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Risk and ex ante cost of equity estimates of emerging market firms

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Abstract

We examine the empirical relationship between estimates of ex ante cost of equity and risk for a sample of individual emerging market equities for the period 1990–2000. The ex ante cost of equity estimates are obtained using the residual income valuation model. As in studies that use mean realized returns on emerging market indexes, a measure of total risk (return volatility) is the most significant risk factor in explaining ex ante expected return estimates. For emerging market equities with substantial investability to global investors, global beta adds some explanatory power.

JEL classification: F3; G15; G31

Keywords: Cost of equity; Emerging markets; Residual income valuation; Political risk; Total risk; Global beta

1. Introduction

Much prior empirical research on risk and return for emerging markets has used mean realized returns to estimate expected returns, including Harvey (1995, 2000), Bekaert and Harvey (1995), Barry et al. (2002), Bansal and Dahlquist (2002), and Bekaert et al. (2003). Since risk–return theory relates to ex ante expectations, not to

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mean realized returns, we estimate ex ante expected returns implicit in stock prices and the residual income valuation model. We then assess the empirical relationship between the ex ante expected return estimates and estimated risk factors. Since the time we began our study, some other researchers have estimated ex ante expected returns for emerging market firms with comparable methods, e.g., Hail and Leuz (2004a,b) and Harvey (in press).

We use data from 1990 to 2000 for individual firms from 16 emerging market countries. Prior empirical research on risk and return for emerging markets has mostly used data for market indices rather than individual firms. Exceptions include Barry et al. (2002), Bekaert et al. (2003), Hail and Leuz (2004a,b) and this study.

We find that the ex ante expected return estimates for individual emerging market stocks are most significantly related to the stock's return volatility, i.e., total risk. This finding is similar to Harvey's (2000) findings using mean realized index returns. Since return volatility of country indexes has been empirically related to country political risk ratings, we think our empirical finding reflects political risk. See, for example, Harvey (in press), who also shows that political risk is "priced" using country aggregates of ex ante expected return estimates. We also find that global beta offers some additional explanatory power for emerging market stocks that permit significant international investment, while local beta offers additional explanatory power for stocks that are more restricted in terms of international investment. This dichotomy is expected in the theory of asset pricing in partially segmented markets, e.g., Bekaert and Harvey (1995).

2. Review of literature

This section reviews the literature on the equilibrium expected return for emerging market firms and on estimating ex ante expected return implicit in asset prices and valuation models.

2.1. Risk and return for emerging market equities

In the theory of risk and return in emerging markets, risk generally has two components. The first is the investment's systematic risk relative to the investor's benchmark portfolio. The second is an additional factor to account for nonsystematic risk. Reasons for including the nonsystematic risk factor vary. Bansal and Dahlquist (2002) think of the factor as an adjustment for political risk, that is, for the likelihood that the market for the investment will close due to political reasons. Bekaert et al. (2003) think of the factor as related to liquidity. For simplicity, we will refer to the second risk factor as political risk.

Lessard (1996) argued that the probability that an asset's market will close for political risk reasons should be accounted for in the estimation of an asset's expected cash flows, not in the equilibrium required return for risk. However, the estimation of the probability seems more difficult than the "denominator approach" of including political risk in the risk–return relationship, as in Bansal and Dahlquist.

This theory leads to a general expression of the risk–return relationship in Eq. (1):

$$\mathrm{RP}_i = \beta_i[\mathrm{RP_G}] + \phi_i[\mathrm{RP_P}] \tag{1}$$

where: RP_i=risk premium for asset i in US dollars, β_i=beta of asset i versus unhedged global market returns, in US dollars, $\mathrm{RP_G}$=risk premium in US dollars on the unhedged global market portfolio, ϕ_i=asset i's political risk, and $\mathrm{RP_P}$=risk premium in US dollars required for political risk.

