Political Risk and International Valuation

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Abstract

Measuring the impact of political risk on investment projects is one of the most vexing issues in international business. One popular approach is to assume that the sovereign yield spread captures political risk and to augment the project discount rate by this spread. We show that this approach is flawed. While the sovereign spread is influenced by political risk, it also reflects other risks that are likely included in the valuation analysis - leading to the double counting of risks. We propose to use "political risk spreads" to undo the double counting in the evaluation of international investment projects.

Keywords: Political risk, sovereign spread, sovereign risk, capital budgeting, international cost of capital, project evaluation.

1 Introduction

When evaluating international investment projects, accounting for political risk remains an important challenge. Political risk refers to the risk that a government action will negatively affect the cash flows of a company conducting an international investment. The theory on project valuation or capital budgeting, which we review in more detail in Section 2, is straightforward: the multinational corporation must assess the effects of political risk on expected cash flows and discount the expected cash flows at a discount rate reflecting systematic (not political) risk. In practice, it is difficult to quantify political risk (see Bremmer, 2005; Henisz and Zelner, 2010). Moreover, as the available political risk ratings are mostly subjective assessments of experts, it is difficult to incorporate them in a quantitative valuation analysis.

Instead, many textbooks and practitioners propose to take political risk into account through an adjustment to the discount rate. That is, the investment analysis initially ignores political risk and forecasts the company's cash flows assuming that no political risk event will take place, but then applies an upward adjustment to the discount rate to reflect the political risk. The majority of such approaches make use of sovereign spreads to obtain market-based and forward-looking readings on political risk (see, for example, Mariscal and Lee (1993) and Damadoran (1999, 2003)).[1] The sovereign spread, also referred to as country (credit) spread, is the difference between the yield on a bond issued by a developing country in U.S. dollars and a U.S. Treasury bond of similar maturity. It depends, among other factors, on the probability of sovereign default and, conditional on default, the expected recovery value of a country's sovereign bond. Political risk is then incorporated into the valuation of an investment project by augmenting the project's discount rate by the country's sovereign

[1] A large number of consultants promote the use of sovereign spreads, for example Price Waterhouse Coopers (see Ogier, Rugman, and Spicer (2004)), TAC - Applied Economic and Financial Research (see Apotheker (2006)), and Zanders (see Boere (2006)), as well as investment banks such as Goldman & Sachs (for an overview, see Harvey (2001)). Duff and Phelps (2014), a leading vendor of cost of capital estimates in the U.S., provides an "International Valuation Report." For each market, several estimates are provided: the country-risk rating estimate following Erb, Harvey, and Viskanta (1996), a sovereign spread adjustment, and a relative equity market standard deviation adjustment. Finally, the major international financial management textbooks such as Shapiro (2009) and Bekaert and Hodrick (2011) also mention the practice.

spread. That is, the project's cash flows are forecasted in the absence of political risk events, which are then incorporated via an upward adjustment to the discount rate based on a country's sovereign spread.

The first contribution of our article is normative. We show that the standard sovereign spread procedure is flawed and tends to lead to costs of capital that are too high. This implies that use of such a procedure may decrease foreign direct investment (FDI) and lead to international capital mis-allocation. The implicit assumption in existing capital-budgeting methods is that sovereign spreads, to a large extent, fully reflect political risk. We show that this is false. Building on an extensive literature examining the determinants of sovereign spreads, we decompose their variation into four major factors: international economic and financial risk conditions, local macroeconomic conditions, bond market liquidity, and political risk.

Our analysis shows that, on average, less than a third of the sovereign spread reflects political risk. A cost of capital adjustment that simply "adds" the entire spread therefore double counts global systematic risk exposures such as economic and financial conditions that should already be reflected in the discount rate. A full spread adjustment further reduces the value of the project by including local macroeconomic conditions that should be reflected in the expected cash flows as well as bond market liquidity that is likely irrelevant to the value of the project.

We propose a new, alternative procedure to more accurately reflect political risk in a project's net present value (NPV). Specifically, we propose to use the concept of a political risk spread recently introduced by Bekaert, Harvey, Lundblad, and Siegel (2014), which essentially extracts the political risk component from sovereign spreads using available information in political risk ratings. Under certain assumptions, a corrected discount rate adjustment can then be obtained by adding the political risk spread, rather than the full spread, to the usual discount rate. Given the importance of NPV analysis for international investment decisions (see, for example, survey evidence in Keck, Levengood, and Longfield (1998) and Graham and Harvey (2001)), it is crucial to properly account for political risk in corporate decision making. For example, Holmen and Pramborg (2009), surveying the capital budgeting techniques for FDI among Swedish firms, show that firms are less likely to use theoretically correct NPV approaches for investments in host countries with elevated political risk. The economic implications are large. In a practical example using recent data, we show that the cost of capital may be over-estimated by anywhere from about 2% to 4% using the standard sovereign spread procedure leading to a misallocation of global investment.

The rest of the paper is organized as follows. Section 2 defines political risk and surveys some standard approaches to account for political risk in international capital budgeting. We also outline our new approach. Section 3 briefly summarizes the data, and reports our empirical analysis of sovereign spreads which is the main input for our political risk adjustment. Section 4 then reviews market-based political risk spreads and demonstrates how to use them in political risk assessment. We also reflect on the largely unexplored issue of whether political risk is priced in international equity returns. Section 5 offers some concluding remarks.

2 Political risk and the cost of capital

In this section, we provide a definition of political risk and review the theoretical arguments for incorporating political risk into the capital budgeting process. We then analyze a number of practical approaches, most of which use sovereign spreads to adjust the project discount rate for political risk. Finally, we propose a new approach which overcomes the shortcomings of existing methods.

2.1 Political risk and the cost of capital

There is a large and growing literature on the effect of political factors on corporate valuations. This includes examining the impact of tax policies (McGrattan and Prescott (2005) and Sialm (2009)) and uncertainty regarding regulations and government policy (Pastor and Veronesi (2012), Baker, Bloom, and Davis (2013)). In this paper, we focus on political risk in an international business context (see Kobrin (1979), and the review of Fitzpatrick (1983)). Political risk for a given country is then the risk that the country's government actions or imperfections of the country's executive, legislative, or judicial institutions adversely affect the value of an investment by a foreign firm in that country. This definition encompasses government initiated seizure of private assets or output and creeping forms of expropriation such as unexpected taxes or royalties on profits (Knudsen (1974), Minor (1994)). It also includes the instability of relevant government policies (see, for example, Brewer (1983, 1993)) as well as the strength of the legal system, especially with respect to the enforcement of property rights. Finally, internal and external conflicts, such as general strikes, terrorism, and (civil) war as also typically categorized as part of political risk. Importantly, political risk does not encompass natural disasters, such as earthquakes and tsunamis, nor does it include macroeconomic or financial risk factors.

To account for political risk in a net present value (NPV henceforth) analysis of investment, one must decide to incorporate political risk into either project cash flows or the discount rate (see Butler and Joaquin (1998)). Lessard (1996) and Bekaert and Hodrick (2011, Chapter 14) argue that in theory political risk should be incorporated into cash flows. Consider an MNC with a shareholder base that is globally diversified. In this case, the discount rate should only reflect international, systematic risks. A standard model to do so would be the world Capital Asset Pricing Model (CAPM), where systematic risk would be related to how the return of the MNC's project in a particular country covaries with the world market return. Consequently, political risk should only affect the discount rate if it somehow represents global systematic risk.We come back to this possibility, which has been the subject of a growing recent literature, in section 4.2. In fact, our empirical tests suggest that political risk in the context of FDI is mainly a diversifiable risk for global investors, and it should therefore mainly be accounted for by adjusting expected cash flows.

Further, political risk can be insured. As Bekaert and Hodrick (2011) discuss, if a MNC takes out an insurance policy against political risk that covers all contingencies and has no deductible, then the company should simply compute its expected cash flows as if there is no political risk and then subtract the insurance premium it must pay each year from the cash flows of the project. The cash flows would then be discounted at the usual discount rate. While it is possible to purchase political-risk insurance, it is seldom the case that an investment can be fully insured.

If a company chooses not to purchase political-risk insurance, it must forecast its future cash flows incorporating how they might be affected by various political risks, such as direct expropriation of the project or indirect expropriation through taxation, royalties on profits and currency regulation. Such forecasting is quite difficult to implement and financial advisors have instead developed simple discount rate adjustments to account for political risk. Importantly, it is always possible to find a discount rate that correctly incorporates political risk, in the sense that it yields the same NPV for the project as the cash flow analysis incorporating political risk scenarios. Let us illustrate this point with a very simple example. Suppose we are considering a one period all equity project, CF is the expected cash flow, and r is the correct discount rate reflecting all risks but political risk. The probability of a political risk event without recovery is p. Then, the present value of the project is

$$PV = \frac{CF\,(1-p)}{1+r} = \frac{CF}{(1+r)(1+PRSS)}, \tag{1}$$

where $PRSS$ stands for Political Risk Sovereign Spread, representing the correct discount rate adjustment yielding the same PV as using political risk probabilities. Also note that:

$$PRSS = \frac{1}{1-p} - 1 \quad \text{or} \quad p = \frac{PRSS}{1+PRSS}. \tag{2}$$

As long as political risk probabilities and discount rates are constant over time, an exact mapping between political risk probabilities and discount rate adjustments exists. Yet, such simple mappings are not always possible, for example, when recovery values have to be taken into account (see Section 4.3). In this paper, we derive political risk spreads for various countries that incorporate up-to-date market information regarding political risk, but are not contaminated by other risks. We now show that extant approaches fail to do so.

2.2 Sovereign spread models

2.2.1 The World CAPM and sovereign spreads

The benchmark model for computing the cost of capital ($r_{i,t}$) for project i in international capital budgeting remains the World CAPM:

$$r_{i,t} = r_{f,t} + \beta_{i,w} r_{w,t}, \tag{3}$$

where $r_{f,t}$ is the risk free rate, $\beta_{i,w}$ is the beta of project i with respect to the world market return, and $r_{w,t}$ is the world market risk premium.[2] We take the perspective of a U.S. based company, expressing all units in U.S. dollars.[3]

The simplest model to accommodate political risk, originally developed by prominent investment banks and consulting firms (see Mariscal and Lee, 1993), simply adds the sovereign spread to the cost of capital:

$$r_{i,t} = r_{f,t} + SS_{j,t} + \beta_{i,w} r_{w,t}, \tag{4}$$

where $SS_{j,t}$ is the sovereign spread for country j, in which investment i is located. Note that this model modification can be applied to any cost of capital model, and need not necessarily rely on the world CAPM as the base model.

The historical context was one in which portfolio and FDI flows into emerging markets started to re-appear in the early 1990s after a "lost decade" dominated by a debt crisis. Discount rate computations for emerging market investments became increasingly important, but applying the world CAPM to emerging markets was problematic. These markets were not fully integrated in global markets yet, making the use of the world CAPM suspect, and the betas of many countries with respect to the world market return very low (see

[2] This model was first applied in an international setting by Solnik (1974) and Stulz (1981). Throughout the paper, we have retained our notation w, which refers to "world". However, in several of the models mentioned below, including Mariscal and Lee (1993), the authors, in fact, use a "domestic" CAPM with the U.S. stock market index instead of the world index.

[3] Alternatively, foreign cash flows can be expressed in foreign currency units, but then so must be the discount rate. Bekaert and Hodrick (2011) show that the two methods are equivalent if the discount rates satisfy a parity condition akin to the uncovered interest rate parity condition in international finance.

Harvey (1995)), leading to implausibly low costs of capital for many emerging markets. The sovereign spread adjustment conveniently increased the cost of capital. However, it is important to realize that if the beta of a project's return with respect to the world market is low, and the shareholders of the company are globally diversified, the cost of capital *should* be low. A more relevant question is whether local equity returns correctly reflect the project's systematic risk, which may depend on many factors, for example, whether the MNC produces for the local or international market. In the present day, the betas of most emerging markets have dramatically increased as their integration in world capital markets has progressed, and, using monthly data from MSCI (2009-2013), the emerging market index return currently has a beta of 1.15 with respect to the world market equity return (see, also, Bekaert and Harvey 2015). It is therefore important to ensure that the sovereign spread adjustment is correctly accounting for political risk and not for other risks.

Clearly, the use of sovereign spreads to augment standard models of the cost of capital has intuitive appeal, as they are observable, forward looking, and undoubtedly reflect political risk. It was also a practical success. Over time, several *ad hoc* modifications to the base model were proposed. We now provide an overview of the most prominent models.

2.2.2 Sovereign spread model variants

These modifications of the benchmark model can be generally represented as:

$$r_{i,t} = r_{f,t} + f(SS_{j,t}) + g(r_{w,t}), \tag{5}$$

where $f(\cdot)$ and $g(\cdot)$ are functions of the sovereign spread and world market risk premium, respectively. These functions vary across the various ad hoc adjustments proposed; Table 1 provides a summary.

