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Cost of Capital Estimation in Emerging Markets
What you need to know

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Contents

Cost of Capital Estimation in Emerging Markets:

What you need to know

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Introduction

Practitioners typically are confronted with this situation: "I know how to value a business in my country, but this one is in Country X, a developing economy. What should I use for a discount rate?" The basic insight of capital market theory, that expected return is a function of market risk, still holds when dealing with cost of equity capital in a global environment.

Estimating a proper cost of capital in developed countries, where a relative abundance of market data and comparable companies exists, requires a high degree of expertise. Estimating cost of capital in less-developed (i.e. "emerging") countries can present an even greater challenge, primarily due to lack of data (or poor data quality) and the potential for magnified financial, economic, and political risks. A good understanding of cost of capital concepts is, therefore, essential information for executives making global investment decisions.

This article provides a brief overview[1] of:

- The risks to consider when investing globally

- International cost of capital models

- The relative risk and reward of Europe

- Diversification and cost of capital

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[1] For a detailed discussion of international cost of capital and valuation issues, please see Dr. Shannon P. Pratt and Roger J. Grabowski, *Cost of Capital: Applications and Examples*, 4th ed. (John Wiley & Sons, September, 2010); Chapter 19, "Global Cost of Capital Issues".

Risks to Consider When Investing Globally

Financial, economic, and political risks

must be considered when planning international acquisitions, divestitures, and projects.

Within an increasingly globalized world economy, some may argue that country-specific risks have been reduced, but it would probably be far too ambitious (and possibly ill-advised) to make decisions without considering the very real differences that continue to exist between economies.

For example, in one study the authors decomposed equity returns into cash flow and cost of capital components and found that variations in industry cash flows explain 72 percent of the variation of individual country cash flows, and changes in drivers of industry cost of capital explain 78 percent of individual country costs of capital[2].

If understood, differences between economies can be planned for and considered in the structure of an investment well in advance. If not understood, these differences can result in unwise investments being pursued – or turn an otherwise sensible investment into a bad one.

The risks associated with international investing can largely be characterized as *financial*, *economic*, or *political*. Many of these are the types of risks associated with investing in general – the possibility of loan default, the possibility of delayed payments of suppliers' credits, the possibility of inefficiencies brought about by the work of complying with unfamiliar (or burdensome) regulation, differences in information availability, and liquidity issues, to name just a few. Some risks, however, are typically associated more with global investing – currency risk, lack of good accounting information, poorly developed legal systems, and even expropriation, government instability, or war.

Currency Risk

Currency risk may be one of the most familiar risks associated with international investing, but currency risk may also be misunderstood in some instances. Currency risk is the *financial* risk that exchange rates (the value of one currency versus another) will change unexpectedly.

When a French investor invests in Brazil, he or she must first convert Euros into the local currency, in this case the Brazilian Real (BRL). The returns that the French investor experiences (in local currency terms) are identical to the returns that a Brazilian investor would experience[3], but the French investor faces an additional risk in the form of currency risk when returns are "brought home" and must be converted back to Euros. Expected changes in exchange rates can often be hedged. But if the Euro has unexpectedly[4] increased in

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[2] Kent Hargis and Jianping Mei, ''Is Country Diversification Better Than Industry Diversification?'' European Financial Management 12(3) (June 2006): 319–340.

[3] For this example, we assume that the French and local investor are both subject to the same regulations, taxes, and local risks when investing in the same local asset.

[4] We say "unexpectedly" for a reason. If the investor had been able to predict (at the time of investing) the precise exchange rate at which he or she would be repatriating his or her returns, it is assumed that these "expected" changes to the exchange rate would have been reflected in the expected cash flows of the investment at inception.

value versus the Real, the French investor will be able to purchase fewer Euros for each Real he made in the Brazilian investment when returns from the investment are repatriated, and his return is diminished[5]. Conversely, had the Euro unexpectedly decreased in value versus the Real, the French investor would be able to purchase more Euros for each Real he made in the Brazilian investment when returns from the investment are repatriated, and his return would be enhanced. Even when currency hedging is used, exchange rate risk often remains.

