Market Revelations

Lessons learned, unlearned and relearned from a crisis

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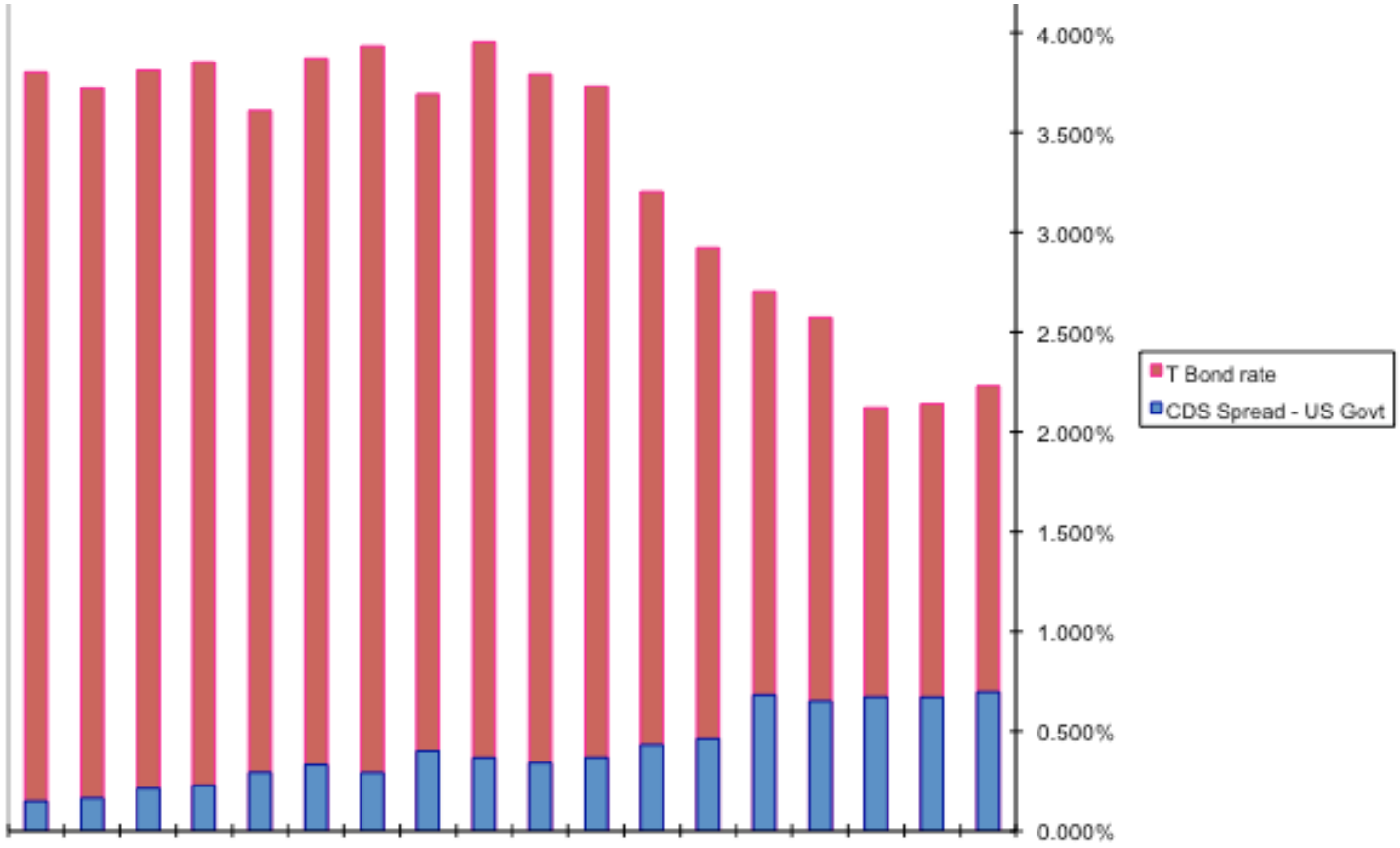
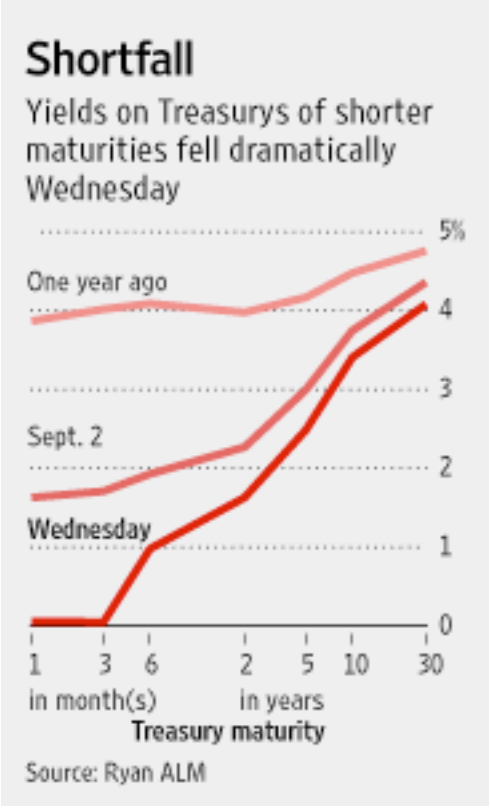
Lesson 1: Nothing is risk free? The market view of US treasuries…



And the consequences..

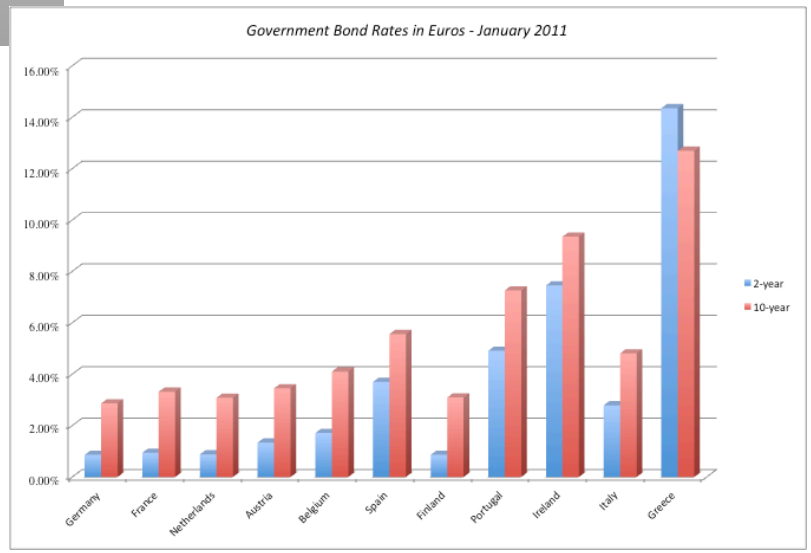
- Reserve Fund "breaks the buck" On Wednesday, September 17, the Reserve Primary Fund had $62.6 billion in assets, making it one of the largest money-market funds.. At least a dozen large investors pulled out almost $40 billion of their money Monday and Tuesday, two-thirds of Primary Fund's formidable asset base. That pushed the fund's per-share price down to $0.97, a bracing signal to investors and a jolt to money-market investors world-wide. The withdrawals meant the Primary Fund had to "break the buck." That is, its net asset value sunk below the time-honored standard of$1 a share.

- Treasury bill rates drop to zero ... on Sept 17



1.1: What is the riskfree rate?

When we use the T.Bond rate as a riskfree rate, we are assuming that there is no default risk in the US treasury. Is that reasonable? What if it is not?



- The Indian government had 10-year Rupee bonds outstanding, with a yield to maturity of about 8% on April 1, 2010. In January 2010, the Indian government had a local currency sovereign rating of Ba2. The typical default spread for Ba2 rated country bonds in early 2010 was 3%.
- The riskfree rate in Indian Rupees is

a) The yield to maturity on the 10-year bond (8%)

b) The yield to maturity on the 10-year bond + Default spread (8%+3% =11%)

c) The yield to maturity on the 10-year bond – Default spread (8%-3% = 5%)

d) None of the above

II. The Equity Risk Premium: Trusting history?

	Arithmetic Average		Geometric Average	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2007	7.78%	6.42%	5.94%	4.79%
1967-2007	5.94%	4.33%	4.75%	3.50%
1997-2007	5.26%	2.68%	3.86%	1.51%

Historical premium in January 2008

	Arithmetic Average		Geometric Average	
	Stocks – T. Bills	Stocks – T. Bonds	Stocks – T. Bills	Stocks – T. Bonds
1928-2008	7.30%	5.65%	5.32%	3.88%
	(2.29%)	(2.40%)		
1959-2008	5.14%	3.33%	3.77%	2.29%
	(2.39%)	(2.63%)		
1999-2008	-2.53%	-6.26%	-4.53%	-7.96%
	(6.36%)	(8.85%)		

Historical premium in January 2009

Or the market?: Implied equity risk premiums in 2008 vs 2009

Between 2001 and 2007 dividends and stock buybacks averaged 4.02% of the index each year.

Analysts expect earnings to grow 5% a year for the next 5 years. We will assume that dividends & buybacks will keep pace.. Last year's cashflow (59.03) growing at 5% a year

After year 5, we will assume that earnings on the index will grow at 4.02%, the same rate as the entire economy (= riskfree rate).

61.98 65.08 68.33 71.75 75.34

$$1468.36 = \frac{61.98}{(1+r)} + \frac{65.08}{(1+r)^2} + \frac{68.33}{(1+r)^3} + \frac{71.75}{(1+r)^4} + \frac{75.34}{(1+r)^5} + \frac{75.35(1.0402)}{(r-.0402)(1+r)^5}$$

January 1, 2008
S&P 500 is at 1468.36
4.02% of 1468.36 = 59.03

Expected Return on Stocks (1/1/08) = 8.39%
Equity Risk Premium = 8.39%-4.02% =4.37%

In 2008, the actual cash returned to stockholders was 68.72. However, there was a 41% dropoff in buybacks in Q4. We reduced the total buybacks for the year by that amount.

Analysts expect earnings to grow 4% a year for the next 5 years. We will assume that dividends & buybacks will keep pace.. Last year's cashflow (52.58) growing at 4% a year

After year 5, we will assume that earnings on the index will grow at 2.21%, the same rate as the entire economy (= riskfree rate).

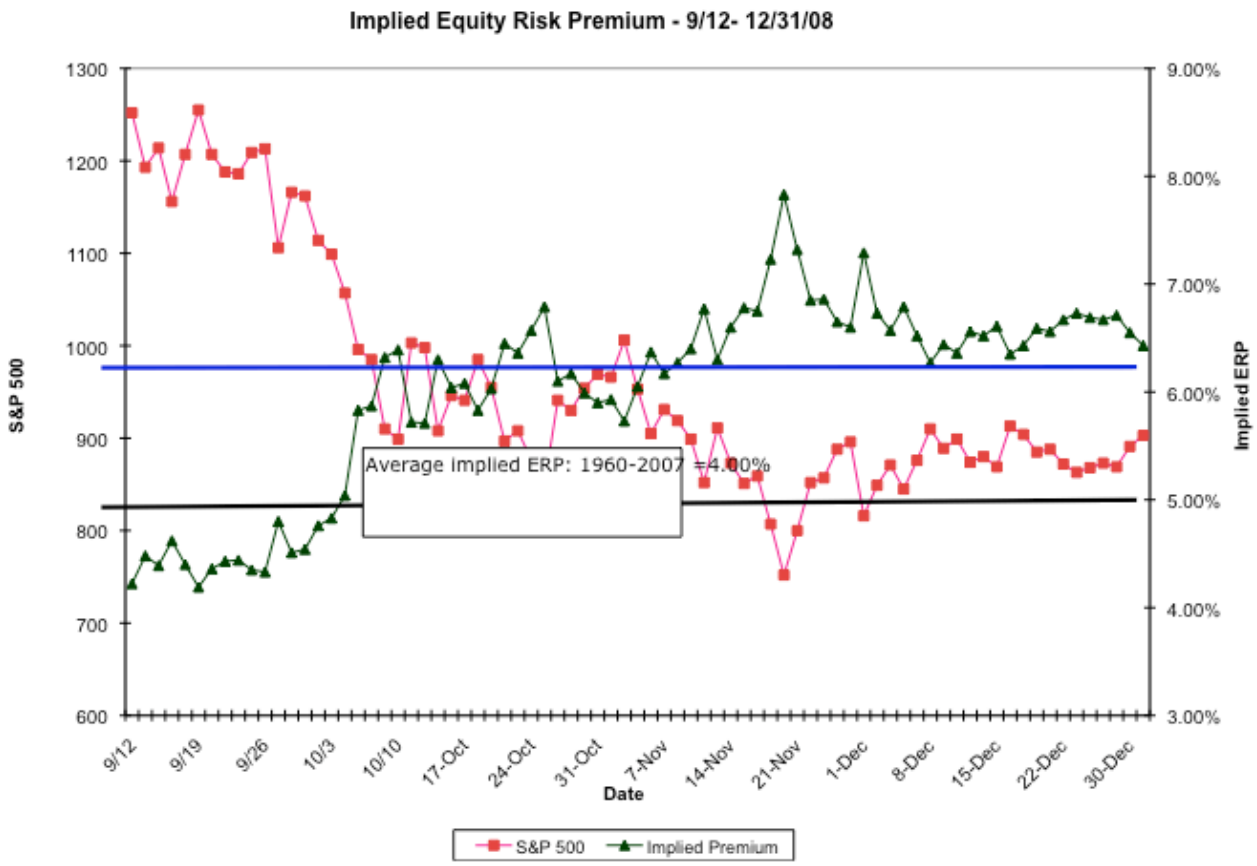
54.69 56.87 59.15 61.52 63.98

$$903.25 = \frac{54.69}{(1+r)} + \frac{56.87}{(1+r)^2} + \frac{59.15}{(1+r)^3} + \frac{61.52}{(1+r)^4} + \frac{63.98}{(1+r)^5} + \frac{63.98(1.0221)}{(r-.0221)(1+r)^5}$$

