Musings on Valuation: Fair Value Accounting, ERP and the Diversification Effect

Aswath Damodaran

Three valuation topics.. With no particular connecting thread..

- Fair value accounting is now the path that true accountants want to follow. While those pushing for it may have the best of intentions, I am skeptical. I don't know what "fair value" means (and neither do the rule writers, I will argue) and that is creating head aches for appraisers all over.
- The risk free rate and equity risk premium are numbers we have always taken for granted in the United States. As a developed, mature market (which is what we thought we were), we took the US treasury rates as riskfree and trusted Ibbotson to deliver us the "right" equity risk premiums. The world has changed and we may need to rethink both practices.
- Risk and return models in finance are built on the premise that the marginal investor (who values and prices equity) is diversified and that the only risk that should be built into discount rates is the non-diversifiable risk (beta or betas). But that assumption is clearly put to the test with privately owned businesses and closely held public companies… My solution may be controversial… but it is built on the same foundations as traditional risk and return models.

Fair Value Accounting: Visionary Thinking or Oxymoron?

Aswath Damodaran

Three big questions about fair value accounting

- Why fair value accounting?
- What is "fair value"?
- What are the first principles that should govern fair value accounting?

Why fair value accounting? Three points of view…

- The Dreamer: To make accounting value (book value) a reasonable measure of the true value of a company.
- The Pragmatist: If we mark assets up to fair value, investors will have a better idea of what a firm is worth and there should be therefore less uncertainty about the true value and lower variance in that value.
- The Marginalist: Fair value accounting, even if imperfect and noisy, will provide investors with useful additional information which they can use to estimate value in a company or assess its risk.

1. A New World Order
Accountants as the final arbiters of value!!

- There are some (accountants, theorists and others) who believe that it is possible to replace the current accountant balance sheet with one that reflects the true value of the company.
- In their vision, investors would not look at the market to assess the fair value of a company but at accounting statements.

The traditional accounting balance sheet…

Valued based upon motive for investment – some marked to market, some recorded at cost and some at quasi-cost

Assets are recorded at original cost, adjusted for depreciation.

The Balance Sheet

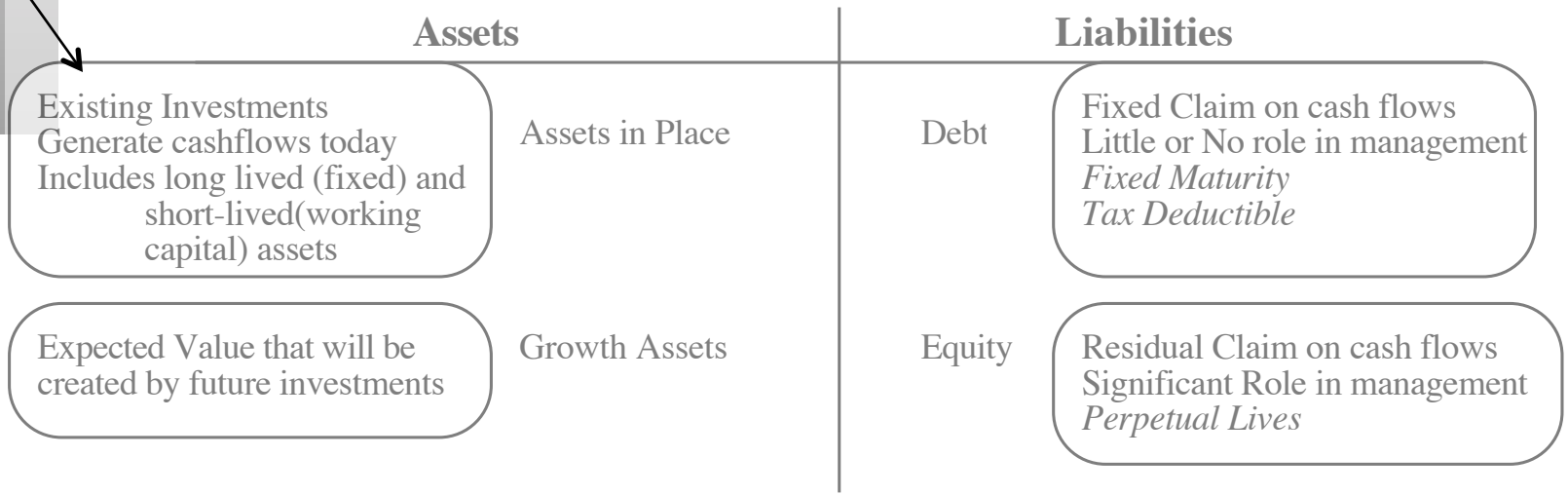
Assets		Liabilities	
Long Lived Real Assets	Fixed Assets	Current Liabilties	Short-term liabilities of the firm
Short-lived Assets	Current Assets	Debt	Debt obligations of firm
Investments in securities & assets of other firms	Financial Investments	Other Liabilities	Other long-term obligations
Assets which are not physical, like patents & trademarks	Intangible Assets	Equity	Equity investment in firm

True intangible assets like brand name, patents and customer did not show up. The only intangible asset of any magnitude (goodwill) is a plug variable that is of consequence only if you do an acquisition.

Equity reflects original capital invested and historical retained earnings.

The intrinsic value balance sheet

Recorded at intrinsic value (based upon cash flows and risk), not at original cost



Value will depend upon magnitude of growth investments and excess returns on these investments

Intrinsic value of equity, reflecting intrinsic value of assets, net of true value of debt outstanding.

The "market value" balance sheet

A Market Value Balance Sheet

Assets		Liabilities	
Existing Investments Generate cashflows today	Investments already made	Debt	Borrowed money
Expected Value that will be created by future investments	Investments yet to be made	Equity	Owner's funds

Assets recorded at market value, i.e, what investors will be willing to pay for the assets today (rather than original cost or intrinsic value)

Should equate to market value of equity, if publicly traded.

Accounting Balance Sheet = Intrinsic value Balance Sheet
The impossible dream!

- Even in a well functioning market, there will be a divergence between intrinsic and market value of both assets (and equity). The dreamer has to first decide which balance sheet he would like the accounting balance sheet to converge on.
- Even if we were able to write up every asset to intrinsic value, all that we will obtain is the fair value of the assets in place of a company.
- Growth assets will be either impossible to value (since they do not exist and may not even be identified yet) or valued haphazardly.
- *Bottom line: Fair value accounting, even if done precisely, will create a two tier system, providing accounting values that are close to true value for mature businesses and divergent values for growth businesses.*

2. Fair value accounting = Lower volatility in markets

- Fair value accounting has had its deepest roots in the financial service businesses, where mark to market has been part of accounting practice for several years now. If the premise of fair value accounting is right, the variance in stock prices should be lower for financial service firms than for otherwise equivalent (in terms of size and maturing) industrial companies.
- Some countries have been quicker to jump on the fair value bandwagon than others. In particular, many countries with high inflation currencies adopted variants of the fair value accounting approach, allowing companies to revalue assets at least to current replacement cost. If the hypothesis is right, securities in these countries should be less volatile than securities elsewhere.

Less volatility.. Says who?

- While it may be a little unfair to use the current crisis to make any long standing arguments, the securities with the most volatility were, in face, stocks in financial service companies that marked-to-market.
  - Marking to market gave little or no advance indication of problems to come.
  - Even more problematic was the feedback loop created by marking to market in a sliding market. Markets dropped and book values were written down. As book values were written down, investors worried about regulatory capital ratios being breached, which led stock prices to drop even further.
- Even controlling for inflation differences, there is no evidence of lower stock price volatility in countries that adopted inflation accounting. On the the contrary, stock prices were often more volatile in these countries.
- *Bottom line: The acceptance of fair value accounting is going to do little to dampen stock price volatility. It may actually increase it.*

3. Useful information for investors!

- Accounting rule changes have been motivated to either protect investors (by providing warnings about dangers lurking in a company) or to provide information to investors (so that they can better assess value). Thus, rules about showing pension obligations on balance sheets are protective, whereas rules about estimating the impairment of goodwill are designed to provide information.
- The ultimate test of whether investors actually find these rules to be protective or informative comes from how they react to changes in these numbers. For instance, if there is information in the impairment of goodwill, we should expect to see stock prices react to news about impairment.

Do investors care about accounting changes? SFAS 121 versus SFAS 142

- In 2002, the accounting standards governing goodwill measurement and reporting were changed. In particular, firms were required to estimate the fair value (as opposed to undiscounted cash flows) of acquired firms (and hence goodwill) every year (instead of when significant events occurred). The intent was to make the goodwill number more informative to investors.
- A study of stock price reactions to goodwill impairments(>5%) compared impairments and reactions in 1996-2001 (the SFAS 121 regime) with impairments in the second half of 2002 and all of 2003. It found that:
  - Goodwill impairments, on average, cause stock prices to decline albeit by about 3% (in the two days around the impairment charge).
  - The decline is larger for firms with fewer analysts (more informational content?) and for larger firms (better assessments?), but has little or no correlation with the complexity of the firm.
  - The effect on the stock price of goodwill impairments dropped significantly (about 1.2%) in the 2002-03 period, after the adoption of SFAS 142.

Why is there so little information in accounting changes?

- Takes too long: Accountants are deliberative. They take time to make their judgments. By the time they do, though, markets already have priced in the information.
- Too structured: Accounting rules have to be structured to prevent the unethical 10% from taking advantage of them. Every rule takes away some of the discretionary power that makes a valuation a "good" one.
- Mixing of the large with the small: The nature of accounting is to worry just as much about the small items as the large ones. The end result is an information dump, where investors have a difficult time separating what matters from what does not.

Bottom line: If investors wait for accounting statements to tell them what is happening in real time in a firm, it is already too late.

Fair Value: What is it?

- While the notion that fair value is in the eye of beholder is too loose for my taste, the fair value of an asset or business can vary depending upon how it is defined.
- It can be different, depending upon the following:
  - How you value: Intrinsic versus Relative Valuation, and within relative valuation, depending upon what you value it relative to.
  - Who you value it for: The valuation can be different depending upon whether you are valuing it for a passive investor or an active investor, and whether and what the latter plans to do with the asset.
  - For transaction or appraisal: The value attached to an asset can be different depending on whether you are planning to sell the asset or hold on to it for its cash flows.

