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# A Model of Unexpected Returns in Emerging Countries*

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ABSTRACT

This paper conducts an event study of the abnormal returns that accompany surprise revisions in sovereign creditworthiness. The novelty of the empirical specification is that it attempts to incorporate the lessons of the sovereign risk literature in an empirical asset pricing context. Given their lower unconditional betas, emerging markets tend to have lower unconditional expected returns than developed markets. However, conditional on a run of surprisingly favorable changes in local conditions, expected returns of emerging markets are well above conditional expected returns of developed countries. In the most unstable countries, abnormal returns can be up to 52 percent per semester conditional on a positive credit rating surprise of one standard deviation.

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## 1. Introduction

While the standard deviation of portfolio returns from emerging markets is typically higher than that of developed markets, there is little evidence that this risk is systematic, in the sense that it should command a positive average risk premium in an asset pricing model. This paper applies a model of unexpected returns to investment in emerging markets based on the key distinction that assets located there are subject to diversifiable sovereign or jurisdictional risk. We construct a proxy measure of the unexpected change in host country conditions for corporate development based on sovereign credit ratings. We find that, conditional on positive sovereign risk surprises, the returns of emerging markets can be much higher than those of developed markets. The model provides a partial rationalization for the high average returns in emerging markets over the recent period, while over the same period the systematic risk in these markets is low for a global investor.

The international asset pricing theories most commonly tested in empirical work [e.g. Ross and Walsh (1983), Adler and Dumas (1983)] define "countries" as subsets of investors who use a common numeraire to translate nominal returns into real returns. Such models ignore a key aspect of cross-border investing, namely that overseas assets are subject to the jurisdiction of a sovereign foreign authority that can take actions to reduce the value of foreign investors' claims. This has been recognized at least since Eaton and Gersovitz (1981) but has not been fully developed in the empirical asset pricing literature.[1] The existence of an active political risk insurance market for foreign direct investment suggests that agents care about jurisdictional risk.[2] Seemingly, the

[1] In the limit, the ability of investors to collect on international investments is subject to the willingness of the host government to respect property rights and to the maintenance of peaceful relations among nations. Williams (1975) estimates that about 20 percent of the value of foreign investments carried into or made during 1956-72 in less developed countries were expropriated without compensation during this period.
[2] Data on private market political risk insurance premia are unavailable. Government (OPIC in the USA) and multilateral (MIGA of the World Bank) agencies state that their rates have not changed since their inception (1971 for OPIC and 1988 for MIGA). Such insurance covers currency transfer and inconvertibility, expropriation and political violence risks of foreign direct investment projects. Premia expressed as a percentage of insured capital per year are: manufacturing and services (OPIC 1.95 percent, MIGA 1.65 percent), natural resources (2.25, 1.95), oil, gas and infrastructure (OPIC-exploration 1.85,

lower quality and the instability of host government policy is one feature that distinguishes emerging from developed markets.

The literature is ambiguous on whether emerging markets should command higher or lower expected returns than developed ones. Harvey (1995) found that most emerging countries contributed little to the variance of the world portfolio and that asset pricing theories had limited ability to explain their returns. Stulz (1999, p.16) interprets the low betas as implying low risk and low expected returns. On the other hand, Eaton and Gersovitz (1983) state that "From a U.S. or West European perspective, investment in the Second and Third Worlds look very much riskier than investment at home." Bekaert, Harvey and Lumsdaine (1999, p.4) and Erb, Harvey and Viskanta (1997) agree that emerging markets are riskier than developed ones, though they do not provide a model justifying the claim.[3]

The evidence in Jorion and Goetzmann (1999) indicates that one dollar invested in 1921 in a portfolio of developed countries would have become $36.84 in 1996 whereas it would have become less than one tenth of that amount ($3.36) if invested in a portfolio of countries now considered emerging. Not only did emerging countries experience lower returns but they also had higher variance than developed markets.[4] Equilibrium asset pricing theories posit that an asset can have a lower expected return if it serves to smooth consumption. But asking this insurance motive to explain the gap in mean returns seems challenging. A casual reading of the names in the emerging pool does not suggest the idea of an insurance trust paying indemnities during world recessions, but rather that of questionable rule of law, diffuse property rights, and chronic economic mismanagement.

One proxy of the fears of international investors regarding sovereign risk is the credit grade reported by *Institutional Investor*'s survey of international bankers. In a scale where 100 indicates the lowest chance of default, the mean sovereign credit rating across

OPIC development 2.95, MIGA 2.45). Since eligible projects need to comply with political criteria, these may not be market rates.

[3] The claim seems to be based on high ex-post-mean returns in recent years.

emerging economies during 1986-1999 (43.4 credit points) was about half the mean rating of developed countries (81.5). Moreover, the typical emerging country had twice the standard deviation of credit rating over time (5.2 credit points) than its developed counterpart (2.5). So not only is the probability of getting your dollar back lower in emerging markets but also the change over time in this probability is higher than in developed markets.

We conjecture that some of the fabulous returns experienced by emerging markets in recent years may be due to a simultaneous hike in expected dividends and reductions in the cost of capital following substantial policy reforms. Therefore, we attempt to clarify the discrepancy among different researchers by allowing returns to depend on contemporaneous unexpected changes in a summary measure of host country conditions for corporate development. Our measure is based on *Institutional Investor* country ratings. Instead of using the identifying assumption that surprises must average to zero over the sample period, we derive surprises from a model of expected credit ratings developed in Cruces (2001). This draws on the insight of Elton (1999) that either large information surprises or "a sequence of correlated surprises" can importantly bias sample mean returns away from expected returns. We use an event study approach to compute stock market reactions to surprise country credit revisions. This seems reasonable given the small size of emerging markets whose average stock market capitalization is similar to that of McDonald's Corp.

Recent work has applied event studies to emerging markets with a more limited scope. Kaminsky and Schmukler (1999) study what triggered the 20 largest one-day changes in nine Asian countries' stock markets from January 1997 until May 1998. They meticulously scanned the press on each day of jitters for news releases regarding the state of the local economy (revisions by credit rating agencies, agreements with the IMF and the international financial community, monetary and fiscal policies, political news, etc.) and used these data to explain stock returns on those days. They found that credit rating

[4] The typical country in the developed (emerging) portfolio had an annualized standard deviation of 20 (30) percent.

revisions by international agencies had the largest impact of the eight event variables considered. On average, prices rise (fall) about 14 percent on days in which credit upgrades (downgrades) are announced.

Henry (2000) estimates the abnormal stock returns associated with the reduction in restrictions binding international investors from holding shares of 12 emerging countries. Cumulative abnormal returns are between 26 and 38 percent during the eight month window leading up to the liberalization between 1975 and 1994. These abnormal returns may also be due to higher expected dividends resulting from other reforms that tend to coincide with financial liberalization.[5] We sidestep the issue of confounding information altogether since our purpose is not to identify the stock market effect of one particular reform, but rather to estimate how a sequence of changes in a continuous synoptic measure of country conditions over a long time period affects returns –a question yet unanswered.

Chile is a good example of what we have in mind. From 1986 until 1999, its credit rating went from being four standard deviations below the emerging country mean rating to almost four standard deviations above it. In the meantime, its stock market rose by a factor of 25, the largest wealth ratio of the 39 countries in our sample. We assess how much of this return can be traced to surprise increases in Chile's credit rating.

