International Cost of Capital
Understanding and Quantifying Country Risk

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Duff & Phelps is the global advisor that protects, restores and maximizes value for clients in the areas of valuation, corporate finance, investigations, disputes, cyber security, compliance and regulatory matters, and other governance-related issues. We work with clients across diverse sectors, mitigating risk to assets, operations and people.
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- Real Estate Advisory
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Roger Grabowski, FASA

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Roger J. Grabowski, FASA, is a Managing Director at Duff & Phelps LLC. He was formerly Managing Director of the Standard & Poor’s Corporate Value Consulting practice, a partner of PricewaterhouseCoopers LLP and one of its predecessor firms, Price Waterhouse (where he founded its U.S. Valuation Services practice and managed the real estate appraisal practice).

He has directed valuations of businesses, interests in businesses, intellectual property, intangible assets, real estate property and machinery and equipment. Roger has testified in court as an expert witness on matters of solvency, the value of closely held businesses and business interests, valuation and amortization of intangible assets and other valuation issues. His testimony in U.S. District Court was referenced in the U.S. Supreme Court opinion decided in his client’s favor in the landmark Newark Morning Ledger case.


Papers include:

• “Two Recent Articles addressing Firm Quality and its Impact on the Size Effect” (with Anas Aboulamer, PhD), Business Valuation Update (May 2019)


Roger teaches courses for the American Society of Appraisers.
Jim Harrington is a director at Duff & Phelps.

Jim is a leading contributor to Duff & Phelps’ efforts in the development of studies, surveys, online content and tools, firm-wide valuation models, data distribution platforms, and published thought leadership. Previously, Jim was director of valuation research in Morningstar’s Financial Communications Business.

Jim is a co-author of the Duff & Phelps “Valuation Handbook” series along with colleagues Roger Grabowski and Carla Nunes. These annual books include:

  (starting in 2018, the data from this book is now available exclusively in the Cost of Capital Navigator)
- Valuation Handbook – International Industry Cost of Capital

Jim is a contributing author to:

- Cost of Capital: Applications and Examples, 5th ed.

Jim is a Duff & Phelps Contributor to:

- Stocks, Bonds, Bills, and Inflation (SBBI) Yearbook
About the Valuation Handbooks
About the Valuation Handbooks

Cost of Capital Navigator
Replaced U.S. Guide to Cost of Capital

2018

Todays Agenda

U.S. Cost of Capital and Industry Data

International Cost of Capital and Industry Data

Today's Agenda
Are country risks real?

Framework for Cross-Border Valuations

Incorporating Country Risk in a Valuation: Common Approaches

Impact of Currency on the Discount Rate and Valuation

Which International Cost of Equity Model Should I Use?

Practical Application: A Case Study

Questions
Are Country Risks Real?
Are country risks real?

“...I know how to value a company in the United States, but this one is in Country X, a developing economy...what should I use for a discount rate?”
Are country risks real?

“Measuring the impact of country risk is one of most vexing issues in finance, particularly in emerging markets, where political and other country-specific risks can significantly change the dynamics of the project. It is absolutely essential to incorporate these risks into either the expected cash flows or the discount rate.”

– Campbell R. Harvey, Professor of International Business at the Fuqua School of Business, Duke University
Are country risks real?

Segmentation

• Regulations that restrict foreign investment
• Taxation differences
• Legal factors
• Information
• Trading costs
• Physical barriers
Are country risks real?

120-month Correlation of the Total Returns of the MSCI World, U.S., Europe, and Far East Indices with the MSCI Emerging Markets Equity Index.

- World Correlation with Emerging Markets: 0.79
- U.S. Correlation with Emerging Markets: 0.76
- Europe Correlation with Emerging Markets: 0.63
- Far East Correlation with Emerging Markets: 0.59

- December 1998
- March 2019
Bekaert and Harvey (2014) succinctly state:

“Given the dramatic globalization over the past twenty years, does it make sense to segregate global equities into ‘developed’ and ‘emerging’ market buckets? We argue that the answer is still yes.

(…)

….. emerging market assets still have higher risk than most developed markets – and as a result, continue to command higher expected returns.” [emphasis added]
Risks typically associated with international investment

These risks may include:

- Political Risks
- Financial Risks
- Economic Risks

Each of these risks is a problem for the discount rate only to the extent that it is non-diversifiable from the perspective of the investor, which is often the case.
Framework for Cross-Border Valuations
Is Subject Company Exposed to Country Risk?
Is Subject Company Exposed to Country Risk?

