EQUITY RISK PREMIUMS: LOOKING BACKWARDS AND FORWARDS…

Aswath Damodaran

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

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*	*Notes*
Individual Investors	Securities Industries Association	8.3% (2004)	One year premium
Institutional Investors	Merrill Lynch	4.8% (2013)	Monrthly updates
CFOs	Campbell Harvey & Graham	4.48% (2012)	5-8% response rate
Analysts	Pablo Fernandez	5.0% (2011)	Lowest standard deviation
Academics	Pablo Fernandez	5.7% (2011)	Higher for emerging markets

- 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 backward looking
  - they tend to be short term; even the longest surveys do not go beyond one year.

Equity Risk Premiums
The ubiquitous historical risk premium

- The historical premium is the premium that stocks have historically earned over riskless securities.
- While the users of historical risk premiums act as if it is a fact (rather than an estimate), 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
1928-2013	7.93%	6.29%	6.02%	4.62%
Std Error	*2.19%*	*2.34%*		
1964-2013	6.18%	4.32%	4.83%	3.33%
Std Error	*2.42%*	*2.75%*		
2004-2013	7.55%	4.41%	5.80%	3.07%
Std Error	*6.02%*	*8.66%*		

The perils of trusting the past.......

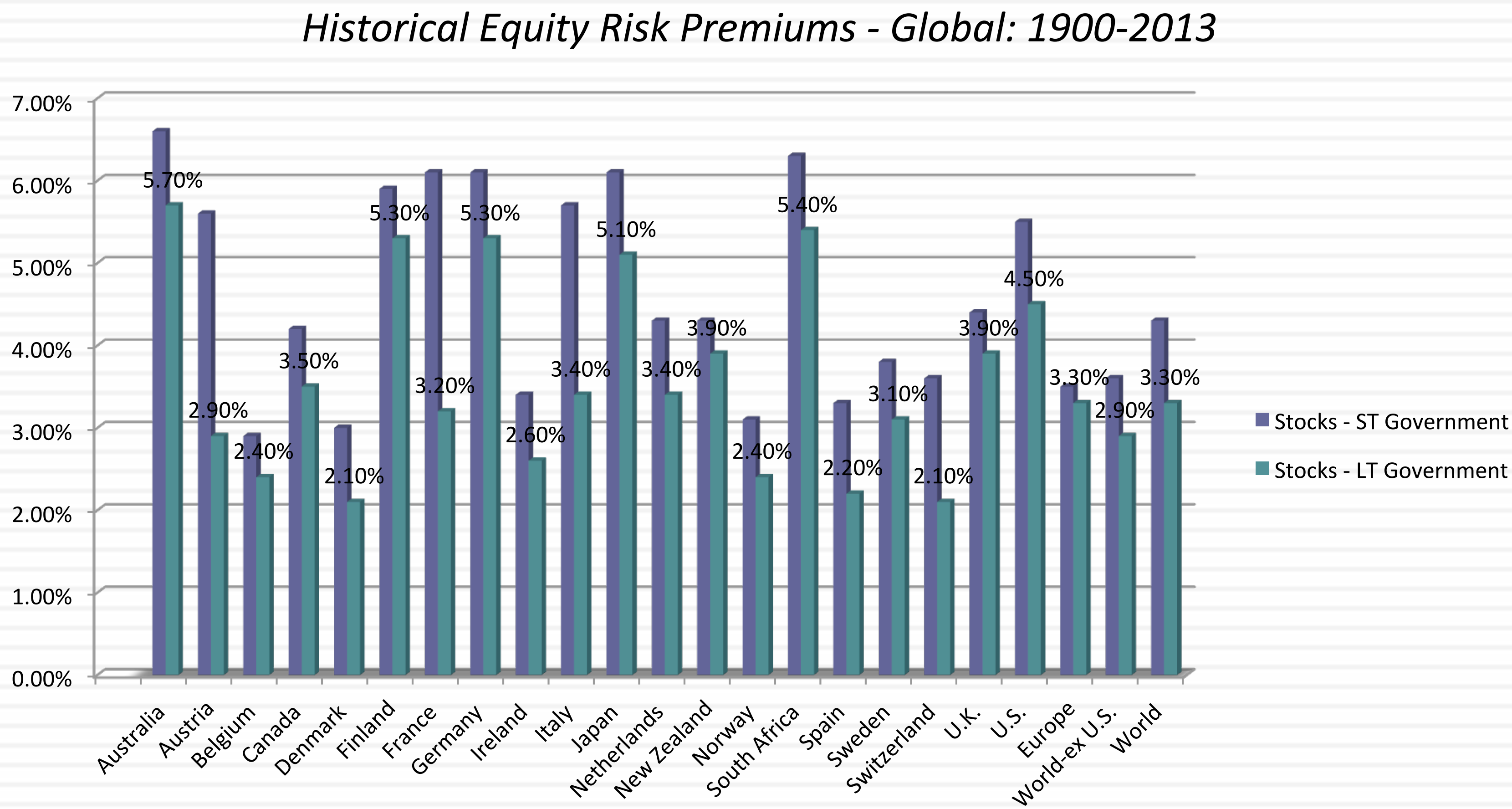
- Noisy estimates: Even with long time periods of history, the risk premium that you derive will have substantial standard error. For instance, if you go back to 1928 (about 80 years of history) and you assume a standard deviation of 20% in annual stock returns, you arrive at a standard error of greater than 2%:

$$\text{Standard Error in Premium} = 20\%/\sqrt{80} = 2.26\%$$

(An aside: The implied standard deviation in equities rose to almost 50% during the last quarter of 2008. Think about the consequences for using historical risk premiums, if this volatility persisted)

- 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.

Risk Premium for a Mature Market? Broadening the sample



The simplest way of estimating an additional country risk premium: The country default spread

- Default spread for country: In this approach, the country equity risk premium is set equal to the default spread for the country, estimated in one of three ways:
  - The default spread on a dollar denominated bond issued by the country. (In January 2014, that spread was 1.50% for the Brazilian $ bond)
  - The sovereign CDS spread for the country. In January 2015, the ten year CDS spread for Brazil was 2.53%.
  - The default spread based on the local currency rating for the country. Brazil's sovereign local currency rating is Baa2 and the default spread for a Baa2 rated sovereign was about 1.90% in January 2014.
- Add the default spread to a "mature" market premium: This default spread is added on to the mature market premium to arrive at the total equity risk premium for Brazil, assuming a mature market premium of 5.00%.
  - Country Risk Premium for Brazil = 1.90%
  - Total ERP for Brazil = 5.00% + 1.90% = 6.90%

An equity volatility based approach to estimating the country total ERP

- This approach draws on the standard deviation of two equity markets, the emerging market in question and a base market (usually the US). The total equity risk premium for the emerging market is then written as:
  - Total equity risk premium = Risk Premium$_{US}$* $\sigma_{\text{Country Equity}} / \sigma_{\text{US Equity}}$
- The country equity risk premium is based upon the volatility of the market in question relative to U.S market.
  - Assume that the equity risk premium for the US is 5.00%.
  - Assume that the standard deviation in the Bovespa (Brazilian equity) is 21% and that the standard deviation for the S&P 500 (US equity) is 18%.
  - Total Equity Risk Premium for Brazil = 5.00% (21%/18%) = 5.83%
  - Country equity risk premium for Brazil = 5.83% - 5.00% = 0.83%

A melded approach to estimating the additional country risk premium

- 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 January 2014, 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) = 21%
    - Standard Deviation in Brazil government bond = 14%
    - Default spread on C-Bond = 1.90%
  - Brazil Country Risk Premium = 1.90% (21%/14%) = 2.85%
  - Brazil Total ERP = Mature Market Premium + CRP = 5.00% + 2.85% = 7.85%