The conclusions can be summarized as follows. A one standard deviation of surprise revision during a semester is accompanied by an abnormal return of about 52 percent in that semester for countries whose starting credit ratings are lowest (between 15 and 20). Surprise revisions command much more modest abnormal effects for other ranges of starting rating. In the 20-30 range, a one standard deviation of revisions commands a return of about 3 percent per semester, while this figure rises to 7.5 in the 30-40 range. These findings put in perspective the ambiguity in the literature about whether emerging

[5] Henry uses one month leads and lags of domestic industrial production, the US Treasury Bill rate, domestic inflation, the real exchange rate and a political stability index and other policy dummies to control for confounding information. It is not obvious that these variables truly control for the run-up in prices due to higher expected cash flows.

market expected returns are higher or lower than those of developed markets. Given their lower unconditional betas, emerging markets tend to have lower unconditional expected returns than developed markets. However, conditional on a run of surprisingly favorable changes in local conditions, expected returns of emerging markets can be well above conditional expected returns of developed countries. Although accounting for credit revisions allows for useful inference on the model's parameters, it fails to reduce the residual variance relative to standard unconditional asset pricing models. More precisely, the estimated model is unable to explain the fabulous returns earned by many emerging markets in recent years –either because our measure of local conditions is not volatile enough or because it measures those conditions imprecisely.

The paper is organized as follows. Section 2 describes the model, section 3 describes the data and section 4 presents the results. Section 5 challenges the model to explain a profitable investment strategy based on country credit ratings suggested by Erb, et al. (1995).

## 2. The Model

A common model that links stock prices to information posits that stock prices equal the present discounted value of rationally forecasted future dividends. This model can be represented as

$$(1) \qquad P_t = E\left( \sum_{t=1}^{\infty} \frac{D_{t+t}}{1+{}_t r_{t+t}} \middle| \Omega_t \right)$$

where $P_t$ is the price of the stock at time *t*, $E(\cdot \mid \Omega_t)$ denotes the mathematical expectation conditional on information available at time *t* $(\Omega_t)$, $D_{t+t}$ is the dividend paid at time $t+t$, and ${}_t r_{t+t}$ is the stochastic discount factor for cash flows that accrue at

$t+t$ . We shall use the phrase "host country conditions" to summarize the quality of government policy and other local circumstances affecting cash flows or discount rates of corporations domiciled there. Important components of these conditions are a well defined system of property rights and the rule of law, government regulations affecting resource allocation, the country's ability to make payments in hard currency to international investors, the weather, etc. Since these conditions are different across countries largely due to the existence of sovereign governments, we refer to them as representing sovereign or jurisdictional risk. Some government policies like industrial regulation and the tax code affect expected dividends. Other policies affect the stochastic discount factor, for example by altering capital market barriers (Stulz, 1999, and Henry, 2000). Finally, some policies can affect both expected dividends and discount rates. For instance, international trade liberalization can result in a country specializing in the production of goods for which it has a comparative advantage. This reduction in the production mix may at once raise expected dividends and lower discount rates if it reduces the country's exposure to priced risk (Adler and Dumas, 1983).

So long as sovereign risk is diversifiable in a portfolio, it should not command a premium in an integrated world without agency costs (see Lombardo and Pagano, 1998, for the case when these constraints fail). We postulate that there exists a continuum of local conditions, from those that result in very low to very high prices in (1). We use country credit ratings awarded by *Institutional Investor*, *CCR*, as an empirical proxy for this synoptic measure of country conditions.

## Specification of Conditional Return Generating Process

If expected returns of country *i* conditional only on knowledge of the market return are consistent with the Sharpe-Lintner CAPM, the return process has the form,

(2) $$r_t^i = b^i r_t^w + u_t^i \qquad t = 1, 2 \ldots, T \qquad i = 1, \ldots, N$$

where $r_t^i$ is the realized excess return on country *i* in excess of the risk-free rate, $r_t^m$ is the realized excess return on the market index, $b^i$ is the market beta coefficient for country *i*, assumed stationary conditional on the risk-free return, and $u_t^i$ is a mean zero, independent disturbance term in period *t* for country *i*. Let $l_t^i$ be its unexpected change in *CCR*,

$$(3) \qquad l_t^i = CCR_t^i - E\left(CCR_t^i \mid \Omega_{t-1}\right).$$

The disturbance term in (2) captures the impact of unanticipated economic events on equity prices apart from any influence resulting from an aggregate market effect. To the extent that surprises about host country conditions change expected dividends or discount rates they affect share prices. We propose to disentangle the disturbance as,

$$(4) \qquad u_t^i = g \; l_t^i + e_t^i \; ,$$

where $g$ measures the effect of the surprise on stock returns and $e_t^i$ is a mean zero error term that is independent of the surprise and of the market return. The expected abnormal return conditional on a given surprise and on the market return is,

$$(5) \qquad E\left(u_t^i \mid r_t^m, l_t^i\right) = g \;\; l_t^i \; ,$$

so the presence of $l$ puts a wedge between the conditional expected returns of two countries of equal beta.[6]

[6] While a similar wedge might arise when an investor from one state invests in another state within the same country, the difference seems more important in cross-border investment. For example, there is a legal recourse system within a country where decisions of a state government can be contested, while there is no such recourse internationally.

There is a long tradition in finance to condition certain statistics of returns on proxies for the state of the economy (e.g. Harvey, 1989, Ferson and Harvey, 1991, McQueen and Roley, 1993, etc.). One obvious candidate to condition the market's reaction is the actual initial level of *CCR*. We propose two formulations for this conditioning. The first one specifies the event coefficient as

(6) $$g\left(CCR\right) = g_0 + g_1\, CCR^i_{t-1} + g_2 \left(CCR^i_{t-1}\right)^2 ,$$

with $g_0, g_1$, and $g_2$ common across countries but the event effect depending on the country's initial rating. The idea of imposing common coefficients across countries is related to the assumed cross sectional consistency of *CCR*. On this assumption, investors revise prices similarly following a given $l$ in two countries of equal *CCR*.

With the event effect measured by (6), the testable hypothesis is that $g\left(CCR\right) \geq 0$. A given absolute surprise implies a greater relative change in *CCR* the lower its starting level. If price revisions in (1) are proportional to the relative change in *CCR*, then the abnormal return should the lower for higher *CCR* levels.

An alternative parameterization of the event effect uses,

(7) $$g\,(CCR) = \sum_{j=0}^{9} g_j\, I_j$$

where,

(8) $$I_j = \begin{cases} 1 & \text{if} \quad 10\,j \leq CCR^i_{t-1} < 10(j+1) \\ 0 & \text{otherwise} \end{cases} .$$

In this case the corresponding testable hypotheses are that $g_j \geq 0$, and that $g_j > g_{j+1}$, $j$ = 0,…,9. The coefficient for each decile of lagged *CCR* reflects the mean abnormal return that accompanies a one credit point surprise during t.