Using data through December 1999, Harvey (2000) examined the empirical relationship between mean realized returns for emerging market stock indices and a large number of potential explanatory risk variables. In contrast to Harvey (1995), the empirical relationship between mean realized return and global beta was positive and significant, suggesting that global beta has become a more important measure of risk of emerging market investments as integration and liberalization have progressed. However, return volatility (i.e., total risk) had the highest R^2 of any risk variable. The fit between mean realized return and the pair, global beta and return volatility, was higher than for any other pair of independent variable risk factors. Bansal and Dahlquist (2002) reported a strong empirical relationship between mean realized returns on emerging market indexes and measures of the two risk components, global beta (with the world market index) and country political risk rating.

Country risk ratings apply to a country as a whole. Thus, such ratings may be useful when researching with equity market indices (as in Harvey, 2000; Erb et al., 1996a) but not with individual stocks. There are at least two reasons that justify the variation in political risk for each stock. First, sensitivity of stock returns to expropriation or market closure may vary across individual stocks. That is, some type of stocks may be more (or less) sensitive to political risk than other type of stocks (see Bailey and Chung, 1995). Second, a change in government may change the regulatory environment that may result in direct restrictions on the foreign ownership of the stocks of certain type (e.g., companies with significant national interest). Some details on impact of political risk in individual stocks may be found in Ma et al. (2003) and Bailey and Chung (1995). Barry et al. (2002) documented size and value effects in mean returns of individual emerging market stocks.

Thus, an individual stock's political risk has two components, the overall country political risk and the stock's political risk exposure (Damodaran's, 2003 λ). Our measure for a stock's political risk (ϕ_i) incorporates these two components and is inspired by the empirical finding that total return volatility for country indexes is related to country political risk ratings, e.g., Erb et al. (1996a,b). We measure ϕ_i as the ratio of the individual stock's return volatility, σ_i, to the return volatility of the global market index, σ_G. That is, $\phi_i=\sigma_i/\sigma_G$. Our ϕ_i measure may be viewed as including both country risk and the individual stock's political risk exposure. One can think of country risk as measured by the ratio of the average return volatility of stocks in the country to σ_G and a stock's political risk exposure as measured by the ratio of σ_i to the average return volatility of stocks in the country. $\mathrm{RP_P}$ is then a general premium for political risk by global investors. A number of ad hoc denominator-approach models of investment banks have employed return volatility as a risk factor, based on political risk intuition, e.g., Godfrey and Espinosa (1996).

Of course, many emerging markets are relatively segmented. In theory, an asset's local beta should play a role in the risk–return relationship of a segmented market. However, Cooper and Kaplanis (2000) argue that an international investor may be close to correct in many cases to use a global model (like Eq. (1)) to estimate the cost of capital for a project in a partially segmented market. Another approach is that of Bekaert and Harvey (1995), where the risk premium of an asset in a partially segmented market may be viewed as a weighted combination of the determinants in an integrated market and a segmented market, where the weights depend on the extent of segmentation.

2.2. Ex ante expected return estimates

In principle, an estimate of an asset's ex ante expected return is a more direct measure of the expected return concept of asset pricing theory than is the often-used mean of a sample of realized returns. To our knowledge, ex ante expected return estimates had not yet been studied for emerging market companies when we began our research. Since then, Hail and Leuz (2004a) and Harvey (in press) find that country risk is priced in ex ante expected return estimates for emerging market companies.

Generally, prior research has found a positive empirical relationship between ex ante expected return estimates and systematic risk for US stocks. Using I/B/E/S growth forecasts and the constant dividend growth model, Harris et al. (2003) reported a significant relationship between ex ante expected return estimates and domestic and global betas for a sample of US stocks in the 1982–1998 period. Applying a discounted cash flow model to 51 highly leveraged transactions (mostly management buyouts) in the period 1980–1989, Kaplan and Ruback (1995) found that implied cost of capital estimates were related to beta but not to the Fama-French size and book-to-market factors. Gordon and Gordon (1997) and Gode and Mohanram (2003), using I/B/E/S forecasts, also observed a significant relationship between ex ante cost of equity estimates and domestic US stock betas; Gordon and Gordon used a finite horizon dividend discount model and the time period 1985–1991, while Gode and Mohanram used the Ohlson and Juettner-Nauroth (2000) valuation model for the period 1984–1998. On the other hand, using I/B/E/S forecasts and a clean-surplus residual income valuation model, Gebhardt et al. (2001) reported no significant association between their ex ante expected return estimates and domestic betas for a sample of US stocks from 1979 to 1995.