January 1, 2009
S&P 500 is at 903.25
Adjusted Dividends & Buybacks for 2008 = 52.58

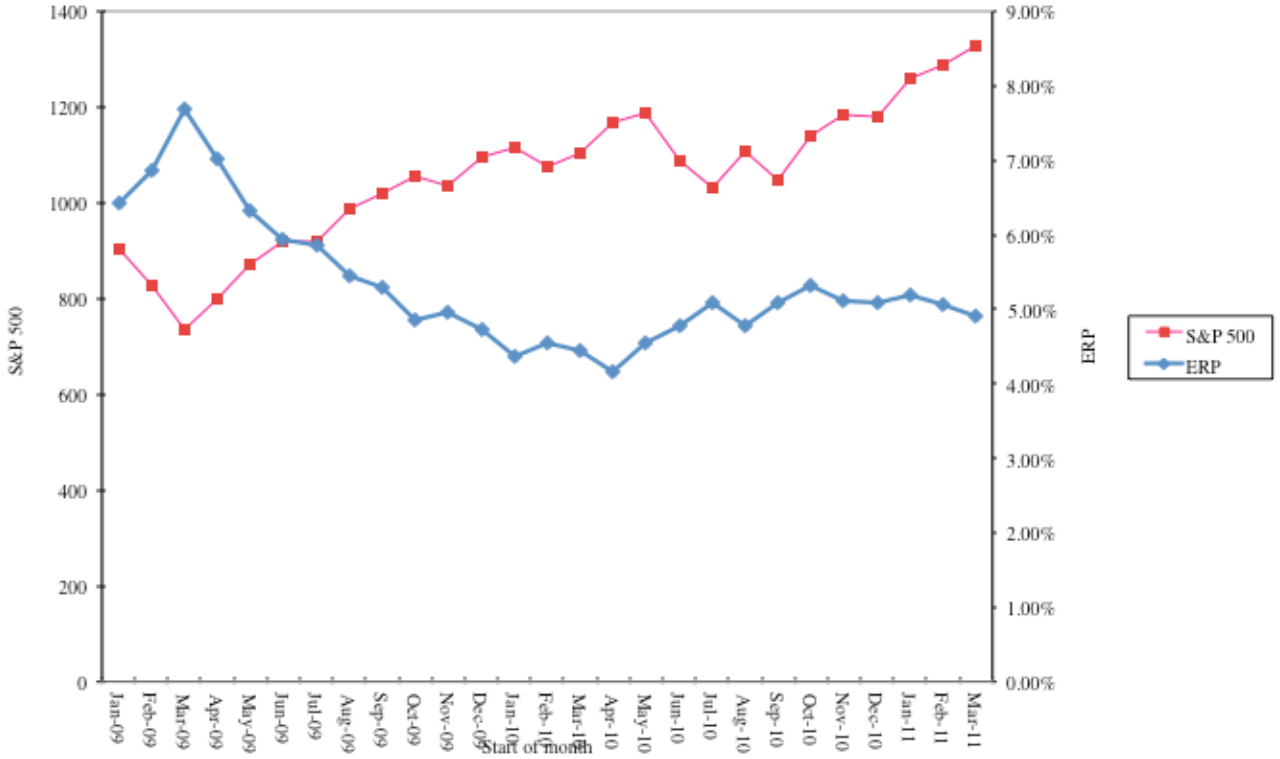
Expected Return on Stocks (1/1/09) = 8.64%
Equity Risk Premium = 8.64% - 2.21% = 6.43%

Lesson 2A: ERPs can change even in mature markets: 9/12/2008 – 12/31/2008



Response 2A: Update your numbers: Implied Equity Risk Premiums

Figure 13: ERP and S&P 500: January 2009 - March 2011



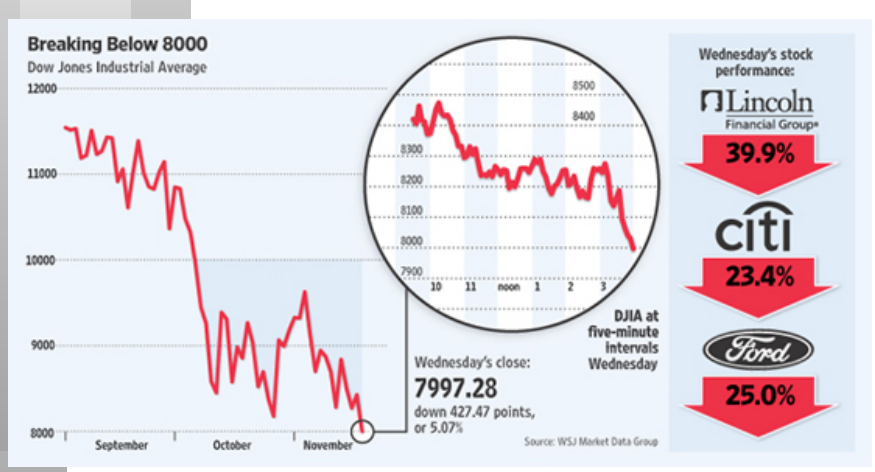
Lesson 2B: Default spreads can also change dramatically…

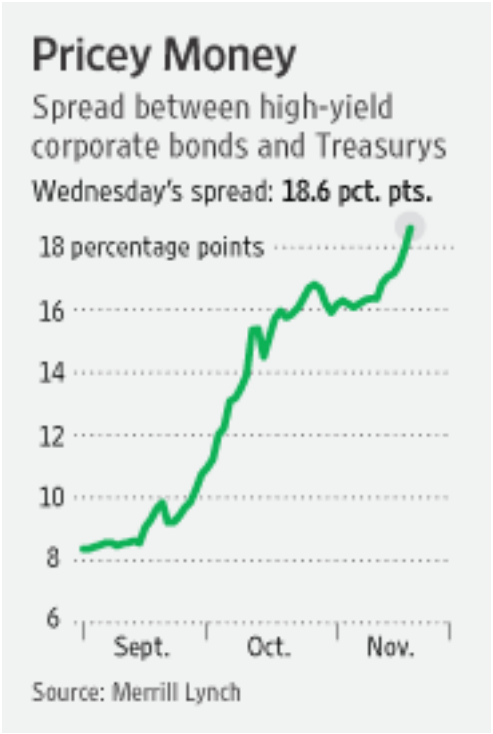
	Default spread over treasury			
Rating	1-Jan-08	12-Sep-08	12-Nov-08	1-Jan-09
Aaa/AAA	0.99%	1.40%	2.15%	2.00%
Aa1/AA+	1.15%	1.45%	2.30%	2.25%
Aa2/AA	1.25%	1.50%	2.55%	2.50%
Aa3/AA-	1.30%	1.65%	2.80%	2.75%
A1/A+	1.35%	1.85%	3.25%	3.25%
A2/A	1.42%	1.95%	3.50%	3.50%
A3/A-	1.48%	2.15%	3.75%	3.75%
Baa1/BBB+	1.73%	2.65%	4.50%	5.25%
Baa2/BBB	2.02%	2.90%	5.00%	5.75%
Baa3/BBB-	2.60%	3.20%	5.75%	7.25%
Ba1/BB+	3.20%	4.45%	7.00%	9.50%
Ba2/BB	3.65%	5.15%	8.00%	10.50%
Ba3/BB-	4.00%	5.30%	9.00%	11.00%
B1/B+	4.55%	5.85%	9.50%	11.50%
B2/B	5.65%	6.10%	10.50%	12.50%
B3/B-	6.45%	9.40%	13.50%	15.50%
Caa/CCC+	7.15%	9.80%	14.00%	16.50%

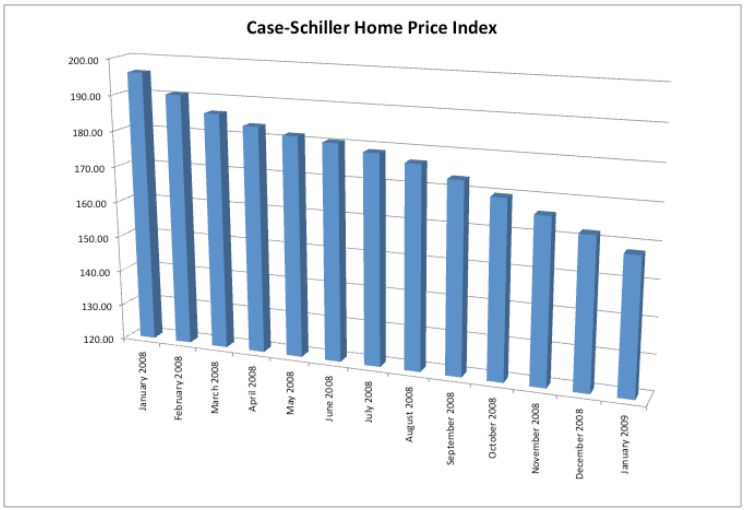
Response 2B: Don't trust (or use) book costs of debt… even for unrated companies..

- Many practitioners use the book cost of debt, computed by dividing the interest expenses by the book value of debt, to estimate the cost of capital. Implicit in this practice are two assumptions:
  - The cost of debt for most companies (at least mature ones) does not change much over time.
  - The book cost of debt is the actual cost that the company has to pay
  - If a company has no bonds or rating, there is no choice
- While this practice has always been sloppy, its inadequacy has been laid bare by the crisis.
  - Even if a company's rating did not change over 2008, its cost of borrowing new funds would have changed significantly
  - If you are valuing a firm, you have to consider the current cost of borrowing, not a historical cost.

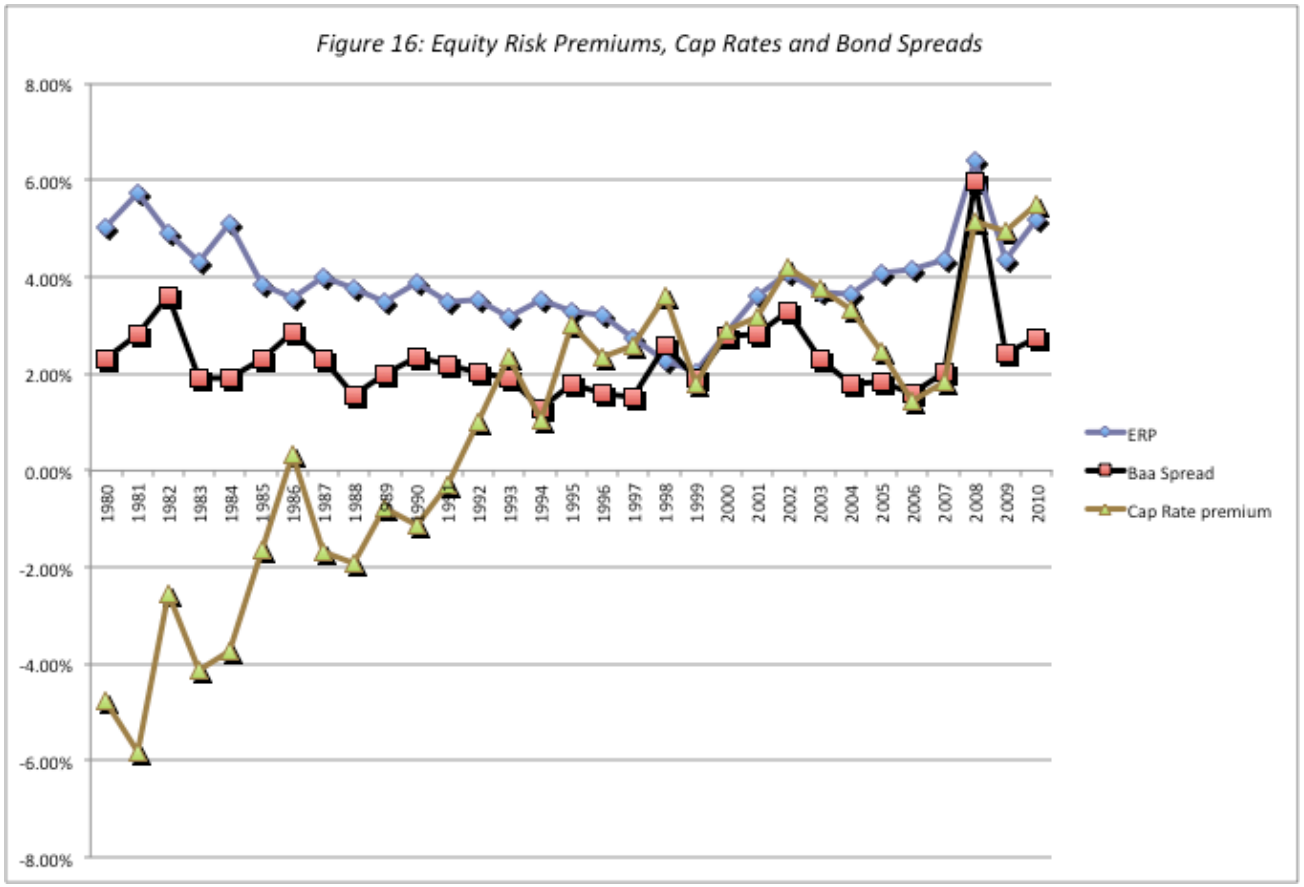
Lesson 2C: Equities, Bonds and Real Estate
All Risky Investments!