The CAPM implies that the intercept in the unconditional market model measured in excess returns has expected value equal to zero. Incorporating such restriction reduces estimation error when the model is true (Thompson, 1995). Given the rejection of the CAPM in Harvey (1995) we will allow for country intercepts in (2). Most event studies use a non-event period to estimate a forecast model and estimate the event’s impact from forecast errors in the event period. An alternative characterization of the conditional return generating process under the same assumptions combines the event and non-event periods into a single model (Thompson, 1995). Plugging (4) in (2) gives a conditional return generating process,

(9) $$r_t^i = a^i + b^i r_t^w + g \; l_t^i + e_t^i \qquad t = 1,\ldots,T \quad i = 1,\ldots,N$$

In an economy in which relative prices of consumption goods covary with asset returns, investment will provide a different risk-return tradeoff depending on the numeraire used to measure real returns [Ross and Walsh (1983), Adler and Dumas (1983)]. One empirical implementation of such models when a large number of countries is involved, consists of adding the excess return on a foreign exchange risk factor $\left(r^{FX}\right)$ in the equation that determines expected returns [Ferson and Harvey (1993, 1994), Harvey (1995)]. Under this specification, (9) becomes,

(10) $$r_t^i = a^i + b^i r_t^w + d^i r_t^{FX} + g\left(CCR\right) \; l_t^i + e_t^i \qquad t = 1,\ldots,T \quad i = 1,\ldots,N \; .$$

Since $l_t^i$ is unobserved, the estimated event parameter depends on a particular forecasting model, with no obvious way to identify (within the asset pricing context) the one that most closely reflects true market expectations. We use a forecast model outside the return regressions to compute $E_{t-1}\left(CCR_t^i\right)$ (as in McQueen and Roley, 1993) and present estimated event effects for five such different forecasting models.

Appendix I presents a model within the realm event studies that delivers a testable hypothesis about the abnormal return that *should* accompany a given surprise, so that it allows to sort out among different forecasting models using stock return data. However, that model is based on such unusual assumptions (e.g. the expected return is constant across countries) that it may be inappropriate to use the estimated event coefficient for a horse-race among different credit forecasting techniques. While we still present that model and the estimated coefficients in Appendix I, we focus on the simpler model (10) which is also the workhorse of the related literature (e.g. Henry, 2000, Kaminsky and Schmukler, 1999, McQueen and Roley, 1993, etc.).

It seems reasonable to assume that the risk associated with changes in local conditions is diversifiable in a global portfolio. This would be consistent with the sovereign risk literature (e.g. Grossman and Van Huyck, 1988, Calvo and Kaminsky, 1991) in which international lending differs from domestic lending by the realization of a mean zero random variable that is uncorrelated with aggregate risk.

However, changes in local conditions could be associated with priced risk either because they are correlated with the state of the global economy, or (even if they are uncorrelated) because the local economy is less than perfectly integrated in the world financial market.

If countries tend to produce positive surprises about local conditions at the same time when the return on the market portfolio is high, the estimated event impact in (10) will only capture the partial effect of those surprises (Thompson, 1985). Harvey (1995) found that only a minor fraction of the variance of emerging market returns was related to standard world risk factors, so that bad realizations of local conditions did not seem to coincide with those of the market portfolio.

When the country producing the surprise is large, changes in local conditions may independently affect the return on the world portfolio, so that they become world factors because of the sheer size of the countries implementing them. While this may be the case for the large developed countries in our sample, emerging countries are usually quite small. For example, the typical emerging market's capitalization is below that of McDonald's corporation.

Last, emerging economies could be imperfectly integrated in the world so that their idiosyncratic risk is priced, in which case (10) would be misspecified. However, emerging markets in the sample have undergone financial liberalizations during the late eighties and early nineties (Henry, 2000, Bekaert, Harvey and Lumsdaine, 1998). Even when restrictions were in force, Bekaert et al. (1998) argue that these may not have been binding if international investors were able to circumvent them. As a result, we make the working assumption to treat changes in country-specific conditions as if they were diversifiable for a global investor so that they did not command a risk premium in emerging countries.

# 3. Data Sources and Description

## 3.1. Returns and Market Capitalization

Measured returns are total returns in U.S. dollars to a strategy that buys a national value-weighted index at the end of one month and holds it until the end of the next month. The sample goes from April 1986, until April 1999. Being portfolios of individual securities, national indices reduce individual corporate risk but they do not diversify the effects of national conditions, so they seem appropriate objects of interest.[7]

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[7] To the extent that there may be distributional effects within a country, it should be emphasized that when we refer to country conditions we mean from the point of view of investors. Unless the distributional

The emerging market data are from the Emerging Markets Data Base of the International Finance Corporation (IFC).[8] Returns are based on the IFC Global and Investable indices, which are both value-weighted. We study the twenty emerging countries most commonly analyzed in the literature, which account for about 75 percent of the total capitalization of the 51 countries covered by the IFC.[9] The IFC produces two types of indices, the Global indices, which are available since 1975, comprise about 2000 stocks and intend to capture about 65 percent of total market capitalization in each country, and the Investable indices, which are available since 1993 and include about 1200 stocks. The Investable indices exclude from the global indices those shares that can not be purchased by foreign investors. Given the assumption of perfect financial integration, we present three sets of results: for the 1986-1999 period and for the post-financial liberalization both based on the Global indices and using the Investable indices.

Interest rates and exchange rates used to distribute semester surprises by month are from Datastream and International Financial Statistics of the IMF. Equity returns for the 19 developed countries and the world equity portfolio are from Morgan Stanley Capital International (MSCI).[10] Data on the U.S. one-month Treasury bill (our proxy for the risk free rate) are from the corresponding Salomon Brothers index. Market capitalization figures for developed markets are from the Financial Times/S&P Actuaries World Indices. All data in this paragraph are taken from Datastream.[11]

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aspects of policy are dominant, the effects of policy for investors and non-investors should be positively correlated. We refer to net, as opposed to gross, effects because some policies could benefit some corporations while harming others (e.g. international trade liberalization).

[8] According to the IFC, it coined the term "emerging" stock markets in 1981 as a way to categorize the stock markets of developing countries. It defines a market as emerging if its GNP per capita is below the high-income country threshold (which was 9656 dollars per year in 1999). None of the markets defined as emerging in 1981 have surpassed the high-income benchmark yet, so they are all still tracked by the IFC. Some of these stock markets had existed for more than a century (Goetzmann and Jorion, 1999).

[9] The time series of the remaining 31 countries are shorter than seven years.

[10] Since the MSCI All Country portfolio is only available since 1988, we follow Bekaert, Erb, Harvey and Viskanta (1997) in using the MSCI World portfolio (which excludes emerging markets) during the first twenty months of the sample. Since total emerging market capitalization never exceeded two percent of world capitalization during 1986 and 1987, this simplification seems unlikely to introduce much bias.

[11] The UW's Datastream license precludes access to Morgan Stanley's capitalization data, so these data are from FT/S&P, which is accessible under the license.

The proxy for the foreign exchange risk factor is based on the Federal Reserve's real foreign exchange value of the dollar against the currencies of major trading partners.[12] Because such series are not the return to a traded asset, we project it on the national excess returns of sixteen countries in the sample and use the fitted values as a portfolio that is maximally correlated with them.[13]

Figure I.A presents the evolution of equity market capitalization of the 39 countries in the sample and the share of emerging countries in the total. World capitalization grew from 4.5 trillion US dollars in April 1986 to 23.2 trillion in March 1999 (or by a factor of 5.1).[14] Emerging markets as a whole went from 1.7 percent of total capitalization at the beginning of the sample to a maximum of about 13.2 in September 1994. The sequence of crises in Mexico (1994), Asia (1997), Russia (1998) and Brazil (1999) together with the rise in U.S. equity values diminished the relative importance of emerging markets to 4.73 percent of total world equity capitalization by the end of the sample.[15]

Table I presents the individual country capitalization figures at the start and at the end of the sample. The largest emerging market in March 1999, Taiwan, is about one percent of world equity and barely larger than the capitalization of Wal Mart Corp. at the time. The next biggest emerging markets are Mexico, South Korea and Brazil with about one half a percentage point of world capitalization each. There are four emerging markets with market caps above 100 billion at the end of the sample, whereas five developed markets

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[12] Available at http://www.federalreserve.gov/releases/H10/Summary/indexbc_m.txt.

