
Valuation: Closing Thoughts

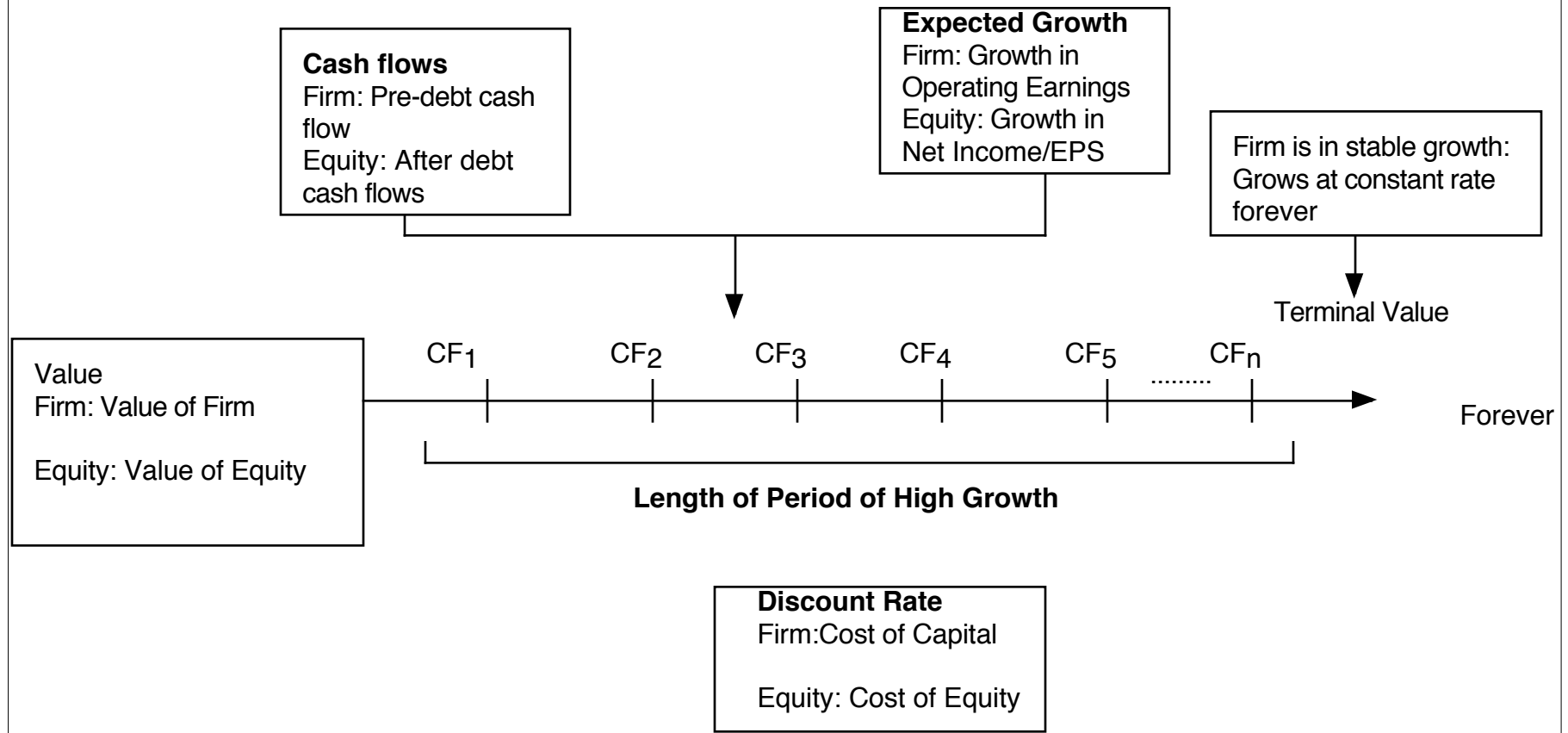
All good things come to an end...