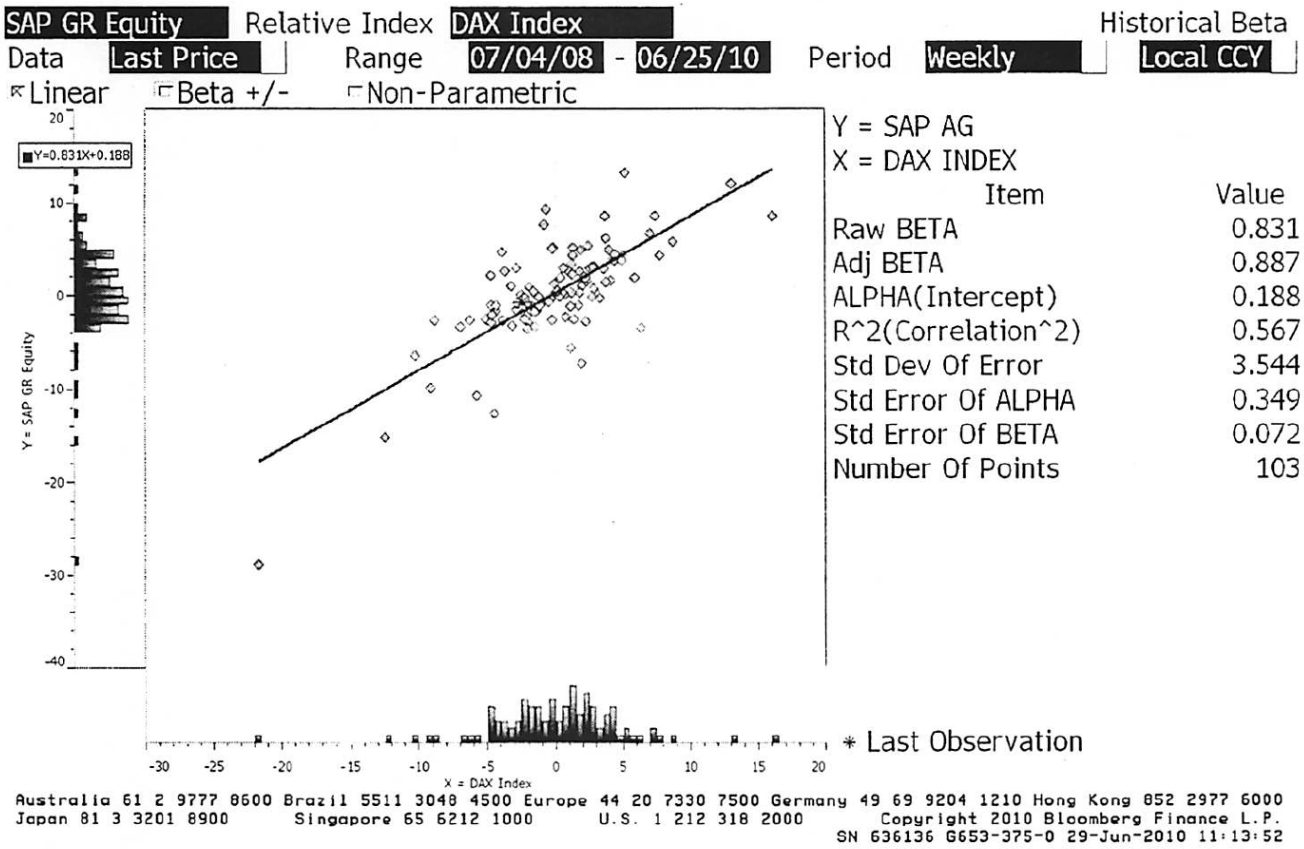




Response 2C: Check risk premiums for consistency…



Estimating Betas: The perils of regressions…

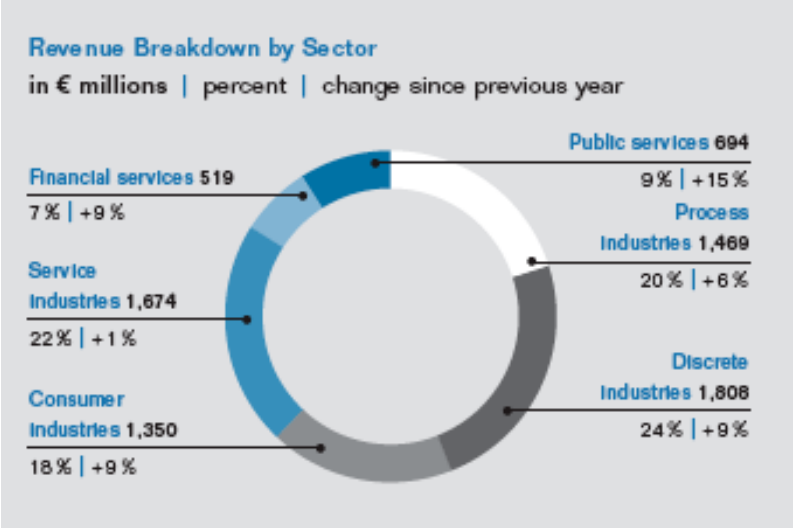


Bottom up Betas as an alternative…

- **Approach 1: Based on business mix**
  - SAP is in three business: software, consulting and training. We will aggregate the consulting and training businesses

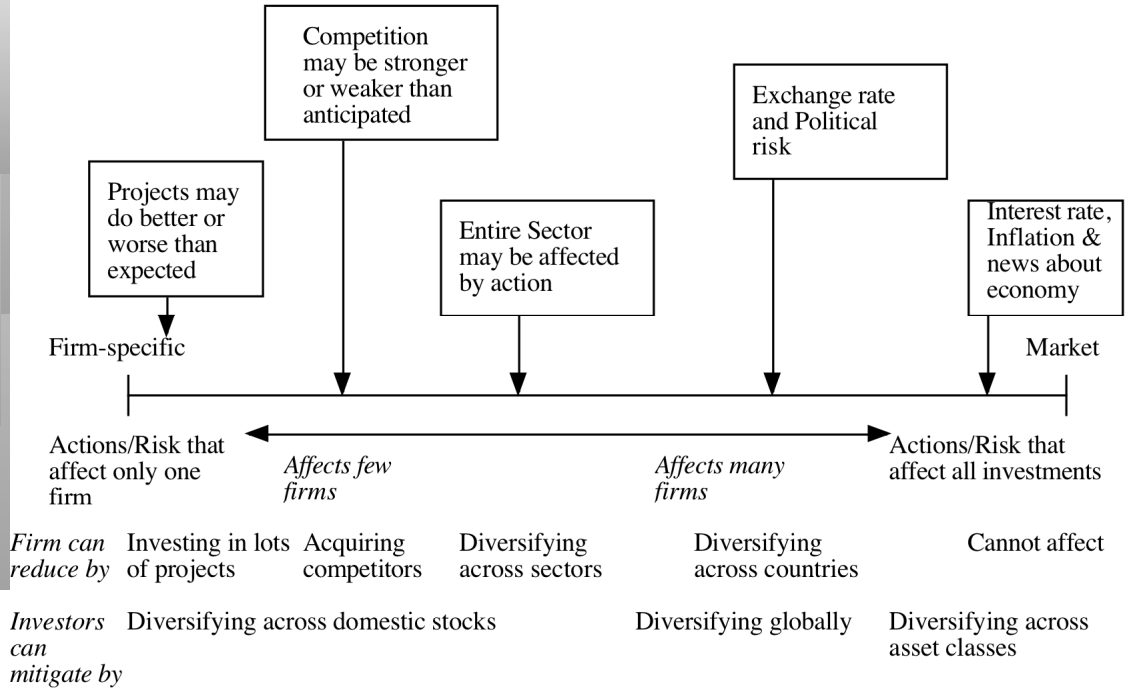
Business	Revenues	EV/Sales	Value	Weights	Beta
Software	€ 5.3	3.25	17.23	80%	1.30
Consulting	€ 2.2	2.00	4.40	20%	1.05
SAP	**€ 7.5**		**21.63**		**1.25**

- **Approach 2: Customer Base**



Lesson 3A: The line between firm specific and market risk can be murky..

Figure 3.5: A Break Down of Risk

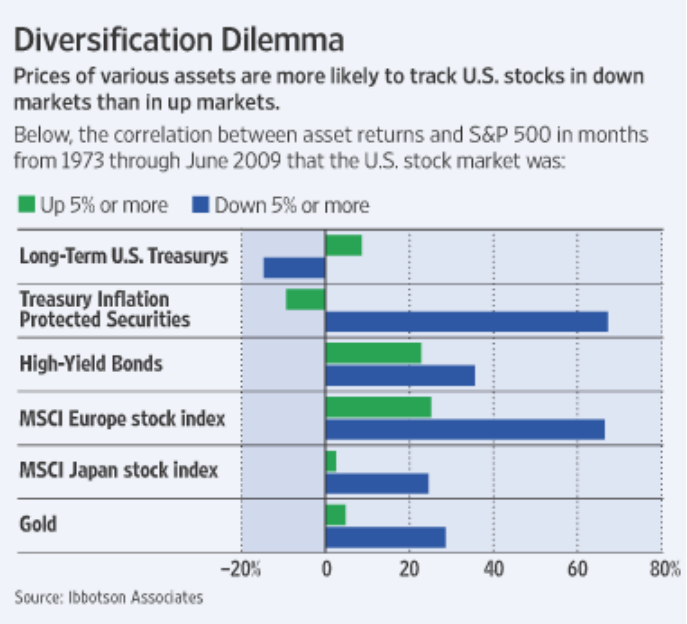


The classic point of view: Market risks come from macro variables and what firms do to enhance their profits/value falls under firm specific risk.

Lehman's woes can be traced to large bets made by the firm in the CDS and deriviatives market. If we stayed with classical finance, this seems to clearly fall under firm specific risk but… Too big to fail? Systemic risks? All of these are really debates about when firm specific risk becomes market risk.

Lesson 3B: The limits of diversification..

- Diversification has always been the mantra in investing. If you stay diversified, we have been told, your portfolio will be less risky since the correlation between asset classes is low.
- The crisis of 2008 illustrated some of the limits of diversification. In this particular crisis, all risky assets (equities, bonds, real assets) dropped in value as investors reassessed the price of risk. The correlation across asset classes increased.



Lesson 3C: Even sector betas can change…

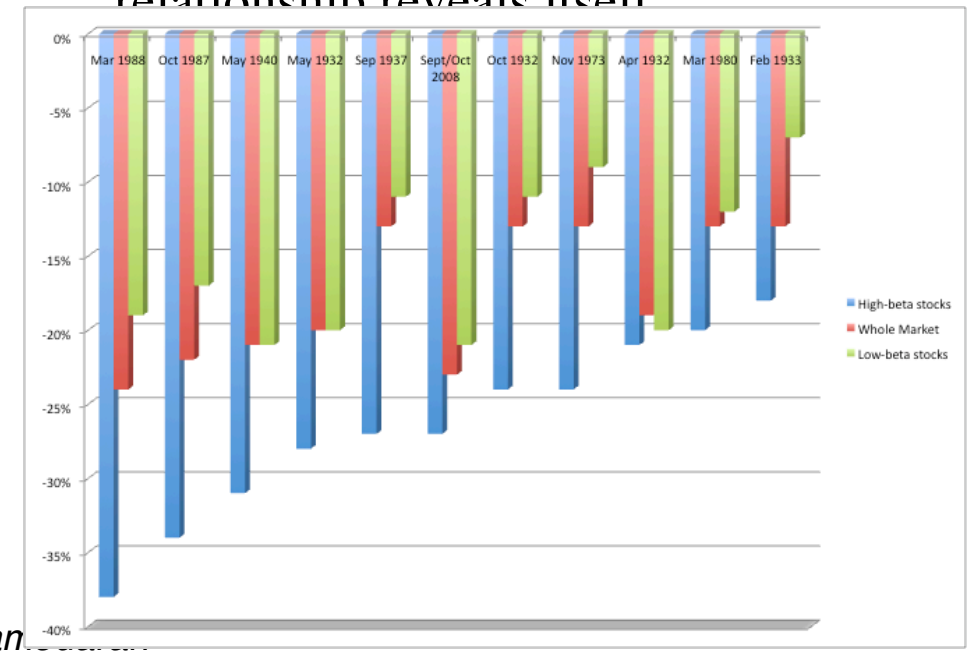
- Estimates of sector betas at the start of 2008 and 2009:

Sector	2009	2008
Financial Services		
Bank	0.71	0.63
Insurance (Prop/Cas.)	0.91	0.89
Investment Co.(Foreign)	1.31	0.71
Technology		
Biotechnology	1.25	1.51
Computer Software/Svcs	1.22	1.56
Computers/Peripherals	1.29	1.86
Internet	1.41	1.97
Real Estate		
Manuf. Housing/RV	1.32	1.19
R.E.I.T.	1.35	0.90

Betas went up for financial service firms, retailers and real estate related businesses and down for technology and health care.

