



Valuation: Closing Thoughts

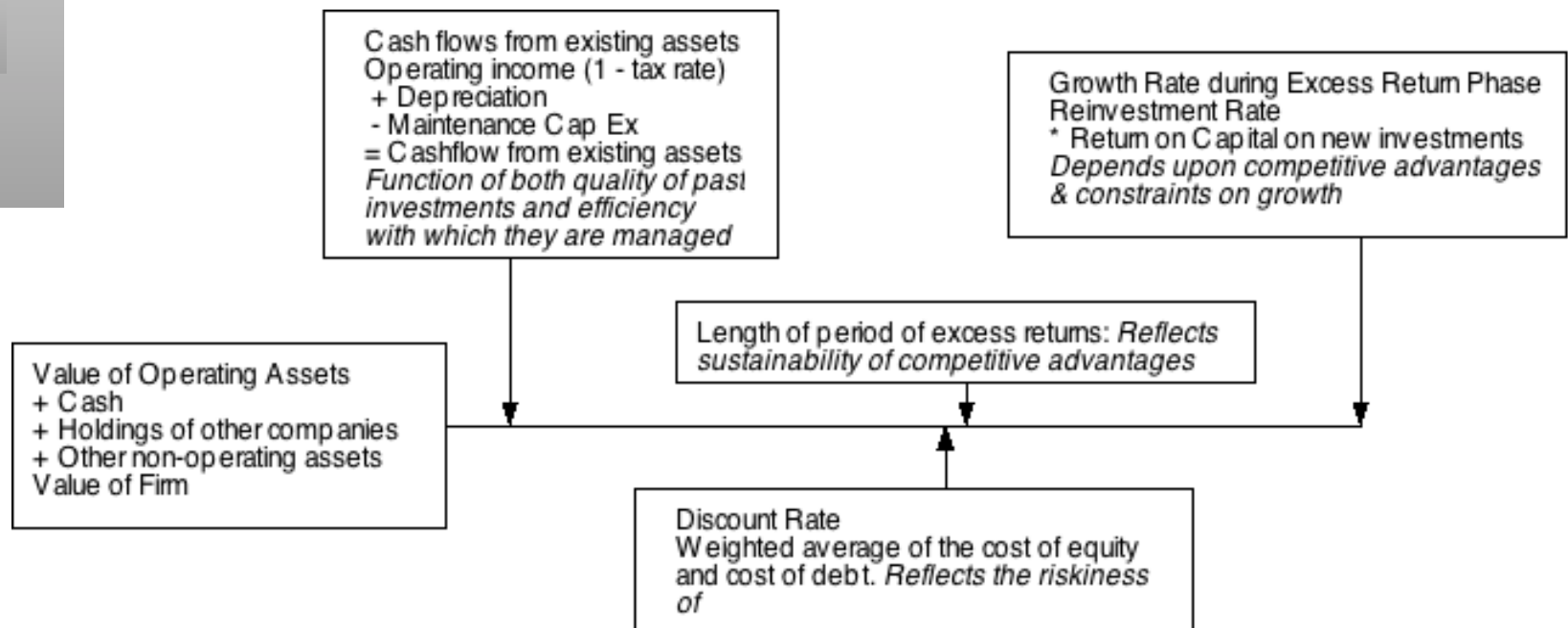
Fall 2011

“It ain’t over till its over”

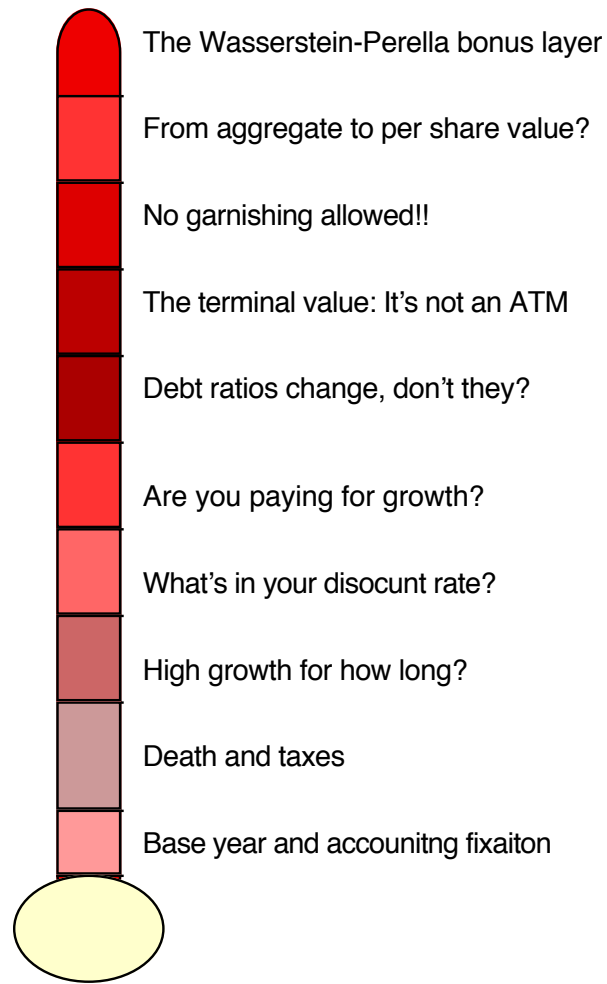
Back to the very beginning: Approaches to Valuation

- **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....

The Wasserstein-Perella bonus layer
From aggregate to per share value?
No garnishing allowed!!
Debt ratios change, don't they?
The terminal value: It's not an ATM
Are you paying for growth?
What's in your discount rate?
High growth for how long?
Death and taxes
Base year and accounting 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	Free Cash flow to firm
- DA	40	EBIT (1- tax rate)
EBIT	100	-(Cap Ex – Depreciation)
- Interest exp	20	- Change in non-cash WC
Taxable income	80	=FCFF
Taxes	32	
Net Income	48	

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?

- 88 million (Net income + Depreciation)
- 108 million (EBIT – taxes + Depreciation)
- 100 million (EBIT (1-tax rate)+ Depreciation)
- 60 million (EBIT (1- tax rate))
- 48 million (Net Income)
- 68 million (EBIT – Taxes)

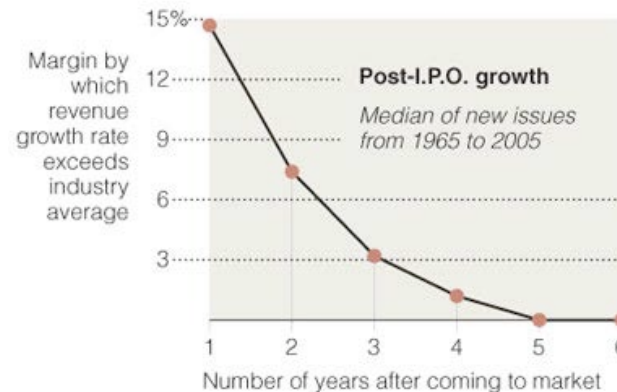
Layer 3: High Growth for how long...

	The Wasserstein-Perella bonus layer
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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

Typically, the revenue growth rate of a newly public company outpaces its industry average for only about five years.



