Country Risk Premiums & Cost of Equity

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ABSTRACT

Investments outside of the U.S. and western Europe may be subject to incremental political, legal, and regulatory risk, including expropriation risk. When the capital markets of the foreign investment are not fully integrated with the U.S. or western Europe markets, localized risks must be accounted for either in the cash flow analysis of a valuation or in the discount rate. This paper describes how country risk may be quantified and incorporated into a discount rate for valuation or regulatory purposes.

1. INTRODUCTION

If capital markets were completely integrated, location-specific risks would be diversifiable and therefore not compensated by the capital market. However, when capital markets are not integrated—that is, when the marginal investor cannot hold a global portfolio—or when capital markets are poorly integrated, investors may require asset returns that compensate them for bearing country-specific risk. This paper discusses country risk, in non-integrated capital markets, how it has been measured, and how it affects the capital costs of foreign investments.[1]

In Section 2, I describe country risk and discusses why it is unlikely to disappear even as connectivity and trading technologies improve. In Section 3, I provide context for country risk in an overall cost-of-equity rate. In Section 4, I discuss some of the more popular ways that practitioners quantify country risk for purposes of modifying a U.S.- (or western Europe-) based cost of equity computation for the average stock. In Section 5, I discuss how to modify the Country Risk Premium (CRP) result when the foreign project bears more (or less) localized risk than does the average firm in the country. Finally, in Section 6, I discuss the adjustment needed to ensure that currency risk is eliminated from the country risk analysis.

2. WHAT IS COUNTRY RISK?

The concept of country risk originated with investors concerned about pricing sovereign debt.[2] Lenders wanted compensation for the risk of loss from a potential sovereign default. The idea of incremental required compensation due to localized economic and political conditions applies to private-sector equity investments as well. Here, the goal is to identify metrics that price out the risk of non-diversifiable macroeconomic events

1 For convenience, "foreign" refers to an investment outside the U.S. and "domestic" refers to an investment made in the U.S.

2 "In the literature of risk management various researchers have defined country risk differently." See, Batool K. Asiri and Rehab A. Hubail, "An Empirical Analysis of Country Risk Ratings,", Journal of Business Studies Quarterly, v5,n4, 2014, pp. 52-67 at 54.

or public interventions (such as expropriation) that would compromise the value of an asset that is located in, or doing business with, a particular foreign market.

A Country Risk Premium represents the increment to the discount rate that captures this non-diversifiable localized risk. The CRP is used to modify the cost-of-equity results that are based on a set of U.S. (or EU) firms that are in, and sell primarily to, U.S. (or EU) markets.[3] A CRP adder is not called for if (1) if the foreign country's sovereign bond yield (in local currency) were used as the risk-free rate and (2) if the Market Risk Premium were derived from foreign country stock market data, provided that reliable data existed. However, as I will discuss, foreign capital markets can provide unreliable risk data due to illiquidity. As a result, practitioners use the more liquid U.S. (or EU) capital market data to estimate a foreign project's cost of capital, and then adjust the result for country risk. But-for its location or target market, the foreign project is assumed to have the same operating and financial characteristics as the comparable U.S. firms on which the cost-of-equity calculation is based.[4]

The term country risk typically comprises several economic and social factors:[5]

- Political instability and turmoil;
- Regulations that restrict foreign investment or repatriation of cash generated from the investment;
- Legal uncertainties regarding asset ownership or claims;
- Macroeconomic fragility;
- Trading costs.

These factors largely are determined by the strength and character of the country's social institutions.[6] Consequently, the lack of capital market integration cannot be solved only by improving communications and trading technologies. Indeed, in recognizing the social and political foundations of localized risks, a recent (2017) analysis of country risk (Bekaert and Harvey) concluded that even in our hyper-connected world, localized undiversifiable risks remain:

> *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.*[7]

Country risk varies widely, as might be anticipated. Figure 1 shows the geographic distribution of Country Risk Premia as computed by NYU's Professor Aswath Damodaran.[8] The figure shows that the Country Risk Premia

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3 I use the U.S. capital market as the base case, since this is the world's largest capital market. However, the comments herein generally apply to western Europe (or any of the green-shaded countries in Figure 1) as well.

4 Aswath Damodaran (2002) INVESTMENT VALUATION: TOOLS AND TECHNIQUES FOR DETERMINING THE VALUE OF ANY ASSET (2E) (New York: John Wiley). See, esp., p. 201, "How Well do Betas Travel? "(describing the theory that firms, but-for their location, that have similar operational and financial risk, would have the same betas).

5 The governing authority may force contract breaches, increasingly restrict transfers of profits outside of the country, or unilaterally change royalties and taxes. The foregoing list (and others) is sometimes called "creeping expropriation." (See, John O'Connell, "Creeping Expropriation," Blackwell Reference. Available by subscription at http://www.blackwellreference.com/public/tocnode?id=g9780631233176_chunk_g97806312349376_ss1-156.

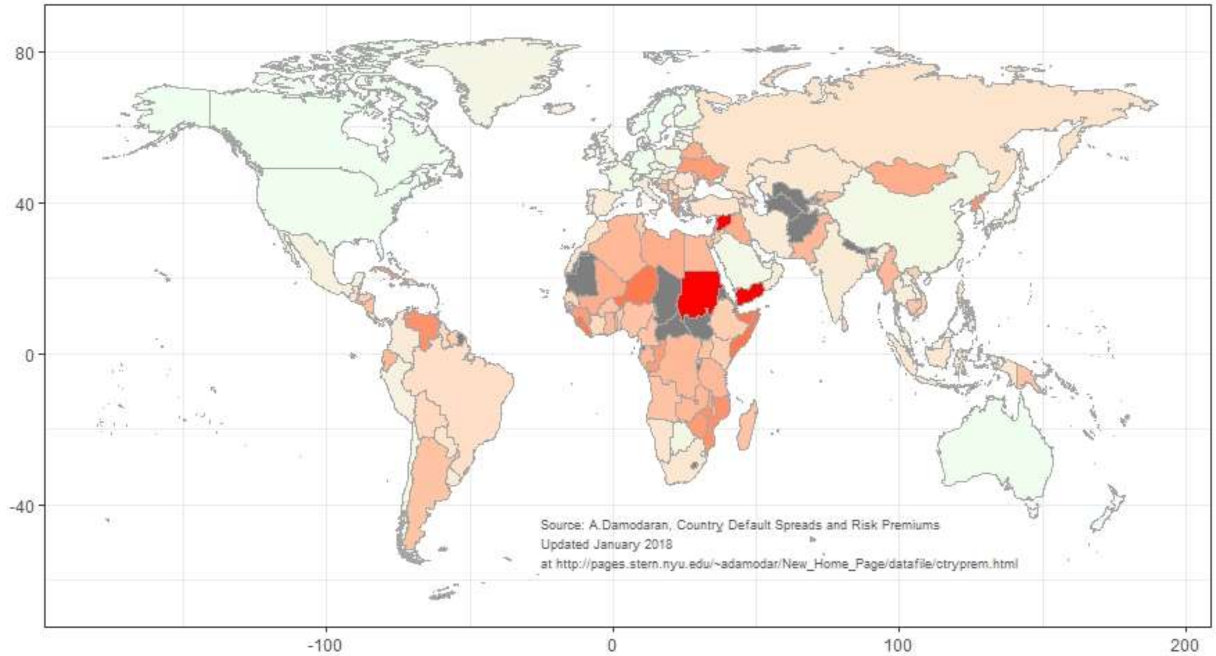
6 See, e.g., Gary W. Cox, Douglass C. North, and Barry R. Weingast, "The Violence Trap: A Political-Economic Approach to the Problems of Development," white paper (2013, rev: 2015) at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2370622

7 Geert Bekaert and Campbell R. Harvey, "Emerging Equity Markets in a Globalizing World," Netspar Discussion Paper No. 05/2014-024, at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2463053.