For example, in 2007, Brazilian equities returned an astonishing 50 percent return in local terms (see Table 1). Because the Euro decreased in value versus the Real in 2007, French-based investors in Brazilian stocks experienced a higher return (62 percent) when they repatriated their returns and converted them to Euros. Similarly, in 2009 the Euro depreciated relative to the South African Rand, and French-based investors realized higher returns once again versus the local South African investors. It is important to note that currency conversion effects can also work to diminish returns – for example, French investors in Japan would have experienced a lower return than their Japanese counterparts in 2009 due to the Euro's appreciation relative to the Yen.

Table 1: Currency Conversion Effects[6]

		Return in Local Terms	Return to French Investors (EUR)	Currency Conversion Effect
2007	Brazil (BRL)	50%	62%	12%
2009	South Africa (ZAR)	26%	53%	27%
2009	Japan (JPY)	9%	3%	-6%

A common misstep we often encounter is companies constructing forward-looking budgets or projection analyses in local currencies, and then converting these projections to the currency of the parent company using the spot rate.

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[5] For example, say the French investor had made a 10 percent return in local (Brazilian) terms on his investment in a given year, but the Euro had increased by 3 percent in value relative to the Real over the same period. When the returns are repatriated, the French investor's overall return is diminished to approximately 6.7 percent [(1+10%)*(1-3%)-1]. Conversely, had the Euro decreased in value versus the Real by 3 percent, the repatriated returns would be enhanced to approximately 13.3 percent [(1+10%)*(1+3%)-1].

[6] Table 1 data source: Morgan Stanley Capital International (MSCI) Brazil, South Africa, and Japan indices. For more information, visit http://www.mscibarra.com/products/indices/.

This is not correct. Projections, which are inherently forward-looking, need to embody expected or forward currency conversion rates. We are interested in currency risks over the period of the projected net cash flows, not just in the spot market. Even then, these are merely estimates of future currency exchange rates and the actual exchange rate can vary from these estimates.

Does currency risk affect the cost of capital? One team of researchers found that emerging market exchange risks have a significant impact on risk premiums and are time-varying (for countries in the sample). They found that exchange risks affect risk premiums as a separate risk factor and represent more than 50 percent of total risk premiums for investments in emerging market equities. The exchange risk from investments in emerging markets was found to even affect the risk premiums for investments in developed market equities[7].

Other Risks

In addition to financial risks, global investors may be exposed to *economic* risks associated with international investing. These risks may include the volatility of a country's economy as reflected in the current (and expected) inflation rate, the current account balance as a percentage of goods and services, burdensome regulation, and labor rules, among others. In the current environment, an economic risk that has come to the forefront is the sovereign debt crisis. The recent crisis in Greece, for example, has prompted many governments to re-think their own fiscal policies, as it becomes evident that current debt loads are unsustainable in many of these countries.

Graph 1: 2009 Government Debt to GDP (in percent)[8]

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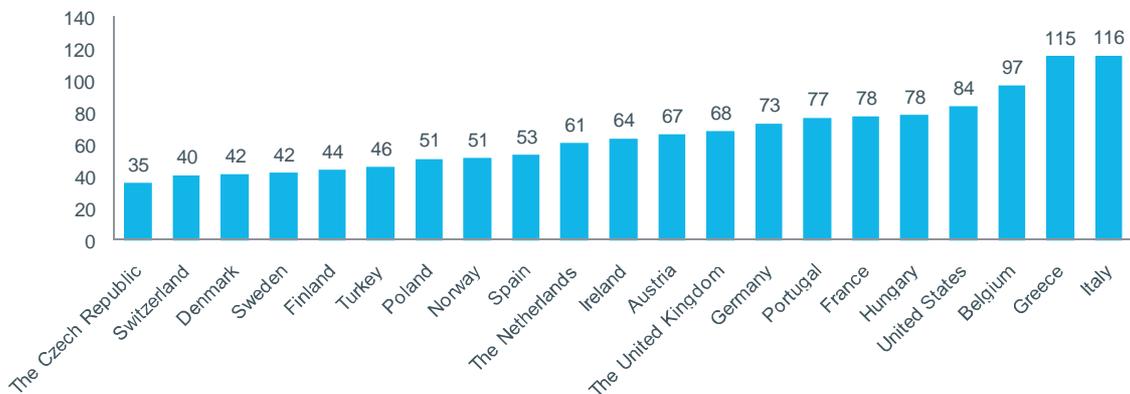
[7] Francesca Carrieri, Vihang Errunza, and Basma Majerbi, ''Does Emerging Market Exchange Risk Affect Global Equity Prices?'' Journal of Financial Quantitative Analysis (September 2006): 511–540.

