HURDLE RATES III: ESTIMATING EQUITY RISK PREMIUMS PART I

Stocks are risky! Really!
The Investment Decision
Invest in assets that earn a return greater than the minimum acceptable hurdle rate

The Financing Decision
Find the right kind of debt for your firm and the right mix of debt and equity to fund your operations

The Dividend Decision
If you cannot find investments that make your minimum acceptable rate, return the cash to owners of your business

Hurdle Rate
4. Define & Measure Risk
5. The Risk free Rate
6. Equity Risk Premiums
7. Country Risk Premiums
8. Regression Betas
9. Beta Fundamentals
10. Bottom-up Betas
11. The "Right" Beta
12. Debt: Measure & Cost
13. Financing Weights

Financing Mix
17. The Trade off
18. Cost of Capital Approach
19. Cost of Capital: Follow up
20. Cost of Capital: Wrap up
21. Alternative Approaches
22. Moving to the optimal

Financing Type
23. The Right Financing

Dividend Policy
24. Trends & Measures
25. The trade off
26. Assessment
27. Action & Follow up
28. The End Game

Investment Return
14. Earnings and Cash flows
15. Time Weighting Cash flows
16. Loose Ends

Valuation
29. First steps
30. Cash flows
31. Growth
32. Terminal Value
33. To value per share
34. The value of control
35. Relative Valuation

Set Up and Objective
1: What is corporate finance
2: The Objective: Utopia and Let Down
3: The Objective: Reality and Reaction

36. Closing Thoughts
The Equity Risk Premium

- The risk premium is the premium that investors demand for investing in an average risk investment, relative to the riskfree rate.

- As a general proposition, this premium should be:
  - greater than zero
  - increase with the risk aversion of the investors in that market
  - increase with the riskiness of the “average” risk investment
What is your risk premium?

Assume that stocks are the only risky assets and that you are offered two investment options:
- a riskless investment (say a Government Security), on which you can make 3%
- a mutual fund of all stocks, on which the returns are uncertain

How much of an expected return would you demand to shift your money from the riskless asset to the mutual fund?

a. Less than 3%
b. Between 3 - 5%
c. Between 5 - 7%
d. Between 7 -9%
e. Between 9% - 11%
f. More than 11%
Risk Premiums do change..

- Go back to the previous example. Assume now that you are making the same choice but that you are making it in the aftermath of a stock market crash (it has dropped 25% in the last month). Would you change your answer?

  a. I would demand a larger premium
  b. I would demand a smaller premium
  c. I would demand the same premium
Estimating Risk Premiums 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.
A. 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:

<table>
<thead>
<tr>
<th>Group Surveyed</th>
<th>Survey done by</th>
<th>Estimated ERP</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Investors</td>
<td>Securities Industries Association</td>
<td>8.3% (2004)</td>
<td>One year premium</td>
</tr>
<tr>
<td>Institutional Investors</td>
<td>Merrill Lynch</td>
<td>4.8% (2013)</td>
<td>Monthly updates</td>
</tr>
<tr>
<td>CFOs</td>
<td>Campbell Harvey &amp; Graham</td>
<td>4.48% (2012)</td>
<td>5-8% response rate</td>
</tr>
<tr>
<td>Analysts</td>
<td>Pablo Fernandez</td>
<td>5.0% (2011)</td>
<td>Lowest standard deviation</td>
</tr>
<tr>
<td>Academics</td>
<td>Pablo Fernandez</td>
<td>5.7% (2011)</td>
<td>Higher for emerging markets</td>
</tr>
</tbody>
</table>

- 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.
B. The Historical Risk Premium
United States – January 2014

<table>
<thead>
<tr>
<th></th>
<th>Arithmetic Average</th>
<th>Geometric Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stocks - T. Bills</td>
<td>Stocks - T. Bonds</td>
</tr>
<tr>
<td>1928-2013</td>
<td>7.93%</td>
<td>6.29%</td>
</tr>
<tr>
<td>Std Error</td>
<td>2.19%</td>
<td>2.34%</td>
</tr>
<tr>
<td>1964-2013</td>
<td>6.18%</td>
<td>4.32%</td>
</tr>
<tr>
<td>Std Error</td>
<td>2.42%</td>
<td>2.75%</td>
</tr>
<tr>
<td>2004-2013</td>
<td>7.55%</td>
<td>4.41%</td>
</tr>
<tr>
<td>Std Error</td>
<td>6.02%</td>
<td>8.66%</td>
</tr>
</tbody>
</table>

What is the right premium?