Lesson 3D: Differences in risk/response widen during crisis…

- The essence of risk and return models is that some stocks are riskier than others and that we have to measure relative risk with a beta or betas and incorporate that risk into expected returns.
- In periods of stability, the relationship between betas and returns is weak. It is only during tumultuous periods (up or down) that the relationship reveals itself

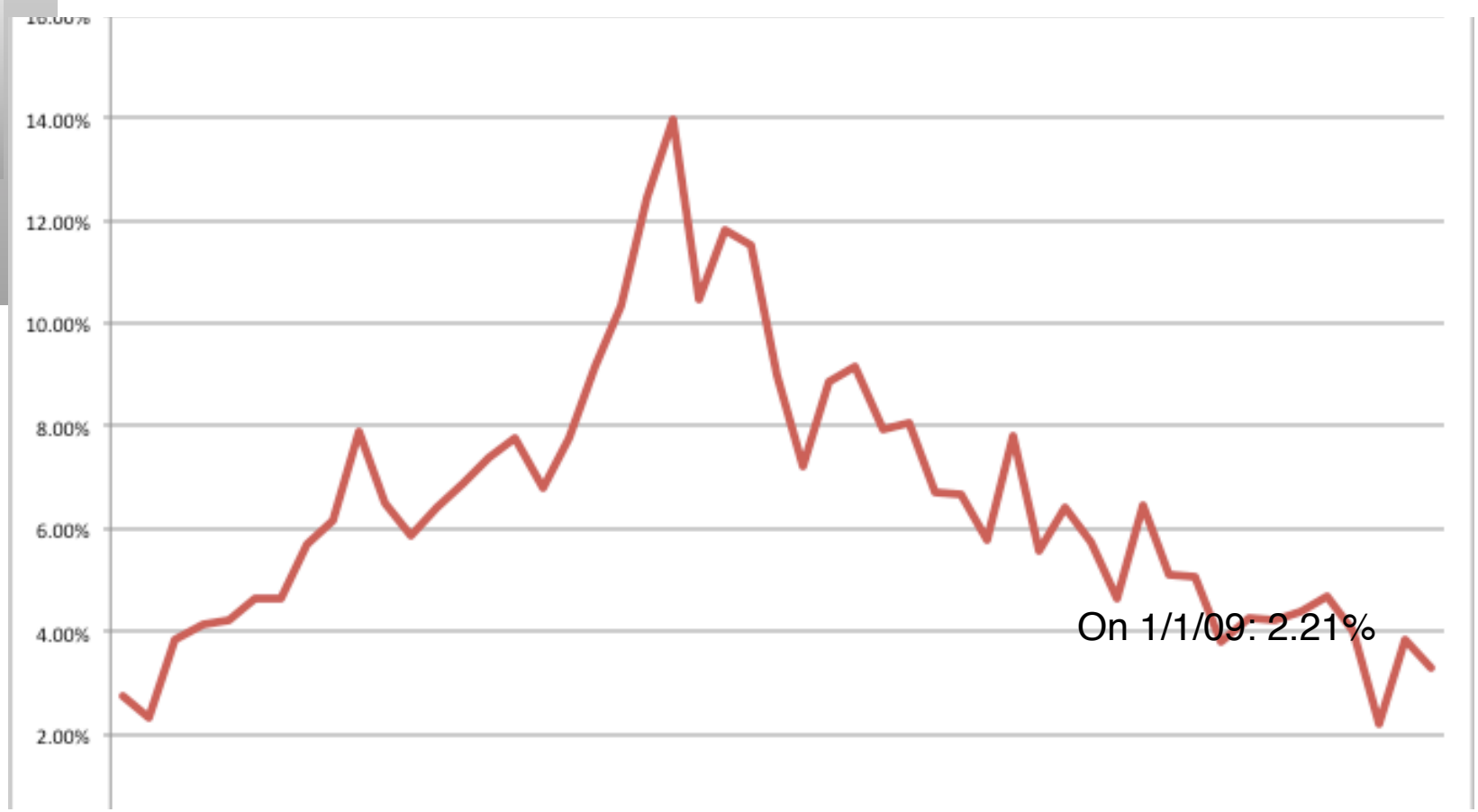


Betas actually work better at explaining return differences during market crises.

Response 3: Return to basics for market betas…

- Average across firms and across time: Instead of using the sector average betas as bottom up betas, we should consider using the average across time for each sector.
- Check against fundamentals: If the beta of a firm reflects the discretionary nature of its products, the betas we estimate for a sector should be a function of the elasticity of demand for the products/ services provided by that sector.
- Adjust for non-diversification: If the marginal investors in the firm are not diversified or only partially diversified, we have to incorporate that portion of the firm specific risk into the beta and cost of equity.
- Check against implied betas: We can estimated implied expected returns for equity by sector, given how the market is pricing stocks in that sector and back out betas from these expected returns. We can compare these betas to the betas that we have estimated.

Lesson 4: Macro variables behave strangely during crisis…



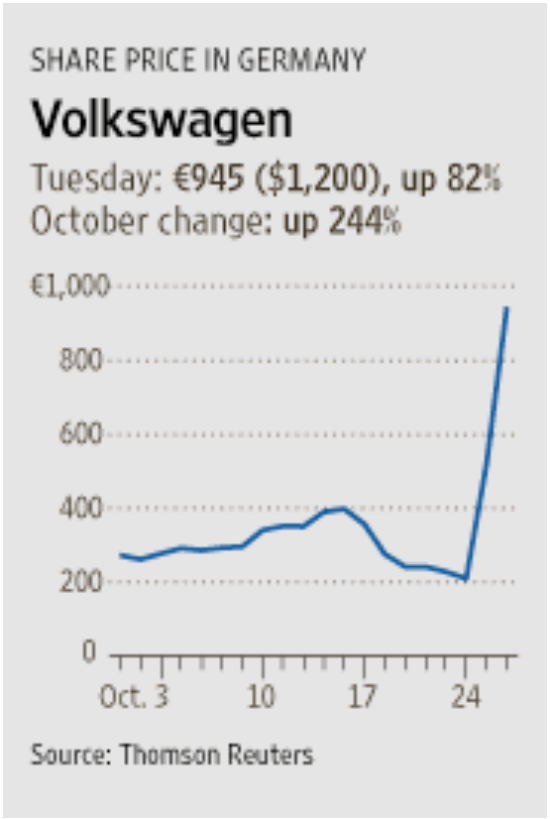
Response 4: Keeping macro views out of your valuation has become more important than ever…

- Selective normalization: Analysts often pick and choose which variables they want to normalize. Thus, they may decide that interest are too low and use higher rates. However, the lower riskfree rate in early 2009 was the result of the market crisis (and the flight to safety), and the crisis also affected equity risk premiums and default spreads (pushing them to new highs) and economic growth (to lows). If you raise the riskfree rate but leave equity risk premiums, default spreads and real growth untouched, you are creating an inconsistent valuation.
- Macro and micro views: When the macro environment becomes unstable, there will be strong disagreements about where the economy, interest rates and exchange rates will go in the near and far future. It is therefore important to separate out your views on the macro economy from your views on a company, when you do valuation. A person looking at your valuation can then decide which of your views is reasonable and which ones are not.

Lesson 5A: Even large cap stocks in developed markets can become illiquid..

- Panic selling..

- And buying…



Lesson 5B: With the concurrent increase in costs…

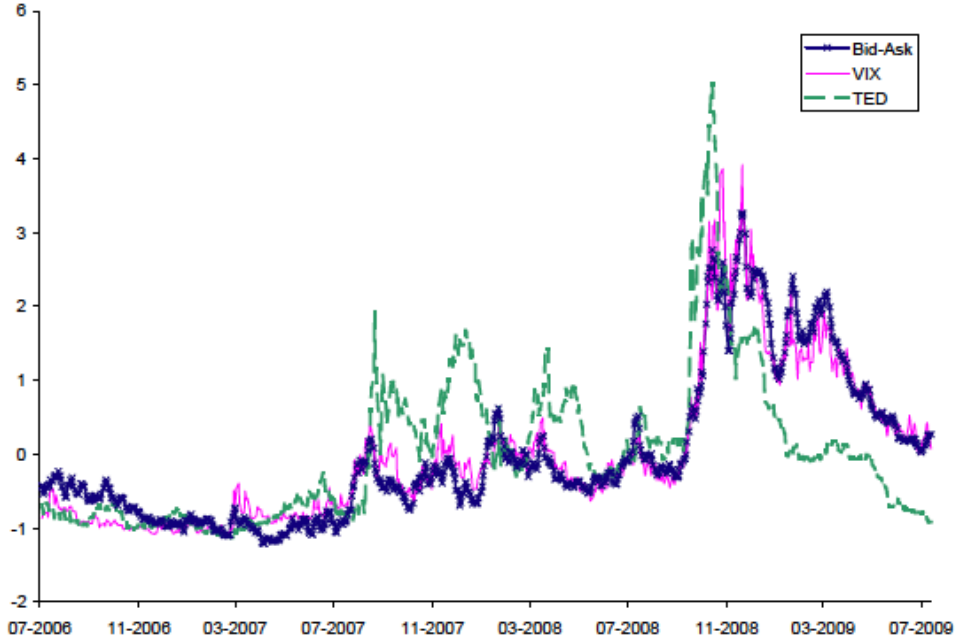
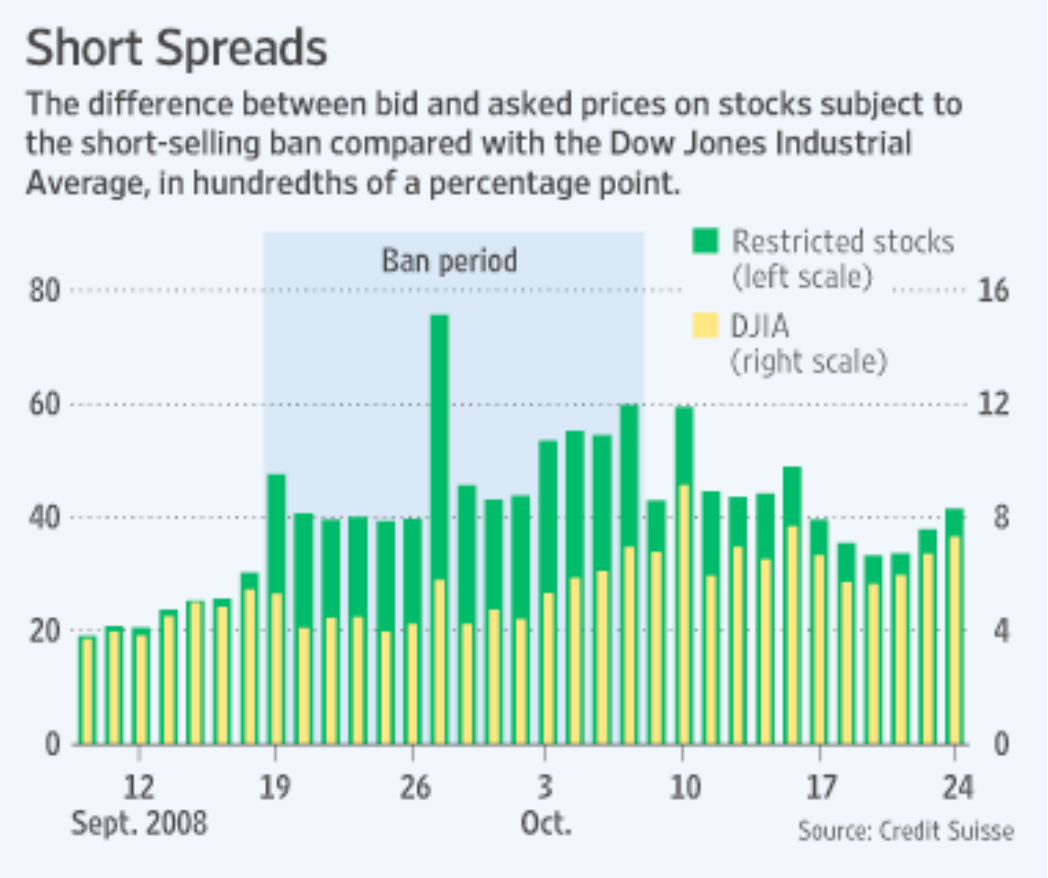


Figure 2: **Bid-Ask Spreads During the Global Liquidity Crisis.** The chart shows average bid-ask spread for large cap U.S. stocks, the equity volatility index VIX, and the interest-rate spread between LIBOR and Treasury bills (TED) from July 2006 to July 2009. Each of the series has been scaled to have a zero mean and a unit standard deviation.

And even more so for stocks with short sales restrictions…



Lesson 5C: With wildly divergent effects for different investors..

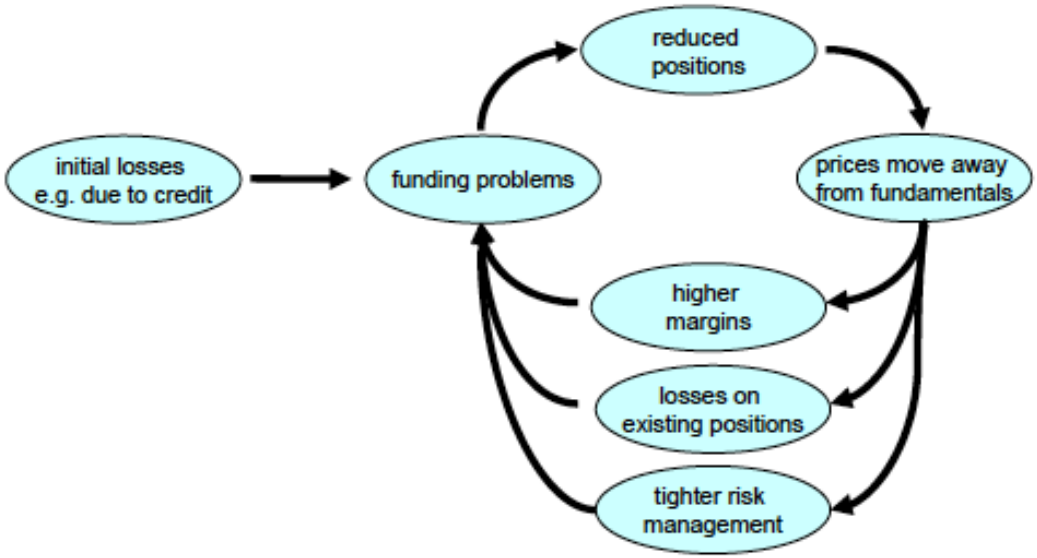


Figure 4: **Liquidity Spirals.** The chart shows how an initial shock to financial institutions' funding is amplified by increasing margins (margin spirals), losses on existing positions (loss spiral), and tightened risk management (risk management spiral).