The second through fourth models leave the sovereign spread adjustment to capture political risk unchanged, but modify the beta. Mariscal and Dutra (1996) propose an adjustment designed to eliminate the problem of low betas; replacing the beta by the ratio of the standard deviation of country j's equity return, σ_j, over the standard deviation of the world (or U.S.) market return, σ_w. Given that the volatility of emerging market returns is almost always higher than that of the world market return, the cost of capital increases significantly. To reduce the chance of "double counting" political risk, Godfrey and Espinosa (1996) down-weight the beta adjustment by multiplying the volatility ratio by 0.6, arguing that local equity market volatility and political risk are correlated. Finally, Mariscal and Hargis (1999) propose replacing the fixed adjustment 0.6 by one minus the observed correlation, $\rho_{e,b}$, between the equity and bond market returns for the country in which the project is located. The articles are silent on an economic justification for these beta adjustments.[4]

Other modifications focus on the sovereign spread terms. Damodaran (1999) argues that the sovereign spread mixes equity and bond premia, and that the bond premia need to be adjusted to make them 'equity like'. Given that equity return volatility is greater than bond return volatility, Damodaran (1999) employs the ratio of the two, $(\frac{\sigma_j^e}{\sigma_j^b})$, to adjust the bond sovereign yield spread upward, where σ_j^e is the standard deviation of country j's equity returns and σ_j^b is the standard deviation of country j's bond returns. Abuaf (2015) replaces the sovereign spread with a multiple of the credit default swap spread.

The modifications by Zenner and Akaydin (2002) and Damodaran (2003) are designed to facilitate the degree to which projects or firms in a particular country may differ in their exposures to that country's perceived political risk. Zenner and Akaydin (2002), in addition to considering a project specific beta, do this by modifying the sovereign spread adjustment. The three γ factors are designed to reflect project-specific considerations: γ_1 represents a company's access to capital markets; γ_2 is the susceptibility of the investment to political risk; and γ_3 is the financial importance of the project to the company. Each adjustment is scored 0 to 10 (10 being the most challenging). As the sum is then divided by 30, the adjustment to the sovereign spread factor will then vary between 0 and 1.

Damodaran (2003) also considers two modifications that allow for country- or project-specific exposure to political risk. In the first approach, which he calls the "β approach," he assumes that a company's exposure to political risk is proportional to its exposure to world market risk, measured by $\beta_{i,w}$. Of course, betas measure overall exposure to world market risk, and may be quite different from exposure to political risk. In the second (his

[4] Another model in this class is by Hauptman and Natella (1997) who keep the intercept equal to the sovereign spread, but make the beta an ad hoc function of data properties and the true beta.

preferred "λ approach"), he allows each firm/project to have a distinct exposure to political risk (λ_i) that is different from its exposure to world market risk. This can be determined, for example, by the degree to which the project's revenues are derived from activities located domestically or otherwise. The acknowledgement that political risk exposure could vary for different firms is appealing, but the implementation of these adjustments requires subjective data analysis.

Importantly, the proposed adjustments to the cost of capital have no theoretical motivation.[5] Furthermore, Estrada (2007) shows that different adjustments deliver wildly different implications for the cost of capital and thus for international valuations.

2.3 Country credit ratings

As an alternative to the various sovereign spread adjustments for political risk mentioned above, Erb, Harvey, and Viskanta (1996) instead employ country credit ratings to infer expected country returns. In particular, they regress future equity returns on the logarithm of current country credit ratings supplied by Institutional Investor. The resulting fitted values are the proposed expected returns. Of course, these credit ratings are highly correlated with sovereign spreads and should reflect political risk concerns incorporated in reported credit ratings. Studies by Brewer and Rivoli (1990) and Cosset and Roy (1991) find that political factors are significant determinants of the Institutional Investor country credit ratings; with Brewer and Rivoli (1990) using political regime instability, as measured by changes in the heads of government and Cosset and Roy (1991) focusing more on political unrest indicators.

An interesting aspect of the Erb, Harvey, and Viskanta (1996) approach is that the only input needed to determine a country risk premium is the country rating. Hence, risk premia from this empirical model are available for many countries that do not have sovereign bonds or equity markets. Our approach below has similar advantages.

[5] See Kruschwitz, Löffler, and Mandl (2013) for a harsh critique of Damodaran's approach.

2.4 Critical assessment and a new approach

These extant approaches, making use of sovereign spreads, have a number of appealing features. First, it is plausible that sovereign spreads reflect political risks relevant for an MNC's investment decisions. The sovereign spread represents an *ex ante* assessment of a country risk premium that reflects the credit worthiness of the government. However, the government's willingness to pay external debt is correlated with its attitude towards MNC's. The ability of a government to service its external debts also depends on the government's ability to extract resources from its citizens, which is likely correlated with typical measures of political stability. While quantifying political risk associated with physical investments may be difficult, such as a government changing the value of a MNC's cash flows through regulations, it is easier to define a realization of a political risk event (namely sovereign default) in the case of sovereign debt (see also Choi, Gulati and Posner, 2011). The link between sovereign spreads and political risk is apparent from two empirical perspectives. The empirical literature on the determinants of sovereign spreads shows that political risk factors, as assessed by political risk ratings, are important determinants of sovereign spreads (see, e.g., Baldacci, Gupta, and Mati, 2011). The international business literature has also linked political risk variables to creditworthiness. For example, Citron and Nickelsburg (1987) find a statistically significant link between political instability, which they proxy by the number of changes of government over a five-year period, and the default probability on external debt for a number of developing countries. Vaaler, Schrage, and Block (2005) show that spreads increase when the probability that a right-wing government is replaced by a left-wing government increases.

Second, sovereign spreads constitute market determined and forward-looking assessments of political risk that are likely superior to the use of, say, macroeconomic data (which are subject to manipulation and usually stale). Third, the spreads are in discount rate units reflecting long-term investments. Even though political risk is a cash flow risk, political risk probabilities are difficult to compute and equation (2) can be used to convert discount rate adjustments to political risk probabilities.

The main problem with the approach is that sovereign spread variation has been shown to reflect variation in a number of other factors, such as local macro-economic and fiscal conditions (see e.g. Edwards (1984)) and Hilscher and Nosbusch (2010)) beyond political risk. A number of recent articles show that global and/or U.S. financial conditions are important drivers of variation in sovereign spreads (see Özatay, Özmen, and Sahinbeyogu (2009), Gonzalez-Rozada and Levy-Yeyati (2008), Maier and Vasishtha (2008), Remolana, Scatigna, and Wu (2008), Pan and Singleton (2008), and Longstaff, Pan, Pedersen, and Singleton (2011) using bond and CDS data). Martell (2008) emphasizes the role of market liquidity for spread determination, but still finds evidence in favor of a significant common component among international bond spreads. Mauro, Sussman, and Yafeh (2002) show that emerging market sovereign spreads currently comove much more than they did in a historical 1870-1913 sample, and that major fluctuations are tied to global events to a greater degree in more recent years. If this is the case, the sovereign spread reflects both political and systematic risks.

We start from a discount rate that only reflects systematic risk and then adjust for a *political risk sovereign spread* as in equation (1) above. This political risk spread, introduced in Bekaert, Harvey, Lundblad, and Siegel (2014), cleanses the sovereign spread (SS) of global risk and local macroeconomic conditions beyond political risk. In particular,

$$SS_{j,t} = PRSS_{j,t} + F_{j,t}, \tag{6}$$

where $F_{j,t}$ represents the effect on sovereign spreads of a number of non-political risk factors. To give concrete content to (6), Bekaert, Harvey, Lundblad, and Siegel (2014) use a regression model linking sovereign spreads to a measure of political risk to infer $PRSS_{j,t}$ and to several other factors to proxy for other determinants of sovereign spreads, following the extant empirical literature on the topic.

To implement this approach, we must find a political risk rating that is forward looking and reflects political risk in a narrow sense, as opposed to broad country risk that also embeds macro-economic factors. We use the political risk rating from the International Country Risk Guide (ICRG) which is designed to mainly reflect political risk as the ICRG has separate ratings on economic and financial risk. While the rating is largely subjective based on the insights of various analysts, the types of quantitative measures of political risk (government turnover, democracy, and left or right leaning governments) mentioned above are surely correlated with various sub-components of the ratings (see below). Moreover, if the ratings are not salient with respect to sovereign spreads and default, our empirical analysis should fail to find a significant link between the two.[6]

We also propose a method, building on the model, to compute political risk spreads even for countries that do not issue sovereign bonds, but do have a political risk rating. While applying the model to countries not issuing bonds skirts some selection issues, it at least provides a reasonable starting point to quantify political risk for a large number of countries.

One may think that corporate bond spreads may be more closely correlated with expectations regarding corporate cash flows than are sovereign spreads. However, it is not at all clear that the cash flow risks facing emerging market companies are very informative about the political risks facing multinational companies investing in the emerging market where they are headquartered. For example, a multinational emerging market company may be more subject to political risks in other countries than political risks in its own country given that most of their business is conducted outside of their home country. Nevertheless, there may be some useful information in these bond prices. First, these companies operate in a similar regulatory framework as do the multinationals trying to do business in the emerging market. Second, the ability of the country to earn foreign exchange likely is correlated with both political risk faced by international MNCs and the cash flow prospects of local companies large enough to issue (international) corporate bonds. In addition, the so-called 'sovereign ceiling' implies that corporations in many countries cannot locally borrow at a cheaper rate than the local government, making the sovereign spread informative about default risk on corporate cash flows.

Of course, corporate bond markets in many emerging markets are still in their infancy and empirical work is scarce. Durbin and Ng (2005) note that corporate bonds that are able to pierce the sovereign ceiling (trade at a lower spread than the government) are typically firms with substantial export earnings and/or a close relationship with either a foreign firm

[6] In fact, Bekaert, Harvey, Lundblad, and Siegel (2014) show that these ratings do predict political risk realizations, as measured by textual-based news of political risk related events.

or with the home government. Dittmar and Yuan (2008) find a strong empirical link between emerging market sovereign and corporate bond spreads, as do Cavallo and Valenzuela (2010). The latter authors do point out that firm specific determinants dominate the explained variation of corporate bonds spreads. These empirical findings suggest that corporate bond spreads from emerging market companies may not necessarily reflect political risk relevant for foreign MNCs. Nevertheless, we check whether corporate bond spreads house information about political risk below.

Our approach assumes a rational world in which agents assign probabilities to political risk events and in which the CAPM holds. A more realistic model of the world involves Knightian uncertainty, where the right probabilities for political risk events and even the range of events may not be fully knowable. In such a world, economic agents are likely to act more conservatively, thus potentially requiring larger discount rates. We believe that there is still value in our approach, as long as markets and the rating analysts account for the Knightian uncertainty. That is, countries with a more "uncertain" environment receive, everything else equal, higher spreads, and poorer political risk ratings. We feel that this is a plausible assumption. The problem is then how to translate our political risk spreads into a political risk probability for use in a discounted cash flow analysis. Under Knightian uncertainty, the CAPM is not likely to hold and the discount rate model would have to be changed. Our contribution lies in political risk measurement and a concrete proposal to conduct capital budgeting with political risk adjustments. Deriving a new equilibrium model for a world with Knightian uncertainty is far beyond the scope of this article.

3 Preliminaries and Data

In this section, we lay the groundwork for the political risk adjustment based on political risk spreads. We update and extend the regressions run in Bekaert, Harvey, Lundblad, and Siegel (2014), briefly outlining the variables and data used, before discussing the results.

3.1 Regression framework and Data

Our key regression takes the form:

$$SS_{i,t} = c_0 + c_1 Global_t + c_2 ZR_{i,t} + c_3 Local_{i,t} + c_4 BVOL_{i,t} + c_5 PR_{i,t} + \epsilon_{i,t}, \tag{7}$$

where $SS_{i,t}$ is the sovereign spread for country i and month t; $Global_t$ represents a global factor that is identical for all countries; $ZR_{i,t}$ measures the illiquidity of the sovereign bonds; $Local_{i,t}$ represents a country-specific macroeconomic factor; $BVOL_{i,t}$ is an estimate of the monthly bond return volatility; and $PR_{i,t}$ represents the political risk measure (our main variable of interest).

As hinted above, the recent literature has stressed the importance of global determinants. Hence, our first factor is the Barclays (formerly Lehman Brothers) U.S. Corporate High Yield Spread over Treasuries. This variable serves as a global corporate factor.