[13] First we regressed the real dollar series on the 39 country returns. We kept all those country returns with absolute *t*-ratios higher than 1 and that gave 16. The $R^2$ on the sixteen national returns was above 35 percent.

[14] Because the target share of market capitalization coverage for the FT/S&P indices is in the range of 82 to 90 percent (FTSE, 1999) the figures were divided by 0.85. For the majority of developed countries, the capitalization data begins in June 1988. The data was backward extrapolated to April 1986 using the total return for each country from the MSCI country indices. For emerging markets, the IFC global indices intend to capture between 60 and 75% of the total market capitalization of all exchange-listed shares in each market since 1994 (IFC, 1999). As a result, the capitalization figures reported by the IFC were divided by .65. In early 1996, the IFC began adjusting the indices for cross-holding of shares. The adjustments eliminated double-counting distortions and reduced the reported capitalization of stock markets where cross-holding is prevalent. Later on that year, the IFC began removing government holdings from the market capitalization of the index constituents. These changes may show as sharp reductions of market capitalization after 1995 when the fact is that the value reported for previous years was artificially high.

[15] If South Africa and Israel (countries with short time series in the IFC dataset) are added to the emerging country list this rises to 5.4 percent.

do not surpass this level (Denmark, Singapore, Norway, Australia and New Zealand). Taken together, the capitalization of the 20 emerging economies in this study accounted for about 72 percent of the Canadian market at the beginning of the sample. At the end of the sample, they are about 2.5 the size of Canada or the size of Canada, Austria, Australia, New Zealand, Denmark and Sweden taken together.

Figure I.B plots each country's share of total world cap at the end of the sample against the average percentage monthly increase in market cap and highlights the skewness in the distribution of world capitalization. The United States accounts for about 53 percent of world cap followed by the United Kingdom and Japan with about 10 percent each. The remaining 27 percent is divided between the other 36 countries, with only France, Germany, the Netherlands, Italy and Switzerland in the 2 to 4 percent range. Also, Argentina, Turkey, the Philippines, Mexico and Chile had the largest average monthly increase in market capitalization over the sample –a result of sizable privatizations and public offerings.

Table I also presents descriptive statistics of returns in excess of the U.S. Treasury bill rate. Emerging markets had both higher arithmetic mean and variance of returns during the sample. The typical emerging country had geometric mean returns of 8 percent per year –about the same as that for the typical developed country.[16] However, the typical emerging country had about twice the standard deviation of returns than the typical developed country. In spite of the last 15 years having been unusually good in emerging countries (Goetzmann and Jorion, 1999), their Sharpe ratios are similar to those of developed countries.

The last column of Table I reports liberalization dates taken from Henry (2000) and breakpoint dates from Bekaert, Harvey and Lumsdaine (1998). Henry constructed a chronology of liberalizations in twelve emerging markets based on either the abolition of restrictions that precluded international investors from holding a given country's equities, the introduction of specific country funds in the US market or a jump in the IFC's

[16] The geometric mean approximates the average return to a buy and hold strategy.

investability index greater than ten percent.[17] For the remaining eight countries, the liberalization dates are proxied by the breakpoint dates reported by Bekaert et al. (1998). If the previous restrictions on holdings of foreigners were binding, then expected returns could have changed after liberalization. We follow the literature (Harvey, 1991, Ferson and Harvey, 1993, 1994, 1998) in treating developed countries as if they have been free of restrictions to foreign investment since 1986.

## 3.2. Credit Ratings

Most leading international banks have credit analysis teams whose job is to appraise the probability of default of the bank's borrowers. *Institutional Investor* (*II*) surveys 75 to 100 of these banks asking them to grade each country, on a scale of zero to 100, in proportion to the perceived creditworthiness of each government.[18] The individual responses are weighted by *II* giving more importance to responses from banks with greater worldwide exposure and more sophisticated country analysis systems. Banks are not permitted to rate their home countries. The survey, which currently comprises 145 countries, has been published in the March and September editions since the fall of 1979. Cruces (2001) studies the statistical properties of these ratings in detail.

Figure II plots the credit ratings for the countries in the sample since the survey began. While some regional patterns are apparent (e.g. OECD, Latin America, South Asia) there seems to be much idiosyncratic movement in the ratings. Table II reports statistics of credit rating by country. The mean rating from 1986 until 1999 was 43.4 for emerging countries, while it was 81.5 for developed ones. Some individual countries experienced wide swings in their grades since 1986. Chile is the country with the largest increase in

[17] The investability index is the ratio of total capitalization of stocks that foreigners can hold to total market capitalization.

[18] "The best rating, 100, would represent the countries with the strongest debt service capacity and the least possibility of defaulting on their debt. A rating of 0, the worst rating, would represent countries with the weakest debt service capacity and the greatest possibility of default. Please use the number 0 only to indicate a ranking" (*Institutional Investor*', 1999).

rating as it went from 24.6 in March 1986 to 61.8 in March 1999. Argentina and the Philippines are the next big winners with an average increase in credit rating of about 3 percentage points per semester, followed by Mexico, Zimbabwe, Portugal and Colombia in the 1-2 percent range. The big losers since 1986 were Nigeria, Pakistan and India. Among the developed countries, Hong Kong, Japan, Canada and Sweden lost ground while New Zealand, Singapore and Denmark had the largest increases over time.

A number of emerging countries have credit ratings as high as those of developed ones. The maximum rating for an emerging country was 79.9 for Taiwan, while the minimum for a developed county was about 61 for New Zealand and Hong Kong. Figure III plots the sample mean credit rating against the average increase per semester for each country and confirms that persistent changes in ratings have been relatively more frequent among emerging countries.

