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Financial Crises, Credit Ratings, and Bank Failures

Emerging Market Instability: Do Sovereign Ratings Affect Country Risk and Stock Returns?

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Changes in sovereign debt ratings and outlooks affect financial markets in emerging economies. They affect not only the instrument being rated (bonds) but also stocks. They directly impact the markets of the countries rated and generate cross-country contagion. The effects of rating and outlook changes are stronger during crises, in nontransparent economies, and in neighboring countries. Upgrades tend to take place during market rallies, whereas downgrades occur during downturns, providing support to the idea that credit rating agencies contribute to the instability in emerging financial markets.

Worldwide financial market instability has been the focus of attention in both academic and policy circles. Following the series of currency crashes in the past decade, most of the discussion has centered on balance of payments crises. This attention on crises is not going to fade any time soon, with the financial crashes in Argentina and Turkey in 2001 surely fueling an avid interest in crises well into the new millennium. But currency collapses are not the only crises to have attracted attention. The daily volatility of stock and bond markets during normal periods has also stirred interest, with, for example, the vagaries of the NASDAQ index in the United States making the daily headlines.

Many have argued that globalization is at the heart of this volatility, with highly diversified investors paying little attention to economic fundamentals and following the herd in the presence of asymmetric information.[1] Policies that can lead to moral hazard, including bailouts by both international institutions and governments, have also been blamed for financial volatility and financial excesses (see, for example, Dooley 1998, McKinnon and Pill 1997).

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1. See, for example, Calvo and Mendoza (2000). This argument has provided ammunition to those who have supported the reintroduction of capital controls, including Krugman (1998) and Stiglitz (2000).

The list of culprits does not stop here. Rating agencies have recently come under scrutiny as promoters of financial excesses. As Ferri and others (1999) suggest, their procyclical behavior (upgrading countries in good times and downgrading them in bad times) may have magnified the boom-bust pattern in stock markets.[2] Rating changes may also reveal new (private) information about a country, fueling rallies or downturns. This effect is likely to be stronger in emerging markets, where problems of asymmetric information and transparency are more severe. Changes in ratings may also act as a wake-up call, with upgrades or downgrades in one country affecting other, similar economies.

Even if rating agencies do not behave procyclically, their announcements may still trigger market jitters because many institutional investors can hold only investment-grade instruments. Downgrading (or upgrading) sovereign debt below (or above) investment grade may thus have a drastic impact on prices because these rating changes can affect the pool of investors. These effects are not confined to the pool of investors acquiring sovereign debt. When a credit rating agency downgrades a country's sovereign debt, all debt instruments in that country may have to be downgraded accordingly because of the sovereign ceiling doctrine. Commercial banks downgraded to subinvestment grade will find it costly to issue internationally recognized letters of credit for domestic exporters and importers, isolating the country from international capital markets. Downgrading corporate debt to subinvestment grade means that firms will face difficulties issuing debt on international capital markets.

Research on the effects of rating changes flourished in the 1990s. Most of this work focused on the effects of ratings on the instruments being rated or on the instruments of the institutions being rated. Cantor and Packer (1996), Larrain and others (1997), and Reisen and von Maztlan (1999), for example, examine the effects of sovereign ratings on emerging market bond yield spreads. Other researchers have focused on ratings of banks and nonfinancial firms. Hand and others (1992) estimate the effects of ratings of corporate firms on the securities they issue. Using bank-level data from emerging markets, Richards and Deddouche (1999) examine the impact of bank ratings on bank stock prices.

Research has not examined whether changes in ratings of assets from one country trigger contagious fluctuations in other countries, and it has largely neglected whether changes in ratings of one type of security affect other asset markets.[3] These two possible spillover effects of credit ratings are important to analyze for several reasons. First, cross-country contagion effects can be large, as spillover effects of the Russian default on industrial and developing econo-

2. Mora (2001) extends these results. She agrees that ratings are procyclical but questions the notion that changes in ratings increased the cost of borrowing and decreased the supply of international credit during the East Asian crisis.