Our second factor measures (local) illiquidity. Hund and Lesmond (2008) show that a significant part of observed yield spreads for emerging market sovereign and corporate issues may be attributable to illiquidity compensation rather than simply default risk. Following the work of Lesmond, Ogden, and Trzcinka (1999), we construct a bond market illiquidity measure based on the incidence of observed zero daily bond returns. ZR, is the equally-weighted monthly average of zero daily returns across all sovereign bonds provided by Datastream. The Datastream data do not represent the exact same constituent set of bonds that enter into the EMBI indices, but the correlation between the average yield on these bonds and the EMBI+ yield is very high, suggesting significant overlap. To mitigate the effect of outliers, we use a 12-month moving average of the monthly illiquidity measure.

Our third factor measures local risk conditions. We use the ICRG ratings on economic and financial risks for this purpose. The economic risk indicator combines information on five economic statistics: GDP levels, GDP growth, inflation, government budgets, and the current account. The ICRG financial risk indicator is designed to assess a country's ability to finance its official, commercial, and trade debt obligations. It combines data from five statistics: foreign debt as a percentage of either GDP or exports, the current account as a percentage of exports, official reserves, and exchange rate stability. We combine both the economic and financial risk indicators into one composite "economic" rating.[7] The ratings are scaled between 0 and 100, with 100 representing the least risk. To have larger values represent more risk, we transform the original ratings by taking the log difference between the U.S. rating and the country's rating.

Our fourth factor, $BVOL$, measure captures *realized* bond market volatility (see Andersen, Bollerslev, Diebold, and Labys (2003) as an example). This measure is particularly useful when in crisis times spreads and bond volatility non-linearly increase. For each market, we construct a monthly scaled measure of realized bond market volatility by cumulating daily squared EMBI bond index returns and dividing the sum by the average life of the bonds in each country index. We then take a 12 month moving average of the monthly bond volatility measures.

Finally, the most important factor for our purposes is obviously, PR, the political risk measure, which we also extract from the ICRG data. The ICRG political risk indicator is designed to assess the political stability of the countries covered, combining information from twelve subcomponents, including measures of government stability, socioeconomic conditions, the investment profile, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tension, democratic accountability, and bureaucratic quality (see Appendix A for more detail). The ratings are scaled between 0 and 100, with 100 representing the least risk. To have larger values represent more risk, we transform the original ratings by taking the log difference between the U.S. rating and the country's rating.[8]

While the political risk indicator purports to measure political and not economic risk, it goes without saying that our political and economic risk indicators are correlated. High unemployment and poverty, for example, can contribute to internal conflicts.[9] In Appendix

[7]In our empirical work, we found that using the two ratings separately did not improve the empirical fit, and that both ratings received statistically indistinguishable coefficients.

[8]The log difference can be interpreted as the percentage difference between the U.S. and the country-level ICRG ratings. A zero value implies that the country has an institutional environment comparable to that of the U.S., where as a much larger number would denote significant political risk. That is, while the scaling of the original ICRG index is arbitrary, the actual value here has economic content as a percentage difference. The log difference is also invariant to re-scalings of the original index. Therefore our results are robust to the use of alternative political risk indices as long as they imply the same relative deviation of a given country vis--vis the U.S.

[9]Yet, Tomz and Wright (2007), using data for the period 1820-2004, find only weak correlation between

A, we report the pooled correlation of the political risk rating and its sub-components with our economic rating. The correlations are as low as 0.172 for *Religious Tensions* and as high as 0.605 for *Investment Profile*. As the overall political rating is almost 70% correlated with economic risk, it may not be surprising that authors such as Perotti and Van Oijen (2001) and Click and Weiner (2010) use the Institutional Investor country risk ratings as a proxy for political risk. The regression framework in equation (7) of course automatically takes correlation into account by measuring partial correlations between the dependent variable and the independent variables.

Given that we investigate spreads relative to U.S. Treasury yields, we subtract from all our country variables their U.S. counterparts. The number of zero returns is assumed to be zero for the highly liquid U.S. Treasury market.

3.2 Empirical Results

Before we report some results regarding the main regression, we must still discuss our sovereign spread data. We collect monthly bond yields for 43 sovereign issuers from January 1994 to December 2013 from JP Morgan's Emerging Market Bond Indices (EMBI). In particular, we employ their EMBI+ series, which cover relatively liquid U.S. dollar denominated sovereign and quasi-sovereign bonds. If EMBI+ series are not available, we employ JP Morgan's EMBI series, which incorporate less liquid instruments. Further, we obtain "Stripped Spreads" (EMBI code: SSPRD) over Treasuries.[10] The indices incorporate emerging market issuers from Latin America, Eastern Europe, Asia, Africa, and the Middle East.

Table 2 presents relevant summary statistics. We distinguish two samples. For our "baseline" sample, we require at least 10 years of monthly data for all variables that we use in the regression specifications (both sovereign spreads and explanatory variables).[11] Among our baseline sample of 20 countries, the mean spreads over non-default periods for each country range from as little as 120 basis points for China to as large as 1,101 basis points

economic output in the borrowing country and sovereign defaults.

[10]These indices include both collateralized restructured (Brady) debt and conventional non-collateralized bonds. A bond's stripped spread is net of the value of any (Brady) guarantees.

[11]The availability of the EMBI data is the most restrictive, but for some countries the construction of an illiquidity measure (see below) is more binding.

for Nigeria. In several cases, the average spreads substantially exceed the median spreads, suggesting the importance of several significant market crises that are present in our data. Finally, the average spreads mask significant time-series variation in spreads, as suggested by the large standard deviations reported. We also provide data for 23 additional countries, denoted "hold out sample", that we employ for several robustness checks. These alternative countries have mostly shorter historical coverage, but generally have similar summary statistics.

We eliminate a small number of sovereign spreads observed during periods of default. It is generally known that sovereign spreads may behave quite differentially when a country has defaulted on its debt. In default, the market attempts to assess the recovery values of the existing bonds, rather than the future political risk situation. Moreover, when a bond goes into default, the market environment is typically plagued by heightened illiquidity, making it difficult to extract political risk information from the spreads. We therefore collect data on default from Fitch, Moody's, and Standard & Poor's. Default starts in the month in which at least one rating agency downgrades at least one sovereign bond of a country to "default" and lasts until the first non-default rating of a sovereign bond is issued (meaning they are all in non-default). The various sovereign bonds have different maturities, so we also include the log of the maturity (in years) as an independent variable to the regression.

The results are reported in Table 3 (Panel A). In our main regressions, we focus on an unbalanced baseline sample of 20 emerging market countries spanning January 1994 through December 2013 (however, we lose the first 11 observations of 1994 due to our 12-month moving average of several variables). All estimated coefficients are based on pooled OLS; however, the standard errors are adjusted for groupwise-heteroskedasticity, SUR effects, and a Newey-West (1987) correction with four lags.

The first column of Table 3 (Panel A) presents estimates for the full specification. The adjusted R^2 is 70%. All coefficients in the regression are highly statistically significant, indicating that factors beyond political risk are important in explaining cross-country and temporal variation in sovereign spreads.

Figure 1 shows the fit of the regression in and out of sample. Figure 1a shows a scatter plot of the actual EMBI spreads on the vertical axis versus the predicted spreads on the horizontal axis with the regression line also being graphed. The equally-weighted absolute residual is 137 basis points. Figure 1b shows the same information but with the regression coefficients applied to sovereign spreads from the "out-sample" countries. The R^2 for this regression is 0.55. Further, the equally weighted absolute residual is now 150 basis points.

To characterize the relative contributions of each determinant, Table 3 (Panel B) reports a variance decomposition for the larger sovereign spread sample, showing the degree to which each factor contributes to the variation of the predicted sovereign spread from the full specification (first column). Political risk accounts for 17.5% of the total predicted variance, with bond volatility being the dominant factor. The factors are obviously correlated and the variance decomposition assigns covariances equally to the different factors (see Appendix B for more detail). In particular, bond volatility is strongly correlated with the other risk factors. To assess what the *maximal* impact of political risk is, we also run a regression after first orthogonalizing bond illiquidity, the economic and financial risk indicator, and bond volatility with respect to political risk so that the political risk coefficient soaks up all the covariances with other factors. The contribution of political risk now increases to 31% (second column).

In the last column, we show an alternative orthogonalization. We first orthogonalize the bond volatility variable with respect to all the other variables. Its contribution drops to below 10% and political risk now accounts for 34% of the total predicted variance. This last specification perhaps provides a good summary of the economic impact of the various factors in "normal times." Political risk is indeed the most important economic driver of sovereign spreads, explaining about 30% of the predicted variance, economic conditions are next in importance, accounting for about 20%. Bond maturity, liquidity, and global market conditions each contribute between 10 and 15% of the predicted variance. Interestingly, the contribution of political risk here is about the same as it is in the previous "max impact" decomposition assigning all correlations to the political risk variable. Thus, political risk is an important driver of sovereign spread variation, but the other determinants do account for a substantial amount of the time series and cross-country variation in sovereign spreads as well.

3.3 Corporate Bond spreads

We also repeat the regression in equation (7) for corporate bond spreads instead of sovereign spreads. We collect monthly yield spreads from country-level corporate bond indices for 13 markets from January 2002 to December 2013 from JP Morgan's Corporate Emerging Market Bond Indices (CEMBI). As with the sovereign spreads, we obtain "Stripped Spreads" (EMBI code: SSPRD) over Treasuries.

In the second column of Table 3, Panel A, we report a regression for our much more limited sample of corporate spreads. We could not construct the bond liquidity variable for these bonds, so we simply drop that variable from the regression. Despite the large difference in sample size (both countries covered and time period), we do observe that the fit is similar across corporate and sovereign bonds and many of the coefficients are similar as well. The only exception is the duration variable which has now an unintuitive negative sign. For political risk, the coefficient is more than 50% larger than in the sovereign spread case, but it is conceivable that this is partially driven by correlation with the bond illiquidity, not present in the regression.

4 Market based political risk assessment

In this section, we review the concept of a "political risk sovereign spread," $PRSS$, measured in basis points, that represents the part of the sovereign spread accounted for by political risk. Before showing how to use the political risk spread in capital budgeting, we assess whether political risk is priced in a cross-section of emerging market equity returns, or whether it is diversifiable, which has a bearing on whether the political risk adjustment should be a pure cash flow or also discount rate adjustment.

4.1 Political risk spreads

Bekaert, Harvey, Lundblad, and Siegel (2014) propose to use the regression framework of equation (7) to compute a "narrow political spread" ($NPRSS$) as follows:

$$NPRSS_{i,t} = \frac{\hat{c}_5 PR_{i,t}}{\hat{SS}_{i,t}} SS_{i,t}. \tag{8}$$

That is, the political risk spread takes the fraction of the predicted value for the sovereign spread accounted for by the political risk variable and multiplies it with the current sovereign spread. The computation therefore embeds up to date information from the forward looking sovereign spread at the same time as the current information in the current political risk rating in a particular country (relative to the U.S.).[12]

It is also important to acknowledge that political and other risks may be correlated; an increase in macroeconomic and/or liquidity risk may be partially induced by political risk events. To more comprehensively account for the potential correlation between the political risk variable and other independent variables, we also construct an upper bound on the political risk spread. To do so, we estimate panel regressions for each of our main explanatory variables, except for the global variable and maturity, onto political risk and store the residuals. These residuals capture the variation in the independent variable not correlated with political risk. We then rerun the main sovereign spread regression using these orthogonalized variables, so that the political risk variable now soaks up all the correlated risks, just as we did for Table 3, Panel A. We then repeat the exact same calculations as we did for the narrow political spread, yielding a wide political risk spread, or $WPRSS_{i,t}$.

In Table 4 (Panel A), we first report some general characteristics of the narrow and wide ratios. These ratios are based on the specification in Panel A of Table 3 (first column), estimated over the non-default baseline sample. Nevertheless, we compute them for our full sample, i.e. both the baseline and hold out sample, and exclude observations related to default periods. We report their values for a few percentiles of the distribution. The narrow

[12] When political risk in the country examined is smaller than in the U.S., making PR_{it} negative, the narrow political risk spread is set to zero. When the political risk variable accounts for more than 100% of the spread, the political risk spread equals the sovereign spread. When the predicted spread is negative, we use an average of the positive ratios over the last 12 months as the ratio. If there are no such positive ratios, we set the ratio to 1.0.

ratio is 1.0 at its 90^{th} percentile and falls to 0.16 for the 10^{th} percentile. The wide ratio is 0.28 at the 10^{th} percentile, but nearly half of the observations have a wide ratio equal to one. Next, we rank all observations based on the political risk rating. For each observation, we calculate the predicted spread, $\hat{SS}_{i,t}$, the predicted narrow and wide political spreads as well as the corresponding ratios. Finally, we apply these ratios to the actual observed spread $SS_{i,t}$, obtaining $NPRSS_{i,t}$ and $WPRSS_{i,t}$. Table 4 (Panel B) reports all of these components in terms of averages around the 90^{th}, 75^{th}, 50^{th}, 25^{th}, and 10^{th} percentile of the political risk distribution.[13] The narrow (wide) ratios increase from 0.40 (0.59) for low political risk to about 0.57 (0.84) for high political risk, suggesting that the top values for the ratios (see Panel A) are observed throughout the distribution of political risk. Actual and predicted spreads increase monotonically with political risk, resulting in narrow and wide spreads that also monotonically increase with political risk. $NPRSS$ is about 77 basis points at the 10% level of the political risk distribution and about 340 basis points at the 90% level. The wide spreads are roughly about 50% higher as the narrow spreads.

