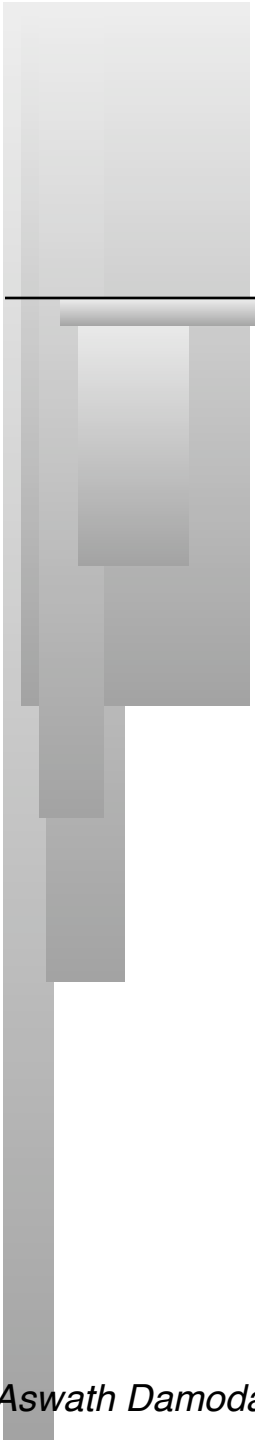


September 12 to October 16  
Five weeks from Hell!  
And the lessons we have learned...