[8] Source: European Economic Forecast – Spring 2010; European Commission (Luxembourg: Publications Office of the European Union, 2010).

There are real costs that tend to go hand-in-hand with unsustainable debt levels. Lenders may demand a higher expected return to compensate them for additional default risk. Governments may decide to increase the money supply in an effort to inflate their way out of debt. Ultimately, some governments may decide on outright currency devaluation or even a repudiation of debt. These risks are not entirely limited to developing countries, but developing countries may be more willing to resort to these extreme measures than developed countries.

Political risks can include government instability, expropriation, bureaucratic inefficiency, corruption, and even war. A recent example of political risk is Venezuela's expropriation of various foreign-owned oil, gas, and mining interests. These actions tend to reduce Venezuela's attractiveness to foreign investors, who will likely demand a significantly higher expected return in exchange for future investment – in effect raising their cost of capital estimates for projects in Venezuela.

Cost of Capital Models

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 regard to companies operating in developing economies.

The economies of developed countries are generally highly integrated into the global economy (a significant portion of input and output of the economy is sourced and sold internationally versus locally sourced and sold). In this context, it is reasonable to expect that companies or projects with similar risks would require similar costs of capital. However, when choosing models for estimating the cost of equity capital for a company or project in a less developed or developing country (which may be less integrated in the regional or world economy), local market volatility may become more important. We present a brief overview of models commonly used for estimating the cost of equity capital in international settings. None are perfect; it is nonetheless important to understand the strengths and limitations of each in order to make well-informed choices when developing cost of capital estimates for global investments.

A key issue in choosing a global cost of capital model:

How integrated is the economy?

Table 2 presents a summary of the general strengths and weaknesses of various international cost of equity capital models. In cases where countries lack stock and/or bond market return data, or yields on government debt denominated in "home" currencies, it may be appropriate to correlate the subject country's credit (or risk) rating with ratings of other countries that do have these metrics[9].

Are country risk rankings useful in measuring country-specific risks? Research correlating risk ratings and cost of capital in countries with stock markets categorized into developed versus emerging indicates that:

a. The lowest-rated countries tend to have the highest equity return volatilities; and

b. Country risk is priced in emerging markets.

This research concludes that the greater the financial and economic risks, the greater the returns demanded by the market; similarly, the greater the risk of government instability and internal conflict, the greater the returns demanded by the market[10]

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[9] Country risk ratings are available from *Institutional Investor's* Country Credit Rating, *Euromoney's* Country Risk Ratings, or *Political Risk Services'* International Country Risk Guide.

[10] Campbell R. Harvey, "Country Risk Components, the Cost of Capital, and Returns in Emerging Markets," Fuqua School of Business NBER Working paper, November 2004. Available at http://ssrn.com/abstract=620710.

Table 2: A Comparison of International Cost of Capital Models

International Cost of Capital Model	Strengths	Potential Weaknesses
Global CAPM Model	Can work well if country is integrated and/or the subject company operates in many countries.	Assumes away meaningful differences across countries Generally requires the "local" country to have a history of bond market and stock market returns
Single Country CAPM Model	Allows more local factors to be introduced.	Does not work well in emerging markets. Generally requires the "local" country to have a history of bond market and stock market returns
Nested Global CAPM Model	Introduces a measure of a country's covariance with its region (in addition to a measure of a country's covariance with the world).	Complexity Generally requires the "local" country to have a history of bond market and stock market returns Requires proxies to measure covariances
Damodaran Model[11]	Introduces a measure of economic integration at the company level.	Complexity Generally requires the "local" country to have a history of bond market and stock market returns
Yield Spread Model	Intuitive / easily implemented	Requires that the "local" government issues debt denominated in the "home" government's currency.[12] May double count (or underestimate) *business* cash flow risks.
Relative Volatility Model	Intuitive / easily implemented	Does not work well in countries that do not have well-diversified stock markets. Requires the "local" country to have a history of stock market returns.[13]
Country Credit Rating Model	Intuitive / It can be applied to a significant number of countries	Complexity to implement Requires access to quality stock market return data from a large number of countries.