For many countries covered by the ICRG, important data items necessary for the political risk spread computation, often including the sovereign bond spreads themselves, are not available. Bekaert, Harvey, Lundblad, and Siegel (2014) therefore use data on the political risk spread for the countries employed in Table 2 to separately fit linear-quadratic cross-sectional regressions through the narrow and wide spreads onto $PR_{i,t}$, available from ICRG for a large set of countries, and its square. The fitted value of this regression then determines what the narrow and wide political risk spreads would be given each country's $PR_{i,t}$. As an example, Appendix C reports narrow and wide political risk spreads for 112 emerging markets in 2013, most of which do not have sovereign bonds. The narrow spreads range from 19.6 basis points (bps) for Bulgaria to 597.9 bps for Somalia. The wide spreads range from 34.9 bps for Bulgaria to 846.6 bps for Venezuela. The regional distribution of the spreads is also plausible. They are the highest for African countries (284 bps, on average, for narrow spreads), followed by the Middle East (with 242 bps), Latin America (207 bps), Asia (201 bps), and finally, emerging Europe (141 bps).

[13]We average observations with political risk ratings ranked 2.5 percentiles above or below the stated percentile. For example, values reported for the 90^{th} percentile represent averages of all observations with political risk ratings between the 92.5^{th} and the 87.5^{th} percentile of the distribution.

4.2 Is political risk priced?

It is conventional wisdom that country risk is priced in equity returns. However, in theory, political risk must affect global discount rates for it to be priced. While political uncertainty in a country with a major equity market such as the U.S. or certain major emerging market political risk events, such as the 1998 Russian crisis for instance, likely or possibly represent systematic risk, most political risk events appear country specific. Some recent theoretical literature has, however, explicitly linked sovereign bond spreads and equity returns. Borri and Verdelhan (2012) formulate a model in which emerging countries tend to default when their economic conditions worsen but these conditions have a global component. Sovereign defaults and bonds prices therefore depend not only on the borrowers' economic conditions, but also on the lenders' time-varying risk-aversion. Andrade (2009) explicitly links expected returns on emerging stock markets to the corresponding average yield spread in sovereign bonds. In his model, it is also the case that the discount rate for emerging market stocks reflects not only the likelihood of a negative macroeconomic regime change but also global risk aversion. Country risk receives compensation because the negative emerging market regime change may be endogenously associated with bad states of the global economy.[14]

Our empirical analysis confirms that sovereign spread variation partially reflects global risk conditions. Nevertheless, this does not imply that pure political risk is not diversifiable. The mechanisms in the models described above seem to mostly apply to the economic component of country risk and it is still conceivable that the political risk components are mostly idiosyncratic. Existing evidence in favor of political risk being priced is not terribly strong (see Bekaert, Erb, Harvey, and Viskanta (1998), Erb, Harvey and Viskanta (1996)).

In this section, we provide a simple test of this hypothesis using portfolios of emerging market equity index portfolios. That is, we make the explicit assumption that the cash flow risks for international projects in a particular country are adequately proxied by those of its local, publicly traded companies. We collect the USD equity market IFCG indices from from January 1998 to December 2013 from Standard & Poor's. For a number of more developed

[14]See also Chen, Lu, and Yang (2015) for a similar idea. Andrade and Chhaochharia (2015) apply the Andrade model to calculate the cost of sovereign default in terms of an increased cost of capital and decreased earnings growth experienced by local firms.

emerging market countries, Standard & Poor's recently replaces the IFCG indices with a new benchmark (BMI) index; we simply switch to the new index when they do. We also employ a simple sorting procedure, where we either sort on total sovereign risk (measured by the sovereign spread) or on (narrow) political risk, measured by our political risk spread. Our conjecture is that sovereign risk is priced, but political risk may not be.

All regressions are run with monthly data on long-short equity return portfolios from January 1998 to December 2013 on various global risk factors. The long-short portfolios involve a long position in the countries with the largest EMBI or PRSS (either top half or top third) and a short position on the countries with the lowest EMBI or PR spreads (again, either bottom half or bottom third). The risk factors, MKT, SMB, HML, and WML, are the usual Fama-French four factors from Ken French's web page, but we use the global versions which are based on averages across developed markets. Finally, EM MKT is the excess return on the MSCI Composite Emerging Market Index. Standard errors (provided in italics) are computed with a Newey-West correction (with 5 lags). Annualized α's and (their standard errors) are computed by taking the regression intercept and multiplying by 12.

The top panels focus on EMBI spread-sorted portfolios, with top/bottom portfolios on the left and top minus bottom terciles on the right hand side. We use four different benchmarks as risk controls; the global market portfolio; the three Fama-French global factors; the three Fama-French global factors plus the global WML momentum factor portfolio, and finally simply the emerging market index. Interestingly, the portfolios typically have negative market betas (so the high country risk countries actually have lower betas than the low country risk portfolios). The one exception is the HML beta which is higher for high sovereign risk portfolios. While the α's in virtually all specifications are positive, they are nonetheless not significantly different from zero. It is conceivable that country risk is priced but the power of our test is weak.

The bottom half of the table contains results for sorting on the (narrow) political risk spread. These portfolios mostly have somewhat smaller global market exposure (in absolute magnitude). Again, the α's are all positive but not statistically significant from zero. Yet, they are larger than the ones we observed for the entire EMBI+ spread and some α's are significant at the 10% level.

The evidence is therefore mixed.[15] We do not find strong statistical evidence that political risk exposure leads to higher expected returns, and in fact, it appears that the exposure of high political risk portfolios to global risk factors is smaller than that of low political risk portfolios. Yet, this topic deserves a lot more attention as it may simply be that our tests lack power. We defer such analysis to future work and for now, proceed under the assumption that political risk constitutes a cash flow risk to be taken into account in capital budgeting analysis.

4.3 Political risk spreads and capital budgeting

We advocate the use of political risk spreads to infer the probability of a political risk event, and then to adjust expected cash flows using that probability, while discounting with the usual discount rate which reflects systematic risk. We acknowledge, however, that many seem to prefer a simple discount rate adjustment (as the voluminous literature on this topic suggests). Therefore, we show how the probability of a political risk event can be estimated and then translated into a simple discount rate adjustment that is correct under special assumptions. In particular, we first derive the formulas under the assumption of a constant probability of a political risk event. Then, we consider alternative specifications, including time-varying political risk probabilities and creeping expropriation.

4.3.1 *Political risk adjustment under a constant probability of risk event*

To begin, consider pricing a sovereign bond. The bond pays coupons, denoted by C_t, (where the final payment also includes the face value of the bond), and the recovery value if a political risk event is equal to RR_t. For the time being, assume that p, the political risk event probability, is constant over time. Let the maturity of the bond be T periods (years). Finally, let r_b denote the bond's discount rate ignoring political risk and r_b^* denote the bond's discount rate incorporating political risk. There is a mapping between the political

[15] We also consider the inclusion of lagged risk factors given the possibility of non-synchronous trading and significant market illiquidity. In each case, some of the coefficients on the lagged risk factors are significant (particularly for the global and emerging market portfolio factors), and the R^2's do rise slightly with the annualized α's falling. However, the broad results are qualitatively unchanged.

risk probability used for valuing the bond by adjusting the expected coupon payments and an alternative valuation that takes the bond's coupon payments as given, but employs a political risk adjustment to the discount rate. The two approaches must yield the same present value:

$$\sum_{t=1}^{T} \frac{C_t\,(1-p)^t + RR_t\,p(1-p)^{t-1}}{(1+r_b)^t} = \sum_{t=1}^{T} \frac{C_t}{(1+r_b^*)^t}. \tag{9}$$

In other words, given values for the bond, the coupon, its maturity, estimates for the recovery values and r_b and r_b^*, we can solve this equation for p.

The actual discount rate is the bond yield, $r_b^* = SS + y_{US}$, where y_{US} is the 10-year U.S. bond yield. Our computations in the previous section essentially split up r_b^* into a political risk component and a yield purged of political risk. It is the latter that is our candidate for r_b, the discount rate on the left hand side in (9). Denote the political risk spread as $APRSS$, to indicate it is an absolute spread. Then we have $r_b = r_b^* - APRSS$. Thus, the total yield purged of political risk is denoted by r_b and reflects the U.S. Treasury rate, liquidity risk, global risk, and macroeconomic conditions.

While Moodys and S&P do provide some estimates of typical recovery values, that element of the computation is the most uncertain. When we set the recovery value to zero, the two present value computations give the same answer if $(1-p)/(1+r_b) = 1/(1+r_b^*)$. To link this to our political risk sovereign spreads, we assume that $1 + r_b^* = (1+r_b)(1+PRSS)$, similar to our discussion in Section 2. This immediately leads to the relation between p and $PRSS$, described in (2). Moreover, $PRSS = \frac{APRSS}{1+r_b}$.

Let's illustrate this numerically. Suppose $SS = 3\%$; $y_{US} = 5.12\%$; and $APRSS = 1.5\%$. These data imply that $r_b^* = y_{US} + SS = 8.12\%$ and $r_b = r_b^* - APRSS = 6.62\%$. Hence, $PRSS = \frac{1.50\%}{1.0662} = 1.41\%$ and $p = \frac{PRSS}{1+PRSS} = 1.39\%$.

To use the political risk spread in a MNC's capital budgeting exercise, consider expected cash flows for a project equal to CF_t. Similar to the bond valuation above, we can take the present value of the project's cash flows by either incorporating the political risk event probability into the cash flows or adjusting the discount rate using our computed political risk spread. If valid, the two approaches yield the same present value:

$$\sum_{t=1}^{T} \frac{CF_t\,(1-p)^t + R_t\, p(1-p)^{t-1}}{(1+r_e)^t} = \sum_{t=1}^{T} \frac{CF_t}{(1+r_e^*)^t}\ , \tag{10}$$

where, in this case, R_t is the recovery value of the MNC's project in the face of a political risk event. To evaluate the left-hand side, one simply computes the expected return on the project (supposedly all equity), r_e, perhaps by using the World CAPM, and uses the p computed from pricing the sovereign bond. Using our political risk spread from above, $PRSS$, the political risk adjusted (equity) discount rate on the right-hand side becomes

$$1 + r_e^* = (1 + r_e)(1 + PRSS). \tag{11}$$

For $R_t = 0$, using the spread or the political risk probability is equivalent.

Note that $PRSS$ is a multiplicative spread. Why do we prefer to use multiplicative rather than absolute spreads? The reason is that the risk profile of bonds and the cash flows for a MNC are likely quite different. For example, sovereign bonds are claims to fixed nominal cash flows, a MNC's project yields uncertain equity flows that must be discounted at appropriate (and likely higher) discount rates. The multiplicative spreads correct for this "level" effect.[16] With multiplicative spreads, there is no longer a need to worry about the fact that bond discount rates are much lower than equity discount rates, which prompted Damodaran (1999) to propose an ad hoc volatility ratio adjustment to the sovereign spread before adding it to the equity discount rate. The absolute equity discount rate adjustments will be larger the higher the equity discount rate is for a given multiplicative political risk spread, consistent with political risk spreads reflecting a particular political risk probability.

To continue the numerical example, suppose we have established that $r_e = 12\%$. To adjust for political risk, we use $r_e^* = (1 + r_e) \cdot (1 + PRSS) - 1 = (1.12) \cdot (1.0141) = 13.58\%$.

In Table 6, we provide sample calculations for several groups of countries with political risk ratings around certain percentiles of the political risk distribution (as in Table 5, Panel B), with the observations restricted to non-default periods. For each group, we calculate the

[16] Bekaert and Hodrick (2011), Chapter 11, provide further details about the differences between absolute and multiplicative spreads, and when they matter.

average promised yield $r^* = r_b^* = SS + y_{US}$, by adding 5.12%, the average 10-year yield on U.S. Treasury bonds during our sample period, to the average sovereign spread SS of the specific group. To obtain a yield purged of political risk $r = r_b$, we subtract from r_b^* the average absolute risk spread $APRSS$ for each group. In Panel A, we use the narrow political risk spread $NPRSS$ to measure $APRSS$. In Panel B, we use the wide political risk spread $WPRSS$, and in Panel C, we assume that the entire sovereign spread represents political risk. Under the additional assumption that recovery values are zero and that the maturity is ten years, we can solve equation (9) for each value of r_b and thus find the corresponding probability p of a political event. For each case, we also report the 10-year cumulative probability of a political event, the implied *multiplicative* discount rate adjustment term $PRSS$ as well as the adjusted discount rate r_e^* based on a hypothetical equity discount rate r_e of 12%.