8 The spreads in the figure are Professor Damodaran's "Ratings-Based Default Spread" (see below for a discussion of this approach). I discuss later and the underlying CRPs that are reflected by the green-orange-red colors.

applicable to the U.S., north-western Europe, and Australia are low (0.00 percent), while the risk premia in Africa, where data are available, are quite high. Sudan, Syria, and Yemen (all in darkest red) have a sovereign risk spread over comparable U.S. Treasury bonds of over 18 percentage points.

Figure 1 - Country Risk Premia around the World



3. GENERAL FEATURES OF A COUNTRY RISK PREMIUM

Valuation studies can account for risk through cash flows or through the rate used to discount the cash flows. Scenario analysis, decision trees, or Monte Carlo simulations can be used to compute future cash flows under possible expected future legal or regulatory outcomes and weight them by their likelihood of occurring. The cash flows (or their expected values) would be discounted back to the present using the cost of capital unadjusted for country risk—or even at the risk-free rate if the decision tree or simulation happened to incorporate all market risks as well as the location-based country risks.

Indeed, the preferred approach in valuation studies is to incorporate uncertainty explicitly in the cash flows when possible. However, cash flow adjustments may not be reliable when there are gross uncertainties about the payoffs under the specific different scenarios or the probabilities of those scenarios occurring. Moreover, cash-flow adjustments for country risk may not be done in cost-of-service utility regulatory rate cases. For either reason, the location-based country risks cannot be captured in cash flows, and so must be captured in the discount rate.[9]

Most of the Country Risk Premiums that I discuss in this paper are *added* to the domestic (U.S.-based) required return. An additive adjustment is flexible in that it can be made to a U.S. domestic-based cost of equity result regardless of how the domestic cost was computed—the Gordon or Discounted Cash Flow (DCF) approach,

[9] Debt costs need not be modified if the utility has traded native-currency bonds with quoted prices, since the cost of debt is directly observed.

the Capital Asset Pricing Model (CAPM), or the risk premium (add-up) method. For concreteness, I discuss the CRP in terms of the CAPM, but the CRP is more widely applicable than just the CAPM.

Equation 1 shows that the Country Risk Premium may be added to an otherwise-domestic U.S. CAPM result:

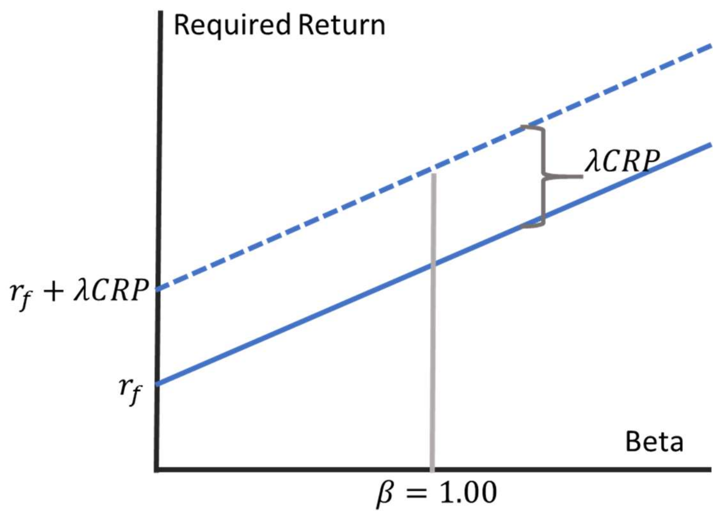
Equation 1

$$r_e = r_f + \beta[MRP] + \lambda[CRP]$$

The CAPM model of Equation 1 expresses the firm's cost of equity (r_e) as a linear function of the risk-free rate (r_f) plus the Market Risk Premium weighted by the beta coefficient (β) plus the Country Risk Premium $(\lambda[CRP])$.[10]

The overall Country Risk Premium applies to the average stock in the foreign country. This average CRP is weighted by what Professor Damodaran has termed "lambda" to account differences in exposure levels that firms may face.[11] The result of including an additive CRP (using the CAPM approach) is shown in the Security Market Line of Figure 2.

Figure 2 - Country Risk as an Adder to the CAPM



[10] As usual, the Market Risk Premium reflects the additional return over the risk-free rate that investors require of the average stock in that market. The beta coefficient reflects the company's exposure to market risk as measured by covariance (divided by market variance).

[11] I discuss lambda in Section 5 of this paper. See also, Aswath Damodaran (2002) INVESTMENT VALUATION: TOOLS AND TECHNIQUES FOR DETERMINING THE VALUE OF ANY ASSET (2E) (New York: John Wiley). Esp., p. 169.

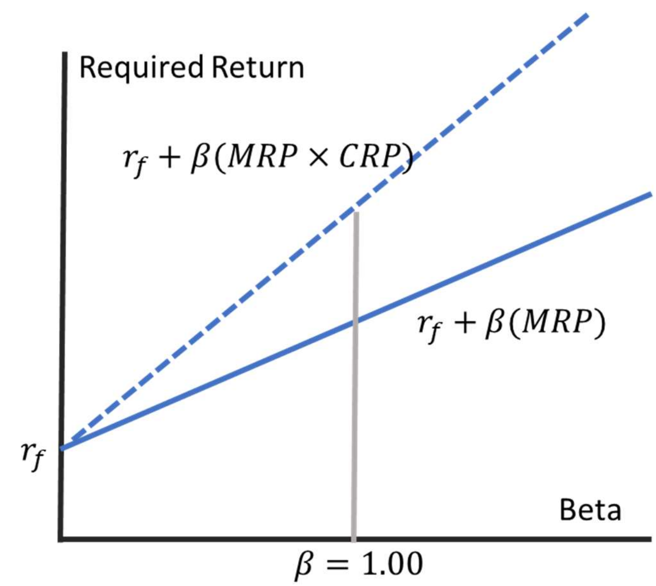
I also discuss (in Section 4) two country risk approaches that have been used to modify the CAPM's Market Risk Premium, sometimes additively and sometimes, as shown in Equation 2, multiplicatively:[12]

Equation 2

$$r_e = r_f + \beta[MRP \times CRP]$$

A Country Risk Premium that directly modifies the Market Risk Premium implies that a company receives the same exposure to country risk as it receives from market risk (i.e., from beta).[13] Modifying the MRP causes an upward pivot to the CAPM's Security Market line, as shown in Figure 3.