A Test: Estimate the fair value of this company- Intrinsic Value

	Expected next year (in millions)
Revenues	$400
- Operating Expenses	$250
- Depreciation	$30
Operating Income	**$120**
- Taxes	$40
Operating Income after taxes	**$80**

- Operating income is expected to remain the same (zero growth) forever (perpetuity). Capital expenditures offset depreciation and there are no working capital requirements.
- The firm is all equity funded and has a cost of equity of 10%.

Estimate the fair value again: Different management

- Assume now that the firm, run by superior (optimal) management, would make the following changes:
  - The after-tax operating margin will increase to 25% (from 20%). As a result the after-tax operating income would be $100 million instead of $ 80 million.
  - Changing the mix of debt and equity will lower the cost of capital to 8%.
- What is the intrinsic value of the firm, with new management?

"Expected" Intrinsic Value

- We have two estimates of fair value - $ 800 million with the status quo and $1,250 million with optimal management.
- Assume now that there is a 40% probability that the management of this firm will change and a 60% probability that it will not. In an efficient market, what is the "expected" intrinsic value of this firm?

And again: Relative Valuation

- Now assume that the firm is a mid-size chemical company and that publicly traded mid-size chemical companies trade at 5 times EBITDA.
- Given that this firm is expected to have EBITDA of $ 150 million, estimate the value of the firm.

Yet again: For sale now!

- Now as a final estimate, assume that equity markets are fairly illiquid right now and that selling the entire business today can be accomplished only by discounting the value.
- If the illiquidity discount is 20% on estimated value, estimate the expected proceeds from selling the business today.

So what is the fair value? You be the judge

- We now have five estimates of fair value for this firm. Which of the following is the "right" fair value?
  - $ 800 million: Intrinsic value, with status quo.
  - $ 1250 million: Intrinsic value, with optimal management
  - $ 980 million: Expected intrinsic value, with probability of change built in
  - $ 750 million: Relative value, based upon sector multiple
  - $ 600 million: Relative value, adjusted for illiquidity

Why?

So, what is FASB's vision? Glimmers from FAS 157

- The ubiquitous "market participant": Through the entire statement, homage is paid to the ubiquitous market participants and what they think about risk and will be willing to pay for an asset. In effect, accountants are asked to attach values to assets/liabilities that market participants would have been willing to pay/ receive.
- Tilt towards relative value: "The definition focuses on the price that would be received to sell the asset or paid to transfer the liability (an exit price), not the price that would be paid to acquire the asset or received to assume the liability (an entry price)." The hierarchy puts "market prices", if available for an asset, at the top with intrinsic value being accepted only if market prices are not accessible.
- Consideration of illiquidity: Accountants are asked to give consideration to specific restrictions on the sale/use of an asset in valuing it. Presumably, if there are restrictions on selling an asset, the value will have to be discounted for illiquidity.

My Road map for fair value accounting (as a user)

- The ultimate role of accounting is to provide investors who follow a company with information that they can use to estimate value and measure performance.
- Fair value accounting done right should make it easier for investors to value companies, not more difficult. It should follow these principles:
  - Do no harm.
  - Don't overreach.
  - Keep it simple.
  - Less is more.

Do no harm…

- The fundamental questions: Financial statements should (and have been designed to) answer three questions:
  - How much did you earn last year?
  - What do you own and how much did you invest to get what you own?
  - What do you owe?
- In the process of moving to fair value accounting, we should not lose information that has been used to answer these questions. Therefore:
  - Replacing existing book values of assets (which measure capital invested) with the fair or market value of those assets replaces a useful piece of information with one that is redundant (if it just reflects market value), misleading (if it incorrectly tries to reflect market value) or confusing (if no one is quite sure).
  - Adjusting earnings for past mistakes in fair value assessment (inevitable with all fair value accounting) will make earnings less informative.
  - Trying to include potential, possible and imagined liabilities in balance sheet dilutes the meaning of debt.

Focus.. And don't over reach

- Be clear about what you want to accomplish : Fair value accounting has to be clear about what it is trying to accomplish. Rather than reaching for the ultimate, settle for the incremental.
- Be realistic: Accept the proposition that an accounting statement cannot be all things to all people. It will always be a reflection of the past and lag both intrinsic and market value.
- Don't over reach: Accounting statements will not replace or even compete with market values and book values will be poor replacements for market values. Accountants are not (and should not try to be) analysts, appraisers or evaluators.

Keep it simple

- Stick with the easy assets: The assets that can be valued with simple rules should be the first targets. Assets that will require complicated or complex rules are best left untouched.
- Let others deal with complex assets: Provide the information (or raw data) for assessing fair value but don't take on the responsibility of doing it yourself.
- Principle based valuation, not rule based valuation: Less rules and more focus on first principles will lead to better valuations.

Less is more…

- Data is not information: Financial statements are increasingly becoming data dumps. There is little evidence that that 10Ks of today are more informative than the 10Ks of 20 years ago, but they are definitely more voluminous.
- Prioritize: Not all information is equally important. The level of detail (and effort spent) on any item should be proportionate to its importance.

Risk free Rates and Risk Premiums: Looking backwards and forwards…

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Risk free Rates & Risk Premiums: Ingredients in every expected return model

Model	*Expected Return*	*Inputs Needed*
CAPM	$E(R) = R_f + \beta (R_m - R_f)$	Riskfree Rate Beta relative to market portfolio Market Risk Premium
APM	$E(R) = R_f + \Sigma_{j=1} \beta_j (R_j - R_f)$	Riskfree Rate; # of Factors; Betas relative to each factor Factor risk premiums
Multi factor	$E(R) = R_f + \Sigma_{j=1,,N} \beta_j (R_j - R_f)$	Riskfree Rate; Macro factors Betas relative to macro factors Macro economic risk premiums
Proxy	$E(R) = a + \Sigma_{j=1..N} b_j Y_j$	Proxies Regression coefficients

I. A Riskfree Rate

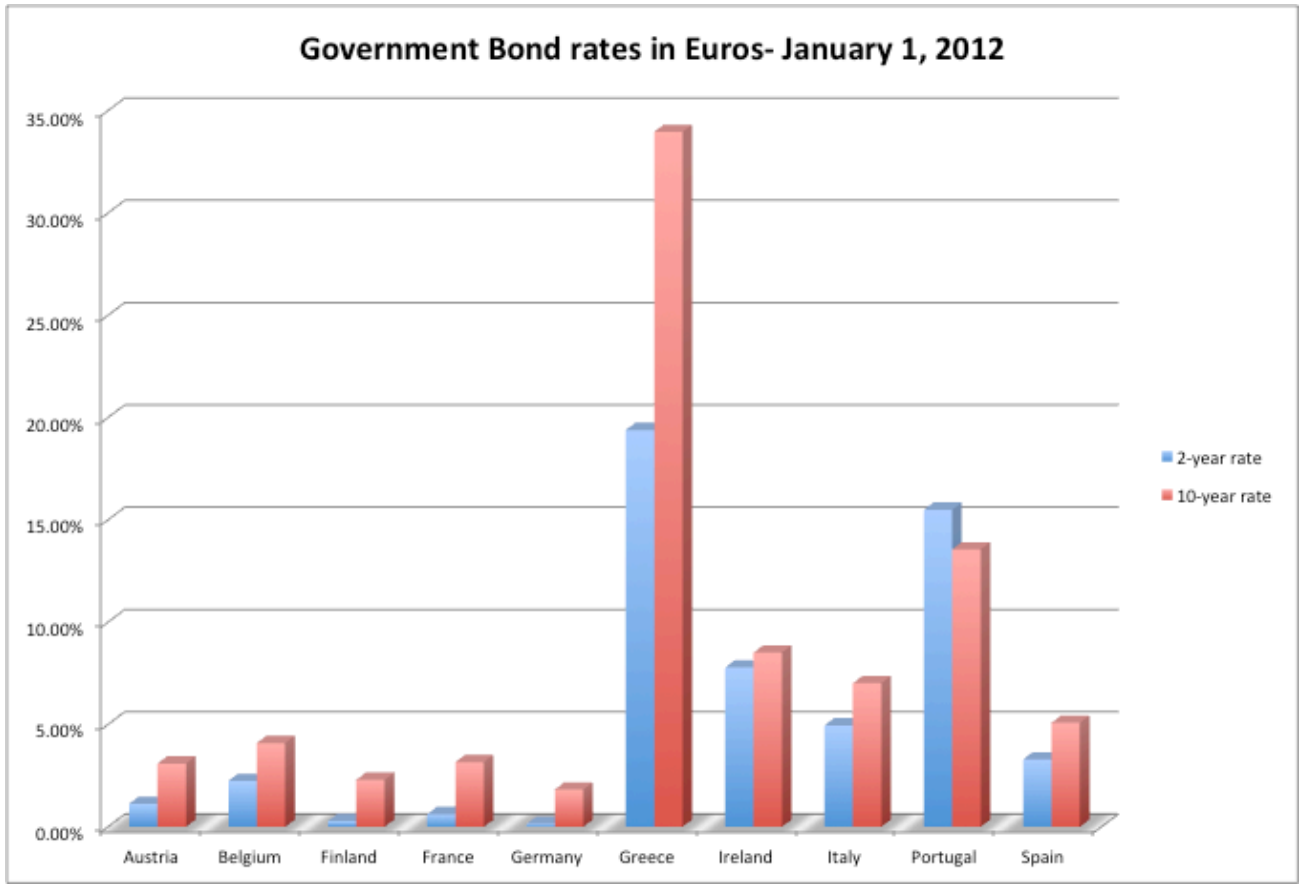
- On a riskfree asset, the actual return is equal to the expected return. Therefore, there is no variance around the expected return.
- For an investment to be riskfree, then, it has to have
  - No default risk
  - No reinvestment risk

1. Time horizon matters: Thus, the riskfree rates in valuation will depend upon when the cash flow is expected to occur and will vary across time.
2. Not all government securities are riskfree: Some governments face default risk and the rates on bonds issued by them will not be riskfree.