Source: Andrew Metrick

The New York Times

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

$$= \text{Riskfree Rate} \quad + \text{Beta} \quad (\text{ERP}) \quad + \text{Small firm premium} \\ = 5\% \quad + 1.20 \quad (5\%) \quad + 3\% \quad = 14\%$$

*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: Small stocks - Overall market*

Cost of capital

$$= \text{Cost of equity (Equity/ (Debt + Equity))} + \quad \text{Cost of debt} \quad (1 - \text{tax rate}) \quad (\text{Debt/ (Debt + Equity)}) \\ = 14\% \quad (1000/2000) \quad + \quad 3\% \quad (1 - .30) \quad (1000/2000) = 8.05\%$$

*From
above*

*Used market value of
equity*

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

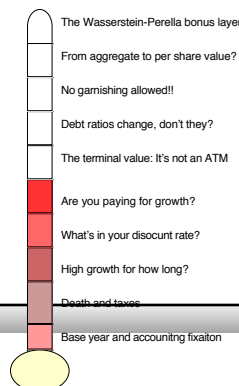
*Used
effective tax
rate of 30%*

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

The Correct Cost of Capital for Chippewa

<i>Input</i>	<i>What was used...</i>	<i>What should have been used...</i>
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 = $\text{Lambda}_{\text{Brazil}}^*$ Brazil CRP = $0.26 \times 6.77\% = 2.28\%$
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

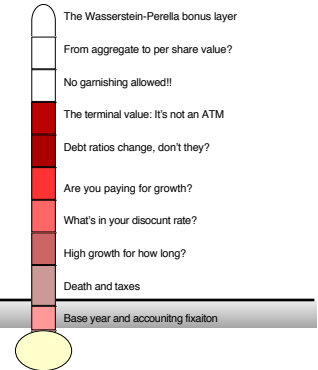
What questions would you raise about the forecasts?

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 = $7.31\% (.9) + 2.36\% (.1) = 6.8\%$
- a. 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?
- b. Which debt ratio (and cost of capital) should you use in valuing this company?

Layer 7: The Terminal Value

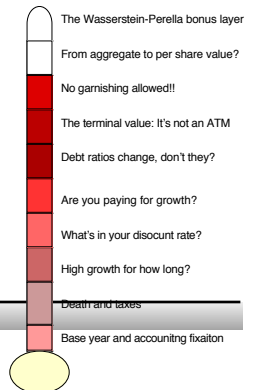


- The best way to compute terminal value is to
 - ❑ Use a stable growth model and assume cash flows grow at a fixed rate forever
 - ❑ Use a multiple of EBITDA or revenues in the terminal year
 - ❑ Use the estimated liquidation value of the assets

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

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	From aggregate to per share value?
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	Base year and accounting taxation

- 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...

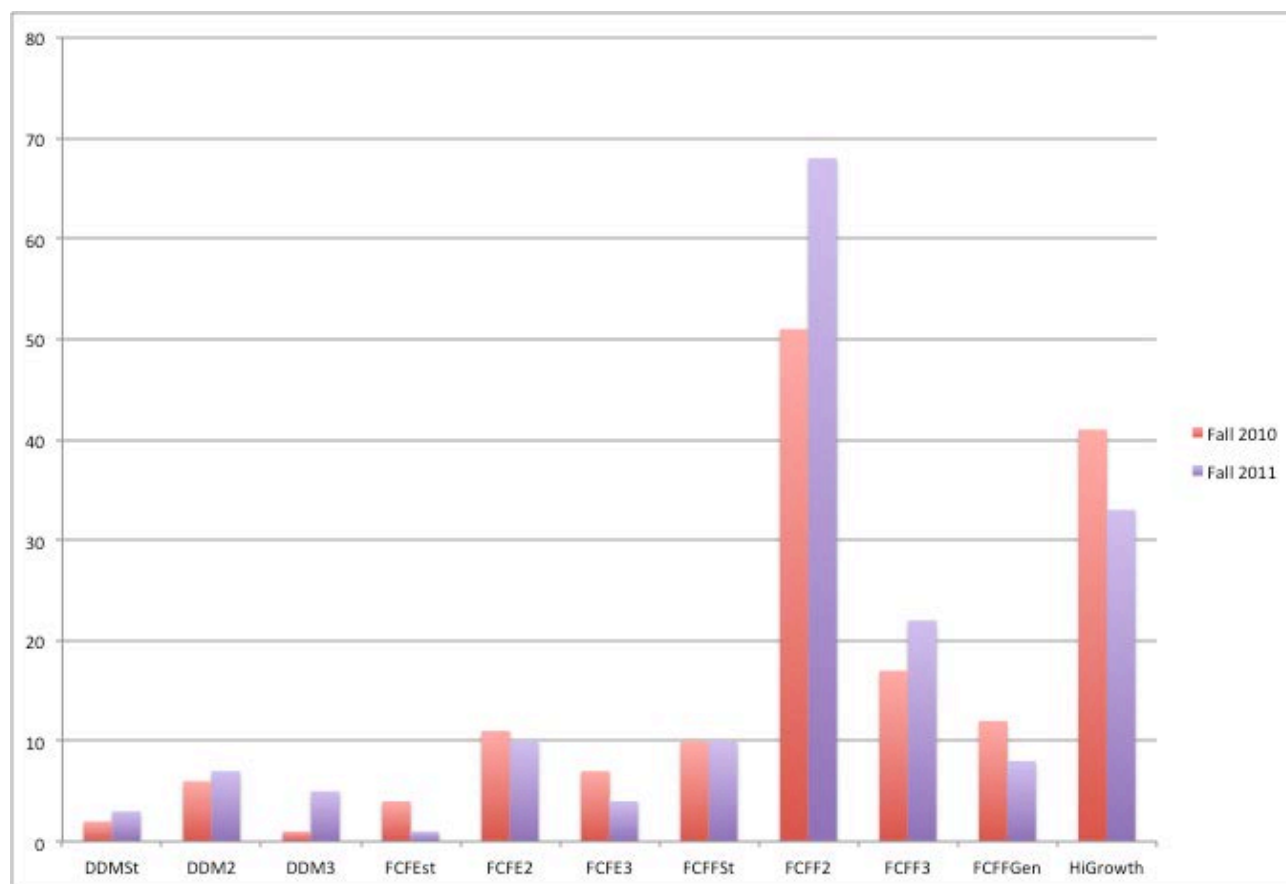
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Exhibit 8
KENNECOTT COPPER CORPORATION
PROJECTED CARBORUNDUM COMPANY FINANCIAL DATA ADJUSTED TO REFLECT THE ACQUISITION OF CARBORUNDUM BY KENNECOTT
AT A PRICE OF \$66 PER SHARE, 1977-1987
(\$ millions except for per share and ratio data)

