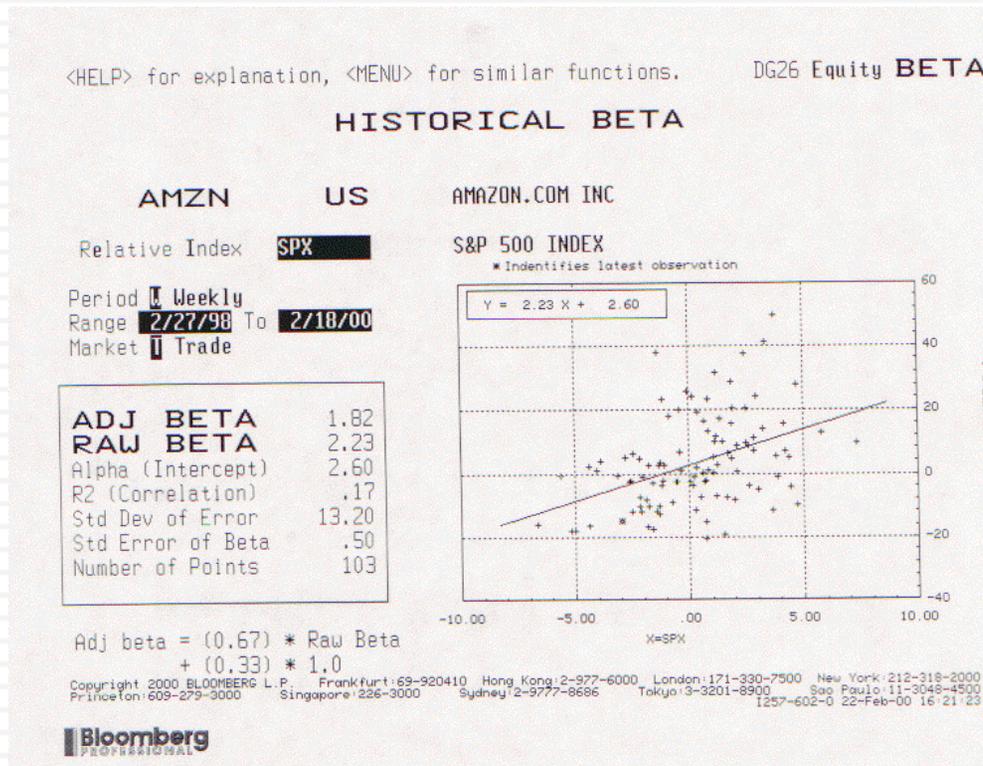


# Lesson 1: Don't sweat the small stuff



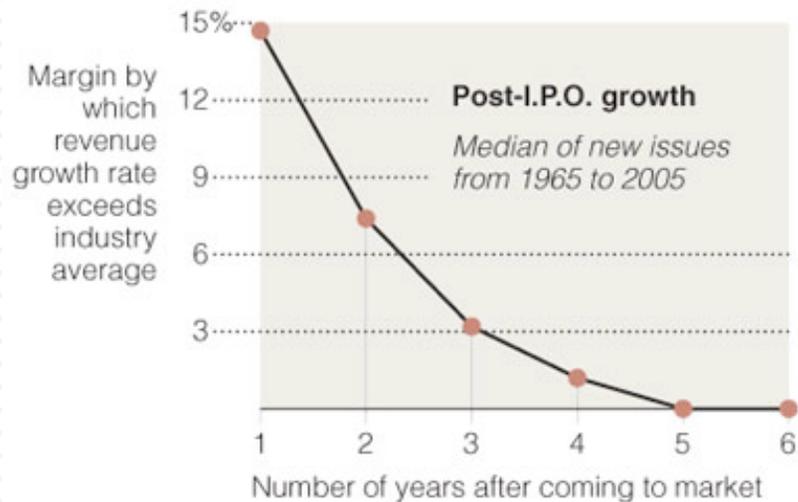
- Spotlight the business the company is in & use the beta of that business.
- Don't try to incorporate failure risk into the discount rate.
- Let the cost of capital change over time, as the company changes.
- If you are desperate, use the cross section of costs of capital to get your estimation going (use the 90<sup>th</sup> or 95<sup>th</sup> percentile across all companies).

## Lesson 2: Work backwards and keep it simple...

Year	Revenue Growth	Sales	Operating Margin	EBIT	EBIT (1-t)
Tr 12 mths		\$1,117	-36.71%	-\$410	-\$410
1	150.00%	\$2,793	-13.35%	-\$373	-\$373
2	100.00%	\$5,585	-1.68%	-\$94	-\$94
3	75.00%	\$9,774	4.16%	\$407	\$407
4	50.00%	\$14,661	7.08%	\$1,038	\$871
5	30.00%	\$19,059	8.54%	\$1,628	\$1,058
6	25.20%	\$23,862	9.27%	\$2,212	\$1,438
7	20.40%	\$28,729	9.64%	\$2,768	\$1,799
8	15.60%	\$33,211	9.82%	\$3,261	\$2,119
9	10.80%	\$36,798	9.91%	\$3,646	\$2,370
10	6.00%	\$39,006	9.95%	\$3,883	\$2,524
TY	6.00%	\$41,346	10.00%	\$4,135	\$2,688

# Lesson 3: Scaling up is hard to do & failure is common

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

- Lower revenue growth rates, as revenues scale up.
- Keep track of dollar revenues, as you go through time, measuring against market size.