Aswath Damodaran

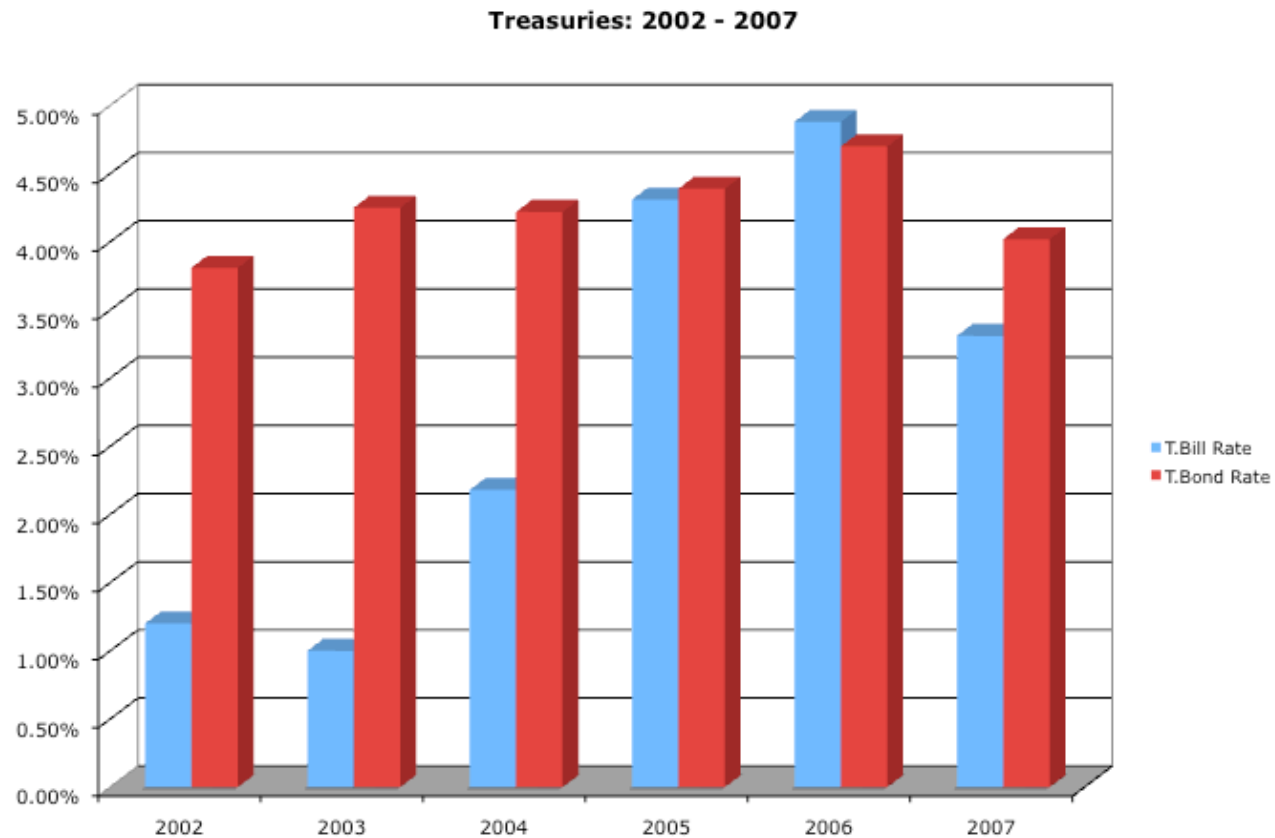


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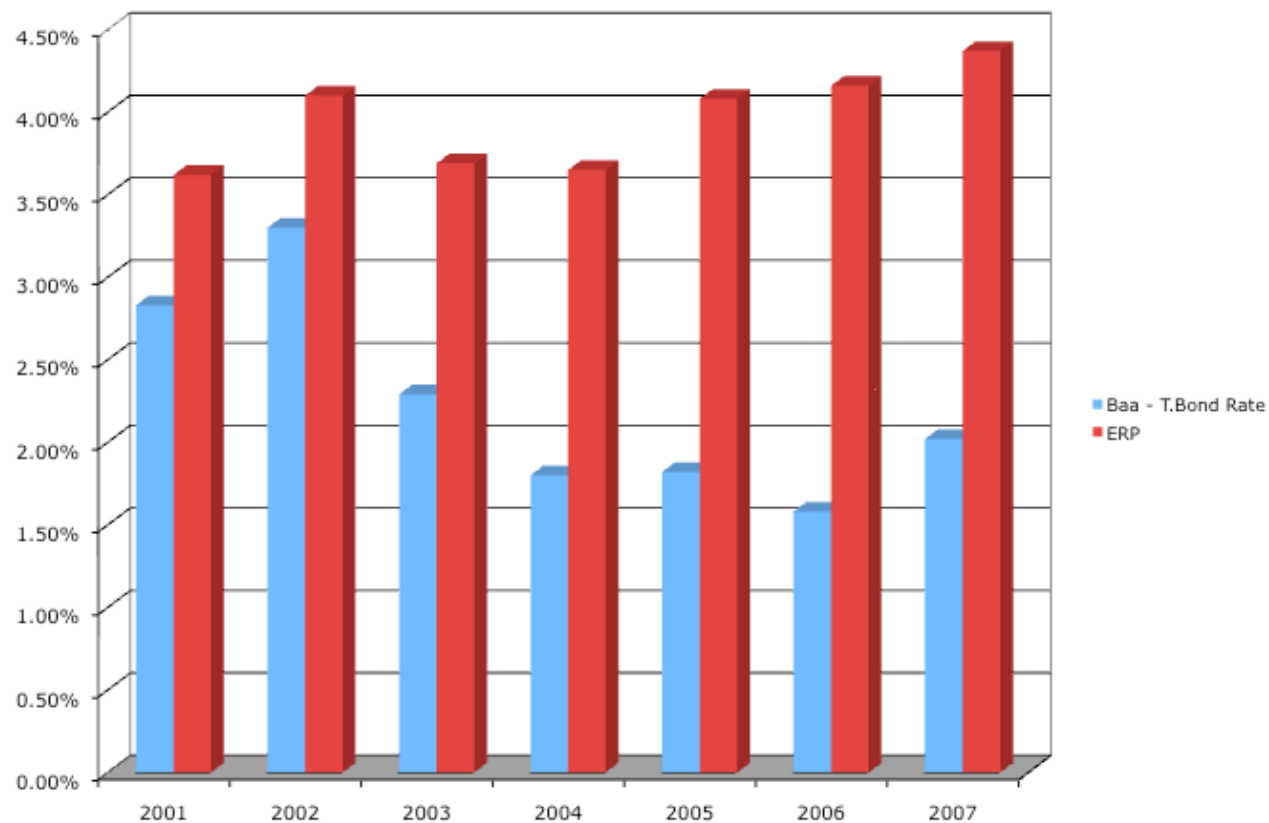
# The way things were.. Before the “troubles”

Innocents led to the slaughter...

## Treasuries were riskless... and rates were stable

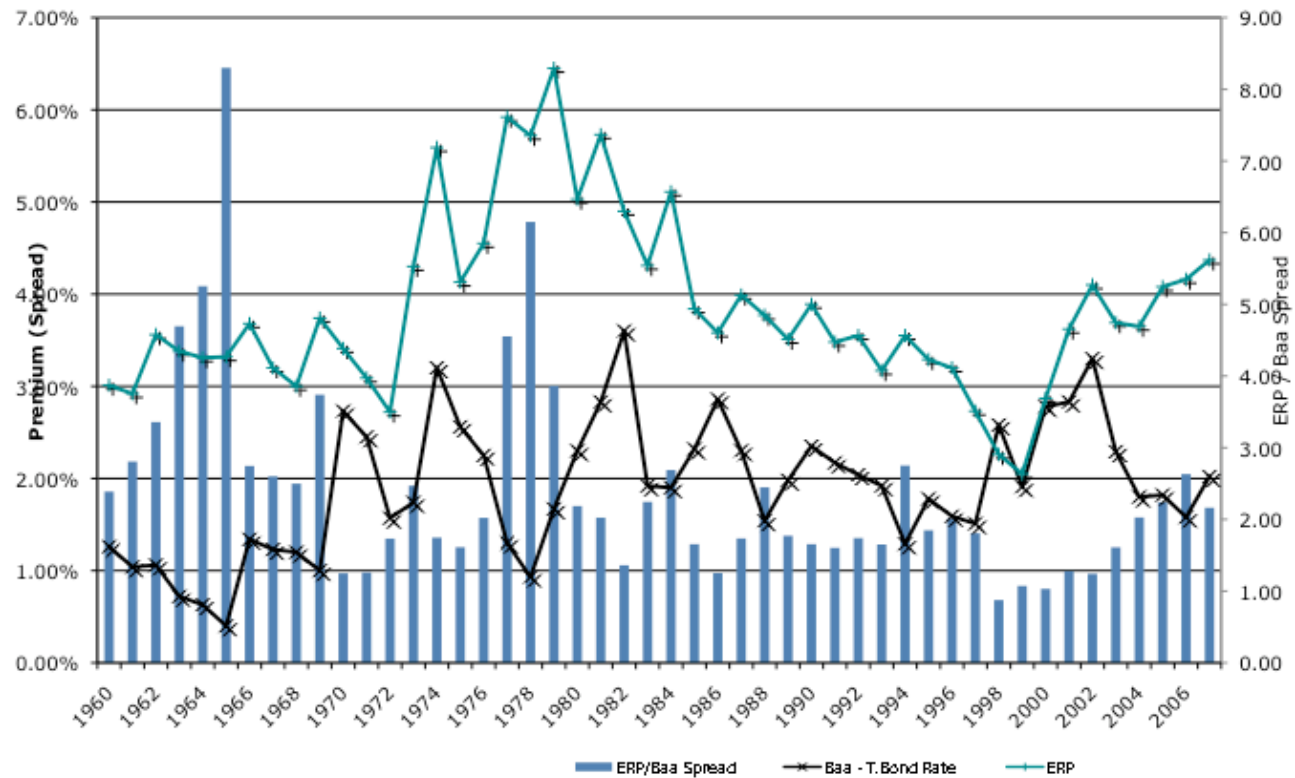


And risk premiums did not change over short periods...



And only gradually over longer periods...