Figure 3 - Security Market Line with CRP Relative Equity Volatility Factor



Notice that the CRP construction in Figure 3 does not modify the risk-free rate, r_f. Is this reasonable? I think the answer is no. If the risk-free rate remains unmodified, a zero- or near-zero-beta investment in the foreign country would be predicted to contain virtually no country risk. Such an investment would have a required return equal to the U.S. risk-free rate (before any adjustment to the foreign-country currency discussed in Section 6). The required return on a zero-beta stock would therefore be less than the required return on the country's own sovereign bonds, which themselves would have a yield equal to the U.S. risk-free rate (r_f) *plus* a country risk premium to account for sovereign default risk. Absent special circumstances that would call into question the use of a country risk premium at all, such a result would produce an underestimate of country risk for the stock. I discuss some other modifications that address this issue in Section 4.

In both Figure 2 and Figure 3 beta remains unchanged. It is easy to see that this would be the case with the CRP adder in Figure 2, since the CRP modifies the entire result, whether that is derived from a CAPM, DCF, or risk-premium approach. However, when the MRP is directly modified (Figure 3) in the CAPM-type approach, it is reasonable to wonder if the beta should be modified in some way.

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12 Alternatively, the CRP may be used to additively modify the MRP. See, e.g., "Country Risk," Investopedia, https://www.investopedia.com/terms/c/country-risk-premium.asp. The results that are shown in Figure 3, are the same whether the CRP is a multiplier or an adder.

13 In principle, multiplicative CRPs can be used to modify the results of a Gordon model or risk-premium model's cost-of-equity results: just multiply the U.S.-based cost of equity by the multiplicative (ratio) CRP.

In theory, betas are trans-national because they are designed to capture operational and financial risk relative to the average stock, and not localized risk.[14] The CRP factor that causes the pivoting shown in Figure 3 conceptually is identical to the situation where investors become more risk averse and demand a higher return for a given amount of compensable risk. An increase in risk aversion does not require a re-computation of betas, since, after all, the beta is the covariance of the asset with regard to the market (deflated by the variance of the market). The risk premium represents the pricing out of the average exposure to market risk. The CRP-multiple method simply "re-prices" risk at a given level of exposure.

4. MEASURING COUNTRY RISK FOR THE AVERAGE STOCK

Let us turn to quantifying Country Risk for the average foreign entity. Professor Damodaran's research, textbooks, web pages, and white papers provide considerable guidance to anyone interested in country risk, and I will selectively highlight some of them, but there are numerous others who have contributed to these approaches.[15]

SOVEREIGN BOND YIELD SPREADS

A popular approach for computing the Country Risk Premium is to compute the difference between yields on a USD-denominated ("Yankee") foreign government ("sovereign") bond and a U.S. Treasury bond of the same maturity:

Equation 3

$$CRP = r_{foreign\ yankee} - r_{US}$$

As stated, this difference-in-yields formula eliminates currency risk because both the foreign sovereign bond and the U.S. Treasury bond are in USD. The CRP applied to the CAPM results in an upward shift in the Security Market Line, as shown in Figure 2, unless it is added directly to the Market Risk Premium, in which case it causes the Security Market Line to pivot as shown in Figure 3.

Research by Bekaert et al. concludes that the Sovereign Spread approach may, however, confound several localized risks: (1) political (country) risk; (2) illiquidity risk; (3) local macroeconomic conditions; and (4) general international risk. Bekaert et al. conclude that pure political risk accounts for 17-31% of the total sovereign spread.[16] The authors provide a way of segregating and including only political risk in the discount rate, with the understanding that the other location-based risks are accounted for in the cash flows of the valuation or diversified away.[17]

If you seek to account *only* for political risk in the Country Risk Premium, then the Bekaert et al. adjustments are useful. However, you must be sure that any of the other of the three risks are accounted for in the cash flows via Monte Carlo, decision tree, or other risk-based approaches. To risks such as macroeconomic,

14 Practical issues may arise when computing betas against different market indexes, especially when those indexes are relatively small. While in principle, there would be no need to compute betas against a U.S. index such as the NYSE or S&P 500, in practice you may want to do so to see whether the differences in caused by using different indexes are material.

15 A useful survey is Campbell R. Harvey, "12 Ways to Calculate the International Cost of Capital2005 ," white paper, available at https://faculty.fuqua.duke.edu/~charvey/Teaching/BA456_2006/Harvey_12_ways_to.pdf.

16 Geert Bekaert, Campbell R. Harvey, Christian T. Lundblad, Stephan Siegel, "Political Risk and International Valuation," white paper, September 2014, at SSRN at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2659257.

17 For example, Bekaert et al. note that when it is difficult to separately quantify local macroeconomic risk, one may use both as a package country risk adder. One would not adjust both the cash flows and the discount rates for macro risks. For public utilities that would seem to have risks highly correlated with the overall government (and are sometimes governmentally owned and controlled), using the entire spread may be appropriate.

international, and liquidity risks from both the discount rate and estimates of future cash flows, when these risks are non-diversifiable, would result in a valuation that is too high.

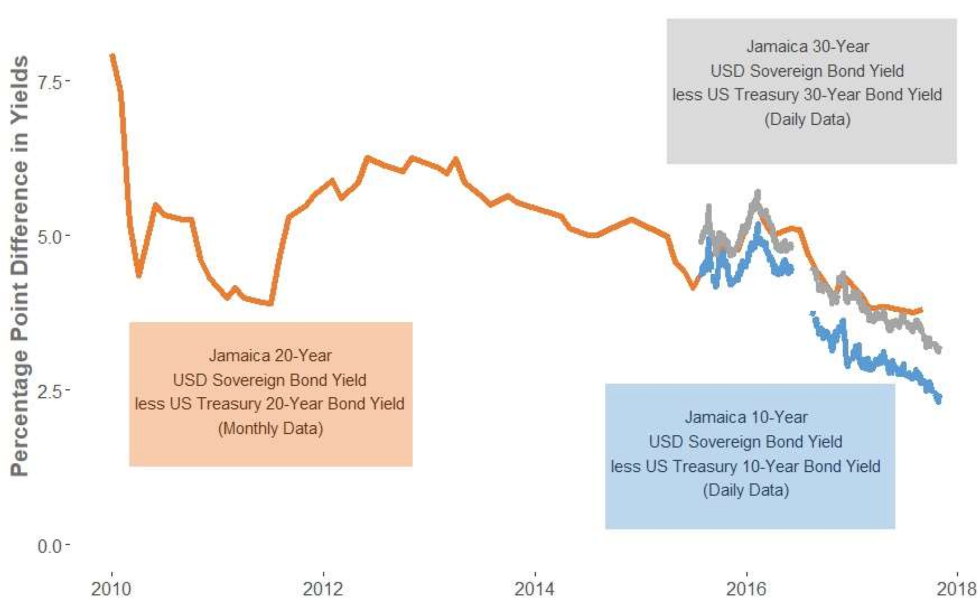
Illiquidity risks and local macroeconomic risks, for example, might reasonably affect a foreign firm, especially one that is tied to its economy as is a public utility, for example. There is no need to perform the Bekaert et al. separation-of-risk exercise since those risk factors would simply be added back in another form.