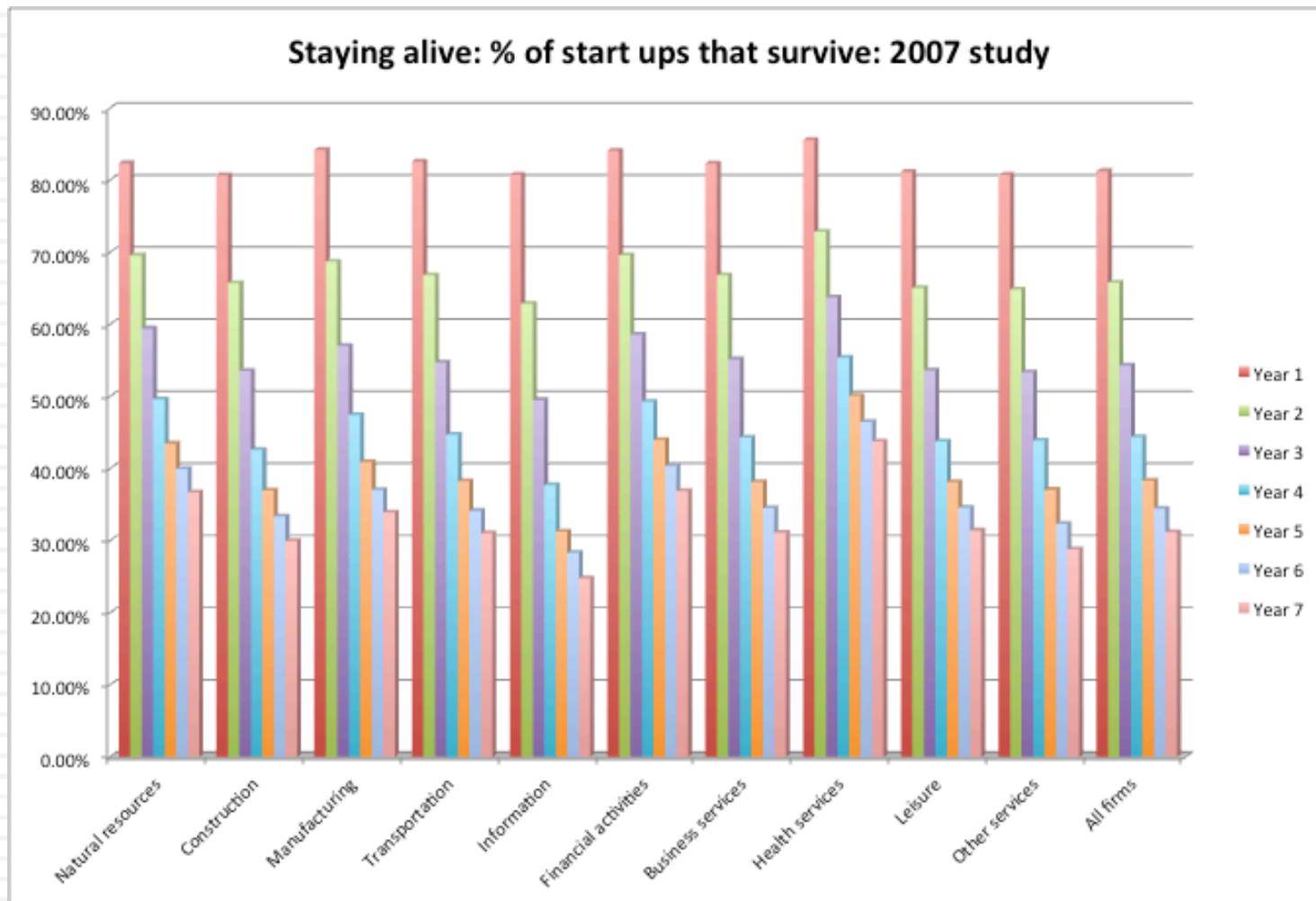
# Lesson 4: Don't forget to pay for growth...

Year	Revenues	Δ Revenue	Sales/Cap	Δ Investment	Invested Capital	EBIT (1-t)	Imputed ROC
Tr 12 mths	\$1,117				\$ 487	-\$410	
1	\$2,793	\$1,676	3.00	\$559	\$ 1,045	-\$373	-76.62%
2	\$5,585	\$2,793	3.00	\$931	\$ 1,976	-\$94	-8.96%
3	\$9,774	\$4,189	3.00	\$1,396	\$ 3,372	\$407	20.59%
4	\$14,661	\$4,887	3.00	\$1,629	\$ 5,001	\$871	25.82%
5	\$19,059	\$4,398	3.00	\$1,466	\$ 6,467	\$1,058	21.16%
6	\$23,862	\$4,803	3.00	\$1,601	\$ 8,068	\$1,438	22.23%
7	\$28,729	\$4,868	3.00	\$1,623	\$ 9,691	\$1,799	22.30%
8	\$33,211	\$4,482	3.00	\$1,494	\$ 11,185	\$2,119	21.87%
9	\$36,798	\$3,587	3.00	\$1,196	\$ 12,380	\$2,370	21.19%
10	\$39,006	\$2,208	3.00	\$736	\$ 13,116	\$2,524	20.39%
TY	\$41,346	\$2,340	NA		Assumed to be =		20.00%

# Lesson 5: The dilution is taken care off..

- With young growth companies, it is almost a given that the number of shares outstanding will increase over time for two reasons:
  - ▣ To grow, the company will have to issue new shares either to raise cash to take projects or to offer to target company stockholders in acquisitions
  - ▣ Many young, growth companies also offer options to managers as compensation and these options will get exercised, if the company is successful.
- In DCF valuation, both effects are already incorporated into the value per share, even though we use the current number of shares in estimating value per share
  - ▣ The need for new equity issues is captured in negative cash flows in the earlier years. The present value of these negative cash flows will drag down the current value of equity and this is the effect of future dilution.
  - ▣ The options are valued and netted out against the current value. Using an option pricing model allows you to incorporate the expected likelihood that they will be exercised and the price at which they will be exercised.

# Lesson 6: If you are worried about failure, incorporate into value



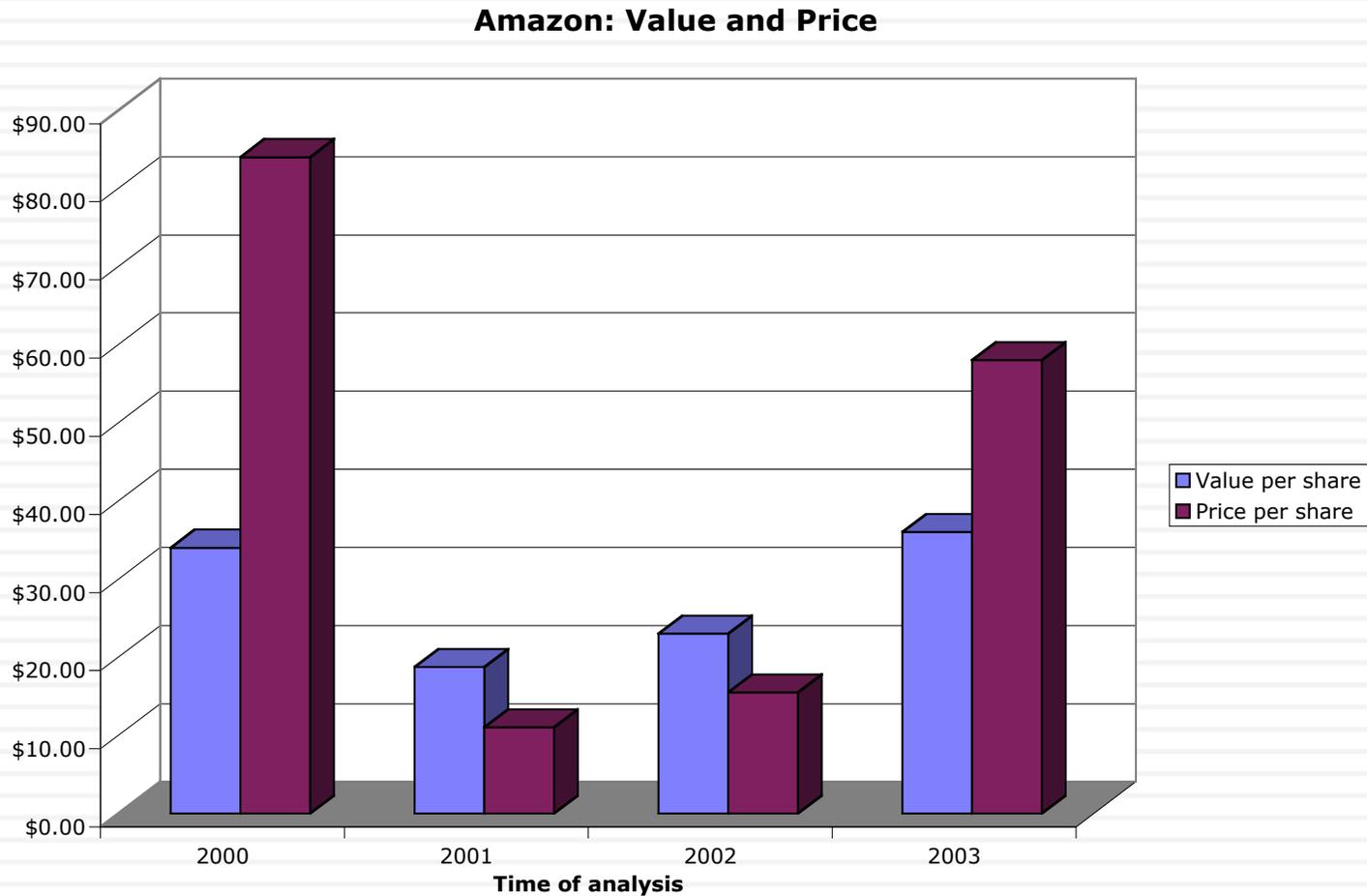
# Lesson 7: There are always scenarios where the market price can be justified...

