THE ONE NUMBER THAT TELLS THE WHOLE STORY: EQUITY RISK PREMIUMS

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 risk-free 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 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 provided 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.
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:

<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>1928-2018</td>
<td>7.93%</td>
<td>6.26%</td>
</tr>
<tr>
<td>Std Error</td>
<td>2.09%</td>
<td>2.22%</td>
</tr>
<tr>
<td>1969-2018</td>
<td>6.34%</td>
<td>4.00%</td>
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<tr>
<td>Std Error</td>
<td>2.38%</td>
<td>2.71%</td>
</tr>
<tr>
<td>2009-2018</td>
<td>13.00%</td>
<td>11.21%</td>
</tr>
<tr>
<td>Std Error</td>
<td>3.71%</td>
<td>5.50%</td>
</tr>
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</table>
An Implied Equity Risk Premium

**Base year cash flow (last 12 mths)**
- Dividends (TTM): 52.25
- Buybacks (TTM): 84.40
- Cash to investors (TTM): 136.65

**Expected cashflow growth in next 5 years**
Cash flow growth = Top down analyst estimate of earnings growth for S&P 500 = 4.12%

<table>
<thead>
<tr>
<th>Last 12 months</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Terminal Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected Earnings</td>
<td>148.34</td>
<td>154.46</td>
<td>160.83</td>
<td>167.46</td>
<td>174.37</td>
<td>181.56</td>
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<tr>
<td>Expected Dividends + Buybacks</td>
<td>136.65</td>
<td>$142.28</td>
<td>$148.15</td>
<td>$154.26</td>
<td>$160.62</td>
<td>$167.25</td>
</tr>
</tbody>
</table>

S&P 500 on 1/1/19 = 2506.85

\[
2506.85 = \frac{142.28}{(1 + r)} + \frac{148.15}{(1 + r)^2} + \frac{154.26}{(1 + r)^3} + \frac{160.62}{(1 + r)^4} + \frac{167.25}{(1 + r)^5} + \frac{167.25 \times (1.0268)}{(r - 0.0268)(1 + r)^5}
\]

Solve for \( r \)

\[ r = \text{Implied Expected Return on Stocks} = 8.64\% \]

**Minus**

Risk free rate = T.Bond rate on 1/1/19 = 2.68%

**Equals**

Implied Equity Risk Premium (1/1/19) = 8.64\% - 2.68\% = 5.96\%
If you want market neutrality...

- **Because your job description proscribes market views:** If your job is to value individual companies, not pass judgment on the overall market, you should use the current implied equity risk premium and move on, no matter how much you disagree with it.

- **Because you have a bad history at market timing:** If you have a history of bad market timing, you should stick with the current implied ERP.
If you want to value (or time) markets, you have to decide on a reasonable ERP.
Implied Premium versus Risk Free Rate

Implied ERP and Risk free Rates

Since 2008, the expected return on stocks has stagnated at about 8%, but the risk free rate has dropped dramatically.
Equity Risk Premiums and Bond Default Spreads

Median ERP/Baa Spread during period = 1.96

Aswath Damodaran
A Template for Estimating the ERP

**ERP Estimation Procedure - January 1, 2019**

**Step 1:** Mature Market Premium
- Estimate the implied equity risk premium for S&P 500.
- On January 1, 2019, ERP for S&P 500 was roughly 5.96%.
- Monthly

**Step 2:** Assess country risk
- Check the sovereign local currency rating for the country, with Moody's.

**Step 3:** Convert country risk measure into an additional country risk premium for equity
- If sovereign rating is AAA
  - ERP for country = US ERP
- If sovereign rating is less than AAA, get a default spread for the country, using one of:
  1. Spread on sovereign bond in US$ 2. CDS spread 3. Ratings table
- If there is no sovereign rating, get a country risk score from PRS.