ERP : Jan 2014

Andorra	6.80%	1.80%	Liechtenstein	5.00%	0.00%
Austria	5.00%	0.00%	Luxembourg	5.00%	0.00%
Belgium	5.90%	0.90%	Malta	6.80%	1.80%
Cyprus	20.00%	15.00%	Netherlands	5.00%	0.00%
Denmark	5.00%	0.00%	Norway	5.00%	0.00%
Finland	5.00%	0.00%	Portugal	10.40%	5.40%
France	5.60%	0.60%	Spain	8.30%	3.30%
Germany	5.00%	0.00%	Sweden	5.00%	0.00%
Greece	20.00%	15.00%	Switzerland	5.00%	0.00%
Iceland	8.30%	3.30%	Turkey	8.30%	3.30%
Ireland	8.75%	3.75%	United Kingdom	5.60%	0.60%
Italy	7.85%	2.85%	**Western Europe**	**6.29%**	**1.29%**

Canada	5.00%	0.00%
United States of America	5.00%	0.00%
North America	**5.00%**	**0.00%**

Argentina	14.75%	9.75%
Belize	18.50%	13.50%
Bolivia	10.40%	5.40%
Brazil	7.85%	2.85%
Chile	5.90%	0.90%
Colombia	8.30%	3.30%
Costa Rica	8.30%	3.30%
Ecuador	16.25%	11.25%
El Salvador	10.40%	5.40%
Guatemala	8.75%	3.75%
Honduras	13.25%	8.25%
Mexico	7.40%	2.40%
Nicaragua	14.75%	9.75%
Panama	7.85%	2.85%
Paraguay	10.40%	5.40%
Peru	7.85%	2.85%
Suriname	10.40%	5.40%
Uruguay	8.30%	3.30%
Venezuela	16.25%	11.25%
Latin America	**8.62%**	**3.62%**

Aswath Damodaran

Angola	10.40%	5.40%
Benin	13.25%	8.25%
Botswana	6.28%	1.28%
Burkina Faso	13.25%	8.25%
Cameroon	13.25%	8.25%
Cape Verde	13.25%	8.25%
DR Congo	14.75%	9.75%
Egypt	16.25%	11.25%
Gabon	10.40%	5.40%
Ghana	11.75%	6.75%
Kenya	11.75%	6.75%
Morocco	8.75%	3.75%
Mozambique	11.75%	6.75%
Namibia	8.30%	3.30%
Nigeria	10.40%	5.40%
Rep Congo	10.40%	5.40%
Rwanda	13.25%	8.25%
Senegal	11.75%	6.75%
South Africa	7.40%	2.40%
Tunisia	10.40%	5.40%
Uganda	11.75%	6.75%
Zambia	11.75%	6.75%
Africa	**10.04%**	**5.04%**

Albania	11.75%	6.75%
Armenia	9.50%	4.50%
Azerbaijan	8.30%	3.30%
Belarus	14.75%	9.75%
Bosnia and Herzegovina	14.75%	9.75%
Bulgaria	7.85%	2.85%
Croatia	8.75%	3.75%
Czech Republic	6.05%	1.05%
Estonia	6.05%	1.05%
Georgia	10.40%	5.40%
Hungary	8.75%	3.75%
Kazakhstan	7.85%	2.85%
Latvia	7.85%	2.85%
Lithuania	7.40%	2.40%
Macedonia	10.40%	5.40%
Moldova	14.75%	9.75%
Montenegro	10.40%	5.40%
Poland	6.28%	1.28%
Romania	8.30%	3.30%
Russia	7.40%	2.40%
Serbia	11.75%	6.75%
Slovakia	6.28%	1.28%
Slovenia	8.75%	3.75%
Ukraine	16.25%	11.25%
E. Europe & Russia	**7.96%**	**2.96%**

Bangladesh	10.40%	5.40%
Cambodia	13.25%	8.25%
China	5.90%	0.90%
Fiji	11.75%	6.75%
Hong Kong	5.60%	0.60%
India	8.30%	3.30%
Indonesia	8.30%	3.30%
Japan	5.90%	0.90%
Korea	5.90%	0.90%
Macao	5.90%	0.90%
Malaysia	6.80%	1.80%
Mauritius	7.40%	2.40%
Mongolia	11.75%	6.75%
Pakistan	16.25%	11.25%
Papua New Guinea	11.75%	6.75%
Philippines	8.30%	3.30%
Singapore	5.00%	0.00%
Sri Lanka	11.75%	6.75%
Taiwan	5.90%	0.90%
Thailand	7.40%	2.40%
Vietnam	13.25%	8.25%
Asia	**6.51%**	**1.51%**

Abu Dhabi	5.75%	0.75%
Bahrain	7.85%	2.85%
Israel	6.05%	1.05%
Jordan	11.75%	6.75%
Kuwait	5.75%	0.75%
Lebanon	11.75%	6.75%
Oman	6.05%	1.05%
Qatar	5.75%	0.75%
Saudi Arabia	5.90%	0.90%
United Arab Emirates	5.75%	0.75%
Middle East	**6.14%**	**1.14%**

Australia	5.00%	0.00%
Cook Islands	11.75%	6.75%
New Zealand	5.00%	0.00%
Australia & New Zealand	**5.00%**	**0.00%**

Black #: Total ERP
Red #: Country risk premium
AVG: GDP weighted average

From Country Equity Risk Premiums to Corporate Equity Risk premiums

- Approach 1: Assume that every company in the country is equally exposed to country risk. In this case,
  - E(Return) = Riskfree Rate + CRP + Beta (Mature ERP)
  - Implicitly, this is what you are assuming when you use the local Government's dollar borrowing rate as your riskfree rate.
- Approach 2: Assume that a company's exposure to country risk is similar to its exposure to other market risk.
  - E(Return) = Riskfree Rate + Beta (Mature ERP+ CRP)
- Approach 3: Treat country risk as a separate risk factor and allow firms to have different exposures to country risk (perhaps based upon the proportion of their revenues come from non-domestic sales)
  - E(Return)=Riskfree Rate+ β (Mature ERP) + λ (CRP)

Mature ERP = Mature market Equity Risk Premium

CRP = Additional country risk premium

Approaches 1 & 2: Estimating country risk premium exposure

- Location based CRP: The standard approach in valuation is to attach a country risk premium to a company based upon its country of incorporation. Thus, if you are an Indian company, you are assumed to be exposed to the Indian country risk premium. A developed market company is assumed to be unexposed to emerging market risk.
- Operation-based CRP: There is a more reasonable modified version. The country risk premium for a company can be computed as a weighted average of the country risk premiums of the countries that it does business in, with the weights based upon revenues or operating income. If a company is exposed to risk in dozens of countries, you can take a weighted average of the risk premiums by region.

Operation based CRP: Single versus Multiple Emerging Markets

- Single emerging market: Embraer, in 2004, reported that it derived 3% of its revenues in Brazil and the balance from mature markets. The mature market ERP in 2004 was 5% and Brazil's CRP was 7.89%.

	Revenues	Total ERP	CRP
US and other mature markets	97%	5.00%	0.00%
Brazil	3%	12.89%	8%
Embraer		**5.24%**	**0.24%**

- Multiple emerging markets: Ambev, the Brazilian-based beverage company, reported revenues from the following countries during 2011.