	6%	8%	10%	12%	14%
30%	\$ (1.94)	\$ 2.95	\$ 7.84	\$ 12.71	\$ 17.57
35%	\$ 1.41	\$ 8.37	\$ 15.33	\$ 22.27	\$ 29.21
40%	\$ 6.10	\$ 15.93	\$ 25.74	\$ 35.54	\$ 45.34
45%	\$ 12.59	\$ 26.34	\$ 40.05	\$ 53.77	\$ 67.48
50%	\$ 21.47	\$ 40.50	\$ 59.52	\$ 78.53	\$ 97.54
55%	\$ 33.47	\$ 59.60	\$ 85.72	\$ 111.84	\$ 137.95
60%	\$ 49.53	\$ 85.10	\$ 120.66	\$ 156.22	\$ 191.77

## Lesson 8: You will be wrong 100% of the time and it really is not your fault...

- No matter how careful you are in getting your inputs and how well structured your model is, your estimate of value will change both as new information comes out about the company, the business and the economy.
- As information comes out, you will have to adjust and adapt your model to reflect the information. Rather than be defensive about the resulting changes in value, recognize that this is the essence of risk.
- A test: If your valuations are unbiased, you should find yourself increasing estimated values as often as you are decreasing values. In other words, there should be equal doses of good and bad news affecting valuations (at least over time).

# And the market is often “more wrong” ....



# Assessing my 2000 forecasts, in 2014

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Year	Revenues		Operating Income		Operating Margin	
	My forecast (2000)	Actual	My forecast (2000)	Actual	My forecast (2000)	Actual
2000	\$2,793	\$2,762	-\$ 373	-\$ 664.00	-13.35%	-24.04%
2001	\$5,585	\$3,122	-\$ 94	-\$ 231.00	-1.68%	-7.40%
2002	\$9,774	\$3,932	\$ 407	\$ 106.00	4.16%	2.70%
2003	\$14,661	\$5,264	\$ 1,038	\$ 271.00	7.08%	5.15%
2004	\$19,059	\$6,921	\$ 1,628	\$ 440.00	8.54%	6.36%
2005	\$23,862	\$8,490	\$ 2,212	\$ 432.00	9.27%	5.09%
2006	\$28,729	\$10,711	\$ 2,768	\$ 389.00	9.63%	3.63%
2007	\$33,211	\$14,835	\$ 3,261	\$ 655.00	9.82%	4.42%
2008	\$36,798	\$19,166	\$ 3,646	\$ 842.00	9.91%	4.39%
2009	\$39,006	\$24,509	\$ 3,883	\$ 1,129.00	9.95%	4.61%
2010	\$41,346	\$34,204	\$ 4,135	\$ 1,406.00	10.00%	4.11%
2011	\$43,827	\$48,077	\$ 4,383	\$ 862.00	10.00%	1.79%
2012	\$46,457	\$61,093	\$ 4,646	\$ 676.00	10.00%	1.11%
2013	\$49,244	\$74,452	\$ 4,925	\$ 745.00	10.00%	1.00%
2014 (LTM)	\$51,460	\$85,247	\$ 5,146.35	\$ 97.00	10.00%	0.11%

# Amazon: My “Field of Dreams” Valuation – October 2014

To deliver this high revenue growth, Amazon will continue to sell its products/services at or below cost. Operating margin stays low for the next few years.

Amazon will continue on its path of revenue growth first, pushing into media & cloud services to become the second largest retailer in the world. Revenues grow @15% a year for 5 years, tapering down to 2.2% growth after year 10

As Amazon becomes more dominant, it will increase prices, but easy entry into the business will act as a restraint. Operating margin improves to 7.38% in year 10, weighted average of retail & media businesses

Amazon will be able to invest more efficiently than the average retailer. Reinvest \$1 for every \$3.68 in additional revenues

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		15.00%	15.00%	15.00%	15.00%	15.00%	12.44%	9.88%	7.32%	4.76%	2.20%	2.20%
Revenues	\$ 85,246	\$98,033	\$112,738	\$129,649	\$149,096	\$171,460	\$192,790	\$211,837	\$227,344	\$238,166	\$243,405	\$ 248,760
EBIT (Operating) margin	0.58%	1.26%	1.94%	2.62%	3.30%	3.98%	4.66%	5.34%	6.02%	6.70%	7.38%	7.38%
EBIT (Operating income)	\$ 494	\$ 1,235	\$ 2,187	\$ 3,397	\$ 4,920	\$ 6,824	\$ 8,984	\$ 11,312	\$ 13,686	\$ 15,957	\$ 17,963	\$ 18,358
Tax rate	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%
EBIT(1-t)	\$ 337	\$ 842	\$ 1,492	\$ 2,317	\$ 3,356	\$ 4,654	\$ 6,127	\$ 7,715	\$ 9,334	\$ 10,883	\$ 12,251	\$ 12,520
- Reinvestment		\$ 3,474	\$ 3,995	\$ 4,594	\$ 5,284	\$ 6,076	\$ 5,795	\$ 5,175	\$ 4,213	\$ 2,940	\$ 1,424	\$ 2,755
FCFF		\$ (2,632)	\$ (2,504)	\$ (2,278)	\$ (1,928)	\$ (1,422)	\$ 332	\$ 2,540	\$ 5,121	\$ 7,943	\$ 10,827	\$ 9,766
Terminal Value											\$168,379	
Cost of capital		8.39%	8.39%	8.39%	8.39%	8.39%	8.32%	8.24%	8.16%	8.08%	8.00%	8.00%
PV(FCFF)		\$ (2,489)	\$ (2,189)	\$ (1,842)	\$ (1,446)	\$ (994)	\$ 169	\$ 1,420	\$ 2,681	\$ 3,865	\$ 80,918	

PV(Terminal value)	\$ 76,029
PV (CF over next 10 years)	\$ 4,064
Value of operating assets =	\$ 80,093
- Debt	\$ 8,353
+ Cash	\$ 10,252
Value of equity	\$ 81,143
- Value of options	\$ -
Value of equity in common stock	\$ 81,125
Number of shares	463.01
Estimated value /share	\$ 175.25
Price	\$ 287.06
Price as % of value	163.84%

Amazon's technology twist will keep financial leverage low: Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

Amazon's risk profile will reflect a mix of retail, media and cloud businesses as well as geographic ambitions: Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and business services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

Amazon: A DCF valuation in late October 2014

# Amazon: World Dominator in October 2014

To deliver this high revenue growth, Amazon will continue to sell its products/services at or below cost. Operating margin stays low for the next few years.