No

No CRP
Country Risk “Decision Tree” – Part 1

Is Subject Company Exposed to Country Risk?

No

Yes (Alt. 1)

Alternative 1: Use Scenario Analysis
Country Risk “Decision Tree” – Part 1

Is Subject Company Exposed to Country Risk?

Yes (Alt. 1)

No CRP

Alternative 1: Use Scenario Analysis

Reflect CRP in Cash Flows
Country Risk “Decision Tree” – Part 1

Is Subject Company Exposed to Country Risk?

No

Yes (Alt. 1)

Alternative 1: Use Scenario Analysis

Reflect CRP in Cash Flows

No CRP in WACC
Country Risk “Decision Tree” – Part 1

Is Subject Company Exposed to Country Risk?

- No
  - No CRP

Yes (Alt. 2)  Yes (Alt. 1)

Alternative 2: Reflect Country Risk in WACC

- Alternative 1: Use Scenario Analysis
  - Reflect CRP in Cash Flows
  - No CRP in WACC
Country Risk “Decision Tree” – Part 1

Is Subject Company Exposed to Country Risk?

Yes (Alt. 2)  No

Yes (Alt. 1)  No CRP

Alternative 1: Use Scenario Analysis

Alternative 2: Reflect Country Risk in WACC

Cash Flows: USD?

Reflect CRP in Cash Flows

No CRP in WACC
Country Risk “Decision Tree” – Part 1

Is Subject Company Exposed to Country Risk?

No

Alternative 1: Use Scenario Analysis

Yes (Alt. 1)

Yes

Alternative 2: Use Scenario Analysis

Cash Flows: USD?

Yes

Compute WACC in USD using available models to quantify CRP

No

No CRP

Yes (Alt. 2)

Alternative 2: Reflect Country Risk in WACC

No CRP in WACC

Reflect CRP in Cash Flows

No CRP in WACC

Compute WACC in USD using available models to quantify CRP

Alternative 1: Use Scenario Analysis
Country Risk “Decision Tree” – Part 1

Is Subject Company Exposed to Country Risk?

No CRP

No

Yes (Alt. 2)

Alternative 2: Reflect Country Risk in WACC

Yes (Alt. 1)

Yes

Compute WACC in USD using available models to quantify CRP

Cash Flows: USD?

Yes

Compute WACC in USD using available models to quantify CRP

No

Alternative 1: Use Scenario Analysis

Reflect CRP in Cash Flows

No CRP in WACC

Reflect CRP in WACC

Compute WACC in USD using available models to quantify CRP
Country Risk “Decision Tree” – Part 1

1. Is Subject Company Exposed to Country Risk?
   - No
     - No CRP

2. Yes (Alt. 2)
   - Alternative 2: Reflect Country Risk in WACC

3. Yes (Alt. 1)
   - Cash Flows: USD?
     - Yes
       - Compute WACC in USD using available models to quantify CRP
     - No
       - Compute WACC in USD using available models to quantify CRP
         - If Local Currency needed, then:
           - Translate WACC into Foreign (local) currency using International Fisher Effect.

4. Alternative 1: Use Scenario Analysis
   - Reflect CRP in Cash Flows
   - No CRP in WACC
Incorporating Country Risk in a DCF Valuation
Incorporating Country Risk in a DCF Valuation

• Scenario Approach

• Country Risk Premium Approach

If consistently and correctly applied, BOTH approaches should yield a similar result.
## Scenario Approach

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• More specific to the situation</td>
<td>• Difficulty in estimating probability factors and scenario</td>
</tr>
<tr>
<td>• Analytically robust and insightful</td>
<td>• Time consuming and costly</td>
</tr>
<tr>
<td></td>
<td>• Adjusts for the mean without adjusting for differences in variances</td>
</tr>
</tbody>
</table>
Incorporating Country Risk in a DCF Valuation

Country Risk Premium Approach

**Strengths**

- Commonly used
- Data Availability
  (D&P estimates CRPs for over 180 countries quarterly)
- Choice of multiple indications
- Time and cost effective

**Weaknesses**

- Lack of consensus on estimation method
- CRP impacts the entire forecast
Impact of Currency on the Discount Rate and Valuation
Impact of Currency on the Discount Rate and Valuation

A common ERROR: mixing currencies.