3. To our knowledge, the only article that examines the contagious role of credit ratings is Kaminsky and Schmukler (1999). Erb and others (1996a, 1996b, 1996c) study how the effect of changes in ratings of one type of security affect other asset markets, studying the link between expected stock returns and future fixed-income returns with different measures of country risk.

mies showed.[4] Rating agencies may contribute to this comovement in financial markets around the world. Second, news about one type of security can affect yields of other securities, through various channels. For example, stock markets can be adversely affected by the downgrading of sovereign bonds because governments may raise taxes on firms (reducing firms' future stream of profits) to neutralize the adverse budget effect of higher interest rates on government bonds triggered by the downgrade. These cross-asset effects can be large, heightening financial instability.

Another line of research on emerging market instability has focused largely on the effects of changes in monetary policy in financial centers. The results have been conflicting. Eichengreen and Mody (1998) and Kamin and von Kleist (1999) find that U.S. interest rate shocks do not affect sovereign bond spreads, whereas Herrera and Perry (2000) find that they do. The Eichengreen and Mody (1998) and Kamin and von Kleist (1999) studies do not include episodes of crises, and the Herrera and Perry (2000) work does. These conflicting results may be reconciled if economic fragility makes countries more sensitive to changes in international financial markets. The degree of economic fragility can be captured by country ratings. Thus, we are able to link the research on the effects of monetary shocks in financial centers on emerging market instability to the research on credit ratings.[5]

This article complements earlier research on rating agencies by examining the cross-country and cross-security spillover effects of rating changes. It contributes to the literature on contagion and international transmission of shocks by examining the effect of domestic vulnerability, as measured by the ratings of credit agencies, on the extent of international spillovers.

The article is organized as follows. Section I describes the institutional features of rating agencies. Section II presents the data. Section III describes the methodology. Section IV discusses the results. Section V summarizes the conclusions.

I. Institutional Features of Rating Agencies

Three major international agencies—Moody's, Standard and Poor's (S&P), and Fitch-IBCA— rate debt.[6] These agencies assign ratings to different types of borrowers and financial instruments. We study sovereign ratings (also known as country ratings), the ratings of both domestic and foreign currency–denominated sovereign debt.

4. The word *contagion* is used in a broad sense to denote cross-country spillover effects, regardless of the nature of the shock. For alternative definitions and related articles, see http://www.worldbank.org/contagion.

5. Another factor that can influence the transmission of international shocks is the exchange rate regime. Frankel and others (2000), for example, find that world interest rates shocks have a stronger effect on countries under pegs.

6. Another important agency is Institutional Investors. Unlike the other three agencies, Institutional Investors reports ratings only twice a year at a predetermined date. It also tends to change its ratings more often than the other agencies. Because of these differences, we excluded Institutional Investors from the sample.

Rating agencies assess the capacity of sovereign borrowers to service their debt. Each of the three agencies has its own rating scale (see appendix table 1). Moody's scale, for example, ranges from Aaa to C. Rating agencies also provide an outlook, or watchlist, that includes prospective changes in ratings. The outlook is typically positive, stable, or negative. A positive (negative) outlook means that a rating may be revised upward (downward).

Moody's, S&P, and Fitch-IBCA upgrade or downgrade particular countries almost simultaneously (figure 1). All three agencies downgraded the East Asian countries immediately following the start of the crisis in July 1997; all three simultaneously upgraded the same countries once the crisis faded.[7]

The number of upgrades and downgrades rose after the Mexican crisis (figure 2). Downgrades increased considerably after the devaluation of the Thai baht, the Korean crisis, and the Russian default, with a peak of 25 downgrades in December 1997. After November 1998 many countries started to be upgraded, but downgrades were also announced in the midst of the Brazilian crisis in January 1999.

A large proportion of changes in outlook are followed by a change in rating (table 1). Between 1990 and 2000, 78 percent of changes in S&P outlook were followed by changes in ratings. Rating changes followed outlook changes 69 percent of the time at Moody's and 50 percent of the time at Fitch-IBCA.

The time interval between changes in outlook and changes in rating varies across agencies. Most of the changes in rating occurred within two months for Moody's and Fitch-IBCA. For S&P most of the upgrades took place five or more months after the change in outlook was announced.