See Pedersen (2009)

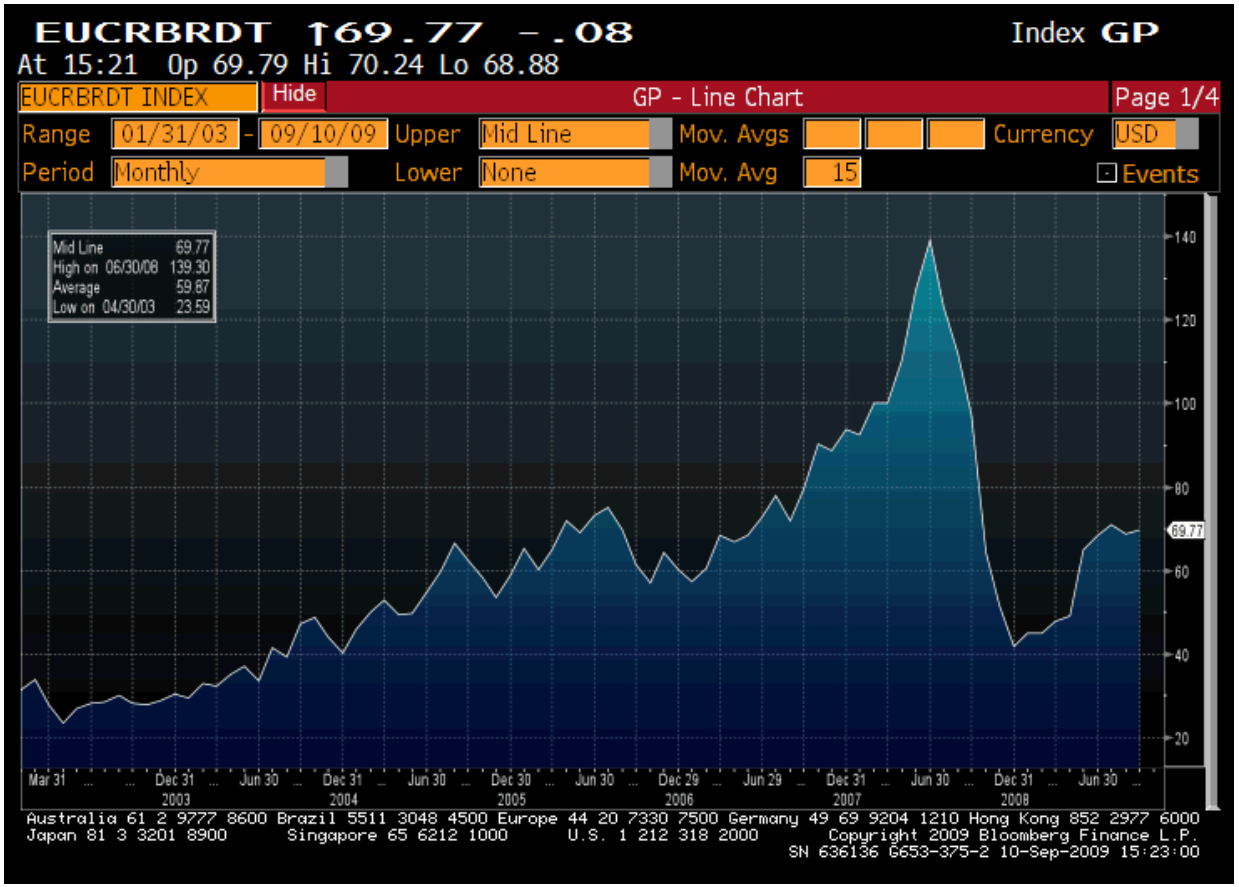
Response 5A: Illiquidity has to be considered explicitly in valuation… for all companies..

- If we accept the premise that illiquidity can be a significant problem, even with large market cap companies, we have to consider ways in which we can explicitly incorporate the illiquidity risk into value. In general, we have two choices:
  - Adjust discount rates: As a general proposition, we could argue that illiquidity is a risk and that discount rates should be higher for illiquid companies. Holding cash flows constant, we will arrive at lower values for illiquid assets.
  - Reduce estimated value for illiquidity: Alternatively, we can ignore illiquidity while estimating value but discount the expected value for illiquidity (like private company practitioners have.

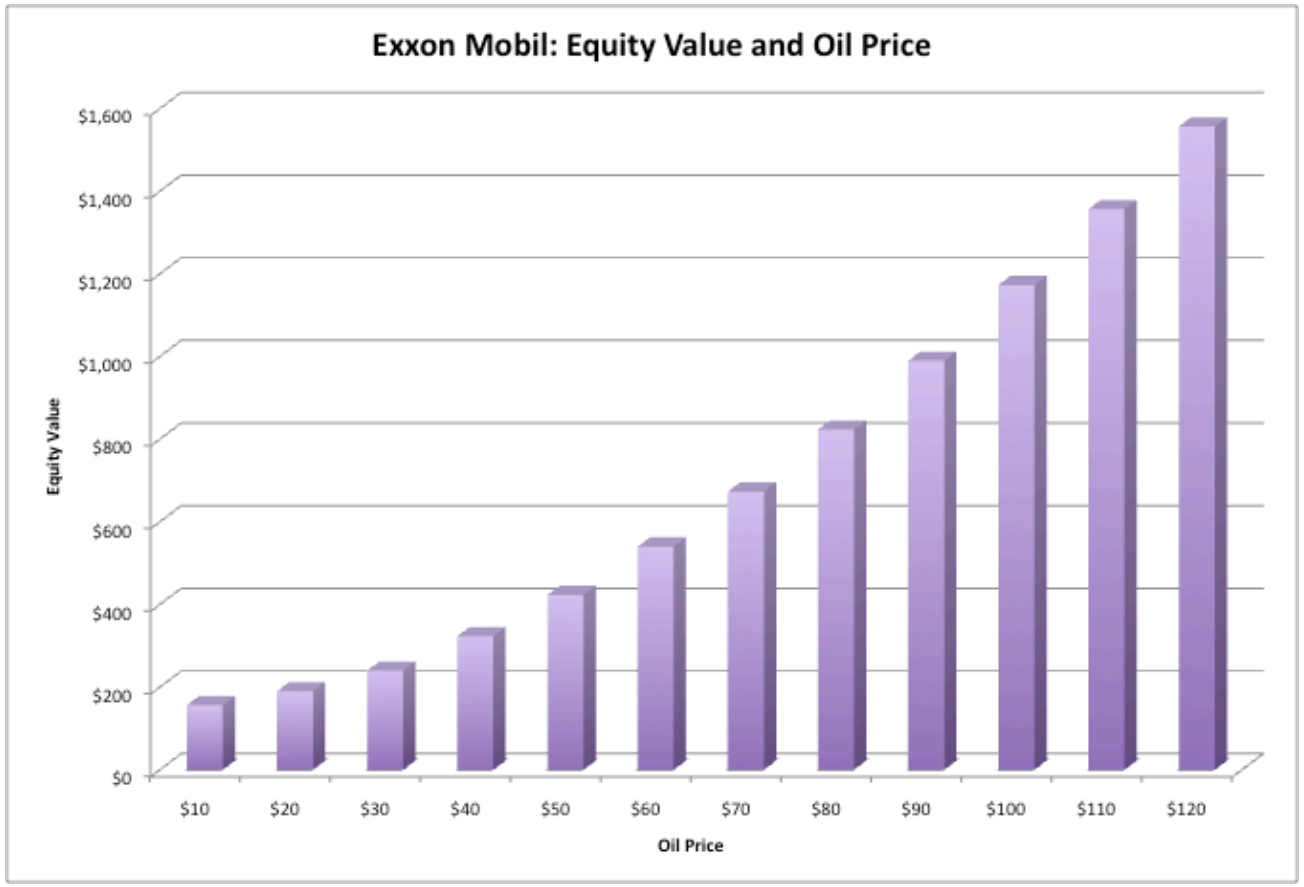
Response 5B: And vary across assets (companies)…

- Liquidity as a source of market risk: We can extend traditional risk and return models (such as the CAPM) to consider illiquidity as a source of market risk. In practice, this would require us to estimate
  - An illiquidity beta for every asset, reflecting not only how illiquid an asset is but how that illkquidity correlates with market illiquidity
  - An illiquidity risk premium which will vary across time
- Historical data: We can look at how the market has priced assets historically and try to back out how much of a discount it has attached to illiquid assets and how that discount varies across asssts.
- Market based approach: Using observed stock prices, we can back out the implied illiquidity discount on estimated value for firms in different sectors (illiquidity classes).

Lesson 6A: There may be no normal…



And value will be a function of your expectations…



Lesson 6B: And stability can be fleeting… Valuing a Bank in 2009 – Wells Fargo..

Year	***2008***	*2007*	*2006*	*2005*	*2004*	*2003*	*2002*	*2001*	*Average: 01-07*
Dividends	**$5,751**	$3,955	$3,641	$3,375	$3,150	$2,527	$1,873	$1,710	
Net Income	**$2,842**	$8,057	$8,482	$7,671	$7,014	$6,202	$5,434	$3,423	
Book Equity	**$47,628**	$45,876	$40,660	$37,866	$34,469	$30,319	$27,214	$26,488	
Growth Rate	**-64.73%**	-5.01%	10.57%	9.37%	13.09%	14.13%	58.75%	-14.98%	12.28%
Payout ratio	**202.36%**	49.09%	42.93%	44.00%	44.91%	40.74%	34.47%	49.96%	43.73%
ROE	**5.97%**	17.56%	20.86%	20.26%	20.35%	20.46%	19.97%	12.92%	18.91%

1. If you were valuing Wells Fargo today, what would you use as your base year earnings? Dividends? Return on equity?
2. Historically banks have had a beta close to one, which would have given both banks a US$ cost of equity of about 14% in 2009 (T.Bond rate =3.5%; ERP =6%; CRP=4.5%). Would you continue to use this beta in the valuation?

Response 6A: When uncertain, keep it simple: The key valuation inputs for Wells Fargo..

- Focus on the key inputs into valuation: the ROE and the cost of equity

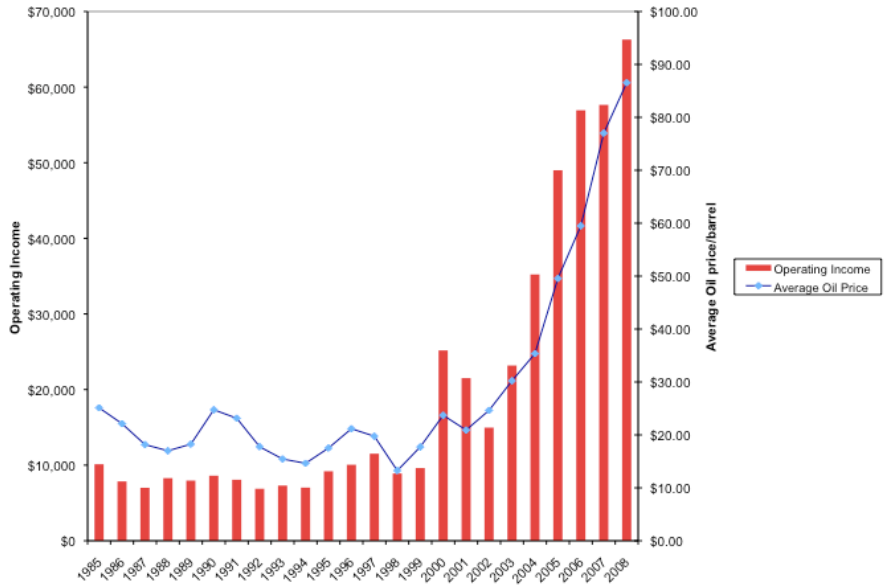
		Cost of Equity			
Return on Equity		9%	11%	13%	15%
	10%	$56,900	$42,971	$34,542	$28,910
	12%	$73,581	$55,185	$44,148	$36,790
	14%	$90,883	$67,909	$54,144	$44,982
	16%	$109,917	$81,157	$64,541	$53,694
	18%	$122,703	$94,942	$75,349	$62,333
	20%	$147,261	$109,279	$86,578	$71,509

- Or define value as a function of key scenarios:

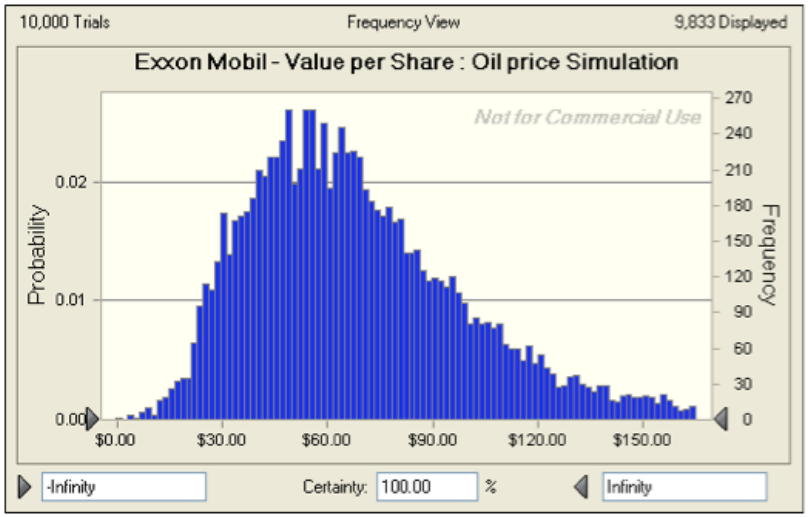
	Net Income	ROE	Cost of equity	Value of equity
Quick bounce back to normalcy	$9,006.45	18.91%	9%	126293.58
Slow bounceback to normalcy	$7,144.20	15.00%	10%	$81,648.00
New World Order	$5,715.36	12.00%	11%	$53,581.50
Market Cap (2/2009)				$66,643.00