Updated: September 2011

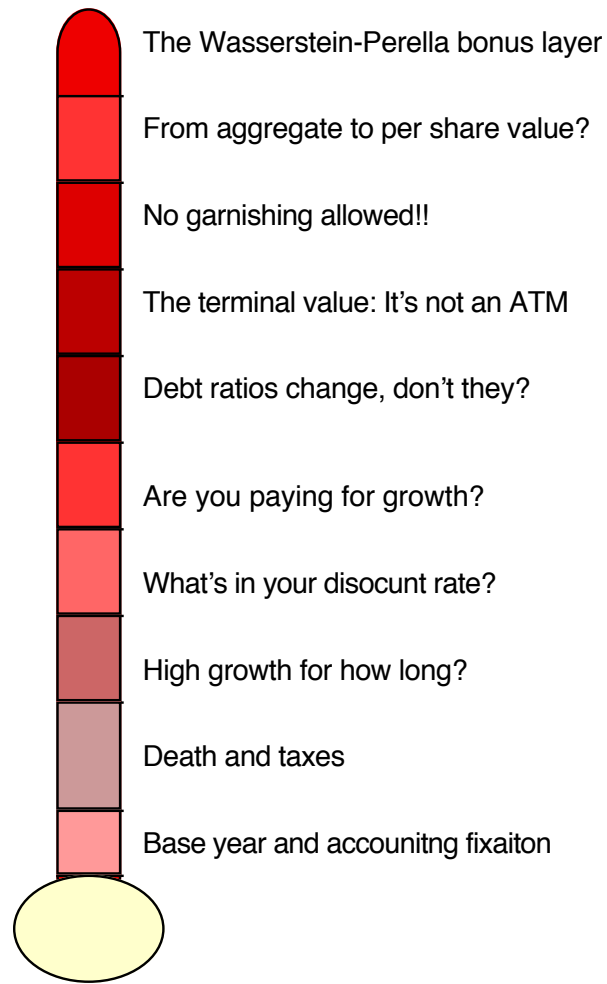
Back to the very beginning: Approaches to Valuation

- **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 of value (equity) and the potential victims of this crime (lenders)

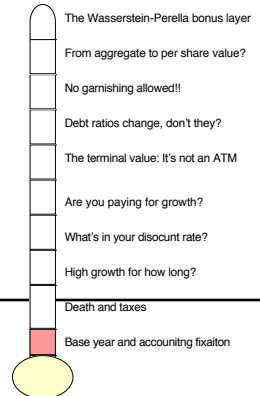
DISCOUNTED CASHFLOW VALUATION



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

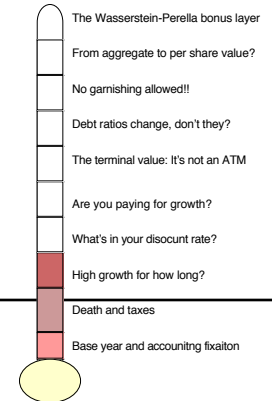
- Assume that you have been asked to value a company and have been provided with the most recent year's financial statements:

EBITDA	140	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?

- 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)

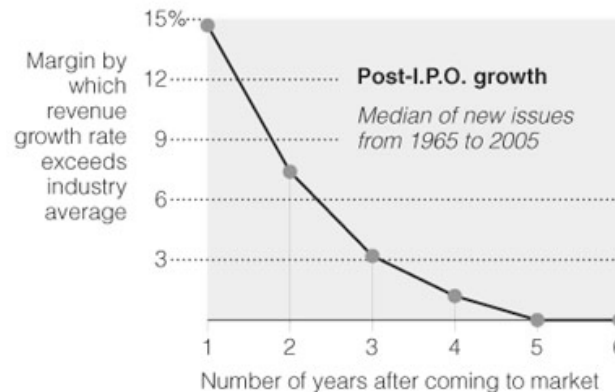
Layer 3: High Growth for how long...



