DUFF & PHELPS

International Cost of Capital

OIV
Organismo Italiano di Valutazione

Roger J. Grabowski, Managing Director
Duff & Phelps LLC
roger.grabowski@duffandphelps.com

Co-author with Shannon Pratt of
Cost of Capital: Applications and Examples 4th ed (Wiley, 2010) and
Cost of Capital in Litigation (Wiley 2011)

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II. Issues in Today's Global Environment – Risk Free Rate

III. Issues in Today's Global Environment – Equity Risk Premium

IV. International Cost of Capital (Forthcoming)

V. International Cost of Capital – Summary

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VII. Appendix B: The Duff & Phelps Equity Risk Premium ERP Methodology

VIII. Appendix C: The Duff & Phelps Risk Premium Report and Online Risk Premium Calculator

Developing Cost of Capital for International Markets

Cost of Capital Defined

Cost of capital: expected rate of return that the market participants require in order to attract funds to a particular investment.

- Opportunity cost—the cost of forgoing the next best alternative investment with the same risk

Market: the universe of investors who are reasonable candidates to fund a particular investment.

Cost of Capital is a Function of the Investment

As Ibbotson puts it: *"The cost of capital is a function of the investment, not the investor."*

Roger G. Ibbotson is chairman and CIO of Zebra Capital Management, LLC, an equity investment and hedge fund manager. He is founder, advisor and former chairman of Ibbotson Associates, now a Morningstar Company.

Cost of Capital is the Discount Rate

Cost of capital is the percentage return that equates expected economic income with present value.

- The terms cost of capital, discount rate, and required rate of return are often used interchangeably.
- Represents the total expected rate of return that the investor requires on the amount invested.
- Economic income represents total expected benefits, usually measured on expected cash flows
- Value is the **market value of an asset**, not its book value, par value, or carrying value

Cost of Capital is Forward-Looking

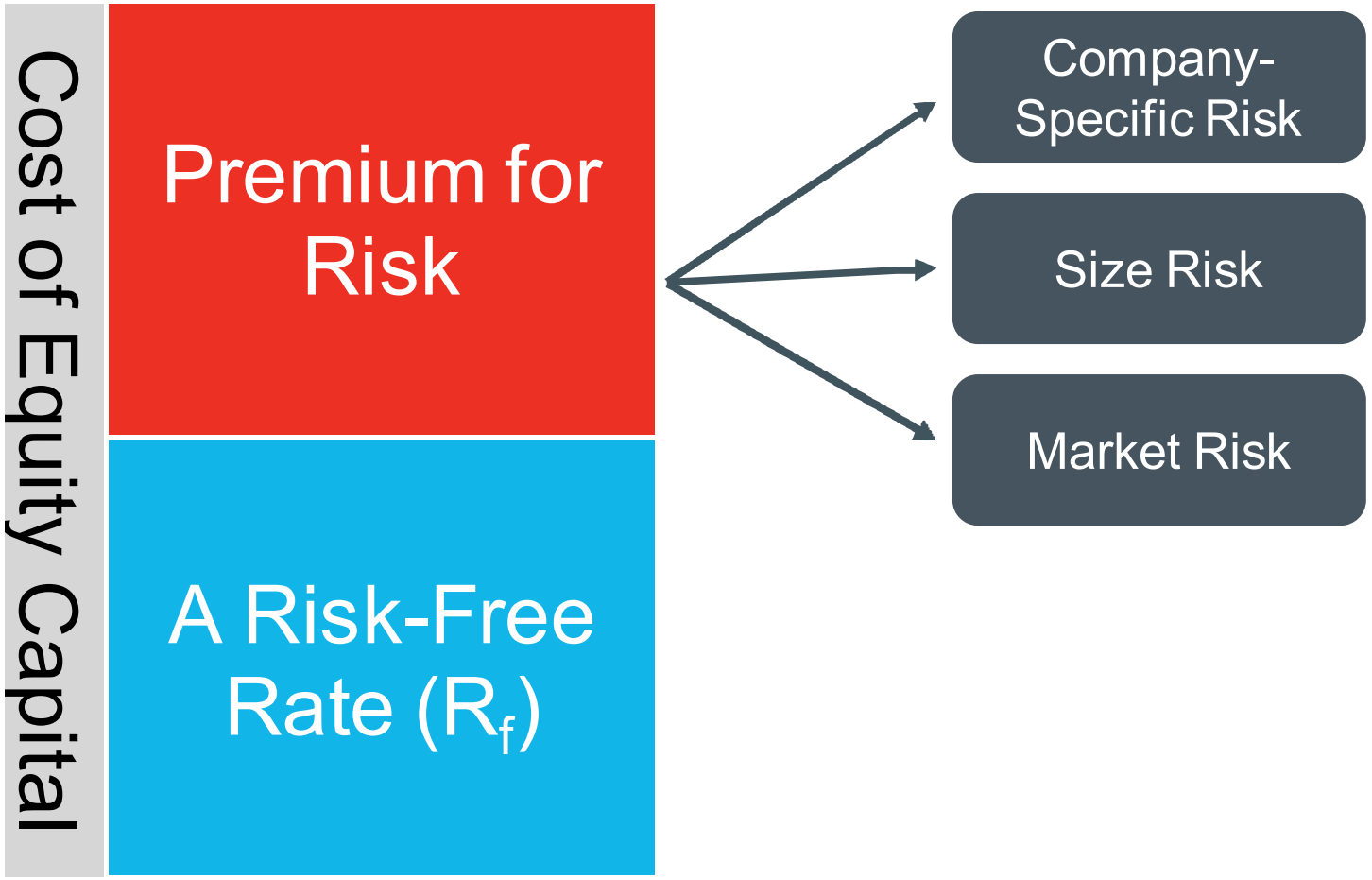
Cost of Capital is always:

- Expectational (i.e., forward-looking), and therefore not observable.
- Represents investors' expectations. Analysts and would-be investors never actually observe the market's views as to expected returns at the time of their investment.

There are two elements to these expectations:

1. Risk-free rate:
   - The "real" rate of return–the amount (excluding inflation) investors expect to obtain in exchange for letting someone else use their money on a risk-free basis.
   - Expected inflation–the expected depreciation in purchasing power while the money is in use.
   - Maturity risk or investment rate risk–the risk that the investment's principal market value will rise or fall during the period to maturity as a function of changes in the general level of interest rates.
2. Risk–the uncertainty as to when and how much cash flow or other economic income will be received.

Cost of Equity Capital has Two Primary Components



Cost of Capital Constraints in Other Market

Developing a cost of capital in different markets (i.e. developed, emerging, and frontier) can be constrained by:

- Data availability
- Data transparency
- Different regulations
- Lack of long term market data
- Political stability (or lack thereof)
- Expropriation risk
- Currency risk

International Cost of Equity Capital Methods

Most commonly used methods of estimating international cost of equity capital:

- Global Version of CAPM
- Local, Single-Country Version of the CAPM
- The U.S. Cost of Equity Capital Adjusted for Yield Spreads Model
- Country Credit Rating Method

Major issues particularly since the 2008 financial crisis affecting the global market:

What risk-free rate should one use?

What equity risk premium (ERP) should one use?

Issues in Today's Global Environment - Risk Free Rate

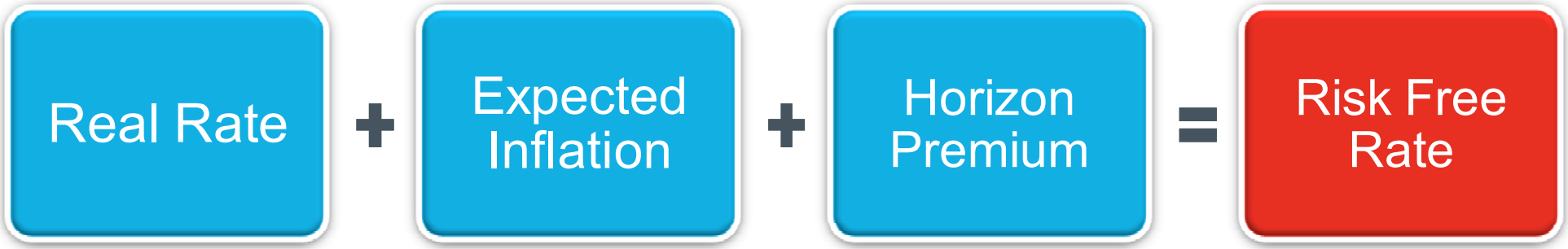
R_f

Issues since 2008

Issues in Today's Global Environment– Risk-Free Rate (R_f)

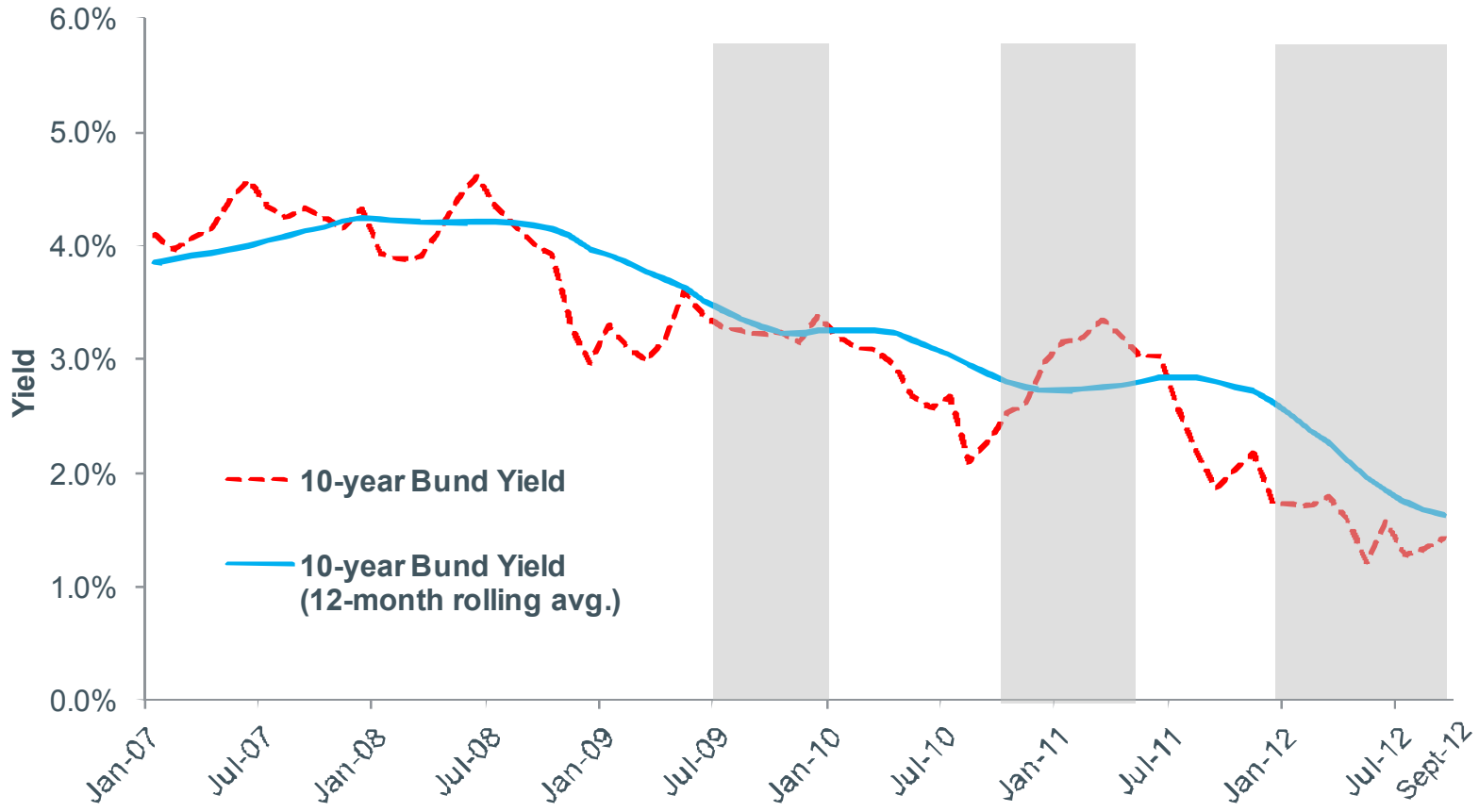
Risk-free Rate (R_f) − a rate of return that is available in the market on an investment that is free of default risk

- Analysts typically use the yield to maturity on highly-rated sovereign debt (e.g., German government securities) as of the valuation date
- Conceptually, reflects a return on the following components:



Financial crises are often accompanied by a "flight to quality". During these periods, nominal returns on "risk-free" securities may fall dramatically for reasons other than inflation expectations.

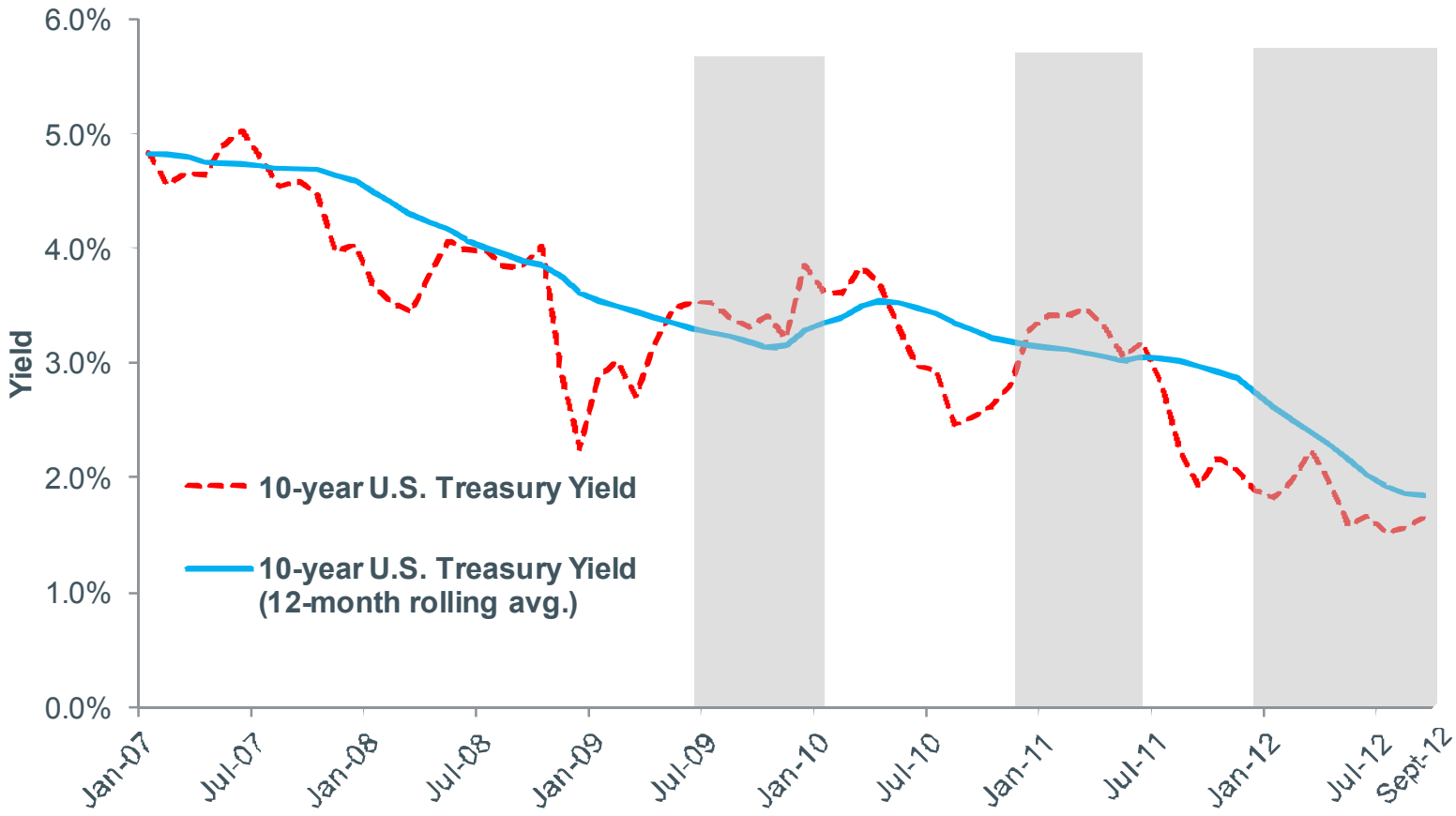
Issues in Today's Global Environment– Risk-Free Rate (R_f) during "flights to quality"



Periods of German risk-free rate normalization shown in gray.

Calculated by Duff & Phelps. Source of underlying data: Standard & Poor's Capital IQ database.

Issues in Today's Global Environment– Risk-Free Rate (R_f) during "flights to quality"



Periods of U.S. risk-free rate normalization shown in gray.

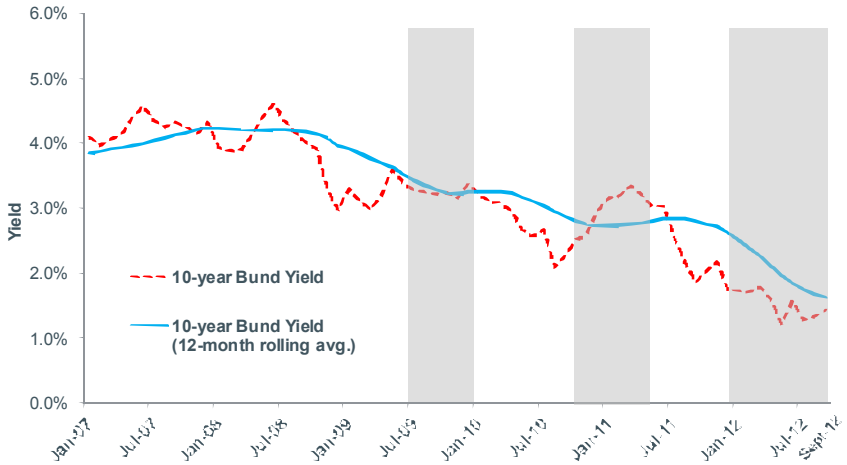
Calculated by Duff & Phelps. Source of underlying data: Standard & Poor's Capital IQ database.