Figure 9: Equity Risk Premiums and Bond Default Spreads

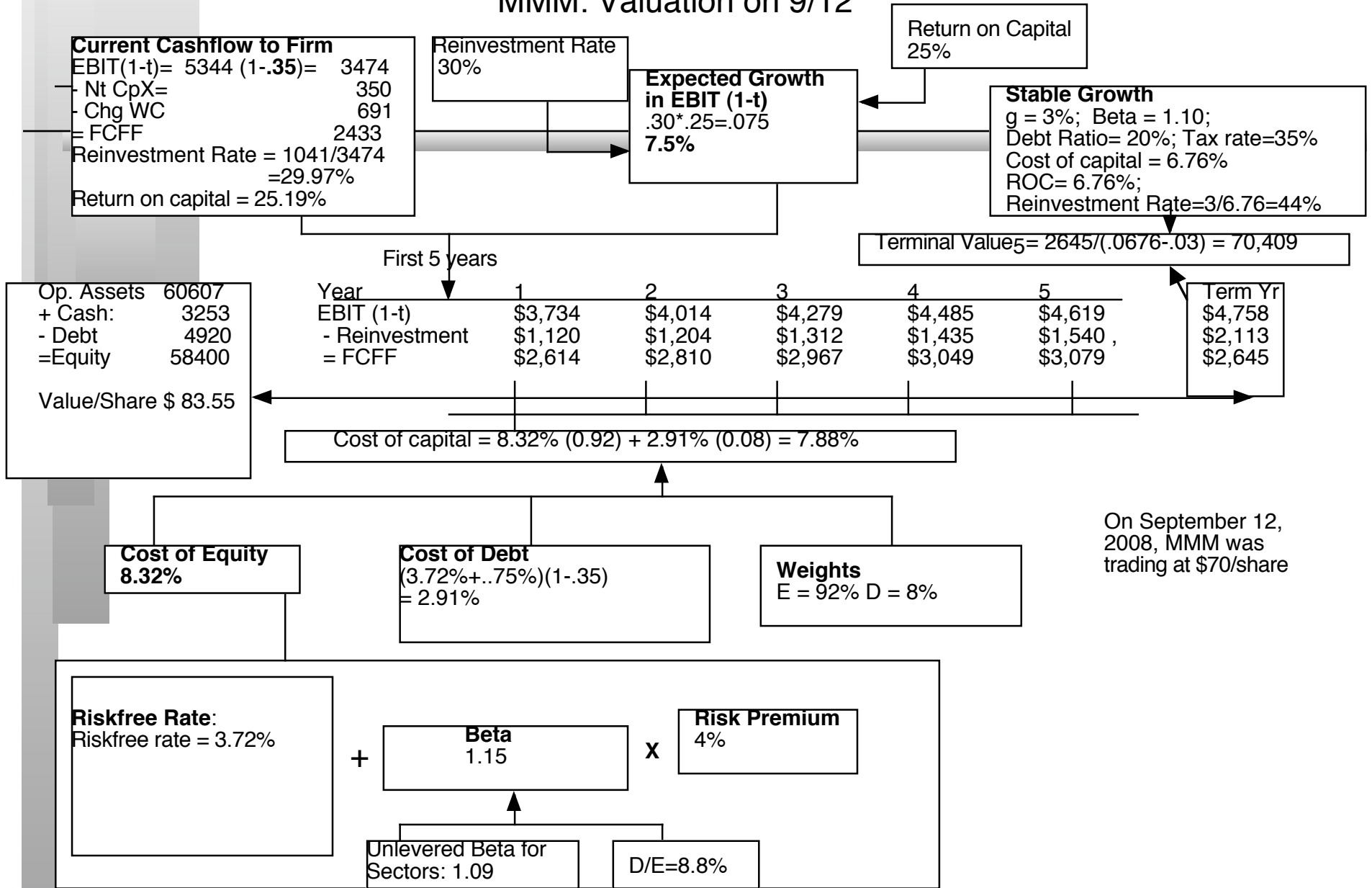


## Real Economic Growth, Earnings Growth and Inflation

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- While we accepted the reality of recessions, we viewed them as bumps in the road to a bigger and better economy. In other words, recessions caused minor blips in real economic growth that would be reversed in future recoveries. And there was always China and India...
- We were even more optimistic about earnings growth. Companies could use financial leverage, stock buybacks and financial engineering tools to keep earnings growing faster than the overall economy.
- Inflation was a minor problem, because central banks had learned their lessons from the 1970s and would figure out ways to keep inflation in check.

# MMM: Valuation on 9/12



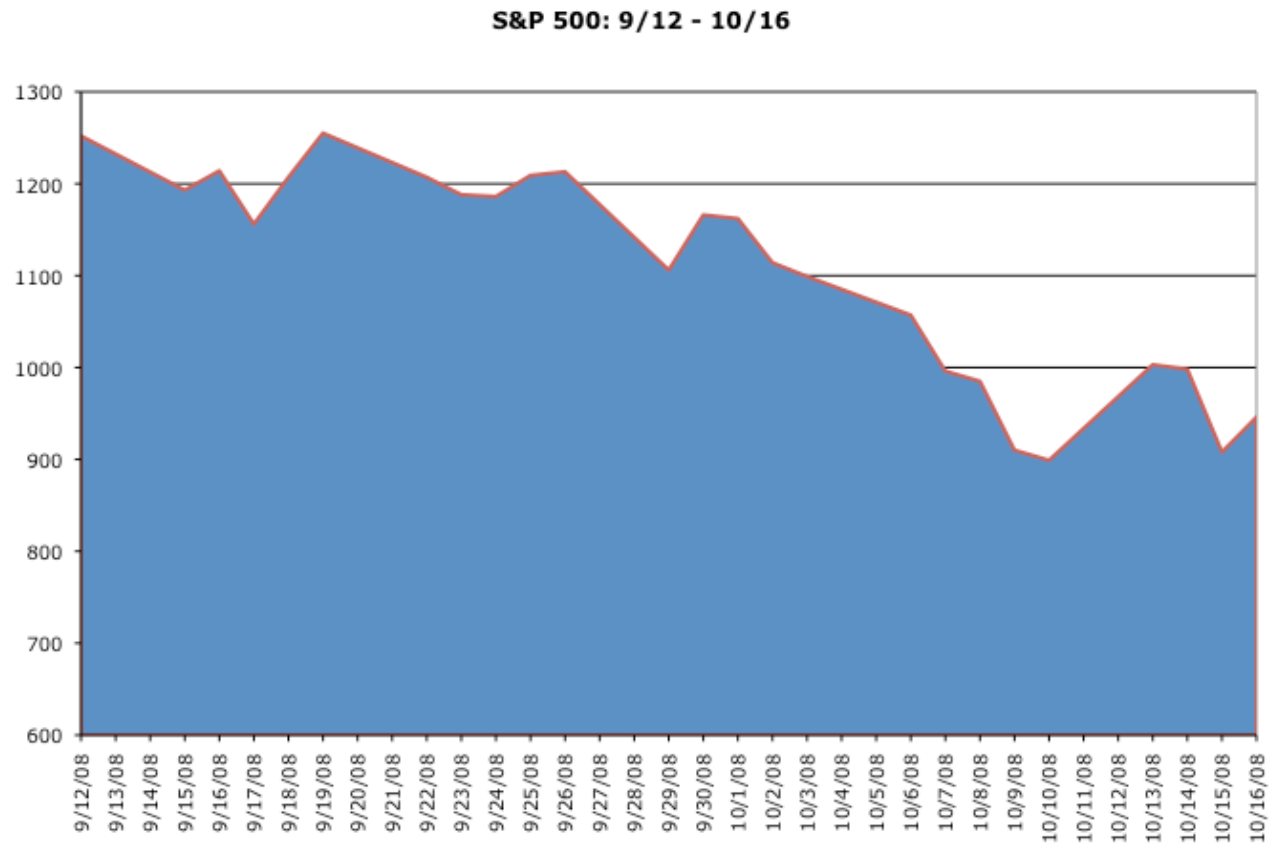


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And then came the troubles...