[11] Aswath Damodaran, *Investment Valuation*, 2nd ed. (Hoboken, NJ: John Wiley & Sons, 2002), 204–206; and Aswath Damodaran, *Damodaran on Valuation*, 2nd ed. (Hoboken, NJ: John Wiley & Sons, 2006), 59–61; and Aswath Damodaran, ''Measuring Country Exposure to Country Risk: Theory and Practice,'' Stern School of Business Working paper, September 2003. Available at http://ssrn.com/abstract=889388.

[12] In such cases it may be appropriate to regress the yields of countries where such bonds *are* issued (as the dependent variable) against the *Institutional Investor* Country Credit Rating (CCR) (as the independent variable), and then use the regression outputs to forecast a yield for countries where such bonds *are not* issued (assuming that the country has a CCR).

[13] In such cases, it may be appropriate to regress the standard deviation of equity returns of countries where equity returns exist as the dependent variable against the Institutional *Investor Country* Credit Rating (CCR) as the independent variable, and then use the regression outputs to forecast a standard deviation of equity returns for countries where equity returns do not exist (assuming that the country has a CCR).

The Relative Risk and Reward of Europe

Table 3 displays the average annual equity return, as well as the highest and lowest annual equity return for European countries since 2001; Table 4 (on next page) displays the same analysis for emerging market countries.

Note that the median (typical) equity return tends to be higher in emerging market countries, but the returns are also more volatile, as reflected in the median standard deviation.

Table 3: Europe: Range of Equity Returns 2001–2009 (in percent); Currency = €[14]

	Arithmetic Mean (%)	Highest Return (%)	Lowest Return (%)	Standard Deviation (%)
Norway	17.3	82.7	-62.0	42.3
Austria	13.8	59.9	-66.6	37.8
Spain	10.0	40.6	-37.0	27.7
Denmark	8.9	44.4	-44.6	29.9
Sweden	7.3	60.7	-46.5	37.9
Greece	5.1	41.0	-64.3	37.5
Belgium	4.9	53.6	-64.4	36.0
Portugal	4.5	37.3	-49.3	29.0
Germany	4.1	37.1	-43.1	30.7
Switzerland	2.3	35.0	-26.3	21.4
France	2.0	29.1	-39.8	26.0
Netherlands	1.8	38.6	-45.2	28.3
UK	1.7	38.9	-45.7	26.3
Italy	1.1	24.3	-46.6	25.6
Ireland	-2.9	32.8	-70.3	34.9
Finland	-3.4	35.7	-52.3	32.4
► Median	4.3	38.7	-46.6	30.3

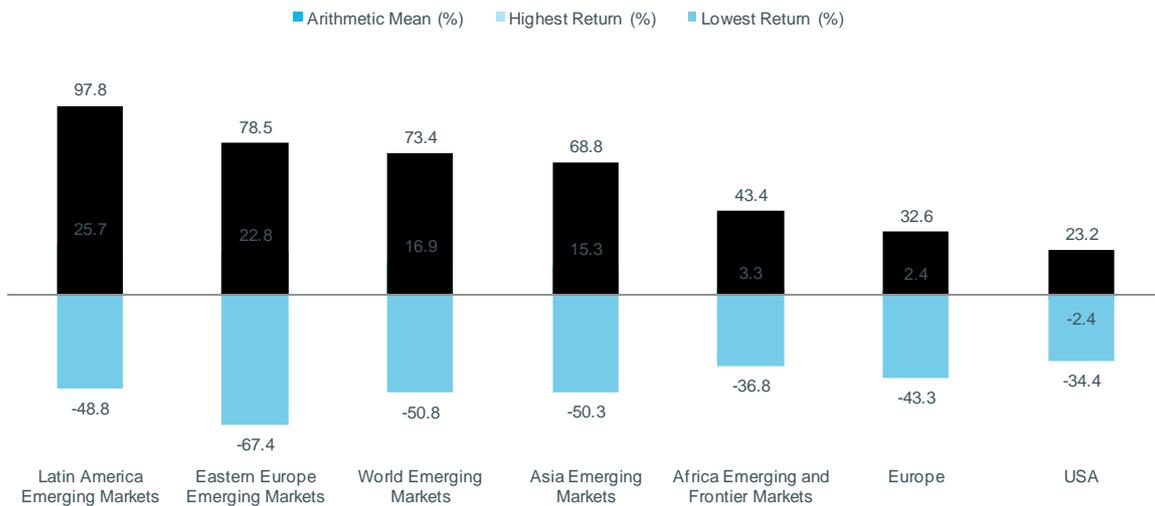[14] Table 3, Table 4 data source: Morgan Stanley Capital International (MSCI) indices. For more information, visit http://www.mscibarra.com/products/indices/.