Corporate finance theory tells us the currency used to project cash flows must be consistent with the currency of the discount rate.

This means that the inputs used to derive a discount rate (in the denominator) should be in the same currency used to project cash flows (in the numerator):

$ USD Cash Flows (in the numerator)

$ USD Discount Rate (in the denominator)
Impact of Currency on the Discount Rate and Valuation

$ CAD Cash Flows (in the numerator)

$ CAD Discount Rate (in the denominator)

€ EUR Cash Flows (in the numerator)

€ EUR Discount Rate (in the denominator)

£ GBP Cash Flows (in the numerator)

£ GBP Discount Rate (in the denominator)
Impact of Currency on the Discount Rate and Valuation

**Method 1:** Convert cash flows at a forecast exchange rate

1. **Forecast Cash Flows in Local**
2. **Convert to Home Currency**
3. **Discount at a Home Currency Discount Rate**

**Method 2:** Perform valuation in local currency

1. **Forecast Cash Flows in Local**
2. **Discount at a Local Discount Rate**
3. **Convert to Home Currency**
Impact of Currency on the Discount Rate and Valuation

What if the valuation must be performed in local currency....
....but local WACC inputs are not available or are unreliable??

First:
Compute discount rate in the home or mature market currency (e.g., USD, or CAD, or EUR...etc)

And then:
Translate discount rate into the local currency using “International Fisher Effect”
Impact of Currency on the Discount Rate and Valuation

Applying the International Fisher Effect: Cost of Equity

\[
\frac{\text{Cost of Equity in local currency}}{(1 + \text{Cost of Equity})_{\text{in home currency}}} \times \frac{(1 + \text{Expected Inflation})_{\text{in local country}}}{(1 + \text{Expected Inflation})_{\text{in home country}}} = 1
\]
Impact of Currency on the Discount Rate and Valuation

Applying the International Fisher Effect: Cost of Debt

\[ \frac{(1 + \text{Cost of Debt}) \text{ in home currency}}{(1 + \text{Expected Inflation}) \text{ in home country}} \times (1 + \text{Expected Inflation}) \text{ in local country} = 1 \]
Which International Cost of Equity Model Should I Use?
In choosing a model, the goal is to balance several objectives:

• **Acceptance and use:** The model has a degree of acceptance, and the model is actually used by valuation analysts.

• **Data Availability:** Quality data is available for consistent and objective application of the model.

• **Simplicity:** The model’s underlying concepts are understandable, and can be explained in plain language.
Which International Cost of Equity Model Should I Use?

When selecting a model (or models), it is important to remember:

There is no consensus among academics and practitioners as to the best model to use in estimating the cost of equity capital in a global environment, particularly with regards to companies operating in emerging economies.

There are several common approaches to incorporating country factors into a cost of equity capital estimate. None are perfect.
Which International Cost of Equity Model Should I Use?

The following are examples of the more commonly used “international” cost of capital models:

• Global CAPM (a.k.a. World CAPM model)

• Single country version of the CAPM

• Local Country Risk Exposure Model (Damodaran Model)

• Country (or Sovereign) Yield Spread model

• Relative Volatility model

• Erb-Harvey-Viskanta Country Credit Rating model

- **Data Exhibit 1**: International Equity Risk Premia (ERPs)
- **Data Exhibit 2**: Country Yield Spread Model, Country Risk Premia (CRPs)
- **Data Exhibit 3**: Relative Volatility Model, Relative Volatility (RV) Factors
- **Data Exhibit 4**: Erb-Harvey-Viskanta Country Credit Rating Model, Country Risk Premia (CRPs)
- **Data Exhibit 5**: Study of Differences in Returns Between Large and Small Companies in Europe
Practical Application: A Case Study
Practical Application: A Case Study

Domestic Investor
No CRP needed
• A Canadian investor investing in Canada
• A German investor investing in Germany
Etc.

International Investor
Country risk premium (CRP) needed
• An U.S. investor investing in India

In today’s presentation, the case study focuses on the “International Investor”.
Case Study: U.S. Investor Investing in India
Overview

A U.S. institutional investor ("U.S. Investor") plans to make an investment in CyberIndia, a company providing information technology services in India.