Issues in Today's Global Environment– Risk-Free Rate (R_f)

Normalization of Risk Free Rates German 10-year Bund, U.S. 10-year

German Bund

€



U.S. Treasury

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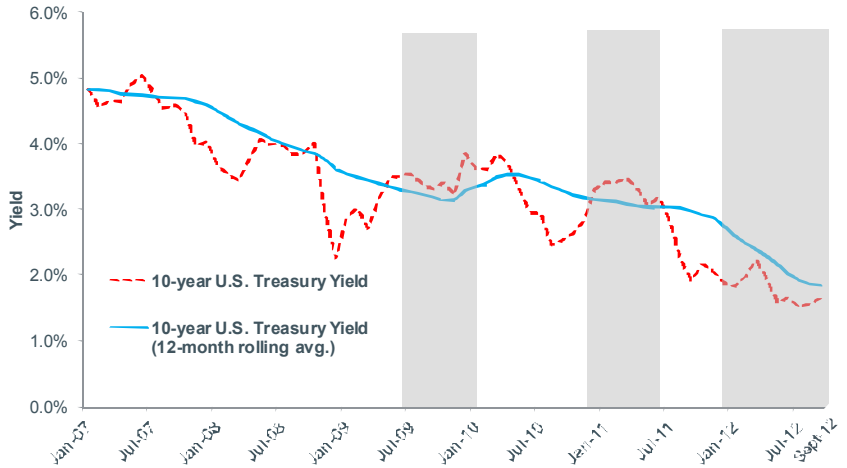
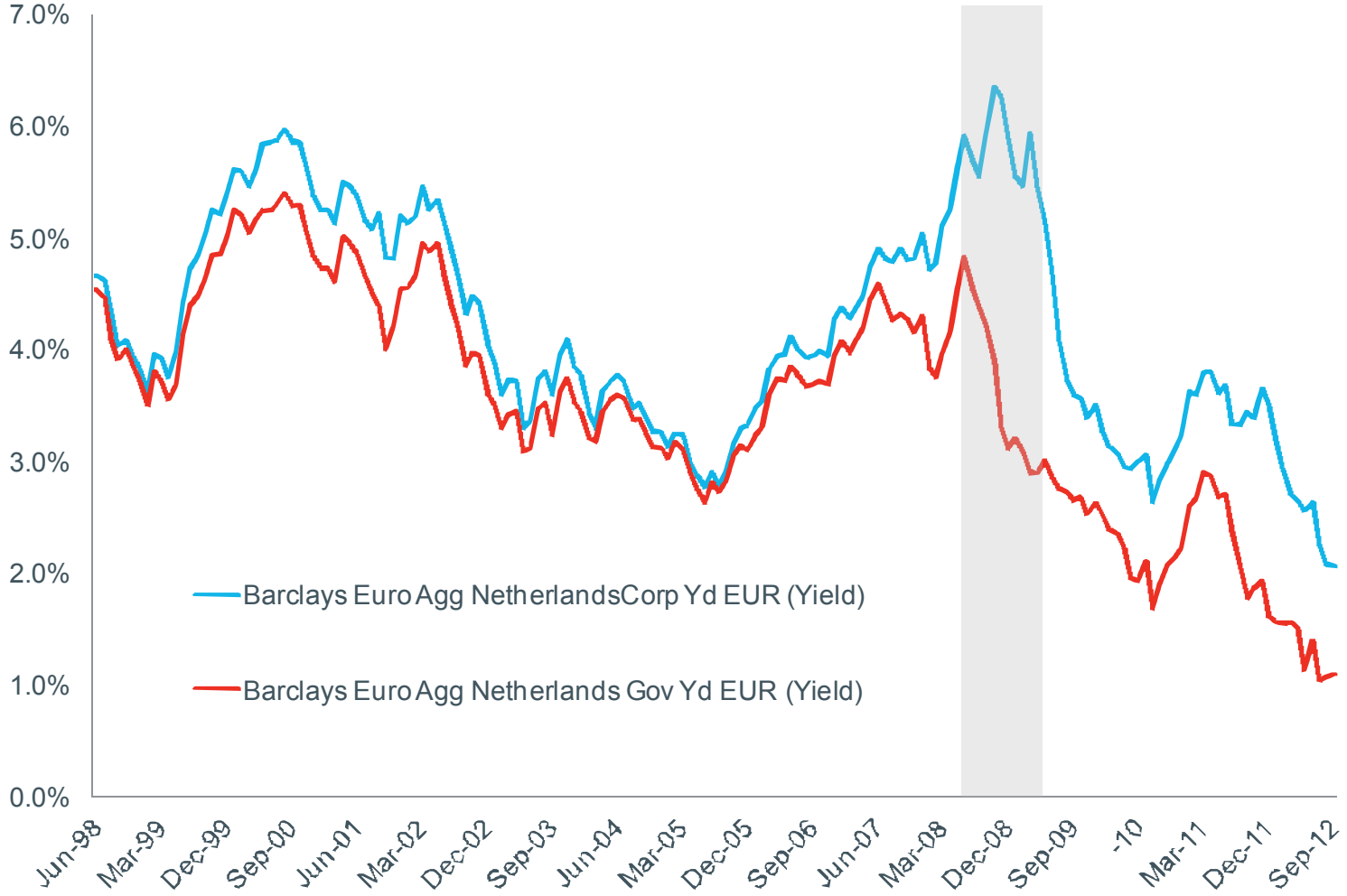


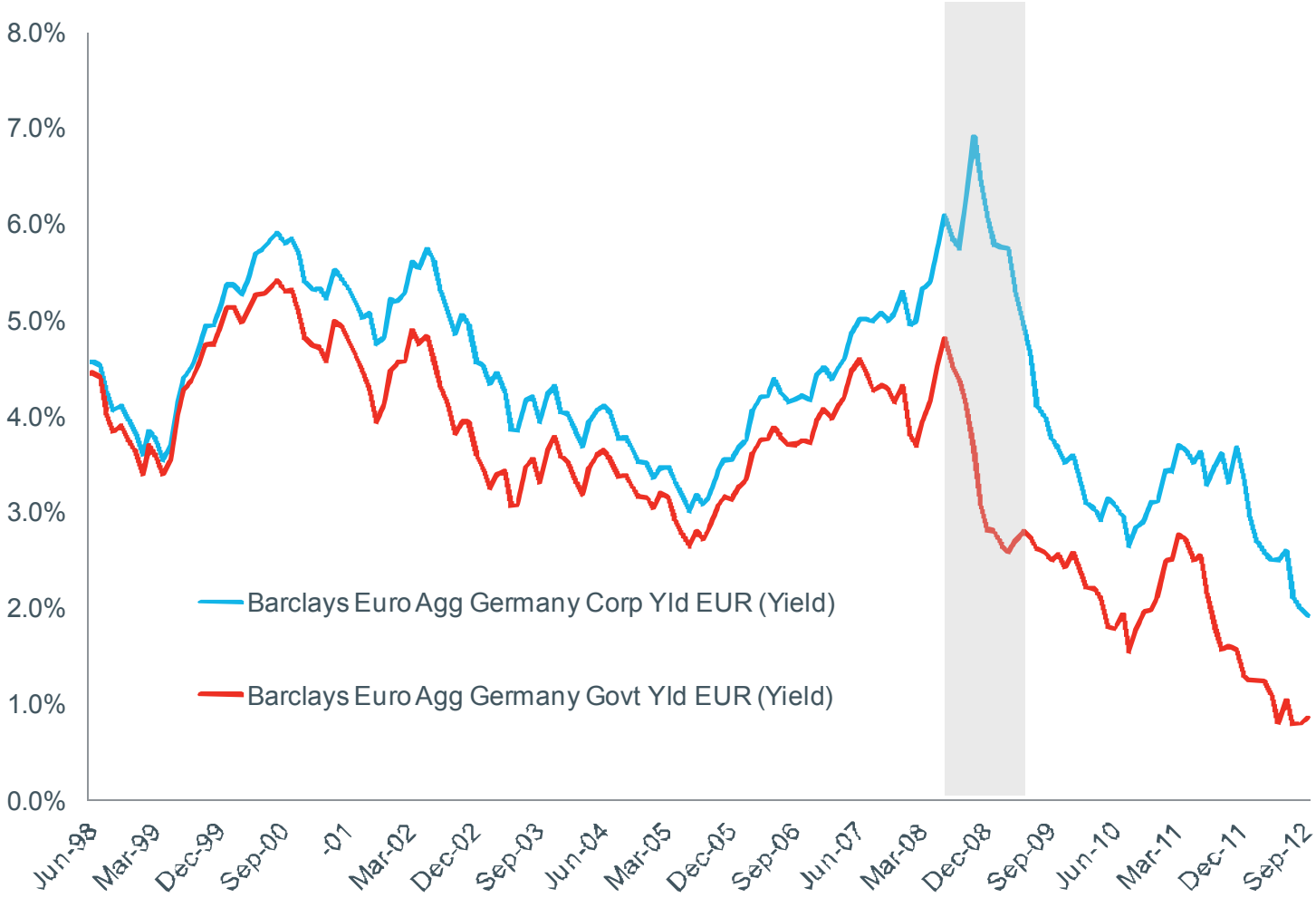
Calculated by Duff & Phelps. Source of underlying data: Standard & Poor's Capital IQ database.

Government Bonds versus Corporate Bonds Netherlands



Source: Morningstar EnCorr

Government Bonds versus Corporate Bonds Germany



Source: Morningstar EnCorr

Issues in Today's Global Environment – Risk-Free Rate (R_f)

During and after the 2008 Financial Crisis, the common inputs we use to estimate cost of capital have the potential of producing *non-sensical* results.

Financial crises are often accompanied by a "flight to quality". During these periods, current yields may be considered *artificially* low, and perhaps for reasons *other* than investor actions based on economic fundamentals.

- Policies adopted by the Federal Reserve (and central banks of other major countries) increasing the money supply by purchasing mid-term and longer-term bonds
- Speculators anticipating government and central bank intervention

Issues in Today's Global Environment – Risk-Free Rate (R_f)

What do you do during periods in which risk-free rates appear to be abnormally low due to "flight to quality" issues (or other factors),

- Either normalizing the risk-free rate
- Or adjusting the equity risk premium.

Normalizing the risk-free rate is more direct and more easy to implement.

Issues in Today's Global Environment - Equity Risk Premium

ERP

Issues since 2008

Issues in Today's Global Environment– ERP

Equity Risk Premium (ERP)

- Extra return that investors demand to compensate them for investing in a diversified portfolio of large common stocks rather than investing in risk-free securities
- One of the most important decisions the analyst must make in developing a discount rate

The equity risk premium can be defines as:

$$RP_m = R_m - R_f$$

where,

RP_m is the equity risk premium (ERP)
R_m is the expected return on stocks
R_f is the rate of return expected on a risk-free security

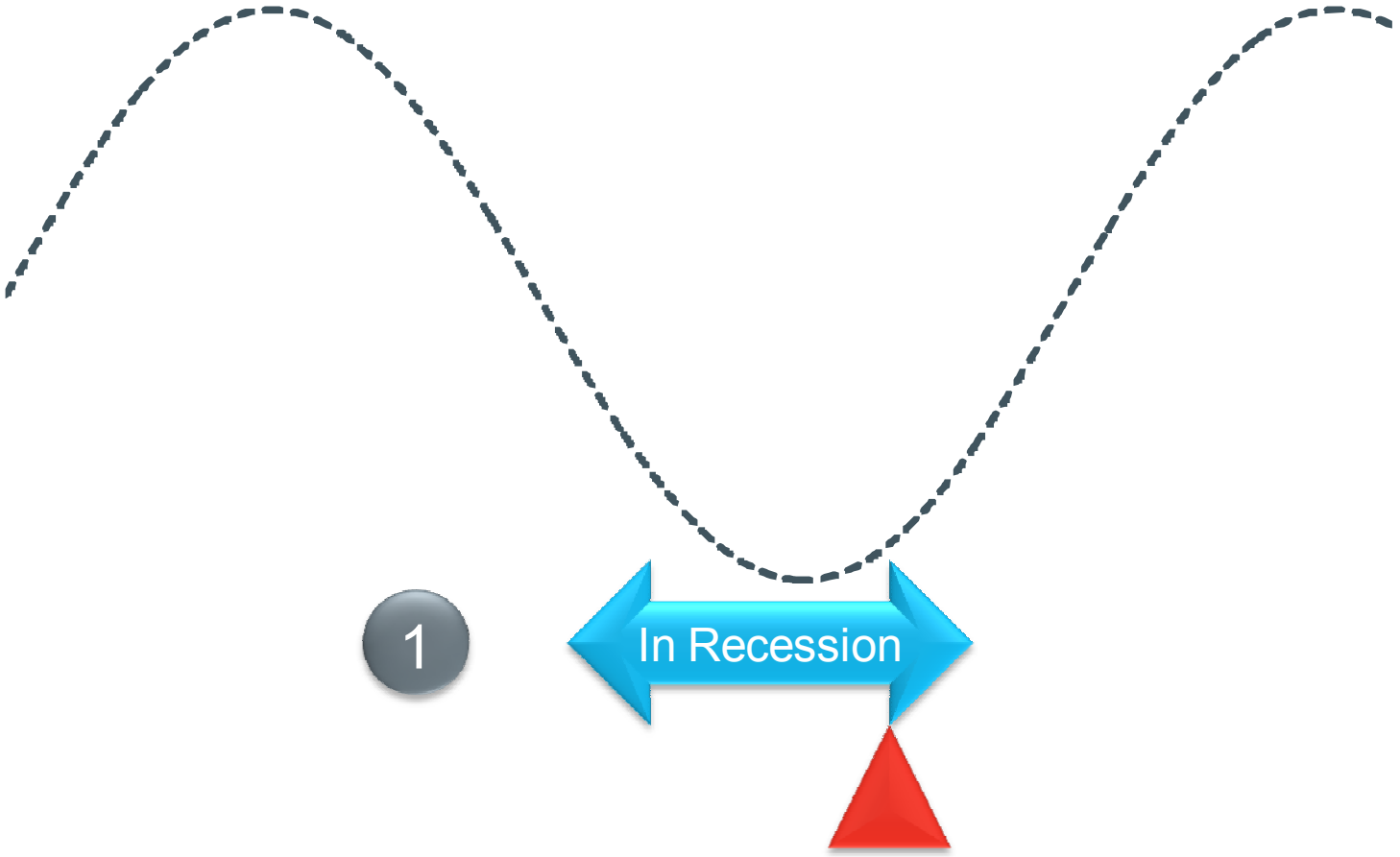
Issues in Today's Global Environment– ERP

There are two broad approaches to ERP estimation

Historical "ex Post" Approaches	Forward Looking "ex Ante" Approaches
• Realized Premium	• Bottom Up • Top Down • Surveys

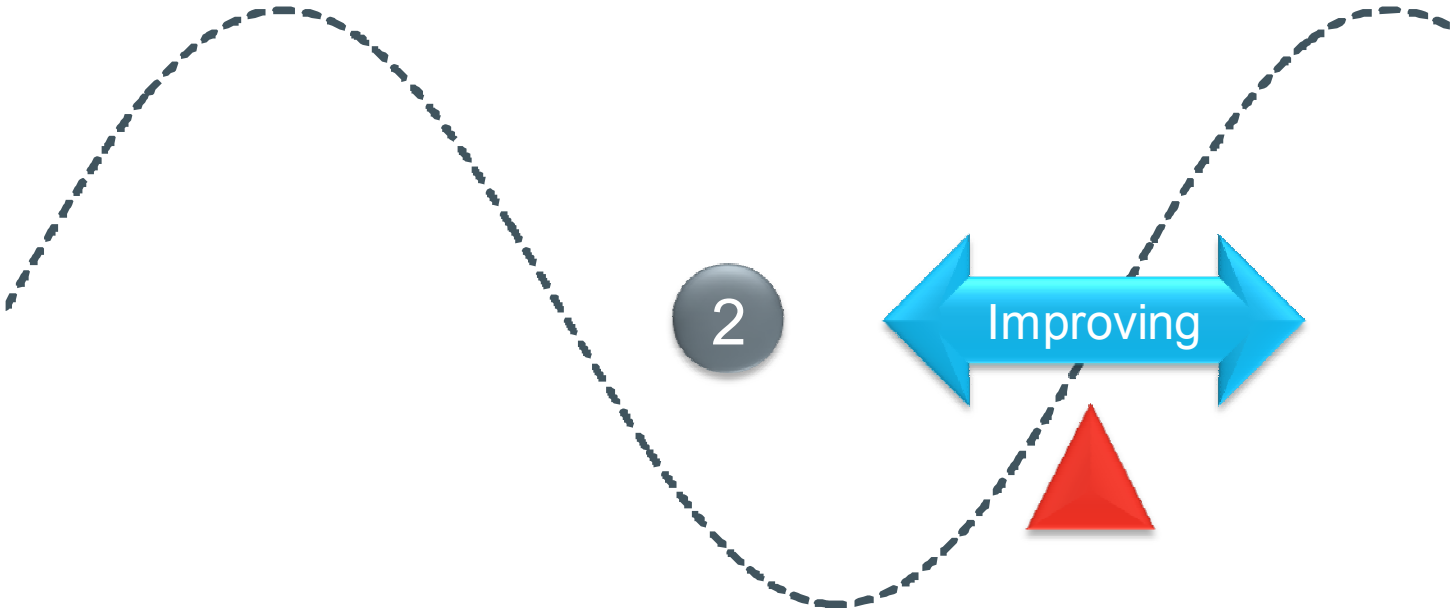
Issues in Today's Global Environment– The ERP is cyclical