II. Data

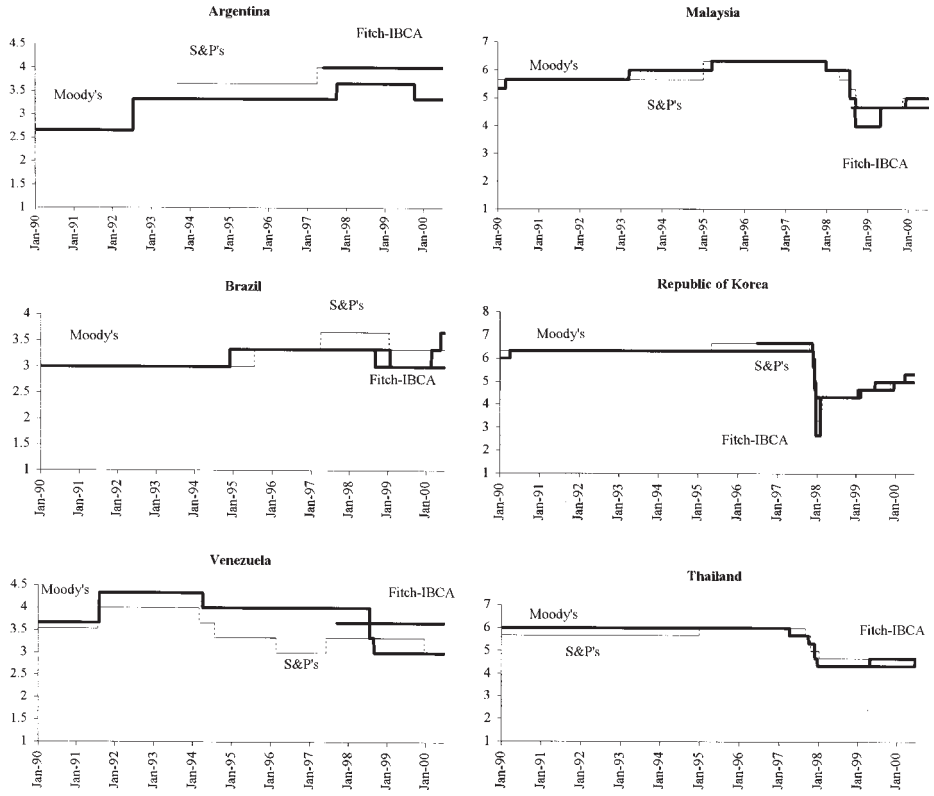
We examine data from 16 emerging markets: Argentina, Brazil, Chile, Colombia, Indonesia, Malaysia, Mexico, Peru, the Philippines, Poland, the Republic of Korea, the Russian Federation, Taiwan (China), Thailand, Turkey, and Venezuela. The data cover the period January 1990– June 2000. We chose countries in the three regions (East Asia, Eastern Europe, and Latin America) that suffered crises and contagion during the 1990s and for which data were available. (Appendix table 2 reports the time periods for which data were available for each country.)

The sample includes 244 changes in ratings and outlooks, 99 upgrades, and 145 downgrades (tables 2 and 3). Most of these changes were changes in ratings rather than changes in outlooks. Countries with currency collapses during the 1990s—such as Brazil, Indonesia, Malaysia, the Republic of Korea, the Russian Federation, and Thailand—were frequently reevaluated by rating agencies.

Sovereign bond yield spreads were obtained from JP Morgan's Emerging Markets Bond Index (EMBI). The yield spread index for each country is either the EMBI or the EMBI+, based on availability. The two indexes track foreign currency–denominated government bond yields for several emerging market econo-

