Valuation: Closing Thoughts

Spring 2012 "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..





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 Layer 2: Taxes and value Base year and accounting fication Assume that you have been asked to value a company and have been provided

EBITDA	140	
- DA	40	Free Cash flow to firm
EBIT	100	-(Cap Ex – Depreciation)
- Interest exp	20	- Change in non-cash WC
Taxable income	80	=FCFF
Taxes	32	
Net Income	48	

with the most recent year's financial statements:

Assume also that cash flows will be constant and that there is <u>no growth in</u> <u>perpetuity</u>. 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)





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	Small cap premium = 3%	No small cap premium
cost of equity		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-	3% (13) = 2.1%	9% (14) = 5.4%
tax)		
Debt ratio	Book ratio: Liabilities=50%	Market ratio: Interest bearing debt = 30%;
	Equity=50%	Equity= 70%
Cost of capital	14% (.5) + 2.1% (.5) = 8.05%	15.68%(.7) + 5.4%(.3) = 12.60%

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

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?

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

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 <u>earnings</u> at 2% a year forever. Estimate the value of the business.

rom aggregate to per share value?

The terminal value: It's not an ATM Debt ratios change, don't they? Are you paying for growth? What's in your disocunt rate?

High growth for how long? Death and taxes Base year and accounition 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?

The Wasserstein-Perella bonus lay

The terminal value: It's not an ATI

Are you paying for growth?

What's in your disocunt rate High growth for how long?

Base year and accouniting fixaitor



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...

				Exhi	011 8								
	-	KEN	INECOT	r copp	ER COR	PORAT	ION Acouts	ITTON OF	CARBO	RUNDUM	BY KEN	INNECOT	т
PROJECTED CARBORUNDUM CO.	MPANY I	AT A	PRICE O	F \$66 PI	ER SHAR	E, 1977-	1987		Cintos				
		(\$ m)	illions exc	ept for p	er snare a	nd ratio	data)						
	1977		1977	1070	1070	1080	10.91	10.82	7083	1984	1985	1986	1987
1	Inadjusted	Majustmenti	Лајшиеа	1978	19/9	1900	1901	1702	1,05	4701			
come statement Solos	\$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			43.1	50.7	60.1	70.6	84.7	93.2	102.5	112.7	124.0	136.4
nterest adjustment ²	0			6.5	7.8	8.5	9.2	9.8	10.7	11.7	12.8	14.0	13.4
Goodwill adjustments	0			2.0	2.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
Plant write-up adjustments	eze 4			\$31.8	\$38.1	\$ 46.8	\$ 56.6	\$ 70.1	\$ 77.7	\$ 86.0	\$ 95.1 \$	105.2 \$	116.2
Net income (arter adjustments)	\$30.4			451.0					1000				
ance sheet		(+ 37.0											
Working capital	\$198.8	+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	437.5	466.6	499.1	535.0	576.1
Goodwill	0	+ 80.0	80.0	78.0	76.0	74.0 048 4	1 007 0	1 065 8	1135.5	1.213.1	1.299.0	1.394.6	1.500.3
Long.term debr	384.5	+ 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	1,039.0	1,117.0
pital sources					A	1262	475 7	42.6.9	412.9	\$16.6	\$40.7	\$45.4	\$50.3
Profit retentions				\$ 0.1	\$33.4	\$20.2	\$23.7	\$2.50	a)2.0	-		-	-
Debr 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
ev financial ratios				44									
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			0.90	1.00	1.00	7 0.05	0 0.05	5 0.0	6 0.05	6 0.050	5 0.05	0.05
Assers /per worth	1.89			2.01	2.01	2.02	2.03	2.05	2.0	3 2.06	2.06	2.06	2.07
Profit/net worth	.124			0.07	8 0.08	6 0.100	0 0.11	4 0.13	5 0.1	41 0.14	6 0.15	0.15	5 0.16
	-		-	-					-		-		
ash flow to Kennecott Acquisition of Carborundum													
Dividends to Kennecott			140.0	\$31.7	\$ 4.7	\$20.6	\$30.9	\$45.3	\$440		A		
carryforwards*									4127	449.4	\$22.4	\$39.8	\$ 65.9
Tax shelter from plant write-up adj.4			- T	20.0	20.0	2.0	2.0				-	-	-
Terminal value at 10 times earnings7				2.0	2.0	4.0	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Net cash flow			\$(410.0)	\$54.5	\$27.5	\$23.4	\$33.7	\$48.1	\$47.7	\$52.2	\$57.2	\$62.6	1,044.9
Assumptions:													

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

Aswath Damodaran

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The Models You Used in DCF Valuation



What you found...