The ERP is cyclical



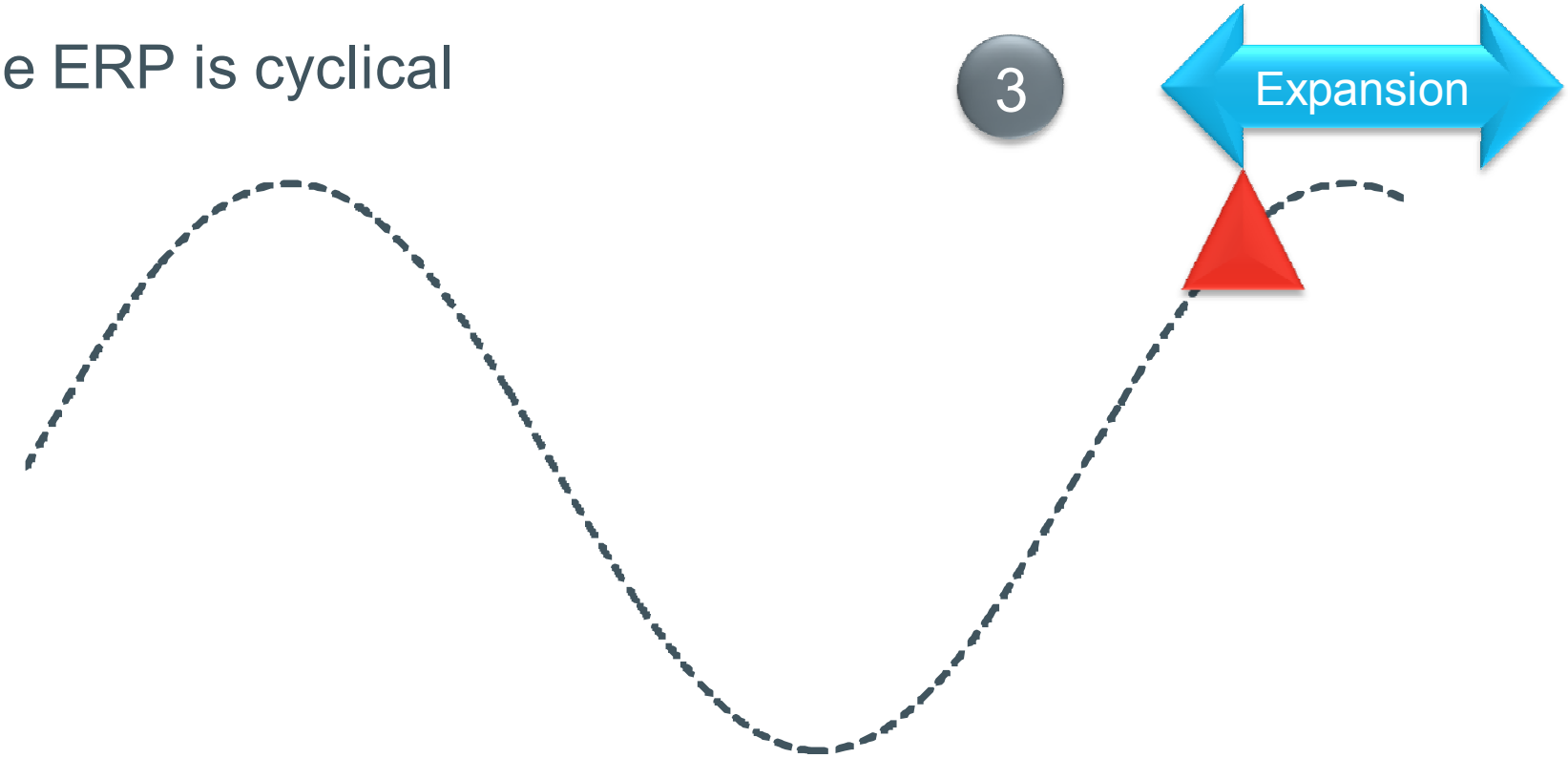
Issues in Today's Global Environment– The ERP is cyclical

The ERP is cyclical



Issues in Today's Global Environment– The ERP is cyclical

The ERP is cyclical



Issues in Today's Global Environment – ERP

Comparing Investor Expectations to Realized Risk Premiums

Dimson, Marsh and Staunton

"Global Evidence on the Equity Risk Premium," *The Journal of Applied Corporate Finance* (Summer, 2003); "The Worldwide Equity Premium: A Smaller Puzzle," *Handbook of the Equity Risk Premium*, Rajnish Mehra, editor (Elsevier, 2008), Chapter 11, pp 467-514; *Credit Suisse Global Investment Returns Sourcebook 2012* (Credit Suisse/London Business School, 2012)

Observe larger equity returns earned in second half of 20th century compared to first half because:

- Corporate cash flows grew faster than investors anticipated due to rapid technological change and unprecedented growth in productivity and efficiency;
- Transaction and monitoring costs fell over the course of the century;
- During final two decades of century, inflation rates generally declined and real interest rates rose;
- Required rate of return reduced due to diminished business and investment risks.

Source: *Credit Suisse Global Investment Returns Sourcebook 2012* (Credit Suisse/London Business School, 2012)

Issues in Today's Global Environment– ERP

Comparing Investor Expectations to Realized Risk Premiums

Convert historical realized premium to forward-looking projection

Assuming: (a) Observed increase in price/dividend ratio is attributable solely to long-term decrease in required risk premium (and decrease will not continue), real dividend growth will not continue; and (b) Future standard deviation of annual returns will approximate historical standard deviation of risk premiums over bonds,

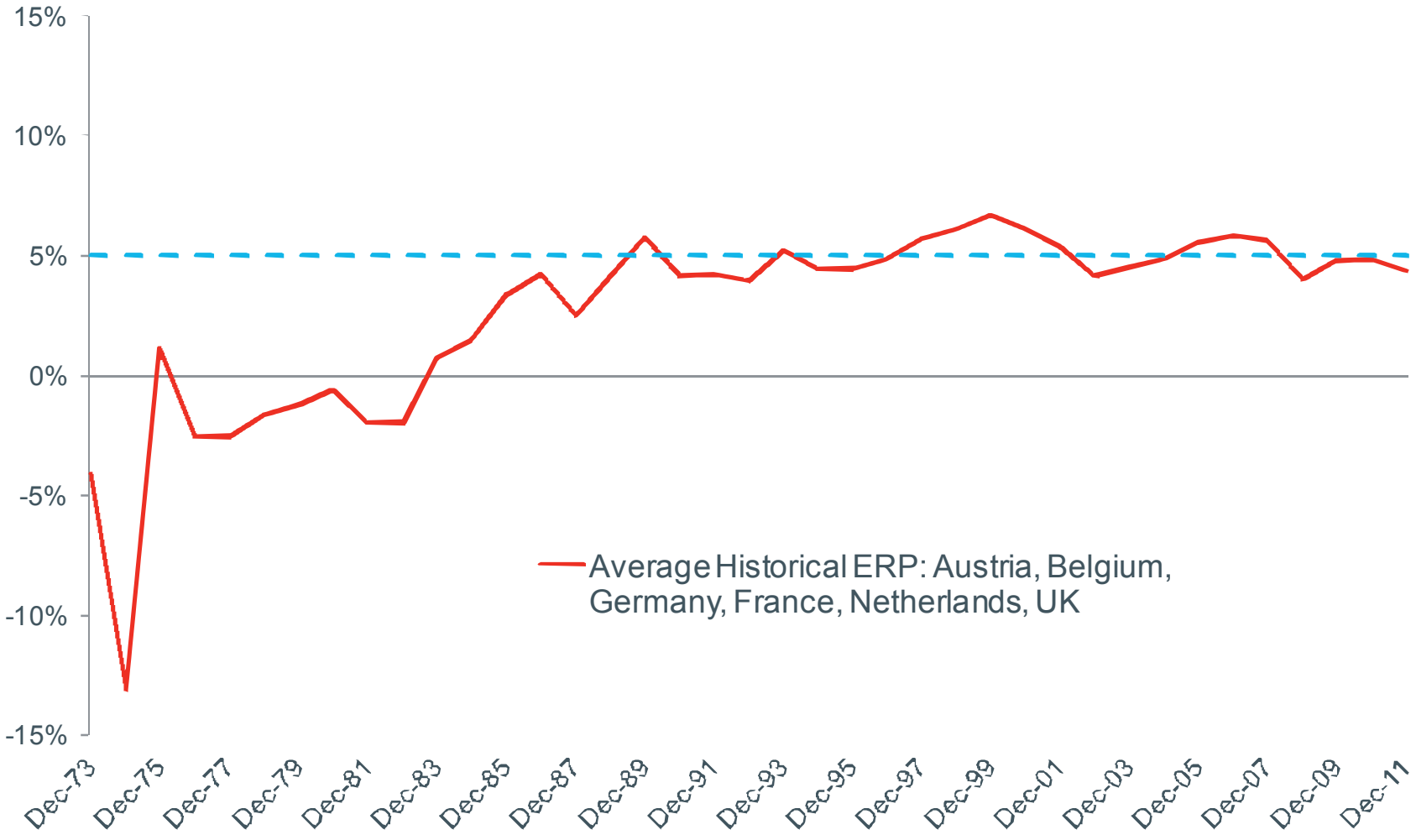
Unconditional ERP estimated at the beginning of 2012:

Arthmetic Avg. vs. Bonds	Unconditional ERP (long-term avg.)
U.S. Investors in U.S. Equities	5.0%–6.0%
"World" Index of Stocks (19 countries)*	4.0%–4.5%

* Denominated in $U.S

Source: *Credit Suisse Global Investment Returns Sourcebook 2012* (Credit Suisse/London Business School, 2012)

Average Historical ERP:
Fixed starting date (1972),variable ending date



Source: Morningstar EnCorr

Issues in Today's Global Environment – ERP

Jäckel and Mühlhäuser

Implied ERP study of 16 European countries

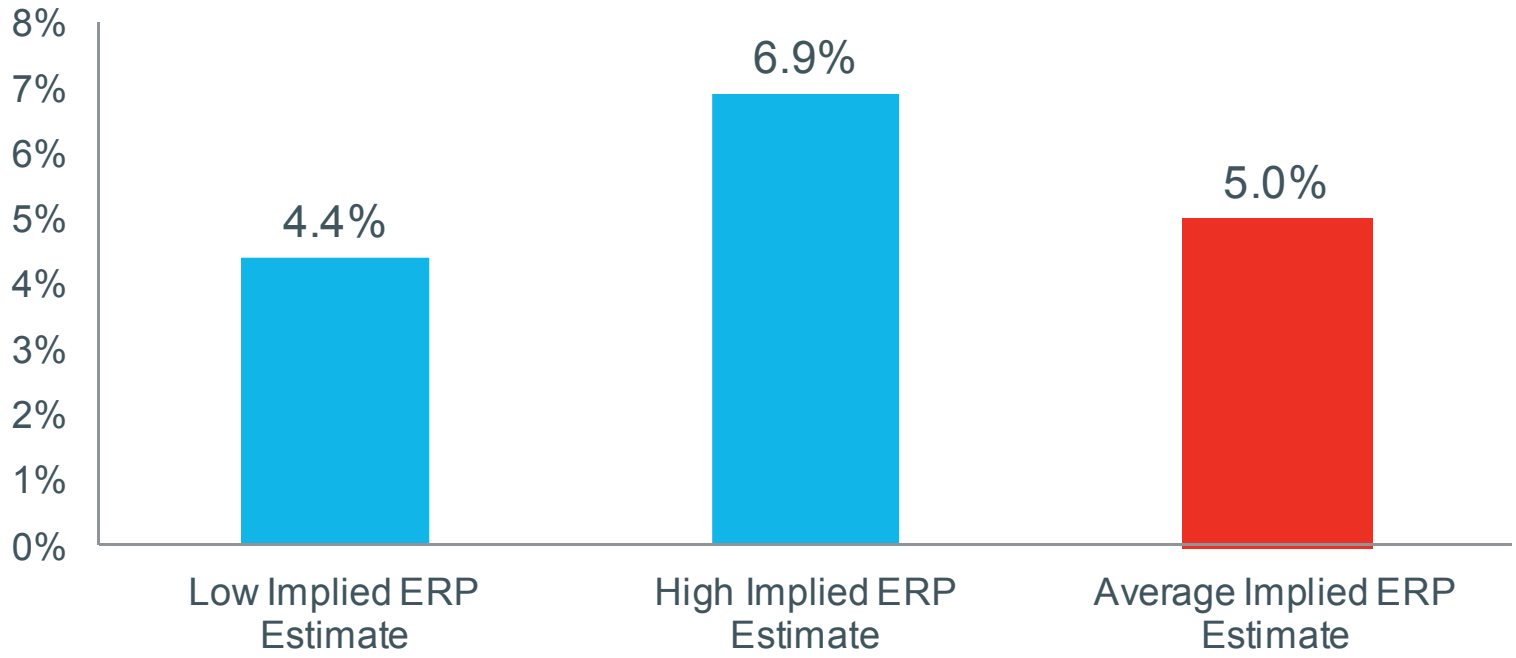
- Estimated an implied ERP for 16 European countries using four variations of the dividend discount model to equate analysts earnings forecasts with current market prices.
- January 1994 through May 2011 time horizon

Christoph Jäckel and Katja Mühlhäuser, "The Equity Risk Premium across European Markets: An Analysis using the Implied Cost of Capital", working paper, Oct. 17, 2011, Department of Financial Management and Capital Markets, Technische Universität München, Germany.

Issues in Today's Global Environment – ERP

Jäckel and Mühlhäuser

- Estimated an arithmetic ERP range from 4.4% (UK) to 6.9% (Ireland), with an average of 5.0%



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Issues in Today's Global Environment – ERP

Forward-Looking Estimates of Conditional ERP – "Top Down" Survey

Pablo Fernandez

"US Market Risk Premium used in 2012 by Professors, Analysts, Managers of Companies, and Managers of Financial Companies: a survey used for 82 countries with 7,192 answers" (June, 2012)

- ERP estimated at beginning of 2012 by Analysts and Companies 5.0% – 6.0% (averages)

* FINCO = Managers of financial companies
Source: Pablo Fernandez, Javier Aguirreamalloa, and Luis Corres, "Market Risk Premium Used In 82 Countries In 2012: A Survey With 7,192 Answers", IESE Business School – University of Navarra, working paper, June 2012.

Issues in Today's Global Environment – ERP

Forward-Looking Estimates of Conditional ERP – "Top Down" Survey

Average European Countries Market Risk Premium (%) by Profession

Pablo Fernandez

	Professors	Analysts	Companies	FINCO*
Austria	5.2	6.2	5.6	4.9
Belgium	6.1	5.9	6.2	5.9
Czech Republic	6.4	7.1	6.6	6.4
Finland	6.0	5.5	6.4	6.4
France	5.7	6.2	5.7	6.0
Germany	5.7	5.5	5.1	5.2
Greece	11.2	7.0	11.8	12.8
Italy	5.8	5.9	5.4	5.1

	Professors	Analysts	Companies	FINCO*
Netherlands	5.1	5.9	4.8	5.4
Norway	5.7	6.5	5.3	5.6
Poland	7.0	6.3	6.1	6.6
Portugal	8.1	6.0	7.4	8.6
Spain	5.7	5.6	6.3	5.9
Sweden	5.9	6.0	5.4	5.9
Switzerland	5.1	5.7	5.1	5.0
United Kingdom	5.6	5.4	5.3	5.8

* FINCO = Managers of financial companies

Source: Pablo Fernandez, Javier Aguirreamalloa, and Luis Corres, "Market Risk Premium Used In 82 Countries In 2012: A Survey With 7,192 Answers", IESE Business School – University of Navarra, working paper, June 2012.

Issues in Today's Global Environment – ERP

Forward-Looking Estimates of Conditional ERP – "Top Down" Survey

Average Non-European Countries Market Risk Premium (%) by Profession

Pablo Fernandez

	Professors	Analysts	Companies	FINCO*
Argentina	10.9	10.4	11.9	10.6
Australia	5.8	5.9	6.8	5.9
Brazil	7.4	7.4	8.1	8.5
Canada	5.4	5.9	5.4	5.1
Chile	6.2	5.9	5.8	6.4
China	7.3	7.7	10.0	9.5
Colombia	7.8	6.4	10.1	7.6
Egypt	11.4	7.5	8.2	13.5
India	7.8	7.6	8.3	8.6

	Professors	Analysts	Companies	FINCO*
Japan	4.8	5.6	5.0	6.4
Mexico	9.2	6.7	7.5	7.1
New Zealand	6.1	6.0	6.5	6.5
Peru	7.4	7.7	9.5	7.7
South Africa	7.1	6.8	6.1	6.3
South Korea	5.6	7.2	8.1	7.5
Taiwan	7.9	7.3	8.0	7.5
Turkey	10.1	7.5	8.4	8.8
United States	5.6	5.0	5.5	5.6

* FINCO = Managers of financial companies

Source: Pablo Fernandez, Javier Aguirreamalloa, and Luis Corres, "Market Risk Premium Used In 82 Countries In 2012: A Survey With 7,192 Answers", IESE Business School – University of Navarra, working paper, June 2012.

Issues in Today's Global Environment – ERP Forward-Looking Estimates of Conditional ERP – "Top Down" Survey

KPMG 2011/2012 Cost of Capital Study

Survey of European Companies

Survey addressing the following issues:

- Impairment testing
- Derivation of cash flows
- Cost of capital parameters
- Outlook overall economic development

493 European companies contacted, 137 companies participated.

Source: KPMG Cost of Capital Study 2011/2012 (www.kpmg.com).