Amazon will continue on its path of revenue growth first, pushing **strongly** into media & cloud services to become the second largest retailer in the world. Revenues grow @20% a year for 5 years, tapering down to 2.2% growth after year 10

As Amazon becomes more dominant, it will increase prices, **with few restraints**. Operating margin improves to 12.84% in year 10, the 75th percentile of retail & media businesses

Amazon will be able to invest more efficiently than the average retailer. Reinvest \$1 for every \$3.68 in additional revenues

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		20.00%	20.00%	20.00%	20.00%	20.00%	16.44%	12.88%	9.32%	5.76%	2.20%	2.20%
Revenues	\$ 85,246	\$102,295	\$122,754	\$147,305	\$176,766	\$212,119	\$246,992	\$278,804	\$304,789	\$322,345	\$329,436	\$ 336,684
EBIT (Operating margin)	0.47%	1.71%	2.94%	4.18%	5.42%	6.65%	7.89%	9.13%	10.37%	11.60%	12.84%	12.84%
EBIT (Operating income)	\$ 400	\$ 1,746	\$ 3,613	\$ 6,158	\$ 9,576	\$ 14,116	\$ 19,492	\$ 25,451	\$ 31,594	\$ 37,401	\$ 42,300	\$ 43,230
Tax rate	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%
EBIT(1-t)	\$ 273	\$ 1,190	\$ 2,464	\$ 4,200	\$ 6,531	\$ 9,627	\$ 13,293	\$ 17,358	\$ 21,547	\$ 25,508	\$ 28,848	\$ 29,483
- Reinvestment		\$ 4,632	\$ 5,559	\$ 6,670	\$ 8,004	\$ 9,605	\$ 9,475	\$ 8,643	\$ 7,060	\$ 4,770	\$ 1,927	\$ 5,405
FCFF		-\$ 3,442	-\$ 3,094	-\$ 2,470	-\$ 1,473	\$ 22	\$ 3,819	\$ 8,715	\$ 14,487	\$ 20,738	\$ 26,922	\$ 24,078
Cost of capital		8.39%	8.39%	8.39%	8.39%	8.39%	8.32%	8.24%	8.16%	8.08%	8.00%	8.00%
Cumulated discount factor		0.9226	0.8511	0.7852	0.7244	0.6683	0.6170	0.5700	0.5271	0.4877	0.4515	
PV(FCFF)		\$3,175	\$2,634	\$1,940	\$1,067	\$15	\$2,356	\$4,968	\$7,636	\$10,113	\$12,156	

Amazon's technology twist will keep financial leverage low: Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

Amazon's risk profile will reflect a mix of retail, media and cloud businesses as well as geographic ambitions: Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and business services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

Terminal value	\$415,134.21
PV(Terminal value)	\$187,447.77
PV (CF over next 10 years)	\$ 28,427.49
Value of operating assets =	\$215,875.26
- Debt	\$ 9,201.58
+ Cash	\$ 10,252.00
+ Non-operating assets	\$ -
Value of equity	\$216,925.67
- Value of options	\$ -
Value of equity in common stock	216,925.67
Number of shares	463.01
Estimated value /share	\$ 468.51

# Amazon: Bezos, the Change-maker

To deliver this high revenue growth, Amazon will continue to sell its products/services at or below cost. Operating margin stays low for the next few years.

Amazon will continue on its path of revenue growth first, pushing into media & cloud services to become the second largest retailer in the world. Revenues grow @15% a year for 5 years, tapering down to 2.2% growth after year 10

Easy entry into the business will push margins down for everyone: Operating margin stays at 2.85% in year 10, in the 25th percentile of retail company margins

Amazon will be able to invest more efficiently than the average retailer. Reinvest \$1 for every \$3.68 in additional revenues

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		15.00%	15.00%	15.00%	15.00%	15.00%	12.44%	9.88%	7.32%	4.76%	2.20%	2.20%
Revenues	\$ 85,246	\$ 98,033	\$ 112,738	\$ 129,649	\$ 149,096	\$ 171,460	\$ 192,790	\$ 211,837	\$ 227,344	\$ 238,166	\$ 243,405	\$ 248,760
EBIT (Operating) margin	0.47%	0.71%	0.95%	1.18%	1.42%	1.66%	1.90%	2.14%	2.37%	2.61%	2.85%	2.85%
EBIT (Operating income)	\$ 400	\$ 693	\$ 1,066	\$ 1,534	\$ 2,120	\$ 2,846	\$ 3,659	\$ 4,524	\$ 5,397	\$ 6,221	\$ 6,937	\$ 7,090
Tax rate	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%	31.80%
EBIT(1-t)	\$ 273	\$ 473	\$ 727	\$ 1,046	\$ 1,446	\$ 1,941	\$ 2,495	\$ 3,086	\$ 3,681	\$ 4,243	\$ 4,731	\$ 4,835
- Reinvestment		\$ 3,474	\$ 3,995	\$ 4,594	\$ 5,284	\$ 6,076	\$ 5,795	\$ 5,175	\$ 4,213	\$ 2,940	\$ 1,424	\$ 1,064
FCFF		\$ (3,001)	\$ (3,268)	\$ (3,548)	\$ (3,838)	\$ (4,136)	\$ (3,300)	\$ (2,089)	\$ (532)	\$ 1,302	\$ 3,307	\$ 3,771
Cost of capital		8.39%	8.39%	8.39%	8.39%	8.39%	8.32%	8.24%	8.16%	8.08%	8.00%	8.00%
Cumulated discount factor		0.9226	0.8511	0.7852	0.7244	0.6683	0.6170	0.5700	0.5271	0.4877	0.4515	
PV(FCFF)		-\$2,768.76	-\$2,781.71	-\$2,785.95	-\$2,780.38	-\$2,763.78	-\$2,036.06	-\$1,191.09	-\$ 280.58	\$ 635.12	\$1,493.45	

PV(Terminal value)	\$29,361
PV (CF over next 10 years)	\$15,260
Value of operating assets =	\$14,101
- Debt	\$9,202
+ Cash	\$10,252
Value of equity	\$15,151
- Value of options	\$0
Value of equity in common stock	\$ 15,151
Number of shares	463.01
Estimated value /share	\$ 32.72

Amazon's technology twist will keep financial leverage low: Debt ratio is 94.7% equity, 5.3% debt, with a pre-tax cost of debt of 5.00%.