Within each panel, the inferred probability of a political risk event as well as the adjusted discount rate generally decrease with decreasing political risk. Comparing results across the three panels, we notice that overstating the size of the political risk component embedded in the sovereign spread has severe consequences. Focusing on the narrow risk spreads, the political risk probability varies between 0.74% at the 10% level and 3.21% at the 90% level of the political risk distribution. At low risk levels, using the actual (unadjusted) spread leads to a political risk probability more than three times as large; at higher risk levels, the probability is still more than double the magnitude obtained when using narrow spreads. When using wide spreads, the difference with erroneously using the actual (unadjusted) spread is obviously smaller, but remains substantial in the lower parts of the political risk distribution (1.60% versus 2.50% at the median). In terms of discount rates, the differences are also substantial. Comparing Panels A (narrow spreads) and C (the full spread), the differences range between about 2% at low risk levels and about 4% at high risk levels. As another example, assuming that the entire sovereign spread proxies for political risk (as in Panel C) yields an adjusted discount rate of 15.18% for the countries around the 10^{th} percentile of the political risk distribution, which is larger than the adjusted discount rate of 14.26%, obtained (in Panel A) for countries around the 75^{th} percentile of the political risk distribution under the assumption that only the narrow political spread presents political risk.

The adjustment proposed here makes a number of implicit assumptions. It assumes our investment project and the observed sovereign bond have the same maturity. Moreover, the political risk adjustment is assumed constant, a political risk event results in total expropriation (no recovery values) and, more subtly, the time profile of cash flows in the bond and the equity project is assumed to be similar. If the cash flow pattern of the equity project is very uneven over time, and very different from the constant coupon implicit in bond pricing, it would certainly be better to infer p from the bond cash flows and apply it to the equity cash flows, i.e. adjust cash flows and not the discount rate.

Finally, the bonds in our sample have an average maturity ranging from two years for Nigeria to 25 for Ecuador, whereas so far we have assumed a 10-year bond in our computations. Taking the actual maturity into account obviously affects the computations on the discount rate in Table 6, which should be carried out for the correct maturity. Moreover, the coefficient on the maturity variable is economically significant (at about 144 basis points), suggesting an upward sloping term structure for spreads, and thus potentially also for political risk spreads. This can be of use if the maturity of the equity cash flows is very different from the maturity of the bond cash flows. Let us take the Nigeria example, where the bonds only have a two year maturity. Suppose we are evaluating an equity project that is lasting five years. We may want to add $[\ln(5) - \ln(2)] \times 144 = 131.9$ basis points to the spread before applying the ratio analysis. We are reluctant to push this too hard, as we do not have a maturity structure within a country, but identify the maturity slope from cross-country variation in maturities.

4.3.2 *Changing probabilities of political risk events and "creeping expropriation"*

The assumption of constant p is made for convenience and it is likely unrealistic. For example, during a political risk event, p is very high due to the crisis. The crisis does not last forever and p falls over time. This is especially true in situations of current political unrest in a particular country. When there is a crisis, the current probability of political risk is quite high, but it should be expected to decrease over time as the crisis passes (see Bekaert and Hodrick (2011) and Anshuman, Martin, and Titman (2011)). One way to deal with this, is to assume that the political risk probability decreases at a constant multiplicative decay rate, λ. Hence, the time profile for political risk probabilities is p, λp, $\lambda^2 p$, $\lambda^3 p$, etc.

For a given λ, we can still derive p from the pricing equation:

$$\sum_{t=1}^{T} \frac{CF_t\,(1-\lambda^{t-1}p)^t + R_t\,\lambda^{t-1}p(1-\lambda^{t-2}p)^{t-1}}{(1+r)^t} = \sum_{t=1}^{T} \frac{CF_t}{(1+r^*)^t}. \tag{12}$$

We can then apply the risk probability, p, and the decay rate, λ, to equity cash flows.

The political risk situation can also be very different from that described here. For example, it is well known that while the risk of direct expropriation has greatly diminished (Minor, 1994), governments have found new ways to divert cash flows of MNCs to state coffers. Multinationals now worry more about breach of contract, restrictions on the transfer and convertibility of profits, unexpected changes in royalties and taxes and other regulatory risks, rather than the potential seizure of assets (see also the discussion in Henisz and Zelner (2010)). The term "creeping expropriation" has become popular, where the government may slowly squeeze a project by taxes, regulation, or legal changes. Under such circumstances, the cash flows may be increasingly subjected to a government's grabbing hand. If we assume that such an environment is increasingly going to erode a country's willingness to pay its debt in full over time, the formula in (10) must be adjusted. A simple way to model such a scenario would be to assume that the expected cash flows returned to investors decay over time at a constant multiplicative rate, δ:

$$\sum_{t=1}^{T} \frac{CF_t\;\delta^{t-1}}{(1+r)^t} = \sum_{t=1}^{T} \frac{CF_t}{(1+r^*)^t}, \tag{13}$$

with $\delta < 1$. We can solve for δ by applying equation (13) to sovereign bonds and this parameter can then be applied to the actual cash flows forecasts (under no political risk) of the multinational company. These kinds of circumstances would give international companies an incentive to front-load their cash flows.

4.4 Case study: Power Generation in Pakistan

We apply our method to the valuation of a power generation project in Pakistan.[17] The project consists of a thermal power station that is being privatized. The Pakistani government is asking U.S. $500 million for the power station. AES, a global power generation and distribution firm, headquartered in the U.S., is considering acquiring the plant. Given the nature of the business (contract power generation), AES has established that the all equity cost of capital for the project would be 4.95% if the project were located in a developed and stable country without political risk, such as the U.S.[18] The estimated world market beta for a value-weighted portfolio of publicly traded electric utilities in Pakistan is similarly low at 0.28.[19]

Table 7 (Panel A) contains free cash flow forecasts in U.S. dollars for the remaining life of the project. The forecasted free cash flows do not account for political risk which is likely non-negligible in Pakistan in 2009. In December 2009, ICRG's political risk rating for Pakistan is 46 compared to 81 for the U.S. The Pakistani sovereign spread at the end of 2009 was 688 basis points, and the "narrow" and "wide" political spreads were 256 and 456 basis points, respectively. As outlined above, these absolute spreads can be transformed into multiplicative spreads that can be applied to the all equity cost of capital of 4.95%. The augmented discount rate can then be used to calculate the NPV of the project, accounting for political risk.

Not accounting for political risk at all, i.e. assuming that the probability of a political risk event is zero and using 4.95% as the discount rate, yields a present value of the future cash flows of U.S. $832 million and a project NPV for AES of $332 million. We use this case as a benchmark to discuss the impact of different approaches to account for political risk. Table 7, Panel B, reports the discount rate as well as the project's NPV when adjusted using the full sovereign spread (SS), the "narrow" or "wide" political risk spread, or no

[17] The data used in this application numbers are illustrative only and drawn from Desai (2006). They have been modified to reflect the macro economic environment in 2009.

[18] The all equity cost of capital is based on an unlevered market beta of 0.25, a market risk premium of 5%, as well as a 10-year U.S. Treasury yield of 3.7%.

[19] The estimation is based on 60 months of return data of a portfolio of up to six local firms. The beta with respect to the local, Pakistani, market is much higher at 1.33, but inappropriate for a firm with a global investor base like AES.

adjustment at all. We also use equation (10) to calculate the political risk probability, that corresponds to the adjustment of the discount rate. Using the full sovereign spread to account for political risk increases the discount rate to 11.91%, dramatically reducing the present value of the future cash flows by 41%, and yields a negative NPV (U.S. $-7 million). Using a discount rate of 11.91% is equivalent to assuming an annual political risk event probability of 6.22% or a cumulative political risk event probability of 72.33%. Using the still conservative "wide" political risk spread, leads to a discount rate of 9.46%, reducing the present value of future cash flows by about 30%, but yielding a positive NPV of U.S. $ 83 million. Using the "narrow" political risk spread moderately increases the discount rate to 7.44% and hence reduces the present value of future cash flows by only about 19%, resulting in a project NPV of U.S. $178 million. This case corresponds to an implicit annual political risk event probability of only 2.31%, about one-third of the political risk event probability assumed when using the full sovereign spread to adjust the discount rate. This application demonstrates that while accounting for political risk is important, simply applying the full sovereign yield spread as a proxy for political risk can lead to severely biased NPV estimates. Finally, AES did invest in two power plants in Pakistan, and, at the time of writing (September 2015), is still operating those plants.

5 Conclusion

In international capital budgeting, sovereign spreads are often used to adjust discount rates for political risk. The forward looking, market-determined nature of these spreads make them attractive sources of information about political risk in a particular country. However, the adjustments are typically ad hoc and fail to acknowledge that sovereign spreads reflect many factors – not just political risk.

In this paper, we propose to use the political risk spread (Bekaert, Harvey, Lundblad, and Siegel, 2014) to adjust for political risk in capital budgeting. The political risk spread is extracted from a panel regression model where sovereign spreads are regressed on global, liquidity, macroeconomic, and volatility risk factors, in addition to ICRG political risk. The regression reveals, depending upon the specification, that political risk accounts for 17 to

31% of the variation in observed spreads during non-default periods.

We then show how to use these political risk spreads to infer a political risk event probability that can be used to adjust the cash flows in an international capital budgeting exercise. We can also use the political risk spread to come up with an adjusted equity discount rate that reflects political risk, without double counting other risks. The economic implications are fundamental. Political risk spreads are often substantially smaller than full sovereign spreads, implying that the standard approaches substantially overstate discount rates used in international project evaluation, potentially leading to significant under investment.

There are alternative methods to use market prices to come up with political risk adjustments. Clark (1997) models political risk as the value of an insurance policy that reimburses all losses resulting from political risk events. Of course, political risk insurance exists making public and private insurance rates for political risk potentially very informative. Jensen (2008), for example, finds that MNC investments located in countries with democratic regimes, given the constraints they place on government power, are associated with lower insurance premia. While public and private sector providers offer select investment insurance against political risk, the vast majority of FDI remains uninsured,[20] suggesting alternative political risk measurements remain essential.

Our methodology has a number of advantages: it is forward-looking and market-based, it produces an adjustment in useful "discount rate" units, and it can be computed for all countries with a political risk rating by ICRG. In addition, several extensions are possible. Our method does assume that sovereign bonds correctly identify political risks relevant for any MNC considering an investment project in a particular country. Both the international business (see Henisz (2003)) and the finance (see Anshuman, Martin and Titman (2011)) literatures discuss how a MNC may mitigate and manage political risks through a variety of actions. Therefore, a particular company may have to adjust to "average" political risk for a particular country to its own circumstances. A company could "customize" ICRG's political risk rating of a country, using its 12 subcomponents. The MNC can, for example,

[20]Members of the Berne Union, an international organization of public and private sector providers of export credit and investment insurance, reported about U.S. $81 billion in new investment insurance exposure in 2010 (Berne Union (2011)). For the same year, global FDI flows are estimated to be U.S. $1,200 billion (UNCTAD, World Investment Report, 2010).

change the relative weights of different sub-components if it thinks it is less susceptible to certain types of risk, or it can exclude certain risks.

In evaluating international projects, country and project specific risks are usually reflected in the cash flows and global systematic risks (e.g. via a world CAPM) are reflected in the discount rate. Country risks, such as political risk, are notoriously difficult to measure. Our paper proposes a simple framework to incorporate political risk into valuation. We determine the increment to the discount rate that reflects the political risk unique to a particular country. The difference between this augmented discount rate and the discount rate implied by systematic risk can be used to adjust the expected cash flows.

While our paper focuses on an adjustment for political risk, our method can be extended to country-specific economic risk as well. In certain countries, it may be challenging to measure expected local economic conditions for project evaluation. Following our panel regression method, we can extract the discount rate increment related to economic risk in the same way as we isolated the premium for political risk. Indeed, there is an advantage to extracting both local economic and political risk because they are naturally correlated and there is no need for orthogonalization if they are viewed as a package. The increment in the discount rate which reflects local economic risk can be used to haircut the cash flows that, importantly, have not yet been adjusted for local economic risk. The implementation of this extension is the subject of further research.