3. Data and methodology

3.1. Data

The initial sample included all emerging market stocks represented in both the S&P Emerging Market Data Base (EMDB) (formerly the International Finance Corporation's EMDB) from January 1990 to September 2000 and the I/B/E/S international database for the same period. Stock prices, company equity book values, and exchange rates are obtained from the EMDB, while earnings forecasts are obtained from the I/B/E/S database.

Only emerging market countries that are classified as major markets in the EMDB are considered in the study. However, Mexico and all other countries with less than 15 firms represented in the initial sample were eliminated. The study examines stocks from 16 emerging market countries: Argentina, Chile, China, Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Poland, Sri Lanka, Taiwan, Thailand, and Turkey.

The initial sample was reduced by the restriction that each firm have 5 years of return data to estimate the risk parameters. In addition, in order to eliminate outlier earnings forecasts, firms with forecasted second year earnings greater than 1/2 of the current price are eliminated. Outliers, based on the top and the bottom 1% of estimated cost of equity, are also eliminated. The final sample consisted of 438 different companies yielding a total of 1553 firm-years of data.[2] One should note that a company represented in the study in a year might not be in the sample in some other years. Earlier years, obviously, have lower representation in both the EMDB and the I/B/E/S, hence, in the sample of this study. Tables 1 and 2 provide the number of companies by country and by year.[3]

Equity data including analyst forecasts are converted to US dollars. The Morgan Stanley Capital International (MSCI) World Index with gross dividend reinvestment is used as the global market index. Monthly data for the global index were downloaded from the website of MSCI. As all parameters are estimated in US dollars, the US dollar risk free rate is used. Yields on 10-year Treasury bonds are obtained from Federal Reserve Bank of St. Louis website.

The firms' equity betas and volatilities are estimated with monthly excess returns (stock return minus 10-year T-Bond return) for 5 years prior to the month for which the ex ante expected return is estimated. Equity betas for all companies are estimated by ordinary least squares (OLS) regression, of excess stock returns on excess market index returns. Tables 1 and 2 show the companies' average global betas and return volatilities (standard deviation of monthly returns) by country and year. Table 1 also shows the average monthly return volatility of the global market index.

In the empirical analysis, the political risk factor is proxied by the total risk ratio of the stock's return volatility (σ_i) to the global market index's return volatility (σ_G). In Table 1, one can see that many of average stock volatilities by country for a given year are four or five times larger than the volatility of the global market index.

Emerging markets have two kinds of stocks, namely, stocks restricted to foreign investors and stocks open to both foreign and domestic investors, with openness to foreign

[2] For the emerging markets included in our sample, Hail and Leuz (2004b) have 4439 firm years of data, while our study has about 1516 firm years of data for the same group of countries. Aside from coverage provided in I/B/E/S, the primary reason for smaller sample is the restriction that firms have five years of historical pricing information in the EMDB to be eligible for inclusion in the sample. Thus a firm that is represented in the EMDB since January 1996 will have only one observation (in year 2000) provided it is also covered substantially by I/B/E/S. Even though the sample of firms in this study is smaller than some recent studies (e.g., Hail and Leuz, 2004a,b), the cost of equity estimates are quite consistent for the countries included in these studies. The correlation of country level (average) cost of equity between this study and Hail and Leuz (2004a) is about 87%, and that between this study and Hail and Leuz (2004b) slightly lower.

[3] It is obvious from the tables that some countries represented have significantly lower number of stocks. For an individual country, the results may not quite be representative of the behavior of the entire stock market. We understand that the data availability for the sample stocks in both databases limits the sample size. However, the readers may note that we are attempting to provide an alternative explanation for US dollar cost of equity estimation of emerging market stocks in general, for which a sample size of 1553 firm/years of observations is expected to be large enough.