Issues in Today's Global Environment – ERP Forward-Looking Estimates of Conditional ERP – "Top Down" Survey

KPMG 2011/2012 Cost of Capital Study

Risk-free Rate

- 62 percent of companies relied on the use of national government bonds to determine the risk-free rate. Remaining companies used yield curve data.
- Average maturity of government bonds applied as risk-free rate: 15 year government bond
- Average risk-free rate applied by survey participants:

2008-2009	4.3%
2009-2010	3.9%
2010-2011	**3.3%**

Premium

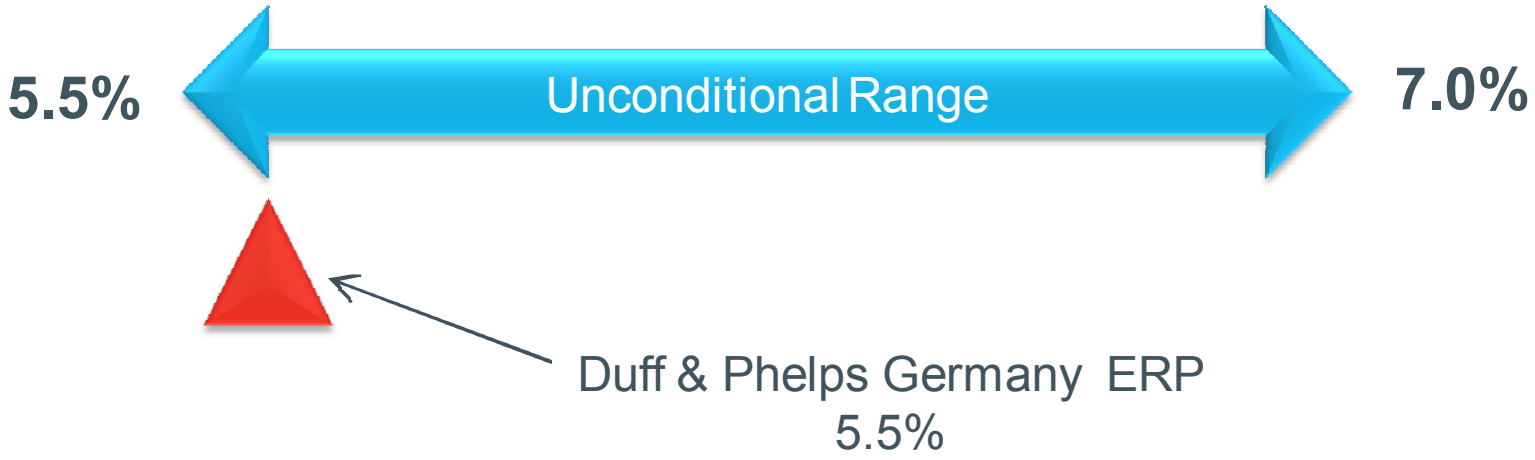
- 84 percent of companies used a market risk premium between 4.5 percent and 5 percent in the fiscal year 2010-2011.
- 66 percent of companies surveyed applied a country risk premium between 1 and 5 percent.
- 20 percent of companies applied a size premium.

Source: KPMG Cost of Capital Study 2011/2012 (www.kpmg.com).

Issues in Today's Global Environment – ERP

The German Institute of Chartered Accountants (IDW) changed it's position on the market risk premium (MRP) for Germany in the context of the European Financial Crisis.

New recommended range between 5.5% and 7.0%.



International Cost of Capital (Forthcoming)

International Cost of Capital (Forthcoming) – Duff & Phelps extension of Damodaran Implied ERP

Implied ERP

Calculates implied ERP estimates for the S&P 500 (US Market) and publishes his monthly estimates on his website.

- Uses a two-stage model, projecting expected distributions (dividends and stock buybacks) based on an average of analyst estimates for earnings growth for individual firms comprising the S&P 500 for the first five years and the risk-free rate thereafter (since 1985).
- He solves for the discount rate, which equates the expected distributions to the current level of the S&P 500.

To learn more: Information and data available at http://pages.stern.nyu.edu/~adamodar/

International Cost of Capital (Forthcoming) – Duff & Phelps extension of Damodaran Implied ERP

Implied ERP

Extension from the U.S. market an implied ERP can be expanded to other markets.

Implied ERP

- Market-driven
- Reflects current prices
- Does not require historical data

To learn more: Information and data available at http://pages.stern.nyu.edu/~adamodar/

International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

The country credit rating model regresses all available country credit ratings in time "t" against all available returns (for all countries that have returns) in time "t+1".

$$k_{local} = \alpha + B \times \log(CCR_{local}) + \varepsilon$$

where:

k_{local} = Cost of equity capital in local country
α = Regression constant
B = Regression coefficient
CCR_{local} = Country credit rating of local country
ε = Regression error term

International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

This model utilizes *Institutional Investor Magazine* Country Credit Ratings (CCRs). These rankings are available from September 1979 on, and are published semi-annually (March and September) for over 150 countries.

Why is this model useful? Because it allows a country-level cost of equity estimate to be calculated for countries that do not have a developed equity returns history (or even no data at all).*

*The model is based upon the work of Erb, Claude, Campbell R. Harvey, and Tadas Viskanta in the mid-1990s.

International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

Duff & Phelps Preliminary Model

1. We first estimated monthly values for these CCRs by simple interpolation between the semi-annual values.

2. Then, using 69 MSCI Barra country-level equity total return indices, we stacked up all available country credit ratings for month "t" against all available returns in time "t+1", for each month from September 1979 through present.

   Example: as of September 2012, the "regression stack" consisted of a total of 16,687 matched pairs of CCRs in time "t" and returns in time "t+1".

International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

The resulting intercept and coefficient (i.e., beta or β) generated by the regression are then used to calculate an estimated country-level cost of equity capital for all countries with a country credit rating.

Example: As of September 2012, the Institutional Investor CCR for Italy was 63.6 (on a 100-point scale).

As of September 2012, the intercept and coefficient generated by regressing a stack of all available country credit ratings in time "t" against all available returns (for all countries that have returns) in time "t+1" were 0.0559076 and -0.0107204. The negative coefficient implies that as credit ratings *increase* (better credit), country-level cost of equity estimates *decrease*.

The country-level cost of equity estimate for Italy is calculated as follows:

$$COE_{Italy} = (Intercept + \beta \times LN(CCR_{Italy,\ Sep\text{-}12})) \times 12 \times 100\%$$

$$COE_{Italy} = (0.0559076 + (-0.0107204) \times LN(63.6)) \times 12 \times 100\%$$

$$13.67\% = (0.0559076 + (-0.0107204) \times LN(63.6)) \times 12 \times 100\%$$

NOTE: the result is multiplied by 12 to annualize the "monthly" estimate.

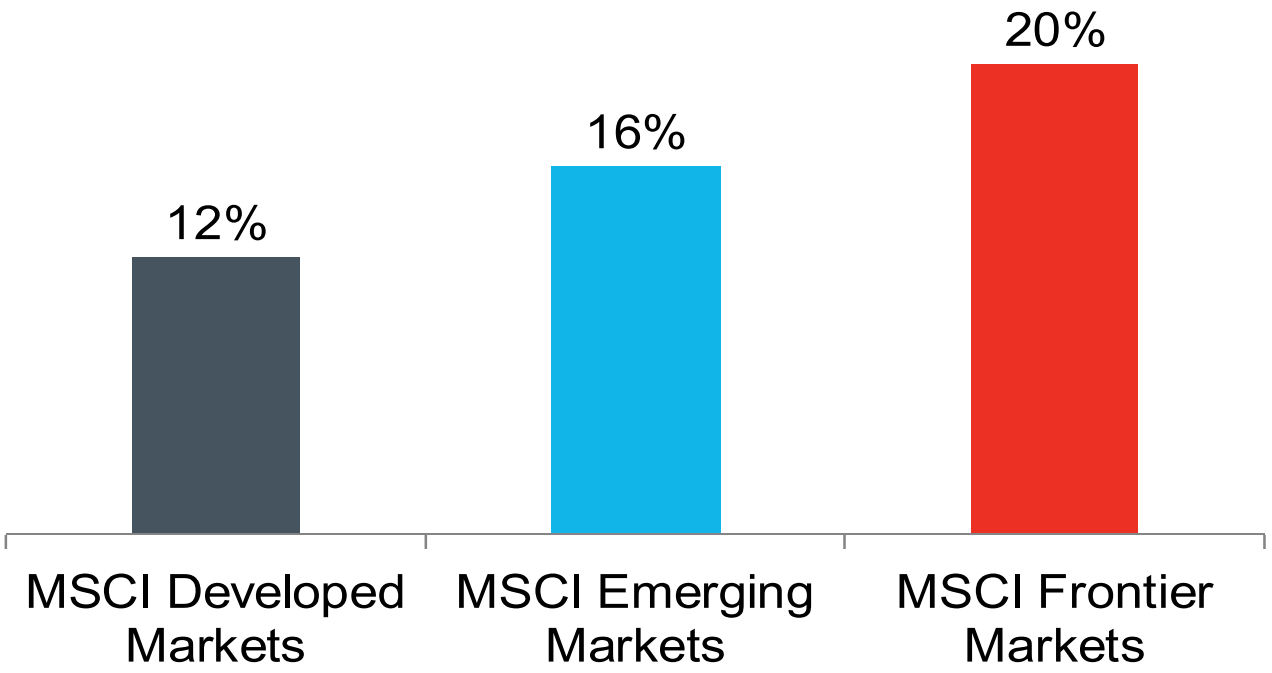
International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

Average "Uncalibrated" Monthly Country-Level COE Estimate (Raw Results)

From the perspective of a U.S. Investor

January 2006–September 2012

We first looked at the results for high-level groupings:

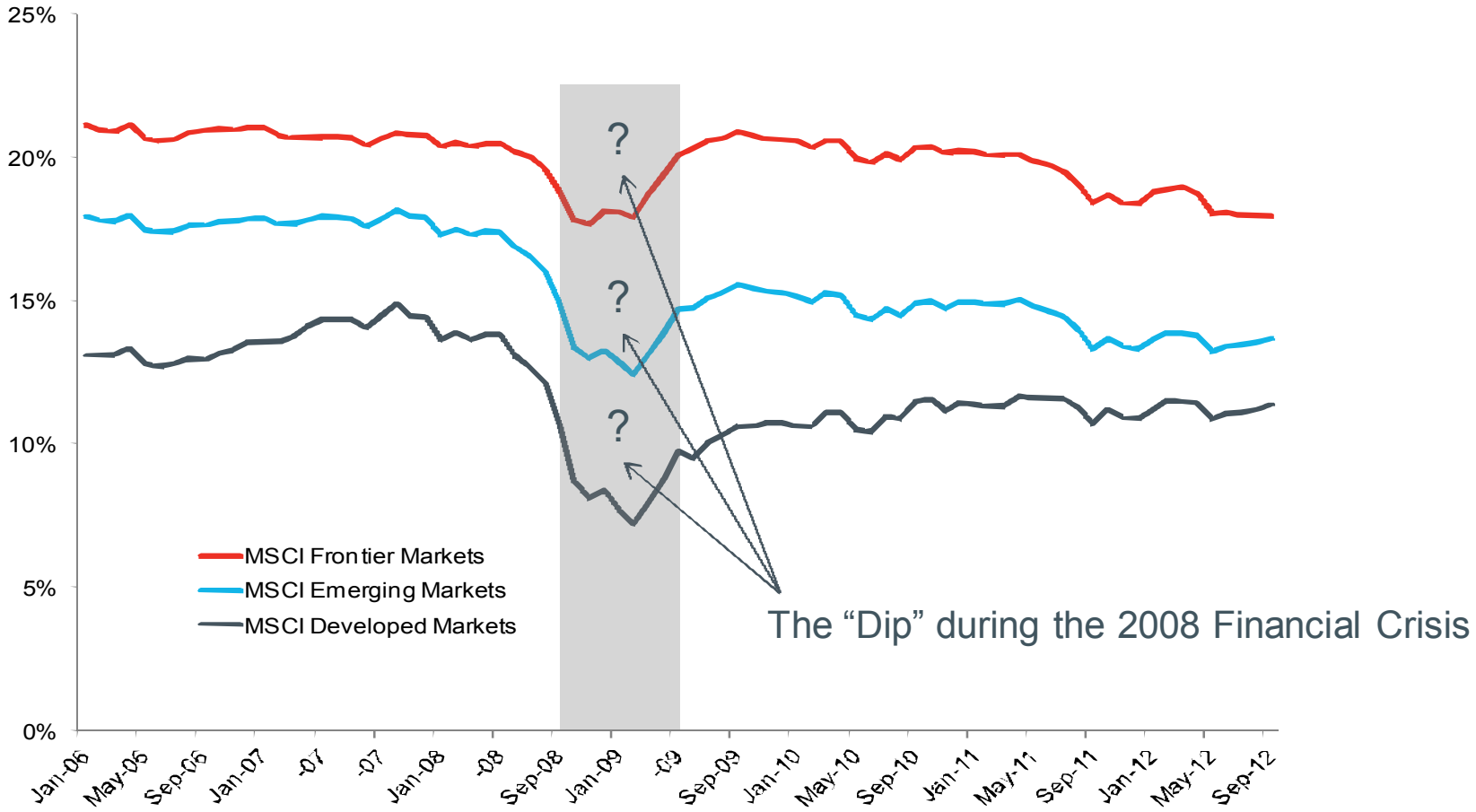


International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

Average "Uncalibrated" Monthly Country-Level COE Estimate (Over Time) (Raw Results)

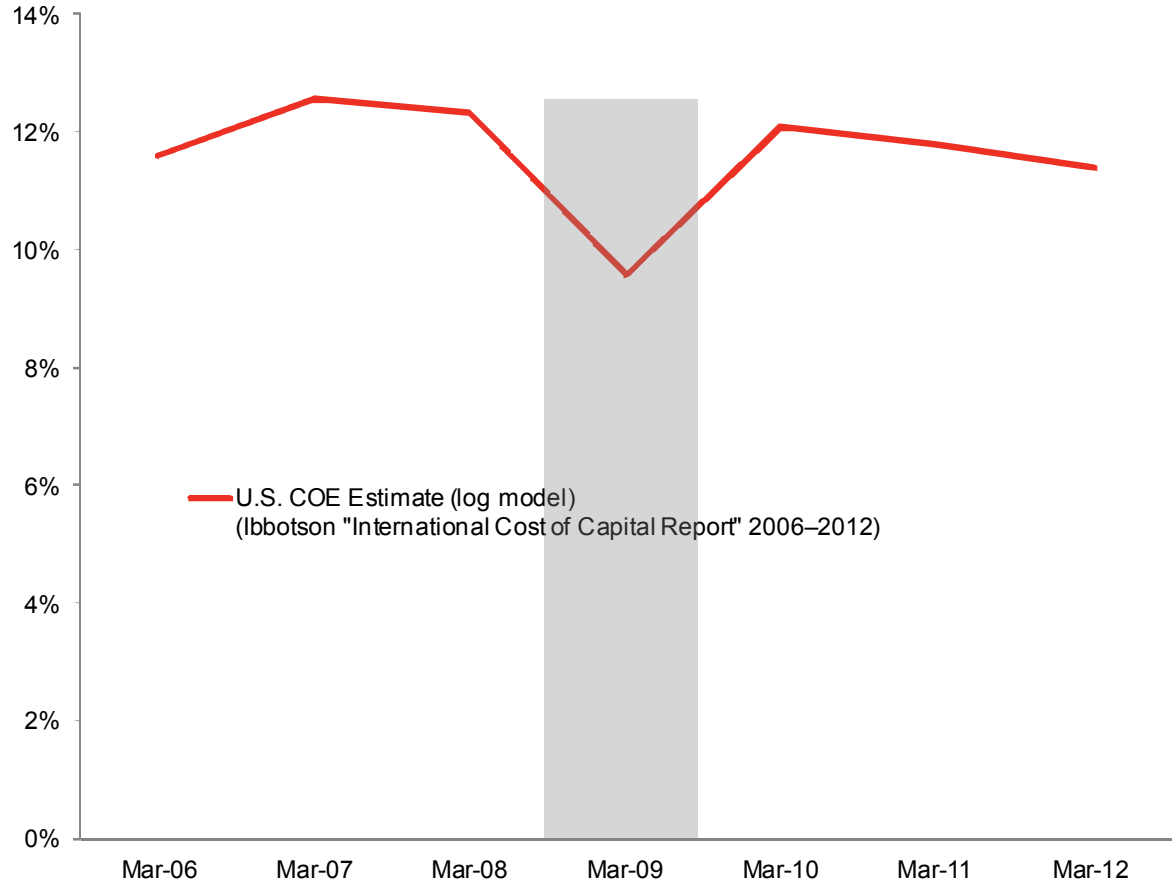
From the perspective of a U.S. Investor

January 2006–September 2012



International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

"Uncalibrated" U.S. COE Estimate (log model) (Raw Results) From the perspective of a U.S. Investor; "Ibbotson International Cost of Capital Report" 2006–2012



International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

Proposed "DP-Calibrated" Adjustment to raw CCR COE model results

The raw results implied that during the 2008 Financial Crisis, risks were *decreasing* (i.e., the "Dip") just as risks were likely *increasing*.

The relationships (i.e., spreads) between countries are intuitive and seemed to hold over time, including during the 2008 Financial Crisis.

Examples:

The U.S. was still less risky compared to say, Zimbabwe or Libya

Greece was still riskier than Germany, Italy, France, or the U.K.

We decided to use the relationship, or spread, between countries' COE estimates, "calibrated" to an external model. The external model is the model that Duff & Phelps uses to develop its "base" U.S. COE estimate.

International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

Proposed "DP-Calibrated" Adjustment to raw CCR COE model results

Calibrated model for hypothetical Country ABC:

$COE_{DP\ base\ U.S.\ COE}$

+ CCR Model COE Estimate for Country ABC

– CCR Model COE Estimate for U.S.