**Meaning and usage of country credit ratings**

*II* country credit ratings were first used in an asset pricing context by Feder and Ross (1982) as a measure of diversifiable risk, later by Erb, Harvey, and Viskanta (1995, 1996) and by Bekaert, Erb, Harvey, and Viskanta (1997) to proxy for expected future returns, and by Ferson and Harvey (1998) as instruments for mispricing and conditional risk.[19] They have also been the subject of other academic scrutiny [Feder and Uy (1984), Lee (1993), Ul-Haque, Kumar, Mark and Mathieson (1996)]. For the most part, this literature addresses whether *CCR* accomplish the task of measuring creditworthiness, and it seems that they do. *CCR* are positively correlated with spreads charged in the Eurodollar market (Feder and Ross, 1982) and they are also associated with the willingness of less-developed country borrowers to repay (Lee, 1993). Regressions of credit rating levels on lagged macroeconomic fundamentals (e.g. output growth, inflation, and the ratios of

[19] The low variance of developed countries' credit ratings discussed above may be one cause of its low significance in the conditional alpha and beta models of Ferson and Harvey (1998).

foreign exchange reserves to imports and current account balance to GDP) suggest that *CCR* are consistent with the predictions of sovereign risk theories as to the variables that should influence them and their signs (Ul-Haque, Kumar, Mark and Mathieson, 1996, Feder and Uy, 1984). Shapiro (1994) summarizes the variables that bankers surveyed by *II* considered important in formulating the country grades. Although there is some disparity in the importance of the different variables across time and countries their ranking seems stable.[20]

PRIORITY GIVEN BY BANKERS IN EVALUATING SOVEREIGN CREDIT RATING TO SELECTED COUNTRY ATTRIBUTES

| Variable | Emerging Countries | | Developed Countries | |
|---|---|---|---|---|
| | 1994 | 1979 | 1994 | 1979 |
| - Debt Service | 1 | 1 | 2 | 5 |
| - Political Outlook | 2 | 3 | 5 | 3 |
| - Economic Outlook | 3 | 2 | 1 | 1 |
| - Financial Reserves and Curr. Acct. | 4 | 4 | 3 | 2 |
| - Trade Balance | 5 | 5 | 7 | 4 |
| - Foreign Direct Investment | 6 | 6 | 9 | 8 |
| - Fiscal Policy | 7 | 9 | 4 | 9 |
| - Inflow of Portfolio Investments | 8 | 8 | 8 | 7 |
| - Acess to Capital Markets | 9 | 7 | 6 | 6 |

In general, the variables affecting the ratings seem to map well into our description of host country conditions, though in some exceptional cases *CCR* may be a poor measure of those conditions. For example, a cut in corporate taxes may increase expected dividends while the ensuing deterioration of the fiscal position may actually hurt the country's rating. Conversely, the government may increase its ability to service foreign debt by nationalizing a major exporting business. From the narrow viewpoint of sovereign creditworthiness, this policy may actually increase its rating (Moody's, 1994, p.147-8). However, if this decision increases the perceived probability that private assets

[20] The correlation is 0.92 between the first two columns and 0.58 between the last two (with the cross-correlations bounded by those values).

will be confiscated, it will negatively affect asset prices. While these cases are theoretically possible, they seem rare. By and large, *CCR* hikes seem correlated with market-friendly reforms.

**Construction of Surprise Change in Local Conditions**

Cruces (2001) uses the credit ratings published since 1979 for all countries covered by the survey (from 90 in 1979 to 145 currently) in order to gain as precise a measure of surprise revisions as possible for the subset of 39 countries used here. The surprises used here are taken directly from the forecasting models used there.

Table III summarizes the findings of serial correlation in revisions. About 31 percent of one country's credit revision is expected to carry over to the next semester and about 9 percent of it independently carries over for two semesters. If the country is in the Middle East, the first order serial correlation coefficient drops by one half. If the country is in Eastern Europe or one of the 20 emerging markets studied here, then the country serial correlation is higher by between 10 and 20 percent. There are also important regional components in credit revisions. About 18 percent of the revision of a GDP-weighted portfolio of countries in a given region is expected to carry over to the individual countries six months later (above and beyond the own country effect). Also, the models in Cruces (2001) suggest that moderately high ratings should be expected to drop while moderately low ratings should be expected to rise. Dummies representing the lagged level of *CCR* are significant with countries in the 0-30 range expected to increase their rating by about one-fifth of a credit point regardless of their lagged revision. Conversely, countries with base ratings in the 60-70 and 90-100 ranges are expected to fall by a similar amount.

We use five different models to characterize surprise credit revisions. The first model assumes that *CCR* changes are unpredictable so the full *CCR* revision is assumed to be the surprise. The other forecasting models use some autoregressive representation for credit revisions. The second model is the one in Table III, so its parameters are estimated using the full panel of revisions from March 1980 until March 2000. The remaining models are constructed in real time. Models three and four use a recursive panel sample, which starts in 1980 and ends at the time that the forecast has to be made. The autoregressive parameters are assumed to be common across countries. Model three has the same functional form as model two but is estimated in real time. When estimated on a recursive sample not all the explanatory variables are significant at each point in time. Only those variables with absolute *t*-ratios greater than 1.95 were included each semester. For example, the emerging country slope dummy does not become statistically significant until March 1989 so it is only included from then on. While the asymmetric revisions for low rated countries are significant since early in the sample, the asymmetry for highly rated countries only becomes significant in Sep-97 (seventh decile) and Sep-98 (tenth decile). Model four is a plain AR(2) that ignores asymmetry and regional or lagged portfolio effects. It is estimated on a recursive sample with common slopes for all countries.

Allowing for a common intercept in models 2-4 would imply that ratings are non-stationary which does not seem reasonable given that they are bounded by zero and 100. Moreover, a statistical test indicated that a common intercept was not significant. Country-specific intercepts in such a global model, are likewise difficult to interpret since they would reveal idiosyncrasies in the way that bankers assign ratings. When we did this, the empirical distribution of their *t*-ratios resembled the standard *t*-distribution. Therefore, we ignored intercepts altogether in models 2-4, but used them in the country-specific regressions of model 5.

The last model is an AR(2) with the parameters estimated by country using a rolling window of the last five years of data available at each point in time. Unlike the previous forecasting models, model five allows for an intercept in the estimating equation.

The rolling window, country-specific model produces the largest squared surprises in most countries, followed by the random walk model. Models 2-4 deliver the smallest mean squared forecast errors –and these are within the same order of magnitude across them. Models 3 and 4 indicate that Emerging countries suffered unexpected credit downgrades in the early 1980s. By contrast, the early 1990s were a particularly benign period in these countries (see Cruces, 2001, for details).

Table IV presents statistics of *CCR* and of surprises computed from model 3 for the whole sample and by sub-periods for each of the 39 countries. Surprises in emerging countries are about one-and-one-half to twice as volatile as they are in developed countries. In many cases, average five-year emerging market surprises are larger than those of developed countries. When compounding by the lower rating level of emerging countries, this gives proportional credit revisions that are much larger in emerging than in developed countries. It will be interesting to see if the market accounts for this lower initial level when producing market reactions to surprise revisions.

The survey published in September (March) of a given year is actually conducted during May-June of that same year (November-December of the previous year). In the base case we aligned surprises revealed in the September survey as having occurred from January until June of that same year and those published in the March edition as having occurred from July until December of the previous year.

**Monthly Distribution of Semester Surprises**

One difficulty arises because credit ratings are measured at six-month intervals while we rely on monthly returns in order to increase power. Semester surprises are distributed by month using related series following Chow and Lin (1971) and as used previously in a factor pricing context by McElroy and Burmeister (1988). We now briefly summarize this method which is described more thoroughly in Appendix II.

We produce two sets of monthly surprises. The first one assumes that one sixth of the semester surprise accrues during each month. The second one assumes a linear relation between semester surprises and the semester values of a set of related variables and estimates the regression parameters. It then uses these parameters times the monthly values of the related series plus one sixth of the semester regression residual in order to infer the monthly surprise in each month (see Appendix II for details). We use the change in the spread of the domestic interest rate over the risk-free rate, local currency devaluation and a time trend as the related variables. Both methods produce monthly surprises whose semester totals equal the surprise from the forecasting models, and they are both particular cases of the Chow and Lin (1971) procedure.

