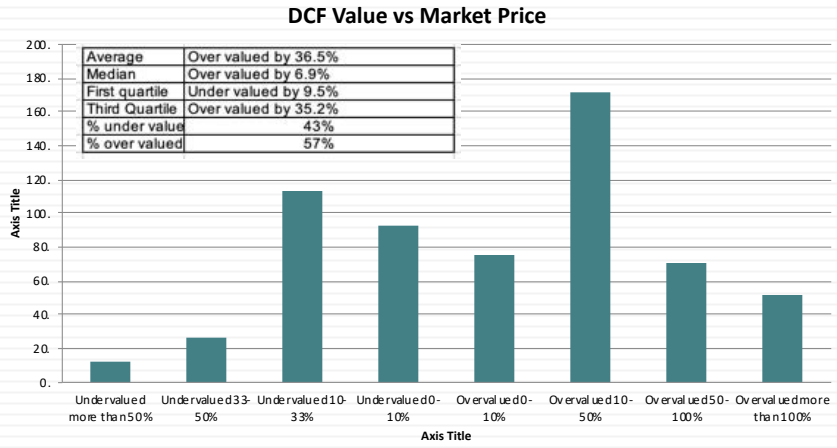
The Most Valued Company (Companies)..

Company	*Number of analyses*
Adobe	7
Costco	7
Snap	10
Chipotle	11
Lululemon	11
GrubHub	12
Salesforce	12
Spotify	16
Netflix	17
Square	18

And here is why you do it..

Company Name	Price	DCF Value	Relative Value	Recommendation
Netflix	$ 385.03	$ 221.41	$ 147.41	Sell
Netflix	$ 356.56	$ 187.91	$ 172.76	Sell
Netflix	$ 361.04	$ 206.86	$ 195.56	Sell
Netflix	$361.04	$201.19	$242.50	Sell
Netflix	$378.17	$135.81	$ 49.23	Sell
Netflix	$361.04	$338.81	$157.68	Sell
Netflix	$361.04	338.81	157.68	Sell
Netflix	$361.49	$210.86	$131.87	Hold
Netflix	$361.04	$305.58	$264.49	Sell
Netflix	$361.04	$257.60	$94.30	Sell
Netflix	$ 361.04	$ 201.74	$ 148.54	SELL
Netflix	$ 376.06	$ 310.34	$ 265.42	Sell
Netflix	$361.04	$98.70	$128.49	Sell
Netflix	$ 361.00	$ 261.77	$ 230.95	Sell
Netflix	$361.04	$98.70	$128.49	Sell
Netflix, Inc.	$361.04	$288.24	$136.37	Hold
Netflix, Inc.	$361.04	$161.86	$102.62	Sell