"DP-Calibrated" CCR COE Estimate for Country ABC

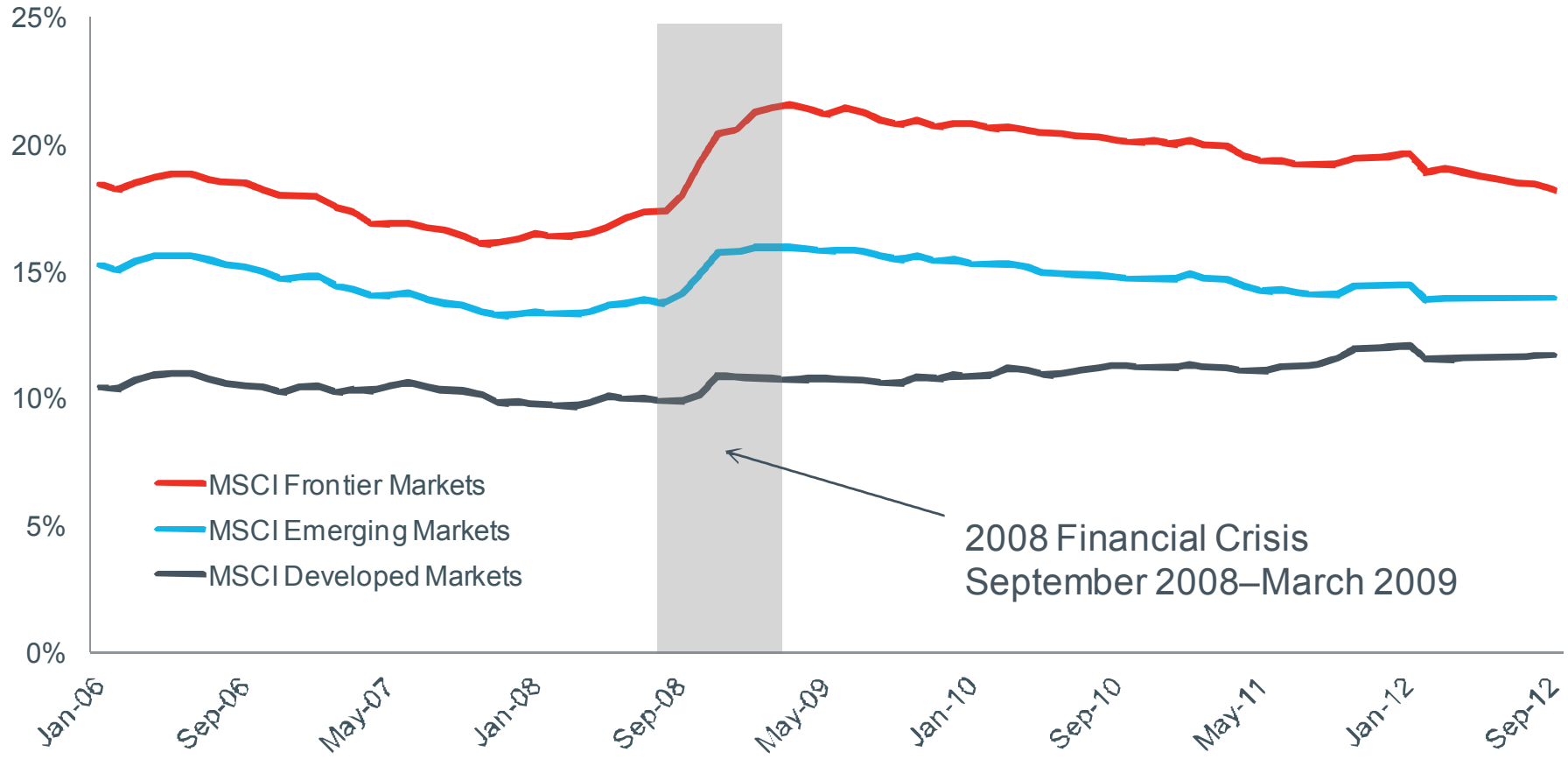
This adjustment is made for each country for each month from January 2006 to September 2012 in the graph in the next slide.

International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

Average "DP-Calibrated" Monthly Country-Level COE Estimate (Over Time)

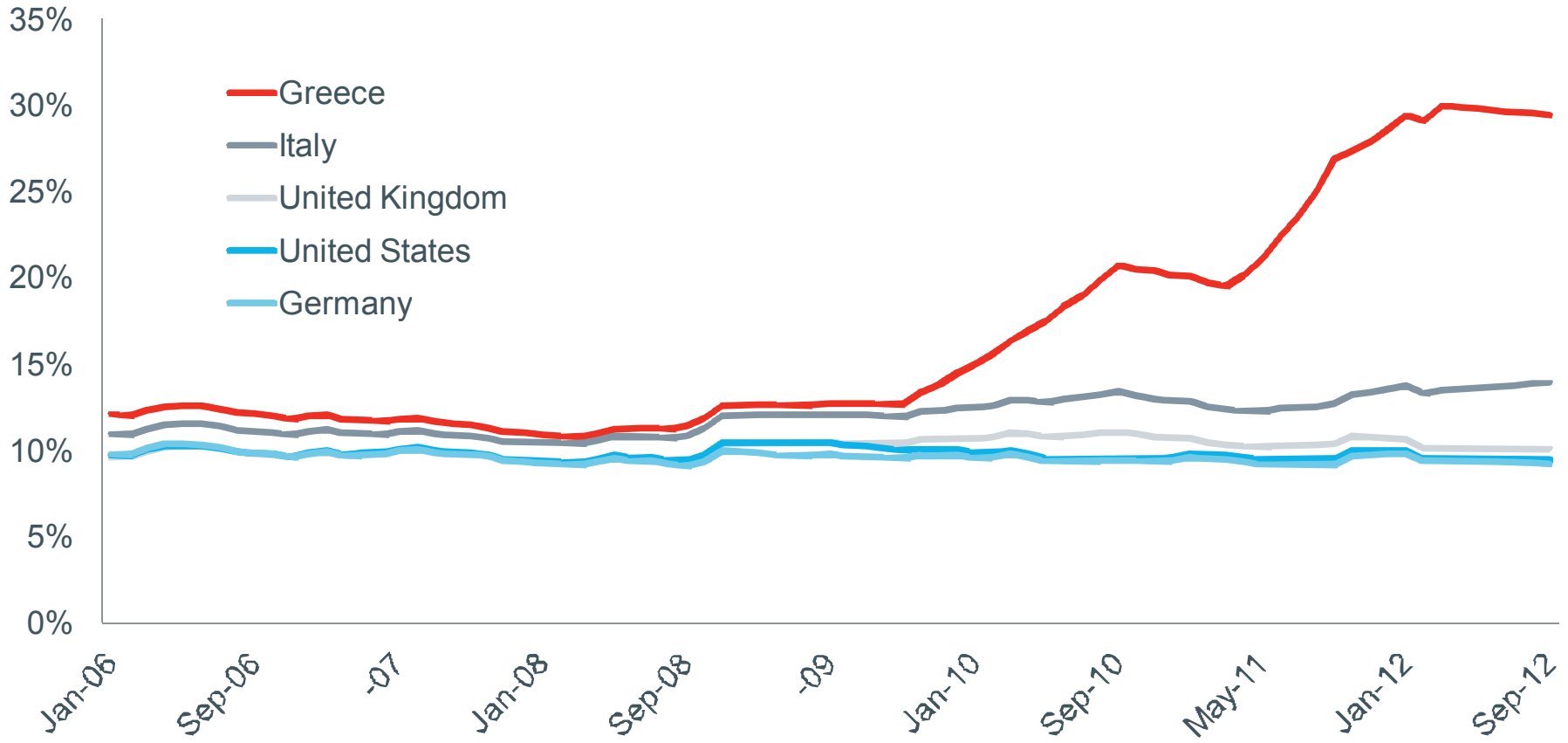
From the perspective of a U.S. Investor

January 2006–September 2012



International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

"DP-Calibrated" Monthly Country-Level COE Estimate (Over Time)
From the perspective of a U.S. Investor
January 2006–September 2012

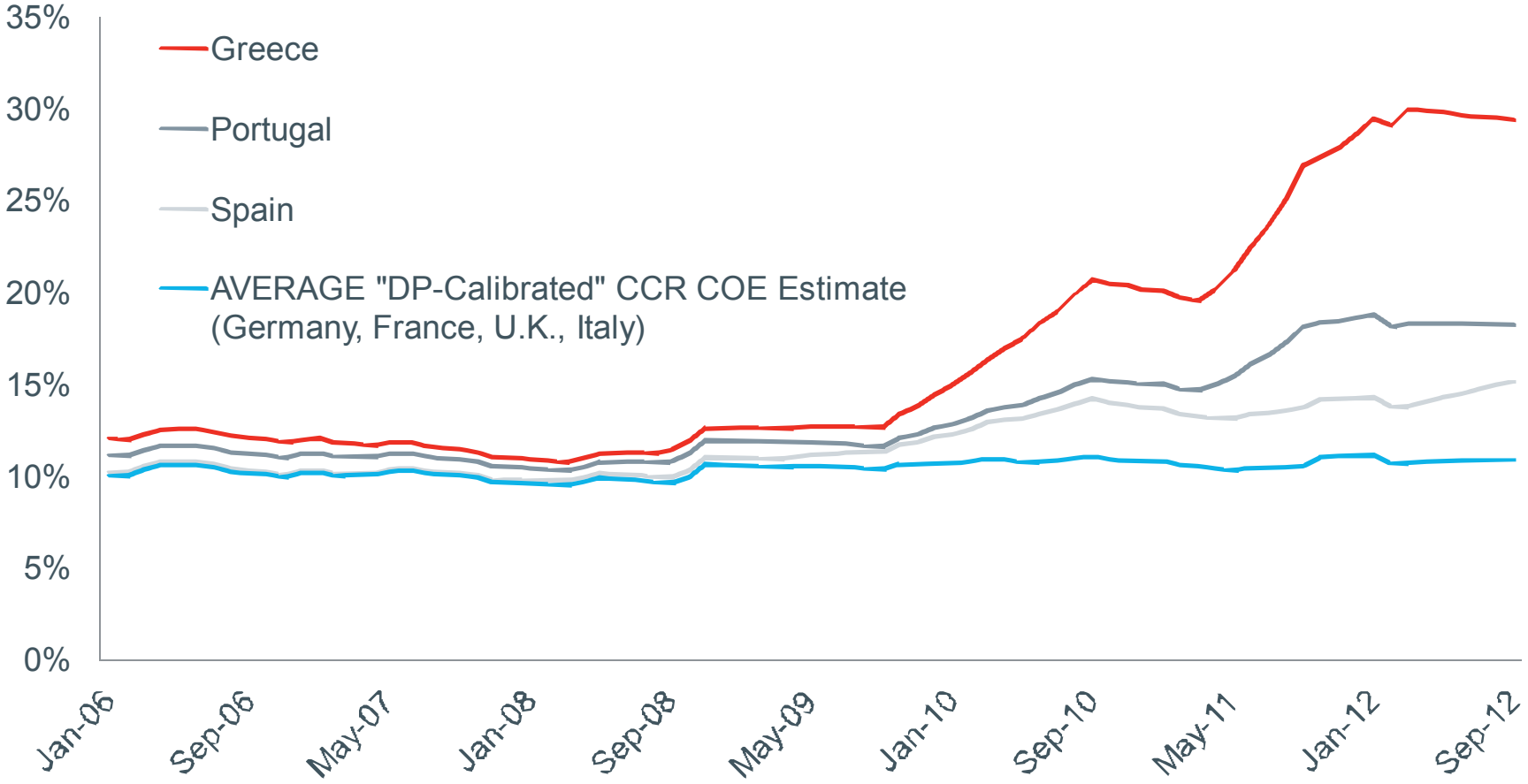


International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

"DP-Calibrated" Monthly Country-Level COE Estimate (Over Time)

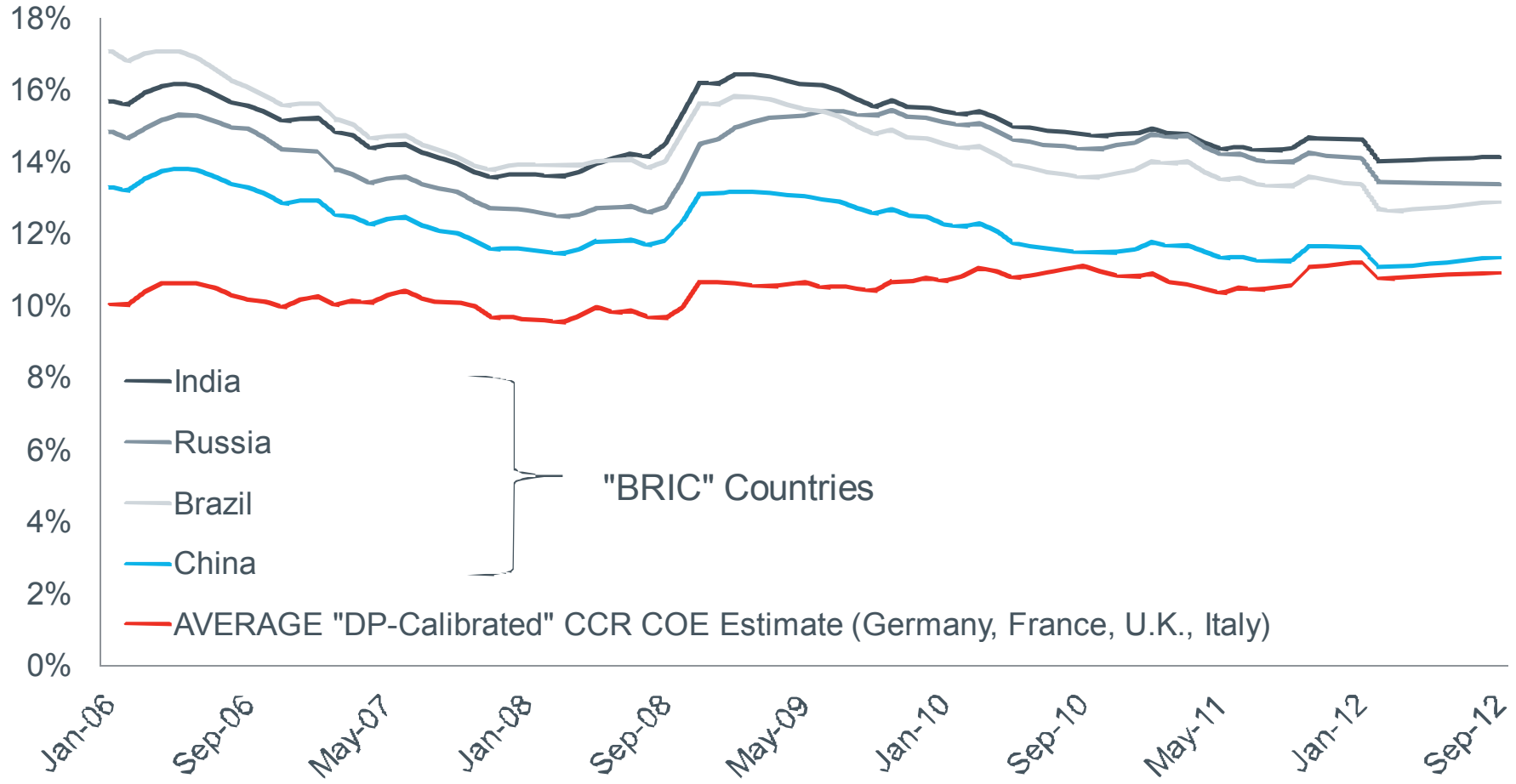
From the perspective of a U.S. Investor

January 2006–September 2012



International Cost of Capital (Forthcoming) – Duff & Phelps expanded Country Credit Rating Method

"DP-Calibrated" Monthly Country-Level COE Estimate (Over Time)
From the perspective of a U.S. Investor
January 2006–September 2012



International Cost of Capital (Forthcoming) – Evidence of Size Effect in the European Markets

Erick Peek

Duff & Phelps' US Risk Premium Report forms the basis of the European edition.

Why a European edition? A few reasons:

- *Most evidence on the size effect has been based on (overlapping) US samples, also because of a lack of international data. We just don't know whether the size effect is a local (US) or global phenomenon.*

- *Size adjustments have an economically significant impact on value estimates.*

- *There is a growing debate on whether adjustments for size are needed in Europe. However, most European studies are single-country studies:*
  - *Low power*
  - *Mixed findings*

- *Size distributions may differ between the US and Europe.*

To learn more about the Duff & Phelp US Risk Premium Report see Appendix C or download excerpt at www.DuffandPhelps.com/CostofCapital

International Cost of Capital (Forthcoming) – Evidence of Size Effect in the European Markets

The accuracy of risk premium estimates depends on the length of the research period. Data availability in Europe is less than in the US.

- *European share price data is systematically available after 1973; accounting data is systematically available after 1987.*
- *Coverage increases substantially during the first years of a database's existence. Balancing selection bias and accuracy concerns, our research period starts in 1990 (and ends in 2010).*

Define Europe.

- *We examine a pooled sample of Western European countries.*
- *To avoid the potentially confounding effects of country factors, we focus on the most strongly integrated European economies/markets: EU15 + Switzerland + Norway*.

International Cost of Capital (Forthcoming) – Evidence of Size Effect in the European Markets Accounting Metrics

Using market capitalization as a size measure may cause size and returns to be spuriously correlated. We therefore also use accounting data to measure size:

- *Book value of equity*
- *3-year average net income*
- *Market value of equity + Book (Market) value of debt (MVIC)*
- *Total assets*
- *3-year average EBITDA*
- *Sales*
- *#Employees*

Additional advantages of using accounting data are that:

- The results can be used to calculate size premiums for privately held companies
- We can examine the distribution of accounting-based risk measures across size portfolios.

International Cost of Capital (Forthcoming) – Evidence of Size Effect in the European Markets
Market capitalization (2010) in the US versus Europe

Top size portfolios (in 2010):

Portfolio	% of total sample	US sample – Average size (USD m)	Euro sample – Average size (USD m)
1	2.47%	109,765	76,157
2	2.07%	32,309	23,215
3	2.20%	22,008	12,907
4	2.40%	14,717	8,445
5	2.20%	11,048	5,922
	…	…	…

Bottom size portfolios (in 2010):

Portfolio	% of total sample	US sample – Average size (USD m)	Euro sample – Average size (USD m)
	…	…	…
21	4.67%	656	162
22	5.94%	501	119
23	6.40%	358	85
24	7.14%	232	58
25	21.81%	68	22

* Relative size of the portfolios has been taken from the US Risk Premium Report. Exchange rate: $1 = e1.44

Summary

In Europe, the relationship between firm size and the cost of equity (realized returns) seems to be nonlinear. In particular, (very) small firms (with market cap < euro 14m) appear to have a significantly higher cost of equity.

- Clear difference with the US results.

When using other measures of size (such as 3-year average EBITDA, average sales, or number of employees), we observe similar patterns (though less pronounced).

GBP returns and ECU returns exhibit similar patterns.

Some (accounting-based) measures of risk systematically vary with firm size … but do not explain the size-return relationship.