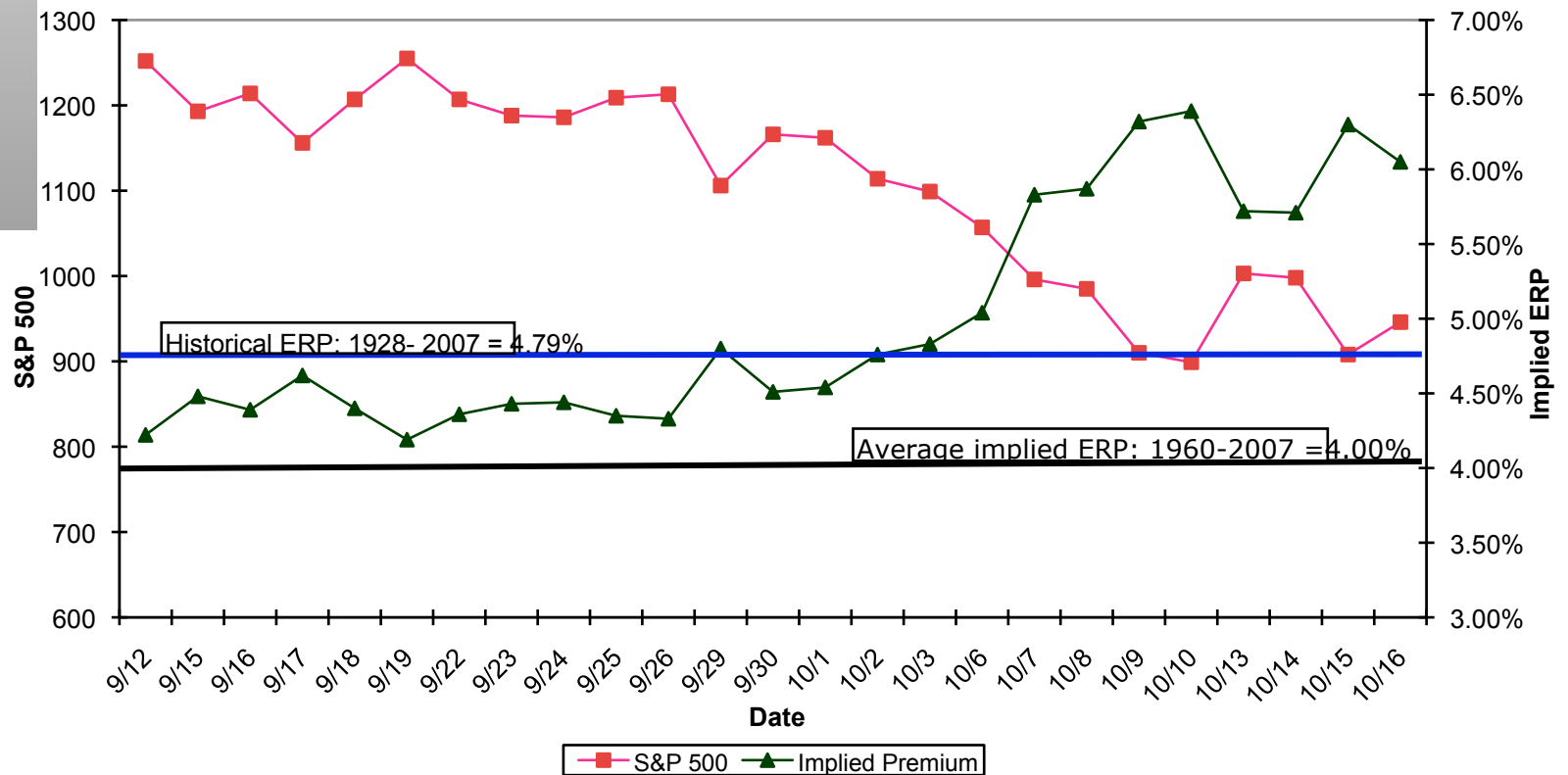


We discovered stocks are risky.. And the reason for demanding an equity risk premium..