Table 1
Descriptive statistics by year

Years	#Obs	Investability	Average β_i	Average σ_i	Average σ_G	Ex ante ER
1990	32	0.72	0.68	0.146	0.048	0.083
1991	31	0.63	0.94	0.135	0.052	0.111
1992	40	0.43	0.71	0.152	0.049	0.104
1993	89	0.35	0.41	0.155	0.044	0.105
1994	129	0.42	0.48	0.153	0.045	0.099
1995	159	0.43	0.58	0.144	0.039	0.105
1996	182	0.52	0.27	0.136	0.030	0.118
1997	202	0.58	0.61	0.134	0.028	0.131
1998	216	0.55	0.95	0.157	0.033	0.177
1999	244	0.60	1.34	0.172	0.037	0.170
2000	229	0.47	1.28	0.183	0.039	0.163
All Years	1553	0.51	0.82	0.155	0.037	0.138

This table reports average level of different variables used in the study by year. #Obs refers to total numbers of firms represented in a year. Investability is the proportion of stocks available to foreign investors collectively. β_i is the beta of stock against global market portfolio, σ_i is standard deviation of monthly returns of an individual stock, σ_G is the standard deviation monthly returns of global market portfolio. Ex ante ER is the implied cost of equity.

investors varying from 0% to 100%. The EMDB also includes an "investability" measure for each stock called the degree open factor, or investable weight, which is also the basis for Edison and Warnock (2003) measure of capital controls. The index represents portion of an emerging market stock that is legally available to foreign investors.

Table 2
Descriptive statistics by country

Country	#Firms	#Obs	Investability	Average β_i	Average σ_i	Ex ante ER
Argentina	20	80	0.94	1.09	0.200	0.121
Chile	22	88	0.66	0.36	0.119	0.127
China	5	9	0.22	0.14	0.204	0.083
Czech Republic	7	13	0.37	0.27	0.115	0.198
Hungary	7	17	0.78	1.68	0.172	0.185
India	61	212	0.19	0.01	0.136	0.141
Indonesia	27	79	0.64	1.43	0.198	0.174
Korea	59	200	0.34	0.89	0.157	0.177
Malaysia	69	304	0.85	1.15	0.144	0.111
Pakistan	19	50	0.57	0.16	0.136	0.179
Philippines	18	60	0.58	1.21	0.152	0.127
Poland	8	17	0.96	1.31	0.159	0.154
Sri Lanka	15	24	0.33	0.82	0.124	0.208
Taiwan	51	243	0.23	0.9	0.138	0.089
Thailand	23	65	0.29	1.44	0.172	0.141
Turkey	27	92	0.72	0.41	0.238	0.205
All Countries	438	1553	0.51	0.82	0.155	0.138

This table reports average level of different variables used in the study by country. #Firms refers to number of firms represented from a country. #Obs refers to total numbers of firms/years represented. Investability is the proportion of stocks available to foreign investors collectively. β_i is beta of stock against global market portfolio, σ_i is standard deviation of monthly returns of an individual stock. Ex ante ER is the implied cost of equity.

The process for determination of the degree open factor could be divided into three parts as follows. First, the national ceiling on foreign holdings of a country's stock is identified. This is the upper limit of the investable weight of any stock in a country (e.g., national ceiling for total foreign holdings of a company's stock in India was 24% until 2003, 49% of voting shares in Brazil, and 100% in Argentina). Second, the sector limits are identified, e.g., foreign investment in some sectors may be more or less stringent than national ceiling. Third, the company specific limits on foreign ownership imposed by corporate charter or corporate by laws are considered. The lowest of these three types of limits constitutes the degree open factor.

Although the degree open factor measures the proportion of company's stock legally available to foreign investors collectively, in practice, the total proportion of a company's stock available to public may be less than the degree open factor. This may be due to government holdings, or cross-holdings by corporations. The EMDB contains a measure called capital adjustment factor, which measures proportion of a stock available to public after adjusting for government holdings and/or cross-holdings. The investability index is set at the lower of the degree open factor and capital adjustment factor. The investability index thus represents maximum proportion of a company's stocks that foreigners collectively can hold in practice (see Exhibit 1).[4]

Exhibit 1: Investability index

	Stock A	Stock B
National ceilings on foreign ownership	100%	80%
Industry ceilings on foreign ownership	60%	100%
Corporate charter/by laws ceilings	70%	70%
Degree open factor	60%	70%
Capital adjustment factor	70%	30%
Investability index	60%	30%

The investability index ranges from 0 to 1. A value of 0 for investability index implies practically 0% shares of a stock are accessible by foreign investors. Such a stock is also called a restricted stock. Similarly, a value of 1 for investability index implies 100% shares of the stock are accessible by foreign investors. Accordingly, a value of 0.3 means approximately 30% shares of a particular stock is accessible by foreign investors. Tables 1 and 2 provide a summary of the investability index averages by year and country, respectively.