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Table 1: **Sovereign spread model variants**

Variant	$f(\cdot)$	$g(\cdot)$
Mariscal and Lee (1993)	$SS_{j,t}$	$\beta_{i,w} r_{w,t}$
Mariscal and Dutra (1996)	$SS_{j,t}$	$\left[\frac{\sigma_j}{\sigma_w}\right] \cdot r_{w,t}$
Godfrey and Espinosa (1996)	$SS_{j,t}$	$0.6 \cdot \left[\frac{\sigma_j}{\sigma_w}\right] \cdot r_{w,t}$
Mariscal and Hargis (1999)	$SS_{j,t}$	$(1 - \rho_{e,b}) \cdot \left[\frac{\sigma_j}{\sigma_w}\right] \cdot r_{w,t}$
Damodaran (1999)	$\left[\frac{\sigma_j^e}{\sigma_j^b}\right] \cdot SS_{j,t}$	$\beta_{i,w} r_{w,t}$
Zenner and Akaydin (2002)	$[(\gamma_1 + \gamma_2 + \gamma_3)/30] \cdot SS_{j,t}$	$\beta_{i,w} r_{w,t}$
Damodaran (2003) (β approach)	$\beta_{i,w} \cdot \left[\frac{\sigma_j^e}{\sigma_j^b}\right] \cdot SS_{j,t}$	$\beta_{i,w} r_{w,t}$
Damodaran (2003) (λ approach)	$\lambda_i \cdot \left[\frac{\sigma_j^e}{\sigma_j^b}\right] \cdot SS_{j,t}$	$\beta_{i,w} r_{w,t}$
Abuaf (2015)	$\alpha \cdot SS_{j,t}$	$\beta_{i,w} r_{w,t}$

This table reports discount rate (for project i and time t) modifications that can be generally represented as $r_{i,t} = r_{f,t} + f(SS_{j,t}) + g(r_{w,t})$, where $r_{f,t}$ is the risk free rate, $SS_{j,t}$ is the sovereign spread for country j in which the investment is located, $\beta_{i,w}$ is the beta of project i with respect to the world market return, and $r_{w,t}$ is the world market risk premium. The first column provides the articles from which the modifications are drawn. The second and third columns provide the functional forms for $f(\cdot)$ and $g(\cdot)$, respectively. σ_j and σ_w are the standard deviations of the equity market return in country j and the world, respectively. $\rho_{e,b}$ is the correlation between the equity and bond market returns for the country in which the project is located. σ_j^e is the standard deviation of country j's equity returns and σ_j^b is the standard deviation of country j's bond returns. (γ_1) represents a company's access to capital markets, (γ_2) the susceptibility of the investment to political risk, and (γ_3) the financial importance of the project to the company (each component is scaled from 1 - 10). λ_i represents project i's exposure to political risk that is different from its exposure to world market risk. In Abuaf (2015), α = [.35, 0.70 or 1.00] by assumption and SS is, in this case, based on credit default swaps.

Table 2

Summary Statistics

	Baseline Sample			
	Mean	Median	Std. Dev.	Start Date
Argentina	744.8	693.0	345.6	01/94
Brazil	579.1	465.2	404.4	01/94
Bulgaria	491.0	291.4	459.3	01/95
China	119.6	117.5	57.9	03/94
Colombia	363.9	286.0	214.6	02/97
Cote d'Ivoire	870.9	860.1	331.0	04/98
Ecuador	989.3	822.3	532.4	01/01
Lebanon	413.3	377.2	184.7	04/98
Malaysia	179.7	150.0	130.6	10/96
Mexico	341.5	242.8	258.8	01/94
Morocco	429.8	388.3	281.8	01/94
Nigeria	1,101.3	927.2	763.8	01/94
Panama	306.8	286.6	126.1	07/96
Peru	351.9	278.6	206.7	03/97
Philippines	369.1	363.3	169.3	01/94
Poland	197.2	172.2	139.8	10/94
Russia	317.9	238.5	232.4	08/97
South Africa	225.8	202.9	123.4	12/94
Turkey	231.0	244.0	70.5	06/96
Venezuela	946.3	955.0	401.8	01/94

	Hold Out Sample			
	Mean	Median	Std. Dev.	Start Date
Algeria	803.1	722.0	404.8	03/99
Chile	146.3	144.6	60.4	05/99
Croatia	320.4	301.4	173.9	08/96
Dominican Rep.	551.3	428.4	351.9	11/01
Egypt	260.9	221.7	181.4	07/01
El Salvador	333.4	317.7	130.8	04/02
Gabon	427.9	359.0	233.4	12/07
Ghana	544.1	452.5	260.5	10/07
Hungary	179.5	104.8	160.2	01/99
Indonesia	287.4	249.1	139.5	04/04
Iraq	553.9	522.7	181.2	03/06
Jamaica	604.9	624.9	184.4	10/07
Kazakhstan	440.1	362.0	269.0	06/07
Pakistan	700.6	637.0	472.1	06/01
Serbia	406.7	383.5	191.0	04/05
South Korea	171.3	114.2	141.6	01/94
Sri Lanka	608.0	439.6	440.5	11/07
Thailand	156.7	128.1	127.6	05/97
Tunisia	406.8	313.5	227.1	05/02
Trinidad & Tobago	170.0	144.2	102.5	05/07
Ukraine	700.4	530.9	615.1	07/00
Uruguay	387.8	273.1	293.5	05/01
Vietnam	315.6	304.8	150.1	11/05

The baseline sample includes twenty emerging-market countries. For each country, we report the time-series average, median, and standard deviation of the monthly EMBI country spread (relative to maturity-matched U.S. Treasuries) from J.P Morgan (in basis points, where 100bp = 1%). The period covers non-default periods from 1994 to 2013 (data are available as countries are added to the sample). For our baseline sample, we require at least 10 years of monthly data for all variables that we use in the regression specifications (both sovereign spreads and explanatory variables). We also provide complementary summary statistics for a 'Hold Out Sample' of 23 additional countries that are used for an out-of-sample exercise.

Table 3, Panel A

Explaining EMBI Spreads

	Sovereign Spreads	Corporate Spreads
Constant	-373.73	213.85
	26.54	*40.19*
Ln(Avg. Life)	144.18	-126.14
	8.87	*17.95*
U.S. High Yield Spread	0.36	0.39
	0.02	*0.02*
Bond Illiquidity	104.05	
	20.28	
Ln(Econ+Fin Risk)	362.75	435.24
	45.96	*80.99*
Bond Volatility	76.69	38.10
	4.00	*5.56*
Ln(Political Risk)	681.81	1016.39
	36.99	*91.39*
Adj. R^2	0.70	0.68

The sovereign spread sample includes 20 emerging-market countries. For an unbalanced panel of 3438 non-default observations from 1994 to 2013 in the first column, we regress the monthly EMBI country spread (over U.S. Treasuries) onto the following variables: 1) a constant, 2) the natural logarithm of average life of the bonds used in the index, 3) Barclays (formerly Lehman Brothers) U.S. High Yield (non-investment grade) bond spread, 4) the proportion of zero daily bond returns for each country, 5) the difference between the logarithm of the summed ICRG economic and financial risk indicators for the U.S. less the comparable value for each country, 6) the difference between the (maturity-adjusted) cumulated daily squared bond returns for the country and for U.S. 10-year Treasuries, and 7) the difference between the logarithm of the ICRG political risk indicator for the U.S. less the comparable value for each country. In columns 2, we run a regression with corporate bond spreads, replacing the sovereign bond data with data on U.S.$ corporate credit spreads (including the relevant explanatory variables). The corporate spread sample includes 13 emerging-market countries for an unbalanced panel of 937 non-default observations from 2002 to 2013. We report coefficient estimates from pooled OLS regressions; however, standard errors, reported in italics, account for group-wise heteroskedasticity, SUR effects, and a Newey-West correction with four lags.

Table 3, Panel B

Variance Decomposition

	Sovereign Spreads		
		Othogonalized	Othogonalized (Alt.)
Ln(Avg. Life)	0.078	0.078	0.107
U.S. High Yield Spread	0.109	0.109	0.097
Bond Illiquidity	0.033	0.019	0.156
Ln(Econ+Fin Risk)	0.087	0.074	0.213
Bond Volatility	0.518	0.409	0.091
Ln(Political Risk)	**0.175**	**0.311**	**0.337**

The sample includes 20 emerging-market countries detailed in Table 2. For an unbalanced panel from 1994 to 2013, we regress the non-default monthly EMBI country spread (over U.S. Treasuries) onto the following variables: 1) a constant, 2) the natural logarithm of average life of the bonds used in the index, 3) Barclays (formerly Lehman Brothers) U.S. High Yield (non-investment grade) bond spread, 4) the proportion of zero daily bond returns for each country, 5) the difference between the logarithm of the summed ICRG economic and financial risk indicators for the U.S. less the comparable value for each country, 6) the difference between the (maturity-adjusted) cumulated daily squared bond return for the country and for U.S. 10-year Treasuries, and 7) the difference between the logarithm of the ICRG political risk indicator for the U.S. less the comparable value for each country. For specification (I) from Table 3, we report the overall contribution of each variable to the variation of the predicted spread, defined as the ratio of the covariance between the given variable and the predicted spread relative to the variance of the predicted spread. To gauge the maximal impact of political risk, we also run the regressions after first orthogonalizing the other factors (Bond Illiquidity, Ln(Econ+Fin Risk), and Bond Volatility) with respect to political risk so that the political risk coefficient soaks up all the covariances with other factors. In the last column, we show an alternative orthogonalization. We first orthogonalize the bond volatility variable with respect to all the other variables.

Table 4

Political Risk Spread Adjustments

Panel A: Percentiles	**Narrow Ratio**	**Wide Ratio**
0.90	1.00	1.00
0.75	0.70	1.00
0.50	0.47	0.84
0.25	0.26	0.47
0.10	0.16	0.28

Panel B: ICRG Political Risk Distribution	**Predicted $\widehat{SS}_{i,t}$**	**Narrow Ratio**	**Wide Ratio**	**Actual EMBI Spread**	**$NPRSS_{i,t}$**	**$WPRSS_{i,t}$**
0.90	660.24	0.57	0.84	717.51	340.79	530.69
0.75	494.68	0.59	0.82	465.53	207.89	306.79
0.50	403.57	0.51	0.77	427.43	167.56	270.54
0.25	280.29	0.54	0.73	308.90	115.37	175.93
0.10	255.43	0.40	0.59	292.14	76.95	122.08

In Panel A, we report the distribution of the narrow and wide ratios for our non-default sample from all countries in Table 2. Using the coefficient estimates for specification (I) from Table 3, we construct predicted spreads for all countries (both the baseline and out sample). The narrow and wide ratios provide information on how much of the predicted spread is attributable to political risk. Narrow ratios are $c_5 PR_{i,t}$/(Predicted $SS_{i,t}$); whereas wide spreads are constructed in the same way but using the c_5 coefficient from an orthogonalized version from Table 3 that attributes maximal weight to political risk. If the ratio is negative or greater than one, we set it to zero or one, respectively. In Panel B, we sort country-months by realized political risk, $PR_{i,t}$, the difference between the logged U.S. and country-level ICRG political risk indicator. Then, for 5% bands around each political risk percentile, we average the Predicted $SS_{i,t}$, $c_5 PR_{i,t}$ (both narrow and wide), and the narrow and wide ratios ($c_5 PR_{i,t}$/(Predicted $SS_{i,t}$)). Finally, we also compute the average EMBI spreads for these realized political risk percentiles and construct the implied political risk spreads, $NPRSS_{i,t}$ and $WPRSS_{i,t}$, by multiplying the narrow and wide ratios, respectively, by the observed EMBI spread for each point along the realized political risk distribution.

Table 5
Political Risk Pricing

	High minus Low EMBI Spread (Top - Bottom Half) Return Spread				High minus Low EMBI Spread (Top - Bottom Thirds) Return Spread			
Annualized α	0.023	0.013	-0.006	0.029	0.058	0.041	0.013	0.066
	0.035	*0.036*	*0.034*	*0.034*	*0.048*	*0.049*	*0.047*	*0.048*
MKT	-0.296	-0.281	-0.229		-0.341	-0.315	-0.237	
	0.052	*0.050*	*0.058*		*0.069*	*0.071*	*0.076*	
SMB		-0.046	-0.129			-0.074	-0.199	
		0.132	*0.140*			*0.162*	*0.162*	
HML		0.195	0.275			0.323	0.444	
		0.113	*0.105*			*0.140*	*0.135*	
WML			0.176				0.265	
			0.061				*0.073*	
EM MKT				-0.192				-0.230
				0.028				*0.045*
Adj. R-square	0.120	0.130	0.159	0.129	0.093	0.114	0.155	0.109

	High minus Low PRS (Top - Bottom Half) Return Spread				High minus Low PRS (Top - Bottom Thirds) Return Spread			
Annualized α	0.046	0.058	0.056	0.050	0.079	0.084	0.067	0.089
	0.037	*0.041*	*0.042*	*0.036*	*0.048*	*0.053*	*0.052*	*0.048*
MKT	-0.105	-0.108	-0.104		-0.307	-0.301	-0.255	
	0.076	*0.066*	*0.079*		*0.069*	*0.063*	*0.079*	
SMB		-0.304	-0.311			-0.283	-0.357	
		0.114	*0.115*			*0.165*	*0.175*	
HML		-0.126	-0.120			-0.005	0.067	
		0.155	*0.141*			*0.181*	*0.155*	
WML			0.014				0.157	
			0.089				*0.100*	
EM MKT				-0.088				-0.228
				0.052				*0.043*
Adj. R-square	0.007	0.017	0.012	0.016	0.063	0.065	0.074	0.091

All regressions are run with monthly data on long-short equity return portfolios from January 1998 to December 2013 on various global risk factors. The long-short portfolios involve a long position in the countries with the largest EMBI or PR spreads (either top half or top third) and a short position on the countries with the lowest EMBI or PR spreads (again, either bottom half or bottom third). The risk factors MKT, SMB, HML, and WML are the usual Fama-French four factors from Ken French's page, but using the global versions which are based on averages across industrialized markets. Finally, EM MKT is the excess return on the MSCI Composite Emerging Market Index. Standard errors (provided *in italics*) are computed with a Newey-West correction (with 5 lags). Annualized a's and (their standard errors) are computed by taking the regression intercept and multiplying by 12.