What you found…



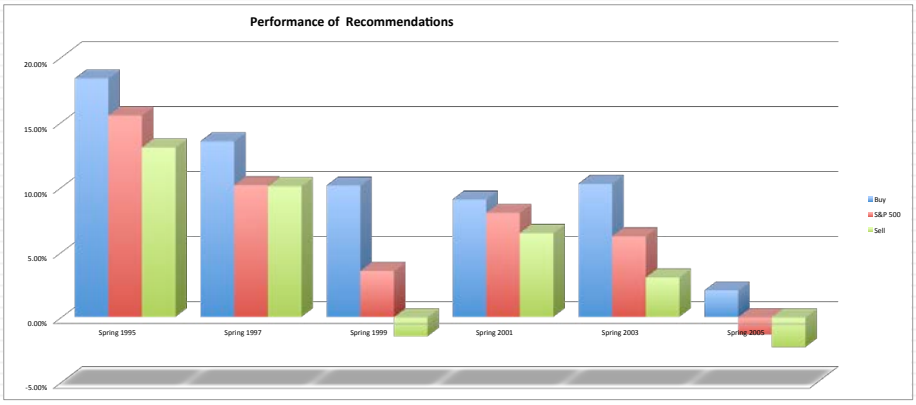
The most undervalued stocks…

Company Name	Price	DCF Value	% Under Valued	Recommendation
Thomas Cook Group plc	£ 0.26	£ 2.66	-90.23%	Buy
ChemBio, Inc. (Nasdaq: CEMI)	$ 7.67	$ 43.85	-82.51%	Buy
Walmart	$ 100.35	$ 450.10	-77.70%	Hold
Deutsche Bank	7.02	30.00	-76.60%	Buy
Fiat Chrysler	13.67	54.2	-74.78%	Buy
Chipotle Mexican Grill	$705.44	$2,128.55	-66.86%	Buy
Snap, Inc.	$ 10.49	$ 27.78	-62.24%	Buy
Cushman & Wakefield	$ 18.18	$ 40.26	-54.84%	Buy
Southwest	$ 54.23	$ 116.64	-53.51%	Buy
Imperial Brands (IMB)	$ 28.32	$ 60.02	-52.82%	Buy
The Kroger Co.	$ 25.17	$ 53.24	-52.72%	Buy
Moelis	$ 35.10	$ 73.32	-52.13%	Buy
Match Group, Inc.	$ 67.27	$ 139.24	-51.69%	Hold
EasyJet, plc	10.34	20.44	-49.41%	Buy
Tesla	$267.54	$502.12	-46.72%	Buy

The Most Overvalued stocks are...

Company Name	Price	DCF Value	% Under or Over Valued	Recommendation
Cementos Pacasmayo	S/.29.79	S/.1.09	2633.03%	Sell
JC Penney	$ 1.32	$ 0.05	2540.00%	Sell
Under Armour	$ 21.79	$ 2.55	754.51%	Sell
Express, Inc (EXPR)	$ 3.79	$ 0.45	742.22%	Sell
Comscore	$12.66	$1.89	569.84%	Sell
CHIPOTLE	$ 706.45	$ 110.26	540.71%	Sell
Regenosine	$ 5.00	$ 0.81	517.28%	Buy
Chipotle	$705.44	$117.79	498.90%	Sell
Barnes & Noble	$6.38	$1.16	450.00%	Sell
NINTENDO	$ 706.45	$ 143.57	392.06%	Hold
Square, Inc. (NYSE: SQ)	$ 65.99	$ 14.17	365.70%	Hold
Bloomin' Brands, Inc.	20.14	5.08	296.46%	Sell
Wyndham Hodels and Resorts	$56.59	$14.49	290.55%	Sell
Chegg	$ 36.70	$ 9.92	269.96%	Sell
Netflix	$361.04	$98.70	265.80%	Sell

The ultimate test… Did undervalued stocks make money?

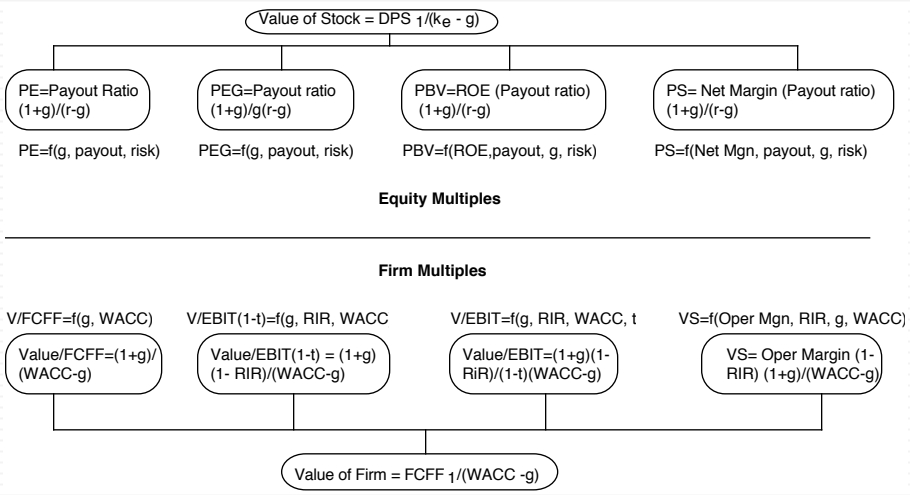


More on the winners...