- The majority of CyberIndia’s cash flows are generated in India.
- U.S. Investor needs to estimate an appropriate WACC to price the investment.
Assumptions

<table>
<thead>
<tr>
<th>Assumptions</th>
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<tbody>
<tr>
<td>Valuation Date:</td>
<td>March 31, 2018</td>
</tr>
<tr>
<td>Investor Perspective:</td>
<td>United States (USD)</td>
</tr>
<tr>
<td>Investee County:</td>
<td>India (INR)</td>
</tr>
<tr>
<td>Cash Flow Projections:</td>
<td>India (INR)</td>
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<td>Industry</td>
<td>Information Technology</td>
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<td><strong>Sub-Industry</strong></td>
<td><strong>Software &amp; Services</strong></td>
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<td>Industry Beta:</td>
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<td>Capital Structure: D/TC</td>
<td>10%</td>
</tr>
<tr>
<td>Tax Rate</td>
<td>34%</td>
</tr>
</tbody>
</table>
Cross-Border Valuation Framework

Are cash flows in:

**Home** Currency of investor?

- Or -

**Foreign** (Local) Currency?

Case Study
Cross-Border Valuation Framework

We are not doing a “Domestic Investor” case study today.

Are cash flows in:

Home Currency of investor?
- Or -
Foreign (Local) Currency?
Cross-Border Valuation Framework

We are not doing a “Domestic Investor” case study today.

Are cash flows in:

**Home** Currency of investor?
- Or -

**Foreign** (Local) Currency?

Foreign Currency
We are not doing a “Domestic Investor” case study today.

Are cash flows in:
- **Home** Currency of investor?
- Or -
- **Foreign** (Local) Currency?

**Foreign Currency**

**Method 1**

Translate projected cash flows at future/expected Fx Rate into “Home” currency (or “Mature Market” currency)

Compute WACC in “Home” currency (or “Mature Market” currency)
Cross-Border Valuation Framework

We are not doing a “Domestic Investor” case study today.

Are cash flows in:
Home Currency of investor?
- Or -
Foreign (Local) Currency?

Foreign Currency

Method 1

Translate projected cash flows at future/expected Fx Rate into “Home” currency (or “Mature Market” currency)

Compute WACC in “Home” currency (or “Mature Market” currency)

Continue to “Country Risk Decision Tree”
We are not doing a “Domestic Investor” case study today.

Are cash flows in:

Home Currency of investor?

- Or -

Foreign (Local) Currency?

Are “foreign” (local) currency inputs available?

(e.g., risk-free foreign government bonds, ERP, betas, etc.)

Method 1

Translate projected cash flows at future/expected Fx Rate into “Home” currency (or “Mature Market” currency)

Compute WACC in “Home” currency (or “Mature Market” currency)

Continue to “Country Risk Decision Tree”
Cross-Border Valuation Framework

We are not doing a “Domestic Investor” case study today.

Are cash flows in:
- Home Currency of investor?
- Or -
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Are “foreign” (local) currency inputs available?
(e.g., risk-free foreign government bonds, ERP, betas, etc.)

Method 1
Continue to “Country Risk Decision Tree”

Translate projected cash flows at future/expected Fx Rate into “Home” currency (or “Mature Market” currency)

Method 2
Yes
Single Country CAPM

Compute WACC in “Home” currency (or “Mature Market” currency)
Are cash flows in:

- **Home** Currency of investor?
- **Foreign** (Local) Currency?

Are “foreign” (local) currency inputs available?
(e.g., risk-free foreign government bonds, ERP, betas, etc.)

- Yes: Single Country CAPM
- No: Continue to “Country Risk Decision Tree”

**Method 1**
- Translate projected cash flows at future/expected Fx Rate into “Home” currency (or “Mature Market” currency)
- Compute WACC in “Home” currency (or “Mature Market” currency)
Is Subject Company Exposed to Country Risk?

No

No CRP

Yes (Alt. 1)

Yes (Alt. 2)

Alternative 2: Reflect Country Risk in WACC

Cash Flows: USD?

Yes

Compute WACC in USD:
- Country Yield Spread Model
- RV Model
- CCR Model

Reflect CRP in WACC in Cash Flows

No

If LC needed, then

Translate WACC into “Foreign” (local) currency using International Fisher Effect

Compute WACC in USD using the 3 Models above

No CRP in WACC

Alternative 1: Use Scenario Analysis
Country Risk Decision Tree – Part 2

Is Subject Company Exposed to Country Risk?