7. For a detailed study of how ratings are changed, see Cruces (2001).

FIGURE 1. Ratings of Foreign-Currency Sovereign Debt for Selected Countries



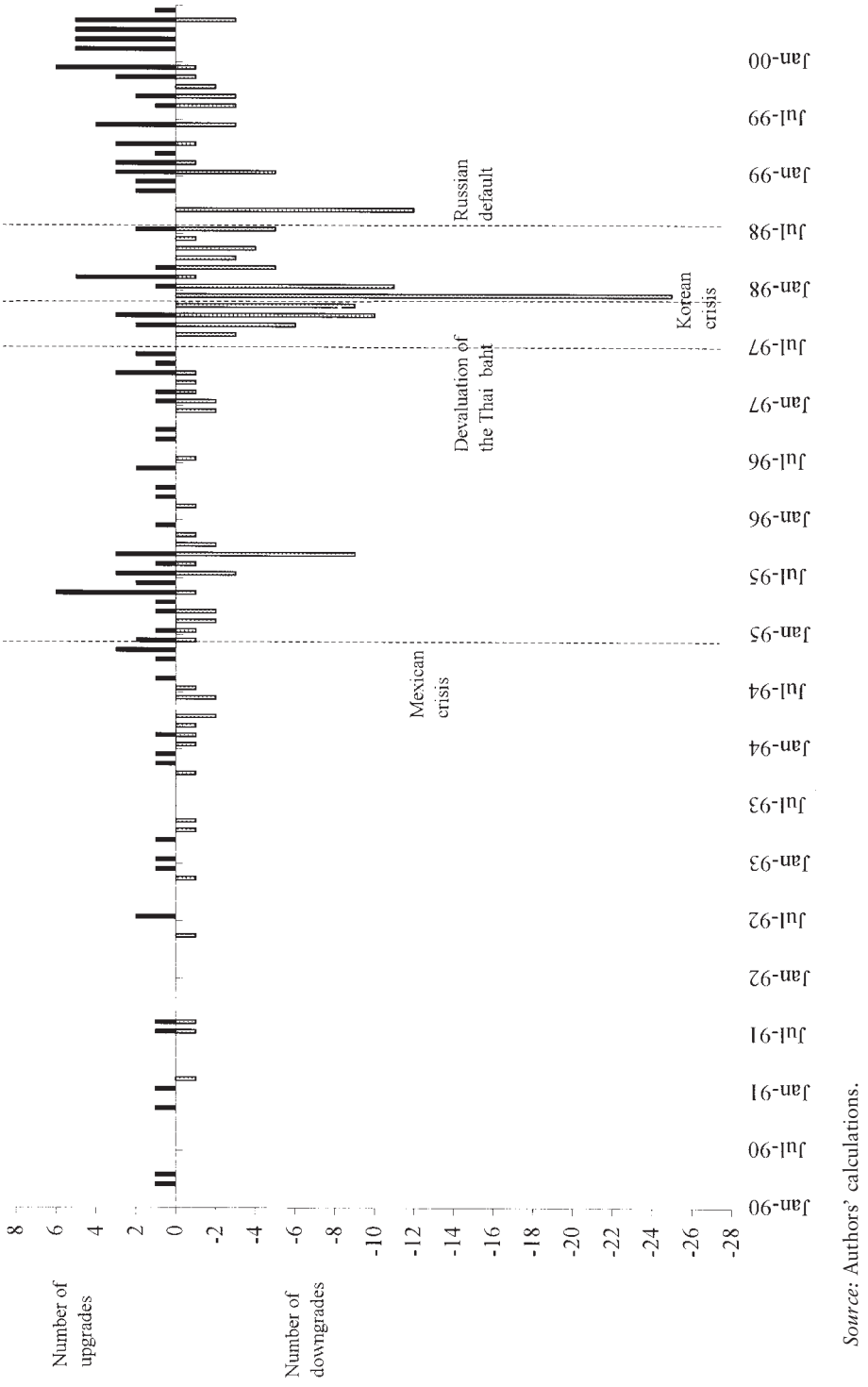
Source: Bloomberg.

mies and compare them with the yields of benchmark instruments issued by industrial countries. The securities included in the EMBI index are Brady bonds, which are traded internationally in highly liquid markets. The EMBI+ is a more comprehensive index and includes benchmark Eurobonds, loans, and Argentine domestic debt. EMBI and EMBI+ (henceforth EMBI) spreads are commonly used as measures of country premia, country risk, or default risk. When the probability of a sovereign default increases, bond prices decrease and yield spreads increase.

Data on stock prices, U.S. interest rates, and credit ratings come from Bloomberg and Datastream. Stock market price indexes for each country are measured in U.S. dollars to be able to compare returns across countries in the same unit of account. Returns in dollars are the ones relevant for international investors. The U.S. interest rate is the one-month interbank offer rate.

Daily changes (in absolute values) in bond and stock markets oscillate about 2.5 percentage points for sovereign spreads and about 1.6 percentage points for stock prices (table 4). The number of observations is high (about 11,000 for bond spreads and 22,000 for stock prices).

FIGURE 2. Changes in Ratings and Outlooks 1990–2000



Source: Authors' calculations.

TABLE 1. Number of Changes in Ratings Following Change in Outlook

	Moody's		S&P		Fitch-IBCA	
Items	Upgrades	Downgrades	Upgrades	Downgrades	Upgrades	Downgrades
Total number of changes in outlooks	13	16	13	23	5	3
Total number of changes in ratings	9	11	13	15	3	1
Within						
1 month	0	2	1	4	1	1
2 months	6	7	0	4	1	0
3 months	1	1	0	4	1	0
4 months	2	1	1	1	0	0
More than 4 months	0	0	11	2	0	0

Source: Authors' calculations.