Response 6B: Probabilistic Analysis

Step 1: Look at history



Step 3: Run simulation



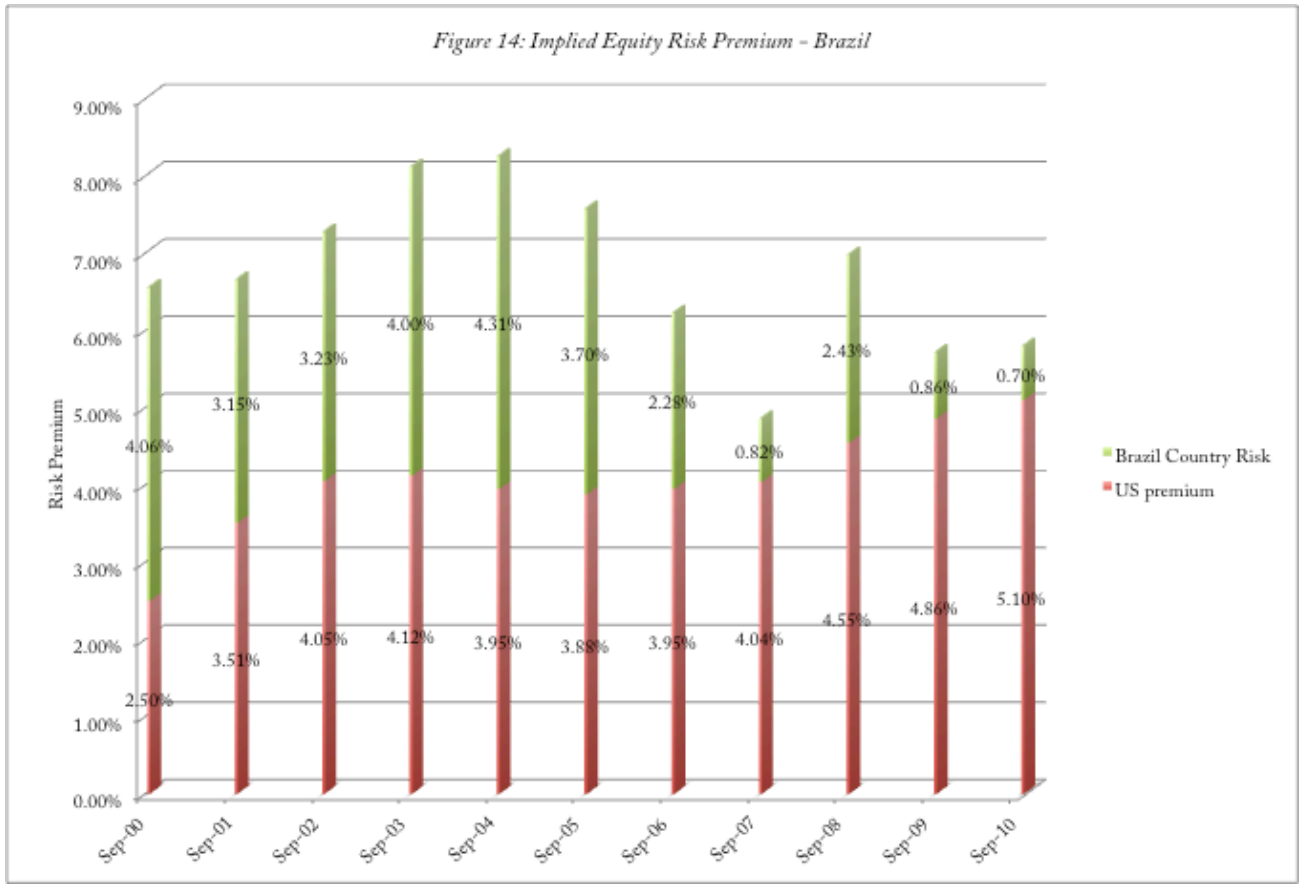
Step 2: Look for relationship

Regression of Exxon income against oil price

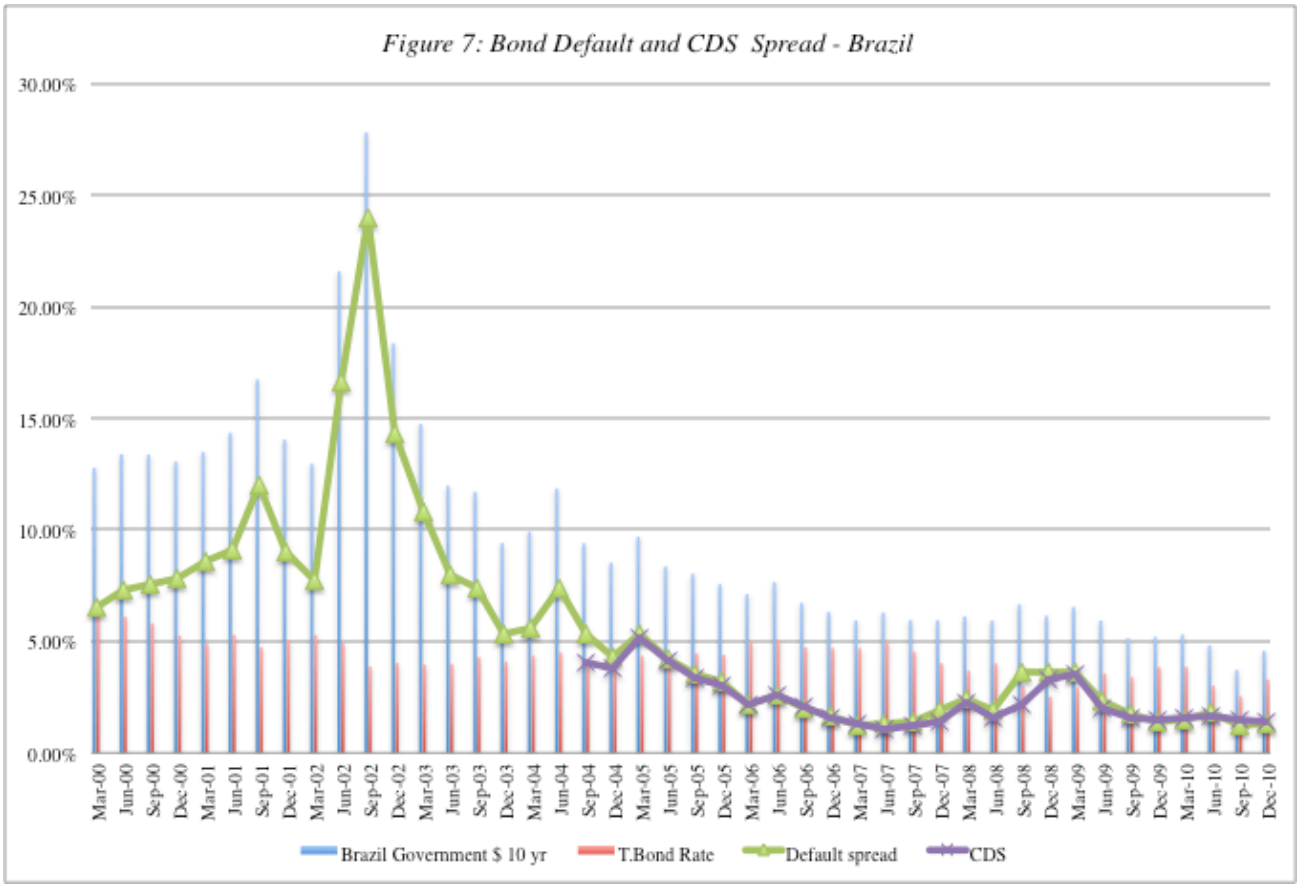
Op Inc = -6,934 + 911 (Price per barrel of oil)

R squared = 94%

Lesson 7A: Country risk can change in a hurry… and the line between emerging and developed markets is blurring

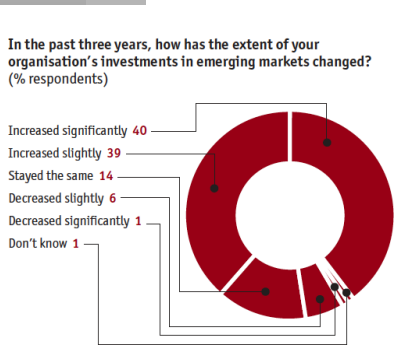


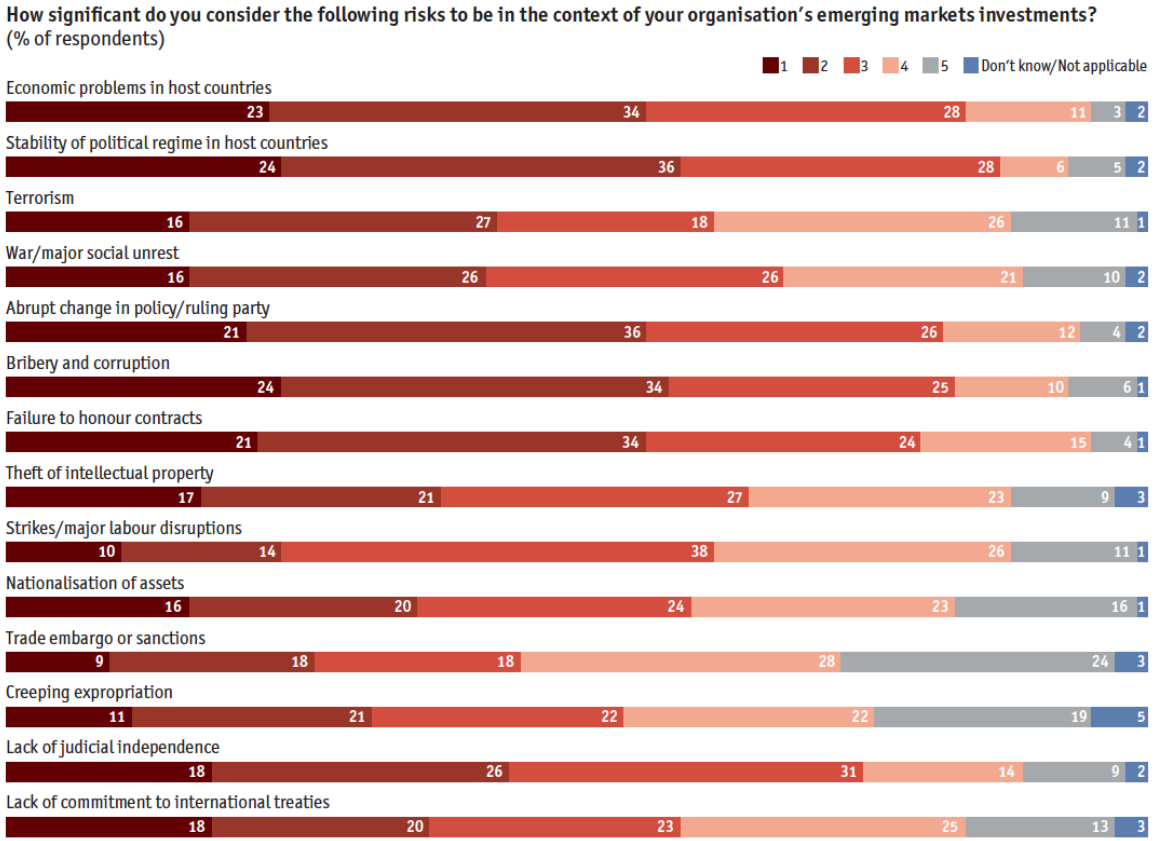
Response 7A: A more dynamic measure of country risk..



Lesson 7B:And affect developed market companies…

- Results of The Economist's Survey of developed market companies

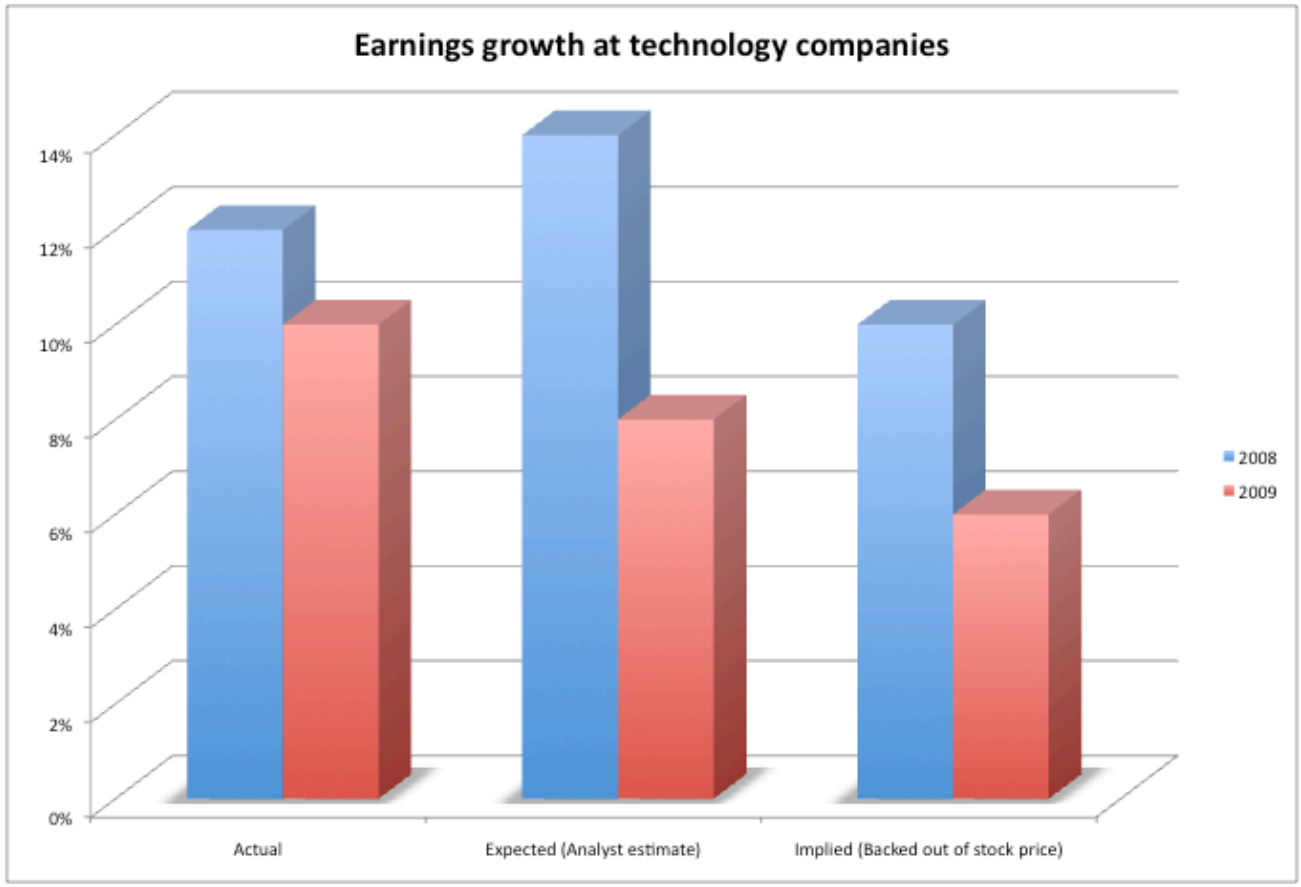




Response 7: Country risk derives from operations, not where you are incorporated..