**Step 4:** Estimate an ERP for country
- Relative Equity Market Volatility = Std dev of emerging market equity index/ Std dev of emerging market bond index
- In January 2019 = 1.23
- Estimate an ERP based on PRS score
- ERP for country = PRS-based ERP

Every six months (in January and July)

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<table>
<thead>
<tr>
<th>Country</th>
<th>ERP</th>
<th>ERG</th>
<th>CRP</th>
<th>Country</th>
<th>ERP</th>
<th>ERG</th>
<th>CRP</th>
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<td>12.21%</td>
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<td>2.22%</td>
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<td>3.47%</td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td>18.46%</td>
<td>12.50%</td>
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<td>12.50%</td>
<td></td>
</tr>
<tr>
<td>Eastern Europe &amp; Russia</td>
<td>9.24%</td>
<td>3.28%</td>
<td></td>
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<td>9.24%</td>
<td>3.28%</td>
<td></td>
</tr>
</tbody>
</table>

**Black #: Total ERP**

**Red #: Country risk premium**

**Regional #: GDP weighted average**

### Europe

- **Andorra**: 10.60% 2.64%
- **Austria**: 6.51% 0.55%
- **Belgium**: 6.96% 0.84%
- **Cyprus**: 10.13% 4.17%
- **Denmark**: 5.96% 0.00%
- **Finland**: 6.65% 0.55%
- **France**: 6.65% 0.69%
- **Germany**: 5.96% 0.00%
- **Greece**: 14.99% 9.03%
- **Guernsey (States): 6.80% 0.84%
- **Iceland**: 7.63% 1.67%
- **Ireland**: 7.14% 1.18%
- **Isle of Man**: 6.65% 0.69%
- **Western Europe**: 7.11% 1.15%

### Black #: Total ERP

- **Albania**: 12.21% 6.25%
- **Armenia**: 12.21% 6.25%
- **Azerbaijan**: 10.13% 4.17%
- **Belarus**: 14.99% 9.03%
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- **Bulgaria**: 8.60% 2.64%
- **Croatia**: 10.13% 4.17%
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- **Georgia**: 10.13% 4.17%
- **Hungary**: 9.02% 3.06%
- **Kazakhstan**: 9.02% 3.06%
- **Kykystan**: 13.60% 7.64%
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- **Lithuania**: 7.63% 1.67%
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- **Serbia**: 10.96% 5.00%
- **Slovakia**: 7.14% 1.18%
- **Slovenia**: 8.18% 2.22%
- **Tajikistan**: 9.43% 3.47%
- **Ukraine**: 18.46% 12.50%
- **Eastern Europe & Russia**: 9.24% 3.28%
An Alternative: Implied ERP for other markets

- 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%

Aswath Damodaran
Why country risk premiums matter, even if you are valuing just US companies: Coca Cola in 2012

<table>
<thead>
<tr>
<th>Region</th>
<th>Revenues</th>
<th>Total ERP</th>
<th>CRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Europe</td>
<td>19%</td>
<td>6.67%</td>
<td>0.67%</td>
</tr>
<tr>
<td>Eastern Europe &amp; Russia</td>
<td>5%</td>
<td>8.60%</td>
<td>2.60%</td>
</tr>
<tr>
<td>Asia</td>
<td>15%</td>
<td>7.63%</td>
<td>1.63%</td>
</tr>
<tr>
<td>Latin America</td>
<td>15%</td>
<td>9.42%</td>
<td>3.42%</td>
</tr>
<tr>
<td>Australia</td>
<td>4%</td>
<td>6.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Africa</td>
<td>4%</td>
<td>9.82%</td>
<td>3.82%</td>
</tr>
<tr>
<td>North America</td>
<td>40%</td>
<td>6.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Coca Cola</td>
<td>100%</td>
<td>7.14%</td>
<td>1.14%</td>
</tr>
</tbody>
</table>

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
Which equity risk premium should you use?

If you assume this

- Premiums revert back to historical norms and your time period yields these norms
- Market is correct in the aggregate or that your valuation should be market neutral
- Marker makes mistakes even in the aggregate but is correct over time

Premium to use

- Historical risk premium
- Current implied equity risk premium
- Average implied equity risk premium over time.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Correlation with implied premium next year</th>
<th>Correlation with actual return- next 5 years</th>
<th>Correlation with actual return – next 10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current implied premium</td>
<td>0.763</td>
<td>0.427</td>
<td>0.500</td>
</tr>
<tr>
<td>Average implied premium: Last 5 years</td>
<td>0.718</td>
<td>0.326</td>
<td>0.450</td>
</tr>
<tr>
<td>Historical Premium</td>
<td>-0.497</td>
<td>-0.437</td>
<td>-0.454</td>
</tr>
<tr>
<td>Default Spread based premium</td>
<td>0.047</td>
<td>0.143</td>
<td>0.160</td>
</tr>
</tbody>
</table>

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