The Bottom Line on Riskfree Rates

- The riskfree rate that you use in an analysis should be in the same currency that your cashflows are estimated in.
- The conventional practice of estimating riskfree rates is to use the government bond rate, with the government being the one that is in control of issuing that currency. Implicitly, you are assuming that the government has no default risk, at least in the local currency.

What is the Euro riskfree rate? An exercise in 2012



No default free entity: Choices with riskfree rates….

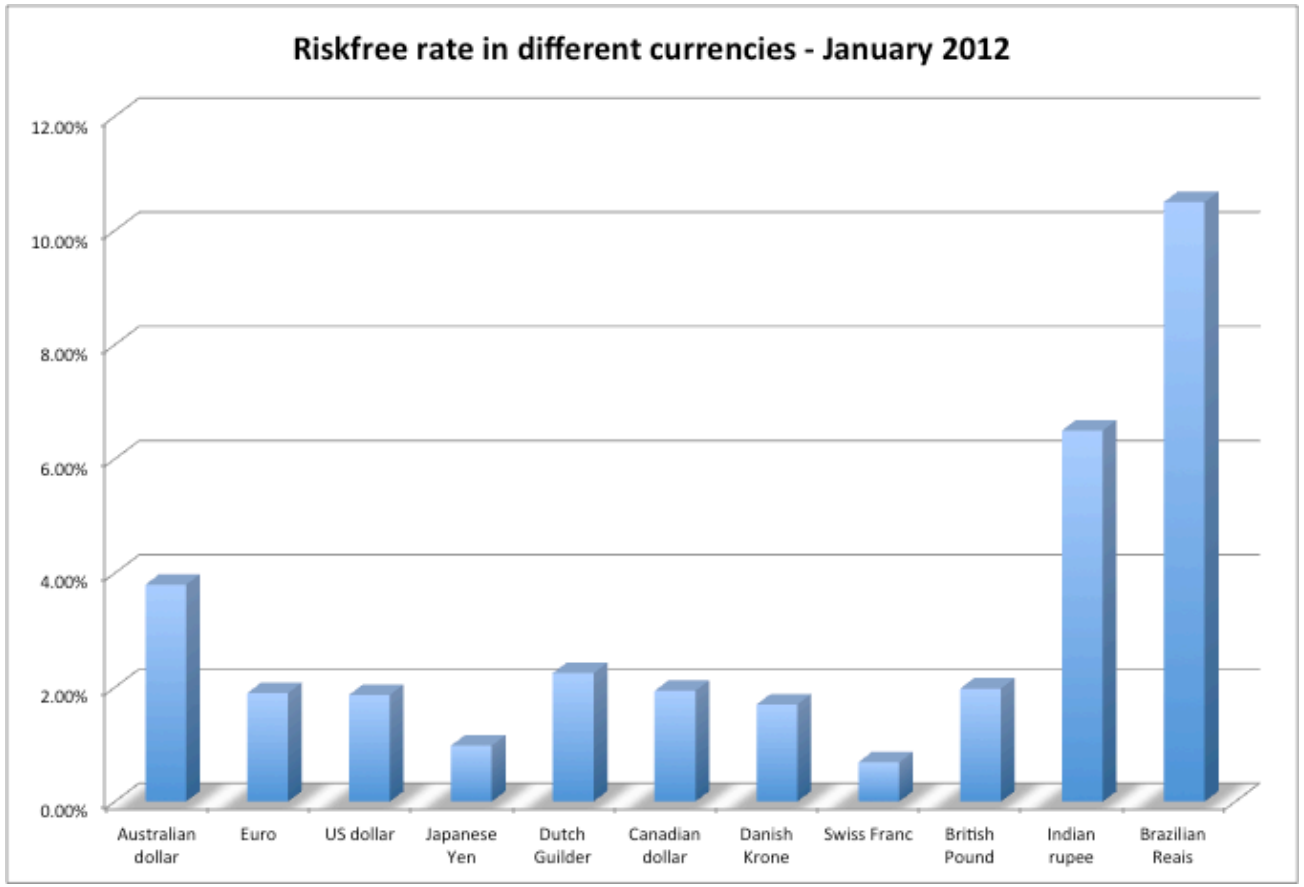
- Estimate a range for the riskfree rate in local terms:
  - Approach 1: Subtract default spread from local government bond rate:

  Government bond rate in local currency terms - Default spread for Government in local currency
  - Approach 2: Use forward rates and the riskless rate in an index currency (say Euros or dollars) to estimate the riskless rate in the local currency.
- Do the analysis in real terms (rather than nominal terms) using a real riskfree rate, which can be obtained in one of two ways –
  - from an inflation-indexed government bond, if one exists
  - set equal, approximately, to the long term real growth rate of the economy in which the valuation is being done.
- Do the analysis in a currency where you can get a riskfree rate, say US dollars or Euros.

Sovereign Default Spread: Three paths to the same destination…

- Sovereign dollar or euro denominated bonds: Find sovereign bonds denominated in US dollars, issued by emerging markets. The difference between the interest rate on the bond and the US treasury bond rate should be the default spread. For instance, in January 2012, the US dollar denominated 10-year bond issued by the Brazilian government (with a Baa2 rating) had an interest rate of 3.5%, resulting in a default spread of 1.6% over the US treasury rate of 1.9% at the same point in time. (On the same day, the ten-year Brazilian BR denominated bond had an interest rate of 12%)
- CDS spreads: Obtain the default spreads for sovereigns in the CDS market. In January 2012, the CDS spread for Brazil in that market was 1.43%.
- Average spread: For countries which don't issue dollar denominated bonds or have a CDS spread, you have to use the average spread for other countries in the same rating class. For Brazil's rating, the default spread would have been 1.80%.

Why do riskfree rates vary across currencies?
January 2012 Risk free rates



II. Risk Premiums and Asset Prices

- If investors are risk averse, they need inducement to invest in risky assets. That inducement takes the form of a risk premium, a premium you would demand over and above the riskfree asset to invest in a risky asset.
- Every risky asset market has a "risk" premium that determines how individual assets in that market are priced.
  - In an equity market, that risk premium for dealing with the volatility of equities and bearing the residual risk is the equity risk premium.
  - In the bond market, the risk premium for being exposed to default risk is the default spread.
  - In real asset markets, there are equivalent (though less widely publicized markets).

General Propositions about Risk Premiums

- Proposition 1: Risk premiums and prices for risky assets are inversely related. When risk premiums go up, risky asset prices go down.
- Proposition 2: Any statement about the magnitude of expected risk premiums is really a statement about the level of asset prices. Thus, if you argue that expected risk premium for a risky asset is too low, you are arguing that its priced too high.
- Proposition 3: Asset allocation and market timing decisions are really judgment calls on the future direction of risk premiums in different asset markets.

The Equity Risk Premium

- Intuitively, the equity risk premium measures what investors demand over and above the riskfree rate for investing in equities as a class. Think of it as the market price for taking on average equity risk.
- It should depend upon
  - The risk aversion of investors
  - The perceived risk of equity as an investment class

Why equity risk premiums matter…

- Every statement about whether equity markets are over or under valued is really a statement about the prevailing equity risk premium.
- Every valuation of an individual stock that you do has embedded in it your implicit or explicit assumptions about the equity risk premium. Getting the premium wrong will lead to misvaluations.
- Fundamental corporate finance decisions depend upon equity risk premium assessments; over (under) estimating the number leads to under (over) investment.
- Many of the most significant financial decisions we make in our personal lives (how much to save… what to put into our pensions.. where to invest our savings) are based upon implicit assumptions on equity risk premiums.

The macro determinants of equity risk..

- Economic risk: As the underlying economy becomes more uncertain, equity risk will rise. Higher volatility in GDP -> Higher equity risk.
- Political risk: As the uncertainty about fiscal and government policy increases, equity risk will rise.
- Information opacity: As the information provides by companies becomes more opaque and difficult to assess, equity risk premiums will rise.
- Liquidity: As liquidity of equities decreases, equity risk increases.
- Catastrophic risk: There is always the potential for catastrophic risk in investing in equities. As that perceived likelihood increases, equity risk will rise.

How equity risk premiums are estimated in practice…

- Survey investors on their desired risk premiums and use the average premium from these surveys.
- Assume that the actual premium delivered over long time periods is equal to the expected premium - i.e., use historical data
- Estimate the implied premium in today's asset prices.

The Survey Approach

- Surveying all investors in a market place is impractical.
- However, you can survey a few individuals and use these results. In practice, this translates into surveys of the following:

Group Surveyed	Survey done by	Estimated ERP
Individual Investors	Securities Industries Assn	8.3% (December 2004)
Institutional Investors	Merrill Lynch	3.8% (2009)
CFOs	Campbell & Harvey	4.7% (2009)
Finance Academics	Fernandez	5.7% (2009)

- The limitations of this approach are:
  - there are no constraints on reasonability (the survey could produce negative risk premiums or risk premiums of 50%)
  - The survey results are extremely volatile
  - they tend to be short term; even the longest surveys do not go beyond one year.

Everyone uses historical premiums..