Amazon's risk profile will reflect a mix of retail, media and cloud businesses as well as geographic ambitions: Beta used in cost of capital is 1.12, weighted average of online retail, entertainment and business services (cloud). ERP is weighted average of US ERP (5%) and rest of the world (6.45%)

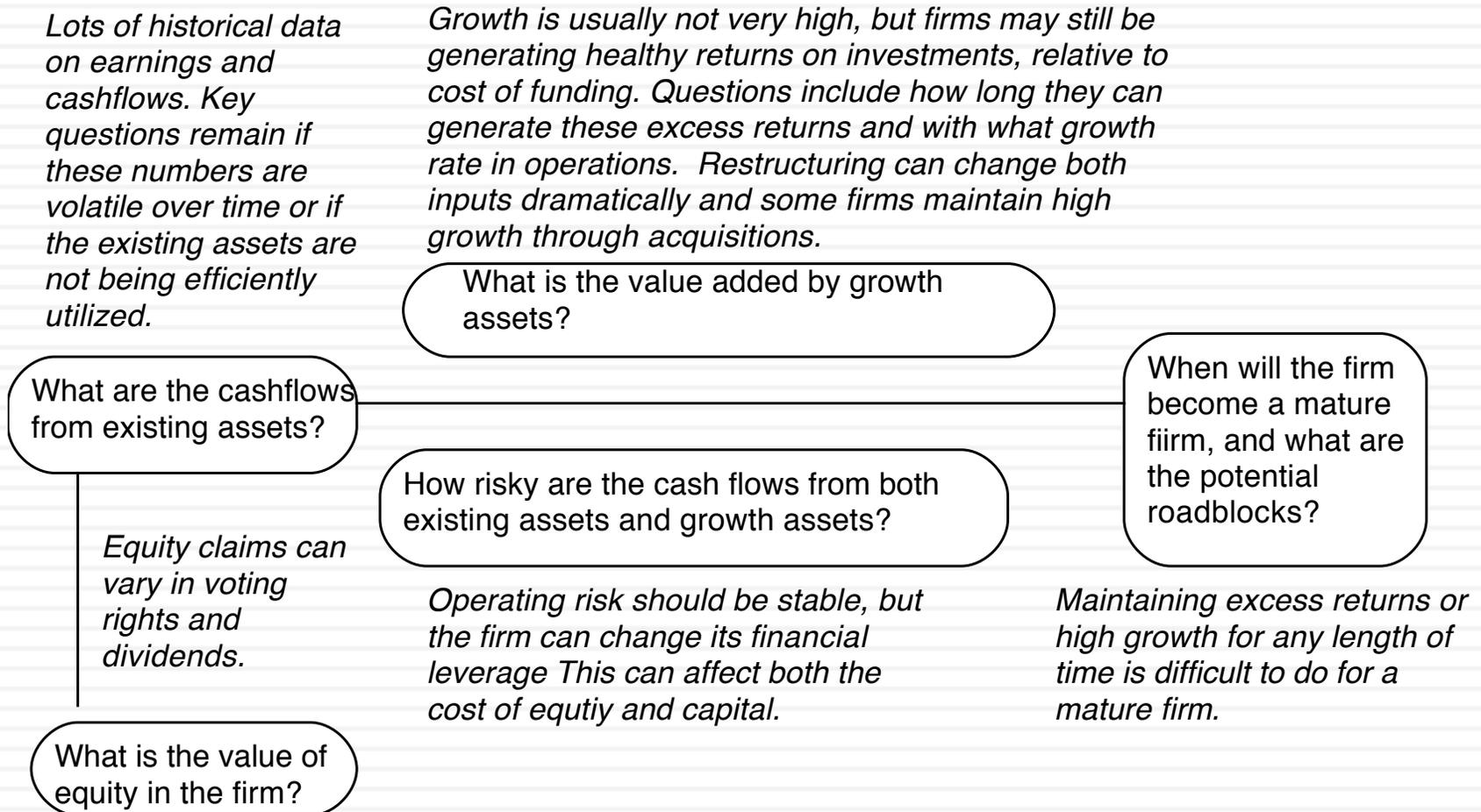
## II. Mature Companies in transition..

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- Mature companies are generally the easiest group to value. They have long, established histories that can be mined for inputs. They have investment policies that are set and capital structures that are stable, thus making valuation more grounded in past data.
- However, this stability in the numbers can mask real problems at the company. The company may be set in a process, where it invests more or less than it should and does not have the right financing mix. In effect, the policies are consistent, stable and bad.
- If you expect these companies to change or as is more often the case to have change thrust upon them,

# The perils of valuing mature companies...

Figure 7.1: Estimation Issues - Mature Companies



### Hormel Foods: The Value of Control Changing

Hormel Foods sells packaged meat and other food products and has been in existence as a publicly traded company for almost 80 years. In 2008, the firm reported after-tax operating income of \$315 million, reflecting a compounded growth of 5% over the previous 5 years.

#### The Status Quo

Run by existing management, with conservative reinvestment policies (reinvestment rate = 14.34% and debt ratio = 10.4%).

Anemic growth rate and short growth period, due to reinvestment policy

Low debt ratio affects cost of capital

Year	Operating income after taxes	Expected growth rate	ROC	Reinvestment Rate	Reinvestment	FCFF	Cost of capital	Present Value
Trailing 12 months	\$315							
1	\$324	2.75%	14.34%	19.14%	\$62	\$262	6.79%	\$245
2	\$333	2.75%	14.34%	19.14%	\$64	\$269	6.79%	\$236
3	\$342	2.75%	14.34%	19.14%	\$65	\$276	6.79%	\$227
Beyond	\$350	2.35%	7.23%	32.52%	\$114	\$4,840	7.23%	\$3,974
Value of operating assets								\$4,682
(Add) Cash								\$155
(Subtract) Debt								\$491
(Subtract) Management Options								\$53
Value of equity in common stock								\$4,293
Value per share								\$31.91

#### New and better management

More aggressive reinvestment which increases the reinvestment rate (to 40%) and tlength of growth (to 5 years), and higher debt ratio (20%).

#### Operating Restructuring (1)

Expected growth rate = ROC \* Reinvestment Rate  
 Expected growth rate (status quo) = 14.34% \* 19.14% = 2.75%  
 Expected growth rate (optimal) = 14.00% \* 40% = 5.60%  
 ROC drops, reinvestment rises and growth goes up.