Breeden at al. (1989) apply a similar technique to distribute annual consumption by quarters between 1929 and 1939, though they ignore the distribution of the annual residuals by quarters suggested by Chow and Lin (1971). In a similar spirit, McQueen and Roley (1993, see their footnote 8) and Roley (1983) use regression analysis to update surveys of market expectations with higher frequency related series.

Table AII.I reports the r-squared values for the regressions on the related variables, by country and by credit forecast model. The typical country's r-squared statistic is between 20 and 26 percent, depending on the forecast model, with emerging countries having almost twice the values of the statistic than developed ones. Also included in Appendix II are plots of uniform and interpolated monthly surprises arising from forecast model 3 (AR with dummies, estimated on a recursive sample) superimposed with stock excess returns. The plots reveal that the actual distribution of surprises may have been far from uniform within semesters. With the data so constructed, we are ready to estimate the event model with the gain in statistical precision afforded by using monthly observations.

## 4. Results

Equation (10) was estimated as a system for the 39 countries by iterated seemingly unrelated regression (ITSUR) when using one risk factor and by SUR when using two factors. These methods allow for the possibility of contemporaneous correlation between the residuals across countries and for cross-sectional heteroskedasticity. In the first step the system is estimated by least squares. Residuals are generated conditional on these parameter estimates, and the error covariance matrix is computed. This covariance matrix is used in the next step in order to do feasible generalized least squares. Upon convergence, the new parameter estimates are used to compute a new residual covariance matrix and so on until both the estimated parameters and the covariance matrix converge. SUR estimators are, even in the absence of normality of the error distribution, strongly consistent and asymptotically normal and they form the basis for classical asymptotic hypothesis testing. If, in addition, the errors are multivariate normal, then iterated SUR yields full-information maximum likelihood estimators [see McElroy and Burmeister (1988) and Gallant (1987) for details].

Tables V and VI present results using the event function (6), while Table VII reports the results of using (7).

Table V presents tests of hypotheses and the estimated coefficients $g_0, g_1$, and $g_2$. The panels correspond to different data and sample periods. For developed countries, all panels use data from April 1986 until April 1999. For emerging countries, the data varies by panel. The top panel is based on the IFC Global indices from April 1986 until April 1999, while the middle panel focuses on these same indices during the post-financial liberalization period in each country. The bottom panel uses the IFC Investable indices. Within each panel, the top five rows present results of the five surprise models with uniform distribution of surprises within the semester in which they are recorded, while the bottom five rows distribute surprises by month using related variables.[21] Table V.A uses the unconditional market model while V.B adds a foreign exchange factor. This makes for a total of 60 specifications of the conditional return generating process.

The first two columns of Table V present p-values from a likelihood ratio test of the null that $(g_0, g_1, g_2) = 0$. This hypothesis is rejected at less than one percent across all specifications. Therefore, surprise credit revisions contain valuable information in explaining contemporaneous returns regardless of the stock index, the sample period, or the pricing benchmark used to compute abnormal returns.

The second column tests the hypothesis that the market's reaction to a given absolute surprise is independent of $CCR_{t-1}$ and of $CCR_{t-1}^2$. This hypothesis is rejected at the 10 percent level across all 60 specifications.

The rest of Table V presents the point estimates of $g_0$, $g_1$ and $g_2$ and their t-ratios. In most cases, the intercept is positive, the slope is negative and the quadratic term is positive. This suggests that the total event effect is captured by a convex function of *CCR* that is positive for low *CCR* values but asymptotically decreases towards zero for higher levels.

The estimated $g_1$ and $g_2$ are individually insignificant in many specifications although they are jointly significant –a result of the covariance between *CCR* and $CCR^2$. Likewise, the intercept is insignificant in one third of the cases. The low significance of these coefficients in some cases could be caused by misspecification of (6) or by the covariance between $\hat{g}_0, \hat{g}_1$, and $\hat{g}_2$ that is missed by the individual t-ratios but that affects the variance of the event function. We next address the total effect of surprises and their significance and later present the more relaxed modeling of the event effect (7).

Tables VI.A and VI.B report the abnormal returns of a one credit point surprise revision during the semester and their t-ratios. Expected abnormal returns can reach 5 percent per semester for countries with $CCR \approx 15$ (the lowest *CCR* recorded in our 39-country sample). For ratings in the 30-50 range (which compose the majority of our emerging country observations), expected abnormal returns are between 1 and 4 percent per

[21] The same structure is used in subsequent tables.

semester under most specifications. For $CCR \approx 70$, in seven out of ten cases the abnormal returns are statistically significant but their economic magnitude seems small (between 0.13 and 1.43 percent per semester). For $CCR \approx 90$, in only one third of the specifications are the effects of surprises statistically significant though they never surpass one percent per semester. All but one of these cases occur in the two-factor model and in many of these, the value of the event function bottoms out near $CCR \approx 70$ and then it rises again for higher *CCR* values.

The lower significance of surprises for higher credit ratings results from two facts. First, from Table I many of these countries account for sizable shares of the world market capitalization. If local conditions in those countries were to materially change, much of the effect would be reflected in $r^w$ itself with a lower partial effect the surprise itself. Second, even the small countries in this range are among the most stable and economically successful in the world, so that there may not be meaningful changes in local conditions to be measured by *CCR*.

In most cases, the total event effect is smaller under forecasting models 1 and 5. One could interpret the lower event coefficient under the random walk model to result from partial anticipation. The smaller magnitude of the estimated event effects relative to their economic value has been attributed to partial anticipation (e.g. Malatesta and Thompson, 1985). For example, if ratings had been steadily rising for some time, the random walk model would declare a larger surprise than models 2-4. Consequently, the estimated event effect would be smaller under the random walk model than under models 2-4 since only a fraction of the declared surprise is actual news to the market. But this reasoning is false in our context. In Malatesta et al., corporations can either attempt a takeover or not, so there is always a positive probability of a beneficial action and zero probability of a negative action. Here the case is different because the anticipation built into current prices can be of a positive, neutral or negative character. For instance if ratings have been falling for some time and suddenly begin to rise. The random walk model will declare a *smaller* and not larger surprise than models 2-4. If ratings have been constant for a while, the random walk model would declare similar surprises to models 2-4. So random walk surprises could be larger, equal or smaller than those under models 2-4. The smaller event coefficient under random walk seems to result from this model measuring surprises much less precisely than models 2-4. When an explanatory variable is measured with error, the variance of the error attenuates the estimated coefficient relative to its true value. Cruces (2001) documents that forecasting models 1 and 5 produce the largest mean squared forecast errors, so this may cause the smaller event effect in model 5 also.

Another stylized fact of Tables VI.A and VI.B is that uniformly distributed surprises yield event effects that tend to be larger than those under interpolated distribution by related variables. This is consistent with the fact that uniform distribution of surprises imputes to each month the mean surprise that occurred during the months of a semester. This averaging introduces an artificial smoothing which lowers the variance of the measured $l$ relative to its true value. In a simple regression of $r$ on $l$, the slope coefficient would be the covariance between $r$ and $l$ divided by the variance of $l$. While the covariance is unaffected by the smoothing, the variance is reduced, so this could explain a higher coefficient with uniform surprises.[22]

Using a two-factor instead of a one-factor model produces event effects that are somewhat larger for $CCR \leq 50$ but otherwise yields similar results. No important differences across the sample and data used are apparent.