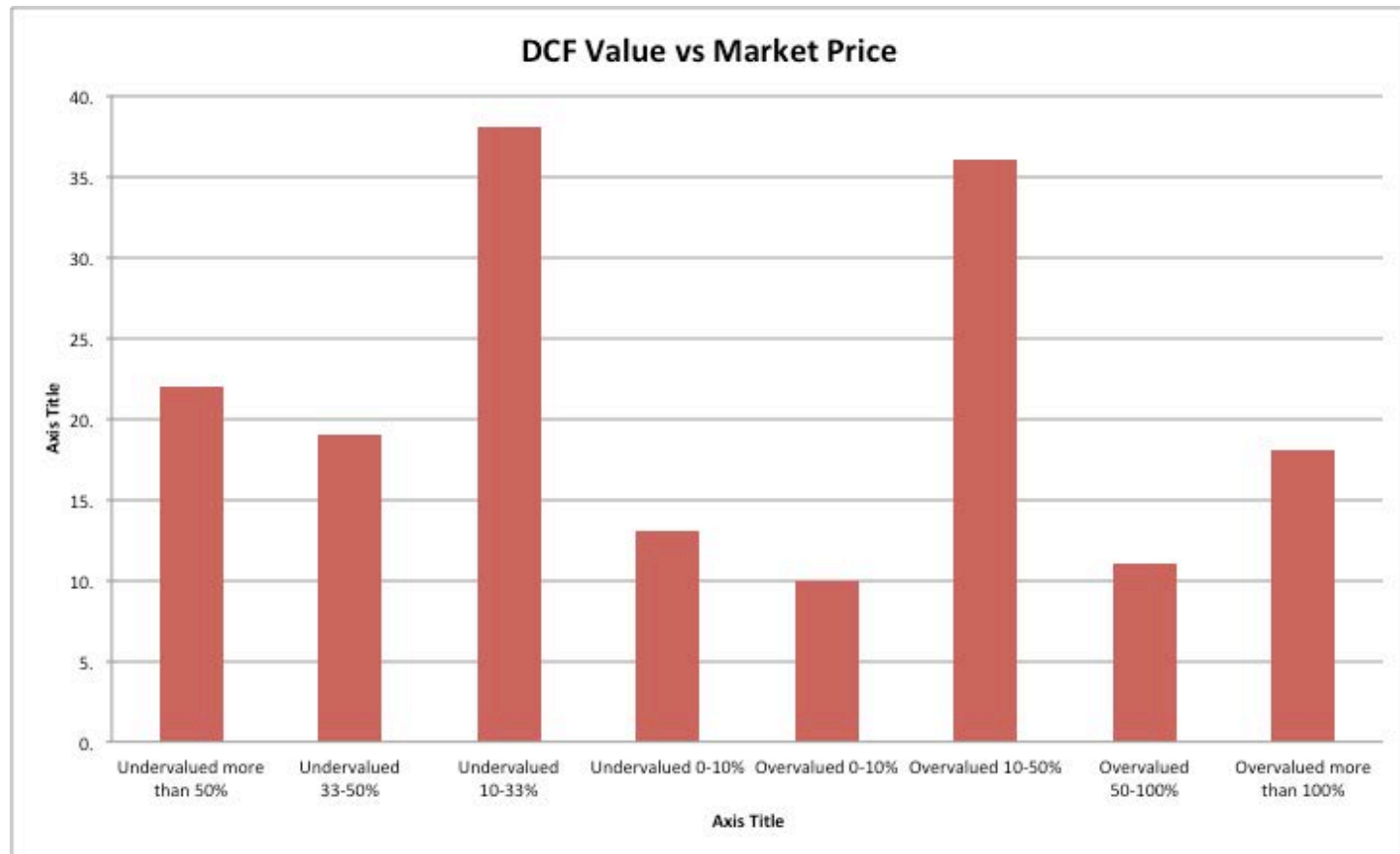
	1977	1977	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
	Unadjusted	Adjustments	Adjusted										
Income statement													
Sales	\$717.6		\$790.1	\$885.9	\$1,005.2	\$1,120.9	\$1,265.5	\$1,392.1	\$1,531.3	\$1,684.4	\$1,852.8	\$2,038.1	
Net income (before adjustments)	38.4		43.1	50.7	60.1	70.6	84.7	93.2	102.5	112.7	124.0	136.4	
Interest adjustments	0		6.5	7.8	8.5	9.2	9.8	10.7	11.7	12.8	14.0	15.4	
Goodwill adjustments	0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Plant write-up adjustments	0		2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	
Net income (after adjustments)	\$38.4		\$51.8	\$58.1	\$66.8	\$76.6	\$87.1	\$97.7	\$108.0	\$118.5	\$129.2	\$140.2	
Balance sheet													
Working capital	\$198.8	+ 37.0 + 100.0 - 140.0	\$195.8	\$202.9	\$223.0	\$248.1	\$274.2	\$302.8	\$329.3	\$358.6	\$390.7	\$426.1	\$465.0
Property, plant, and equipment	181.8	+ 124.0	305.8	334.2	367.4	384.6	400.1	411.6	417.5	466.6	499.1	535.6	576.1
Goodwill	0	+ 80.0	80.0	78.0	76.0	74.0	72.0	70.0	68.0	66.0	64.0	62.0	60.0
Total assets	584.3	+ 201.0	785.3	824.0	889.9	948.4	1,007.0	1,065.8	1,135.5	1,213.1	1,299.0	1,394.6	1,500.3
Long-term debt	86.2	+ 100.0	186.2	220.9	238.8	252.9	266.8	280.1	297.7	317.5	339.4	363.9	391.0
Shareholders' equity	309.0	+ 101.0	410.0	410.1	443.5	469.7	495.4	520.2	553.0	589.6	630.3	675.7	726.0
Total capital	395.2	+ 201.0	596.2	631.0	682.3	722.6	762.2	800.3	850.7	907.1	969.7	1,039.6	1,117.0
Capital sources													
Profit retentions	\$ 0.1	\$33.4	\$26.2	\$25.7	\$24.8	\$23.8	\$22.8	\$21.8	\$20.8	\$19.8	\$18.8	\$17.8	\$16.8
Capital contributed by Kennecott	—	—	—	—	—	—	—	—	—	—	—	—	—
Debt financing (net)	34.7	17.9	14.1	13.9	13.3	12.6	11.9	11.2	10.5	9.8	9.1	8.4	7.7
Total capital added	\$34.8	\$51.3	\$40.3	\$39.6	\$38.1	\$36.4	\$34.7	\$33.0	\$31.3	\$29.6	\$27.9	\$26.2	\$24.5
Key financial ratios													
Growth rate in sales (%)	16.9		10.1	12.1	13.5	12.4	12.0	10.0	10.0	10.0	10.0	10.0	10.0
Sales/assets	1.23		0.96	1.00	1.06	1.12	1.19	1.23	1.26	1.30	1.33	1.36	1.36
Profit/sales	0.04		0.040	0.043	0.047	0.050	0.053	0.056	0.059	0.062	0.065	0.068	0.071
Assets/net worth	1.89		2.01	2.01	2.02	2.03	2.03	2.03	2.06	2.06	2.06	2.06	2.07
Profit/net worth	0.124		0.078	0.086	0.100	0.114	0.135	0.141	0.146	0.151	0.156	0.160	0.160
Cash flow to Kennecott													
Acquisition of Carborundum	—		\$ (550.0)										
Dividends to Kennecott	140.0		\$31.7	\$ 4.7	\$20.6	\$30.9	\$45.3	\$44.9	\$49.4	\$54.4	\$59.8	\$ 65.9	
Utilization of Kennecott tax loss carryforwards	—		—	20.0	20.0	—	—	—	—	—	—	—	—
Tax shelter from plant write-up adj.	—		2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Terminal value at 10 times earnings	—		—	—	—	—	—	—	—	—	—	—	—
Net cash flow	\$ (410.0)		\$54.5	\$27.5	\$23.4	\$33.7	\$48.1	\$47.7	\$52.2	\$57.2	\$62.6	\$1,113.6	
Assumptions:													
Kennecott would pay \$550 million to acquire Carborundum's equity which had a book value of \$309 million. The \$241 million in excess of purchase price over book value of assets acquired would be allocated as follows: (a) \$17.0 million would be added to inventory to reflect the replacement cost of inventory; (b) \$111.0 million would be added to land to reflect the replacement cost of land; (c) \$113 million would be added to net plant and equipment to reflect the depreciated replacement cost of plant and equipment; and (d) \$90 million would be added to goodwill. Immediately following the acquisition of Carborundum, Carborundum borrows \$100 million and then pays a \$140 million dividend to Kennecott. This dividend is financed with the \$100 million plus \$40 million of Carborundum's excess cash.													
Interest at the rate of 10% (5% after taxes) is paid on the difference between the amount of Carborundum debt outstanding in Exhibit 8 and the amount of debt assumed to be outstanding in Exhibit 5. In Exhibit 8, it is assumed that the acquisition is amortized over 40 years. This expense is not tax-deductible.													
The \$80 million of goodwill created as a result of the acquisition will have 35% debt in its total capital structure after 1977.													
The \$113 million write-up of plant and equipment is depreciated over a 20-year life, providing a reduction in profit after taxes and an increase in cash flow equal to (\$113/20) x .5. It is assumed that this added cash flow is paid to Kennecott as dividends.													
Dividends to Kennecott equal the difference between Carborundum's net profit (after adjustments) and the profit retention requirements needed to support Carborundum's growth. The utilization of \$40 million of tax loss carryforwards and investment tax credit carryforwards available to Kennecott are assumed to be utilized as a result of the Carborundum acquisition and that these would expire unutilized without the acquisition.													
Carborundum is assumed to be sold at the end of ten years at a price equal to ten times earnings. The proceeds from this sale, \$1,162 million, are reduced by \$117.1 million as a result of taxes on the capital gain of \$1,162 - \$726. Carborundum's net worth at 12/31/87 is assumed to be \$726 million.													
Sources: Exhibit 5 and casewriter projections.													