TABLE 2. Number of Upgrades and Downgrades, by Rating Agency

		Ratings		Outlooks	
Agency	Total changes	Upgrades	Downgrades	Upgrades	Downgrades
Moody's	77	19	29	13	16
Foreign-currency debt	37	14	23		
Domestic-currency debt	11	5	6		
S&P	112	28	48	13	23
Foreign-currency debt	45	19	26		
Domestic-currency debt	31	9	22		
Fitch-IBCA	55	21	26	5	3
Foreign-currency debt	30	15	15		
Domestic-currency debt	17	6	11		
Total	244	68	103	31	42

Source: Authors' calculations.

III. METHODOLOGY

To study the effects of ratings and outlooks on financial markets, we estimate panel regressions and perform event studies. The panel regressions focus on the immediate response of financial markets to rating and outlook changes. The event studies examine the dynamic response of financial markets around the time of important events.

Panel Regressions

The panel estimations study the daily reactions of country premia and stock returns to changes in ratings, outlooks, and U.S. interest rates. The fact that we use daily data does not allow us to control for country fundamentals, which are typically reported on a monthly or quarterly basis, but we do control for past changes of the explanatory variables. We use only one lag, because additional lags appear to be insignificant.

We estimate different regressions for both country premia and stock prices. We start with a benchmark regression, which we then modify to examine to test various hypotheses:

$$\Delta Y_{i,t} = \alpha + \delta \Delta Y_{i,t-1} + \beta \Delta R_t + \gamma \Delta i_t^{US} + \varepsilon_{i,t}, \quad (1)$$

such that $i = 1, \ldots, N$ and $t = 1, \ldots, T$. $\Delta Y_{i,t}$ represents the log change in spreads and the log change in stock market prices. The subindexes i and t stand for country and time. ΔR_t stands for the change in ratings and outlooks. It is equal to 1 (–1) if there is an upgrade (downgrade) in rating or outlook at time t by any agency of any type of debt (denominated in foreign or domestic currency) from any country in the sample; otherwise it is equal to zero. Δi_t^{US} stands for the change in U.S. interest rates; strictly speaking, the interest rate is $100 \times \log(1 + i_t^{US})$.

TABLE 3. Number of Upgrades and Downgrades, by Country

		Ratings		Outlooks	
Agency	Total changes	Upgrades	Downgrades	Upgrades	Downgrades
Argentina	14	4	3	3	4
Brazil	19	9	6	3	1
Chile	5	3	1	1	0
Colombia	11	0	7	1	3
Indonesia	22	1	20	1	0
Korea, Rep. of	40	14	17	2	7
Malaysia	28	5	12	3	8
Mexico	17	6	5	5	1
Peru	2	1	0	1	0
Philippines	8	4	0	2	2
Poland	10	9	0	1	0
Russian Federation	26	7	15	2	2
Taiwan (China)	0	0	0	0	0
Thailand	22	2	11	1	8
Turkey	10	1	3	3	3
Venezuela	10	2	3	2	3
Total	244	68	103	31	42

Source: Authors' calculations.

The second regression is

$$\Delta Y_{i,t} = \alpha + \delta \Delta Y_{i,t-1} + \beta^r \Delta R_t^r + \beta^o \Delta R_t^o + \gamma \Delta i_t^{US} + \varepsilon_{i,t}. \quad (2)$$

The variable $\Delta R_{i,t}^r$ is equal to 1 (–1) if there is a change in rating (upgrade or downgrade) at time t by any agency on any type of debt from any country in the sample. The variable is equal to zero otherwise. The variable ΔR_t^o is similar to ΔR_t^r but takes the value 1 (–1) when there is a change in outlook (upgrade or downgrade) in any country in the sample. This specification tries to disentangle the effects of changes in ratings from those of changes in outlooks.

TABLE 4. Sovereign Yield Spreads and Stock Prices

	Mean	Median	Standard deviation	Minimum	Maximum	Number of observations
Log change in EMBI spreads	–0.0004	–0.0012	0.0379	–0.4986	0.4652	11,122
Log change in absolute value of EMBI spreads	0.0243	0.0160	0.0291	0.0000	0.4986	11,122
Log change in stock prices	–0.0001	0.0000	0.0257	–0.3947	0.3171	21,788
Log change in absolute value of stock prices	0.0158	0.0095	0.0203	0.0000	0.3947	21,788

Source: Authors' calculations.