	Revenues	%	Total ERP	CRP
Argentina	19	9.31%	15.00%	9.00%
Bolivia	4	1.96%	10.88%	4.88%
Brazil	130	63.73%	8.63%	2.63%
Canada	23	11.27%	6.00%	0.00%
Chile	7	3.43%	7.05%	1.05%
Ecuador	6	2.94%	12.75%	6.75%
Paraguay	3	1.47%	12.00%	6.00%
Peru	12	5.88%	9.00%	3.00%
Ambev	**204**		**9.11%**	**3.11%**

Extending to a multinational: Regional breakdown Coca Cola's revenue breakdown and ERP in 2012

Region	*Revenues*	*Total ERP*	*CRP*
Western Europe	19%	6.67%	0.67%
Eastern Europe & Russia	5%	8.60%	2.60%
Asia	15%	7.63%	1.63%
Latin America	15%	9.42%	3.42%
Australia	4%	6.00%	0.00%
Africa	4%	9.82%	3.82%
North America	40%	6.00%	0.00%
Coca Cola	100%	7.14%	1.14%

Things to watch out for

1. Aggregation across regions. For instance, the Pacific region often includes Australia & NZ with Asia
2. Obscure aggregations including Eurasia and Oceania

Two problems with these approaches..

- Focus just on revenues: To the extent that revenues are the only variable that you consider, when weighting risk exposure across markets, you may be missing other exposures to country risk. For instance, an emerging market company that gets the bulk of its revenues outside the country (in a developed market) may still have all of its production facilities in the emerging market.
- Exposure not adjusted or based upon beta: To the extent that the country risk premium is multiplied by a beta, we are assuming that beta in addition to measuring exposure to all other macro economic risk also measures exposure to country risk.

Approach 3: Estimate a lambda for country risk

- 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.
- Manufacturing facilities: Other things remaining equal, a firm that has all of its production facilities in a "risky country" 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.
- Government "national" interests: There are sectors that are viewed as vital to the national interests, and governments often play a key role in these companies, either officially or unofficially. These sectors are more exposed to country risk.

Estimating Company Exposure to Country Risk

- The factor "l" measures the relative exposure of a firm to country risk. One simplistic solution would be to do the following:

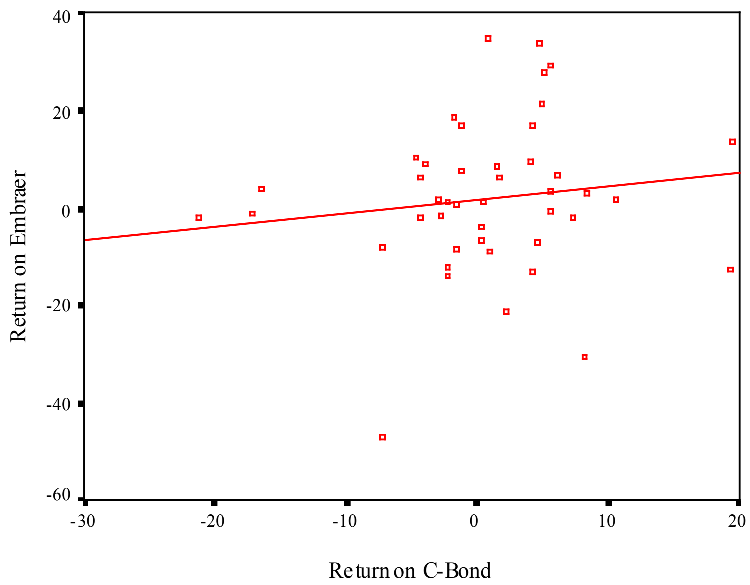
λ = % of revenues domestically$_{firm}$/ % of revenues domestically$_{average\ firm}$

- Consider two firms – Tata Motors and Tata Consulting Services, both Indian companies. In 2008-09, Tata Motors got about 91.37% of its revenues in India and TCS got 7.62%. The average Indian firm gets about 80% of its revenues in India:
  - $\lambda_{\text{Tata Motors}}$= 91%/80% = 1.14
  - λ_{TCS}= 7.62%/80% = 0.09
- There are two implications
  - A company's risk exposure is determined by where it does business and not by where it is incorporated.
  - Firms might be able to actively manage their country risk exposures

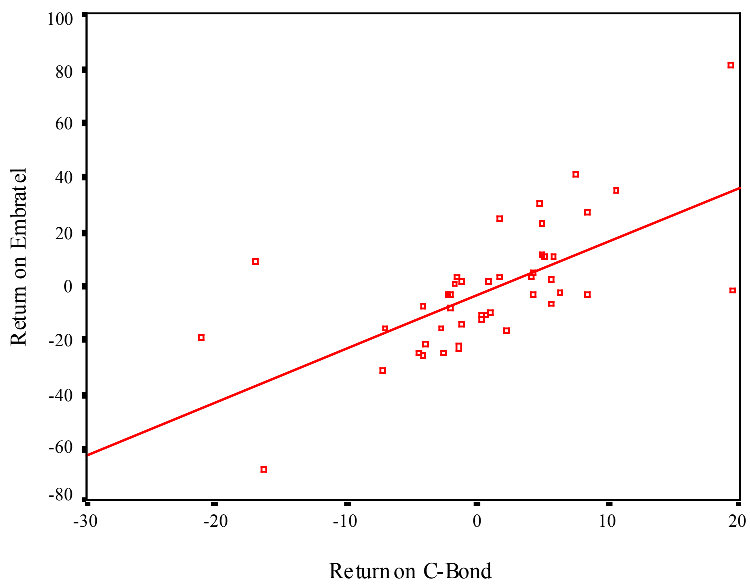
A richer lambda estimate: Use stock returns and country bond "returns": Estimating a "lambda" for Embraer in 2004

$$\text{Return}_{\text{Embraer}} = 0.0195 + \mathbf{0.2681}\ \text{Return}_{\text{C Bond}}$$
$$\text{Return}_{\text{Embratel}} = -0.0308 + \mathbf{2.0030}\ \text{Return}_{\text{C Bond}}$$

Embraer versus C Bond: 2000-2003



Embratel versus C Bond: 2000-2003



Estimating a US Dollar Cost of Equity for Embraer - September 2004

- Assume that the beta for Embraer is 1.07, and that the US $ riskfree rate used is 4%. Also assume that the risk premium for the US is 5% and the country risk premium for Brazil is 7.89%. Finally, assume that Embraer gets 3% of its revenues in Brazil & the rest in the US.
- There are five estimates of $ cost of equity for Embraer:
  - Approach 1: Constant exposure to CRP, Location CRP
    - E(Return) = 4% + 1.07 (5%) + 7.89% = 17.24%
  - Approach 2: Constant exposure to CRP, Operation CRP
    - E(Return) = 4% + 1.07 (5%) + (0.03*7.89% +0.97*0%)= 9.59%
  - Approach 3: Beta exposure to CRP, Location CRP
    - E(Return) = 4% + 1.07 (5% + 7.89%)= 17.79%
  - Approach 4: Beta exposure to CRP, Operation CRP
    - E(Return) = 4% + 1.07 (5% +(0.03*7.89%+0.97*0%)) = 9.60%
  - Approach 5: Lambda exposure to CRP
    - E(Return) = 4% + 1.07 (5%) + 0.27(7.89%) = 11.48%%

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).

Valuing Emerging Market Companies with significant exposure in developed markets

- The conventional practice in investment banking is to add the country equity risk premium on to the cost of equity for every emerging market company, notwithstanding its exposure to emerging market risk. Thus, in 2004, Embraer would have been valued with a cost of equity of 17-18% even though it gets only 3% of its revenues in Brazil. As an investor, which of the following consequences do you see from this approach?

a. Emerging market companies with substantial exposure in developed markets will be significantly over valued by equity research analysts.

b. Emerging market companies with substantial exposure in developed markets will be significantly under valued by equity research analysts.

Can you construct an investment strategy to take advantage of the mis-valuation? What would need to happen for you to make money of this strategy?

Implied Equity Premiums

- Let's start with a general proposition. If you know the price paid for an asset and have estimates of the expected cash flows on the asset, you can estimate the IRR of these cash flows. If you paid the price, this is what you have priced the asset to earn (as an expected return).
- If you assume that stocks are correctly priced in the aggregate and you can estimate the expected cashflows from buying stocks, you can estimate the expected rate of return on stocks by finding that discount rate that makes the present value equal to the price paid. 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).