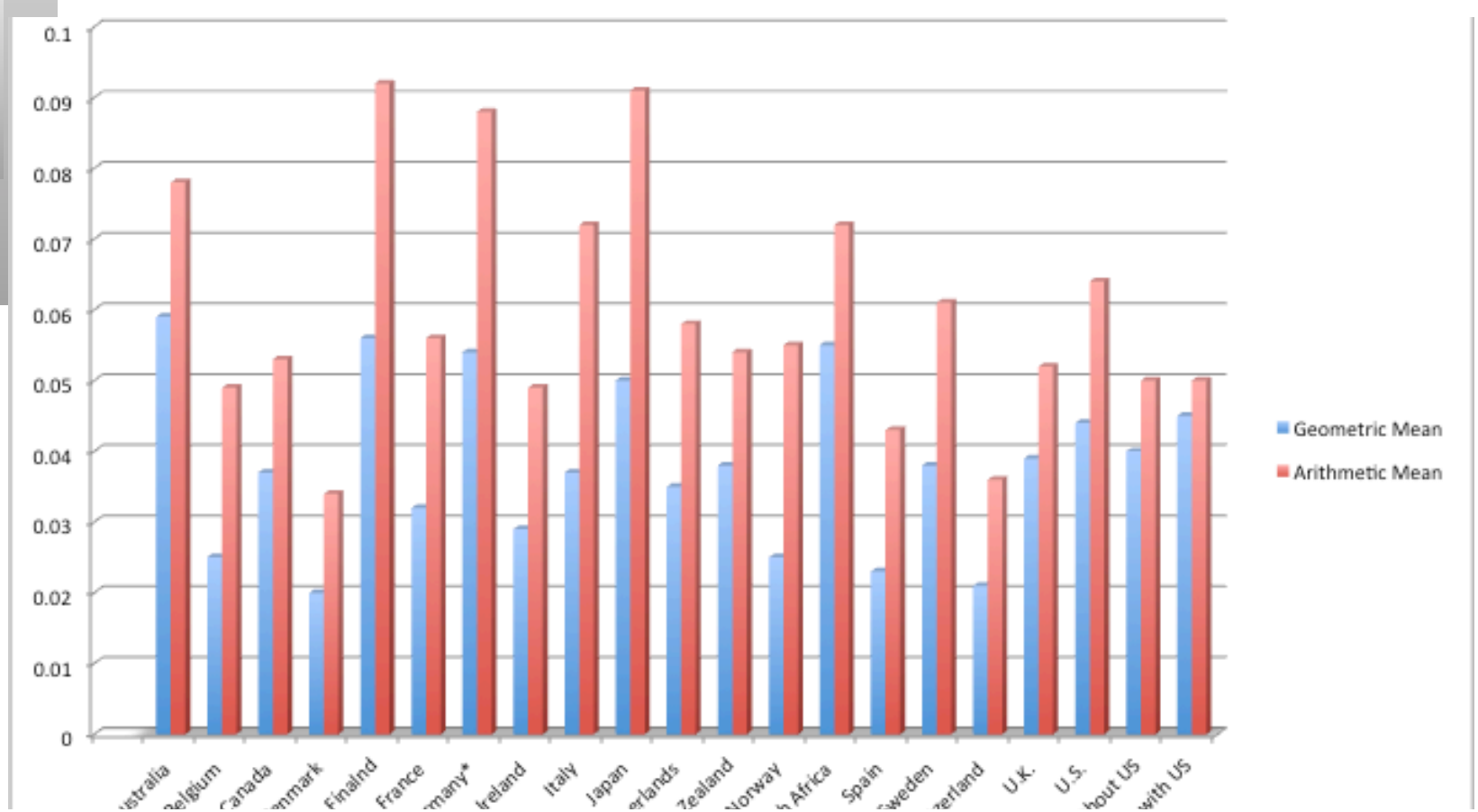
- Practitioners never seem to agree on the premium; it is sensitive to
  - How far back you go in history…
  - Whether you use T.bill rates or T.Bond rates
  - Whether you use geometric or arithmetic averages.
- For instance, looking at the US:

	Arithmetic Average		Geometric Average	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2011	7.55%	5.79%	5.62%	4.10%
	2.22%	2.36%		
1962-2011	5.38%	3.36%	4.02%	2.35%
	2.39%	2.68%		
2002-2011	3.12%	-1.92%	1.08%	-3.61%
	6.46%	8.94%		

But they stink…

- Noisy estimates: Even with long time periods of history, the risk premium that you derive will have substantial standard error.
- Survivorship Bias: Using historical data from the U.S. equity markets over the twentieth century does create a sampling bias. After all, the US economy and equity markets were among the most successful of the global economies that you could have invested in early in the century.
- Markets with no history: Even if you buy into a "historical" risk premium, most markets in the world do not have enough history to even compute a reliable historical risk premium.

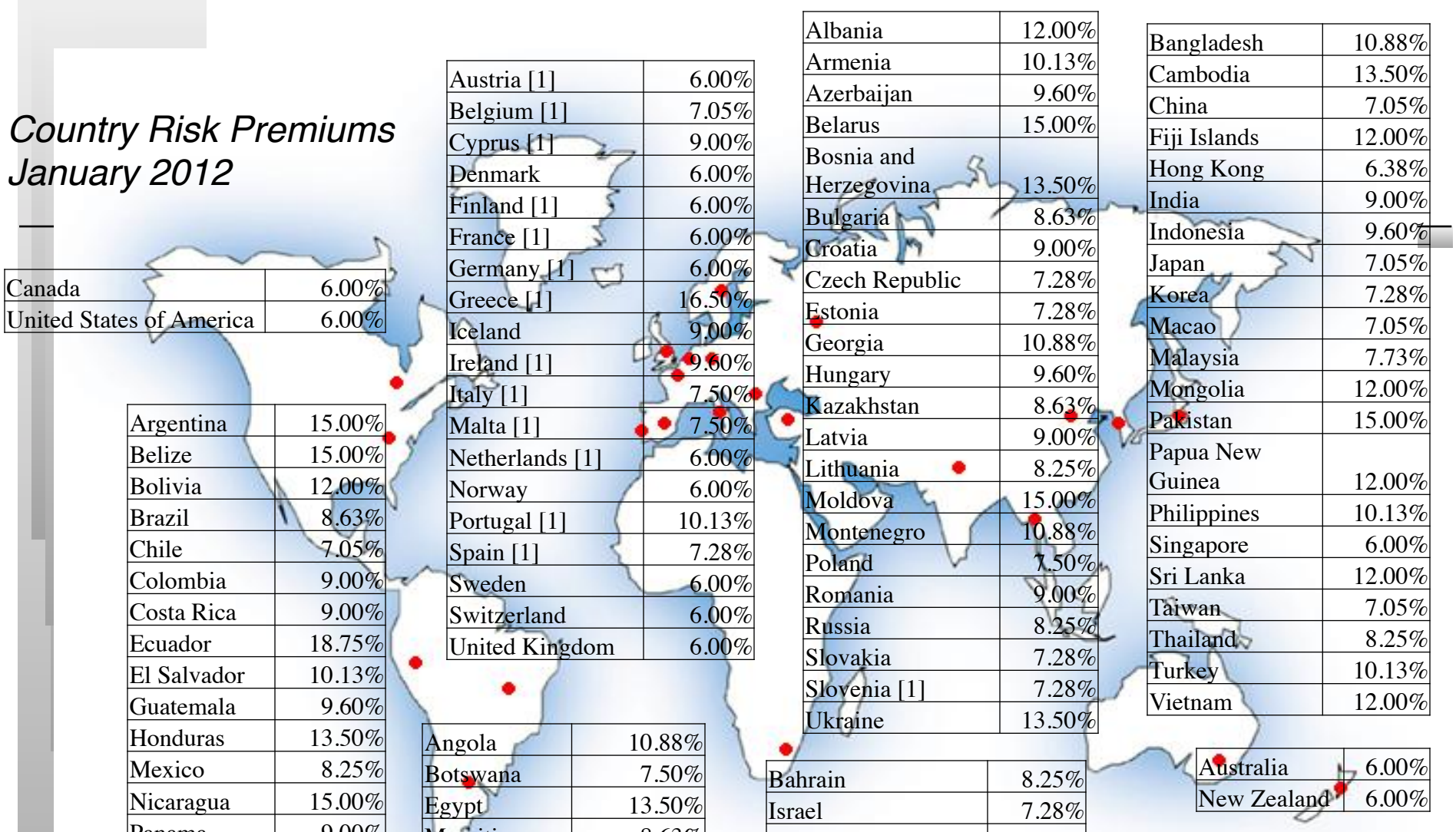
Risk Premium for a Mature Market? Broadening the sample



Estimating an equity risk premium for an emerging market

- Country ratings measure default risk. While default risk premiums and equity risk premiums are highly correlated, one would expect equity spreads to be higher than debt spreads.
- Another is to multiply the bond default spread by the relative volatility of stock and bond prices in that market. Using this approach for Brazil in August 2004, you would get:
  - Country Equity risk premium = Default spread on country bond* $\sigma_{\text{Country Equity}}$ / $\sigma_{\text{Country Bond}}$
    - Standard Deviation in Bovespa (Equity) = 34.56%
    - Standard Deviation in Brazil C-Bond = 26.34%
    - Default spread on C-Bond = 6.01%
  - Country Equity Risk Premium = 6.01% (34.56%/26.34%) = 7.89%

Country Risk Premiums
January 2012



Canada	6.00%
United States of America	6.00%

Argentina	15.00%
Belize	15.00%
Bolivia	12.00%
Brazil	8.63%
Chile	7.05%
Colombia	9.00%
Costa Rica	9.00%
Ecuador	18.75%
El Salvador	10.13%
Guatemala	9.60%
Honduras	13.50%
Mexico	8.25%
Nicaragua	15.00%
Panama	9.00%
Paraguay	12.00%
Peru	9.00%
Uruguay	9.60%
Venezuela	12.00%

Austria [1]	6.00%
Belgium [1]	7.05%
Cyprus [1]	9.00%
Denmark	6.00%
Finland [1]	6.00%
France [1]	6.00%
Germany [1]	6.00%
Greece [1]	16.50%
Iceland	9.00%
Ireland [1]	9.60%
Italy [1]	7.50%
Malta [1]	7.50%
Netherlands [1]	6.00%
Norway	6.00%
Portugal [1]	10.13%
Spain [1]	7.28%
Sweden	6.00%
Switzerland	6.00%
United Kingdom	6.00%

Angola	10.88%
Botswana	7.50%
Egypt	13.50%
Mauritius	8.63%
Morocco	9.60%
Namibia	9.00%
South Africa	7.73%
Tunisia	9.00%