[4] Normally, the investable weight (degree open factor) is less than capital adjustment factor. However, for a small number of stocks included in the sample, the capital adjustment factor is less than the degree open factor. Refer to "The S&P Emerging Market Indices: Methodology, Definitions, and Practices," February 2000. In addition, average investable weight in the Table 1 is decreasing over time. This should note be interpreted as investable weight of the particular firm from a particular country decreases over time. It rather means that the coverage for the firms (from countries) with lower ceilings in foreign ownership increases in the databases used in the study. Thus in recent years higher proportion of firms with lower investable weight increases. For example, firms from India are represented in the sample starting 1993, which has a foreign ownership ceiling of 25% until recently.

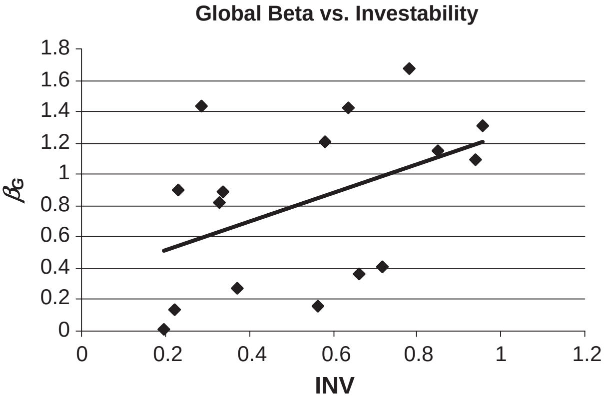

Fig. 1. Based on the country level average of each variable as it appears in Table 2 or otherwise constructed in the similar manner. β_G is global beta; INV is investability index.

3.2. Ex ante expected return estimation

Ex ante expected rates of return, implicit in observed stock prices and analysts' forecasts of earnings growth, are estimated using the residual income (RI) valuation model, also known as the Edwards–Bell–Ohlson (EBO) model.[5] All estimates are made in the US dollars. The IFC/EMDB also provides US dollar price of emerging market stocks, which is essentially converted from original price at the spot exchange rate. Analysts' forecasts of the stocks not available in the US dollars are converted into US dollars at the spot exchange rate.[6] We follow the Claus and Thomas (2001) application of the RI model, employing Eq. (2).

$$P_{i0} = B_{i0} + \frac{E_{i1} - k_i B_{i0}}{(1+k_i)} + \frac{E_{i2} - k_i B_{i1}}{(1+k_i)^2} + \ldots + \frac{E_{i5} - k_i B_{i4}}{(1+k_i)^5} + \frac{(E_{i5} - k_i B_{i4})(1+g)}{(k_i - g)(1+k_i)^5} \tag{2}$$

where: k_i=ex ante expected rate of return (cost of equity) estimate for company i, P_{i0}=current price per share for company i, B_{it}=book value per share for company i expected at time t; E_{it}=earnings per share for company i expected to be received at time t, and g=expected long-term growth rate.

The application of Eq. (2) is also based on the approach used by Claus and Thomas (2001). E_{i1} and E_{i2} are from analysts' earnings forecasts. E_{i3} through E_{i5} are taken directly from I/B/E/S where available, otherwise forecasted using 5-year growth rate from I/B/E/S where available, and otherwise forecasted using the growth rate in the forecasted earnings for the first 2 years. B_{it} is forecasted using clean surplus relation as

[5] The empirical usefulness of the residual income model was demonstrated by Lee et al. (1999).

[6] We understand that for converting the forecasted earnings, the forward exchange rate would be more appropriate. However, due to difficulty in obtaining and thinness of forward exchange rate data of emerging market currencies we used spot exchange rate.