Implied Equity Premiums: January 2008

- We can use the information in stock prices to back out how risk averse the market is and how much of a risk premium it is demanding.

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

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

- If you pay the current level of the index, you can expect to make a return of 8.39% on stocks (which is obtained by solving for r in the following equation)

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

- Implied Equity risk premium = Expected return on stocks - Treasury bond rate = 8.39% - 4.02% = 4.37%

Implied Risk Premium Dynamics

- Assume that the index jumps 10% on January 2 and that nothing else changes. What will happen to the implied equity risk premium?
  a. Implied equity risk premium will increase
  b. Implied equity risk premium will decrease
- Assume that the earnings jump 10% on January 2 and that nothing else changes. What will happen to the implied equity risk premium?
  a. Implied equity risk premium will increase
  b. Implied equity risk premium will decrease
- Assume that the riskfree rate increases to 5% on January 2 and that nothing else changes. What will happen to the implied equity risk premium?
  a. Implied equity risk premium will increase
  b. Implied equity risk premium will decrease

A year that made a difference.. The implied premium in January 2009

Year	Market value of index	Dividends	Buybacks	Cash to equity	Dividend yield	Buyback yield	Total yield
2001	1148.09	15.74	14.34	30.08	1.37%	1.25%	2.62%
2002	879.82	15.96	13.87	29.83	1.81%	1.58%	3.39%
2003	1111.91	17.88	13.70	31.58	1.61%	1.23%	2.84%
2004	1211.92	19.01	21.59	40.60	1.57%	1.78%	3.35%
2005	1248.29	22.34	38.82	61.17	1.79%	3.11%	4.90%
2006	1418.30	25.04	48.12	73.16	1.77%	3.39%	5.16%
2007	1468.36	28.14	67.22	95.36	1.92%	4.58%	6.49%
2008	903.25	28.47	40.25	68.72	3.15%	4.61%	7.77%
Normalized	903.25	28.47	24.11	52.584	3.15%	2.67%	5.82%

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).

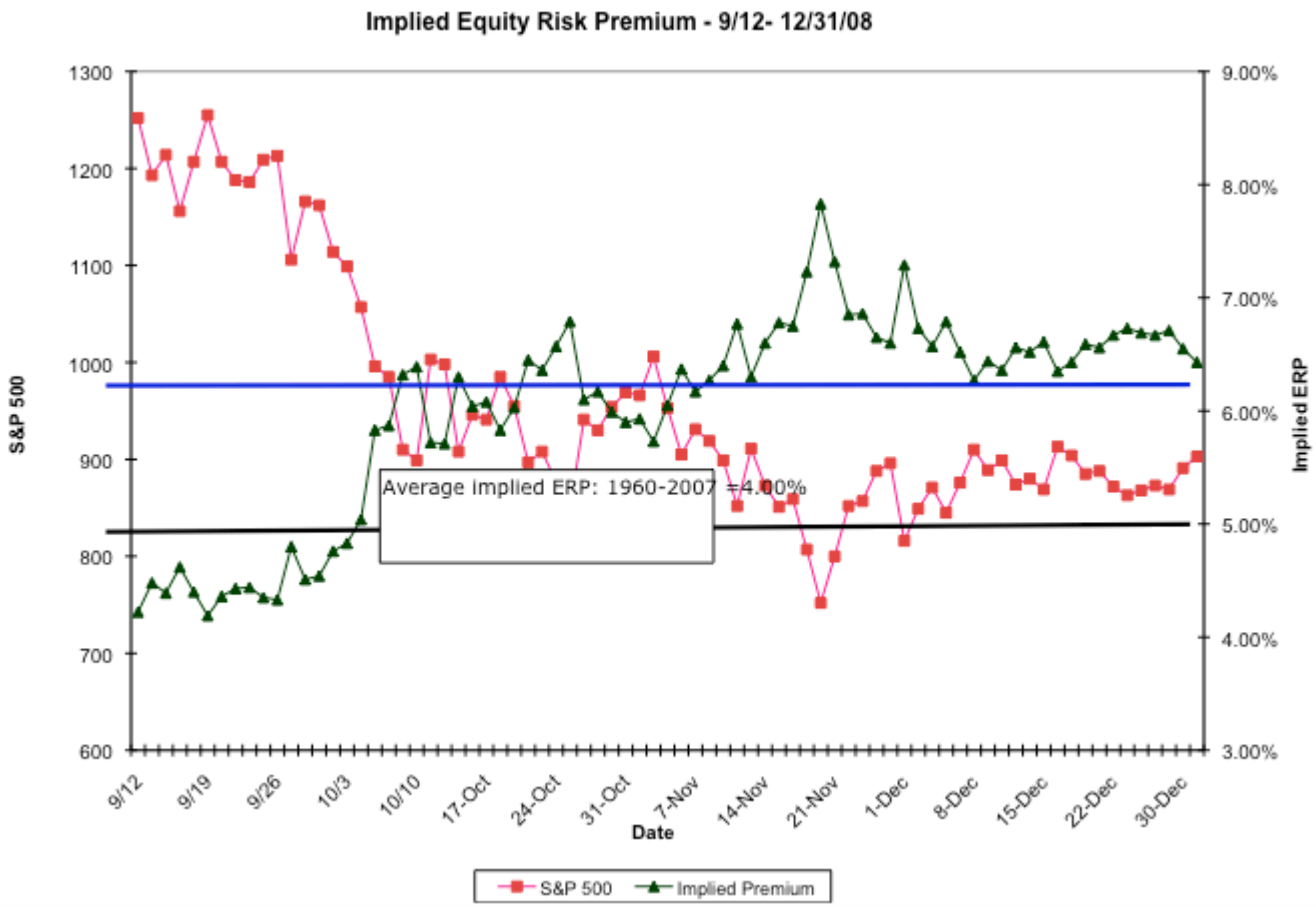
54.69 56.87 59.15 61.52 63.98

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

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

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

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



An Updated Equity Risk Premium: January 2014

Base year cash flow
Dividends (TTM): 34.32
+ Buybacks (TTM): 49.85
= Cash to investors (TTM): 84.16
Earnings in TTM:

Expected growth in next 5 years
Top down analyst estimate of earnings growth for S&P 500 with stable payout: 4.28%

E(Cash to investors)	87.77	91.53	95.45	99.54	103.80

S&P 500 on 1/1/14 = 1848.36

Beyond year 5
Expected growth rate = Riskfree rate = 3.04%
Terminal value = 103.8(1.0304)/(,08 - .0304)

$$\frac{87.77}{(1+r)^1}+\frac{91.53}{(1+r)^2}+\frac{95.45}{(1+r)^3}+\frac{99.54}{(1+r)^4}+\frac{103.80}{(1+r)^5}+\frac{103.80(1.0304)}{(r-.0304)(1+r)^5}=1848.36$$