Albania	12.00%
Armenia	10.13%
Azerbaijan	9.60%
Belarus	15.00%
Bosnia and Herzegovina	13.50%
Bulgaria	8.63%
Croatia	9.00%
Czech Republic	7.28%
Estonia	7.28%
Georgia	10.88%
Hungary	9.60%
Kazakhstan	8.63%
Latvia	9.00%
Lithuania	8.25%
Moldova	15.00%
Montenegro	10.88%
Poland	7.50%
Romania	9.00%
Russia	8.25%
Slovakia	7.28%
Slovenia [1]	7.28%
Ukraine	13.50%

Bahrain	8.25%
Israel	7.28%
Jordan	10.13%
Kuwait	6.75%
Lebanon	12.00%
Oman	7.28%
Qatar	6.75%
Saudi Arabia	7.05%
Senegal	12.00%
United Arab Emirates	6.75%

Bangladesh	10.88%
Cambodia	13.50%
China	7.05%
Fiji Islands	12.00%
Hong Kong	6.38%
India	9.00%
Indonesia	9.60%
Japan	7.05%
Korea	7.28%
Macao	7.05%
Malaysia	7.73%
Mongolia	12.00%
Pakistan	15.00%
Papua New Guinea	12.00%
Philippines	10.13%
Singapore	6.00%
Sri Lanka	12.00%
Taiwan	7.05%
Thailand	8.25%
Turkey	10.13%
Vietnam	12.00%

Australia	6.00%
New Zealand	6.00%

Implied Equity Premiums

- If we assume that stocks are correctly priced in the aggregate and we can estimate the expected cashflows from buying stocks, we can estimate the expected rate of return on stocks by computing an internal rate of return. Subtracting out the riskfree rate should yield an implied equity risk premium.
- This implied equity premium is a forward looking number and can be updated as often as you want (every minute of every day, if you are so inclined).

An Updated Equity Risk Premium: January 2012

- On January 1, 2012, the S&P 500 was at 1257.60, essentially unchanged for the year. And it was a year of macro shocks – political upheaval in the Middle East and sovereign debt problems in Europe. The treasury bond rate dropped below 2% and buybacks/ dividends surged.

In the trailing 12 months, the cash returned to stockholders was 74.17. Using the average cash yield of 4.71% for 2002-2011 the cash returned would have been 59.29.

Analysts expect earnings to grow 9.6% in 2012, 11.9% in 2013, 8.2% in 2014, 4.5% in 2015 and 2% therafter, resulting in a compounded annual growth rate of 7.18% over the next 5 years. We will assume that dividends & buybacks will grow 7.18% a year for the next 5 years.

After year 5, we will assume that earnings on the index will grow at 1.87%, the same rate as the entire economy (= riskfree rate).

63.54 | 68.11 | 73.00 | 78.24 | 83.86

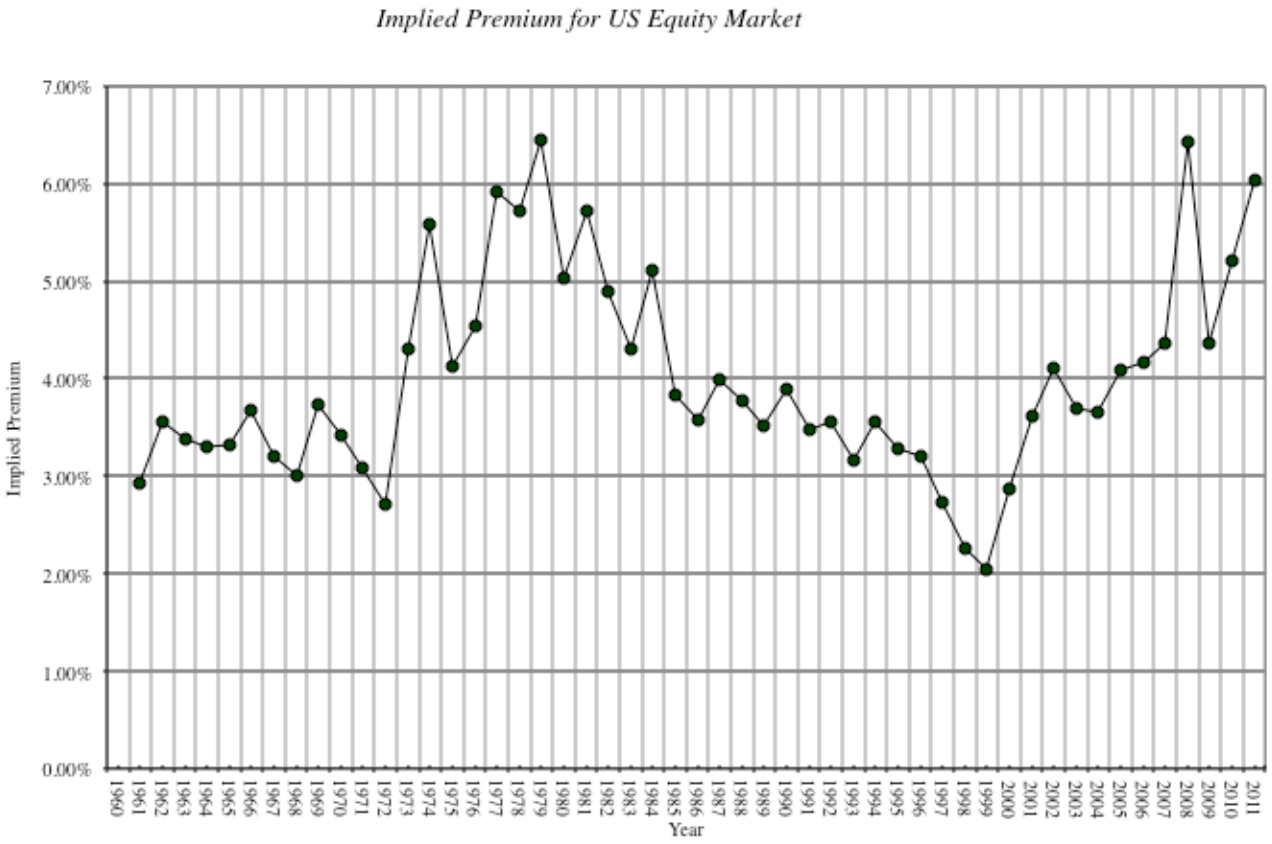
$$1257.60 = \frac{63.54}{(1+r)} + \frac{68.11}{(1+r)^2} + \frac{73.00}{(1+r)^3} + \frac{78.24}{(1+r)^4} + \frac{83.86}{(1+r)^5} + \frac{83.86(1.0187)}{(r-.0187)(1+r)^5}$$

January 1, 2012
S&P 500 is at 1257.60
Adjusted Dividends & Buybacks for 2011 = 59.29

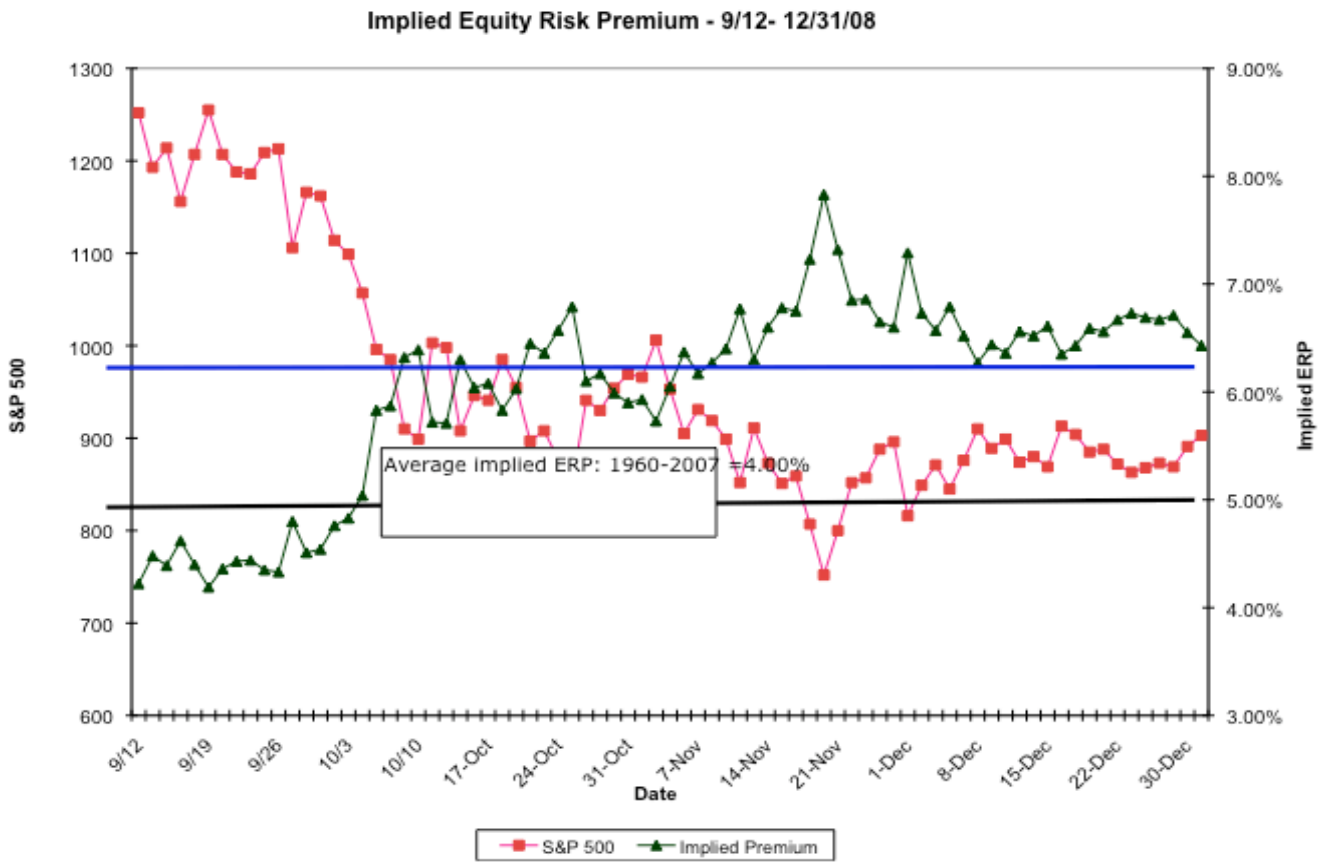
Expected Return on Stocks (1/1/12) = 7.91%
T.Bond rate on 1/1/12 = 1.87%
Equity Risk Premium = 7.91% - 1.87% = 6.04%