Excluding relevant risks is not meritorious, but neither is double-counting. For example, the small-firm premium, which may apply to a particular foreign investment, is thought to possibly include a premium for illiquidity,[18] so you may not want to apply a small-firm adder to a project to which you already are adding a country risk premium based on the sovereign spread approach.

The sovereign spread approach is widely used by practitioners because the data are reasonably available; the data are of relatively high quality since they are actually observed prices;[19] and the data either capture a reasonable country risk premium applicable to private-sector equity investments, or can form the basis of one.[20]

Data on dollar-based foreign sovereigns, if they exist, are usually easy to obtain, including the St. Louis Federal Reserve Bank's FRED database, ThompsonOne, and Bloomberg, which probably contributes to the popularity of the Sovereign Spread approach. As an example, Figure 4 shows the spreads on Jamaica dollar-denominated bonds since 2010 for 10-, 20-, and 30-year bonds. These data are from the St. Louis Fed. The data show that the sovereign spread has averaged around 5 percentage points in recent years, but has declined sharply since 2016.

Figure 4 – Sovereign Spreads between Jamaica Yankee Bonds and U.S. Treasury Bonds



18 Damodaran (2002), p. 138 (describing possible reasons for the observed small firm effect). But see p. 207 recommending caution when considering adjustments to the discount rate to account for anomalies generally. See also, See, e.g., Ibbotson/Morningstar (requires subscription, although discussion white papers on the size premium are generally available).

19 Prices for infrequently-traded bonds that are presented on Bloomberg, for example, may be synthesized and not actual trades prices, but they are used as if traded prices.

20 See the discussion on the adjusted sovereign spread, below, for a method of converting the sovereign spread to an equity risk premium.

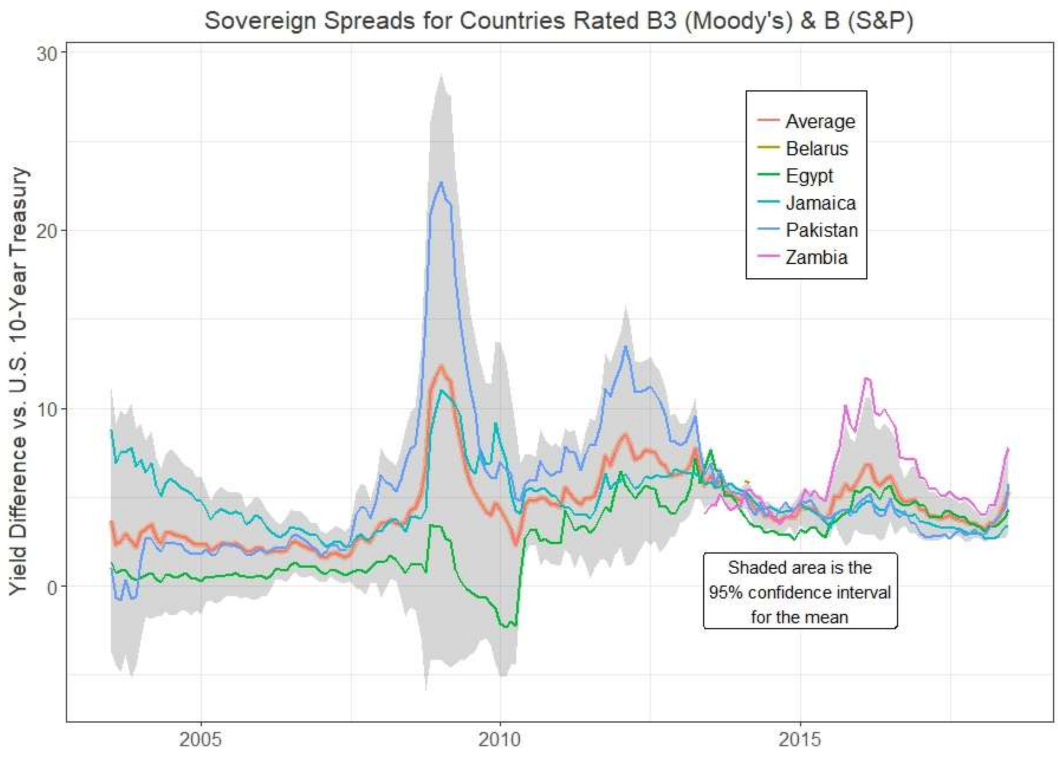
SYNTHETIC SPREAD

Not every country will have a traded or priced Yankee bond. You can still use the sovereign spread approach, provided that the country's bonds are rated by a credit rating agency.[21] You would compute the spreads of comparably-rated Yankee bonds that have price data and use the average (or median) spread as the best measure of the missing spread. However, this approach requires an additional assumption that the yields on firms or projects with similar credit ratings are reasonable proxies for the missing yield.

Under the synthetic spread approach, a proxy for the yield on the foreign country's Yankee bonds, were they to be issued, is computed as an average of yields on Yankee bonds of countries with the same credit rating that happen to have pricing information. The additional assumption, therefore, is that sovereign Yankee bonds with a particular Moody's or S&P bond rating will trade at the same price and have the same yield to maturity. This may not be true. While providing useful services, credit rating agencies can be slow with ratings changes, especially during times of macroeconomic of financial distress.[22]

Figure 5 shows that the 95% confidence interval of the mean of a cross-sectional average of bond yields for USD-denominated sovereign bonds rated B3 by Moody's and B by S&P varies over time.[23]

Figure 5



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21 The synthetic spread approach can be used when the target entity's country does not have Yankee bonds rated by a credit agency, but it requires yet another abstraction. You will have to supply the credit rating yourself, possibly by looking at typical credit metrics such as coverage and leverage and comparing the target country to the metrics of rated countries.