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

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:

$$\text{Cost of equity} = \text{Riskfree Rate} + \text{Beta} \times \text{ERP} + \text{Small firm premium} = 5\% + 1.20 \times 5\% + 3\% = 14\%$$

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*

$$\text{Cost of capital} = \text{Cost of equity} \left(\frac{\text{Equity}}{\text{Debt} + \text{Equity}} \right) + \text{Cost of debt} \left(\frac{\text{Debt}}{\text{Debt} + \text{Equity}} \right) = 14\% \left(\frac{1000}{2000} \right) + 3\% \left(\frac{1000}{2000} \right) = 8.05\%$$

From above

Used market value of equity

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

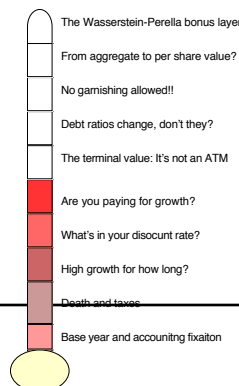
Used effective tax rate of 30%

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

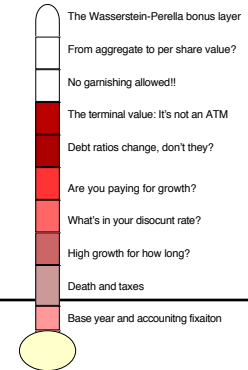
What questions would you raise about the forecasts?

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

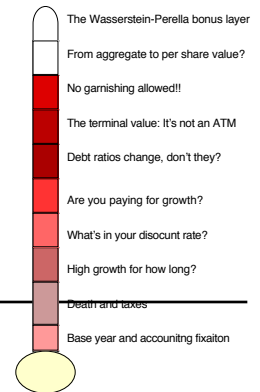


- The best way to compute terminal value is to
 - ❑ Use a stable growth model and assume cash flows grow at a fixed rate forever
 - ❑ Use a multiple of EBITDA or revenues in the terminal year
 - ❑ Use the estimated liquidation value of the assets

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

- 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...

- The Wasserstein-Perella bonus layer
- From aggregate to per share value?
- No garnishing allowed!!
- The terminal value: It's not an ATM
- Debt ratios change, don't they?
- Are you paying for growth?
- What's in your discount rate?
- High growth for how long?
- Death and taxes
- Base year and accounting fixation