Data Sources:
Dividends and Buybacks last year: S&P
Expected growth rate: News stories, Yahoo! Finance, Bloomberg

Implied Premiums in the US: 1960-2012

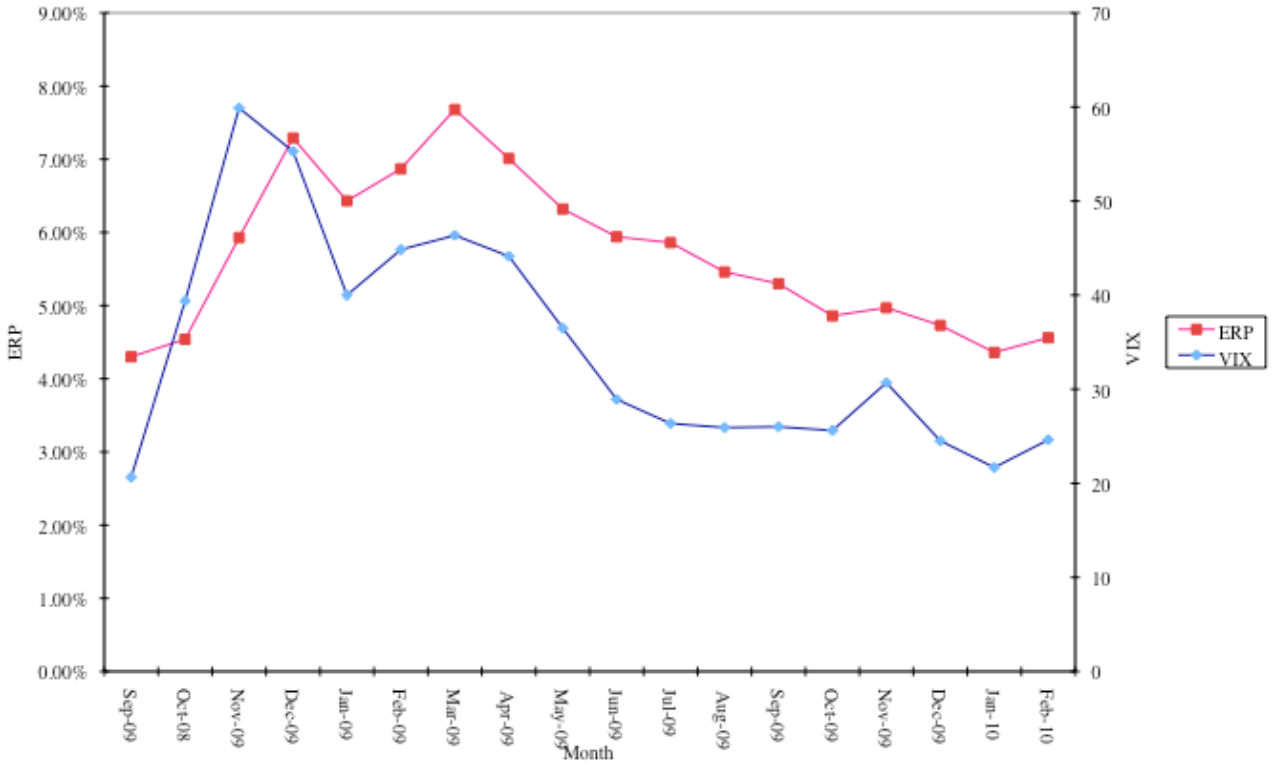


The Anatomy of a Crisis: Implied ERP from September 12, 2008 to January 1, 2009



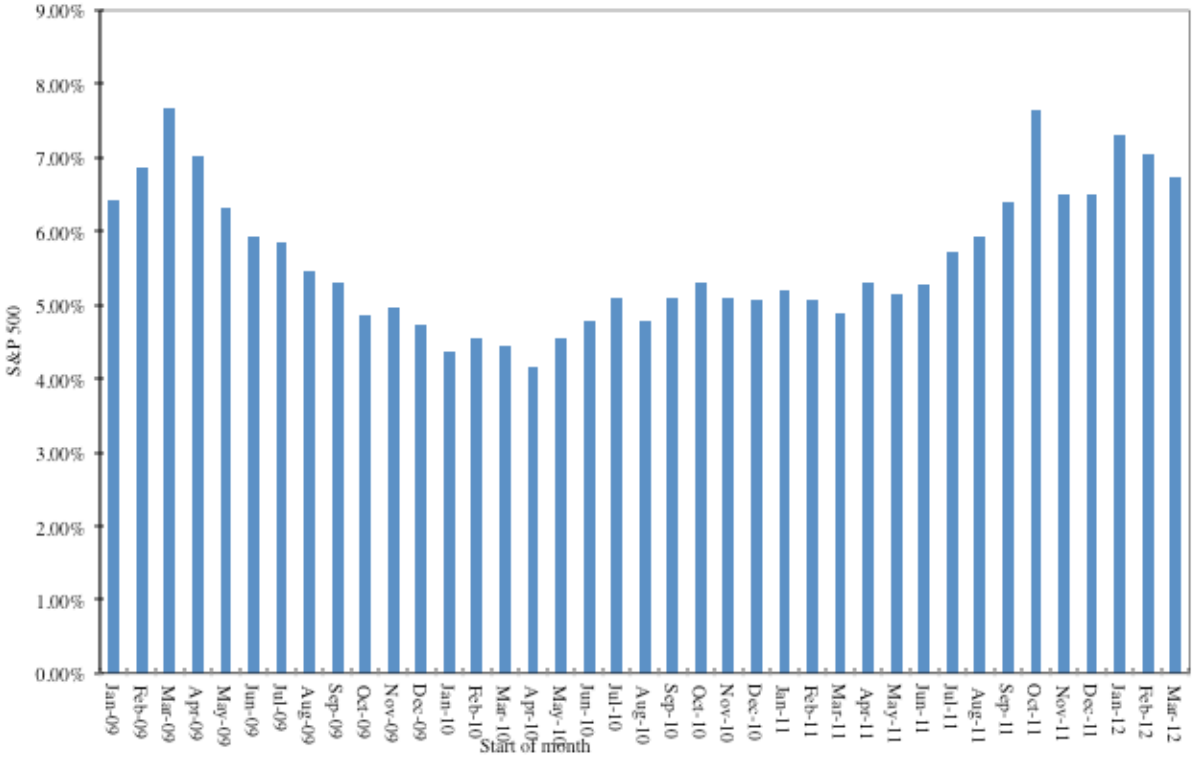
Connected to stock market volatility…

Figure 18: ERP versus VIX



Updated numbers…

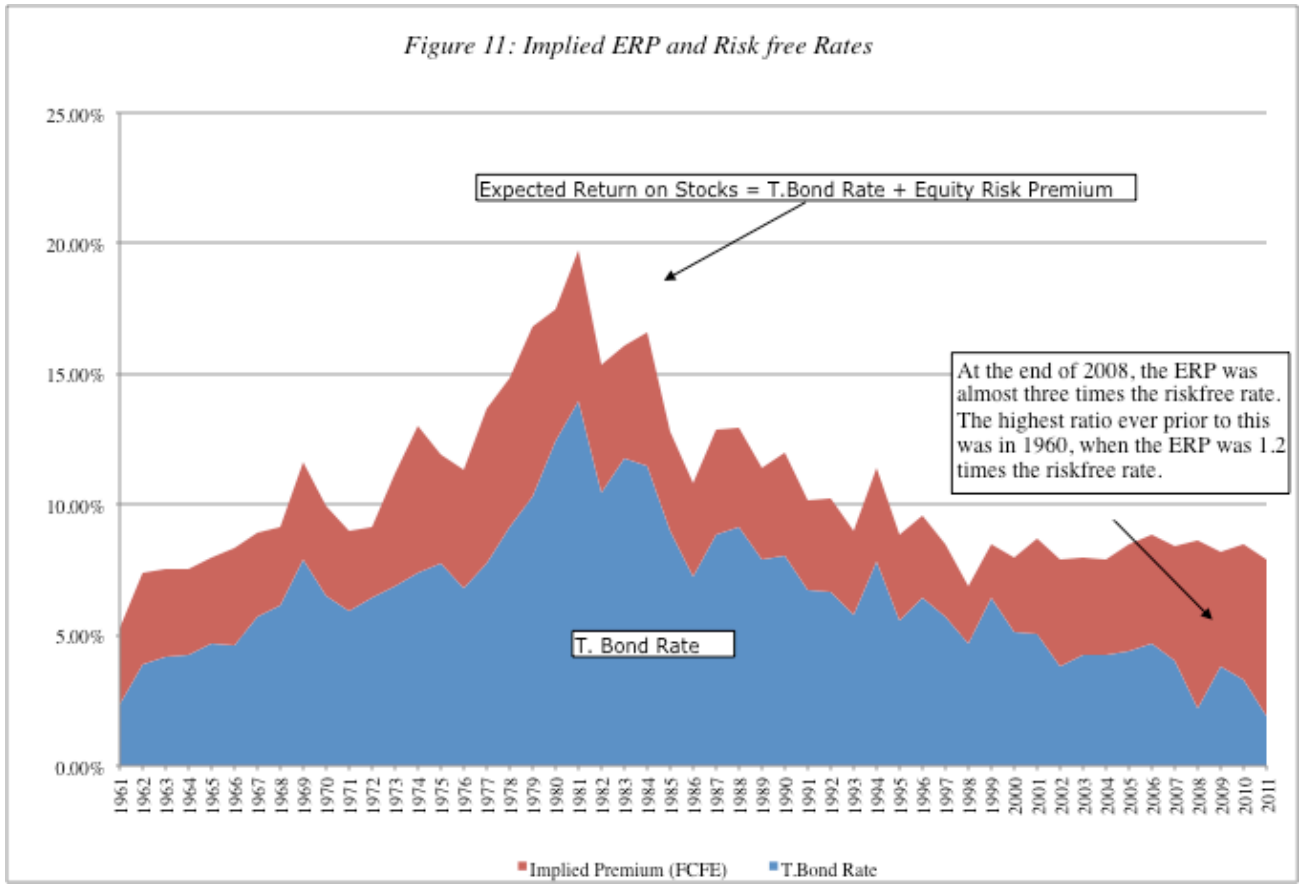
Figure 12: Implied ERP by month: S&P 500
January 2009- February 2012