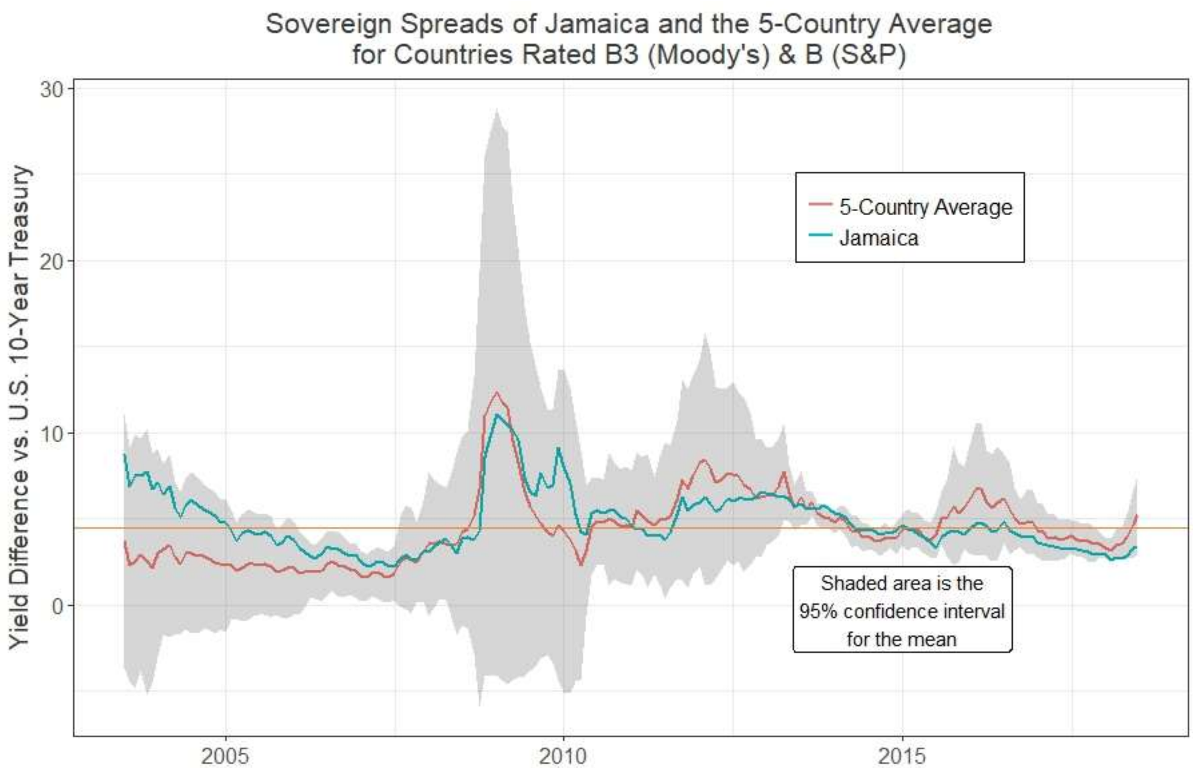
22 There are many papers that discuss the role of credit rating agencies in being late to make credit changes and possibly even affirmatively contributing to the 2008 financial crisis.

23 TradingEconomics lists 5 countries that share Jamaica's ratings of B3 by Moody's and B by S&P: Jamaica, Belarus, Bosnia-Herzegovina, Egypt, and Zambia. See, "Credit Rating," TradingEconomics.com at https://tradingeconomics.com/country-list/rating.

I obtained yields for 5 (out of 6) Yankee sovereign bonds with B3/B ratings.[24] Figure 5 shows that there is considerable variance around the average. The 95% confidence interval (grey-shaded region) narrows during 2014, but it was as wide as 33 percentage points during the 2008 financial crisis, indicating that during the crisis, the average yield on the 5 available Yankee bonds was merely a statistical artifact largely devoid of genuine economic guidance.

Because I had the benefit of the underlying data, we are able to see that the synthetic spread approach may not be terribly reliable in some circumstances. Figure 6 illustrates this. The figure presents only the 5-country average and Jamaica (and retains the original grey-shaded 5-country margin of error). The two lines appear reasonably close to one another, so perhaps the 5-country average is a reasonable proxy for Jamaica. To examine this claim, I computed the root mean square deviation (RMSD) for the average difference between the 5-Country Average and Jamaica. The RMSD is a measure of average differences between the two data series. The RMSD was 1.66 percentage points.

Figure 6



To provide a feel for the relevance of the 1.66 RMSD, I compare the RMSD of 1.66 to a naïve alternative hypothesis that computes the RMSD between the actual Jamaica yield and the overall 2003-2018 average of the 5 countries of 4.46% (the orange horizontal line in Figure 6). The RMSD of the actual Jamaica yield spread and this average spread of 4.46% was 1.79. The use of the synthetic spread approach therefore represents an improvement in RMSD of only about 7% over a naïve model. Moreover, a t-test on differences of means indicates that the two RMSDs are not statistically significantly different from one another at a 95% level of confidence (p-value is 0.47, indicating a difference worthy of a coin-flip).

24 Belarus, Egypt, Jamaica, Pakistan, and Zambia. I was unable to obtain historical USD-denominated yield data for Bosnia-Herzegovina.

In sum, the synthetic spread approach is a useful work-around when a country does not have a traded Yankee bond, but the cross-sectional differences in the countries whose yields are available results in reduced confidence in the ultimate outcome.

Ratings-based approaches are also thought to be useful insofar as the very stickiness of these ratings results in less observed noise (e.g., volatility based on market inefficiencies rather than due to actual changes in intrinsic value). While filtering noise out of the data is a worthy task, this argument can be self-serving. Just because credit ratings are sticky does not mean that they reduce only noise. A ratings-based approach may ignore relevant market volatility information. A measure that artificially suppresses genuine volatility may be manufacturing a misrepresentative (lower volatility) result. It might be better to analyze the volatility rather than to simply claim that a method that reduces the observed volatility is worthwhile.

A final point on synthetic spreads: Be sure to use country sovereign yields and not yields on corporate bonds of the same rating. A sovereign that is rated as B3 is not the same as a corporate bond rated as B3.[25]

SOVEREIGN SPREAD ADJUSTED FOR RELATIVE STANDARD DEVIATION

This approach augments the sovereign spread or synthetic with a relative volatility measure:

Equation 4

$$CRP = (Jamaica\ Yankee\ 20\ Year\ Yield - US\ 20\ Year\ Treasury\ Yield) \times \frac{\sigma_{Jamaica\ Equity}}{\sigma_{Jamaica\ 20\ Year}}$$

The modification is used because the sovereign spread arguably captures only the incremental risk of the sovereign bond market, but not necessarily the equity market. The multiplier is intended to correct for any volatility difference in the two markets. The relative volatility measure is the ratio of the standard deviation of the foreign country's equity returns to the standard deviation of its sovereign bond returns. Since the sovereign bond spreads are measured in terms of USD, the standard deviations likewise should be computed in terms of USD. The numerator should be converted to USD as described in the prior discussion, while the denominator can be computed using the returns of Jamaica Yankee, which already is denominated in USD.

The basic sovereign spread approach (or synthetic spread approach) implicitly presumes that the equity-to-debt volatility ratio is 1.00, which likely understates the true stock-to-bond relationship. For Jamaica, since 2008, the standard deviation of dollarized equity returns on the Jamaica Main Index was 0.1193 (i.e., about 12 percentage points) while the standard deviation of Jamaica 20-year Yankee bond returns was 0.0907, which produces a relative standard deviation adjustment of 1.3157.[26]

For comparison, the standard deviation of returns computed from weekly Adjusted Closing Prices for the past 10 years of the S&P was 0.141, and for long-term treasuries it was 0.097, which produces an equity-to-debt volatility ratio of 1.455.[27] Absent reliable evidence, the value of 1.455 (updated as appropriate) could be a useful initial benchmark for evaluating a foreign country's equity-to-bond return volatility ratio.

The Adjusted-Sovereign-Spread approach requires that capital markets be sufficiently liquid that the standard deviations be reliable and economically meaningful, which may not always be true. For example, Jamaica's

[25] "Rating Methodology: Government-Related Issuers," Moody's Investor Services, June 6, 2018. (available upon registration with the Moody's website).