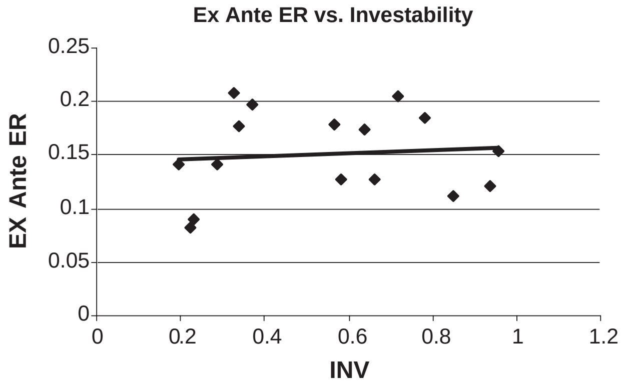

Fig. 2. Based on the country level average of each variable as it appears in Table 2 or otherwise constructed in the similar manner. INV is investability index.

follows: $B_{it}=B_{it-1}+E_{it}-D_{it}$. D_{it} is assumed to be 50% of E_{it}, as in Claus and Thomas, but D_{it} is assumed to be 0 if E_{it} is negative. The long-term growth rate is set at 4%.

The ex ante risk premium is obtained from the ex ante expected return estimate by subtracting the corresponding 10-year Treasury bond yield. Table 1 shows the average ex ante cost of equity estimates by year and Table 2 by country. Figs. 1–5 are based on the average estimates of variables by country as in Table 2, except for the average of variable σ_i/σ_G (total risk) as used in Figs. 4 and 5. Average size of the ex ante cost of equity (13.8%) is over twice the size reported in Claus and Thomas (2001) for a sample of US firms. Likewise, the average ex ante cost of equity for the sample of countries is about 35 basis points higher than those cross-represented in Hail and Leuz (2004a).[7] The figures indicate that global beta is increasing in investability, but at the country level, the relationship between global beta and the ex ante cost of equity is flat. The relationship between the total risk and the ex ante cost of equity is increasing and substantial for the firms in the higher investability group. We test this relationship in detail in the later section using the panel data of individual stocks.

The figures are based on the country level average of each variable as they appear in Table 2 or otherwise constructed in the similar manner. β_G is global beta, INV is investability index, σ_i/σ_G is ratio of stock standard deviation to global market standard deviation.

4. Estimated risk–return relationships

The ex ante risk premium estimates are then used in panel regressions on three risk variables: (1) global beta, (2) political risk, as measured by the ratio of return volatility of the stock to the return volatility of the global market, and (3) local beta. Each of the

[7] Average cost of equity for some countries (e.g., China) may appear to be lower for the risk profiles these countries. Please see footnote 3 for further clarification.

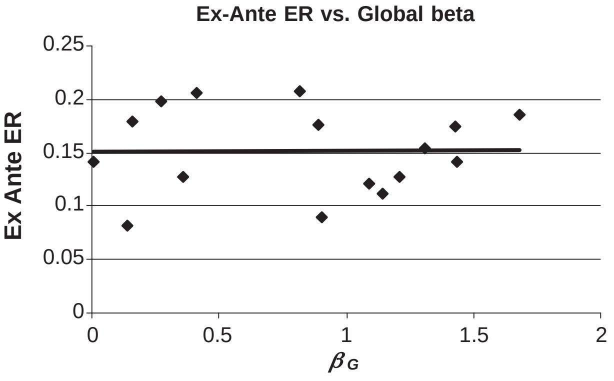

Fig. 3. Based on the country level average of each variable as it appears in Table 2 or otherwise constructed in the similar manner. β_G is global beta.

1553 observations is stratified into one of four groups based on the stock's investability index. White's heteroskedasticity consistent co-variance matrix is used in estimating standard errors. The results of the panel data regressions are summarized in Table 3.