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

The Models You Used in DCF Valuation



What you found...



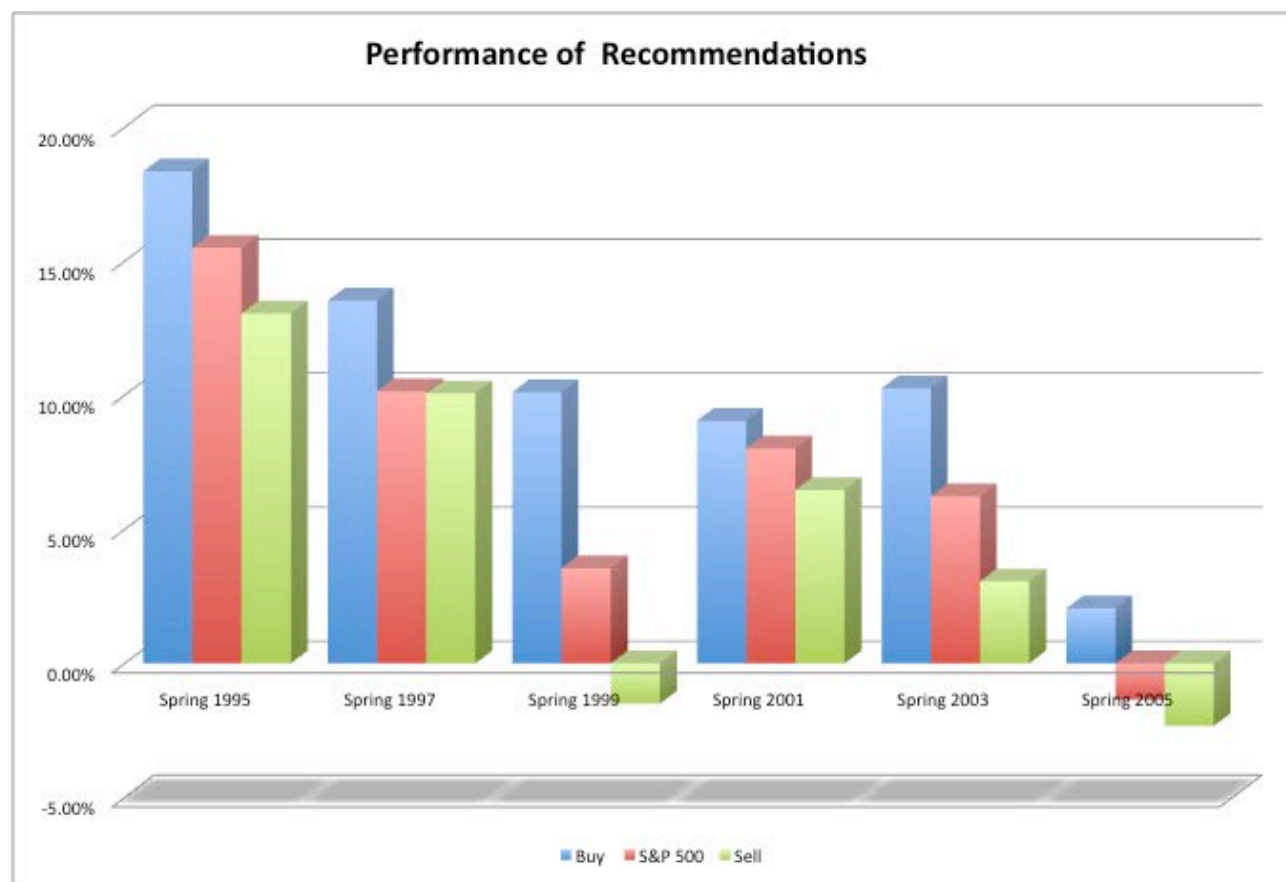
The most undervalued stocks...

Company Name	Price	DCF model used	DCf Value	% Under valued	Recommendation
Sprint	\$ 2.61	FCFFGen	\$ 53.48	95.12%	Buy
Ener 1, Inc.	0.07	HiGrowth	0.98	92.86%	Buy
American Airlines	\$ 1.03	FCFFGen	\$ 6.73	84.70%	Buy
Li & Fund Ltd.	\$ 2.02	FCFE2	\$ 10.45	80.67%	Buy
Luby's Inc.	\$ 4.55	FCFF2	\$ 21.09	78.43%	Buy
Ista Pharmaceuticals	\$ 3.94	HiGrowth	\$ 16.68	76.38%	Buy
Chiquita Brands Intl	\$ 8.47	FCFF2	\$ 34.42	75.39%	Buy
AK Steel	\$ 8.39	FCFF2	\$ 33.02	74.59%	Buy
Aeroflot Russian Airlines	\$ 1.50	FCFF2	\$ 5.76	73.96%	Hold
Veeco Instruments Inc.	\$23.17	FCFF2	\$ 76.81	69.83%	Buy
Freeport-McMoRan Copper & Gold Inc	\$39.73	FCFF2	\$109.03	63.56%	Buy
Sprint	\$ 2.44	FCFF2	\$ 6.47	62.29%	Buy
Bank of America	\$ 5.64	FCFE2	\$ 14.90	62.15%	Sell
Perry Ellis	\$14.19	FCFF2	\$35.38	59.89%	Buy
CVR Energy	\$19.01	FCFFGen	\$ 46.04	58.71%	Buy

The Most Overvalued stocks are...

Company Name	Price	DCF model used	DCf Value	% Under valued	Recommendation
Lululemon	\$ 46.12	FCFFGen	\$ 22.67	103.44%	Sell
Electronic Arts	\$ 21.85	FCFE3	\$10.4	110.10%	Buy
Pantaloon Retail India Ltd.	₹183.00	FCFFSt	₹ 84.83	115.73%	Sell
LVS	\$43.97	FCFF2	\$20.31	116.49%	Sell
Teva Pharmaceuticals Industry Ltd.	\$ 40.20	FCFF2	\$ 18.34	119.19%	Buy
Netflix Inc.	\$70.89	FCFF2	\$32.33	119.27%	Sell
Sears Holdings Corp.	\$ 56.96	HiGrowth	\$ 22.90	148.73%	Sell
Lionsgate	\$ 8.62	FCFF2	\$ 3.14	174.52%	Sell
Agnico-Eagle Mines	\$ 42.33	FCFFGinzu	\$ 15.16	179.22%	Sell
Concur Technologies Inc.	\$52.18	FCFF2	\$18.22	186.39%	Sell
Chipotle Mexican Grill	\$ 338.60	FCFF2	\$ 117.37	188.49%	Sell
LinkedIn	\$ 71.89	HiGrowth	\$ 23.44	206.70%	Sell
Groupon Inc.	\$23.48	FCFF3	\$7.54	211.41%	Sell
Advisory Board Company	\$ 72.30	FCFF2	\$ 17.25	319.13%	Sell
Salesforce	\$123.88	HiGrowth	\$25.58	384.28%	Sell

The ultimate test... Did undervalued stocks make money?



More on the winners...