#### Financial restructuring (2)

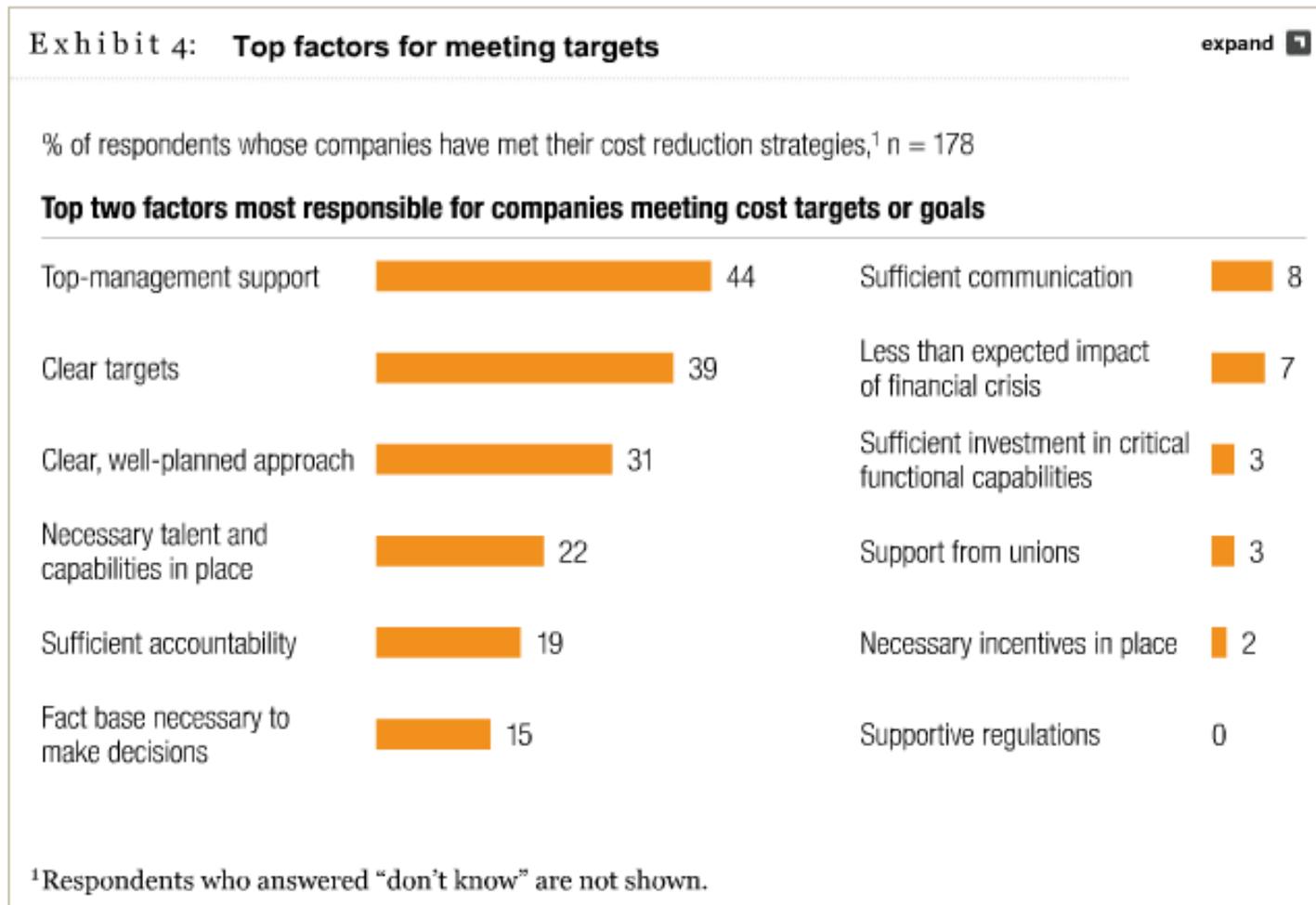
Cost of capital = Cost of equity (1-Debt ratio) + Cost of debt (Debt ratio)  
 Status quo = 7.33% (1-.104) + 3.60% (.104) = 6.79%  
 Optimal = 7.75% (1-.20) + 3.60% (.20) = 6.63%  
 Cost of equity rises but cost of capital drops.

Year	Operating income after taxes	Expected growth rate	ROC	Reinvestment Rate	Reinvestment	FCFF	Cost of capital	Present Value
Trailing 12 months	\$315							
1	\$333	5.60%	14.00%	40.00%	\$133	\$200	6.63%	\$187
2	\$351	5.60%	14.00%	40.00%	\$141	\$211	6.63%	\$185
3	\$371	5.60%	14.00%	40.00%	\$148	\$223	6.63%	\$184
4	\$392	5.60%	14.00%	40.00%	\$260	\$235	6.63%	\$182
5	\$414	5.60%	14.00%	40.00%	\$223	\$248	6.63%	\$180
Beyond	\$423	2.35%	6.74%	34.87%	\$148	\$6,282	6.74%	\$4,557
Value of operating assets								\$5,475
(Add) Cash								\$155
(Subtract) Debt								\$491
(Subtract) Management Options								\$53
Value of equity in common stock								\$5,085
Value per share								\$37.80

Probability of management change = 10%  
 Expected value = \$31.91 (.90) + \$37.80 (.10) = \$32.50

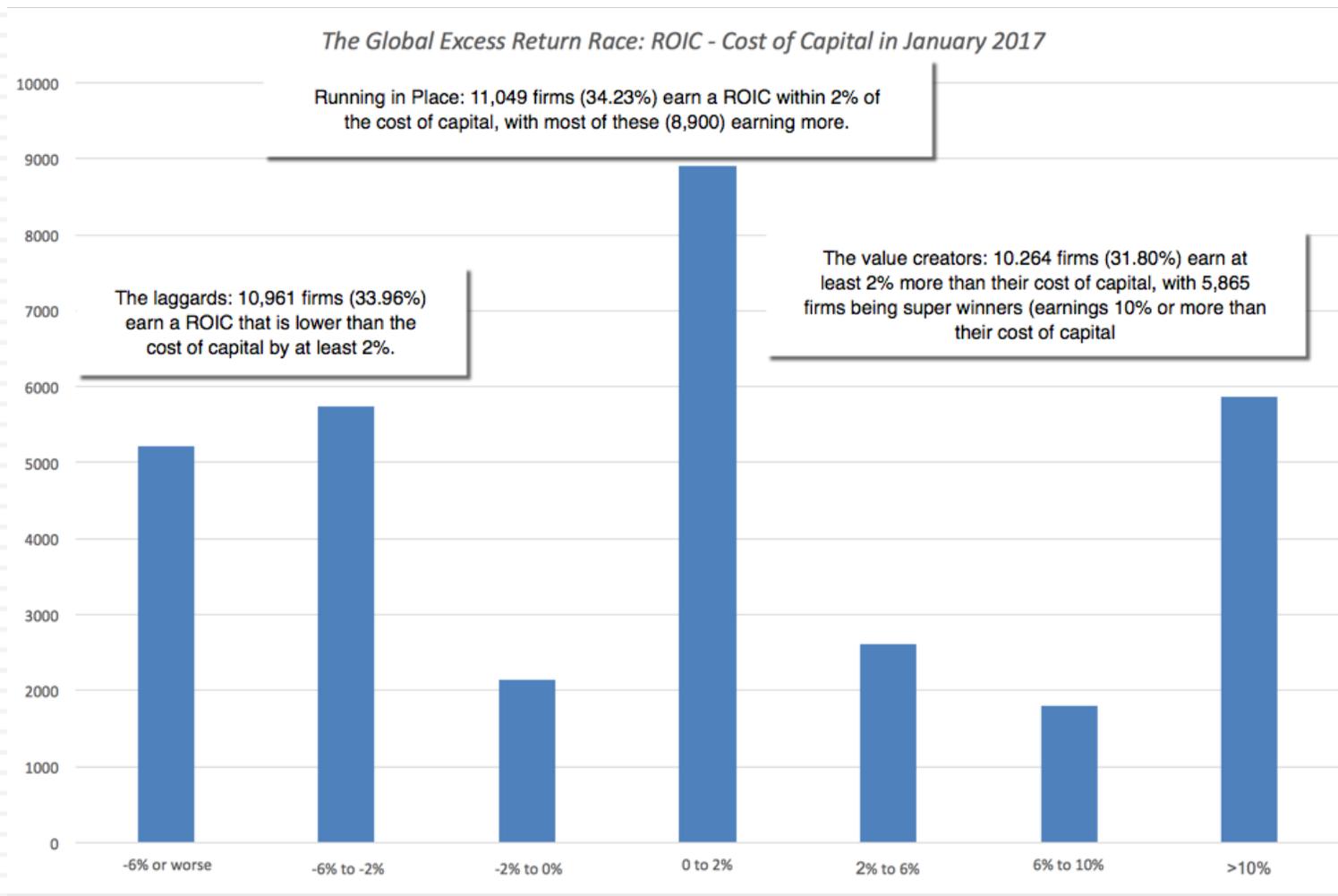
# Lesson 1: Cost cutting and increased efficiency are easier accomplished on paper than in practice... and require commitment