r = Implied Expected Return on Stocks = 8.00%

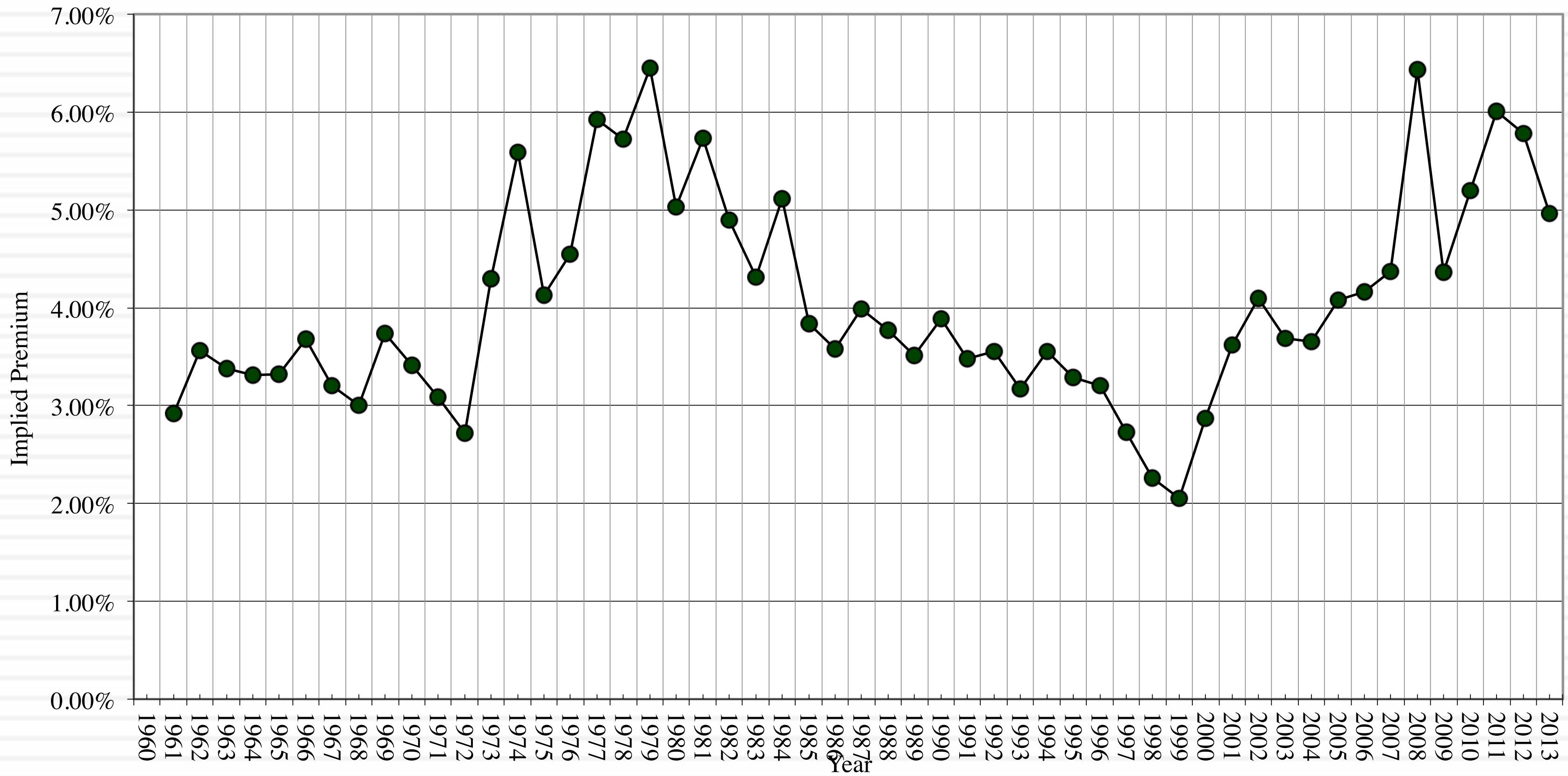
Minus

Risk free rate = T.Bond rate on 1/1/14=3.04%

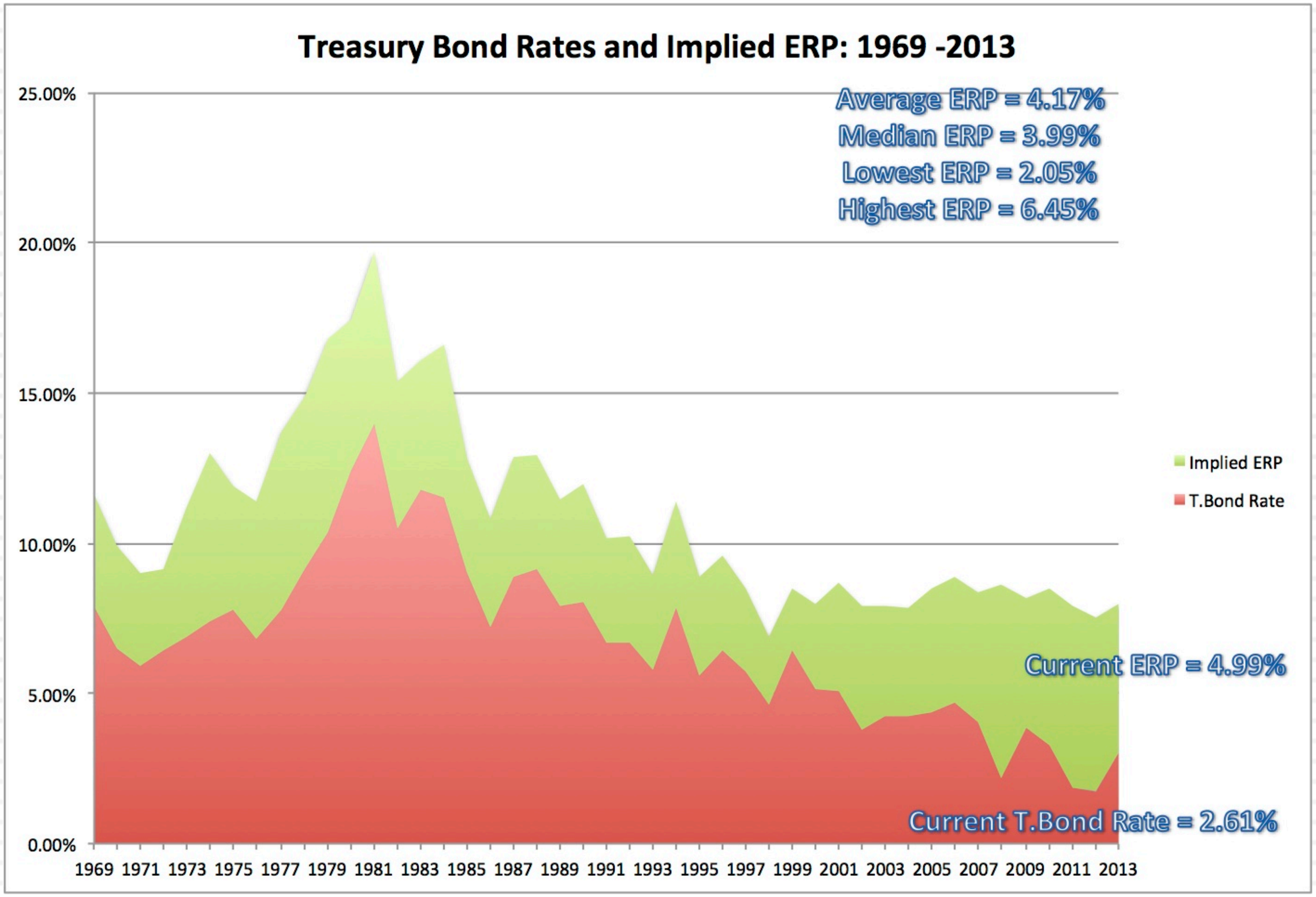
Equals

Implied Equity Risk Premium (1/1/14) = 8% - 3.04% = 4.96%

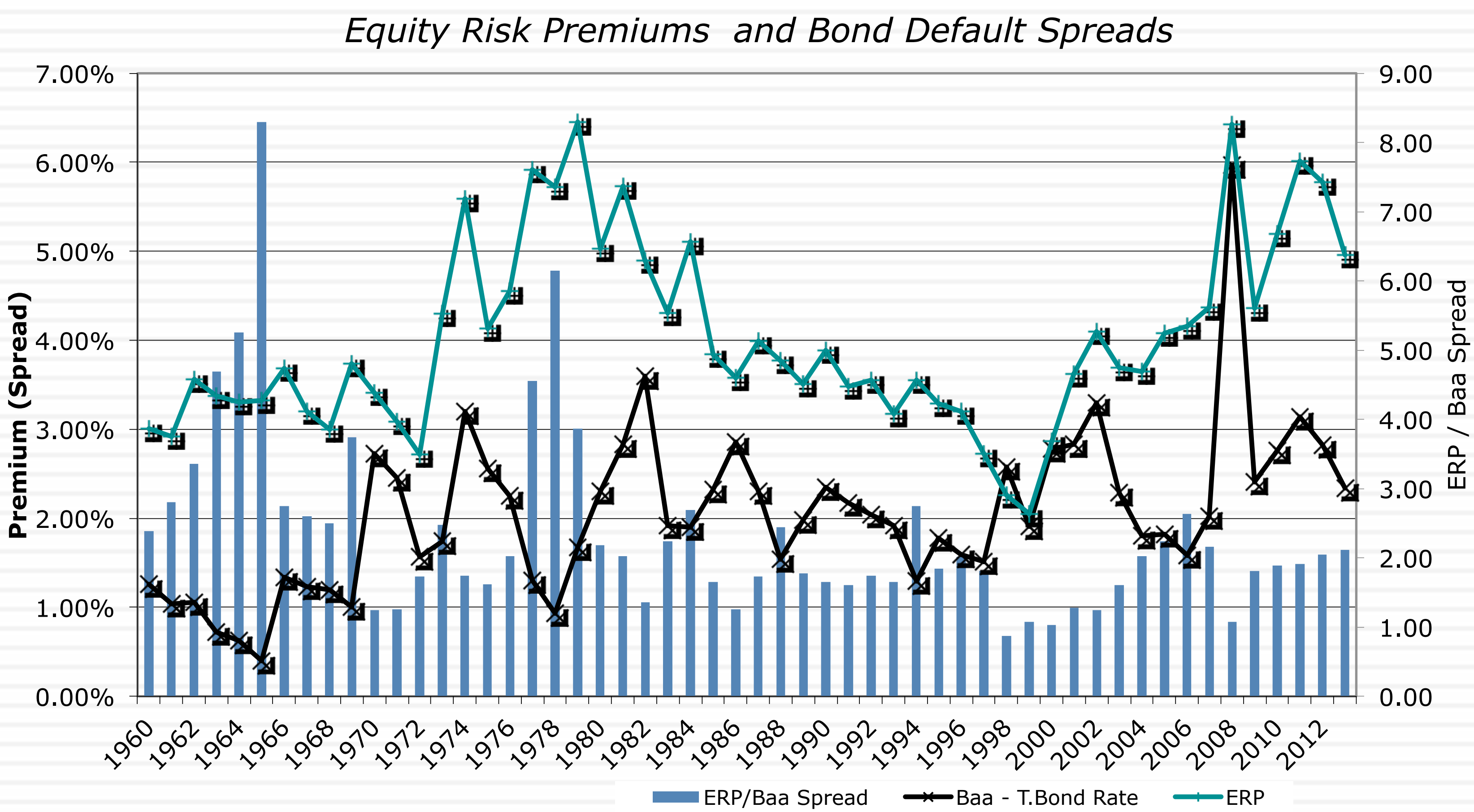
Implied Premiums in the US: 1960-2013



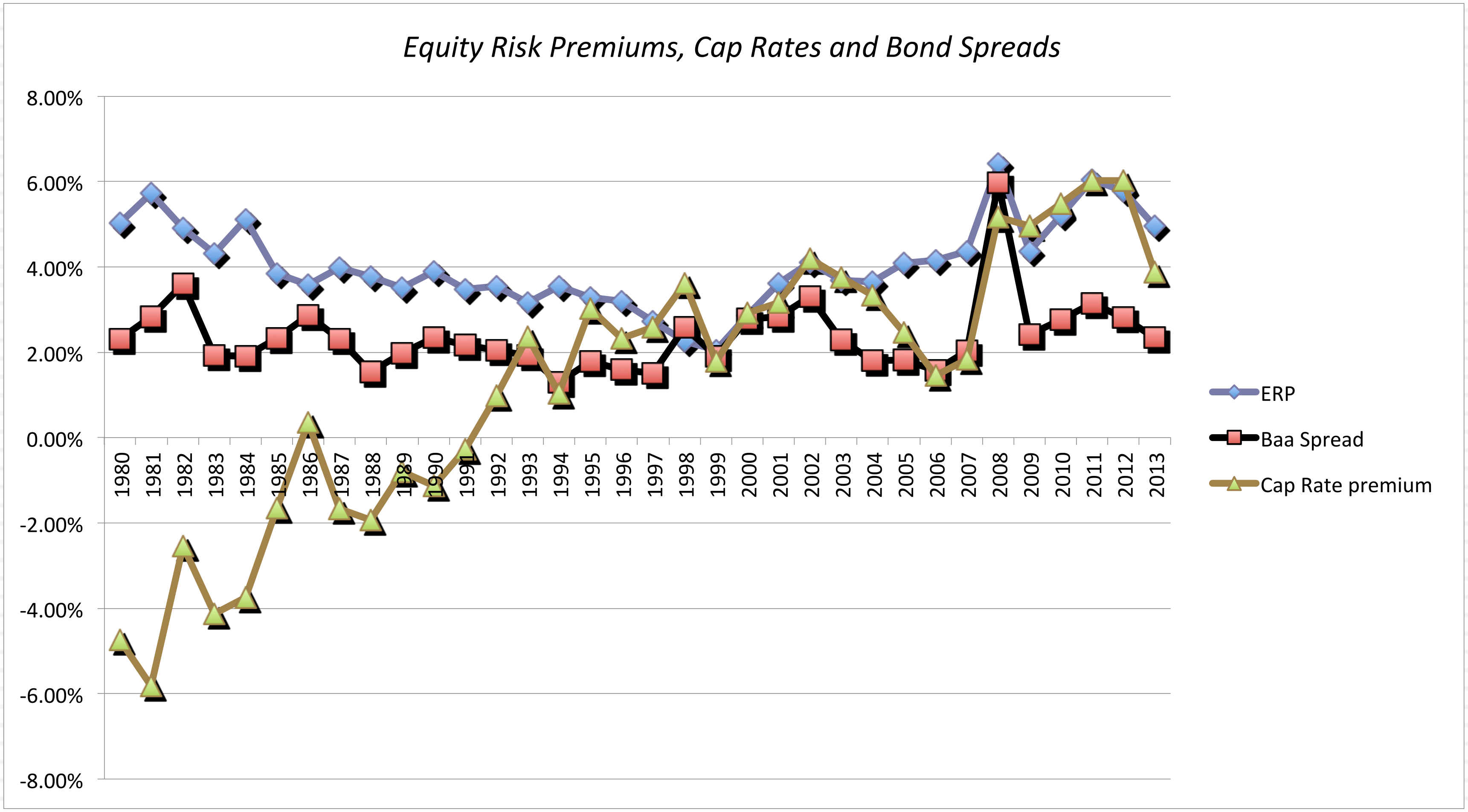
Implied ERP & Risk Free Rate



Equity Risk Premiums and Bond Default Spreads



Equity Risk Premiums and Cap Rates (Real Estate)



Why implied premiums matter?

- In many investment banks, it is common practice (especially in corporate finance departments) to use historical risk premiums (and arithmetic averages at that) as risk premiums to compute cost of equity. If all analysts in the department used the arithmetic average premium (for stocks over T.Bills) for 1928-2013 of 6% to value stocks in January 2014, given the implied premium of 4.96%, what are they likely to find?

a. The values they obtain will be too low (most stocks will look overvalued)
b. The values they obtain will be too high (most stocks will look under valued)
c. There should be no systematic bias as long as they use the same premium to value all stocks.

Which equity risk premium should you use?