- Source of revenues: Other things remaining equal, a company should be more exposed to risk in a country if it generates more of its revenues from that country. A Brazilian firm that generates the bulk of its revenues in Brazil should be more exposed to country risk than one that generates a smaller percent of its business within Brazil.
- Manufacturing facilities: Other things remaining equal, a firm that has all of its production facilities in Brazil should be more exposed to country risk than one which has production facilities spread over multiple countries. The problem will be accented for companies that cannot move their production facilities (mining and petroleum companies, for instance).
- Use of risk management products: Companies can use both options/ futures markets and insurance to hedge some or a significant portion of country risk.

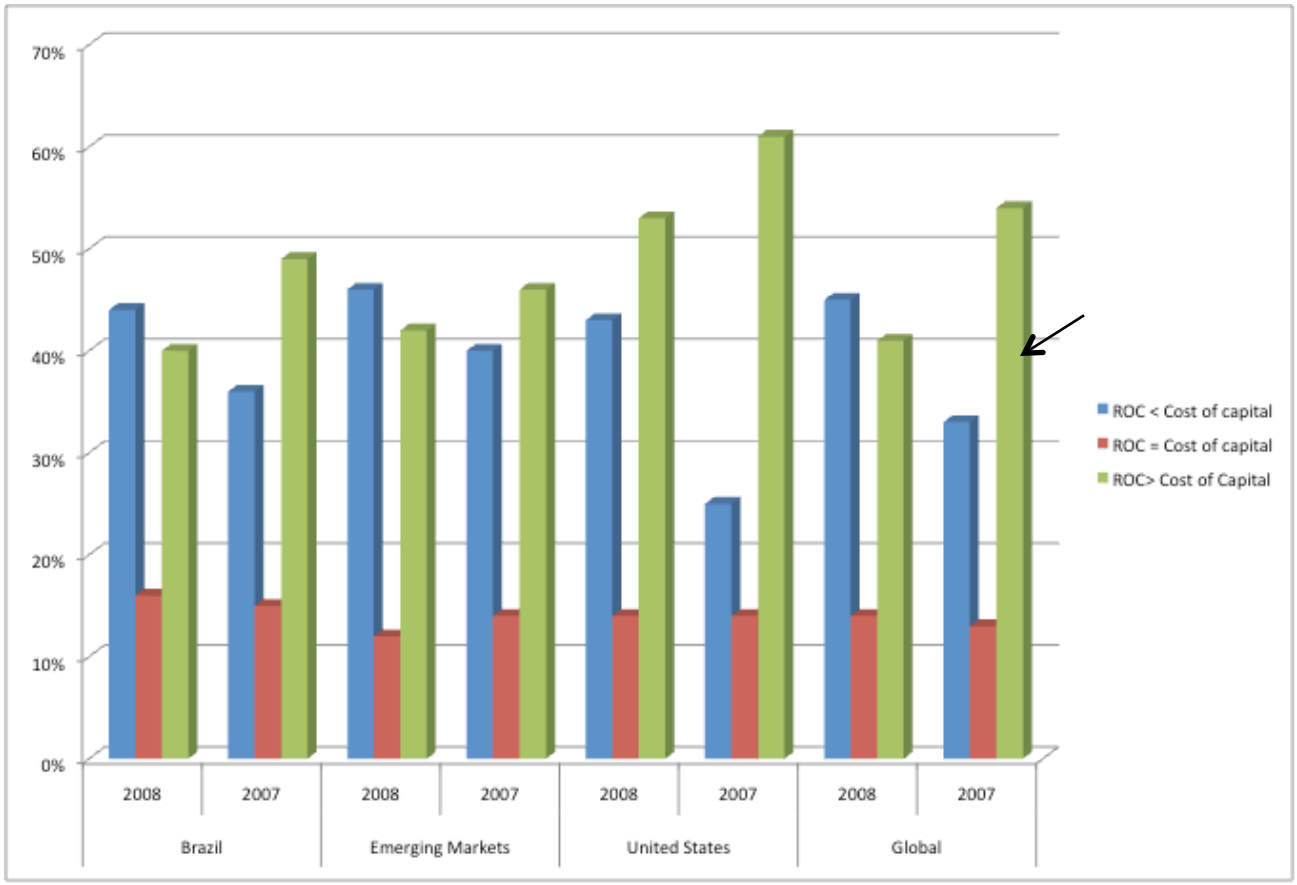
Lesson 8A: Growth can be illusory…



Lesson 8B: And destroy value..

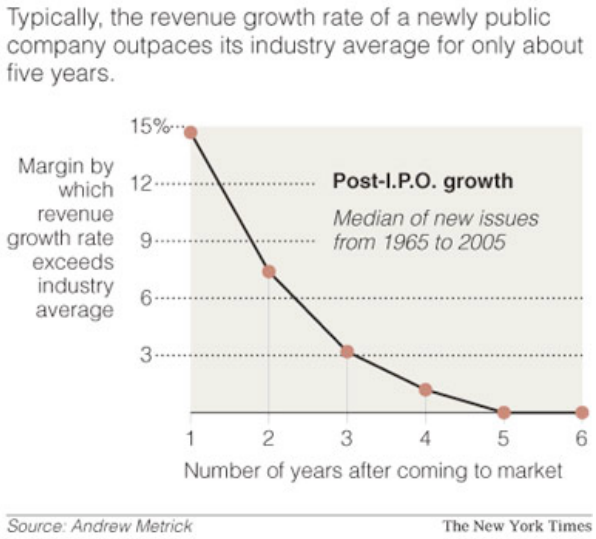
- For growth to create value, the new investments that generate that growth have to earn a return on capital > cost of capital. While this is easy to show, it is tough to measure in practice, since
  - Our estimates of cost of capital are backward-looking, and even if done right, reflect the past risk profile of the company. If a firm grows by sequentially entering riskier and riskier businesses, we will give it higher values as it grows, but the risk will eventually catch up.
  - Our estimates of return on capital are based upon the operating income reported in a specific year and the accounting capital invested. Both numbers reflect both accounting choices and short term profitability, rather than long term returns.
- In effect, we may be rewarding many companies for growth when we should be punishing them.

Backed up by some evidence…

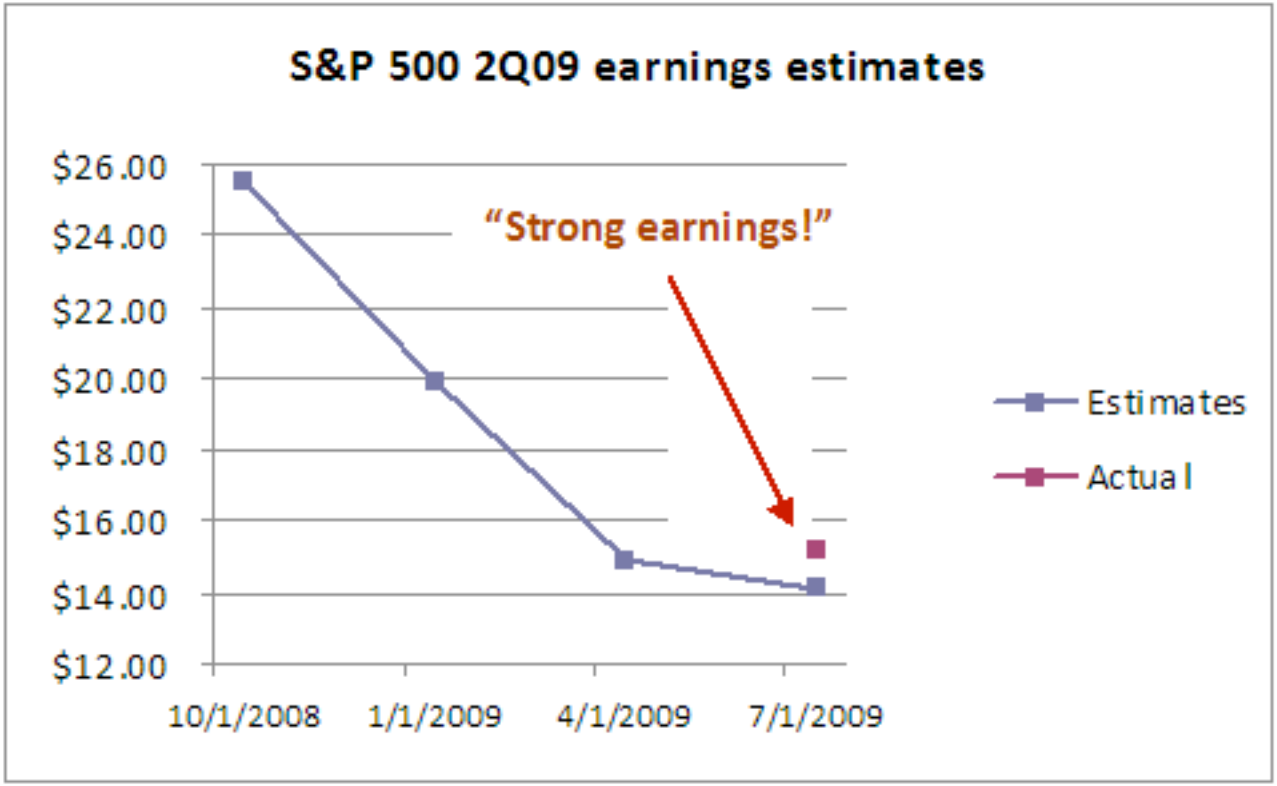


Response 8A: Don't trust historical growth rates..

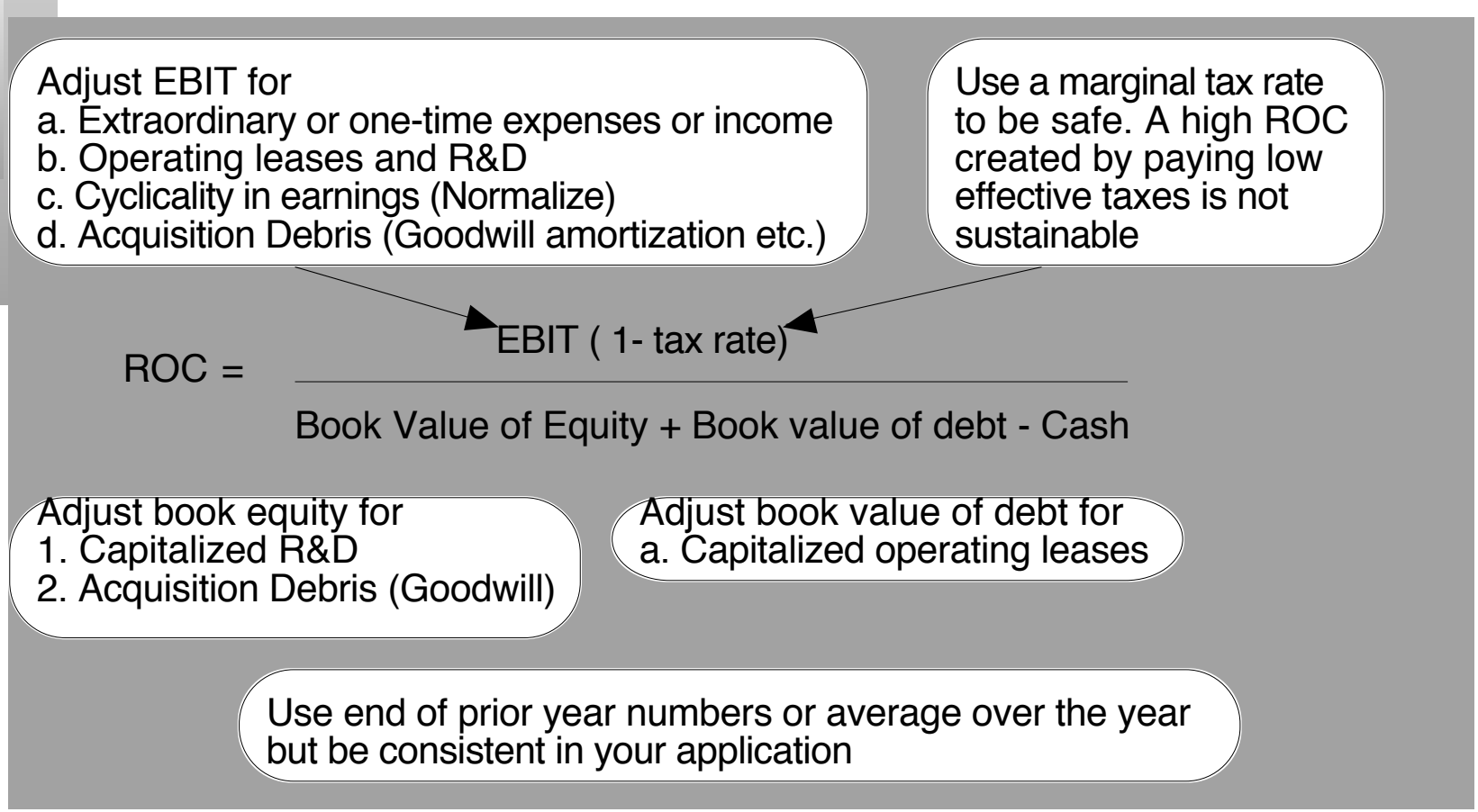
First 5 years	Growth Class	Next 5 years: Lowest	2	3	4	5	Highest
	Lowest	13.73%	7.19%	7.52%	9.80%	13.07%	48.69%
	2	27.27%	6.74%	12.61%	15.84%	17.01%	20.53%
	3	15.23%	14.09%	27.27%	20.45%	11.14%	11.82%
	4	10.03%	14.09%	34.15%	21.14%	11.38%	9.21%
	5	9.09%	12.63%	24.24%	28.79%	12.12%	13.13%
	Highest	16.32%	10.88%	19.67%	22.18%	13.81%	17.15%



Response 8B: Or analyst estimates and management forecasts…



Response 8C: Spend some time getting return on capital right!!