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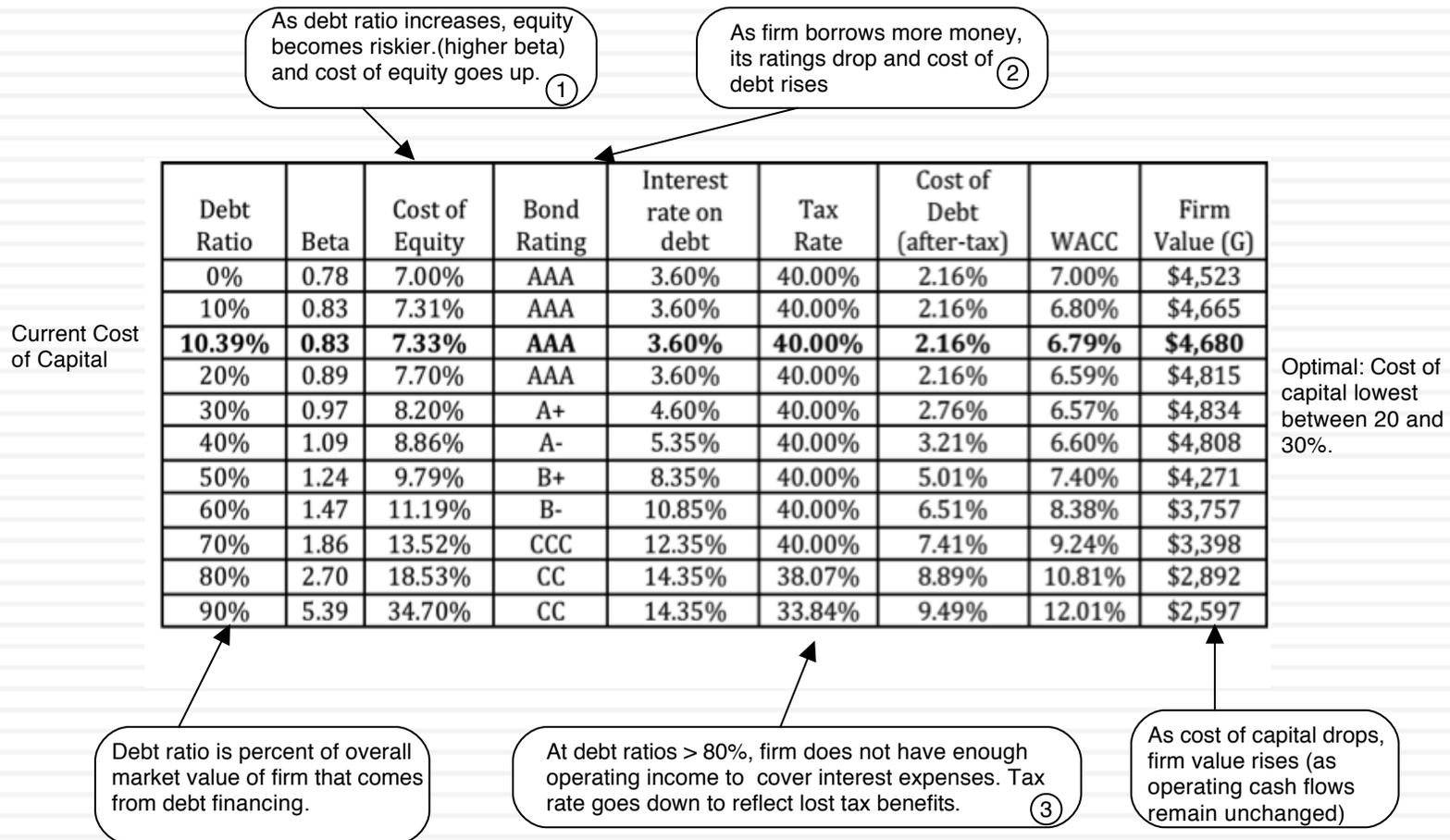
# Lesson 2: Increasing growth is not always a value creating option.. And it may destroy value at times..

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# Lesson 3: Financial leverage is a double-edged sword..

Exhibit 7.1: Optimal Financing Mix: Hormel Foods in January 2009



# III. Dealing with decline and distress...

*Historical data often reflects flat or declining revenues and falling margins. Investments often earn less than the cost of capital.*

*Growth can be negative, as firm sheds assets and shrinks. As less profitable assets are shed, the firm's remaining assets may improve in quality.*

What is the value added by growth assets?

What are the cashflows from existing assets?

*Underfunded pension obligations and litigation claims can lower value of equity. Liquidation preferences can affect value of equity*

What is the value of equity in the firm?

How risky are the cash flows from both existing assets and growth assets?

*Depending upon the risk of the assets being divested and the use of the proceeds from the divestiture (to pay dividends or retire debt), the risk in both the firm and its equity can change.*

When will the firm become a mature firm, and what are the potential roadblocks?

*There is a real chance, especially with high financial leverage, that the firm will not make it. If it is expected to survive as a going concern, it will be as a much smaller entity.*

## a. Dealing with Decline

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- In decline, firms often see declining revenues and lower margins, translating in negative expected growth over time.
- If these firms are run by good managers, they will not fight decline. Instead, they will adapt to it and shut down or sell investments that do not generate the cost of capital. This can translate into negative net capital expenditures (depreciation exceeds cap ex), declining working capital and an overall negative reinvestment rate. The best case scenario is that the firm can shed its bad assets, make itself a much smaller and healthier firm and then settle into long-term stable growth.
- As an investor, your worst case scenario is that these firms are run by managers in denial who continue to expand the firm by making bad investments (that generate lower returns than the cost of capital). These firms may be able to grow revenues and operating income but will destroy value along the way.