International Cost of Capital – Summary

International Cost of Capital – Summary

Consider Normalizing Risk Free Rates (R_f) During Periods of Flight to Quality

- During periods of flight to quality, using the spot yield of so-called risk free securities may imply overall discount rates inappropriately low vis-à-vis the risks currently facing investors. Consider using normalized risk free rates during periods of "flight to quality".

European Cost of Capital Inputs (e.g., ERP, R_f)

- Consider multiple models (e.g. implied ERP models, empirical evidence, surveys, etc.) when establishing European cost of capital inputs.
- Two-dimensional process Duff & Phelps Equity Risk Premium (ERP) Methodology (See Appendix B)

To learn more about the equity risk premium, the risk free rate, and other cost of capital related issues, visit :www.DuffandPhelps.com/CostofCapital

International Cost of Capital – Summary

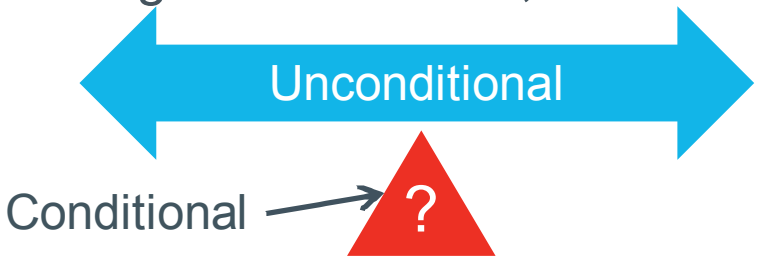
Re-evaluate Equity Risk Premium (ERP) Estimates Regularly

- One should review ERP assessment regularly, based on global economic and financial conditions, and based on multiple models.

Unconditional ERP versus Conditional ERP

- Unconditional ERP is a reasonable range for ERP that can be expected over a business cycle.

- Conditonal ERP is where in the range the ERP falls, based on current economic conditions.



To learn more about the equity risk premium, the risk free rate, and other cost of capital related issues, visit :www.DuffandPhelps.com/CostofCapital

DUFF & PHELPS

Thank You!

Roger.Grabowski@duffandphelps.com

OIV
Organismo Italiano di Valutazione

To learn more about the equity risk premium, the risk free rate, and other cost of capital related issues, visit:
www.DuffandPhelps.com/CostofCapital

Appendix A:
Global Cost of Capital Model

Global Cost of Capital Models

Risks

- Currency Risks
- Country Risks
- Sources of Information on Countries and Their Economies

Cost of Equity Capital Models

- Global Version of CAPM
- Local, Single-Country Version of the CAPM
- The U.S. Cost of Equity Capital Adjusted for Yield Spreads Model
- Country Credit Rating Method
- Alternative Risk Measures to Beta

Expanding Models to Incorporate Size Premium and Company-Specific Risk

- Expanded Cost of Capital Model

Should Projected Net Cash Flows and the Cost of Capital Be Nominal or Real?

Currency Risks

EXHIBIT 19.1 Adjusting Cost of Equity Capital for Currency Translation

(Formula 19.1)

$$k_{e,local} = [1 + k_{e,u.s.}]\left(\frac{(1 + Inflation_{local})}{(1 + Inflation_{u.s.})}\right) - 1$$

or (approximately, but perhaps more intuitively):

(Formula 19.2)

$$k_{e,local} \approx R_{f,local} + [B_{u.s.} RP_{u.s.}]$$

and

(Formula 19.3)

$$R_{f,local} = [1 + R_{f,u.s.}]\left(\frac{(1 + Inflation_{local})}{(1 + Inflation_{u.s.})}\right) - 1$$

where:

$k_{e,local}$ = Discount rate for equity capital in local country for discounting expected cash flows in local currency

$k_{e,u.s.}$ = Discount rate for equity capital in U.S.

$Inflation_{local}$ = Expected rate of inflation in local country

$Inflation_{u.s.}$ = Expected rate of inflation in U.S.

$R_{f,local}$ = Return on local government default-risk-free debt

$R_{f,u.s.}$ = U.S. risk-free rate

$B_{u.s.} \times RP_{u.s.}$ = Risk premium appropriate for a U.S. company in similar industry as the subject company in local country, expressed in U.S. dollar denominated returns.

Country Risks (cont'd)

What are legitimate reasons for country risk adjustments? Investors may view some country-level phenomena as unique or country-specific and demand a pre-mium due to:

Financial Risks

- Currency volatility plus the inability to convert, hedge, or repatriate profits
- Loan default or unfavorable loan restructuring
- Delayed payment of suppliers' credits
- Losses from exchange controls
- Foreign trade collection experience

Economic Risks

- Volatility of the economy
- Inflation: current and future expected
- Debt service as a percentage of exports of goods and services
- Current account balance of the country in which the subject company operates as a percentage of goods and services
- Parallel foreign exchange rate market indicators
- Labor issues

Country Risks (cont'd)

Political Risks

- Repudiation of contracts by governments
- Expropriation of private investments in total or part through change in taxation
- Economic planning failures
- Political leadership and frequency of change
- External conflict
- Corruption in government
- Military in politics
- Organized religion in politics
- Lack of law-and-order tradition
- Racial and national tensions
- Political terrorism
- Civil war
- Poor quality of the bureaucracy
- Poorly developed legal system

Global Version of CAPM

Global Version of CAPM

This model has intuitive appeal where markets are integrated and/or the subject company operates in many countries. This method recognizes cross-border diversification opportunities and prices securities accordingly.

(Formula 19.1)

$$k_e = R_{f,u.s.} + (B_w \times RP_w)$$

where:
k_e = Cost of equity capital
$R_{f,u.s.}$ = U.S. risk-free rate
B_w = Market or systematic risk measured with respect to a world portfolio of stocks
RP_w = Equity risk premium (rate of return expressed in terms of U.S. dollar returns) on a world diversified portfolio

Global Version of CAPM (cont'd)

Elroy Dimson, Paul Marsh, and Mike Staunton have published the most definitive work on equity risk premiums for 17 developed markets and a world index denominated in U.S. dollar returns. They report both realized risk premiums since 1900 and also provide a methodology to estimate RP_w by converting the historical realized premium for the world index into a forward-looking ERP projection. They assume that:

The observed increase in the price/dividend ratio is attributable solely to the long-term decrease in the required risk premium (and the decrease will not continue).

The future standard deviation of annual risk premiums will approximately equal the historical standard deviation of risk premiums.

Global Version of CAPM (cont'd)

The authors note:

Further adjustments should almost certainly be made to historical risk pre-miums to reflect long-term changes in capital market conditions. Since, in most countries corporate cash flows historically exceeded investors' expectations, a further downward adjustment is in order.

They concluded that a further downward adjustment of approximately 50 to 100 basis points in the expected ERP at the beginning of 2009 was plausible. Adjust-ing the realized risk premiums for the increase in price-to-dividend ratio that resulted from a decrease in the dividend yield to current levels, they estimate these ERPs at the beginning of 2009:

Local, Single-Country Version of the CAPM

(Formula 19.3)

$$k_{local} = R_{f,\,local} + [B_{local} \times RP_{local}]$$

where: k_{local} = Cost of equity capital in local country

$R_{f,local}$ = Return on the local country government's (default-risk-free) debt

B_{local} = Market risk of the subject company measured with respect to the local securities market

RP_{local} = Equity risk premium in local country's stock market

Local, Single-Country Version of the CAPM (cont'd)

Dimson, Marsh, and Staunton annually publish the most definitive work on equity risk premiums for 19 developed markets.
They observe larger equity returns earned in the second half of the twentieth century compared with the first half because:

- Corporate cash flows grew faster than investors anticipated due to rapid technological change and unprecedented growth in productivity and efficiency.
- Transaction and monitoring costs fell over the course of the final two decades of the century.
- Inflation rates generally declined.
- Real interest rates rose, resulting in a reduced required rate of return due to diminished business and investment risks.

Local, Single-Country Version of the CAPM (cont'd)

EXHIBIT 19.2 Worldwide Risk Premiums Relative to Bonds, 1900–2008

Country	Geometric Mean%	Arithmetic Mean%	Standard Error%	Standard Deviation %
Australia	5.7	7.5	1.9	19.5
Belgium	2.0	4.0	2.0	20.7
Canada	3.7	5.3	1.8	18.3
Denmark	1.5	2.9	1.6	16.9
France	3.4	5.7	2.2	22.7
Germany*	4.8	8.1	2.7	27.7
Ireland	2.4	4.4	1.9	19.7
Italy	3.7	7.2	2.9	29.9
Japan	5.0	9.2	3.2	33.1
The Netherlands	3.2	5.6	2.1	22.2
Norway	2.0	5.0	2.7	27.9
South Africa	5.2	7.0	1.9	19.6
Spain	2.1	4.2	2.0	20.7
Sweden	4.6	7.1	2.2	22.8
Switzerland	1.5	3.0	1.7	17.9
United Kingdom	3.6	5.0	1.6	16.9
World ex-U.S.	3.5	4.7	1.5	15.9
World incl. U.S.	3.4	4.6	1.5	15.6

*All statistics for Germany are based on 107 years, excluding 1922–23.

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* (Princeton, NJ: Princeton University Press, 2002); *Credit Suisse Global Investment Returns Sourcebook 2009* (London: Credit Suisse/London Business School, 2009), Table 10, p. 27.

Local, Single-Country Version of the CAPM (cont'd)

There are four problems with this approach.

1. It is most justified in developed economies (e.g., the United States, United Kingdom, Eurozone, Japan).
2. Data are poor to nonexistent in segmented, developing country settings, especially for the local beta and ERP.
3. Many beta estimates using historical returns may be low because the local stock market may be dominated by a few firms.
4. The local country government's debt is possibly not free of default risk.

The U.S. Cost of Equity Capital Adjusted for Yield Spreads Model

(Formula 19.4)

$$k_{local} = R_{f,\,u.s.} + \left(R_{local\ euro\ \$issue} - R_{f,\,u.s.}\right) + \left[B_{u.s.} \times RP_{u.s.}\right]$$

where:

k_{local} = Cost of equity capital in local currency

$R_{f,u.s.}$ = Current market interest rate of debt issued by U.S. government with the same maturity as debt issued by the local country government denominated in U.S. dollars

$R_{local\ euro\ \$issue}$ = Current market interest rate on debt issued by the local country government denominated in U.S. dollars (eurodollar debt represents debt issued by local country in U.S. dollars and repaid in U.S. dollars)

$B_{u.s.} \times RP_{u.s.}$ = Risk premium (expressed in terms of U.S. dollar returns) appropriate for a U.S. company in a similar industry as the subject company in the local country

The U.S. Cost of Equity Capital Adjusted for Yield Spreads Model (cont'd)

EXHIBIT 19.3 Example Yield Spreads as of September 30, 2009

Austria	0.51%
Brazil	1.69%
China	0.94%
Ecuador	9.61%
Israel	1.35%
Lebanon	3.82%

The U.S. Cost of Equity Capital Adjusted for Yield Spreads Model (cont'd)

There are six problems with this approach.

1. In some cases, the local government's credit quality may be a very poor proxy for risks affecting business cash flows.

2. This approach may double-count country-level risks that are already incorporated into projections of expected cash flows.

3. Many countries do not issue dollar-denominated debt. In such cases, you can correlate the Institutional Investor *Country Credit Rating* using the credit rating for countries that do issue dollar-denominated debt. Then you can use the Institutional Investor's *Country Credit Rating* for countries that do not issue dollar-denominated debt to input a yield spread. Exhibit 19.4 shows an example of such an analysis as of September 30, 2009.

The U.S. Cost of Equity Capital Adjusted for Yield Spreads Model (cont'd)

4. Any equity estimate is really lacking currency risk to the extent the currency of such bonds studied for the spread are nonlocal currency denominated (dollar, euro, etc.). Such dollar, euro, or other currencies are probably superior to the emerging country's currency. This often (in part) explains why the spread method provides lower equity estimates than the *Country Credit Rating* method, which fully loads in total risk (currency included).
5. A method based on spot yield is prone to be more volatile than the *Country Credit Rating* method. The point is to be aware of extremes in yields. This may cause the spread method to have extreme indications in some crisis environments.
6. Debt is typically less volatile than equity, so by using debt as the reference point, this method inherently tends to underestimate equity risk.

The U.S. Cost of Equity Capital Adjusted for Yield Spreads Model (cont'd)

EXHIBIT 19.4 Example of Guideline Yield Spreads Based on Country Credit Rating as of September 30, 2009

S&P's Rating [1]	Rating Score [2]	*CCR* Rating [3]	Guideline Yield Spread [4]
CC	22	0.0	14.46%
CCC–	21	14.1	12.08%
CCC	20	18.2	10.10%
CCC+	19	22.3	8.44%
B–	18	26.4	7.05%
B	17	30.6	5.90%
B+	16	34.7	4.93%
BB–	15	38.8	4.12%
BB	14	42.9	3.44%
BB+	13	47.1	2.88%
BBB–	12	51.2	2.40%
BBB	11	55.3	2.01%
BBB+	10	59.4	1.68%
A–	9	63.5	1.40%
A	8	67.7	1.17%
A+	7	71.8	0.98%
AA–	6	75.9	0.82%
AA	5	80.0	0.68%
AA+	4	84.2	0.57%
AAA	2	90.3	0.00%

[1]Standard & Poor's credit rating.
[2]Numeric ranking of S&P's credit rating.
[3]Institutional Investor's *Country Credit Rating.*
[4]Guideline yield spread determined using regressed equation: Yield spread = EXP [-5.8807 + 0.1794 x (S&P's debt rating)] Data as of September 30, 2009.
Source: Calculations by Duff & Phelps, LLP.

The U.S. Cost of Equity Capital Adjusted for Yield Spreads Model (cont'd)

EXHIBIT 19.5 Guideline Yield Spreads Based on Country Credit Rating from December 2007 through September 2009

	Historical Guideline Yield Spreads (1)							
S&P's Rating	December-07	March-08	June-08	September-08	December-08	March-09	June-09	September-09
CC	7.91%	9.66%	10.27%	13.44%	27.68%	24.76%	17.02%	14.46%
CCC–	6.91%	8.45%	8.88%	11.56%	22.82%	20.48%	14.42%	12.08%
CCC	6.04%	7.39%	7.68%	9.95%	18.81%	16.94%	12.21%	10.10%
CCC+	5.28%	6.46%	6.64%	8.57%	15.50%	14.01%	10.35%	8.44%
B–	4.61%	5.65%	5.74%	7.38%	12.78%	11.58%	8.77%	7.05%
B	4.03%	4.94%	4.96%	6.35%	10.53%	9.58%	7.43%	5.90%
B+	3.52%	4.32%	4.29%	5.47%	8.68%	7.92%	6.29%	4.93%
BB–	3.08%	3.78%	3.71%	4.70%	7.15%	6.55%	5.33%	4.12%
BB	2.69%	3.31%	3.21%	4.05%	5.90%	5.42%	4.52%	3.44%
BB+	2.35%	2.89%	2.78%	3.49%	4.86%	4.48%	3.83%	2.88%
BBB–	2.06%	2.53%	2.40%	3.00%	4.01%	3.71%	3.24%	2.40%
BBB	1.80%	2.21%	2.08%	2.58%	3.30%	3.07%	2.75%	2.01%
BBB+	1.57%	1.93%	1.80%	2.22%	2.72%	2.54%	2.33%	1.68%
A–	1.37%	1.69%	1.55%	1.91%	2.24%	2.10%	1.97%	1.40%
A	1.20%	1.48%	1.34%	1.65%	1.85%	1.73%	1.67%	1.17%
A+	1.05%	1.29%	1.16%	1.42%	1.52%	1.43%	1.42%	0.98%
AA–	0.92%	1.13%	1.00%	1.22%	1.26%	1.19%	1.20%	0.82%
AA	0.80%	0.99%	0.87%	1.05%	1.04%	0.98%	1.02%	0.68%
AA+	0.70%	0.87%	0.75%	0.90%	0.85%	0.81%	0.86%	0.57%
AAA	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

The U.S. Cost of Equity Capital Adjusted for Volatility Spreads Model

(Formula 19.5)

$$k_{local} = R_{f,u.s.} + (B_{u.s.} \times RP_{u.s.})(\sigma_{local}/\sigma_{u.s.})$$

where:

k_{local} = Cost of equity capital in local country

$R_{f,u.s.}$ = U.S. risk-free rate, adjusted if necessary for currency risk

$B_{u.s.} \times RP_{u.s.}$ = Risk premium (rates of return expressed in U.S. dollar returns) appropriate for a U.S. company in similar industry as the subject company in the local country

σ_{local} = Volatility of returns in the local country's stock market index

$\sigma_{u.s.}$ = Volatility of U.S. stock market

The U.S. Cost of Equity Capital Adjusted for Volatility Spreads Model (cont'd)

This approach has two problems:

1. The observed difference in volatilities may reflect mostly a difference in the composition of the subject country's economy (e.g., lots of natural resources but not many service businesses). This is not a country effect but an industry effect. It is incorrect to apply it to other industries.
2. This adjustment is troublesome when the investor (e.g., a multinational firm) clearly has access to global markets.