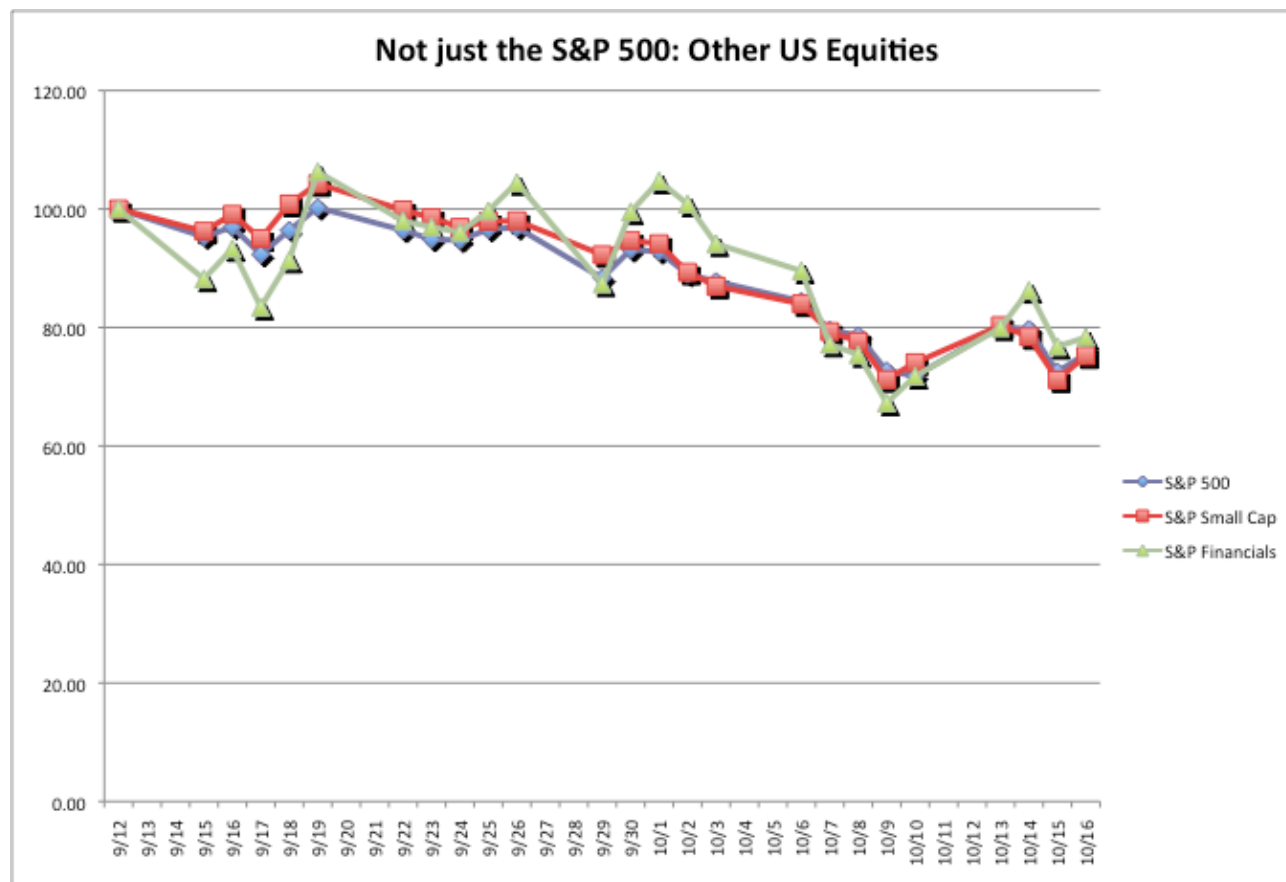


# Quantifying the ERP...

Figure 7A: Implied Equity Risk Premium - 9/12- 10/16

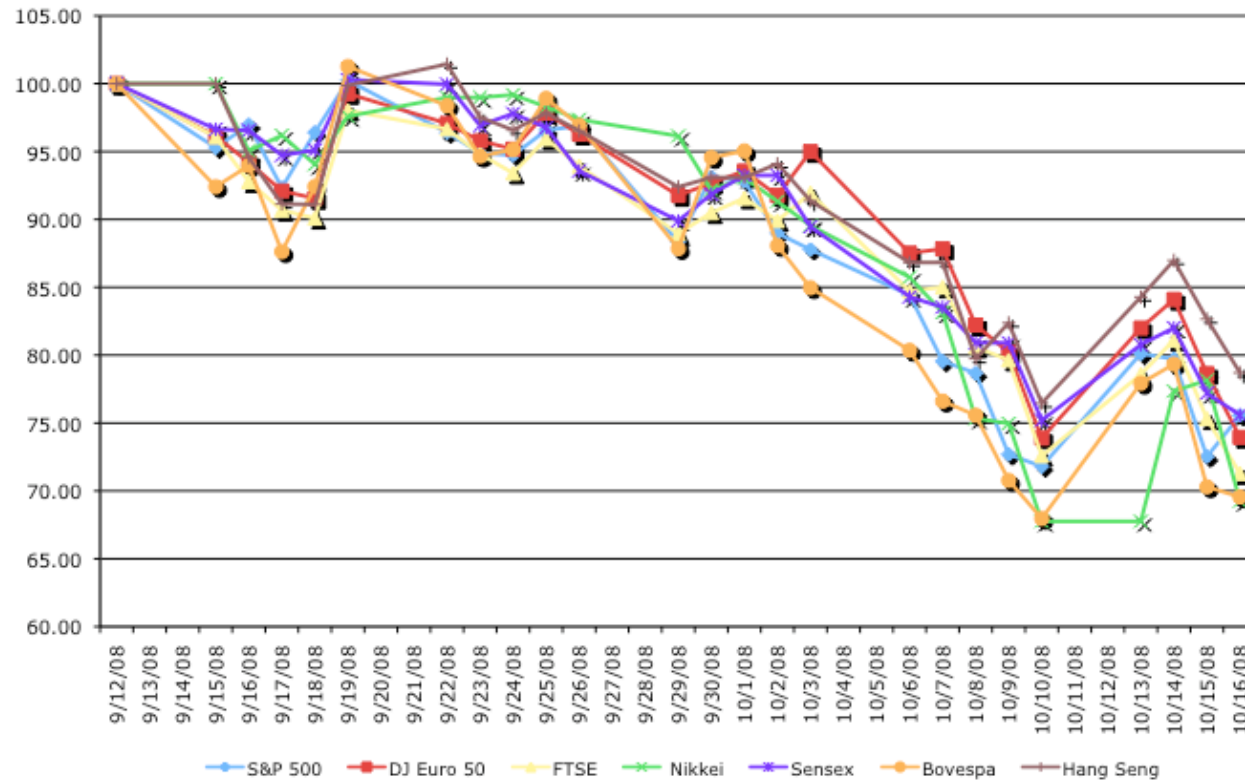