The third regression is

$$(3) \qquad \Delta Y_{i,t} = \alpha + \delta \Delta Y_{i,t-1} + \beta^{i} \Delta R_{i,t} + \beta^{r} \Delta R_{r,t} + \beta^{nr} \Delta R_{nr,t} + \gamma \Delta i_t^{US} + \varepsilon_{i,t}.$$

$\Delta R_{i,t}$ is equal to 1 (–1) if there is an upgrade (downgrade) in rating or outlook at time t by any agency on any type of debt from country i. It is equal to zero otherwise. The variable $\Delta R_{r,t}$ is similar to $\Delta R_{i,t}$ but takes the value 1 (–1) when there is an upgrade (downgrade) in country r for $r \neq i$. The variable r represents a country that belongs to the same geographic region (East Asia, Eastern Europe, or Latin America) as i. The variable $\Delta R_{nr,t}$ is used for countries in other regions; nr represents a country that belongs to a geographic region other than i. The last two variables are related to changes in foreign country ratings and outlooks. This specification tries to examine whether there is a contagion effect of credit ratings and whether these effects are of a regional or nonregional nature.

We estimate different versions of the third regression. The first divides the sample into crisis and noncrisis periods to test whether markets react more strongly to changes in domestic and foreign ratings in good and bad times. This difference can arise in models with multiple equilibria. In this type of model, a signal can coordinate investors' expectations, shifting them from a good to a bad equilibrium in both the domestic economy and other economies (see, for example, Masson 1998). In our case the signal can be provided by a rating downgrade.

A second version of the third regression divides the sample between transparent and nontransparent countries, based on the data used by Mehrez and Kaufmann (2000). If rating changes provide any information to markets, they should do so more in nontransparent countries than in transparent ones.

As a fourth regression, we estimate

$$(4) \quad \Delta Y_{i,t} = \alpha + \delta \Delta Y_{i,t-1} + \beta^{i} \Delta R_{i,t} + \beta^{r} \Delta R_{r,t} + \beta^{nr} \Delta R_{nr,t} + \gamma^{h} h_{i,t} \Delta i_t^{US} + \gamma^{l} l_{i,t} \Delta i_t^{US} + \varepsilon_{i,t}.$$

This regression allows for different responses (γ^h and γ^l) of the dependent variable to changes in U.S. interest rates depending on the state of vulnerability of the domestic economy, as captured by the assessment of rating agencies. In particular, we divide the observations into two groups, those with above-average and below-average ratings relative to the mean rating of all the countries in our sample. Those observations are divided using two dummy variables, $h_{i,t}$ and $l_{i,t}$, which capture high and low ratings.

We estimate all of these specifications using pooled panels in which the error term $\varepsilon_{i,}$t can be characterized by an independently distributed random variable with mean zero and variance $\sigma_{i,t}^2$. We estimate the equations using least squares, allowing for heteroscedastic residuals.

The least squares specifications assume a zero correlation between the error term and the explanatory variables. This correlation may arise if an explanatory variable is endogenously determined. However, we do not expect changes in U.S. interest rates or changes in ratings to respond to contemporaneous daily changes

in emerging market spreads or stock prices. Still, a correlation between the lagged dependent variable and the error term is possible. This correlation can arise if, for example, the true original model were in levels and then first differenced. In that case, the error term in our equations would be in first differences and correlated with the lagged endogenous variable by construction. To correct for potential biased coefficients, we estimate the more complete specification, equation (4), using instrumental variables or two-stage least squares. As instruments, we use lagged values of the lagged dependent variable, as proposed by Anderson and Hsiao (1982).

We expect certain signs for the estimated coefficients. If changes in ratings convey new information to market participants, we expect $\hat{\beta} < 0$ in the regressions for country premia; that is, rating upgrades (downgrades) lead to decreases (increases) in bond spreads. Analogously, in the regressions for stock returns, we expect $\hat{\beta} > 0$ for the coefficients of both ratings and outlooks and those for domestic- and foreign-country ratings.