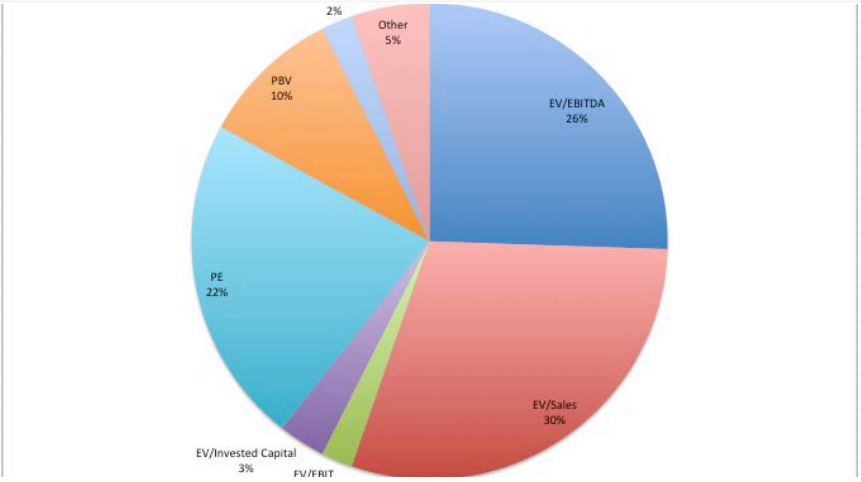
- On average, right: About 60% of all buy recommendations make money; about 45% of sell recommendations beat the market. The average return on buy recommendations was about 4% higher, on an annualized basis, than the average return on sell recommendations.
- More so on some: The excess returns on buy recommendations on small cap and emerging market companies is higher than the excess returns on large market cap companies, with higher mistakes in both directions on the former.
- Skewed payoffs: There are two or three big winners in each period, but the payoff was not always immediate. Buying Apple in 1999 would have led to negative returns for a year or more, before the turnaround occurred.
- Double whammy: Stocks that are under valued on both a DCF and relative valuation basis do better than stocks that are under valued on only one approach.

Relative Valuation: The Four Steps to Understanding Multiples

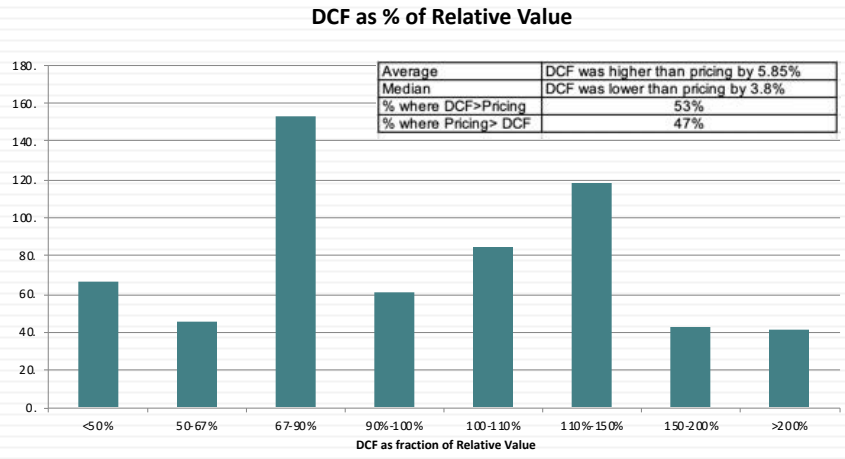
- Anna Kournikova knows PE…. Or does she?
  - In use, the same multiple can be defined in different ways by different users. When comparing and using multiples, estimated by someone else, it is critical that we understand how the multiples have been estimated
- 8 times EBITDA is not always cheap…
  - Too many people who use a multiple have no idea what its cross sectional distribution is. If you do not know what the cross sectional distribution of a multiple is, it is difficult to look at a number and pass judgment on whether it is too high or low.
- You cannot get away without making assumptions
  - It is critical that we understand the fundamentals that drive each multiple, and the nature of the relationship between the multiple and each variable.
- There are no perfect comparables
  - Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.