1. Go back as far as you can. Otherwise, the standard error in the estimate will be large.

2. Be consistent in your use of a riskfree rate.

3. Use arithmetic premiums for estimates of short term costs of equity and geometric premiums for estimates of long term costs of equity.

\[
\text{Std Error in estimate} = \frac{\text{Annualized Std deviation in Stock prices}}{\sqrt{\text{Number of years of historical data}}}
\]
What about historical premiums for other markets?

- Historical data for markets outside the United States is available for much shorter time periods. The problem is even greater in emerging markets.
- The historical premiums that emerge from this data reflects this data problem and there is much greater error associated with the estimates of the premiums.
- Put simply, if you distrust historical risk premiums in the United States, because the estimates are backward looking and noisy, you will trust them even less outside the US, where you have less data.
One solution: Bond default spreads as CRP – November 2013

- In November 2013, the historical risk premium for the US was 4.20% (geometric average, stocks over T.Bonds, 1928-2012)

<table>
<thead>
<tr>
<th>Year</th>
<th>Arithmetic Average</th>
<th>Geometric Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stocks - T. Bills</td>
<td>Stocks - T. Bonds</td>
</tr>
<tr>
<td>1928-2012</td>
<td>7.65%</td>
<td>5.88%</td>
</tr>
<tr>
<td></td>
<td>2.20%</td>
<td>2.83%</td>
</tr>
</tbody>
</table>

- Using the default spread on the sovereign bond or based upon the sovereign rating and adding that spread to the mature market premium (4.20% for the US):

<table>
<thead>
<tr>
<th>Country</th>
<th>Rating</th>
<th>Default Spread (Country Risk Premium)</th>
<th>US ERP</th>
<th>Total ERP for country</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>Baa3</td>
<td>2.25%</td>
<td>4.20%</td>
<td>6.45%</td>
</tr>
<tr>
<td>China</td>
<td>Aa3</td>
<td>0.80%</td>
<td>4.20%</td>
<td>5.00%</td>
</tr>
<tr>
<td>Brazil</td>
<td>Baa2</td>
<td>2.00%</td>
<td>4.20%</td>
<td>6.20%</td>
</tr>
</tbody>
</table>

- If you prefer CDS spreads:

<table>
<thead>
<tr>
<th>Country</th>
<th>Sovereign CDS Spread</th>
<th>US ERP</th>
<th>Total ERP for country</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>4.20%</td>
<td>4.20%</td>
<td>8.40%</td>
</tr>
<tr>
<td>China</td>
<td>1.20%</td>
<td>4.20%</td>
<td>5.40%</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.59%</td>
<td>4.20%</td>
<td>6.79%</td>
</tr>
</tbody>
</table>
Beyond the default spread? Equities are riskier than bonds

- While default risk spreads and equity risk premiums are highly correlated, one would expect equity spreads to be higher than debt spreads. One approach to scaling up the premium is to look at the relative volatility of equities to bonds and to scale up the default spread to reflect this:

- **Brazil:** The annualized volatilities of the Brazilian equity index over the previous year is 21 percent, whereas the annualized standard deviation in the Brazilian C-bond is 14 percent.

- Using the same approach for India and China:
  
  Brazil's Total Risk Premium = 4.20% + 2.00% \( \left( \frac{21\%}{14\%} \right) \) = 7.20%

  Equity Risk Premium_{India} = 4.20% + 2.25% \( \left( \frac{24\%}{17\%} \right) \) = 7.80%

  Equity Risk Premium_{China} = 4.20% + 0.80% \( \left( \frac{18\%}{10\%} \right) \) = 5.64%
Task
Estimate the historical equity risk premium in the market of your choice (if you can)