In sum, the event function (6) is able to detect abnormal returns that are below 5 percent per credit point surprise revision per semester. This seems a modest premium for improvement in conditions of a market where the starting rating reveals a very unstable situation.

The low statistical significance of the coefficients in (6) may indicate that the quadratic event function is misspecified, so we next estimate the non-parametric approximation (7) to it. In this case, (20) was estimated using only surprises from model 3, on the three data samples, using the one- and two-factor models for a total of 12 specifications. Surprise model 3 has the advantage that it is estimated in real time and that it accounts for the predictability of credit revisions mentioned above.

Table VII reveals that surprise credit revision effects are highly non-linear functions of lagged ratings. Revisions only command statistically significant abnormal returns uniformly across the 12 specifications for ratings in the 10-20 and 30-40 ranges. The existence of abnormal returns for other deciles is less obvious.

For the 10-20 range, the median effect of a one-point surprise across the 12 specifications is about 35 percent per semester, much higher than the 5 percent reported in Table VI.B.[23] Using the Investable indices and interpolated surprises, abnormal returns can be as high as 56 percent per semester.[24] Abnormal returns are again significant across the 12 specifications in the 30-40 range, with a median effect of 5 percent per semester.

The effect of credit revisions is more questionable in other ranges. Ratings in the 10-20 decile command significant abnormal returns in only two of the 12 specifications and these are about 2.3 percent per semester. Seven of the 12 specifications report significant abnormal returns in the 40-50 range but they are between 1 and 3 percent. Four of the 12 models report statistically significant abnormal returns in the 50-60 range and these are about 3 percent per semester. The only other range in which credit revisions produce some effect is the 70-90 range with about half of the models reporting statistically significant revisions, although these never surpass 1 percent per semester. The fact that

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[22] Assuming $l_t$ is iid, we have $\mathrm{Cov}(r, \bar{l}) = \mathrm{Cov}\left(r, \sum_t^T l_t / T\right) = \sum_t^T \mathrm{Cov}(r, l_t)/T = \mathrm{Cov}(r, l)$.

Also, $\mathrm{Var}(\bar{l}) = \mathrm{Var}(l)/T$ .

[23] Multiplying this median excess return by the typical standard deviation of surprises in emerging countries in Table IV gives the 52 percent reported in the introduction (1.47*35=52).

[24] The sample contains 142 country-months observations with lagged ratings from 14.8 to 20, corresponding to Argentina, Nigeria and Philippines. These observations correspond to turbulent times in each country: Argentina's hyperinflation in 1989-1990, the transition from dictatorship to democracy in the Philippines in 1986, and Nigeria (which ended 16 years of dictatorship in 1999) during the late 1980s and 1990s.

surprises are largely insignificant in the 50-70 range and then become statistically important again in the 70-90 range is consistent with the bottoming out of the event function (6) near $CCR \approx 70$ shown in Table VI.B.

Looking at the significance columns in Table VII shows that the interpolated surprises produce a larger number of statistically significant coefficients across the different *CCR* deciles than uniform surprises. This is consistent with interpolation by related variables being able to allocate surprises more accurately to the months in which they took place so reducing measurement error.

Table VIII reports the r-square statistics and betas from different versions of the unconditional one-factor model. Results in the first column correspond to the unconditional CAPM without controlling for events (2), in the second column to (9) and (6) and in the third column to (9) and (7). As found by previous authors emerging country betas are relatively small, so that their expected returns based on the unconditional CAPM are also small. Although credit revisions are highly significant in explaining contemporaneous returns for the system of equations (Tables V and VII), the effects on r-squared are almost nil. The estimates of beta and their t-ratios are likewise unaffected by controlling for country-specific events under either specification. It seems that *CCR* are such aggregate and infrequently measured gauges of local conditions that controlling for them does not allow to reduce individual country residuals in any significant way.

Emerging market ratings are usually below 50 while developed country ratings usually surpass 70 (Table II). So, ratings of emerging markets are in a range where surprises have important quantitative effects on returns while the same is not true for developed markets. The abnormal return is further strengthened by the fact that surprises tend to be much larger in absolute magnitude in emerging markets (Table IV). So while the unconditional expected returns of emerging countries may be only slightly higher than the risk-free rate, the expected return conditional on an improvement in local conditions can be much larger than the world market premium. Moreover, average surprises can be positive for a five-year period and then turn negative for the next five years (e.g. see Argentina, Brazil, Jordan, South Korea, Malaysia, Thailand, etc.).

Take India for example, whose beta is –0.07 so that its expected return is below the risk free rate. From Table IV, the standard deviation of surprises from 1990 until 1994 was 2.14 credit points per semester. Table VII suggests that conditional on a good typical surprise during this period, expected returns are 2.14*5.04=10.8 percent per semester or almost 21.6 percent per year above the risk free rate! When the surprise was negative the conditional expected return was correspondingly below. Cruces (2001) documents that while emerging market credit revisions were disappointing from 1980 to 1985, they were surprisingly upbeat from 1985 until 1995. This is our point, namely that the high returns earned by emerging markets in recent years are more related to surprisingly good changes in local conditions than to exposure to priced risk.

**Robustness Checks**

**ARMA Structure of Residuals**

If the residuals from (10) are serially correlated, then the estimated parameters will be unbiased but the standard errors will be wrong, and this could lead to invalid inferences. About one in three countries from (10) with the event function (6) had residuals with some sort of ARMA structure, so it was estimated again adjusting for this structure and the results are presented in Tables IX.A and IX.B. The new results indicate that in 11 of 12 specifications surprise credit revisions are still significant, but in three specifications the event effect seems to be independent of the lagged level of *CCR*.

Table IX.B presents the estimated event effect under the different specifications. For the most part, this table confirms the results obtained without controlling for ARMA structure of residuals in that there is a significant abnormal return as high as 4 percent per semester for each surprise credit point revision for countries with starting $CCR \approx 30$, and that this effect wanes down as the starting level of *CCR* rises. Adjusting the estimation of (10) with event function (7) for the ARMA structure of residuals gave essentially the same results, so these are not reported.

**Alignment of Surprise Revision Relative to Return Series**

Since the survey published in September (March) of a given year is conducted during May-June of that same year (November-December of the previous year), in the base case we aligned surprises revealed in the September survey as having occurred from January until June (and similarly for the March survey). To check the robustness of the findings, we changed the alignment of surprises by month within a seven month window centered at this benchmark alignment. The latest alignment (three months after the benchmark) actually coincides with the month in which the survey is published, so the surprise revealed by the September survey is supposed to have occurred between April and September (and correspondingly for the March survey).[25] Table X.A conducts the analysis based on the quadratic event function (6) while X.B computes abnormal returns by decile (7).

The results of this exercise confirm the prior that the later the surprise is aligned with returns, the smaller its market impact, since its effects become incorporated in prices. Otherwise, the results are similar to those obtained in the benchmark case. The bottom panels of Table X.A show that for a country with $CCR \approx 30$ the market impact of a surprise 1 credit point revision varies between 5.7 and 1.3 percent per semester. The exercise based on event effects by deciles confirms that ratings in the 10-20 range fetch returns well above 10 percent per semester under most alignments, and that this effect wanes down as the starting rating increase. The fact that ratings in the 20-30 range command smaller abnormal returns than ratings in some upper and lower deciles is confirmed under most alternative alignments. One oddity revealed by this exercise is that in the latest alignment of surprises with returns, abnormal effects reverse signs from significantly positive to significantly negative over low rating ranges. We have no justification for this pattern.