- About 60% of all buy recommendations make money; about 45% of sell recommendations beat the market.
- There are two or three big winners in each period, but the payoff was not immediate. Buying Apple in 1999 would have led to negative returns for a year or more, before the turnaround occurred.
- Stocks on which there is disagreement among different people tend to do worse than stocks on which there is no disagreement
- 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.

$$\text{Value of Stock} = \text{DPS}_1 / (k_e - g)$$

$$\text{PE} = \text{Payout Ratio} (1+g)/(r-g)$$

$$\text{PE} = f(g, \text{payout}, \text{risk})$$

$$\text{PEG} = \text{Payout ratio} (1+g)/g(r-g)$$

$$\text{PEG} = f(g, \text{payout}, \text{risk})$$

$$\text{PBV} = \text{ROE (Payout ratio)} (1+g)/(r-g)$$

$$\text{PBV} = f(\text{ROE}, \text{payout}, g, \text{risk})$$

$$\text{PS} = \text{Net Margin (Payout ratio)} (1+g)/(r-g)$$

$$\text{PS} = f(\text{Net Mgn}, \text{payout}, g, \text{risk})$$

Equity Multiples

Firm Multiples

$$V/\text{FCFF} = f(g, \text{WACC})$$

$$\text{Value}/\text{FCFF} = (1+g)/(WACC-g)$$

$$V/\text{EBIT}(1-t) = f(g, \text{RIR}, \text{WACC})$$

$$\text{Value}/\text{EBIT}(1-t) = (1+g)/(1-\text{RIR})/(WACC-g)$$

$$V/\text{EBIT} = f(g, \text{RIR}, \text{WACC}, t)$$

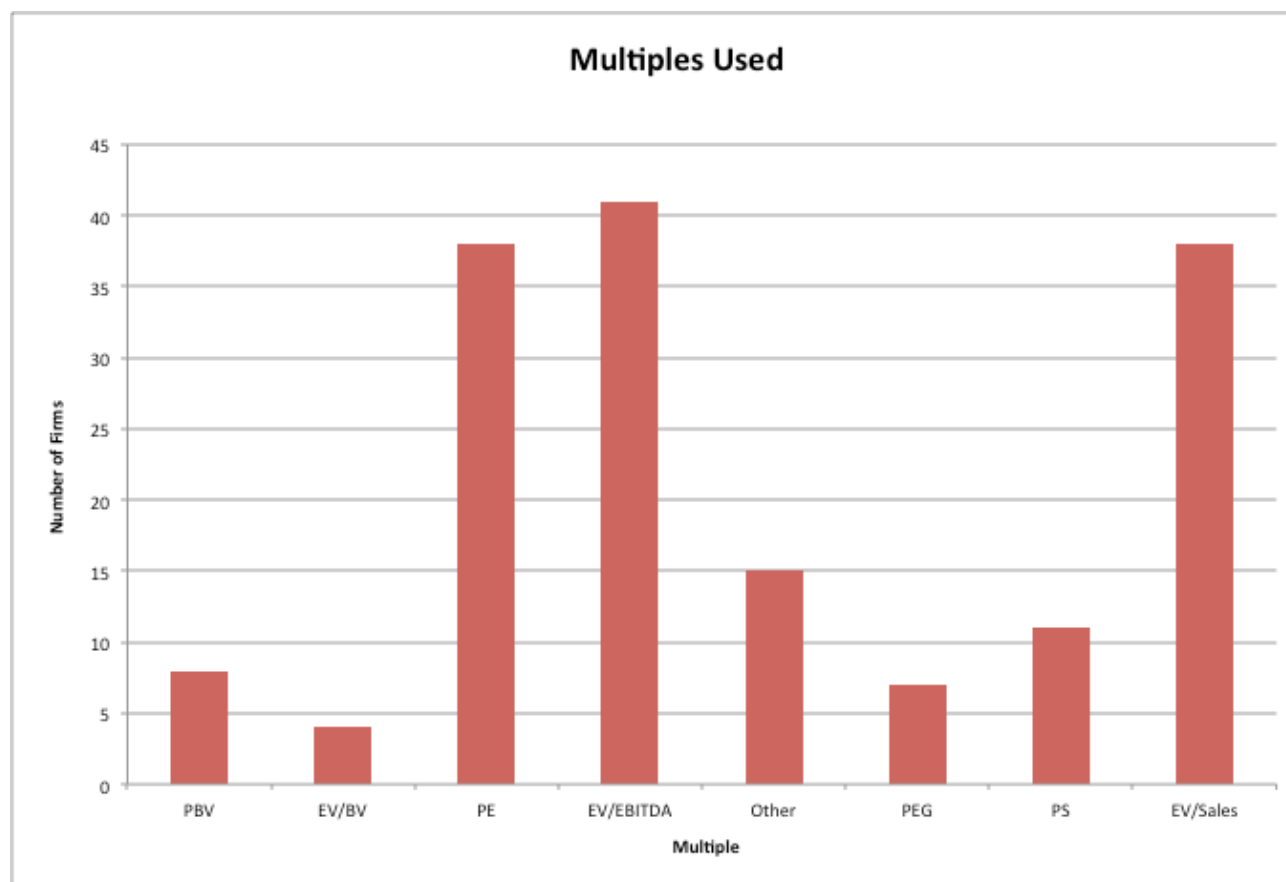
$$\text{Value}/\text{EBIT} = (1+g)(1-\text{RiR})/(1-t)(WACC-g)$$

$$\text{VS} = f(\text{Oper Mgn}, \text{RIR}, g, \text{WACC})$$

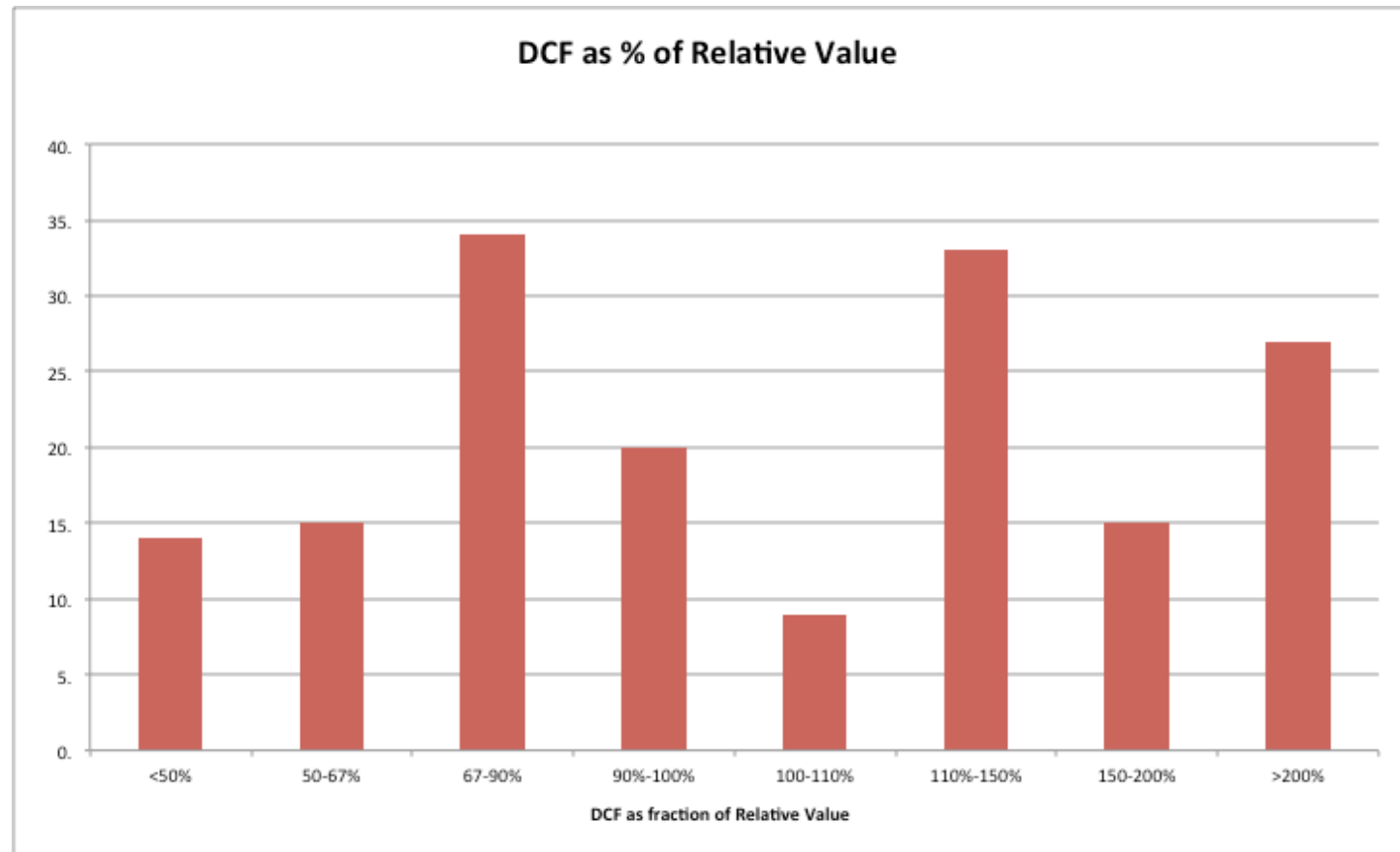
$$\text{VS} = \text{Oper Margin} (1-\text{RIR}) (1+g)/(WACC-g)$$

$$\text{Value of Firm} = \text{FCFF}_1 / (WACC - g)$$

The Multiples you used were ...