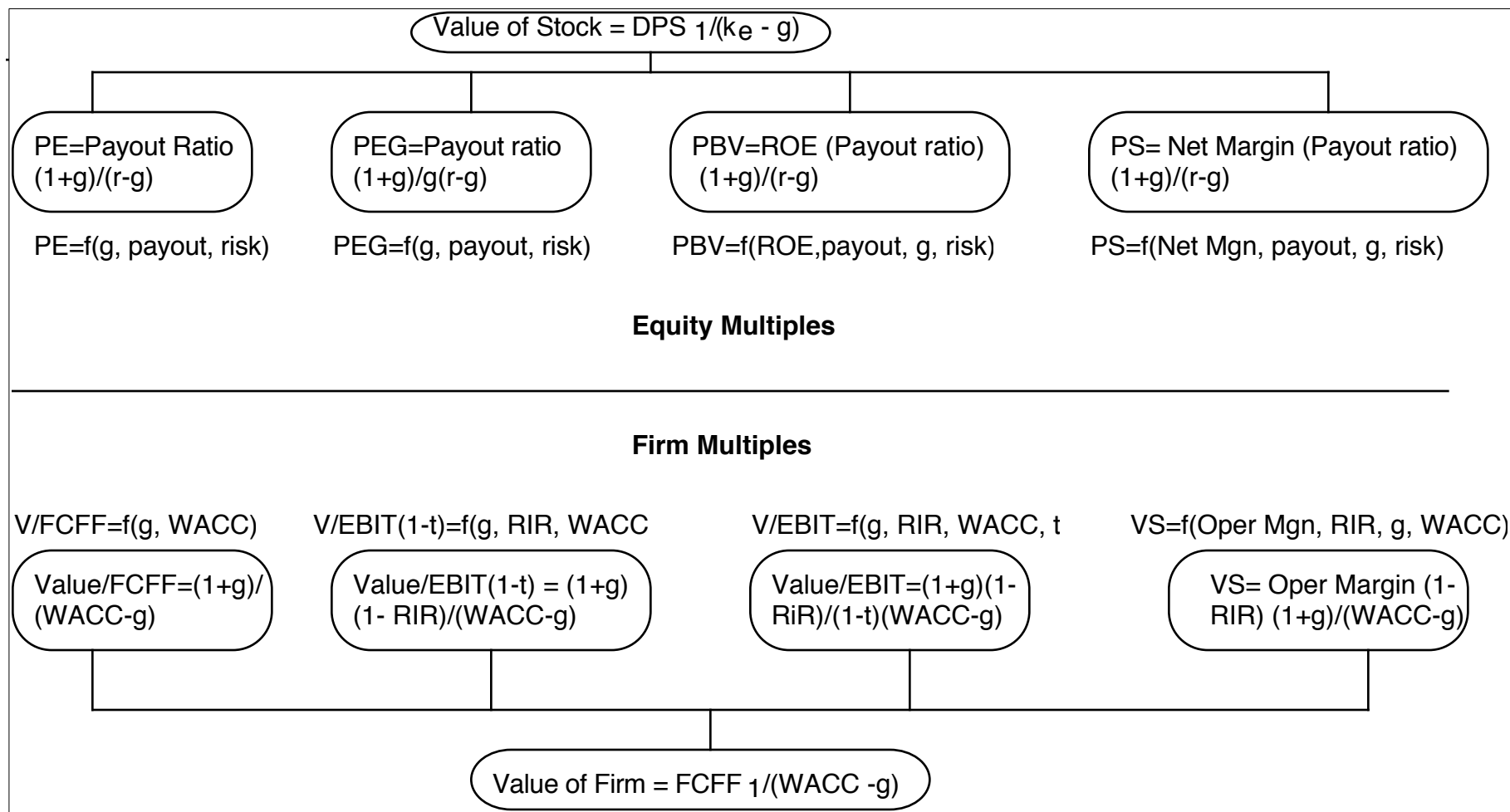
Exhibit 8
KENNECOTT COPPER CORPORATION
PROJECTED CARBORUNDUM COMPANY FINANCIAL DATA ADJUSTED TO REFLECT THE ACQUISITION OF CARBORUNDUM BY KENNECOTT
AT A PRICE OF \$66 PER SHARE, 1977-1987
(\$ millions except for per share and ratio data)

	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	\$1,129.9	\$1,265.5	\$1,392.1	\$1,531.3	\$1,684.4	\$1,852.8	\$2,038.1	
Net income (before adjustments)	38.4		45.1	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	\$87.0	\$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	\$32.8	\$36.6	\$40.7	\$45.4	\$50.3			
Capital contributed by Kennecott	—	—	—	—	—	—	—	—	—	—	—	—	—
Debt financing (net)	34.7	17.9	14.1	13.9	13.3	17.6	19.8	21.9	24.5	27.1			
Total capital added	\$34.8	\$51.3	\$40.3	\$39.6	\$38.1	\$50.4	\$56.4	\$62.6	\$69.9	\$77.4			
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	
Sales/assets	1.23		0.96	1.00	1.06	1.12	1.19	1.23	1.26	1.30	1.33	1.36	
Profit/sales	0.04		0.040	0.043	0.047	0.050	0.055	0.056	0.056	0.056	0.057	0.057	
Assets/net worth	1.89		2.01	2.01	2.02	2.03	2.05	2.05	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	
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	\$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 market value 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 Carborundum will have 35% debt in its total capital structure after 1977.													
The \$80 million of goodwill created as a result of the acquisition is amortized over 40 years. This expense is not tax-deductible.													
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.													