If you assume this	**Premium to use**
Premiums revert back to historical norms and your time period yields these norms	Historical risk premium
Market is correct in the aggregate or that your valuation should be market neutral	Current implied equity risk premium
Marker makes mistakes even in the aggregate but is correct over time	Average implied equity risk premium over time.

Predictor	*Correlation with implied premium next year*	*Correlation with actual risk premium – next 10 years*
Current implied premium	0.712	0.424
Average implied premium: Last 5 years	0.646	0.360
Historical Premium	-0.394	-0.486
Default Spread based premium	0.059	0.174

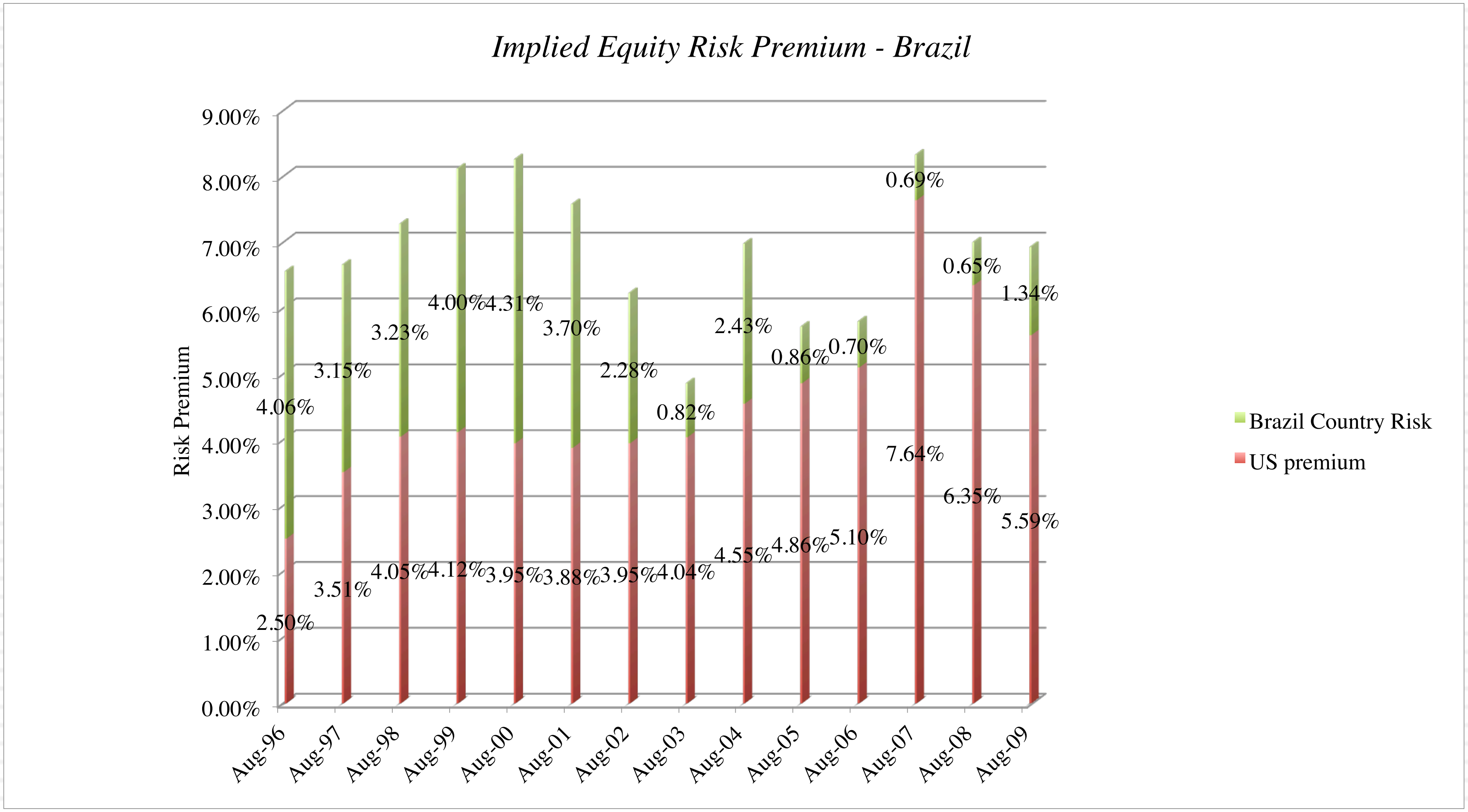
And the approach can be extended to emerging markets Implied premium for the Sensex (September 2007)

- Inputs for the computation
  - Sensex on 9/5/07 = 15446
  - Dividend yield on index = 3.05%
  - Expected growth rate - next 5 years = 14%
  - Growth rate beyond year 5 = 6.76% (set equal to riskfree rate)
- Solving for the expected return:

$$15446 = \frac{537.06}{(1+r)} + \frac{612.25}{(1+r)^2} + \frac{697.86}{(1+r)^3} + \frac{795.67}{(1+r)^4} + \frac{907.07}{(1+r)^5} + \frac{907.07(1.0676)}{(r - .0676)(1+r)^5}$$

- Expected return on stocks = 11.18%
- Implied equity risk premium for India = 11.18% - 6.76% = 4.42%