The most undervalued stocks...

		-		
Company Name	Price	DCf Value	Recommendation	% Under or over
ISK	\$ 0.34	\$ 2.09	Buy	-83.73%
First Solar	16.94	58.97	Buy	-71.27%
BAIDU	130.02	330.86	Hold	-60.70%
Grupo Mexico	\$ 3.10	\$ 7.80	Buy	-60.26%
Suntech	\$ 2.51	\$ 5.63	Buy	-55.42%
B&N	17.98	38.35	Buy	-53.12%
Stillwater Mining Co.	9.45	19.38	Buy	-51.24%
Morgan Stanley	\$16.95	\$ 33.81	Buy	-49.87%
Elmos Semiconductor AG	7.64	15.08	Buy	-49.34%
USS	26.74	49.28	Buy	-45.74%
Microsoft	\$30.98	\$ 56.05	Buy	-44.73%
Morgan Stanley	\$16.00	\$ 28.87	Buy	-44.58%
Advanced Micro Devices (AMD)	\$ 7.18	\$ 12.11	Buy	-40.71%
Specialty Products, S.A. de C.V.	\$11.43	\$ 17.26	Buy	-33.78%
TESCO (TSCO)	3.19	4.80	Buy	-33.54%

The Most Overvalued stocks are...

Company Name	Price	DCf Value	Recommendation	% Under or over
Pacific Sunwear	\$ 1.48	\$ 0.15	Sell	886.67%
LinkedIn	\$106.40	\$ 18.38	Sell	478.89%
LinkedIn	\$106.40	\$ 18.38	Sell	478.89%
Clearwire	1.52	0.28	Sell	442.86%
iRobot	\$ 22.14	\$ 5.69	Sell	289.10%
iRobot	\$ 22.14	\$7.19	Sell	207.93%
VMWARE	\$108.02	\$ 36.48	Sell	196.11%
VMWARE	\$108.02	\$ 36.48	Sell	196.11%
Urban Outfitters	\$30.10	\$11.00	Sell	173.64%
Lazard	25.62	10.33	Sell	148.02%
Lazard	25.62	10.33	Sell	148.02%
Saks Inc.	\$ 10.78	\$ 4.48	Sell	140.63%
Air Berlin	2.01	0.99	Sell	103.03%
Amazon	223.99	113.11	SELL	98.03%
Tesla	32.30	19.41	Sell	66.41%
Tesla	32.30	19.41	Sell	66.41%
Tesla Motors, Inc.	\$ 34.08	\$ 21.95	Sell	55.26%
Jubilant Foodworks Limited	1,096.00	724.00	SELL	51.38%
Hot Topic	\$ 10.11	\$ 6.71	Sell	50.67%

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 <u>different ways</u> by different users. When comparing and using multiples, estimated by someone else, it is critical that we <u>understand how the multiples have been estimated</u>

8 times EBITDA is not always cheap...

• Too many people who use a multiple have <u>no idea what its cross sectional</u> <u>distribution</u> 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 <u>understand the fundamentals</u> that drive each multiple, and the <u>nature of the relationship</u> between the multiple and each variable.
- There are no perfect comparables
 - Defining the <u>comparable universe</u> and <u>controlling for differences</u> is far more difficult in practice than it is in theory.



The Multiples you used were ...



DCF vs Relative Valuation



Most undervalued on a relative basis...