Table 6
Numerical Examples of Political Risk Adjustments

Panel A: Narrow Political Risk Spreads (*APRSS = NPRSS*)

Political Risk (percentile)	Absolute Political Risk Spread in bp (*APRSS*)	Political Risk Probability (*p*)	Cumulative Probability (at maturity)	PRSS	Adjusted Discount Rate of 12%
90th	340.8	3.2%	27.8%	3.31%	15.71%
75th	207.9	2.0%	18.1%	2.02%	14.26%
50th	167.6	1.6%	14.9%	1.63%	13.82%
25th	115.4	1.1%	10.6%	1.12%	13.26%
10th	77.0	0.7%	7.2%	0.75%	12.84%

Panel B: Wide Political Risk Spreads (*APRSS = WPRSS*)

Political Risk (percentile)	Absolute Political Risk Spread in bp (*APRSS*)	Political Risk Probability (*p*)	Cumulative Probability (at maturity)	PRSS	Adjusted Discount Rate of 12%
90th	530.7	4.9%	39.5%	5.16%	17.78%
75th	306.8	2.9%	25.5%	2.98%	15.34%
50th	270.5	2.6%	22.9%	2.63%	14.94%
25th	175.9	1.7%	15.6%	1.71%	13.91%
10th	122.1	1.2%	11.1%	1.19%	13.33%

Panel C: Sovereign Spreads (*APRSS = SS*)

Political Risk (percentile)	Absolute Political Risk Spread in bp (*APRSS*)	Political Risk Probability (*p*)	Cumulative Probability (at maturity)	PRSS	Adjusted Discount Rate of 12%
90th	717.5	6.5%	49.0%	6.97%	19.81%
75th	465.5	4.3%	35.8%	4.52%	17.07%
50th	427.4	4.0%	33.4%	4.15%	16.65%
25th	308.9	2.9%	25.6%	3.00%	15.36%
10th	292.1	2.8%	24.4%	2.84%	15.18%

Table 6 provides results of sample calculations for implied political risk probabilities (*p*), *multiplicative* political risk spreads (*PRSS*) as well as adjusted discount rates. We sort country-months by realized political risk. For 5% bands around several political risk percentiles, we calculate the average sovereign spread (*SS*) as well as the average narrow and wide implied political risk spreads, (*NPRSS*) and (*WPRSS).* For each case, we find the implied political risk probability (p) by solving equation (9), assuming a 10-year maturity and a 2.90% yield on the 10-year U.S. Treasury bond. We use the implied *multiplicative* political risk spreads (PRSS) to adjust a hypothetical discount rate of 12% to account for political risk.

Table 7
Case Study: Power Generation in Pakistan

Panel A: Free Cash Flows (in millions of U.S. dollars)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Free Cash Flow	63.2	63.6	64.0	64.4	64.8	65.2	65.7	66.1	66.5	66.9

(continued)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Free Cash Flow	67.3	67.7	68.2	68.6	69.0	69.4	69.8	70.3	70.7	71.1

Panel B: Valuation

Approach	*PRSS*	Adjusted Discount Rate	NPV (in million U.S. dollars)	Political Risk Probability	Cumulative Probability (by 2029)
Full Sovereign Spread	6.63%	11.91%	-7	6.22%	72.33%
Wide Political Spread	4.30%	9.46%	83	4.12%	59.83%
Narrow Political Spread	2.37%	7.44%	178	2.31%	37.40%
No Adjustment	0.00%	4.95%	332	0.00%	0.00%

Table 7 provides an application of different discount rate adjustments to the valuation of a power generation project in Pakistan. Panel A presents the project's forecasted Free Cash Flows in millions of U.S. dollars for the remaining life of the project. Panel B reports the multiplicative political risk spreads (*PRSS*), the adjusted discount rates, corresponding net present values (NPV) of the project as welll as the implied political risk probability *(p)* and the cumulative probality of a political risk event by 2029. The data are based on Desai (2006), but have been adjusted to reflect the macro-economic environment in 2009.

Appendix A
ICRG political risk subcategories and correlations

Political Indicators	Description	Pooled Correlation with ICRG (Political Risk)	Pooled Correlation with ICRG (Econ+Fin Risk)
Government Stability	An assessment both of the government's ability to carry out its declared program(s), and its ability to stay in office. The risk rating assigned is the sum of three subcomponents: Government Unity, Legislative Strength, and Popular Support.	0.516	0.476
Socioeconomic Conditions	An assessment of the socioeconomic pressures at work in society that could constrain government action or fuel social dissatisfaction. The risk rating assigned is the sum of three subcomponents: Unemployment, Consumer Confidence, and Poverty.	0.729	0.531
Investment Profile	An assessment of factors affecting the risk to investment that are not covered by other political, economic and financial risk components. The risk rating assigned is the sum of three subcomponents: Contract Viability/Expropriation, Profits Repatriation, Payment Delays	0.731	0.605
Internal Conflict	An assessment of political violence in the country and its actual or potential impact on governance. The highest rating is given to those countries where there is no armed or civil opposition to the government and the government does not indulge in arbitrary violence, direct or indirect, against its own people. The lowest rating is given to a country embroiled in an on-going civil war. The risk rating assigned is the sum of three subcomponents: Civil War/Coup Threat, Terrorism/Political Violence, Civil Disorder.	0.828	0.556
External Conflict	An assessment both of the risk to the incumbent government from foreign action, ranging from non-violent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc) to violent external pressure (cross-border conflicts to all-out war). External conflicts can adversely affect foreign business in many ways, ranging from restrictions on operations, to trade and investment sanctions, to distortions in the allocation of economic resources, to violent change in the structure of society. The risk rating assigned is the sum of three subcomponents: War, Cross-Border Conflict, Foreign Pressures.	0.655	0.453
Corruption	An assessment of corruption within the political system. Such corruption is a threat to foreign investment for several reasons: it distorts the economic and financial environment; it reduces the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability; and, last but not least, introduces an inherent instability into the political process. The most common form of corruption met directly by business is financial corruption in the form of demands for special payments and bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans. Such corruption can make it difficult to conduct business effectively, and in some cases may force the withdrawal or withholding of an investment. Although the measure takes such corruption into account, it is more concerned with actual or potential corruption in the form of excessive patronage, nepotism, job reservations, 'favor-for-favors', secret party funding, and suspiciously close ties between politics and business. In our view these insidious sorts of corruption are potentially of much greater risk to foreign business in that they can lead to popular discontent, unrealistic and inefficient controls on the state economy, and encourage the development of the black market. The greatest risk in such corruption is that at some time it will become so overweening, or some major scandal will be suddenly revealed, as to provoke a popular backlash, resulting in a fall or overthrow of the government, a major reorganizing or restructuring of the country's political institutions, or, at worst, a breakdown in law and order, rendering the country ungovernable.	0.643	0.309
Military in Politics	The military is not elected by anyone. Therefore, its involvement in politics, even at a peripheral level, is a diminution of democratic accountability. However, it also has other significant implications. The military might, for example, become involved in government because of an actual or created internal or external threat. Such a situation would imply the distortion of government policy in order to meet this threat, for example by increasing the defense budget at the expense of other budget allocations. In some countries, the threat of military take-over can force an elected government to change policy or cause its replacement by another government more amenable to the military's wishes. A military takeover or threat of a takeover may also represent a high risk if it is an indication that the government is unable to function effectively and that the country therefore has an uneasy environment for foreign businesses. A full-scale military regime poses the greatest risk. In the short term a military regime may provide a new stability and thus reduce business risks. However, in the longer term the risk will almost certainly rise, partly because the system of governance will be become corrupt and partly because the continuation of such a government is likely to create an armed opposition. In some cases, military participation in government may be a symptom rather than a cause of underlying difficulties. Overall, lower risk ratings indicate a greater degree of military	0.798	0.497
Religious Tensions	Religious tensions may stem from the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process; the desire of a single religious group to dominate governance; the suppression of religious freedom; the desire of a religious group to express its own identity, separate from the country as a	0.511	0.172
Law and Order	Law and Order are assessed separately. The Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law.	0.802	0.540
Ethnic Tensions	An assessment of the degree of tension within a country attributable to racial, nationality, or language divisions. Lower ratings are given to countries where racial and nationality tensions are high because opposing groups are intolerant and unwilling to compromise	0.604	0.378
Democratic Accountability	A measure of how responsive government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic on	0.644	0.357
Bureaucratic Conditions	The institutional strength and quality of the bureaucracy is another shock absorber that tends to minimize revisions of policy when governments change. Therefore, high points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions.	0.766	0.548

The summary statistics provided are for the entire ICRG sample of countries from 1984 - 2013.

Appendix B: Variance Decomposition

In the appendix, we explain how we examine the degree to which variation in the sovereign spreads is explained by the right-hand side explanatory variables and what is the relative contribution of each. We use a simple R^2 concept computed as $\frac{Var(\hat{SS}_{i,t})}{Var(SS_{i,t})}$ where $\hat{SS}_{i,t} = \hat{c}_0 + \hat{c}_1 Global_t + \hat{c}_2 ZR_{i,t} + \hat{c}_3 Local_{i,t} + \hat{c}_4 BVOL_{i,t} + \hat{c}_5 PR_{i,t} = \hat{\alpha} + \hat{\beta} x_{i,t}$, where the latter equality represents a simple notation for explanatory purposes. The denominator is defined as

$$Var(SS_{i,t}) = \frac{1}{N} \sum_{i=1}^{N} \frac{1}{T_i} \sum_{t=1}^{T_i} (SS_{i,t} - \bar{SS})^2 \tag{14}$$

where $\bar{SS} = \frac{1}{N} \sum_{i=1}^{N} \frac{1}{T_i} \sum_{t=1}^{T_i} SS_{i,t}$. The numerator is defined analogously as

$$Var(\hat{SS}_{i,t}) = \frac{1}{N} \sum_{i=1}^{N} \frac{1}{T_i} \sum_{t=1}^{T_i} (\hat{SS}_{i,t} - \bar{\hat{SS}})^2 \tag{15}$$

where $\bar{\hat{SS}} = \frac{1}{N} \sum_{i=1}^{N} \frac{1}{T_i} \sum_{t=1}^{T_i} \hat{SS}_{i,t}$.

To examine the contributions of each of the independent variables to the overall variation of the predicted sovereign spreads, we compute the following covariance for each explanatory variable j:

$$Cov(\hat{SS}_{i,t}, \hat{\beta}_j x_{i,j,t}) = \frac{1}{N} \sum_{i=1}^{N} \frac{1}{T_i} \sum_{t=1}^{T_i} \hat{\beta}_j (\hat{SS}_{i,t} - \bar{\hat{SS}})(x_{i,j,t} - \bar{x}_j) \tag{16}$$

where $\bar{x}_j$ is defined analogously as above. Summed across all individual explanatory variables, these covariance terms must exactly equal the variance of the predicted sovereign spreads. We report the ratio of each covariance term to the overall predicted sovereign spread, $\frac{Cov(\hat{SS}_{i,t}, \hat{\beta}_j x_{i,j,t})}{Var(\hat{SS}_{i,t})}$, where each column must necessarily sum to 1.