DCF vs Relative Valuation



Most undervalued on a relative basis...

Company Name	Price	Multiple used	Relative Value	% under valued	Recommendation
American Airlines	\$ 1.03	PE	\$ 8.09	87.27%	Buy
Ener 1, Inc.	0.07	PS	0.44	84.09%	Buy
Vical Inc.	\$ 4.58	EV/SALES	\$ 26.53	82.74%	Buy
Pacific Sunwear of California	\$1.68	VS	\$8.54	80.33%	Buy
Ista Pharmaceuticals	\$ 3.94	VS	\$ 18.99	79.25%	Buy
Hudson Pacific Properties	\$ 13.35	VS	\$ 50.91	73.78%	Buy
B2W	\$ 9.81	PS	\$ 35.85	72.64%	Buy
Sprint	\$ 2.44	PS	\$ 8.42	71.02%	Buy
Sprint Nextel	\$ 2.47	VS	\$ 7.68	67.84%	Buy
Netflix	\$70.89	P/E	\$206.80	65.72%	Buy
Aeroflot Russian Airlines	\$ 1.50	VS	\$ 4.23	64.54%	Hold
Chiquita Brands Intl	\$ 8.47	Current PE	\$ 21.79	61.13%	Buy
Perry Ellis	\$14.19	EV/Sales	\$35.75	60.31%	Buy
Pantaloon Retail India Ltd.	₹ 183.00	EV/S	₹ 438.76	58.29%	Sell

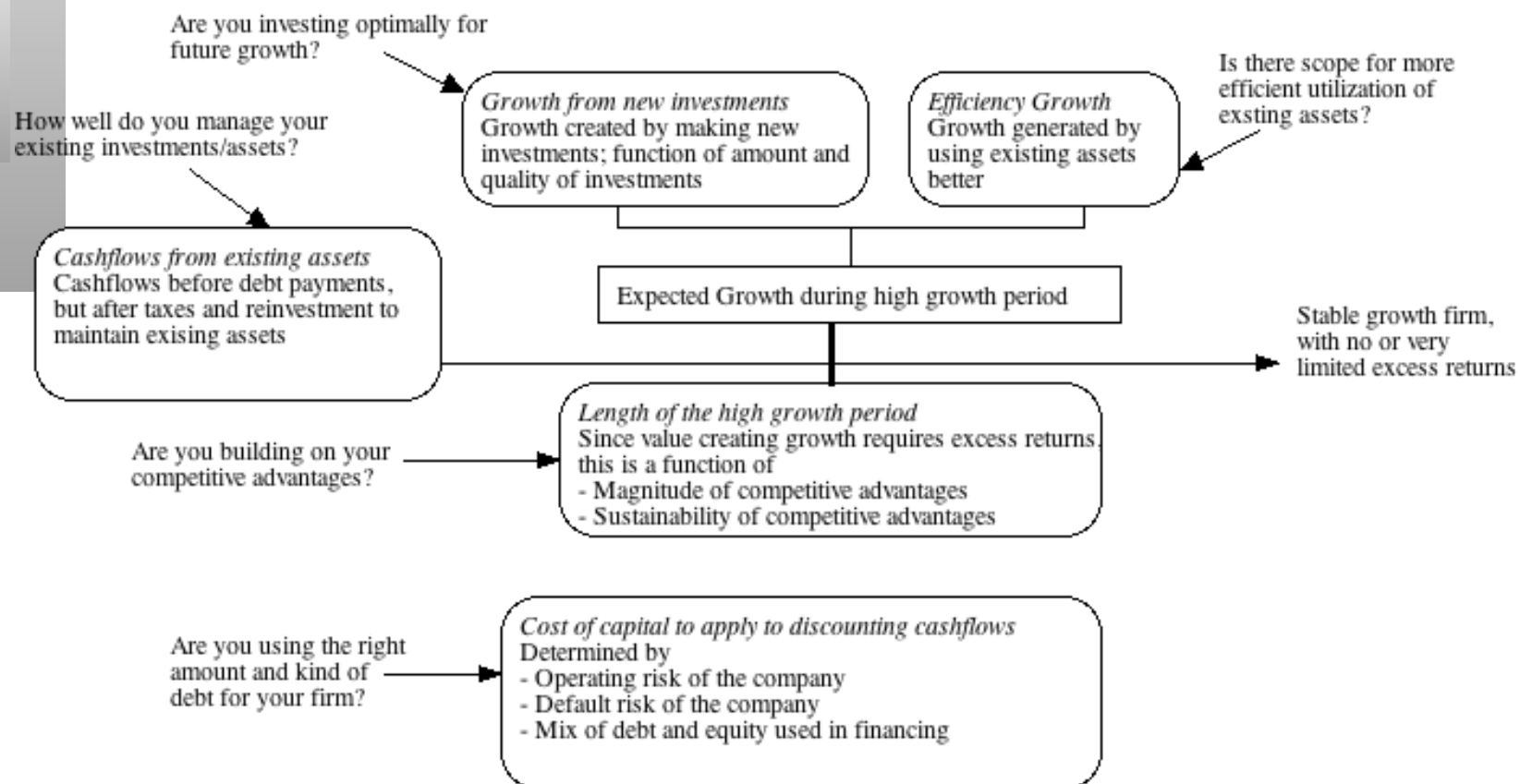
Most overvalued on a relative basis...

Company Name	Price	Multiple used	Relative Value	% under valued	Recommendation
Six Flags	\$38.35	VS	\$ 14.61	162.49%	Sell
Nike Inc.	\$97.62	P/E	\$33.08	195.10%	Sell
Advisory Board Company	\$72.30	PE	\$ 24.09	200.11%	Sell
Dunkin' Brands Inc	25.28	EV/Sales	\$ 7.38	242.55%	Sell
Lionsgate	\$ 8.62	VEBITDA	\$ 2.42	256.20%	Sell
LinkedIn	\$71.89	EV/EBITDA	\$ 19.75	264.00%	Sell
Kodiak Oil & Gas	\$9.18	EV/EBITDA	\$2.44	276.23%	Sell
I.T. Ltd	\$4.64	VS	\$1.07	333.64%	Buy
Netflix Inc.	\$70.89	PEG	\$12.60	462.62%	Sell
Tesla Motors	\$30.50	PBV	\$ 5.00	510.00%	Buy
Pandora Media	\$10.47	EV/SALES	\$ 1.44	627.08%	Buy
MAKO Surgical	\$26.68	VS	\$ 3.21	731.15%	Sell
Tesla	31.04	VS	2.97	945.12%	Buy
Rite Aid	\$ 1.19	EV/EBITDA	\$ 0.07	1600.00%	Sell
LinkedIn	73.19	PE	2.31	3068.40%	Sell

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 = 15
- Median Percent increase in value over DCF value= 99.45%

Value Enhancement... You too can do it!