## Not just the S&P 500...

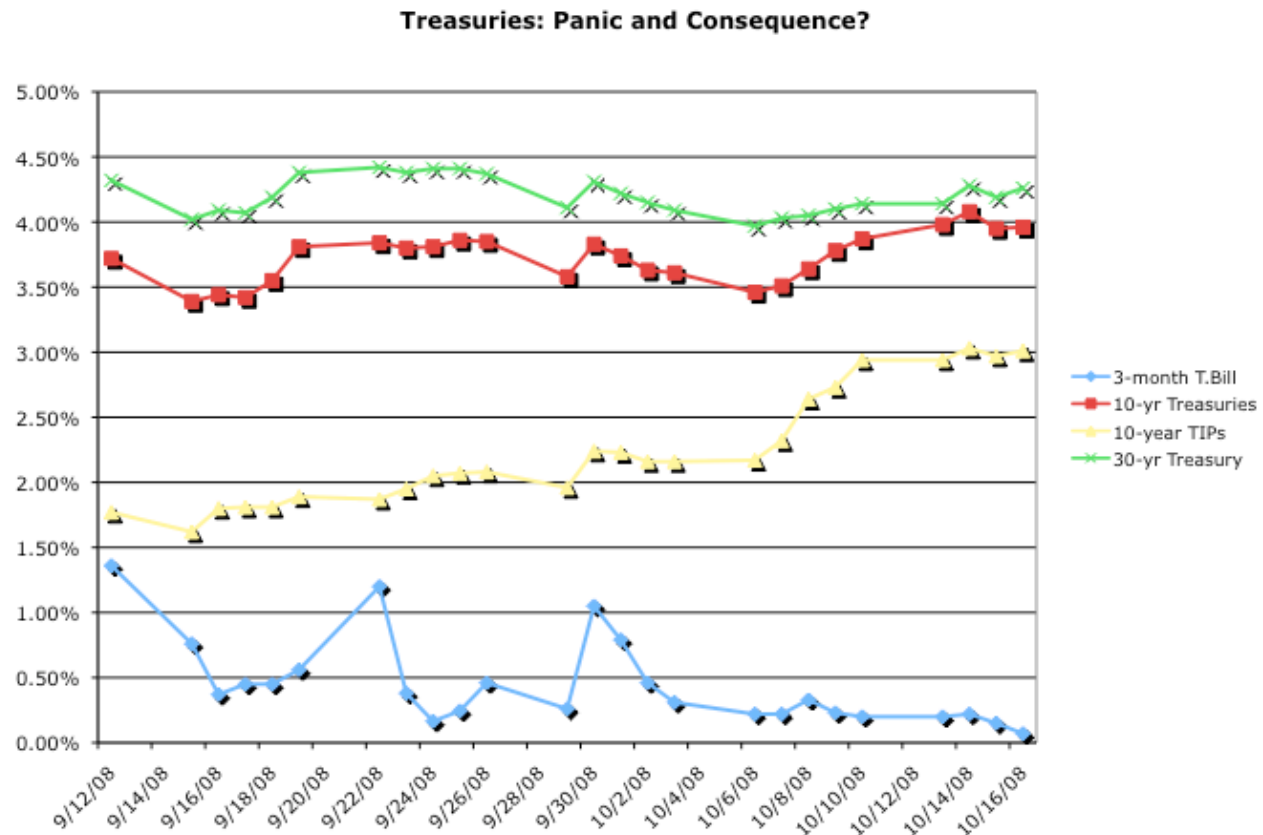


# Going Global with the crisis...

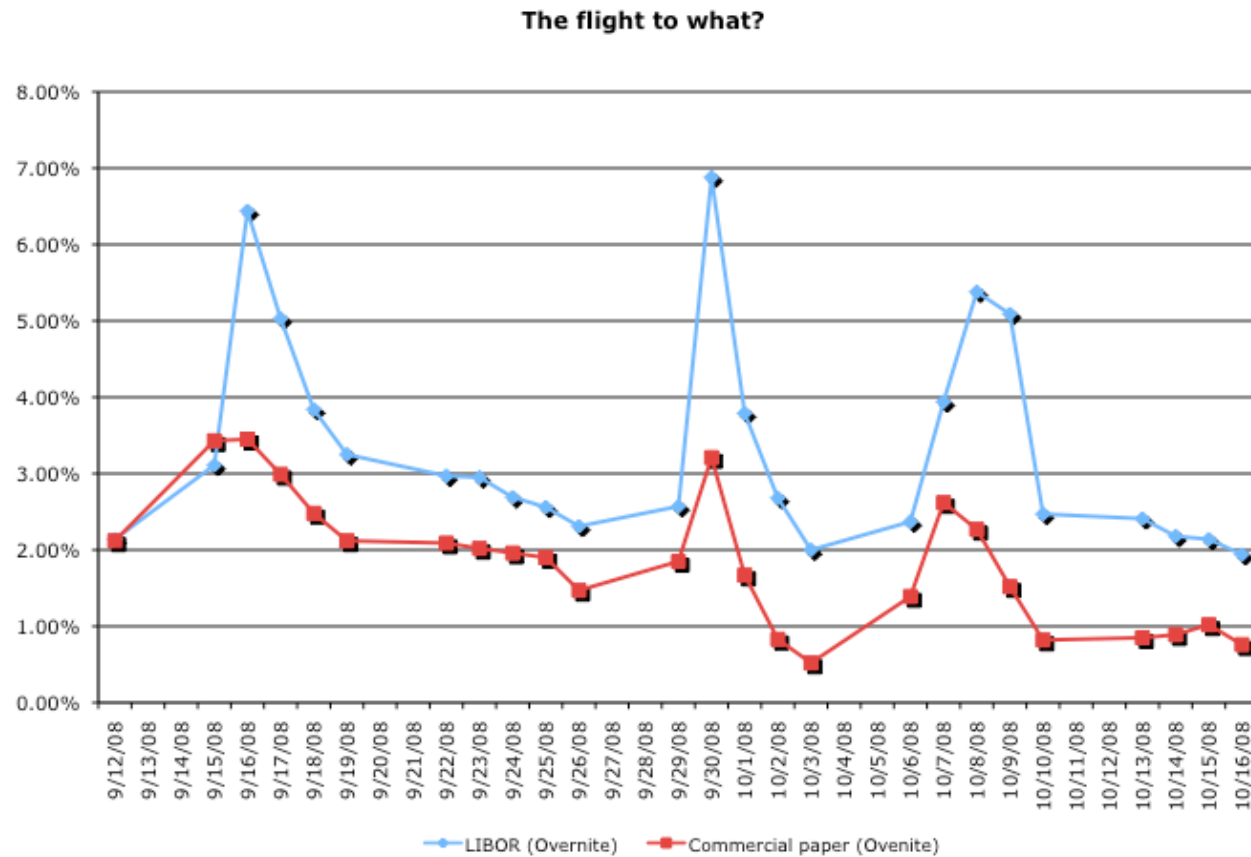
The flip side of globalization!!