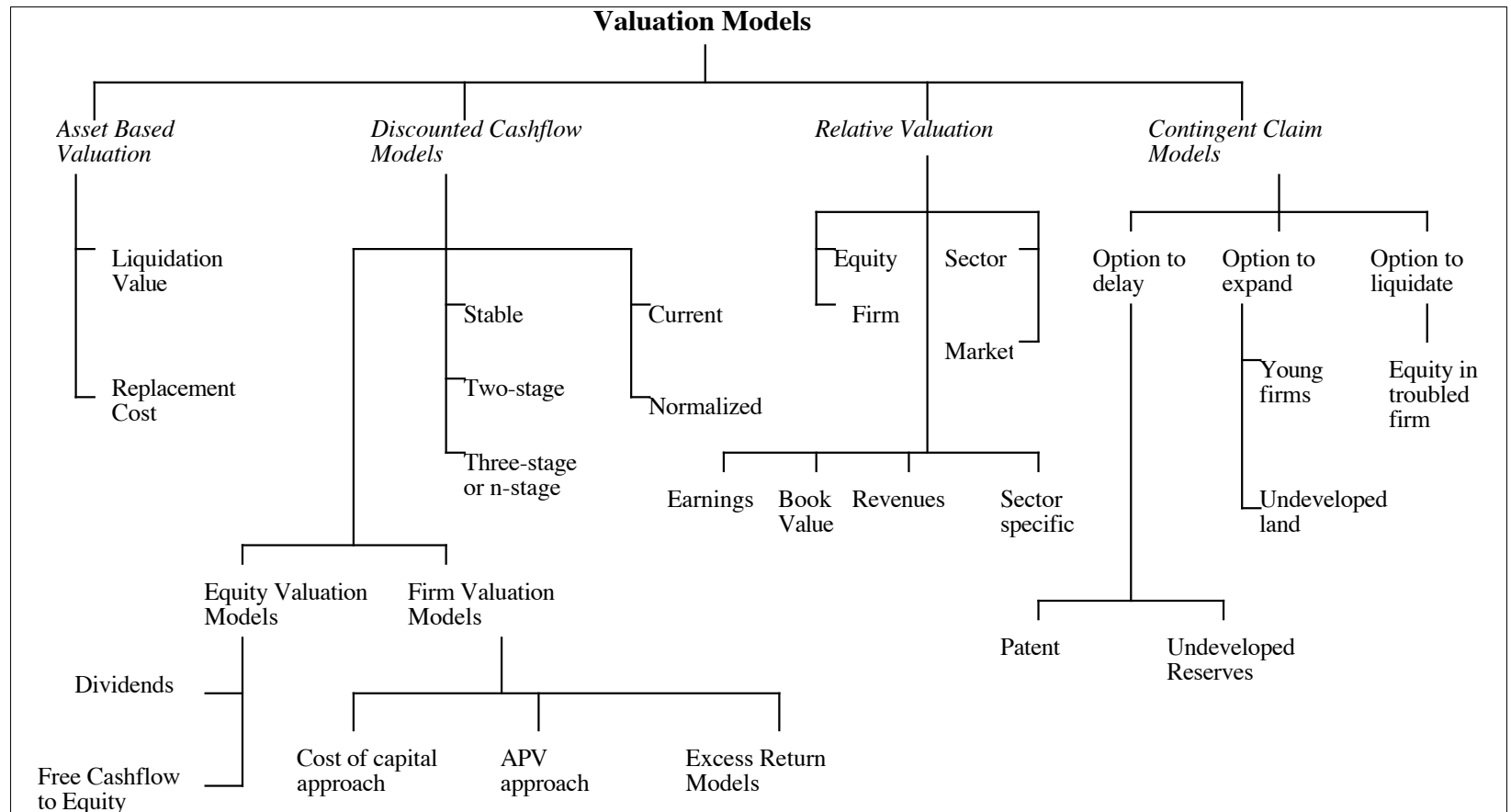
	Cost of Equity	Cost of Capital
Kennecott Corp (Acquirer)	13.0%	10.5%
Carborandum (Target)	16.5%	12.5%

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.



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.
- Luck dominates...

Or maybe you can fly....