Figure 14.5: A Valuation of JC Penney

Declining business: Revenues expected to drop by 3% a year for next 5 years

	Base year	1	2	3	4	5	6	7	8	9	10
Revenue growth rate		-3.00%	-3.00%	-3.00%	-3.00%	-3.00%	-2.00%	-1.00%	0.00%	1.00%	2.00%
Revenues	\$ 12,522	\$12,146	\$11,782	\$11,428	\$11,086	\$10,753	\$10,538	\$10,433	\$10,433	\$10,537	\$10,748
EBIT (Operating) margin	1.32%	1.82%	2.31%	2.80%	3.29%	3.79%	4.28%	4.77%	5.26%	5.76%	6.25%
EBIT (Operating income)	\$ 166	\$ 221	\$ 272	\$ 320	\$ 365	\$ 407	\$ 451	\$ 498	\$ 549	\$ 607	\$ 672
Tax rate	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	36.00%	37.00%	38.00%	39.00%	40.00%
EBIT(1-t)	\$ 108	\$ 143	\$ 177	\$ 208	\$ 237	\$ 265	\$ 289	\$ 314	\$ 341	\$ 370	\$ 403
- Reinvestment		\$ (188)	\$ (182)	\$ (177)	\$ (171)	\$ (166)	\$ (108)	\$ (53)	\$ -	\$ 52	\$ 105
FCFF		\$ 331	\$ 359	\$ 385	\$ 409	\$ 431	\$ 396	\$ 366	\$ 341	\$ 318	\$ 298
Cost of capital		9.00%	9.00%	9.00%	9.00%	9.00%	8.80%	8.60%	8.40%	8.20%	8.00%
PV(FCFF)		\$ 304	\$ 302	\$ 297	\$ 290	\$ 280	\$ 237	\$ 201	\$ 173	\$ 149	\$ 129
Terminal value	\$ 5,710										
PV(Terminal value)	\$ 2,479										
PV (CF over next 10 years)	\$ 2,362										
Sum of PV	\$ 4,841										
Probability of failure =	20.00%	High debt load and poor earnings put survival at risk. Based on bond rating, 20% chance of failure and liquidation will bring in 50% of book value									
Proceeds if firm fails =	\$2,421										
Value of operating assets =	\$4,357										

Margins improve gradually to median for US retail sector (6.25%)

As stores shut down, cash released from real estate.

The cost of capital is at 9%, higher because of high cost of debt.

## b. Dealing with the “downside” of Distress

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- A DCF valuation values a firm as a going concern. If there is a significant likelihood of the firm failing before it reaches stable growth and if the assets will then be sold for a value less than the present value of the expected cashflows (a distress sale value), DCF valuations will overstate the value of the firm.
- Value of Equity= DCF value of equity (1 - Probability of distress) + Distress sale value of equity (Probability of distress)
- There are three ways in which we can estimate the probability of distress:
  - ▣ Use the bond rating to estimate the cumulative probability of distress over 10 years
  - ▣ Estimate the probability of distress with a probit
  - ▣ Estimate the probability of distress by looking at market value of bonds..
- The distress sale value of equity is usually best estimated as a percent of book value (and this value will be lower if the economy is doing badly and there are other firms in the same business also in distress).

Current Revenue  
\$ 4,390

Current Margin:  
4.76%

EBIT  
\$ 209m

Reinvestment:  
Capital expenditures include cost of new casinos and working capital

Extended reinvestment break, due of investment in past

Industry average

Expected Margin:  
-> 17%

**Stable Growth**

Stable Revenue Growth: 3%

Stable Operating Margin: 17%

Stable ROC=10%  
Reinvest 30% of EBIT(1-t)

Terminal Value=  $758 \cdot (0.0743 - 0.03)$   
=\$ 17,129

Value of Op Assets \$ 9,793  
+ Cash & Non-op \$ 3,040  
= Value of Firm \$ 12,833  
- Value of Debt \$ 7,565  
= Value of Equity \$ 5,268

Value per share \$ 8.12

		1	2	3	4	5	6	7	8	9	10	Term. Year
Revenues		\$4,434	\$4,523	\$5,427	\$6,513	\$7,815	\$8,206	\$8,616	\$9,047	\$9,499	\$9,974	\$10,273
Oper margin		5.81%	6.86%	7.90%	8.95%	10%	11.40%	12.80%	14.20%	15.60%	17%	17%
EBIT		\$258	\$310	\$429	\$583	\$782	\$935	\$1,103	\$1,285	\$1,482	\$1,696	\$1,746
Tax rate		26.0%	26.0%	26.0%	26.0%	26.0%	28.4%	30.8%	33.2%	35.6%	38.00%	38%
EBIT * (1 - t)		\$191	\$229	\$317	\$431	\$578	\$670	\$763	\$858	\$954	\$1,051	\$1,083
- Reinvestment		-\$19	-\$11	\$0	\$22	\$58	\$67	\$153	\$215	\$286	\$350	\$325
FCFF		\$210	\$241	\$317	\$410	\$520	\$603	\$611	\$644	\$668	\$701	\$758
Beta		3.14	3.14	3.14	3.14	3.14	2.75	2.36	1.97	1.59	1.20	
Cost of equity		21.82%	21.82%	21.82%	21.82%	21.82%	19.50%	17.17%	14.85%	12.52%	10.20%	
Cost of debt		9%	9%	9%	9%	9%	8.70%	8.40%	8.10%	7.80%	7.50%	
Debt/ratio		73.50%	73.50%	73.50%	73.50%	73.50%	68.80%	64.10%	59.40%	54.70%	50.00%	
Cost of capital		9.88%	9.88%	9.88%	9.88%	9.88%	9.79%	9.50%	9.01%	8.32%	7.43%	

Term. Year  
\$10,273  
17%  
\$1,746  
38%  
\$1,083  
\$325  
\$758

Forever

**Cost of Equity**  
21.82%

**Cost of Debt**  
 $3\% + 6\% = 9\%$   
 $9\% (1 - 0.38) = 5.58\%$

**Weights**  
Debt = 73.5% -> 50%

**Riskfree Rate:**  
T. Bond rate = 3%

+ **Beta**  
3.14 -> 1.20 X

**Risk Premium**  
6%

Casino  
1.15

Current  
D/E: 277%

Base Equity  
Premium

Country Risk  
Premium

**Las Vegas Sands**  
February 2009  
Trading @ \$4.25

# Adjusting the value of LVS for distress..

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- In February 2009, LVS was rated B+ by S&P. Historically, 28.25% of B+ rated bonds default within 10 years. LVS has a 6.375% bond, maturing in February 2015 (7 years), trading at \$529. If we discount the expected cash flows on the bond at the riskfree rate, we can back out the probability of distress from the bond price:

$$529 = \sum_{t=1}^{t=7} \frac{63.75(1 - \Pi_{\text{Distress}})^t}{(1.03)^t} + \frac{1000(1 - \Pi_{\text{Distress}})^7}{(1.03)^7}$$

- Solving for the probability of bankruptcy, we get:
  - $\pi_{\text{istress}}$  = Annual probability of default = 13.54%
  - Cumulative probability of surviving 10 years =  $(1 - .1354)^{10} = 23.34\%$
  - Cumulative probability of distress over 10 years =  $1 - .2334 = .7666$  or 76.66%
- If LVS is becomes distressed:
  - Expected distress sale proceeds = \$2,769 million < Face value of debt
  - Expected equity value/share = \$0.00
- Expected value per share =  $\$8.12 (1 - .7666) + \$0.00 (.7666) = \$1.92$