The U.S. Cost of Equity Capital Adjusted for Volatility Spreads Model (cont'd)

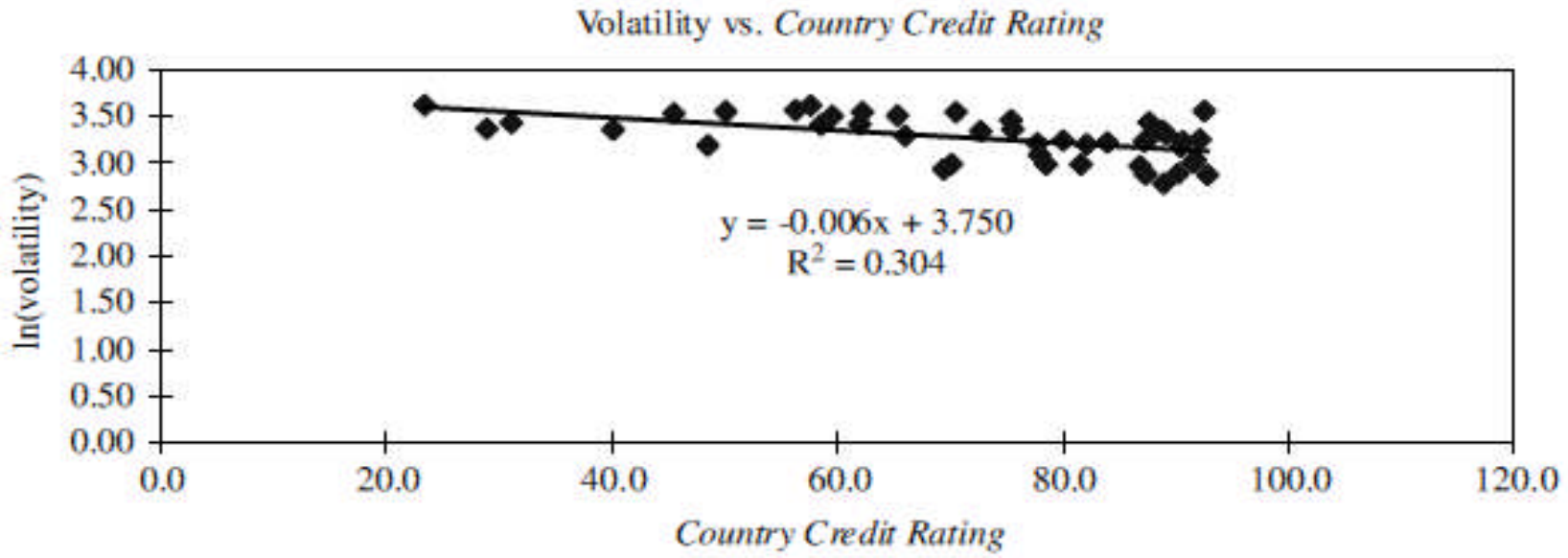


EXHIBIT 19.6 Example of Using *Country Credit Rating* to Estimate Volatility

The U.S. Cost of Equity Capital Adjusted for Volatility Spreads Model (cont'd)

EXHIBIT 19.7 Example of Estimating Relative Volatility Using Country Credit Rating

	CCR	σ	$\frac{\sigma}{\sigma_B}$
Developed Economies	80.0*	24.7†	1.00
Kazakhstan	49.8	30.3%	1.23
Jordan	45.3	31.3%	1.26

*Lowest country credit rating for 25 developed economies.
†Average standard deviation of return for stock markets in 25 developed economies; serves as base standard deviation = σ_B.

$$\text{Volatility} = \text{Exp}\left[\frac{(3.7504 - .0068 \times (\text{CCR}))}{24.69}\right]$$

Local Country Risk Exposure Model

(Formula 19.6)

$$k_{local} = R_{f,u.s.} + [B_{u.s.} \times RP_{u.s.}] + \lambda \times (CRP)$$

where:

k_{local} = Discount rate for equity capital in local country

$R_{f,u.s.}$ = U.S. risk-free rate adjusted if necessary for currency risk

$B_{u.s.} \times RP_{u.s.}$ = Risk premium (in U.S. dollars terms) appropriate for a U.S. company in a similar industry as the subject company in the local country

λ = Company's exposure to the local country risk

$CRP = [(R_{localeuroissue} - R_{f,u.s}). \times (\sigma_{stock}/\sigma_{bond})]$

$(R_{localeuroissue} - R_{f,u.s}).$ = Yield spread between government bonds issued by the local country versus U.S. government bonds

σ_{stock} = Volatility of returns in local country's stock market

σ_{bond} = Volatility of returns in local country's bond market

Country Credit Rating Method

(Formula 19.7)

$$k_{local} = \alpha + B \times \log(CCR_{local}) + \varepsilon$$

where:
k_{local} = Cost of equity capital in local country
α = Regression constant
B = Regression coefficient
CCR_{local} = Country credit rating of local country
ε = Regression error term

Alternative Risk Measures to Beta

Another model that incorporates downside risk as the measure of risk is shown in

Formula 19.8:

(Formula 19.8)

$$k_{local} = R_{f,u.s.} + (DR_j/DR_w)RP_w$$

where: k_{local} = Discount rate for equity capital in local country
$R_{f,u.s.}$ = U.S. risk-free rate
DR_j = Downside risk in the returns in the local stock market (measured in terms of U.S. dollar returns)
DR_w = Downside risk in the returns in the global ("world") stock market index (measured in terms of U.S. dollar returns)
RP_w = General market risk premium in global "world" stock market index

Political Risk Adjustment

But in emerging markets, another risk factor enters the equation: the risk of expropriation. Is adding a political risk adjustment double-counting other risks?

Political Risk Adjustment (cont'd)

Case 1: No Political Risk

- Cash flow = \$100 next year if no expropriation
- $k_{local} = 10\%$
- $PV = \$100/(1.10) = \$90.91$

In case 2, the analyst adjusts the distribution of possible net cash flows for the 5% risk of expropriation. This creates greater variability in the distribution of possible net cash flows, which in turn requires an increased cost of capital.

Case 2: 5% Chance of Expropriation (\$0 Cash Flow)

- Expected cash flow = $(.95)\$100 + (.05)\$0 = \$95$
- $k_{local} = 14\%$ due to greater risk (variability) of net cash flows
- $PV = \$95/(1.14) = \$83.33$

Finally, the analyst can determine the cost of capital that is equivalent to the value resulting in case 2. That cost of capital adjusts for the risk of expropriation (increased variance of expected net cash flows) without highlighting the issue specifically.

Case 3: Case 2 Assumptions Applied to Case 1 Cash Flows

- $PV = \$100/(1 + k_{local}) = \$83.33$
- $k_{local} = 20\%$ = Imputed local country cost of equity capital

Expanded Cost of Capital Model

If we expand the models to also reflect the size effect and specific risk, we can expand the cost of equity capital formula to add these two factors. For example, if we expand Formula 19.5, we get:

(Formula 19.9)

$$k_{local} = R_{f,u.s.} + [B_{u.s.} \times RP_{u.s.}](\sigma_{local}/\sigma_{u.s.}) + RP_s + RP_u$$

where:

k_{local} = Cost of equity capital in local country

$R_{f,u.s.}$ = U.S. risk-free rate

$B_{u.s.} \times RP_{u.s}$ = Risk premium appropriate for a U.S. company in similar industry as the subject company in the local country

σ_{local} = Volatility of returns of local country stock market

$\sigma_{u.s.}$ = Volatility of returns for U.S. stock market

RP_s = Risk premium for small size

RP_u = Risk premium attributable to the specific company (u stands for unique or unsystematic risk).

Global Cost of Capital Model
Summary

In today's economy, there is often little theoretical justification for large country risk premiums. Such risk premiums must be carefully documented and address the risks inherent in the business mix of the subject company. Expect estimates of country risk premiums to have large standard errors.

From a theoretical perspective, discrete "event" risks, such as political risk, ideally should be reflected in the expected net cash flows.

Any systematic country risk should be treated in the cost of equity capital, but there is no foolproof way to estimate the premium. Do not expect to be highly confident in most estimates of the country risk premium for developing economies. Whenever possible, treat country considerations in the net cash flow projections, and avoid allowing the discount rate to be a repository for fudge factors.

Appendix B:
The Duff & Phelps Equity Risk Premium

ERP

Methodology

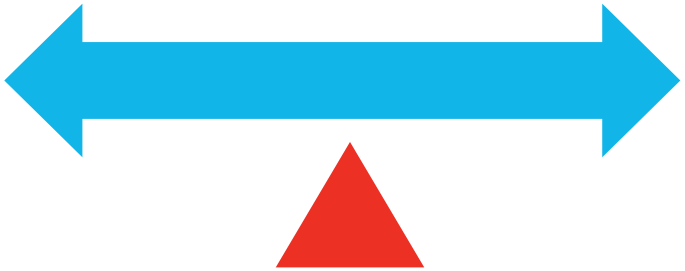
The Duff & Phelps Equity Risk Premium (ERP) Methodology is a two-dimensional process

What is a reasonable range of unconditional ERP that can be expected over an entire business cycle?

"What is the range?"

Research has shown that ERP is cyclical during the business cycle. We use the term *conditional ERP* to mean the ERP that reflects current market conditions.

"Where are we in the range?"



The Duff & Phelps Equity Risk Premium (ERP) Methodology is a two-dimensional process

Duff & Phelps regularly reviews fluctuations in global economic and financial conditions that warrant periodic reassessments of ERP.

General economic conditions. For example, Duff & Phelps increased its U.S. ERP estimate from 5.5% to 6.0% as of September 30, 2011, citing two broad areas of concern:

- Slowing growth
- Fiscal uncertainty (e.g., skepticism about governments' ability to stabilize their public debt)

More quantitative measures are also monitored, including:

- Damodaran Model

To learn more about the equity risk premium, the risk free rate, and other cost of capital related issues, visit :www.DuffandPhelps.com/CostofCapital

The Duff & Phelps Equity Risk Premium (ERP) Methodology is a two-dimensional process

Damodaran Implied ERP

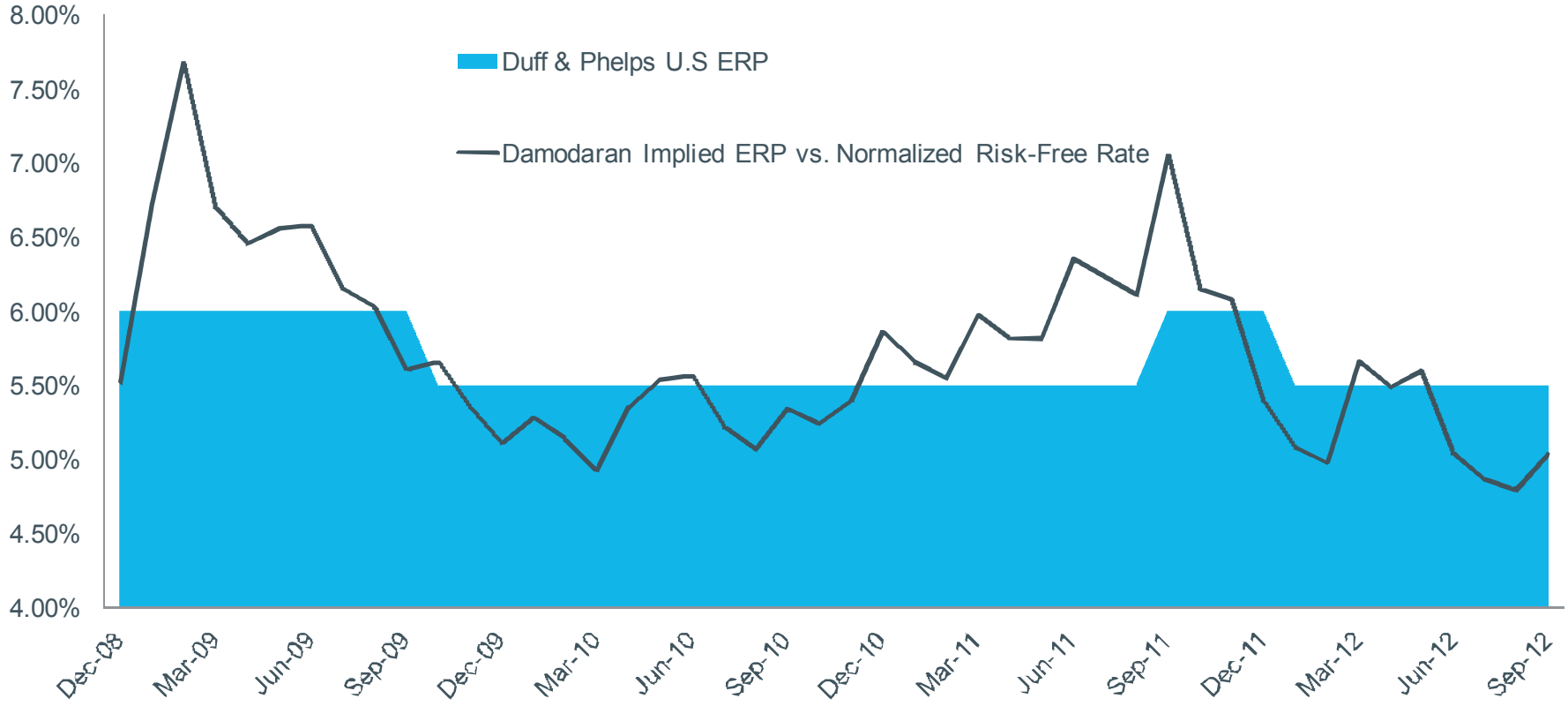
Professor Aswath Damodaran calculates implied ERP estimates for the S&P 500 and publishes his estimates on his website.

He uses a two-stage model, projecting expected distributions (dividends and stock buybacks) based on an average of analyst estimates for earnings growth for individual firms comprising the S&P 500 for the first five years and the risk-free rate thereafter (since 1985).

He solves for the discount rate, which equates the expected distributions to the current level of the S&P 500.

To learn more: Information and data available at http://pages.stern.nyu.edu/~adamodar/

The Duff & Phelps U.S. Equity Risk Premium (ERP) Methodology is a two-dimensional process



To learn more about the equity risk premium, the risk free rate, and other cost of capital related issues, visit :www.DuffandPhelps.com/CostofCapital

Cost of Capital – Equity Risk Premium(ERP)
Duff & Phelps Recommended U.S. ERP

	Duff & Phelps Recommended ERP	*Risk Free Rate*
Current ERP Guidance ✓ January 15, 2012 – UNTIL FURTHER NOTICE	5.5%	4.0% Normalized 20-year Treasury yield *
Change in Guidance September 30, 2011 – January 14, 2012	6.0%	4.0% Normalized 20-year Treasury yield *
July 2011 – September 29, 2011	5.5%	4.0% Normalized 20-year Treasury yield *
June 1, 2011 – June 30, 2011	5.5%	Spot 20-year Treasury Yield
May 1, 2011 – May 31, 2011	5.5%	4.0% Normalized 20-year Treasury yield *
December 1, 2010 – April 30, 2011	5.5%	Spot 20-year Treasury Yield
June 1, 2010 – November 30, 2010	5.5%	4.0% Normalized 20-year Treasury yield *
Change in Guidance December 1, 2009 – May 31, 2010	5.5%	Spot 20-year Treasury Yield
June 1, 2009 – November 30, 2009	6.0%	Spot 20-year Treasury Yield
November 1, 2008 – May 31, 2009	6.0%	4.5% Normalized 20-year Treasury yield *
Change in Guidance October 27, 2008 – October 31, 2008	6.0%	Spot 20-year Treasury Yield
January 1, 2008 – October 26, 2008	5.0%	Spot 20-year Treasury Yield

* Normalized in this context means that in months where the risk-free rate is deemed to be abnormally low, a proxy for a longer-term sustainable risk-free rate is used.

To learn more about the equity risk premium, the risk free rate, and other cost of capital related issues, visit :www.DuffandPhelps.com/CostofCapital

Appendix C:
The Duff & Phelps Risk Premium Report & Online Risk Premium Calculator

History of the Risk Premium Report

Published annually since 1996

…17 years and counting!


DUFF & PHELPS

Risk Premium Report 2012

Inside

Who Should Use the Duff & Phelps Risk Premium Report

1. Professional Valuation Practitioner
2. Corporate finance officers
4. Investment bankers
5. CPAs
6. Judges and attorneys

History of the Duff & Phelps Risk Premium Report

Why it is important to use more than a SINGLE measure of size

- Bias may be introduced when ranking companies by market value
- Market capitalization may be an imperfect measure of the risk of a company's operations
- Eliminates "circularity issue"
- It is generally better to approach things from multiple directions if at all possible

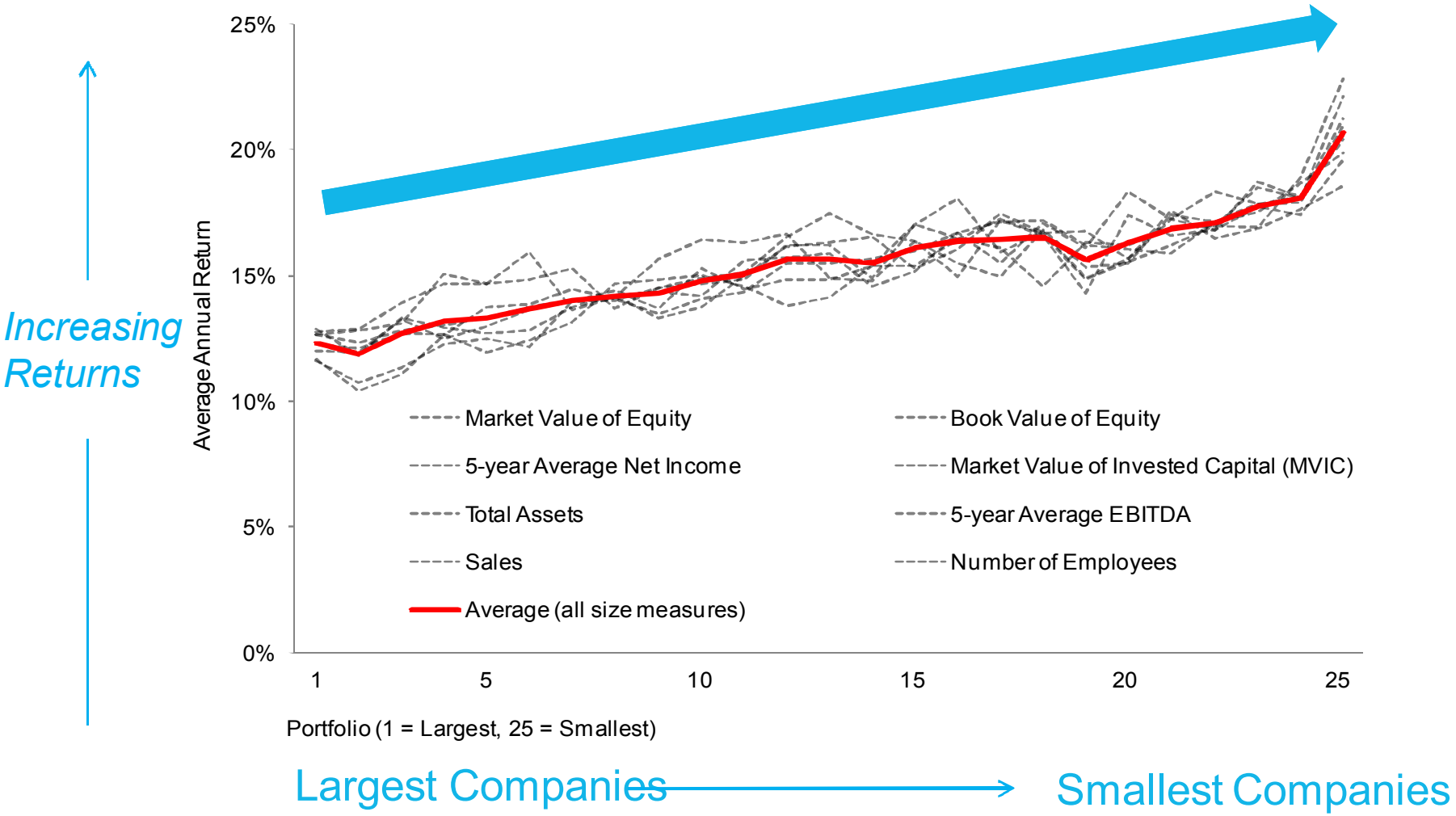
Duff & Phelps Risk Premium Report and Calculator