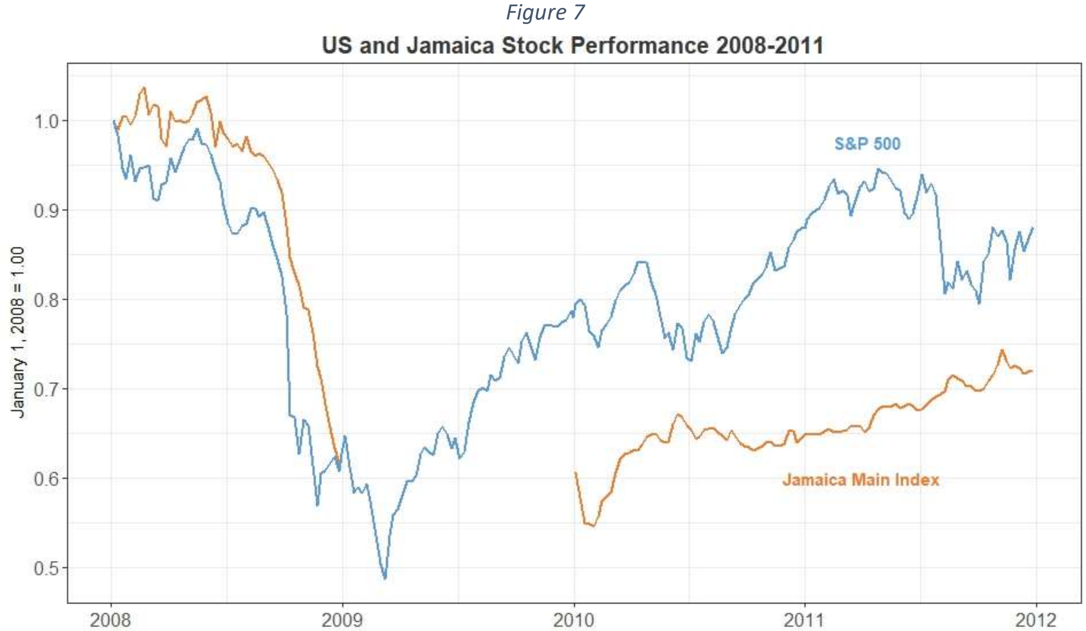
[26] Both of these standard deviations are less than their respective U.S. counterparts.

[27] For bond prices, I used Vanguard's Long-Term U.S. Treasury (VUSTX) adjusted prices (both downloaded on 7/9/2018 from Yahoo Finance). I computed the standard deviation of returns of VUSTX Adjusted Closing Prices. One would not compute the standard deviation of yields.

stock exchange comprises fewer than 30 stocks.[28] Median daily trading volume over the past 10 years (where data are available) was 4.6 million shares. The annual turnover for shares of stocks on the Jamaica Stock Exchange is on the order of 5% according to the World Bank.[29] This turnover ratio means that the average share of stock changes hands once every 20 years. In contrast, the median daily trading volume for the S&P500 is about 3.8 billion shares, and the average U.S. share of stock turns over about once per year according to the World Bank.

Low turnover implies that statistical measures of volatility can be biased low. In illiquid markets, stocks may be traded when markets are normal or ebullient but may not trade when capital markets are distressed. For example, Figure 7 shows that there is a gap in the available of stock index prices for the Jamaica Main index between 2009 and 2010.[30] This period corresponds to the decline and slow recovery in U.S. stocks, or, in other words, a period of distress. A standard deviation based on these incomplete data is likely to be biased low.

Figure 7



The liquidity issue can result in a lower denominator in the Adjusted-Sovereign-Spread case, and can also affect the Ratio of Equity Market Standard Deviations approach that I discuss later in this Section.

As with the simpler sovereign spread approach, this volatility-adjusted country risk premium would typically be used as an adder to the U.S.-based CAPM, DCF, or risk-premium results. The risk adder could likewise be weighted by the company-specific country risk exposure coefficient, lambda, described in Section 5.

CREDIT DEFAULT SWAP SPREADS

This CRP approach computes CRP as the yield of foreign government USD-denominated Credit Default Swaps (CDS) minus the yield on US CDS.

28 See, Jamaica Stock Exchange, "Daily Market Summary for Main Market for July 13, 2018: Summary for Friday, 13 Jul, 2018," at https://www.jamstockex.com/market-data/summary/.

29 Daily volumes from Yahoo Finance. Turnover from "Stocks traded, turnover ratio of domestic shares (%)," World Bank, at https://data.worldbank.org/indicator/CM.MKT.TRNR.

30 As noted in fn. 28, the Jamaica Main Index data were obtained from the Jamaica Stock Exchange web site.

A credit default swap is an insurance policy. If *A* invests in a bond *B*, he can pay a premium to insurer *C* who will insure the bond's payoff. If bond *B* defaults, *C* must pay *A* an amount (depending on the agreement) such as the value absent the writedown less the value of any remaining cash flows.[31] Investor *A* need not even invest in a bond. A may simply contract with *C* regarding the performance of bond *B* whether or not *A* actually owns bond *B*.

The difference between the yields of the two CDSs, measured in basis points, represents the value of a bet on the incremental chance of a default and incremental recovery-given-default by the foreign government on that bond issue relative to the U.S., and these basis points can be added to a U.S.-based cost-of-equity result.

Data for CDSs are available on Bloomberg.[32]

RATIO OF EQUITY-MARKET STANDARD DEVIATIONS

This may be called a "equity volatility ratio approach" because it is the ratio of (1) the standard deviation of stock returns in the foreign market denominated in USD and (2) the standard deviation of stock returns in the U.S., EU, or other reference market:

Equation 5

$$CRP\ equity\ volatility\ ratio = \frac{\sigma_{foreign\ in\ USD}}{\sigma_{US}}$$

The resulting CRP factor is a ratio, which one would anticipate is greater than 1.00. Because standard deviations have units, you must (1) convert each month, quarter, or annual return of the foreign market into U.S. dollar returns using contemporaneous exchange rates and then (2) compute the standard deviation of the dollarized foreign stock market return to use as the numerator of the ratio.

Applied to Jamaica, the volatility ratio approach would produce a Country Risk volatility ratio of 0.845 because the standard deviation of the Jamaica stock market over (approximately) the past 10 years has been 0.119 versus the U.S. standard deviation of 0.141. A ratio less than 1.00 indicates that the foreign country has less country risk than the U.S., which seems unlikely. As noted earlier, the more likely culprit is that Jamaica volatility is biased low due to missing observations during times of market distress.

Unlike the other CRP measures described above, this approach by necessity must directly modify the U.S.-based Market Risk Premium of the CAPM by the ratio:

Equation 6

$$r_e = r_f^* + \beta[MRP \times CRP\ equity\ volatility\ ratio]$$

As shown in Figure 3 (at p. 5), the effect of this modification is a counter-clockwise rotation of the Security Market Line. As I discussed, this approach implies that zero-beta stocks receive no country risk, and otherwise, the country risk exposure is equal to beta, unless r_f^* is also modified so that $r_f^* > r_f$ to represent the sovereign spread. More generally, the specification posits that firms and projects whose betas are less than 1.00 would face less country risk than those firms and projects whose betas exceed 1.00. Such a relationship does not seem well-founded, at least as applied to public utilities.