Exploring interactions…

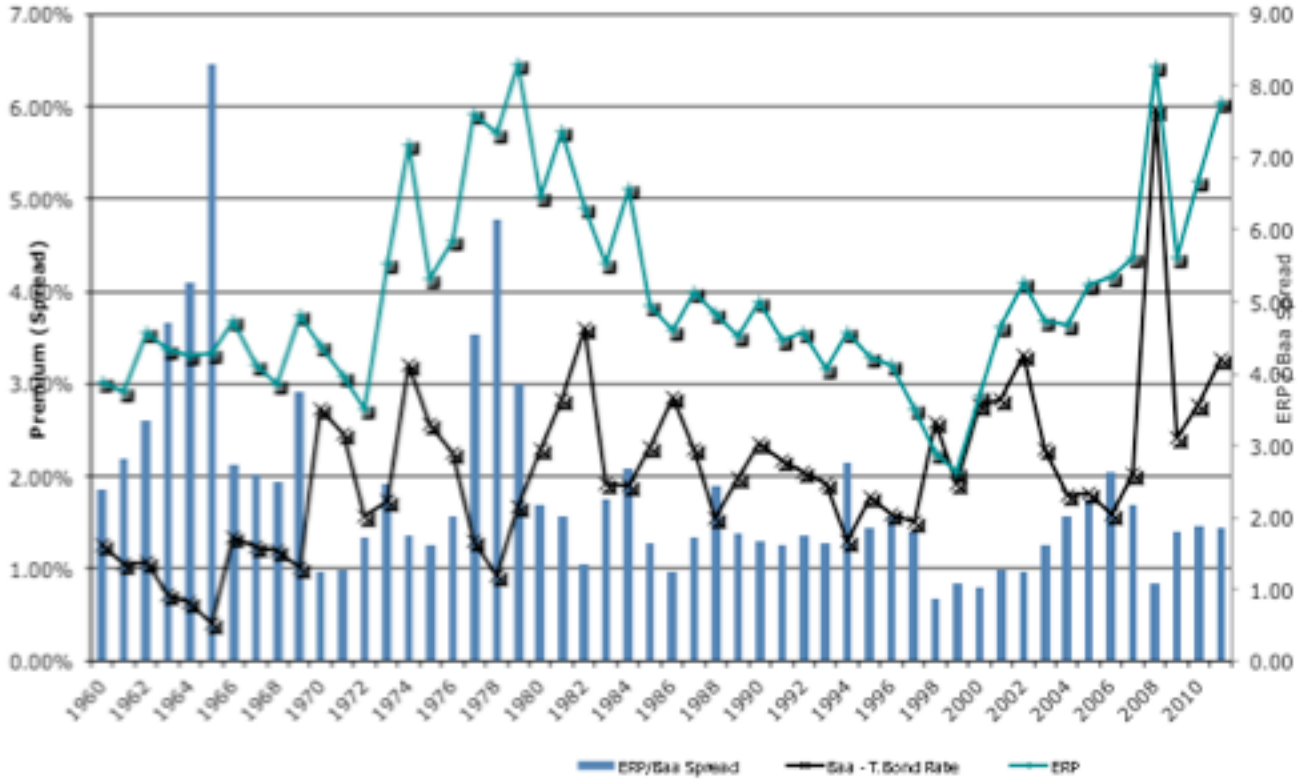
- No asset market exists in isolation. The same investors often invest across markets, and if they become more risk averse in one market, they should show similar tendencies in others.
  - When returns and risk premiums change significantly in one asset market, you should expect them to change in other markets as well.
  - When risk premiums move in different directions in different markets at the same time, it can reflect changing fundamentals in the markets or market mistakes.

Implied Premium versus Risk Free Rate

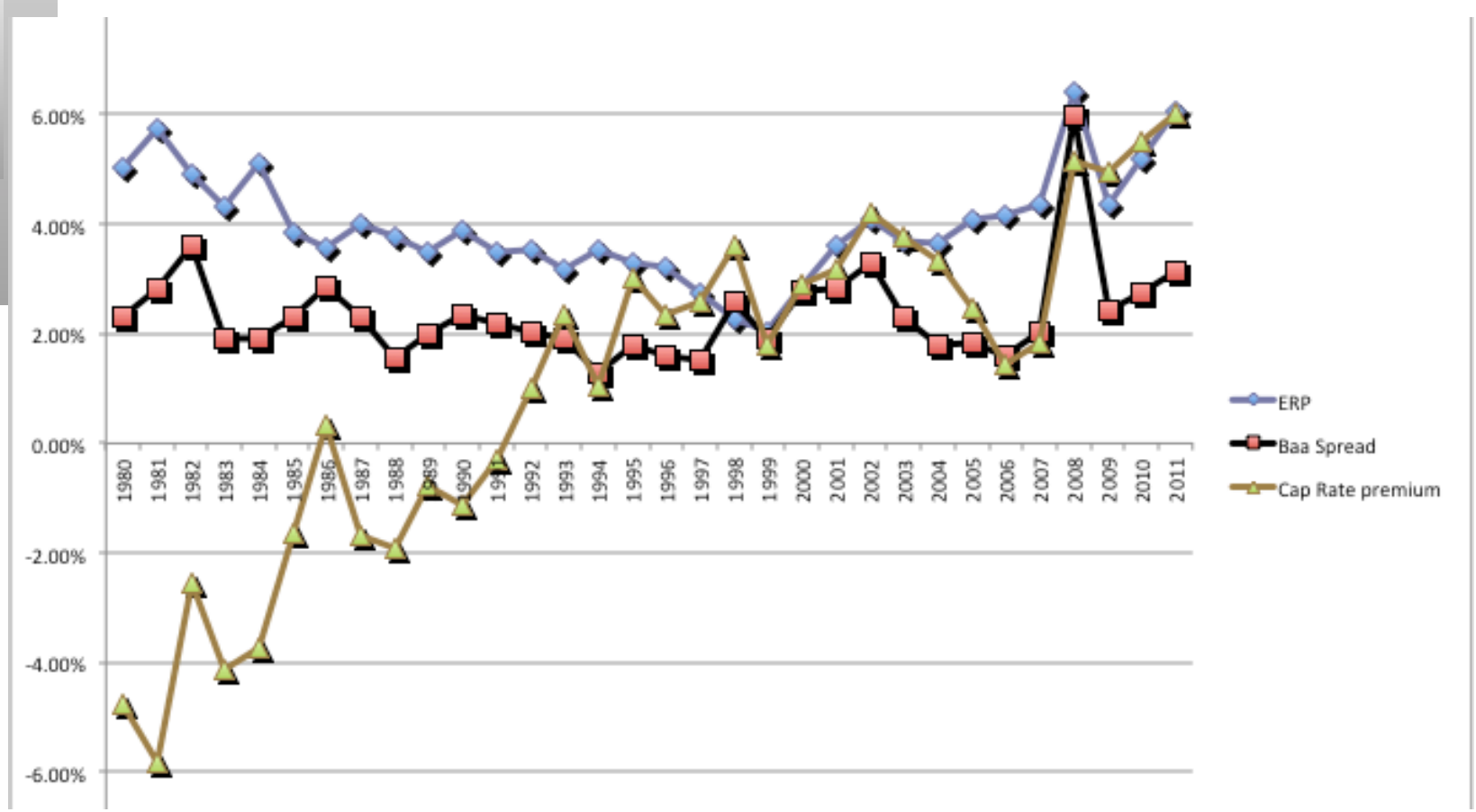


Equity Risk Premiums and Bond Default Spreads

Figure 15: Equity Risk Premiums and Bond Default Spreads



Equity Risk Premiums and Cap Rates (Real Estate)



The bottom line…

- The days of stable equity risk premiums are behind us. We are in a new world order, where all risk premiums will become more volatile.
- Sticking with a fixed risk premium or trusting mean reversion in this market is a recipe for disaster, since fundamentals shift so dramatically over time.
- Here is what we need to do:
  - Have dynamic, constantly recomputed forward looking estimates of risk premiums
  - Relate these risk premiums to real events and fundamentals
  - Compare these risk premiums across different markets to check for consistency and mispricing.

Diversification, Cost of Equity and Value

Aswath Damodaran
www.damodaran.com

Start at the beginning: A generic definition of risk…

- Risk, in traditional terms, is viewed as a 'negative'. Webster's dictionary, for instance, defines risk as "exposing to danger or hazard". The Chinese symbols for risk, reproduced below, give a much better description of risk

危机

- The first symbol is the symbol for "danger", while the second is the symbol for "opportunity", making risk a mix of danger and opportunity.

The Mean Variance Framework… Convenience at a price…

- In the mean variance framework, there are only two dimensions on which we measure investments – expected returns (good… opportunity) and variance/ standard deviation (bad… danger).
- There are two ways in which we can justify a mean-variance framework:
  - Investors have utility functions for wealth that are derive their value from only expected return and standard deviation. One utility function with this characteristic is the quadratic utility function:

    $U(W) = a + bW - c\,W^2$

    The problem with this function is that your risk aversion increases as wealth increases.
  - Returns are normally distributed… or log returns are normally distributed… or some version of returns is normally distributed.…

Stand alone risk versus Risk added to a portfolio.. The Markowitz Revolution..