The Multiples you used were ...



DCF vs Relative Valuation



Most underpriced on a relative basis…

Company Name	Price	Multiple used	Relative Value	Recommendation	% Under Priced
Thomas Cook Group plc	£ 0.26	EV/Sales	£ 5.26	Buy	-95.06%
NeuroMetrix	$ 0.67	PBV	$ 4.33	Sell	-84.53%
BlackBerry Limited	$ 8.77	PBV	$ 56.21	Hold	-84.40%
Medmen	$ 2.54	EV/Sales	$ 15.57	Buy	-83.69%
ARHT Media	$ 0.15	Price/Sales	$ 0.70	Sell	-78.57%
Air France	10.23	EV/Sales	$44.23	Buy	-76.87%
Qiwi plc	$ 877.50	EV/Revenue	$ 3,790.17	Hold	-76.85%
Almacenes Exito S.A	$ 14,580.00	EV/Sales	$ 62,928.07	Buy	-76.83%
SIGA Technologies, Inc	$ 5.61	EV/Sales	$ 23.25	Sell	-75.87%
Corus Entertainment	$ 5.89	EV/EBITDA	$ 24.40	Buy	-75.86%
JC Penney	$ 1.32	EV/Sales	$ 5.40	Sell	-75.56%
HCA Healthcare, Inc	$ 123.75	EV/EBITDA	$ 493.70	Buy	-74.93%
Gazprom	163.77 ₽	EV/Sales	583.21 ₽	Hold	-71.92%
Zillow	$ 35.41	EV/Sales	$ 118.23	Buy	-70.05%
Zillow	$ 35.41	EV/Sales	$ 118.23	Buy	-70.05%
Via	$ 531.00	EV/Sales	$ 1,761.00	Sell	-69.85%
Via	$ 531.00	EV/Sales	$ 1,761.00	Sell	-69.85%
Bed Bath and Beyond	$ 15.76	EV/EBITDA	$ 50.50	Hold	-68.79%

Most overpriced on a relative basis…

Company Name	Price	Multiple used	Relative Value	Recommendation	% Over Priced
Cementos Pacasmayo	S/.29.79	EV/EBITDA	S/.0.99	Sell	2909.09%
Netflix	$378.17	EV/Sales	$ 49.23	Sell	668.17%
Tesla	$264.47	EV/Sales	$34.94	Sell	656.93%
Ferrari	€ 125.00	EV/EBITDA	19.78	Sell	531.95%
IMAX	$23.37	EV/Sales	$4.21	Sell	455.11%
a2 Milk Company Limited	$ 15.97	EV/Sales	$ 2.91	Sell	448.80%
Nvidia	$168.82	EV/Sales	$34.28	Buy	392.47%
Chegg	$ 36.70	EV/Sales	$ 8.29	Sell	342.70%
Regenosine	$ 5.00	EV/Sales	$ 1.15	Buy	334.78%
Chegg Inc	$ 36.70	EV/Sales	$ 8.63	Sell	325.26%
Sales Force	$ 156.90	EV/Sales	$ 37.90	Sell	313.98%
Salesforce	$ 159.94	EV/EBITDA	$ 40.15	Buy	298.36%
Netflix	$361.04	EV/EBITDA	$94.30	Sell	282.86%
Zillow	$40.59	EV/Sales	$11.05	Sell	267.33%
Costco Wholesale Corporation	$ 247.02	PBV	$ 67.40	Sell	266.50%
Tencent	$ 382.00	PE	$ 104.45	Sell	265.73%
Roku	82.85	EV/Sales	23.40	Sell	254.06%
Netflix, Inc.	$361.04	PBV	$102.62	Sell	251.82%
AMD	$ 27.96	EV/Sales	$ 9.17	Hold	204.91%