## 5. High-Credit Risk versus Low-Credit National Stock Returns

Erb, Harvey, and Viskanta (1995) use country credit ratings to proxy for risk in international equities. They sort 40 national equity indices into quartiles based on *II*'s country credit ratings and compute the returns of equally weighted portfolios thereof.[26] The quartile of lowest rated countries (i.e. highest credit risk) obtained an average annual return of 27.3 percent whereas the quartile of highest rated countries (i.e. lowest credit risk) only returned 15.7 percent from March 1980 until December 1993. This strategy gave a risk-adjusted excess return of about 14 percent per annum using the unconditional CAPM. "…Country credit ratings have substantial predictive power in discriminating between high-expected returns and low-expected returns countries," they conclude. Bekaert, Erb, Harvey and Viskanta (1997) follow a similar strategy confirming the earlier results.

On the other hand, Jorion and Goetzmann (1999) find that the mean return of countries now considered developed was 4.9 percent per year while that of countries now considered emerging was 1.6 percent per year from 1921 until 1996.[27] So, if developed countries were high-rated while emerging countries were low-rated throughout this period, the strategy of Erb et al. would have performed poorly if carried out since 1921.

[25] In the robustness check, we focused on uniformly distributed surprises from model 3 and the April 1986-April 1999 sample period. The interpolated surprises use current month devaluation and interest rate spreads so it is questionable that changing their time alignment would be appropriate.
[26] Their country sample differs from the one used here by excluding the U.S. and adding Finland and Ireland.
[27] Compounding these returns over the 75-year period gives a cumulative return of 36.84 for developed countries and 3.36 for emerging countries.

Accounting for unexpected changes in local conditions is one way to exploit the insight of Jorion and Goetzmann in a 13-year sample.

If in sample, the low-rated countries experienced larger mean surprise credit revisions than the high-rated countries, then the portfolio that is long low-rated countries and short high-rated countries will show a positive alpha when credit surprises are ignored. Though we have found surprises to be accompanied by significant price rises only in low rated countries, there is no reason to expect *surprises* to be better for one group of countries than for the other,

Was the mean surprise of the high-risk minus low-risk portfolio positive? Does this explain the Erb, Harvey and Viskanta (1995) anomaly? In fact, the lowest 10 rated countries had mean surprises that were positive on average while the highest 10 rated countries' surprises were negative on average. Moreover, the absolute magnitude of the surprises for low rated countries was about 10 times as big as that in highly rated countries. In spite of these relative magnitudes, the absolute value of surprises in low-rated countries was very small, in the order of 1/20 of a credit point per semester on average. When converted into abnormal returns through any of the estimated event models, the abnormal returns do not make any meaningful difference in the risk adjusted excess returns of the high credit risk minus low credit risk portfolios of Erb et al. (1995). So the estimated model is unable to explain the return differences identified by these authors.

One possible reason for this shortcoming is that the model here computes abnormal returns due to unexpected *changes* in sovereign risk, but it ignores the premium due to the *level* of sovereign risk. The existence of an active political risk insurance market for foreign direct investment suggests that observed returns may be inflated by the premium that agents would be willing to pay in order to free themselves of political hazards. The unexpected returns model ignores this feature as it only computes abnormal returns conditional on changes in the hazard rate.[28] Still the rates currently charged by official insurers (the World Bank's Multilateral Investment Guarantee Agency and the US government's Overseas Private Investment Corporation) for foreign direct investment projects are around 2 percent per year which is much lower than the risk-adjusted excess returns of Erb et al.[29]

## 6. Conclusion

While the literature is ambiguous about whether expected returns are higher or lower in emerging than in developed countries, there is consensus that emerging market risk is not systematic. This paper highlights the role of sovereign risk in affecting the returns of securities whose underlying assets are located in emerging countries. We postulate that there exists a continuum of host country conditions for corporate development, from those that result in very low to very high asset prices. We use *Institutional Investor's* sovereign credit ratings as a proxy for this synoptic measure of country conditions and ask how a sequence of unexpected changes thereof affect stock returns.

Since changes in credit ratings are correlated over time and across countries, we use the five forecasting models from Cruces (2001) to identify surprise credit revisions. Credit surprises so constructed can be consistently negative or positive for periods greater than five years. Though emerging market ratings are typically about half of those of developed countries, their surprise revisions display about twice the standard deviation of that in developed markets.

[28] Computation of the implicit insurance premium embedded in international portfolio investments would require separating which returns in the sample come from months during which expectations of sovereign mishaps were confirmed by subsequent occurrences from those months during which these expectations were not confirmed, which is beyond the scope of our work.
[29] The official insurers policies can not be used for portfolio investment and projects are subject to some political eligibility criteria, so the insurance premia are not free market rates. Data on private market insurance premia are unavailable.

We use an event study model to measure the abnormal return associated with surprise revisions. The effect seems to be a highly non-linear function of starting credit rating. The non-parametric formulation of the event effect suggests that one standard deviation of surprise revision during a semester is accompanied by an abnormal return of about 52 percent in that semester for countries whose starting ratings are between 15 and 20 –the lowest ratings observed in the sample. Surprise revisions command much more modest abnormal effects for other ranges of starting rating. In the 20-30 range, a one standard deviation of revisions commands a return of about 3 percent per semester, while they rise again the 30-40 range to about 7.5 percent per semester. These are the credit ranges in which many emerging countries operate. The effects of surprises on returns are much less meaningful for other starting credit ratings.

These findings put in perspective the ambiguity in the literature about whether emerging market expected returns are higher or lower than those of developed markets. Given their lower unconditional betas, emerging markets tend to have lower unconditional expected returns than developed markets. However, conditional on a run of surprisingly favorable changes in local conditions, expected returns of emerging markets can be well above conditional expected returns of developed countries.

Although accounting for credit revisions allows for useful inference on the model's parameters, it does not allow to reduce the residual variance relative to standard unconditional asset pricing models. More precisely, the estimated model is unable to explain the fabulous returns earned by many emerging markets. For instance, Chile was the country whose rating rose the most during the sample –from 24.6 in 1986 to 61.8 in 1999. One dollar invested in its stock market in 1986 became 25 dollars in 1999, while the unconditional CAPM predicts 6.6 dollars and the unexpected returns model predicts 8.1 dollars. Seemingly, our local conditions measure is either too aggregate or not volatile enough to account for revisions of expected dividends and stochastic discount rates as reflected in stock prices. Extending the sample from the current starting date of April 1986 until 1980 may yield incremental explanatory power of the conditional return generating process given that it would include the debt crisis of the early eighties.

Another extension would entail using the model to explain the finding in Bekaert and Harvey (1995) that some emerging countries (particularly Latin American ones) were more integrated in the world economy during the early eighties (when they defaulted on national debt and stock prices plunged), than in the late eighties and early nineties (when they recovered from a long recession and stocks soared). Cruces (2001) documents that that surprises for those countries were negative in the early eighties and positive in the late eighties and nineties and this paper finds economically significant returns associated with these revisions. This may provide a different interpretation of the finding in Bekaert and Harvey (1995).

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