Table 4: Emerging Markets: Range of Equity Returns 2001–2009 (in percent); Currency = €

	Arithmetic Mean (%)	Highest Return (%)	Lowest Return (%)	Standard Deviation (%)
Colombia	46.4	139.1	-21.2	55.5
Egypt	39.1	201.4	-49.9	78.8
Indonesia	33.7	120.5	-53.9	46.9
Peru	33.4	75.6	-37.0	37.5
Brazil	32.6	121.5	-53.8	59.4
Russia	31.7	100.2	-72.5	54.8
Czech Republic	27.9	73.8	-39.8	34.1
India	24.4	96.5	-62.8	48.0
China	23.9	148.7	-59.8	73.4
Turkey	22.1	92.3	-60.1	60.8
Thailand	22.1	103.5	-45.6	44.0
Korea	21.4	82.1	-52.7	41.6
Hungary	18.8	78.6	-59.5	41.4
Chile	17.8	80.9	-32.0	37.1
Mexico	17.6	71.8	-40.0	35.7
South Africa	14.7	52.9	-34.7	28.1
Morocco	12.0	50.8	-22.3	24.6
Poland	10.6	49.9	-52.1	34.3
Philippines	10.3	62.7	-49.4	44.5
Malaysia	9.8	47.3	-38.2	25.3
Taiwan	7.0	74.6	-43.1	34.5
► Median	22.1	80.9	-49.4	41.6

Referring to Graph 2, it is apparent that on a regional basis, emerging markets outperformed Europe (and also the USA) over the period 2001–2009 in Euro-terms. Once again, this outperformance was accompanied by significant volatility.

Graph 2: Average Annual, Highest Annual, and Lowest Annual Equities Return (in percent); 2001–2009; Currency = €[15]

■ Arithmetic Mean (%) ■ Highest Return (%) ■ Lowest Return (%)

	Latin America Emerging Markets	Eastern Europe Emerging Markets	World Emerging Markets	Asia Emerging Markets	Africa Emerging and Frontier Markets	Europe	USA
Highest Return	97.8	78.5	73.4	68.8	43.4	32.6	23.2
Arithmetic Mean	25.7	22.8	16.9	15.3	3.3	2.4	-2.4
Lowest Return	-48.8	-67.4	-50.8	-50.3	-36.8	-43.3	-34.4

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[15] The returns presented in Graph 2 are arithmetic mean returns, not geometric (compound) returns. Graph 2 data source: Morgan Stanley Capital International (MSCI) indices. For more information, visit http://www.mscibarra.com/products/indices/.

Graph 3 indicates that a European investor would have done very well by investing in emerging markets in the 2000s. While an investment of 1.00 € in the USA on December 31, 2000 would have decreased to 0.71 € by August 31, 2010 (due in part to the general appreciation of the Euro versus the U.S. dollar over this period), an investment of 1.00 € in Latin American emerging markets would have increased to 4.39 € over the same time period.

Graph 3: Ending Index Values as of August 2010; Index (Year-End 2000 = 1.00€)[16]

■ January 2001–August 2010
Ending Index Value

Latin America Emerging Markets	4.39 €
Eastern Europe Emerging Markets	3.18 €
World Emerging Markets	2.79 €
Asia Emerging Markets	2.58 €
Europe	1.05 €
Africa Emerging and Frontier Markets[17]	0.92 €
USA	0.71 €

[17]

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[16] The ending index values in Graph 3 represent the growth of 1€ invested on December 31, 2000 and held through August 31, 2010 (116 monthly periods) in each of the respective indices (with the exception of Africa, which had data from December 2007–present), using $V_n = V_0[\prod(1 + r_t)]$; where V_n is the index value at end of period n, V_0 is the initial index value at time **0**, and r_t is the return in period **t**. Graph 3 data source: Morgan Stanley Capital International (MSCI) indices. For more information, visit http://www.mscibarra.com/products/indices/.