Can country risk premiums change? Brazil CRP & Total ERP from 2000 to 2013

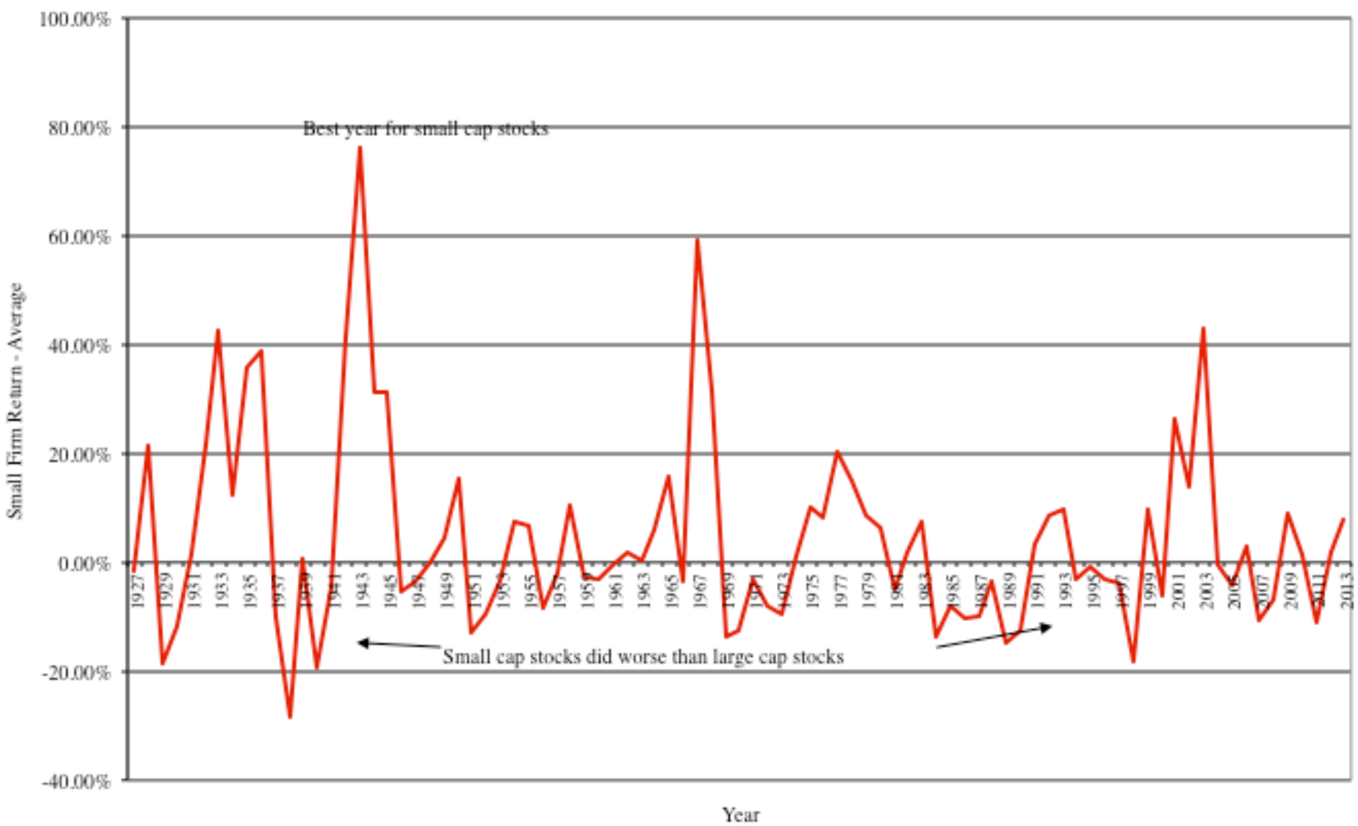


The evolution of Emerging Market Risk

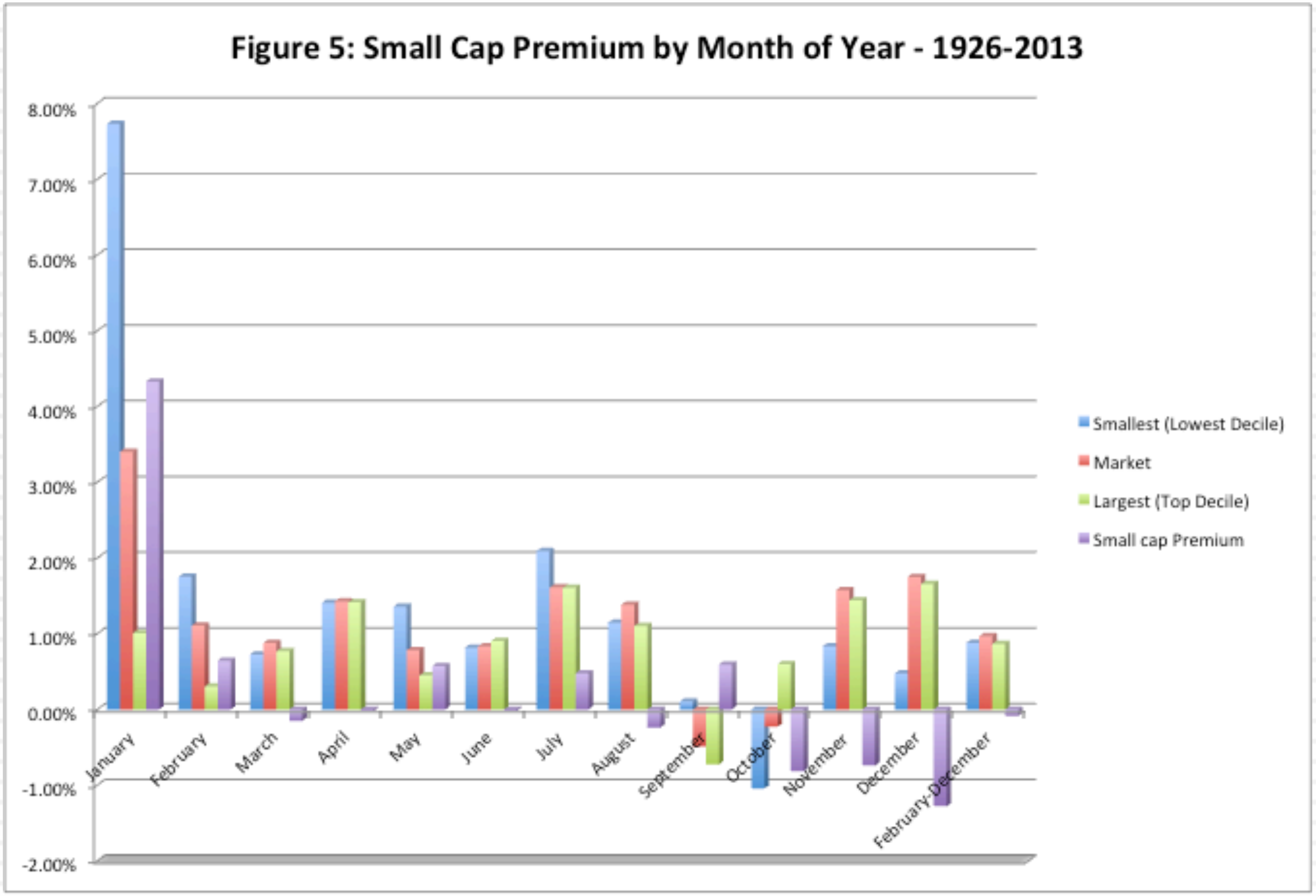
	PBV Developed	PBV Emerging	ROE Developed	ROE Emerging	US T.Bond rate	Growth rate Developed	Growth rate Emerging	Cost of equity (Developed)	Cost of equity (Emerging)	Differential ERP
2004	2.00	1.19	10.81%	11.65%	4.22%	3.72%	5.22%	7.27%	10.62%	3.36%
2005	2.09	1.27	11.12%	11.93%	4.39%	3.89%	5.39%	7.35%	10.54%	3.19%
2006	2.03	1.44	11.32%	12.18%	4.70%	4.20%	5.70%	7.71%	10.20%	2.49%
2007	1.67	1.67	10.87%	12.88%	4.02%	3.52%	5.02%	7.92%	9.73%	1.81%
2008	0.87	0.83	9.42%	11.12%	2.21%	1.71%	3.21%	10.57%	12.74%	2.17%
2009	1.20	1.34	8.48%	11.02%	3.84%	3.34%	4.84%	7.62%	9.45%	1.83%
2010	1.39	1.43	9.14%	11.22%	3.29%	2.79%	4.29%	7.36%	9.14%	1.78%
2011	1.12	1.08	9.21%	10.04%	1.88%	1.38%	2.88%	8.37%	9.51%	1.14%
2012	1.17	1.18	9.10%	9.33%	1.76%	1.26%	2.76%	7.96%	8.33%	0.37%
Jun-13	1.17	1.17	8.79%	9.37%	2.55%	2.05%	3.55%	7.81%	8.52%	0.71%

Small Cap Premiums? History

Figure 4: Small Firm Premium over time- 1927 -2013



A Look by Month



Small Cap Premium: Noise in the numbers

Decile	Average	Standard Error	Maximum	Minimum
Smallest	4.45%	1.96%	76.28%	-28.42%
2	1.71%	1.14%	41.25%	-17.96%
3	1.50%	0.77%	41.98%	-13.54%
4	0.68%	0.55%	15.56%	-7.33%
5	0.08%	0.53%	11.63%	-16.05%
6	0.00%	0.51%	15.21%	-14.01%
7	-0.50%	0.55%	7.48%	-19.50%
8	-1.60%	0.81%	11.20%	-29.42%
9	-2.24%	1.02%	21.96%	-36.09%
Largest	-4.09%	1.56%	31.29%	-65.57%

Small Cap Premium: Cautionary Notes

1. Standard Error on estimates: There is a small cap premium, but it is noisy, subject to estimation periods used and vary across months.
2. Small versus Large Cap: Dividing companies into small & large companies is arbitrary. It is a continuum.
3. Understanding Risk: Using small cap premiums allows analysts to evade basic questions about what it is that makes smaller cap companies riskier, and whether these factors may vary across companies.
4. Small cap companies become large cap companies over time: Companies that are small market cap companies now grow to become large market cap companies over time.
5. Other risk premiums: Using a small cap premium opens the door to other premiums being used to augment expected returns.