Appendix C
Political Risk Spreads: December 2013

Country	EMBI Spread	Narrow	Wide
Albania		154.3	229.7
Algeria		252.4	364.2
Angola		257.1	370.7
Argentina	808	180.0	320.8
Armenia		229.5	332.8
Azerbaijan		211.8	308.5
Bahamas		65.1	107.3
Bahrain		186.4	273.7
Bangladesh		333.3	475.3
Belarus		271.5	390.4
Bolivia		234.0	338.9
Botswana		113.2	173.2
Brazil	224	131.3	224.0
Brunei		65.1	107.3
Bulgaria	68	19.6	34.9
Burkina Faso		286.3	410.7
Cameroon		252.4	364.2
Chile	148	77.8	138.7
China	149	149.0	149.0
Colombia	166	121.9	166.0
Congo, Dem. Rep.		271.5	390.4
Congo, Rep.		456.0	643.6
Costa Rica		139.0	208.6
Cote d'Ivoire	442	239.1	426.1
Croatia	300	120.2	214.2
Cuba		238.5	345.2
Cyprus		158.2	235.0
Czech Rep.		99.0	153.8
Dominican Rep.	349	218.4	349.0
Ecuador	530	530.0	530.0
Egypt	443	261.1	443.0
El Salvador	389	197.0	351.1
Estonia		124.1	188.2
Ethiopia		344.4	490.4
Gabon	348	309.8	348.0
Gambia		220.6	320.5
Ghana	547	271.2	483.4
Guatemala		207.5	302.6
Guinea		385.0	546.2
Guinea-Bissau		317.2	453.1
Guyana		234.0	338.9
Haiti		367.2	521.8
Honduras		225.0	326.6
Hungary	278	63.5	113.2
India		229.5	332.8
Indonesia	292	162.7	289.9
Iran		296.4	424.6
Iraq	511	388.7	511.0
Israel		166.1	245.9
Jamaica	641	474.6	641.0
Jordan		186.4	273.7
Kazakhstan		166.1	245.9
Kenya		261.9	377.2
Korea, D.P.R.		333.3	475.3
Korea		75.0	120.9
Kuwait		154.3	229.7
Latvia		135.2	203.5
Lebanon	366	366.0	366.0
Liberia		286.3	410.7
Libya		296.4	424.6
Lithuania		106.0	163.4
Madagascar		291.3	417.6
Malawi		286.3	410.7
Malaysia		113.2	173.2
Mali		286.3	410.7
Mexico	155	78.4	139.7
Moldova		220.6	320.5
Mongolia		158.2	235.0
Morocco		182.3	268.0
Mozambique		190.5	279.4
Myanmar		291.3	417.6
Namibia		99.0	153.8
Nicaragua		182.3	268.0
Niger		350.0	498.1
Nigeria		385.0	546.2
Oman		116.8	178.2
Pakistan	606	470.9	606.0
Panama	199	128.9	199.0
Paraguay		225.0	326.6
Peru	159	113.5	159.0
Philippines	130	92.1	130.0
Poland	118	84.9	118.0
Qatar		116.8	178.2
Romania		170.1	251.3
Russia	181	181.0	181.0
Saudi Arabia		158.2	235.0
Senegal		257.1	370.7
Serbia	374	182.6	325.4
Sierra Leone		234.0	338.9
Slovak Rep.		102.5	158.6
Slovenia		135.2	203.5
Somalia		597.9	838.3
South Africa	247	145.0	247.0
Sri Lanka		266.7	383.8
Sudan		449.1	634.1
Suriname		182.3	268.0
Syria		409.7	580.1
Taiwan		88.6	139.5
Tanzania		211.8	308.5
Thailand		243.1	351.5
Togo		311.9	445.9
Trinidad & Tobago		142.8	213.8
Tunisia		220.6	320.5
Turkey	309	180.7	309.0
Uganda		327.9	467.8
Ukraine	718	267.4	476.5
Uruguay	194	61.9	110.3
Venezuela	1093	475.1	846.6
Vietnam	274	274.0	274.0
Yemen		311.9	445.9
Zambia		211.8	308.5
Zimbabwe		338.8	482.8

For the thirty three of our forty three countries that have observed EMBI spreads in December of 2013, we report the EMBI spread and the narrow and wide implied political risk spreads. For these countries, Implied spreads are computed by multiplying the computed narrow and wide ratios by the observed EMBI spread for each country. For December 2013, narrow ratios are $c_4 PR_{i,t}$/(Predicted $SS_{i,t}$); whereas wide spreads are constructed in the same way but using the c_4 coefficient from the orthogonalization from Table 3 that attributes maximal weight to political risk. If the ratio is negative or greater than one, we set it to zero or one, respectively. For the remaining countries for which we do not have EMBI spreads but do have ICRG political risk ratings, we report predicted December 2013 narrow and wide political risk spreads. Using data from Table 5, we separately fit a linear regression through the narrow and wide spreads onto $PR_{i,2013}$. Then, for all other countries for which the political risk rating is available, we employ the fitted coefficients to determine what the narrow and wide spreads would be given each country's $PR_{i,2013}$.

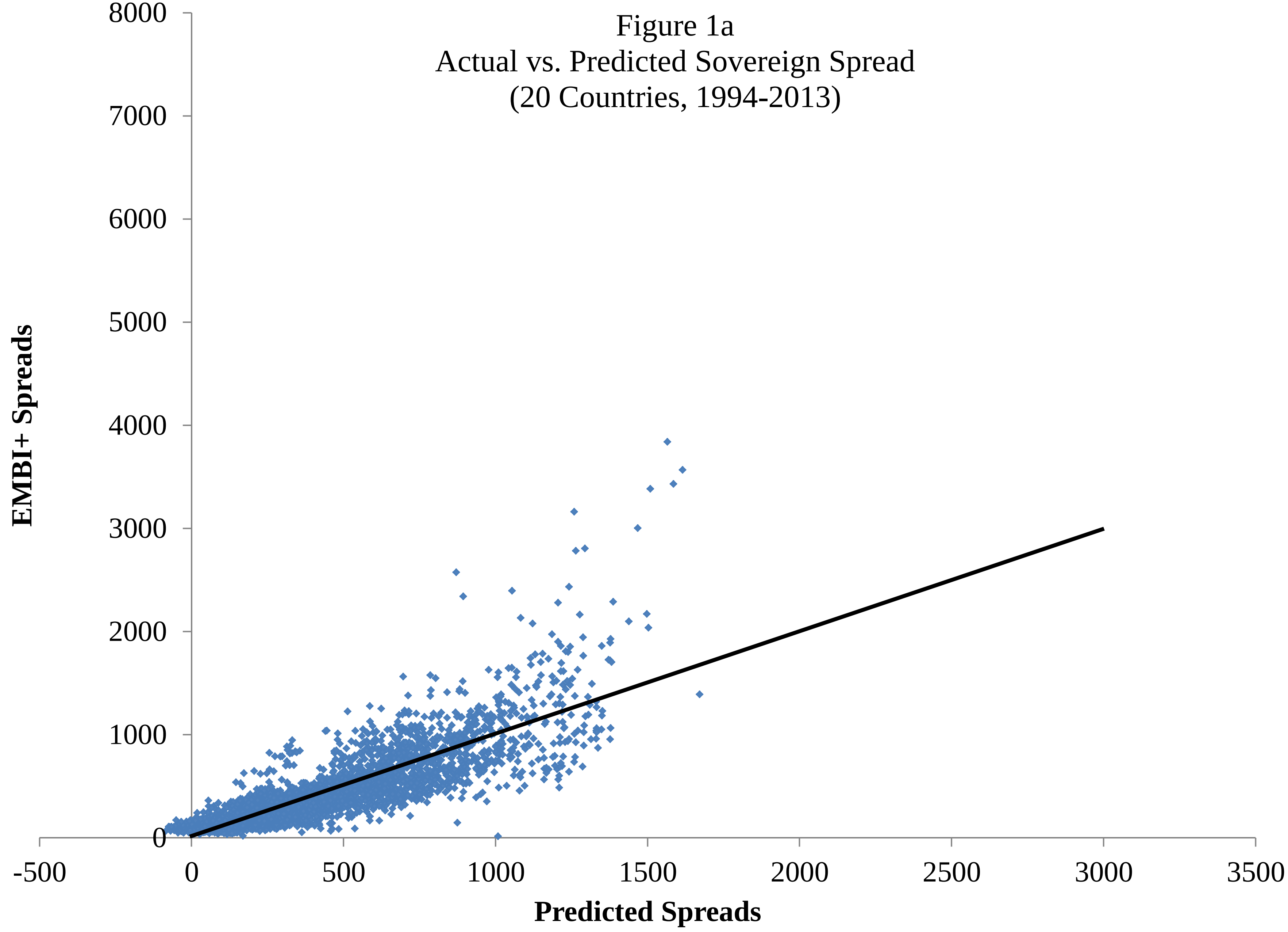
Figure 1a
Actual vs. Predicted Sovereign Spread
(20 Countries, 1994-2013)
EMBI+ Spreads
Predicted Spreads
8000
7000
6000
5000
4000
3000
2000
1000
0
-500
0
500
1000
1500
2000
2500
3000
3500

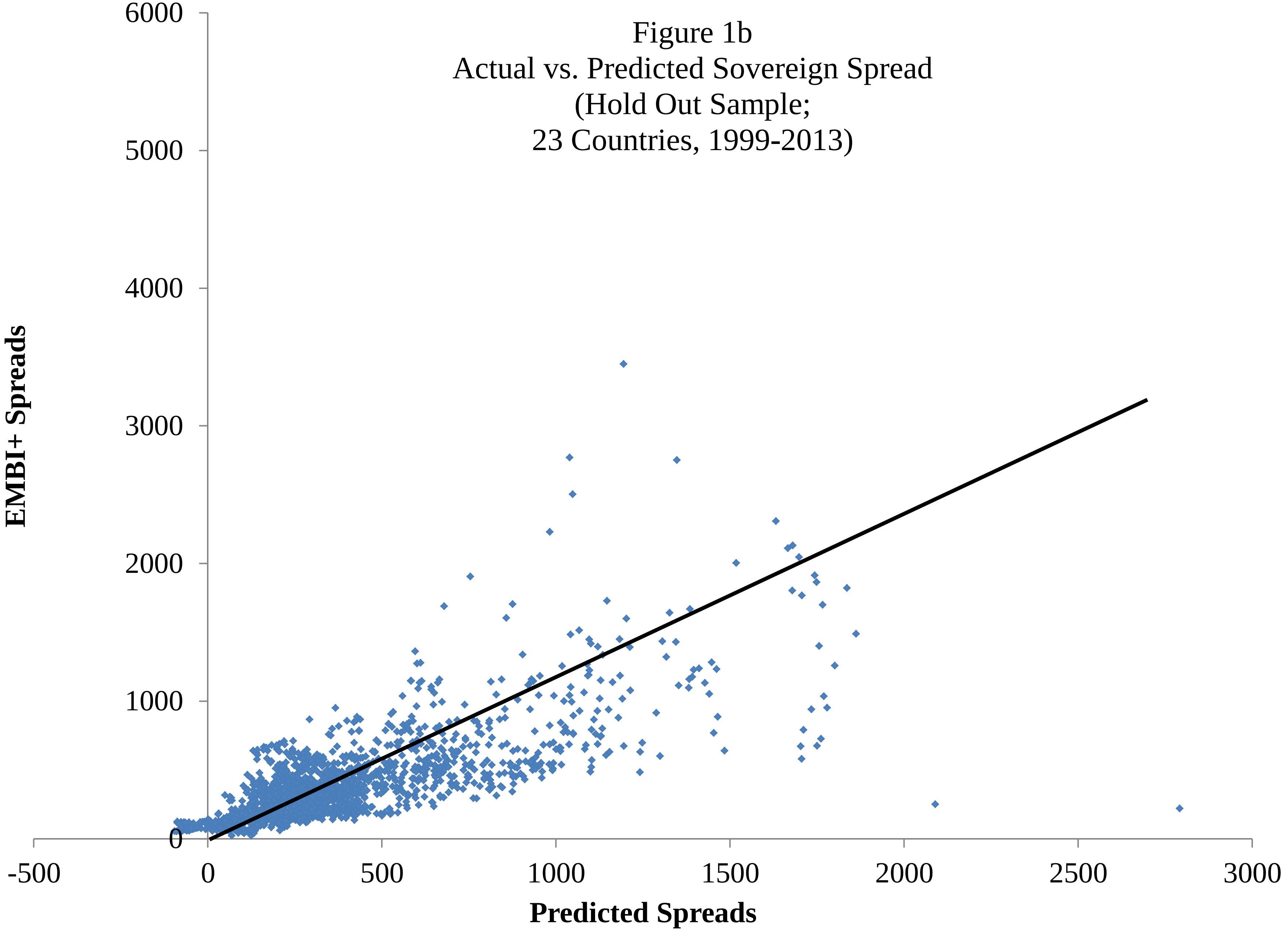
Figure 1b
Actual vs. Predicted Sovereign Spread
(Hold Out Sample;
23 Countries, 1999-2013)
EMBI+ Spreads
Predicted Spreads
6000
5000
4000
3000
2000
1000
0
-500
0
500
1000
1500
2000
2500
3000