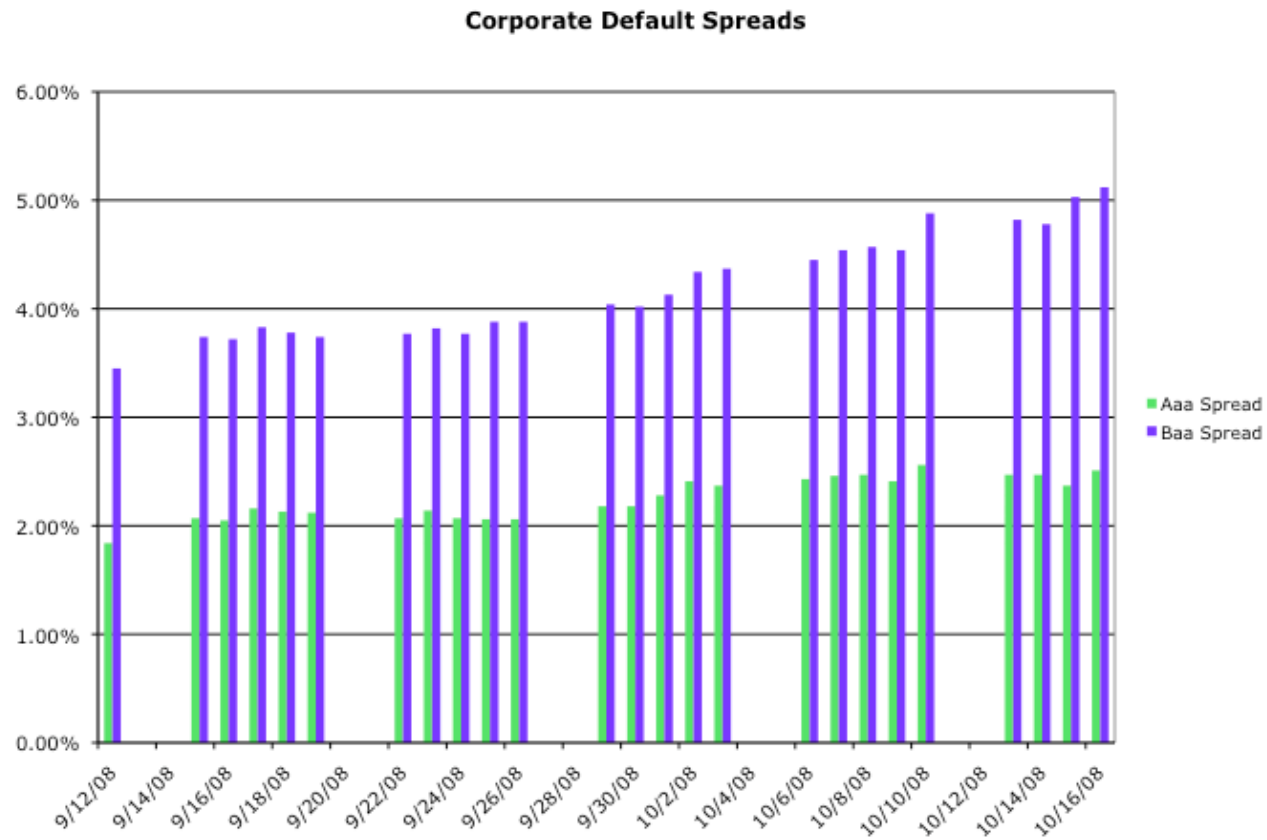
# While treasuries started behaving in odd ways...



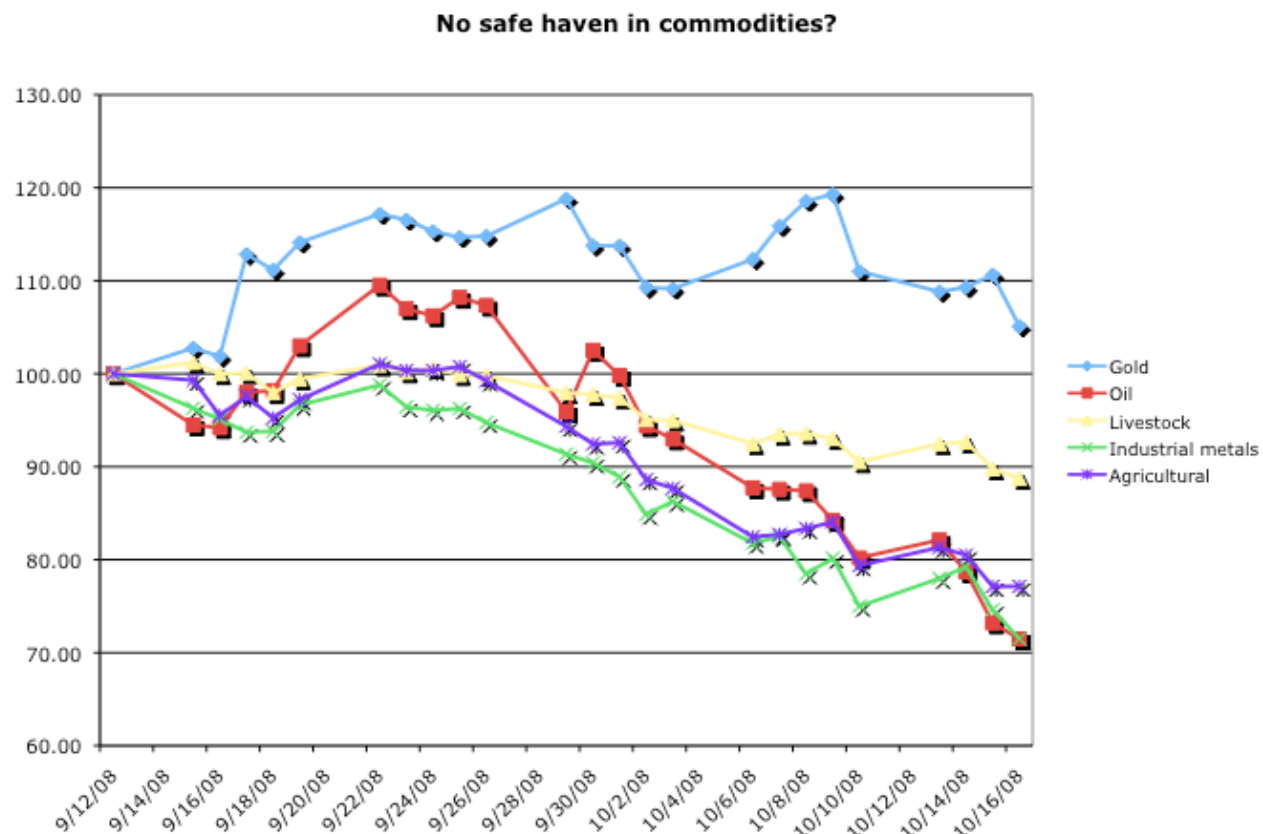
## Short term corporate borrowing markets froze..