- The key insight: The risk in an investment is not the risk of it standing alone but the risk that it adds to your overall investment portfolio:
- If you live in a mean-variance world, the risk in an investment becomes the risk added to what you have in your portfolio. Generally speaking, if we assume that your existing portfolio has a standard deviation of σ_p and you are investing a proportion of your overall portfolio in an individual asset (w_j), with a standard deviation of σ_j, the variance of your newly composed portfolio is:

$$\sigma^2_{p'} = \sigma^2_p (1 - w_j)^2 + \sigma^2_j w_j^2 + 2 w_j (1 - w_j) \rho_{jp} \sigma_p \sigma_j$$

- If the proportion invested in the new asset j (w_j) is small, relative to the overall portfolio, the risk added to the portfolio by the asset can be captured by the covariance term:

  Variance added to portfolio by an individual asset = $\rho_{jp}\sigma_p\sigma_j$

The CAPM…Sharpe and Lintner to the rescue..

- Now assume that we add two items to the mix:
  - A riskless asset with an E(R) = R_r and $\sigma_f = 0$
  - No transactions costs and no private information
- We obtain the following:
  - There is no logical limit to diversification and we all end up holding every single traded asset, held in proportion to market value. This supremely diversified portfolio is the market portfolio, with E(R) = E(R_m) and a variance of σ^2_m.
  - The risk in an individual investment (j) then becomes the risk added to this market portfolio and is measured as follows:

    Risk added to market portfolio by asset j = $\rho_{jm}\sigma_m\sigma_j$
  - Scaling the risk of an individual investment to the risk of the market, we get:

$$\text{Scaled Risk} = \frac{\rho_{jm}\sigma_m\sigma_j}{\sigma^2_m} = \frac{\rho_{jm}\sigma_j}{\sigma_m} = Beta_j$$

Which leads to betas… and expected returns..

- One way to interpret the beta is as a relative standard deviation measure:

$$\frac{\rho_{jm}\sigma_j}{\sigma_m}$$

$\rho_{jm}\sigma_j$ ← *Non-diversifiable portion of standard deviation in investment j*

σ_m ← *Standard deviation of market portfolio*

- In the CAPM, the expected return on an individual investment can then be written in beta units as follows:

  Expected Return in beta units = $R_f + \text{Beta}_j\,(E(R_m) - R_f)$

- We can rewrite the same equation in standard deviation units:

  Expected Return in std deviation units = $R_f + \rho_{jm}\sigma_j \left[\frac{E(R_m) - R_f}{\sigma_m}\right]$

 # units of market standard deviation in investment j

Price per unit of market standard deviation

A Rebel in a CAPM world..

- Now assume that you introduce a rebel into this CAPM world, who instead of holding the market portfolio, chooses to invest all of his wealth in his own private business j (with an E(R)= $E(R_j)$ and standard deviation of σ_j). His portfolio is composed only of this investment and the standard deviation is:

  Standard deviation in investment j = σ_j

- Since he operates in a CAPM world, the price of risk is set by the market at

$$\frac{E(R_m) - R_f}{\sigma_m}$$

- If he wants to earn a return that is comparable to what he would made as a diversified investor:

$$E(R) = R_f + \sigma_j * \frac{E(R_m) - R_f}{\sigma_m}$$

$$= R_f + \frac{\sigma_j}{\sigma_m}(E(R_m) - R_f)$$

Contrasting Views of Risk

	CAPM follower	CAPM Rebel
Holds	Market Portfolio	Just investment j
Risk in investment j	$\frac{\rho_{jm}\sigma_j}{\sigma_m} = Beta$	$\frac{\sigma_j}{\sigma_m}$ = Total Beta
Expected Return	$R_f + Beta_j (E(R_m) - R_f)$	$R_f + Total\ Beta_j (E(R_m) - R_f)$

$$\text{Total Beta} = \frac{\text{Market Beta}}{\rho_{jm}}$$

And Consequences..

- A diversified investor will see less risk in the same investment than an undiversified investor looking at that investment.
- If these investors have to face the same market price per risk, the diversified investor will demand a lower expected return (and discount rate) for the same investment as an undiversified investor.
- If the investors have the same expectations of cash flows from the asset, the diversified investor will pay a higher price for the same asset than an undiversified investor.

Implication 1: When selling a private business or asset, the best potential buyer, other things remaining equal, will be a diversified investor or an entity with diversified investors (a publicly traded firm).

Implication 2: Private business owners who are fully invested in their own businesses are holding on to these businesses at a discount, especially if going public or selling to a publicly traded company is an option.

A diversification continuum..

- Assume that you have a private business operating in a sector, where publicly traded companies have an average beta of 1 and where the average correlation of firms with the market is 0.25. Consider the cost of equity at three stages in the process (Riskfree rate = 4%; ERP = 5%):

Stage 1: The nascent business, with a private owner, who is fully invested in that business.

Perceived Beta = 1/ 0.25 = 4

Cost of Equity = 4% + 4 (5%) = 24%

Stage 2: Angel financing provided by specialized venture capitalist, who holds multiple investments, in high technology companies. (Correlation of portfolio with market is 0.5)

Perceived Beta = 1/0.5 = 2

Cost of Equity = 4% + 2 (5%) = 14%

Stage 3: Public offering, where investors are retail and institutional investors, with diversified portfolios:

Perceived Beta = 1

Cost of Equity = 4% + 1 (5%) = 9%

To value this company…

Assume that this company will be fully owned by its current owner for two years, will access the technology venture capitalist at the start of year 3 and that is expected to either go public or be sold to a publicly traded firm at the end of year 5.

Growth rate 2% forever after year 5

	1	2	3	4	5	Terminal year
E(Cash flow)	$100	$125	$150	$165	$170	$175
Market beta	1	1	1	1	1	1
Correlation	0.25	0.25	0.5	0.5	0.5	1
Beta used	4	4	2	2	2	1
Cost of equity	24.00%	24.00%	14.00%	14.00%	14.00%	9.00%
Terminal value					$2,500	
Cumulated COE	1.2400	1.5376	1.7529	1.9983	2.2780	2.4830
PV	$80.65	$81.30	$85.57	$82.57	$1,172.07	

175/ (.09-.02)

Value of firm	$1,502	(Correct value, using changing costs of equity)
Value of firm	$1,221	(using 24% as cost of equity forever. You will undervalue firm)
Value of firm	$2,165	(Using 9% as cost of equity forever. You will overvalue firm)

Here are reasons why you might not like total beta…

- You do not like the mean-variance framework.
  - Build models that carry other measures of opportunity (skewness or the possibility of high payoffs) and danger (kurtosis, or dangers of jumps).
- You do not believe that the market price for risk is set by diversified investors. In other words, you believe that the bulk of the trading done in markets is by undiversified investors and the bulk of the assets are held by these investors.
  - The relationship between expected return and risk may no longer be linear.
  - Relate expected returns to micro factors (not macro factors). Proxy models that are built only on firm-specific characteristics (such as market cap) do this.
- You do not like the assumptions of the CAPM, i.e., no transactions costs and no private information.
  - Multifactor models that try to capture the risks that the CAPM does not capture, but only macro risks.
- You do not believe that private business owners set expected returns based upon traded assets in the market place.

Even if you do believe in total beta… notes of caution…

- Total beta should provide little explanatory power for expected returns at publicly traded firms, especially those that are widely held by institutions and have large market cap.
- It is not the appropriate measure of risk if an asset is being valued to a potential buyer, who is partially or mostly diversified. Thus, when valuing a private business for sale to a publicly traded company or even to a partially diversified investor, it is not appropriate to use total beta (and cost of equity).
- If asked to assess fair value, where fair value is the value to the best potential buyer of a business, using total beta is unlikely to provide the answer, unless you happen to be in a business where all of the potential buyers are undiversified.

And consider the alternative…

- The alternative to the total beta model seems to be the build up model, where you start with the CAPM and proceed to add premiums for various aspects of private firms that you feel are being ignored, including:
  - Size: Private firms are smaller than public firms – hence, a small firm premium
  - Illiquidity: Private firms are not traded – hence, an illiquidity discount
  - Sector premiums: In some cases, sector premiums are added on.
- Build up models are recipes for disaster and here is why:
  - Dependence on historical data
  - Double counting or triple counting of risk
  - Internal inconsistencies

Does it actually work?

- With publicly traded companies, here are some implications that are testable:
  - While betas should explain differences in returns across larger, widely held, publicly traded companies, standard deviations should explain differences in returns across smaller, closely held companies. (The investors in the latter are likely to be less diversified).
  - It follows then that when we look at excess returns earned by companies, when those excess returns are measured relative to the CAPM, smaller, closely held firms should earn excess returns.
- With private businesses, here are some implications:
  - The transaction prices and multiples paid for private businesses in sectors where there are diversified buyers (publicly traded companies) should be higher than the transaction prices and multiples paid in sectors where these buyers do not exist.
  - As venture capitalists and private equity investors become more diversified, the values of private businesses that depend on these investors for capital should increase.

The bottom line..

- The degree to which the buyer of an asset is diversified will affect the risk he or she perceives in that asset and by extension the value.
- If you stay within the parameters of the CAPM and assume that private business owners operate at the margin, are completely undiversified and have to take market prices set by the public market, total beta is a defensible measure..
- If you abandon those assumptions, then the task becomes more arduous. However, build-up models whose sole objective seems to arrive at a high enough rate (which you can still legally defend) are not the alternative.
- Finally, the diversification discount is separate from the illiquidity discount. In other words, it is perfectly logical to use a higher discount rate to capture the absence of diversification and also apply an illiquidity discount to value. The same cannot be said of build up models.

Yada… Yada… Yada…

- Pick your fights.
  - Be steadfast to first principles
  - Be flexible on models
  - Be pragmatic on estimation processes
- Accept the facts.. You will be wrong 100% of the time…. But so is everyone else..
- Legally defensible ≠ Sensible..
- Life's too short.. Total betas are not that important.