We see from the results in Table 3 that for the entire sample of 1553 observations (righthandmost two columns), the most significant univariate relationship is between the ex ante risk premium and political risk, as measured by the ratio of the stock's total risk to the volatility of the global market. Here, the adjusted R^2 is 0.0883 and the t-statistic on the political risk variable is 8.83. Both global beta and local beta have significant t-statistics in the entire-sample univariate regressions, but the adjusted R^2 are only 0.0136 and 0.0127, respectively. For global beta, the lowest investability category shows the lowest R^2 and lowest t-statistic, while for local beta, the highest investability category shows the lowest R^2 and lowest t-statistic. These findings are in line with the theory covered earlier. The political risk variable is the most significant,

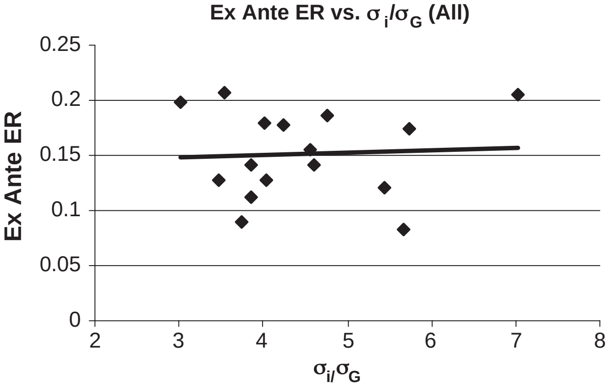

Fig. 4. Based on the country level average of each variable as it appears in Table 2 or otherwise constructed in the similar manner. σ_i/σ_G is ratio of stock standard deviation to global market standard deviation.

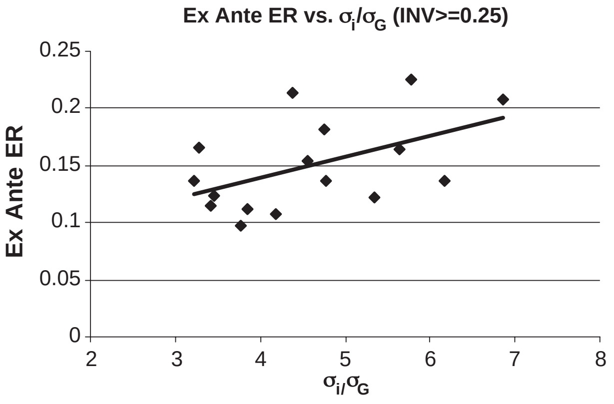

Fig. 5. Based on the country level average of each variable as it appears in Table 2 or otherwise constructed in the similar manner. σ_i/σ_G is ratio of stock standard deviation to global market standard deviation.

not only in the overall sample, but also in each investability category except for the lowest, where local beta wins the race. In the highest investability category, the political risk variable has an R^2 of 0.1499.[8]

In the multivariate regressions, we observe that global beta adds additional explanatory power to the leading role played by the political risk variable for the three highest investability categories. Also, the political risk variable can add additional explanatory power to the leading role played by local beta for the lowest investability category.

Based upon these observations, we regressed the ex ante risk premium on the pair, global beta and political risk, for the all 1007 observations in the three highest investability categories. The result was the estimated Eq. (3), which had an R^2 of 0.1368.

$$RP_i = -0.0169 + \beta_i[0.0053] + \phi_i[0.0194] \tag{3}$$

where

$$\phi_i = \sigma_i/\sigma_G.$$

Consider how Eq. (3) might be applied to estimate the cost of capital of an investable emerging market investment to an international investor. Let us assume that the

[8] This result holds in the panel regressions of ex ante risk premium with pairs of global beta and country risk ratings versus pairs of local beta and country risk ratings. Five different kind of country risk rating indices are used as in (Harvey, 2000; Erb et al., 1996b), which are Institutional Investor's country risk ratings, and International Country Risk Guide's composite risk ratings, economic risk ratings, financial risk ratings, and political risk ratings. Panel regression with pairs of global beta and risk ratings have consistently higher adjusted R^2 than pairs with local beta and risk ratings for all three investability groups involving greater than 0.25 investability index. However, pairs with local beta and country risk ratings win the race only for the group representing the lowest investability index (less than 0.25). These results are not reported in the tables.