The *Report* includes:

- The Size Study
- The Risk Study
- The High-Financial Risk Study

The Duff & Phelps Risk Premium – Size Study

As Size Decreases, Returns (and Risk) Tend to Increase



The Duff & Phelps Risk Premium – Size Study Reasons for Using Additional Measures of Size

Market cap is not always available

Low market cap does not necessarily mean "small"

Removes the "circularity" problem

It's just good practice

The 2012 Duff & Phelps Risk Premium Report is available for purchase through Business Valuation Resources, ValuSource, and Morningstar. For purchasing information please visit www.DuffandPhelps.com/CostofCapital

The Duff & Phelps Risk Premium – Risk Study

As Risk Increases, Returns (and Risk) Tend to Increase

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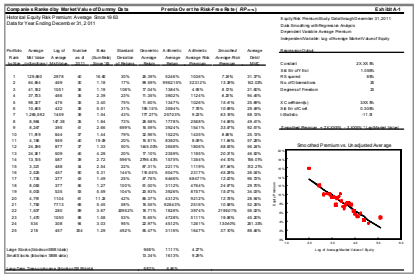
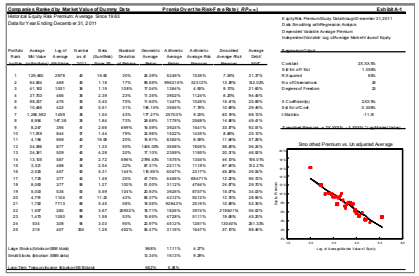
Duff & Phelps Risk Premium Report – Using the Report

Example: CAPM, the eight "B" Exhibits

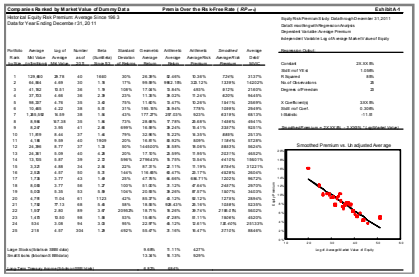
B-1: Market Value



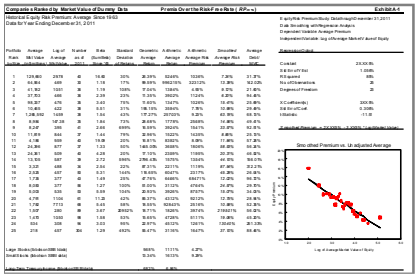
B-2: Book Value



B-3: Net Income

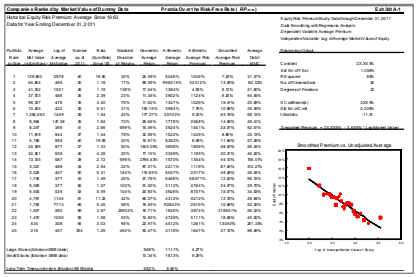


B-4: MVIC

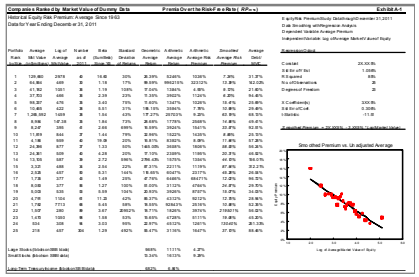


The "B" Exhibits are where you find Size Premia for use in the CAPM model.

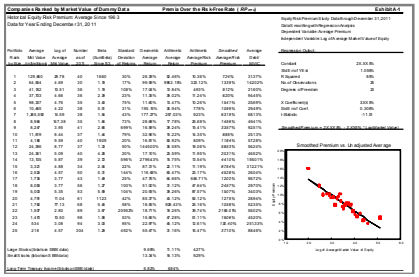
B-5: Total Assets



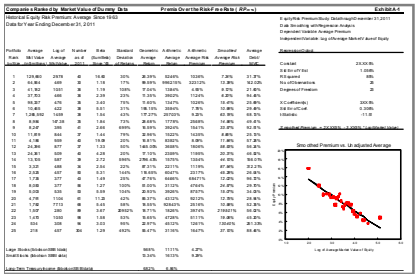
B-6: EBITDA



B-7: Sales



B-8: Employees



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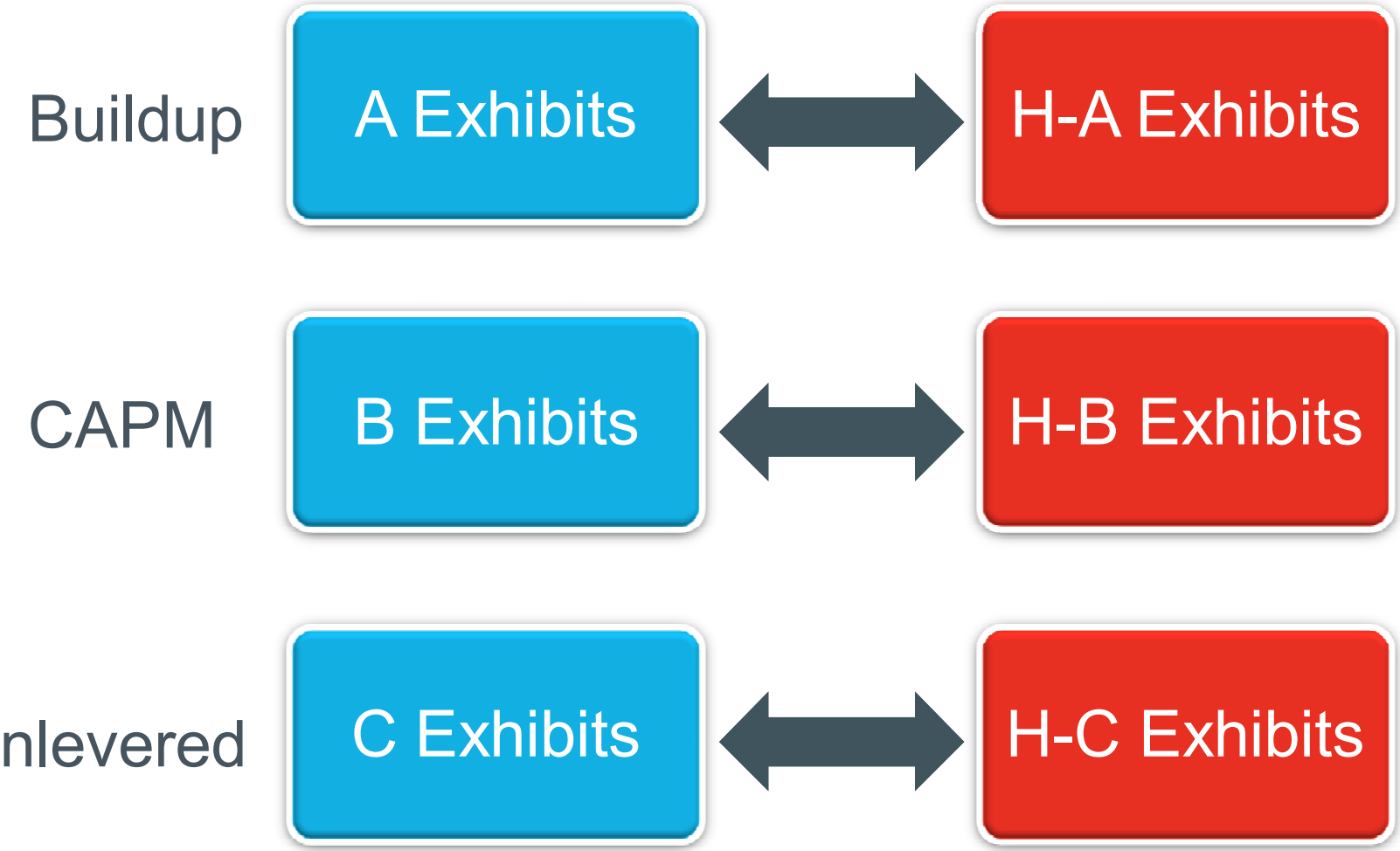
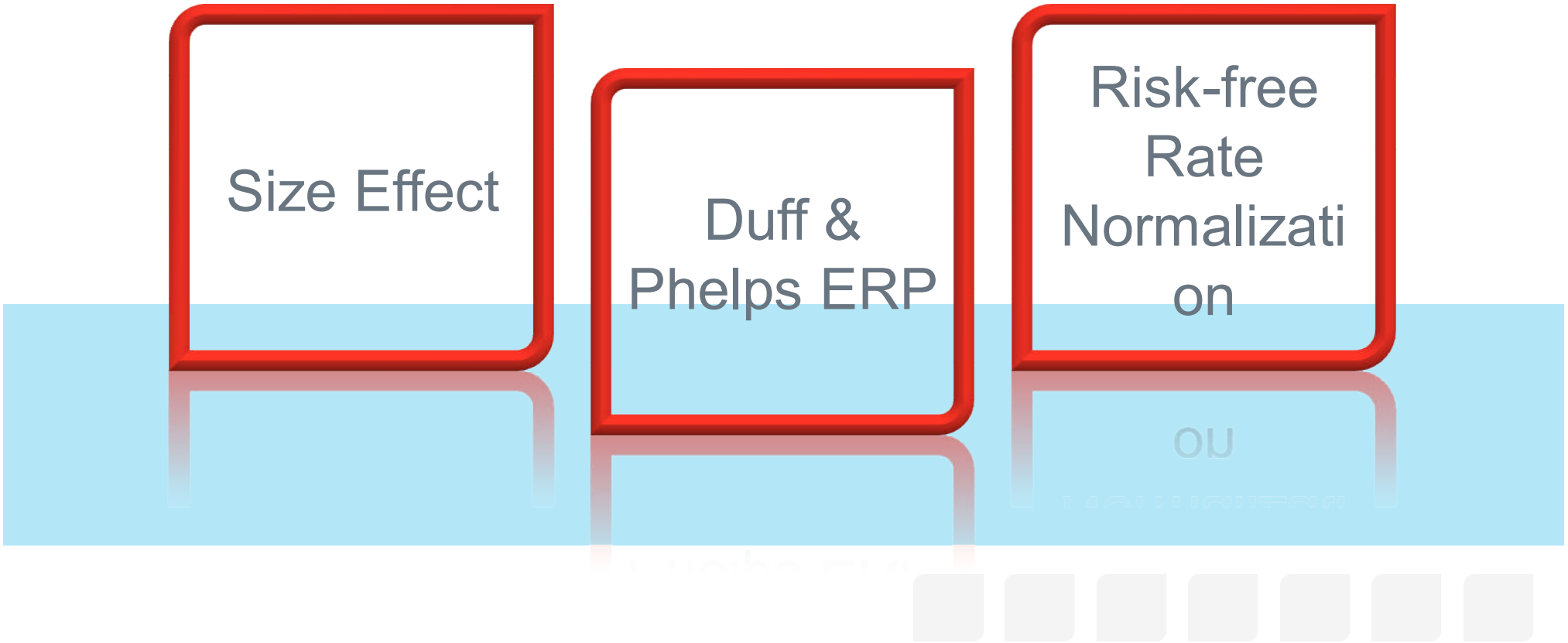
The Duff & Phelps Risk Premium – High-Financial-Risk Study

The High-Risk Equivalents of the A, B, and C Exhibits



New in the 2012 Risk Premium Report



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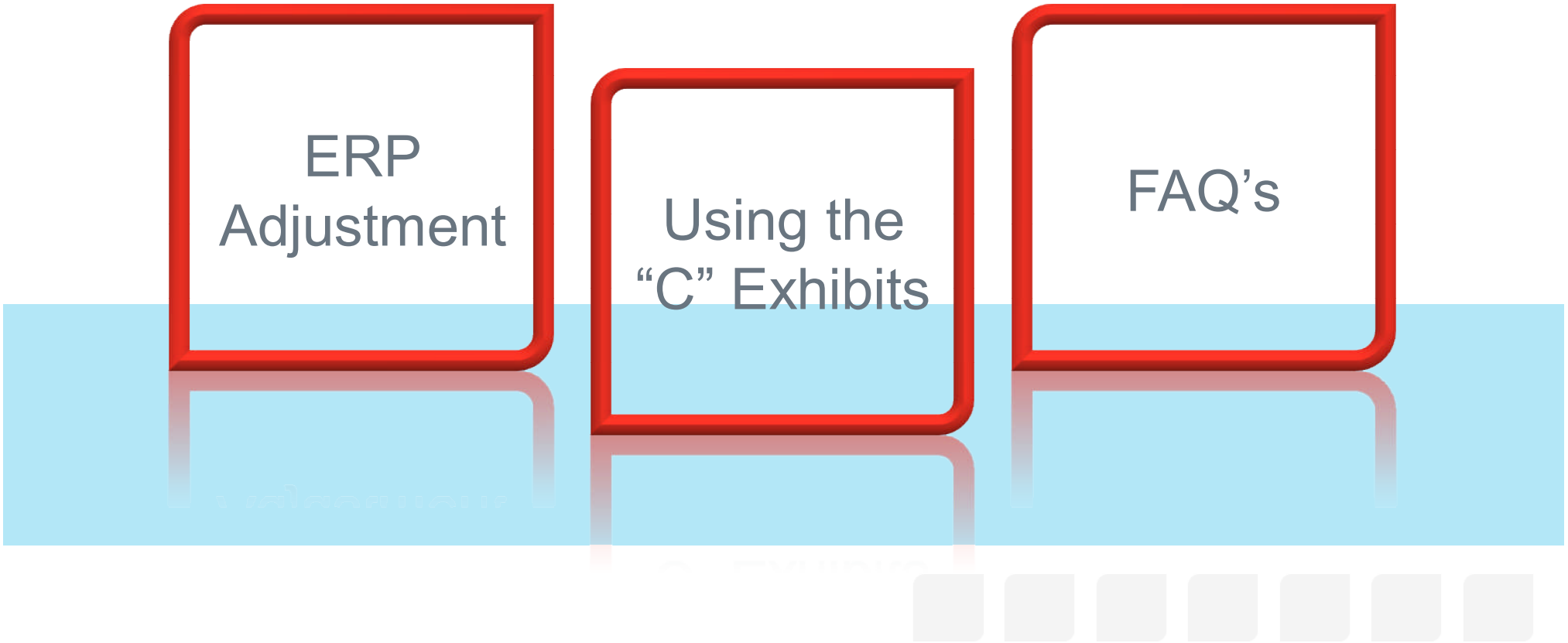
New in the 2012 Risk Premium Report



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The Duff & Phelps Risk Premium Calculator
Four Simple Goals

Easy to use


Automatic output


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1996–2011

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Risk Premium Report 2012

Inside

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The Duff & Phelps Risk Premium Calculator

Executive Summary (in Microsoft Word Format)
Fully customizable to suit individual needs
Full Audit Trail
Detailed Data Sourcing
Summary of User Inputs used in calculations
Concluded range of COE estimates analysis (both from *Size Study* and *Risk Study*)

Support and Detail Workbook (in Microsoft Excel Format)
Full Audit Trail (summary of all inputs and calculations)
Automatic mapping of subject company's size measures
Detailed explanation of "company-specific" risk adjustment
Includes a table of content, section divider tabs, ready for print

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For purchasing information please visit www.DuffandPhelps.com/CostofCapital

The Duff & Phelps Risk Premium Calculator

Executive Summary
Cost of Equity Capital Summary
Size Study
- Buildup 1
- Buildup 2
- Capital Asset Pricing Model (CAPM)

Risk Study
- Buildup 3

Summary Table of User Inputs
Summary Table of All COE Models
Conclusion of Cost of Equity Capital Range

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The Duff & Phelps Risk Premium Calculator

Support and Detail Workbook
Summary of User Inputs – Size and Risk Studies
Cost of Equity Capital Estimates – Size Study
- Summary of all Size Study Models
- Buildup 1 Model
- Buildup 2 Model
- CAPM Model
- Unlevered Model

Cost of Equity Capital Estimates – Risk Study
- Buildup 3 Model
- Company-Specific Risk: Indication of Direction

Exhibits Summary
- Exhibits A (Risk Premia Over Risk-Free Rate)
- Exhibits B (Risk Premia Over CAPM)
- Exhibits C (Comparative Risk Characteristics)
- Exhibits D (Company-specific Risk)

High Financial Risk Study
- Survey Question to indicate high financial risk
- Altman z-Score Testing
- Exhibit H (High-Financial-Risk Premia Over Risk Free-Rate)

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Duff & Phelps Risk Premium Report & Calculator™ – General Information

The Duff & Phelps Risk Premium Report

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Duff & Phelps, LLC
311 South Wacker Drive
Suite 4200
Chicago, IL 60606
(312) 697-4600
www.duffandphelps.com

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Thank You!

Roger.Grabowski@duffandphelps.com

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Organismo Italiano di Valutazione

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