No

No CRP

Yes (Alt. 1)

Yes (Alt. 2)

Alternative 2: Reflect Country Risk in WACC

Cash Flows: USD?

Yes

Compute WACC in USD:
- Country Yield Spread Model
- RV Model
- CCR Model

No

If LC needed, then

Translate WACC into “Foreign” (local) currency using International Fisher Effect

Yes

Compute WACC in USD using the 3 Models above

Alternative 1: Use Scenario Analysis

Reflect CRP in Cash Flows

No CRP in WACC
Country Risk Premium

A country risk premium (CRP) is designed to be a gauge of the relative risks between investing in the “home” country and the “foreign” country:

Example:

- Assume the base country cost of equity for a U.S. investor (the “home country”) investing in Country ABC (the “foreign country”) is 10.0%.

- Assume the base country cost of equity for a U.S. investor investing in the United States is 9.0%.

The CRP for the American investor investing in Country ABC is 1.0% (10.0% - 9.0%).
Country Yield Spread Model: Country Risk Premia (CRP)

\[ K_{e, \text{foreign country}} = R_{f, \text{home country}} + \beta_{\text{home country}} \times \text{ERP}_{\text{home country}} + \text{CRP} \]

Where:

- \( K_{e, \text{foreign country}} \) = Cost of equity capital in the foreign country (denominated in the home country currency)
- \( R_{f, \text{home country}} \) = Risk free rate on government-issued bonds (in the home country currency)
- \( \beta_{\text{home country}} \) = Beta appropriate for a company located in the home country in a similar industry as the foreign country’s subject company (i.e., beta is measured using returns expressed in the home currency)
- \( \text{ERP}_{\text{home country}} \) = Equity risk premium of home country
- \( \text{CRP} \) = Country risk premium, determined as the difference between the yield-to-maturity on a foreign country government bond (issued in the home country’s currency) and the yield-to-maturity on a home country government bond with a similar maturity
Case Study: Calculating Cost of Equity in USD and apply a India Country Risk Premium (CRP)

\[ K_e = R_f + \beta \times ERP + CRP \]

**Assumptions**

- U.S. Normalized Risk-free Rate: 3.5%
- U.S. Duff & Phelps Recommended ERP: 5.0%
- Industry Beta: 1.3
Country Yield Spread Model: Country Risk Premia (CRP)

\[ K_e, \text{India, USD} = 3.5\% + 1.3 \times 5.0\% + \text{CRP} \]

\[ K_e, \text{India, USD} = ? \]
## India CRP


**Country Yield Spread Model as of March 31, 2018**

Investor Perspective: United States  
Currency: United States dollar (USD)

The country risk premium (CRP) is not the cost of equity capital (COE). The CRP is to be added to base COE.

### Data Updated Through December 2017

<table>
<thead>
<tr>
<th>Investee Country</th>
<th>December 2017 Country Risk Premium (CRP) (%)</th>
<th>Tier Method*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>5.3</td>
<td>4</td>
</tr>
<tr>
<td>Albania</td>
<td>3.2</td>
<td>3</td>
</tr>
<tr>
<td>Algeria</td>
<td>3.0</td>
<td>4</td>
</tr>
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</table>

### Data Updated Through March 2018

<table>
<thead>
<tr>
<th>Investee Country</th>
<th>March 2018 Country Risk Premium (CRP) (%)</th>
<th>Tier Method*</th>
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</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>5.9</td>
<td>4</td>
</tr>
<tr>
<td>Albania</td>
<td>3.4</td>
<td>3</td>
</tr>
<tr>
<td>Algeria</td>
<td>3.9</td>
<td>4</td>
</tr>
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### S&P Sovereign Credit Rating

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<tr>
<th>Investee Country</th>
<th>S&amp;P Sovereign Credit Rating §</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>B+</td>
</tr>
</tbody>
</table>

### MSCI Market Classification †

<table>
<thead>
<tr>
<th>Investee Country</th>
<th>MSCI Market Classification †</th>
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<tbody>
<tr>
<td>Afghanistan</td>
<td>Emerging</td>
</tr>
</tbody>
</table>