1. Hostile Acquisition: Example

- In a hostile acquisition, you can ensure management change after you take over the firm. Consequently, you would be willing to pay up to the optimal value.
- As an example, Blockbuster was trading at \$9.50 per share in July 2005. The optimal value per share that we estimated as \$ 12.47 per share. Assuming that this is a reasonable estimate, you would be willing to pay up to \$2.97 as a premium in acquiring the shares.
- Issues to ponder:
 - Would you automatically pay \$2.97 as a premium per share? Why or why not?
 - What would your premium per share be if change will take three years to implement?

2. Market prices of Publicly Traded Companies: An example

- The market price per share at the time of the valuation (May 2005) was roughly \$9.50.
Expected value per share = Status Quo Value + Probability of control changing * (Optimal Value – Status Quo Value)
 $\$9.50 = \$5.13 + \text{Probability of control changing} (\$12.47 - \$5.13)$
- The market is attaching a probability of 59.5% that management policies can be changed. This was after Icahn's successful challenge of management. Prior to his arriving, the market price per share was \$8.20, yielding a probability of only 41.8% of management changing.

	Value of Equity	Value per share
Status Quo	\$ 955 million	\$ 5.13 per share
Optimally managed	\$2,323 million	\$12.47 per share

Value of stock in a publicly traded firm

- When a firm is badly managed, the market still assesses the probability that it will be run better in the future and attaches a value of control to the stock price today:

$$\text{Value per share} = \frac{\text{Status Quo Value} + \text{Probability of control change (Optimal - Status Quo Value)}}{\text{Number of shares outstanding}}$$

- With voting shares and non-voting shares, a disproportionate share of the value of control will go to the voting shares. In the extreme scenario where non-voting shares are completely unprotected:

$$\text{Value per non - voting share} = \frac{\text{Status Quo Value}}{\# \text{ Voting Shares} + \# \text{ Non - voting shares}}$$

$$\text{Value per voting share} = \text{Value of non - voting share} + \frac{\text{Probability of control change (Optimal - Status Quo Value)}}{\# \text{ Voting Shares}}$$

3. Voting and Non-voting Shares: An Example

- To value voting and non-voting shares, we will consider Embraer, the Brazilian aerospace company. As is typical of most Brazilian companies, the company has common (voting) shares and preferred (non-voting shares).
 - Status Quo Value = 12.5 billion \$R for the equity;
 - Optimal Value = 14.7 billion \$R, assuming that the firm would be more aggressive both in its use of debt and in its reinvestment policy.
- There are 242.5 million voting shares and 476.7 non-voting shares in the company and the probability of management change is relatively low. Assuming a probability of 20% that management will change, we estimated the value per non-voting and voting share:
 - Value per non-voting share = Status Quo Value/ (# voting shares + # non-voting shares) = $12,500 / (242.5 + 476.7) = 17.38$ \$R/ share
 - Value per voting share = Status Quo value/sh + Probability of management change * (Optimal value – Status Quo Value) = $17.38 + 0.2 * (14,700 - 12,500) / 242.5 = 19.19$ \$R/share
- With our assumptions, the voting shares should trade at a premium of 10.4% over the non-voting shares.

4. Minority Discount: An example

- Assume that you are valuing Kristin Kandy, a privately owned candy business for sale in a private transaction. You have estimated a value of \$ 1.6 million for the equity in this firm, assuming that the existing management of the firm continues into the future and a value of \$ 2 million for the equity with new and more creative management in place.
 - Value of 51% of the firm = 51% of optimal value = $0.51 * \$ 2 \text{ million} = \1.02 million
 - Value of 49% of the firm = 49% of status quo value = $0.49 * \$1.6 \text{ million} = \$784,000$
- Note that a 2% difference in ownership translates into a large difference in value because one stake ensures control and the other does not.

Alternative Approaches to Value Enhancement

- *Maximize a variable that is correlated with the value of the firm. There are several choices for such a variable. It could be*
 - an accounting variable, such as **earnings or return on investment**
 - a marketing variable, such as **market share**
 - a cash flow variable, such as cash flow return on investment (CFROI)
 - a risk-adjusted cash flow variable, such as Economic Value Added (EVA)
- **The advantages of using these variables are that they**
 - Are often simpler and easier to use than DCF value.
- **The disadvantage is that the**
 - Simplicity comes at a cost; these variables are not perfectly correlated with DCF value.

Value this company..

- Assume that you have a firm with a book value value of capital of \$ 100 million, on which it expects to generate a return on capital of 15% in perpetuity with a cost of capital of 10%.
- This firm is expected to make additional investments of \$ 10 million at the beginning of each year for the next 5 years. These investments are also expected to generate 15% as return on capital in perpetuity, with a cost of capital of 10%.
- After year 5, assume that
 - The earnings will grow 5% a year in perpetuity.
 - The firm will keep reinvesting back into the business but the return on capital on these new investments will be equal to the cost of capital (10%).

An EVA valuation..

Capital Invested in Assets in Place	= \$ 100
EVA from Assets in Place = $(.15 - .10)(100)/.10$	= \$ 50
+ PV of EVA from New Investments in Year 1 = $[(.15 - .10)(10)/.10]$	= \$ 5
+ PV of EVA from New Investments in Year 2 = $[(.15 - .10)(10)/.10]/1.1$	= \$ 4.55
+ PV of EVA from New Investments in Year 3 = $[(.15 - .10)(10)/.10]/1.1^2$	= \$ 4.13
+ PV of EVA from New Investments in Year 4 = $[(.15 - .10)(10)/.10]/1.1^3$	= \$ 3.76
+ PV of EVA from New Investments in Year 5 = $[(.15 - .10)(10)/.10]/1.1^4$	= \$ 3.42
Value of Firm	= \$ 170.85

Firm Value using DCF Valuation: Estimating FCFF

	<i>Base Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>Term. Year</i>
EBIT (1-t) : Assets in Place	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	
EBIT(1-t) :Investments- Yr 1		\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	
EBIT(1-t) :Investments- Yr 2			\$1.50	\$1.50	\$1.50	\$1.50	
EBIT(1-t): Investments -Yr 3				\$1.50	\$1.50	\$1.50	
EBIT(1-t): Investments -Yr 4					\$1.50	\$1.50	
EBIT(1-t): Investments- Yr 5						\$1.50	
Total EBIT(1-t)		\$16.50	\$18.00	\$19.50	\$21.00	\$22.50	\$23.63
- Net Capital Expenditures	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$11.25	\$11.81
FCFF		\$6.50	\$8.00	\$9.50	\$11.00	\$11.25	\$11.81
PV of FCFF	(\$10)	\$5.91	\$6.61	\$7.14	\$7.51	\$6.99	
Terminal Value						\$236.25	
PV of Terminal Value						\$146.69	
Value of Firm	\$170.85						