## And corporate bond default spreads widened...

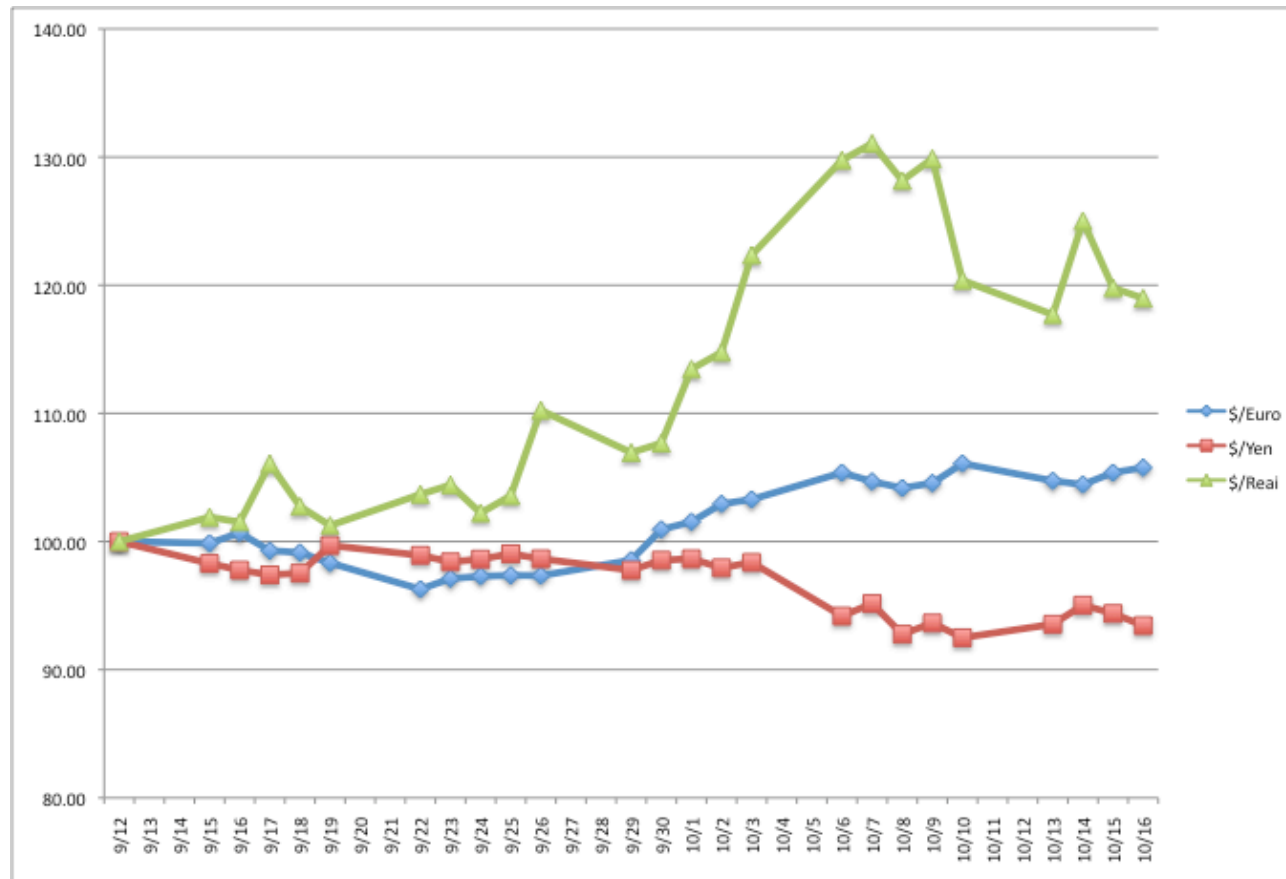


## Commodities were no safe haven...





## Currencies moved... with a flight to what?





Now what?

Consequences for investing and valuation

## Discount Rates

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- Equity risk premiums have increased at least for the near term. For the next couple of years, an equity risk premium of 5-6% is more realistic. In the long term (5 years), we should revert back to historical risk premiums of 4-4.5%.
- Default spreads have also increased in the near term. The spreads have doubled over the last few weeks. While they will decline somewhat, as markets settle down, it is unlikely that they will return to pre crisis levels for the next year or so.
- Firms will be more reluctant to borrow money. For firms with low debt ratios, it is likely that these ratios will stay low for the near term.
- The net effect of these changes is that the cost of capital will rise for all firms, and especially for firms with high debt ratios and high degrees of operating risk.

## Cash Flows & Growth

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- The prospect of an economic slowdown will reduce earnings next year, and more so for cyclical firms.
- The bounce back from a recession will be slower and more long drawn out than has been in the case in past recessions.
  - Firms will be more cautious and reinvest less, leading to lower earnings growth in the recovery.
  - The consequences for future return on capital are more murky. If smaller firms have difficulty accessing capital, it is possible that the returns on capital at large firms will remain higher for longer periods.
  - Firms cannot use the “globalization” argument for higher growth. The reduction in growth will be global.

Lowered base operating income by 10%

# MMM: Valuation on 10/16

Reduced growth rate to 5%

Did not increase debt ratio in stable growth to 20%

**Current Cashflow to Firm**  
 EBIT(1-t)= 5344 (1-.35)= 3,180  
 - Nt CpX= 350  
 - Chg WC 691  
 = FCFF 2139  
 Reinvestment Rate = 1041/3180  
 =33%  
 Return on capital = 23.06%

Reinvestment Rate  
25%

**Expected Growth in EBIT (1-t)**  
 $.25 \times .20 = .05$   
 5%

Return on Capital  
20%

**Stable Growth**  
 g = 3%; Beta = 1.00;; ERP =4%  
 Debt Ratio= 8%; Tax rate=35%  
 Cost of capital = 7.55%  
 ROC= 7.55%;  
 Reinvestment Rate=3/7.55=40%

Terminal Value<sub>5</sub> = 2645 / (.0755 - .03) = 70,409

Op. Assets 43,975  
 + Cash: 3253  
 - Debt 4920  
 =Equity 42308  
  
 Value/Share \$ 60.53

Year	1	2	3	4	5	Term Yr
EBIT (1-t)	\$3,339	\$3,506	\$3,667	\$3,807	\$3,921	\$4,758
- Reinvestment	\$835	\$877	\$1,025	\$1,288	\$1,558	\$2,113
= FCFF	\$2,504	\$2,630	\$2,642	\$2,519	\$2,363	\$2,645

Cost of capital = 10.86% (0.92) + 3.55% (0.08) = 10.27%

Higher default spread for next 5 years

On October 16, 2008, MMM was trading at \$57/share.

**Cost of Equity**  
10.86%

**Cost of Debt**  
 $(3.96\% + .1.5\%)(1-.35)$   
 = 3.55%

**Weights**  
 E = 92% D = 8%

**Riskfree Rate:**  
 Riskfree rate = 3.96%

**Beta** 1.15 x **Risk Premium** 6%  
 +  
 Unlevered Beta for Sectors: 1.09 x D/E=8.8%

## The Bottom Line

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- The fundamentals of value do not change in a crisis. The estimated value, though, will change as the inputs change.
- Valuations have to be updated more frequently when macro economic variables are in flux.
  - Equity risk premiums and default spreads have to be constantly monitored and updated. For the near term, they will have much bigger effects on the values of companies than company-specific data.
  - As we find out more about how much economies will slow, we have to revisit earnings estimates for individual companies.