### Case Study

India 1.7%
Country Yield Spread Model: Country Risk Premia (CRP)

\[ K_e, \text{India, USD} = \frac{3.5\%}{1.3} \times 5.0\% + 1.7\% \]

\[ K_e, \text{India, USD} = 11.7\% \]
## Comparison of International Cost of Capital Models

### Country Yield Spread Model

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intuitive</td>
<td>• May double count business cash flow risks</td>
</tr>
<tr>
<td>• Easily implemented</td>
<td>• Requires “local” government debt issues in “home” government currency</td>
</tr>
</tbody>
</table>
Relative Volatility Model: Relative Volatility (RV) Factors

Where:

\[ K_e = \frac{R_f}{\beta} \times ERP \]

- \( K_e \): Cost of equity capital in the foreign country (denominated in the home country currency)
- \( R_f \): Risk free rate on government-issued bonds (in the home country currency)
- \( \beta \): Beta appropriate for a company located in the home country in a similar industry as the foreign country's subject company (i.e., beta is measured using returns expressed in the home currency)
- \( ERP \): Equity risk premium of home country

\[ RV = \frac{\text{Relative Volatility (RV)}}{\text{Factors}} \]

- \( RV \): Relative Volatility (RV) factor determined as the ratio of the annualized monthly standard deviation of the foreign country equity returns (as denominated in home country currency) relative to the annualized monthly standard deviation of the home country equity returns (as denominated in home country currency)
Relative Volatility Model: Relative Volatility (RV) Factors

$K_e, \text{ India, USD} = 3.5\% + 1.3 \times 5.0\% \times \text{ RV}$

$K_e, \text{ India, USD} = ?$
## India RV


Relative Volatility Model as of March 31, 2018

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**Investor Perspective:** United States  
**Currency:** United States dollar (USD)

The RV Factor is to be multiplied to the ERP.

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### Relative Volatility Model: Relative Volatility RV Factors

<table>
<thead>
<tr>
<th>Investee Country</th>
<th>December 2017 Relative Volatility Factor (RV)</th>
<th>March 2018 Relative Volatility Factor (RV)</th>
<th>S&amp;P Sovereign Credit Rating</th>
<th>MSCI Market Classification</th>
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<tbody>
<tr>
<td>Argentina</td>
<td>5.0</td>
<td>4.5</td>
<td>B+</td>
<td>Frontier</td>
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<tr>
<td>Australia</td>
<td>1.0</td>
<td>1.0</td>
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<td>Hong Kong</td>
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<td>AA+</td>
<td>Developed</td>
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<td>Hungary</td>
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<td>India</td>
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<td>BBB-</td>
<td>Emerging</td>
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</tbody>
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**India RV**

**India**

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Relative Volatility Model:
Relative Volatility (RV) Factors

\[ K_e, \text{India, USD} = 3.5\% + 1.3 \times 5.0\% \times 1.8 \]

\[ K_e, \text{India, USD} = 15.2\% \]
Comparison of International Cost of Capital Models

Relative Volatility Model

Strengths

• Intuitive
• Easily implemented

Weaknesses

• Does not work well in countries that do not have well-diversified stock markets
• Results are sensitive to the period selected
Erb-Harvey-Viskanta Country Credit Rating Model

Country Risk Premia (CRP)

\[ K_e = R_f + \beta \times ERP + CRP \]

Where:

- \( K_e \), foreign country = Cost of equity capital in the foreign country (denominated in the home country currency)
- \( R_f \), home country = Risk free rate on government-issued bonds (in the home country currency)
- \( \beta \), home country = Beta appropriate for a company located in the home country in a similar industry as the foreign country's subject company (i.e., beta is measured using returns expressed in the home currency)
- \( ERP \), home country = Equity risk premium of home country
- CRP = The incremental risk associated with investing in the foreign country vs. investing in the home country (as calculated by the Country Credit Rating Model)
### India CRP


**Country Credit Rating (CCR) Model as of March 31, 2018**

**Investor Perspective:** United States  
**Currency:** United States Dollar (USD)

The country risk premium (CRP) is not the cost of equity capital (COE). The CRP is to be added to base COE.