[17] Africa had data available from December 2007–present only. Data source for Africa markets: MSCI Emerging and Frontier Markets (EFM) Africa.

Diversification and the Cost of Capital

Opportunities for international investing (and the ease of investing internationally) have increased dramatically in the last 50 years. International diversification can lower the volatility of investors' portfolios, which in theory could lower the required rate of return of the portfolio.

Table 5: Cross Correlations of Historical Monthly Returns; January 1988–August 2010; Currency = €[18]

	Europe	Emerging Markets	USA
Europe	1.00	—	—
Emerging Markets	0.70	1.00	—
USA	0.78	0.69	1.00

Table 5 is a correlation matrix for European, emerging market, and USA historical returns measured over the period January 1988–August 2010. The less correlated, the greater the potential for diversification benefits (higher returns or lower risk). European returns were less correlated with emerging market returns than with USA returns (0.70 vs. 0.78), and thus had the potential of offering greater diversification benefits to European investors than did U.S.-based investments.

A possible side effect of diversification benefits is a downward adjustment to the cost of capital. Several authors suggest that the cost of capital for companies operating in international markets may be lower than companies that do not operate internationally[19].

It is important to note that when measured over more recent periods, emerging markets still seem to offer greater potential for diversification benefits to European investors than does the USA, but the gap has narrowed, as illustrated in Graph 4. It is too early to definitively say if the narrowing is a fundamental change in pattern, or merely a temporary blip.

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[18] Table 5 data source: Morgan Stanley Capital International (MSCI) indices. For more information, visit http://www.mscibarra.com/products/indices/.

[19] See for e.g., Kate Phylaktis and Lichuan Xia, "Sources of Firm's Industry and Country Effects in Emerging Markets," *Journal of International Money and Finance* (2005): 459−475; and Gikas Hardouvelis, Dimitrious Malliartopulos, and Richard Priestly, "The Impact of Globalization on the Equity Cost of Capital," Working paper, May 9, 2004.

Graph 4: Rolling 120-month Correlations: European and Emerging Market Equity Returns, European and USA Equity Returns[20]

120-Month Period Ending

[20] Graph 4 data source: Morgan Stanley Capital International (MSCI) indices. For more information, visit http://www.mscibarra.com/products/indices/.

Conclusion

In today's global economy, there may less theoretical justification for country risk premiums than may have been warranted even a few decades ago , but these risks still exist in the real world. It would be unwise to make investment decisions without considering them.

Country risks are real

It would be unwise to make investment decisions without considering them.

Any systematic country risk should be reflected in the cost of equity capital, but there is no universally accepted means to estimate this risk premium. Do not anticipate a high level of confidence in most estimates of the country risk premiums for developing economies, as no model is perfect. Do, however, expect estimates of country risk premiums to have large standard errors[21]. Whenever possible, reflect country specific considerations in the cash flow projections, and avoid relying on the discount rate to absorb an excess amount of the risk. Such risk premiums must be carefully documented and address the risks inherent in the operations of the subject company.

Country risks are real. There have been many unexpected changes in risks since the crisis of 2007−2010 began and we expect those uncertainties to continue, thereby impacting the appropriate cost of capital.

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[21] Standard error can be decreased by increasing the number of observations. This indicates that it could be beneficial to develop country premia by employing multiple models.

Appendix:
MSCI Index
Constituents

MSCI Europe	MSCI EFM Africa	MSCI World EM	MSCI EM Latin America
Austria	Egypt	Brazil	Brazil
Belgium	Kenya	Chile	Chile
Denmark	Mauritius	China	Colombia
Finland	Morocco	Colombia	Mexico
France	Nigeria	Czech Republic	Peru
Germany	South Africa	Egypt	
Greece	Tunisia	Hungary	
Ireland		India	
Italy	**MSCI EM Asia**	Indonesia	
Netherlands	China	Korea	
Norway	India	Malaysia	
Portugal	Indonesia	Mexico	
Spain	Korea	Morocco	
Sweden	Malaysia	Peru	
Switzerland	Philippines	Philippines	
United Kingdom	Taiwan	Poland	
	Thailand	Russia	
MSCI EM Eastern Europe		South Africa	
Czech Republic		Taiwan	
Hungary		Thailand	
Poland		Turkey	
Russia			