Contingent Claim (Option) Valuation

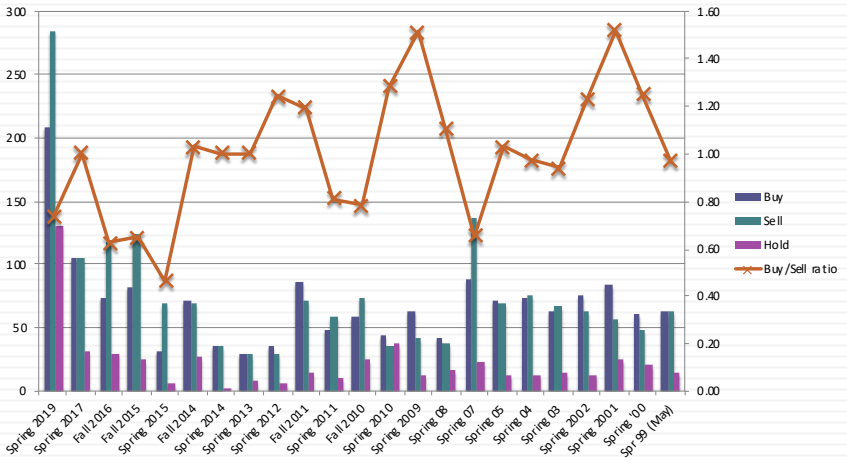
- Options have several features
  - They derive their value from an underlying asset, which has value
  - The payoff on a call (put) option occurs only if the value of the underlying asset is greater (lesser) than an exercise price that is specified at the time the option is created. If this contingency does not occur, the option is worthless.
  - They have a fixed life
- Any security that shares these features can be valued as an option.

- Number of firms valued using option models = 61
- Median Percent increase in value over DCF value= 45.55%

Acting on valuation: It is not just an academic exercise

a. I am not sure yet: Uncertainty is not a shield against action. If you wait until you feel "certain" about your valuation, you will never act.
b. All believers now? Ultimately, you have to believe in some modicum of market efficiency. Markets have to correct their mistakes for your valuations to pay off.
c. The law of large numbers: Assuming your valuations carry heft, you are far more likely to be right across many companies than on any individual one.

Your recommendations were to..



Picking your valuation approach

- Asset characteristics
  - Marketability
  - Cash flow generating capacity
  - Uniqueness
- Your characteristics
  - Time horizon
  - Reasons for doing the valuation
  - Beliefs about markets

What approach would work for you?

- As an investor, given your investment philosophy, time horizon and beliefs about markets (that you will be investing in), which of the the approaches to valuation would you choose?
  a. Discounted Cash Flow Valuation
  b. Relative Valuation
  c. Neither. I believe that markets are efficient.

Story Tellers? Number Crunchers?

- If you are a story teller, I hope that you have
  - More confidence in your number crunching
  - More discipline in your stories
  - Less intimidation, when confronted with number crunchers
- If you are a number cruncher, I hope that you have
  - More willingness to put stories behind your numbers
  - More imagination in your number crunching
  - More understanding, when confronted with story telling

Some Not Very Profound Advice

1. Its all in the fundamentals.
2. Focus on the big picture. Don't sweat the small stuff and don't get distracted.
3. Anecdotes mean little and experience does not equal knowledge.
4. Keep your perspective. It is only a valuation.
5. In investing, luck dominates skill and knowledge.

Do not forget to do your CFEs. Your ability to check your grade rests on it.

My commuting reason!