31 For a discussion of CDSs, see, e.g., Patrick Augustin, Marti G. Subrahmanyam, Dragon Yongjun Tang and Sarah Qian Wang (2014), "Credit Default Swaps: A Survey," Foundations and Trends in Finance: Vol. 9: No. 1–2, pp 1-196. http://dx.doi.org/10.1561/0500000040.

32 At this time, I have not fully investigated the literature regarding CDSs' power to identify credit risk versus other (e.g., liquidity) risk.

Also, as I noted earlier, the lack of liquidity in the foreign stock market can result in a measured volatility that is biased low. The result in this case is an understatement of the true country risk premium.

5. COMPANY EXPOSURE TO COUNTRY RISK ("LAMBDA")

Different firms in a country have different abilities to shield revenues and assets from arbitrary changes in regulation, taxation, or from expropriation. Firms whose assets are liquid or at least readily re-deployable may better avoid or manage exposure to country risk. In contrast, assets that are sunk and irreversible, which typify utility assets, are more exposed to country risk.

A public utility may have a relatively low correlation with overall market returns, and therefore a beta less than 1.00. However, relative to the average firm, a considerable proportion of a public utility's value in the form of its income-producing assets is sunk and irreversible. A utility generally sells its output in a prescribed area that does not pass over country boundaries. Sunk assets and captive revenues are precisely those situations that one would anticipate are especially susceptible to capricious changes in law and regulation in the home area. It would not be unusual therefore for a utility's exposure to country risk to exceed that of the average stock in a country.

As noted earlier, Professor Damodaran has labeled as *lambda* the quantum of exposure that firm has to the country's overall risk premium.[33] The average firm in the country has an exposure of 1.00. Firms whose products are exported or whose valuable assets can easily be relocated without loss of value have lambdas less than 1.00. Foreign firms whose products are not exported or whose assets are sunk and whose value is subject to expropriation (creeping or otherwise) would have lambdas higher than those of the average firm in the foreign locale. The location of the headquarters building or of the stock registration is not an indicator of country risk. For example, a U.S. based oil exploration and production (E&P) company doing business in another country would need to consider its projects in terms of the local country risk, not necessarily in terms of U.S. country risk.[34]

A metric that reasonably measures country risk exposure may not always be obvious. Professor Damodaran suggests that the proportion of revenues that are tied to the native country would be a starting point for measuring lambda:

Equation 7

$$\lambda = \frac{\%\ of\ the\ target\ firm's\ revenues\ in\ the\ native\ country}{\%\ of\ the\ average\ private\ firm's\ revenues\ in\ that\ country}$$

Revenue exposure may not always be the best measure of country risk exposure, nor is it the only such measure.[35] The appropriate metric should be based on the project's value-driver. Are investors buying into a net revenue stream with fixed assets? Or is the value primarily represented by the portfolio of physical assets? While these questions may be distinction without a difference in a valuation sense, they can make a difference

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33 Damodaran (2002) Investment Valuation: Tools and Techniques for Determining the Value of Any Asset (2e) (New York: John Wiley). See, esp., p. 169.

34 Similarly, a multi-national company like Coca Cola or Pepsi Cola with company-owned bottlers in Peru would want to evaluate the risks of that investment using a localized discount rate.

35 Professor Damodaran also suggests that lambda may be estimated by regressing stock returns of each firm in the emerging market against the returns of the sovereign bond (all measured in the local currency). The slope of the regression measures the sensitivity of the stock to country risk (contending that bond returns measure country risk). See Damodaran (2002), pp. 204-205.

in lambda and so consideration should be exercised to determine how best to measure the exposure to country risk.

The distinction between a revenue- and asset-based measure can better be seen for an hypothetical E&P. When oil prices are very high, the intrinsic value of the firm as measured by discounting expected cash flows from the project greatly exceeds the embedded cost of the physical plant. Valuing a project's country risk exposure on the basis of expected net revenue, and assigning a low lambda value because the project's oil is exported to the U.S. for refining, provides a very different, and possibly more reasonable, quantification of a project's country risk than an asset-based metric.

The selection of a reasonable metric seems to be clearer in the case of public utilities. Both a revenue-based and asset-based metric would produce a lambda greater than 1.0 for utilities. The reason is that a utility whose output is substantially sold within the country and whose assets are installed in that country as well (and cannot be moved) would yield approximately the same lambda (greater than 1.00).

Table 1 below shows an example of a lambda computation that might serve as a model for investments in a foreign utility. The example considers country risk applied to a public utility in Jamaica. The analysis relies on a net revenue-based metric where the proportion of domestic (Jamaica-based) revenues in each economic sector is weighted by its contribution to Jamaica's GDP.

The GDP weights (column E) are relatively easy to obtain from the Statistical Institute of Jamaica. The Percent of Domestic Country Risk Exposure (column C) data are difficult to obtain and involve judgment. I compute a "raw" lambda in column G as the percent domestic revenue (col C) divided by the overall percent domestic revenue (cell C17). This produces the proportion of country risk for a particular industry relative to the economy as a whole, which is in keeping with Professor Damodaran's formula noted above.

Because (1) the government sector's lambda is 1.00 and (2) the GDP-weighted average of private sector lambdas to have a lambda of 1.00, columns H and I, rescale the raw private-sector lambdas. Column J is verification that the GDP-weighted average of the private-sector lambdas sum to 1.00 as planned (cell J18). The result is that the re-scaled lambda for a utility in Jamaica is on the order of 1.60. This would be applied to an overall CRP (4.5% in cell I20 of the table) to produce the CRP applicable to the utility of 7.2%.

This example also shows that revenue weights may not be entirely appropriate for the Mining sector in Jamaica. Jamaican Mining produces bauxite, used to produce aluminum. Bauxite is largely (if not entirely) exported. From a revenue-based perspective, the implied lambda for Mining is essentially 0.00, indicating virtually no exposure to country risk. However, it might be appropriate for an asset-based lambda analysis for Mining to better account for the fact that mines and related capital largely are sunk and irreversible and that the value produced by the mining project is dependent upon the control of those sunk assets.