Lesson 9A: Debt ratios and costs of capital can shift, even if dollar debt does not…

		Jan-08		Jan-09	
Industry Name	*Change in debt ratio*	*MV Debt Ratio*	*BV Debt Ratio*	*MV Debt Ratio*	*BV Debt Ratio*
Market	**12.72%**	**20.07%**	**47.62%**	**32.80%**	**48.31%**
Coal	20.07%	12.37%	50.23%	32.44%	51.26%
Manuf. Housing/RV	20.92%	12.47%	24.53%	33.39%	25.44%
Trucking	23.12%	32.79%	47.75%	55.91%	61.76%
Steel (Integrated)	23.48%	15.90%	32.67%	39.38%	32.34%
Paper/Forest Products	25.15%	29.00%	44.26%	54.15%	44.17%
Advertising	26.84%	28.97%	55.45%	55.81%	56.97%
Securities Brokerage	27.03%	55.19%	85.64%	82.22%	88.14%
Property Management	27.31%	46.57%	74.55%	73.88%	74.90%
Building Materials	28.00%	22.77%	43.70%	50.76%	46.57%
Maritime	31.36%	33.64%	55.32%	65.00%	60.90%
Publishing	32.32%	25.51%	84.10%	57.83%	98.13%
Hotel/Gaming	32.57%	26.21%	60.84%	58.78%	62.52%
Utility (Foreign)	35.58%	3.00%	18.93%	38.58%	36.70%
Power	41.22%	10.68%	76.06%	51.90%	69.10%

Lesson 9B: The costs of distress can be higher than we thought!!

- Difficulty in accessing capital markets: By assuming that capital markets are always open and always accessible, we under estimate the cost of distress. In effect, we assume that if a firm (especially a large one in a developed market) has a cash flow problem, it can access the equity and bond markets and raise fresh funding to keep going. The crisis of 2008 illustrated that capital markets can shut down even for large companies in developed markets.
- Bank crises: We assume that banking authorities and regulatory capital ratios have made bank runs a thing of the past. While banks may become tighter in granting credit in bad times, they are assumed to be willing to lend to companies with good credit standing. The huge losses incurred on sub-prime mortgages and other securities devastated the capital at banks and imperiled this assumption as well.

Response 9: Build in the costs of distress into the trade off… Disney modified..

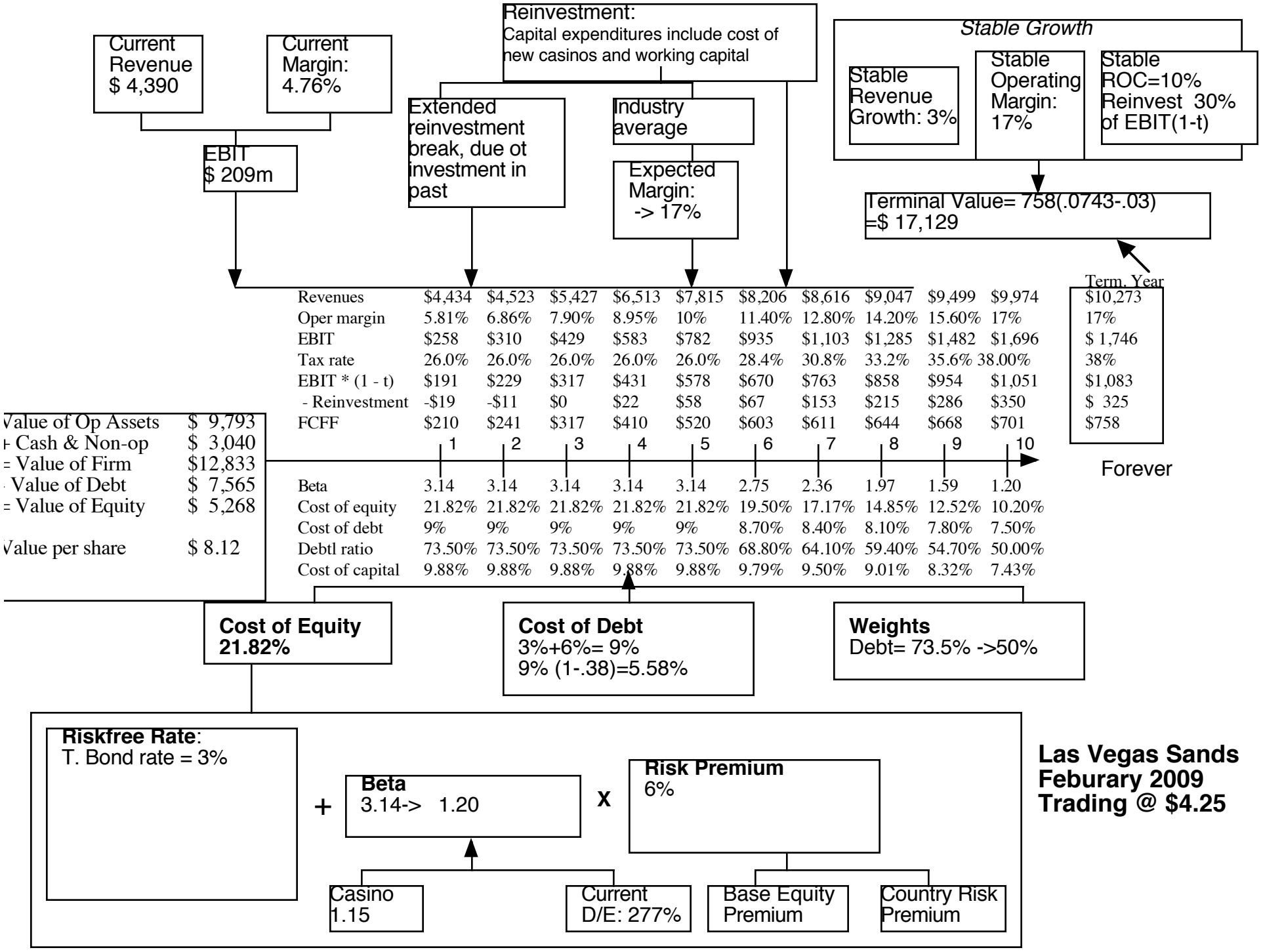
Debt Ratio	Beta	Cost of Equity	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC	Firm Value (G)
0%	0.73	7.90%	AAA	4.75%	38.00%	2.95%	7.90%	$58,522
10%	0.78	8.20%	AAA	4.75%	38.00%	2.95%	7.68%	$60,384
20%	0.85	8.58%	AAA	4.75%	38.00%	2.95%	7.45%	$62,368
30%	0.93	9.07%	A+	5.75%	38.00%	3.57%	7.42%	$62,707
40%	1.04	9.72%	CCC	13.50%	38.00%	8.37%	9.18%	$24,987
50%	1.30	11.29%	C	18.50%	22.97%	14.25%	12.77%	$17,569
60%	1.62	13.24%	C	18.50%	19.15%	14.96%	14.27%	$15,630
70%	2.16	16.48%	C	18.50%	16.41%	15.46%	15.77%	$14,077
80%	3.25	22.97%	C	18.50%	14.36%	15.84%	17.27%	$12,804
90%	6.49	42.44%	C	18.50%	12.76%	16.14%	18.77%	$11,743

Operating income is a function of rating

Rating	*Coverage gt*	*and lt*	*Spread*	*Drop in EBITDA*
AAA	8.5	100000	1.25%	0.00%
AA	6.5	8.499999	1.75%	0.00%
A+	5.5	6.499999	2.25%	0.00%
A	4.25	5.499999	2.50%	0.00%
A-	3	4.249999	3.00%	-2.00%
BBB	2.5	2.999999	3.50%	-10.00%
BB	2	2.2499999	5.00%	-20.00%
B+	1.75	1.999999	6.00%	-20.00%
B	1.5	1.749999	7.25%	-20.00%
B-	1.25	1.499999	8.50%	-25.00%
CCC	0.8	1.249999	10.00%	-40.00%
CC	0.65	0.799999	12.00%	-40.00%
C	0.2	0.649999	15.00%	-40.00%
D	-100000	0.199999	20.00%	-50.00%

Lesson 10: We under estimate truncation risk.. With distressed firms..

- Our assumptions of perpetual life and terminal value are based upon two premises:
  - The consequences of getting into financial trouble are short term and easily reversed.
  - Capital markets are always open and accessible. A company that needs to raise equity to cover negative cash flows or repay debt can always do so, albeit at a higher cost.
- *Lesson 10.1: Indirect bankruptcy costs are much higher than we thought*. In other words, the perception that you are in trouble can be almost as damaging as being in trouble, especially in businesses that are dependent upon intangible assets.
- *Lesson 10.2: Capital markets can shut down*, even in developed markets and even for the largest companies.


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 ot 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(.0743-.03) =$ 17,129
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
1 2 3 4 5 6 7 8 9 10
Forever
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
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%
Debtl 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%
Cost of Equity 21.82%
Cost of Debt 3%+6%= 9% 9% (1-.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 Feburary 2009 Trading @ $4.25

Response 10: Adjust value for truncation risk

- 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 (3%), we can back out the probability of distress from the bond price:

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

- Solving for the probability of bankruptcy, we get:

$\pi_{Distress}$ = 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

Lesson 11: Governments and regulators can affect value..

- In most developed market valuations, there is little explicit consideration for how governments and politics affect value. In fact, the only effect on value that governments have on value is through tax policy, primarily through tax rates.
- In this crisis, we have been reminded that governments can influence equity value in many ways…
  - Bailouts: By determining who is "too large to fail" and who is not, governments can determine the destiniex of even large enterprises.
  - Nationalizations: We used to think of the fear of nationalization as restricted to tinpot dictatorships in small emerging markets. No more!
  - Regulations and rules: We think of rules and regulations as clearly defined boundaries and constraints. We forget that rules are written and enforced by human beings, and they can be changed by those same humans.
- *Implication: When valuing companies, especially regulated businesses, we have to consider the effects of not only existing regulations, but changes in those regulations.*

Response 11: Incorporate the "Heavy Hand" into Equity Value per Share

	Average for companies where government has large stake	Average for other companies in the same sector
Tax Rate	41%	32%
ROIC	7%	11%
Debt ratio	43%	35%
Dividends/FCFE	135%	78%

The government's interests may diverge from your interests.
- Dividend policy
- Cost cutting
- Taxes

If the company is badly run, can you do anything about it as a stockholder?

The Government put: The government will not let a company that it owns go under, offering bailouts and other measures to save the firm. This will increase the value of the firm.

The Government call: If the firm becomes too valuable, the government may decide to expropriate the firm at favorable prices (nationalization).

Lesson 12: Independent Board ≠ Effective Board

Where Was Lehman Board?

Firm's External Directors Had Relied on Experiences Of a Bygone Financial Era

By DENNIS K. BERMAN

Article | Comments

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Nine of them are retired. Four are over 75 years old. One is a theater producer, another a former Navy admiral. Only two have direct experience in the financial-services industry.

Meet the Lehman Brothers Holdings external board directors, a group of 10 people who, perhaps unknowingly, carried the health of the world's financial system on their shoulders the past 18 months.

As the world nervously awaits the effects of the unprecedented Lehman Brothers liquidation, one can't help but wonder how and why this board let its longtime chairman and patron, Richard

Response 12: Let's think about effective boards… Directors should..

- Know the business: If we want board members to oversee managers, we have to also accept the proposition that these board members understand the business that the company is in.
- (At least some should) serve the interests of those most opposed to incumbent managers: If one of the problems with boards is that they are unwilling to challenge incumbent managers, we need directors who represent stockholders who most disagree with incumbent managers (proportional voting for directors versus majority voting).
- Have a counter weight to the CEO: If it is human nature to assent to authority, we need to create counters to the power of the CEO. In effect, it may be time to create a "Devil's Advocate" on the Board, with powers (and resources) to match the CEO.

Lesson 13: Biased processes = Bad valuations!!

- The biggest barrier to sensible valuations is not bad data, poor modeling skills, poorly trained or lack of inflation. It is bias.
- If we enter a valuation with strong preconceptions about what we expect or should find, we will find ways to confirm those preconceptions.
- If we tie rewards, compensation and other incentives to the conclusions of a valuation, the bias will get worse.

Response 13: If you want good valuations, fix the processes…

- Require disclosure of bias: All analysts should be required to reveal their biases before they reveal their valuation results.
- Separate valuation from deal making and selling: Asking deal makers (sales people) to analyze whether a deal (sale) makes sense creates conflicts of interest that lead to biased valuations.
- Force transparency: It is easy to hide bias, when assumptions are not explicit and valuations are not transparent.
- Avoid "post-valuation garnishing": While rules of thumb are often based in fact, they get dated and can lead us to set aside good sense.

Lesson 14: Poorly designed rewards = Bad risk taking

Risk = Danger + Opportunity

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"Upside" skewed systems
- Risk takers share in upside but not in downside
- Too much risk taking

"Downside" skewed systems
- Punish risk takers
- Too little risk taking
- Managers behave like bondholders

Response 14: Design systems that reward good risk taking

- Have more symmetry in payoff: If you share in the upside, you have to share in the downside.
- Tie compensation to process, not outcome: It is entirely possible that we can get good outcomes (make money) from bad choices and bad outcomes (lose money) from good choices. Compensation has to look at both outcome and process.
- Side costs and benefits: No person is an island and no action is made in a vacuum. We have to look at the impact (positive and negative) that an employee's have on others in the organization, when determining compensation.
- Consider the law of large numbers: When confronted with success or failure, separating how much can be attributed to luck as opposed to skill remains a difficult task. Consistent success should count for more than an occasional big win….

CLOSING THOUGHTS..

- We all make mistakes. When confronted with them, we can
  - Ignore them and act like nothing has happened
  - Panic (and throw out everything that we have learned out as useless)
  - Learn from them and adapt
- We will make more mistakes in the future. We cannot design systems and models that are always right but we can incorporate "early warning" mechanisms in them to allow us to fix mistakes before it is too late.
- If uncertainty is the name of the game, we have to develop estimation approaches that are flexible, less dependent upon historical data and more grounded in fundamentals.