#### Data Updated Through March 2018

<table>
<thead>
<tr>
<th>Investee Country</th>
<th>December 2017 Country Risk Premium (CRP) (%)</th>
<th>March 2018 Country Risk Premium (CRP) (%)</th>
<th>S&amp;P Sovereign Credit Rating</th>
<th>World Rank Out of 186+</th>
<th>MSCI Market Classification</th>
<th>Euromoney Region</th>
<th>Regional Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>14.4</td>
<td>14.0</td>
<td>B+</td>
<td>147</td>
<td></td>
<td>Asia</td>
<td>25 out of 32</td>
</tr>
<tr>
<td>Albania</td>
<td>9.6</td>
<td>9.3</td>
<td>B+</td>
<td>96</td>
<td></td>
<td>Central and Eastern Europe</td>
<td>18 out of 25</td>
</tr>
<tr>
<td>Algeria</td>
<td>9.6</td>
<td>10.4</td>
<td>B+</td>
<td>110</td>
<td></td>
<td>Africa</td>
<td>18 out of 51</td>
</tr>
<tr>
<td>Iceland</td>
<td>1.7</td>
<td>1.8</td>
<td>A</td>
<td>30</td>
<td></td>
<td>Western Europe</td>
<td>15 out of 19</td>
</tr>
<tr>
<td>India</td>
<td>4.8</td>
<td>4.8</td>
<td>BBB-</td>
<td>52</td>
<td>Emerging</td>
<td>Asia</td>
<td>9 out of 32</td>
</tr>
<tr>
<td>Indonesia</td>
<td>5.4</td>
<td>5.1</td>
<td>BBB-</td>
<td>58</td>
<td>Emerging</td>
<td>Asia</td>
<td>11 out of 32</td>
</tr>
</tbody>
</table>

#### India CRP

**Case Study**

**Erb-Harvey-Viskanta**  
**Country Credit Rating (CCR) Model**

---

**India 4.8%**
Erb-Harvey-Viskanta Country Credit Rating Model
Country Risk Premia (CRP)

\[ K_e, \text{India, USD} = 3.5\% + 1.3 \times 5.0\% + 4.8\% \]

\[ K_e, \text{India, USD} = 14.8\% \]
### Country Credit Rating Model

#### Strengths
- Intuitive
- Can be applied to a large number of countries

#### Weaknesses
- Complexity
- Requires access to quality stock market return data
- Stock market data is more frequently available for countries that are more developed, which may bias results
Calculating Cost of Equity in USD

Range of estimates of custom Cost of Equity:

<table>
<thead>
<tr>
<th>Model</th>
<th>Cost of Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country Yield Spread</td>
<td>11.7%</td>
</tr>
<tr>
<td>Relative Volatility Model</td>
<td>15.2%</td>
</tr>
<tr>
<td>Country Credit Rating Model</td>
<td>14.8%</td>
</tr>
</tbody>
</table>
Calculating Cost of Debt in USD and apply India CRP

Range of estimates of custom Cost of Debt for a U.S.-based investor investing in India:

<table>
<thead>
<tr>
<th>Model</th>
<th>Pre-tax Cost of Debt</th>
<th>CRP</th>
<th>Implied Pre-tax Cost of Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country Yield Spread</td>
<td>6.5%</td>
<td>1.7%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Relative Volatility Model</td>
<td>6.5%</td>
<td>4.0%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Country Credit Rating Model</td>
<td>6.5%</td>
<td>4.8%</td>
<td>11.3%</td>
</tr>
</tbody>
</table>
WACC Calculation

Range of estimates of custom WACC for a U.S.-based investor investing in India:

<table>
<thead>
<tr>
<th>Model</th>
<th>Implied Pre-tax Cost of Debt</th>
<th>Cost of Equity</th>
<th>WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country Yield Spread</td>
<td>8.2%</td>
<td>11.7%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Relative Volatility Model</td>
<td>10.5%</td>
<td>15.2%</td>
<td>14.4%</td>
</tr>
<tr>
<td>Country Credit Rating Model</td>
<td>11.3%</td>
<td>14.8%</td>
<td>14.1%</td>
</tr>
</tbody>
</table>

Assumptions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Structure: D/TC</td>
<td>10%</td>
</tr>
<tr>
<td>Tax Rate</td>
<td>34%</td>
</tr>
</tbody>
</table>
### Inflation Estimates per IHS Markit