Company Name	Price	Multiple used	Relative Value	Recommendation	% Under or Over: Relative
Groupon	9.97	VS	101.61	Buy	-90.19%
Air Berlin	2.01	VS	14.27	Sell	-85.91%
Grupo Mexico	\$ 3.10	PE	\$ 11.27	Buy	-72.49%
First Solar	16.94	EV/Sales	42.4	Buy	-60.05%
Advanced Micro Devices (AMD)	\$ 7.18	PE	\$ 16.29	Buy	-55.92%
Stillwater Mining Co.	9.45	PE	21.15	Buy	-55.32%
Activision Blizzard	\$12.36	PBV	\$ 26.49	Buy	-53.34%
USS	26.74	EV / Sales	55.16	Buy	-51.52%
Netflix	73.14	EV / EBITDA	139.02	Hold	-47.39%
B&N	17.98	VS	32.04	Buy	-43.88%
Pandora Media, Inc.	\$ 8.75	EV/Sales	\$ 14.58	Buy	-39.99%
Acadia Realty Trust	\$23.15	P/ CFE	\$ 37.48	Buy	-38.23%
TESCO (TSCO)	3.19	EV/EBITDA	4.973	Buy	-35.85%
Suntech	\$ 2.51	PBV	\$ 3.89	Buy	-35.48%
Elmos Semiconductor AG	7.64	PE	11.02	Buy	-30.67%

Most overvalued on a relative basis...

Company Name	Price	Multiple used	Rela	tive Value	Recommendation	% Under or Over: Relative
Pacific Sunwear	\$ 1.48	VS	\$	0.10	Sell	1380.00%
Dixons Retail	0.18	VS		0.03	Buy	500.00%
Dixons Retail	0.18	VS		0.03	Buy	500.00%
VMWARE	\$108.02	PEG	\$	27.26	Sell	296.26%
VMWARE	\$108.02	PEG	\$	27.26	Sell	296.26%
iRobot	\$ 22.14	Price/Sales	\$	5.81	Sell	281.07%
iRobot	\$ 22.14	PS		\$5.81	Sell	281.07%
Linkedin	117.3	P/BV		57.3	Sell	104.71%
Facebook	\$ 31.50	EV/Sales	\$	16.16	Sell	94.93%
Liz Claiborne, Inc	13.29	EV/Sales		7.24	SELL	83.56%
BAIDU	130.02	EV/EBITDA		81.97	hold	58.62%
Hot Topic	\$ 10.11	EV/Sales	\$	6.69	Sell	51.12%
ARM Holdings	5.07	VEBITDA		3.37	Sell	50.45%
LinkedIn	\$106.40	VS	\$	80.20	Sell	32.67%
LinkedIn	\$106.40	VS	\$	80.20	Sell	32.67%
Novartis	\$ 54.10	LTM EVS	\$	43.03	Buy	25.73%

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 = 10
- Median Percent increase in value over DCF value= 80%

Value Enhancement... You too can do it!



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..

Value of Firm	=\$ 170.85
+ PV of EVA from New Investments in Year $5 = [(.1510)(10)/.10]/1.1^4$	=\$ 3.42
+ PV of EVA from New Investments in Year 4 = $[(.1510)(10)/.10]/1.1^3$	=\$ 3.76
+ PV of EVA from New Investments in Year $3 = [(.1510)(10)/.10]/1.1^2$	=\$ 4.13
+ PV of EVA from New Investments in Year $2 = [(.1510)(10)/.10]/1.1$	= \$ 4.55
+ PV of EVA from New Investments in Year $1 = [(.1510)(10)/.10]$	=\$ 5
EVA from Assets in Place = $(.1510) (100)/.10$	=\$ 50
Capital Invested in Assets in Place	=\$ 100

Firm Value using DCF Valuation: Estimating FCFF

	Base Year	1	2	3	4	5	Term. Year
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

- <u>Old wine in a new bottle</u>: 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.
- <u>No magic bullets</u>: 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:
 - <u>The Growth trade off game</u>: Managers may give up valuable growth opportunities in the future to deliver higher EVA in the current year.
 - <u>The Risk game</u>: 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.
 - <u>The capital invested game</u>: 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...



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.

A parting message...