Table 3
Panel data estimation results

Investability group	$0.25>I$		$0.50>I\geq0.25$		$0.75>I\geq0.50$		$I\geq0.75$		All	
No. of observations	546		312		127		568		1553	
	Coef	*t*-stat	Coef	*t*-stat	Coef	*t*-stat	Coef	*t*-stat	Coef	*t*-stat
Panel A: Ex ante RP versus all three risk factors together										
β_i	0.0037	0.52	0.0199**	2.47	0.0134	0.89	0.0056	0.88	0.0061*	1.74
σ_i/σ_G	0.0064	1.11	0.0155***	3.02	0.0099**	1.99	0.0257***	8.31	0.0182***	8.04
β_L	0.0313	1.53	−0.0168	−0.79	−0.0131	−0.43	−0.0579***	−3.61	−0.0213**	−2.08
Intercept	0.0166	0.94	−0.0107	−0.57	0.0427*	1.78	0.0192	1.12	0.0132	1.44
R^2 adjusted	0.0166		0.1637		0.0361		0.1633		0.0911	
Panel B: Ex ante RP versus global beta										
β_i	0.0025	0.37	0.0362***	4.91	0.0188	1.49	0.0099	1.35	0.0141***	3.84
Intercept	0.0706***	15.90	0.0243***	3.64	0.0684***	4.55	0.0721***	7.87	0.0634***	17.00
R^2 adjusted	−0.0016		0.1185		0.0191		0.0041		0.0136	
Panel C: Ex ante RP versus volatility ratio										
σ_i/σ_G	0.0092**	1.95	0.0199***	4.66	0.0108**	2.54	0.0222***	7.86	0.0173***	8.83
Intercept	0.0368**	2.14	−0.0267	−1.59	0.0395**	2.49	−0.0204*	−1.76	0.0009	0.12
R^2 adjusted	0.0146		0.1472		0.0409		0.1486		0.0883	
Panel D: Ex ante RP versus local beta										
β_L	0.0494***	3.06	0.0580***	2.92	0.0364	1.54	0.0214	1.20	0.0406***	4.25
Intercept	0.0257*	1.77	0.0031	0.17	0.0515**	2.09	0.0598***	3.13	0.0344***	3.67
R^2 adjusted	0.014		0.0375		0.0046		0.0015		0.0127	

This table provides results of regression tests where the ex ante risk premium is dependent variable and global beta (β_i), total risk (σ_i/σ_G), and local beta (β_L) are explanatory variables. I refers to investability group. Panel A provides regression results of all three explanatory variables for four investability groups and entire sample. Panel B reports results using β_i as sole explanatory variable, panel C, using σ_i/σ_G, and panel D using β_L. Coef refers to regression coefficients. The standard errors are corrected for heteroskedasticity.

* Significant at 0.10 level.

** Significant at 0.05 level.

*** Significant at 0.01 level.

investment's global beta is 1.20, the ratio of the asset's return volatility to that of the global market is 5, and the Treasury bond yield is 5%. Eq. (3) would yield that the asset's risk premium should be $-0.0169+1.20[0.0053]+5[0.0194]=0.0865$. Since the risk premium is 8.65% and the Treasury bond yield is 5%, the estimated cost of capital for the asset is 13.65%.[9]

5. Conclusion

This paper takes an empirical perspective on the issue of a global investor's cost of capital for an emerging market investment. We assess the relationship between estimated risk measures and ex ante cost of equity estimates for a sample of emerging market equities. As in Harvey's (2000) work with mean realized returns and emerging market indexes, a measure of total risk is the most significant risk factor in explaining ex ante expected return estimates. For emerging market equities with substantial investability to global investors, global beta appears to add some explanatory power.

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[9] We also estimated Eq. (3) in a pooled sample, as expected coefficient of ϕ_i was highly significant, adjusted R^2 was 14.85% and estimated ex ante risk premium and ex ante cost of equity at assumed investment was 9.59% and 14.59%, respectively. Similarly, estimation of Eq. (3), after removing the observations from 1994 (Peso crisis) and 1997 (Asian financial crisis) the coefficient of ϕ_i was highly significant. The adjusted R^2 was 15.59% and estimated ex ante risk premium and ex ante cost of equity at assumed investment was 9.24% and 15.59%, respectively.

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