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>3.94</td>
<td>4.53</td>
<td>5.47</td>
<td>5.53</td>
<td>5.20</td>
<td>4.88</td>
<td>4.63</td>
<td>4.73</td>
<td>4.9</td>
</tr>
<tr>
<td>United States</td>
<td>2.44</td>
<td>1.95</td>
<td>2.14</td>
<td>2.34</td>
<td>2.43</td>
<td>2.40</td>
<td>2.40</td>
<td>2.35</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Long-term inflation of India = 4.9%

Long-term inflation of U.S. = 2.3%
Applying International Fisher Effect to Cost of Equity

Country Yield Spread Model

Cost of Equity
Local Currency

(1 + Cost of Equity)
Home Currency

(1 + Expected Inflation)
Local Country

(1 + Expected Inflation)
Home Country

14.5%

(1 + 11.7%)

(1 + 4.9%)

(1 + 2.3%)

1
Applying International Fisher Effect to Cost of Equity

Relative Volatility Model

\[
\text{Cost of Equity Local Currency} = \frac{(1 + \text{Cost of Equity Home Currency})}{(1 + \text{Expected Inflation Local Country})} \times \frac{(1 + \text{Expected Inflation Home Country})}{1}
\]

\[
18.1\% = \frac{(1 + 15.2\%)}{(1 + 4.9\%)} \times \frac{(1 + 2.3\%)}{1}
\]
Applying International Fisher Effect to Cost of Equity

Country Credit Rating Model

\[
\text{Cost of Equity (Local Currency)} = \frac{(1 + \text{Cost of Equity (Home Currency)})}{(1 + \text{Expected Inflation (Local Country)})} \times \frac{(1 + \text{Expected Inflation (Home Country)})}{1}
\]

Case Study

Cost of Equity

<table>
<thead>
<tr>
<th>Country</th>
<th>Credit Rating Model</th>
<th>Cost of Equity</th>
<th>Expected Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Country</td>
<td>17.7%</td>
<td>(1 + 14.8%)</td>
<td>(1 + 4.9%)</td>
</tr>
<tr>
<td>Home Country</td>
<td>(1 + 2.3%)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
## WACC in Local Currency After Applying Fischer Effect

<table>
<thead>
<tr>
<th>Model</th>
<th>Cost of Debt After Fischer Effect (INR)</th>
<th>Cost of Equity After Fischer Effect (INR)</th>
<th>WACC After Fisher Effect (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country Yield Spread</td>
<td>10.9%</td>
<td>14.5%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Relative Volatility Model</td>
<td>13.3%</td>
<td>18.1%</td>
<td>17.2%</td>
</tr>
<tr>
<td>Country Credit Rating Model</td>
<td>14.1%</td>
<td>17.7%</td>
<td>16.9%</td>
</tr>
</tbody>
</table>
Key Points to Remember

• Cash flows generated in foreign currency and country risk may have a significant impact in a valuation

• There are different forms of country risk

• Currency used to project cash flows MUST always be consistent with the currency of the discount rate

• There is no single cost of capital model in the context of foreign-based valuations

• Evaluating multiple methods may be prudent

The Duff & Phelps 2019 Valuation Handbook – International Guide to Cost of Capital provides multiple models that can be used when estimating international cost of capital.
Other Uses of International CRPs in the Country Credit Rating Model
United Kingdom Base Cost of Equity from an American Perspective ($)
Before and After the First Brexit Vote

<table>
<thead>
<tr>
<th>Period</th>
<th>Average US Base Cost of Equity</th>
<th>Average United Kingdom Country Risk Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep-13 to May-16</td>
<td>7.8%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Jul-16 to Mar-19</td>
<td>8.4%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

Average United Kingdom Country Risk Premium
Average US Base Cost of Equity
During the Greek Sovereign Debt Crisis

- Snap election held, leading to rejection of planned bailout (25 January, 2015)
- Installments of first bailout given to Greece (May 2010-March 2011)
- Second bailout terms finalized (21 February, 2012)
- Third bailout program is accepted (14 August, 2015)
Benchmarking Your Results with Countries from the Same Region

Your Results

Japan

South Korea

Malaysia

China

Country Risk Premia

Base Cost of Equity
Benchmarking Your Results with Countries with the Same Credit Rating

- Canada
- United States
- United Kingdom
- Germany

Your Results

- Base Cost of Equity
- Country Risk Premia

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Questions?