Table 1 - Example of a GDP-weighted Revenue Lambda

	A	B	C	D	E	F	G	H	I	J
1			% Domestic Exposure		GDP Weighting		Raw Lambda [N]	Private Sector Weight [O]	Public-Private Sector Lambdas [P]	Weighted Priv. Sector Lambdas [Q]
2			% Domestic	Notes	Weight	Notes				
3		Government & Subsidies	100%	[A]	26.93%	[H]	1.38		1.00	
4		Tourism	5%	[A]	8.40%	[I]	0.06	11.50%	0.07	0.01
5		FIRE	75%	[B]	18.01%	[J]	1.03	24.65%	1.20	0.30
6		Utilities	100%	[C]	2.83%	[K]	1.38	3.87%	**1.60**	0.06
7		Wholesale/Retail, Comm. & Other Svcs	60%	[D]	21.00%	[L]	0.83	28.74%	0.96	0.28
8		**Services**	**73%**		**77.17%**	[M]	1.00	68.76%	1.17	0.80
9										
10		**Agriculture & Forest**	**82%**	[E]	**6.63%**	[M]	1.12	9.07%	1.30	0.12
11										
12		Mining	8%	[A]	1.95%	[K]	0.11	2.67%	0.13	0.00
13		Manufacturing (inc. Refined Petrol)	55%	[F]	7.60%	[K]	0.76	10.40%	0.88	0.09
14		Construction & Other Industry	100%	[G]	6.65%	[K]	1.38	9.10%	1.60	0.15
15		**Industry**	**68%**		**16.20%**		0.93	22.17%	1.08	0.24
16										
17		**Overall weighted by GDP**	**72.7%**		**100.00%**		1.00			
18		**Overall excluding Govt Sector**	**62.6%**		**73.07%**			**100.00%**		**1.00**
19		**Implied Lambda for Utilities**							**1.60**	
20		**Overall Country Risk Premium**							**4.5%**	
21		**Country Risk Factor for Utilities**							**7.2%**	
22	NOTES:									
23	[A]	Estimate based on 2007 Input-Output Table and other reading.								
24	[B]	Average US S&P 500 firm. See, Silverblatt, S&P 500® 2016: Global Sales YEAR IN REVIEW at Exhibit 5								
25		at https://us.spindices.com/documents/research/research-sp-500-2015-global-sales.pdf								
26	[C]	Water & Electric utilities are for domestic use.								
27	[D]	Some services are related to Tourism including medical tourism. Telephone call centers are exported also.								
28	[E]	Ag exports were $272 and GDP was $14.82b (2012 USD), so % Domestic is 1-272/1472 =82%.								
29	[F]	Same rational as [B] for now. (i.e., based on S&P)								
30	[G]	Assigned all construction to domestic, even if for tourism.								
31	[H]	Statistical Institute of Jamaica. 10.82+Subsidies of 16.83%- 3.7% . Heritage says 27.4%								
32	[I]	Stat. Inst. of Jamaica for Tourism (separate spread sheet)								
33	[J]	Stat. Inst. of Jamaica for Finance & Insurance (8.59%) and Real Estate & Business (9.42%)								
34	[K]	Stat. Inst. of Jamaica								
35	[L]	Stat. Inst. of Jamaica: Other Services 5.48%; Wholesale & Retail 16.6%; Transport & Comm 6.91% and adjusted for Tourism								
36	[M]	globaledge.msu.edu								
37	[N]	Raw Lambda = % Domestic / 72.7%								
38	[O]	Private Sector Weight = GDP Weight / 73.07%								
39	[P]	Public-Private Sector Lambdas: Government Lambda = 1.00. Private sector weighted avg is 1.00 and is computed as								
40		=% Domestic Exposure / 62.6%								
41	[Q]	Verification that weighted sum of private lambda is 1.00 as is public lambda. Computed as								
42		=Public-Private Sector Lambda x Private Sector Weight, summed over all private economic sectors.								

6. MAINTAINING A DISCOUNT RATE THAT IS CONSISTENT WITH THE PROJECT'S CASH FLOWS

Suppose that you have estimated a USD-based cost of equity for the target (foreign) firm using U.S. firms that are comparable but-for the location of the enterprise's value-producing assets (e.g., assets, revenues). The basic U.S.-based cost-of-equity model results are adjusted to account for the enterprise's exposure to country risk. If the project's cash flows are computed in the native (foreign) currency, then this USD-based discount rate must be restated to the foreign currency. This is done by applying the international Fisher Effect formula:[36]

Equation 8

$$r_{foreign} = \left[(1 + r_{US})\left(\frac{1 + i_{foreign}}{1 + i_{US}}\right)\right] - 1$$

[36] See, James P. Harrington, Carla S. Nunes, "Quantifying the Country Risk Premium," Duff & Phelps, December 6, 2016. Available at the CFA website (https://www.cfainstitute.org/en/research/multimedia/2016/quantifying-country-risk-premiums), membership required.

Similarly:

Equation 9

$$r_{US} = \left[(1 + r_{foreign})\left(\frac{1 + i_{US}}{1 + i_{foreign}}\right)\right] - 1$$

Where r_{US} is the nominal cost of equity in USD, $r_{foreign}$ is the nominal cost of equity in the domestic currency; and i_x is the expected rate of inflation in either the domestic or US currencies. A simpler way of making the adjustment is to add the difference between the inflation rates:[37]

Equation 10

$$r_{foreign} = r_{US} + (i_{foreign} - i_{US})$$

And

Equation 11

$$r_{US} = r_{foreign} + (i_{US} - i_{foreign})$$

The IFE equations say that in a capital market equilibrium, two nominal interest rates (or discount rates) that are identical in all ways but-for the currency unit, the rates will differ by the relative rates of inflation in the currencies in which they were computed.

7. CONCLUSIONS

Country risk is a valid concern when capital markets are not integrated and when location-specific risks cannot be diversified away. Such risks will affect the marginal investor's willingness to invest and therefore will affect the required return on the investment.

Even in today's world of increasing capital market integration, country risk varies widely across the world. A country risk premium is not required for investments in North America, Australia, and most of western Europe, whose assets are located in—and cash flows are derived from—those areas but otherwise it is a factor to consider in foreign (non-U.S.) investments or multinationals with operations all over the world.

This paper has focused on a Country Risk Premium that would be used to modify a U.S.- (or western Europe-) based discount rate. In principle, incremental country risks may be incorporated into the expected future cash flows using simulation, Monte Carlo, or decision tree analysis, but when this cannot be done, a risk premium adjustment to the discount rate is required.

There are many ways of computing the overall CRP for the discount rate. Different methods can produce different results, and there is considerable debate as to the merits of the different approaches. However, despite the theoretical or practical shortcomings in any of the methods, ignoring country risk is neither riskless nor meritorious. The purpose of the analysis is to quantify the extent to which the market prices a foreign government's ability and willingness to appropriate some or all of the project's value outside of normal legal protections.

The Sovereign Spread and its synthetic alternative are widely used for good reason. There generally is at least some reliable yield data available since many smaller countries offer Yankee (or Euro-based) bonds.

[37] This ignores the cross-product effects but would seem to be sufficiently accurate given the uncertainties inherent in the data and forecasts.

Upon computing an overall CRP, further adjustments may be called for to (1) isolate political risk (provided that liquidity, macroeconomic, and general international risks already are accounted for); and (2) quantify the exposure that the foreign project has to the foreign country's risk.

Regardless of the CRP approach used, the computations should be made in like currencies. So, the CRP applied to U.S. based comparables should itself be computed in terms of USD. Once the domestic U.S.-based (and USD-based) cost-of-equity has been risk-adjusted to the foreign country, the USD-based discount rate can be translated to the foreign currency using the relative inflation rates and the International Fisher Equation.

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