After year 5, the reinvestment rate is 50% = g / ROC

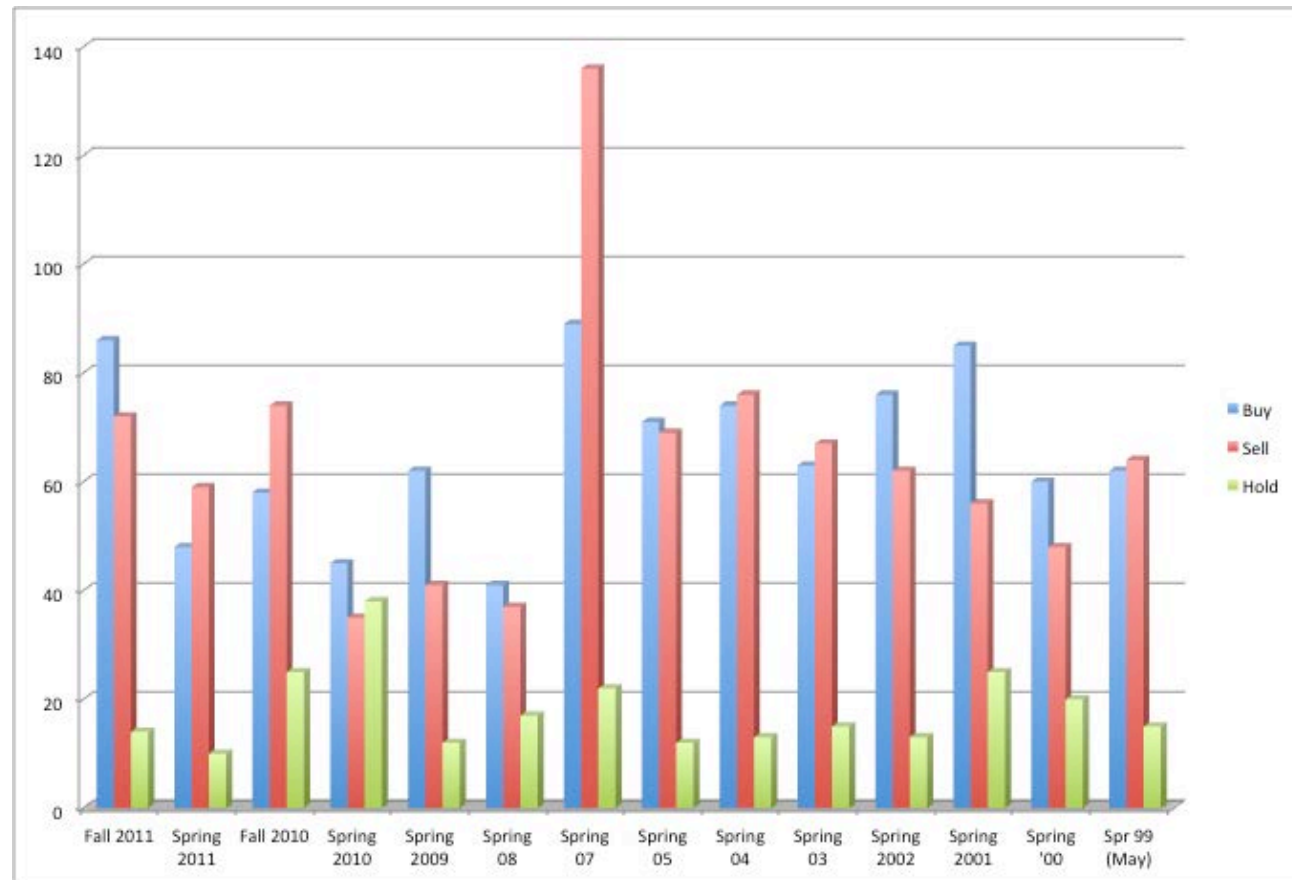
The bottom line

- Old wine in a new bottle: All discounted cash flow models (cost of capital, APV, EVA, Excess return models) are all variants of the same model and, done right, should yield the same value.
- No magic bullets: Value enhancement is hard work. There are no “short cuts” and adopting EVA, CFROI or any other measure will not increase value.
- Tying compensation systems to a measure is a recipe for game playing: If you tie management compensation to EVA, for instance, can lead to:
 - The Growth trade off game: Managers may give up valuable growth opportunities in the future to deliver higher EVA in the current year.
 - The Risk game: Managers may be able to deliver a higher dollar EVA but in riskier businesses. The value of the business is the present value of EVA over time and the risk effect may dominate the increased EVA.
 - The capital invested game: The key to delivering positive EVA is to make investments that do not show up as part of capital invested. That way, your operating income will increase while capital invested will decrease.

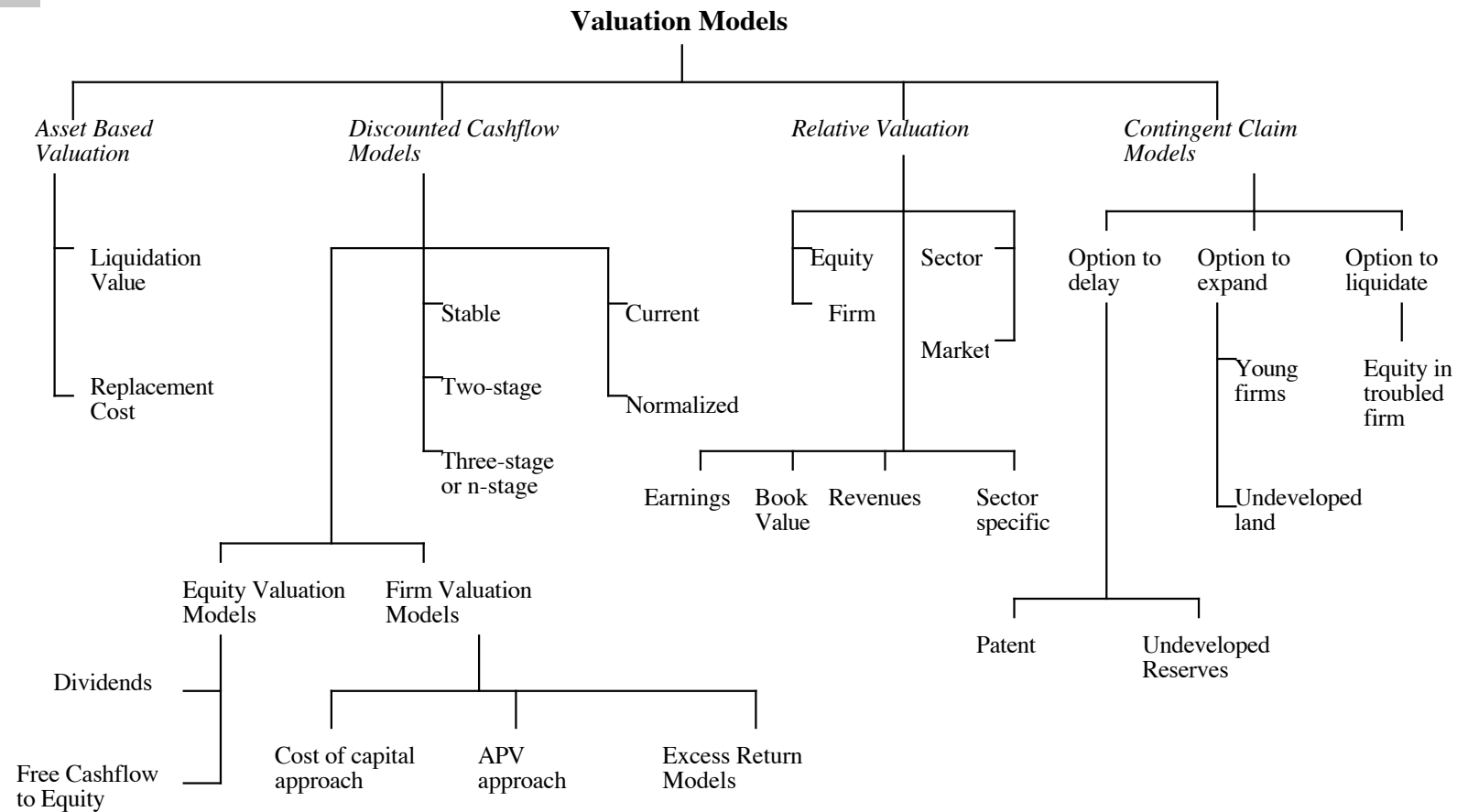
Acting on valuation: It is not just an academic exercise

- *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.
- *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.
- *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..



Choices...Choices...Choices...



Picking your 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?
 - ☐ Discounted Cash Flow Valuation
 - ☐ Relative Valuation
 - ☐ Neither. I believe that markets are efficient.

Some Not Very Profound Advice

- Its all in the fundamentals. The more things change, the more they stay the same....
- Focus on the big picture. Don't let the details trip you up.
- Experience does not equal knowledge...
- Keep your perspective. It is only a valuation.
- In investing, luck dominates skill and knowledge.

Or maybe you can fly....