If increases in U.S. rates lead to higher country premia, we expect $\hat{\gamma} > 0$ in the equation for country premia. As Kamin and von Kleist (1999) argue, there are different channels through which changes in U.S. interest rates might positively affect country premia. First, if there is a positive probability that a government will not pay its debt, increases in U.S. rates will prompt a larger rise in the interest rate of the government's debt. These higher rates compensate for the probability of no repayment. Second, increases in U.S. interest rates increase the burden of the debt, decreasing a country's repayment capacity. Third, increases in U.S. rates can decrease investors' appetite for risk, reducing the demand for risky assets from emerging countries and thereby increasing the country premia.

A similar argument can be used to explain stock returns. Governments can levy taxes on corporations if they face higher debt payments. Therefore, we expect that U.S. interest rates negatively affect stock returns ($\hat{\gamma} < 0$ in the equation for stock returns).

We expect countries with healthy economies to be less affected by changes in U.S. rates ($|\hat{\gamma}^l| > |\hat{\gamma}^h|$), for several reasons. First, given that higher ratings mean a lower probability of default, changes in U.S. interest rates will have a greater effect on spreads in countries with lower ratings. Second, countries with higher ratings tend to have lower levels of debt, so the burden of the debt will increase less in countries with high ratings when U.S. interest rates increase. Third, if there is a flight to quality when U.S. rates increase, sovereign yield spreads of countries with lower ratings should react more strongly. Similar arguments can be made for the quantitative responses of stock returns to changes in U.S. interest rates in more vulnerable and less vulnerable countries.

The coefficient on the lagged dependent variable $\hat{\delta}$ is expected to be positive if returns are autocorrelated. In efficient capital markets $\hat{\delta}$ should be zero, because returns are unpredictable. However, recent research has shown that returns

are to some degree predictable and are positively autocorrelated (see, for example, Richards 1996, Rouwenhorst 1998, and Kaminsky and others 2000).[8]

Event Studies

The regressions presented focus on the contemporaneous effect of ratings on bond spreads and stock returns. To capture the dynamic effects around the time of changes in outlooks or ratings, we use event studies. Event studies can provide evidence on whether rating agencies act procyclically, downgrading countries during bad times and upgrading them during good times. They can also help determine whether the actions of rating agencies have sustained or merely transitory effects on financial markets.

The event studies examine the evolution of country premia (sovereign bond yield spreads) and stock market spreads (domestic stock markets prices relative to the S&P 500 index) during a ± 10-day window around an upgrade or downgrade of a rating or outlook. We use stock market spreads because we want to measure the evolution of local stock prices relative to a benchmark.

The event study methodology allows us to study the effect of an upgrade or downgrade on the evolution of spreads around the event. Of course, other events that affect spreads may take place at the same time. We do not control for those factors and assume that on average there is no particular bias in the event studies. That is, we expect that other factors influence spreads both positively and negatively in a random way. If, however, rating changes are serially correlated, the event studies will be biased. To control for this effect, we work with "clean events," that is, upgrades and downgrades that do not overlap during the 10-day window. In this manner, we ensure that we are studying the effect of only one upgrade or downgrade in each event.

IV. RESULTS

We first examine the contemporaneous impact of changes in ratings and outlooks. We then we report on the dynamic aspects of market responses to these changes.

Panel Regressions

The panel regression results for EMBI spreads show that the coefficient for the lagged dependent variable is positive and statistically significant (table 5). As found in previous research, this result suggests that returns are somewhat predictable, so that trading strategies (such as momentum trading) may be profitable. This result holds in several specifications.

The coefficient for rating and outlook changes (both domestic and foreign) is negative and statistically significant. The negative sign of the coefficient is as

8. For other alternative specifications, including those that look at ratings on domestic and foreign currency–denominated debt, see Kaminsky and Schmukler (2001).

TABLE 5. Panel-Regression Estimates
(dependent variable: log change in EMBI spreads)

	Alternative specifications								
Explanatory variable	1	2	3	Crisis periods 4	Noncrisis periods 5	Transparent countries 6	Nontransparent countries 7	8	Independent variable 9
Lagged dependent variable	0.039*	0.039*	0.039*	0.049	0.017	0.051	0.032	0.040*	–0.510
	(1.863)	(1.829)	(1.844)	(1.167)	(1.080)	(1.287)	(1.307)	(1.874)	(1.204)
Changes in ratings and outlooks									
All countries (ratings and outlooks)	–0.006*** (4.673)								
All countries (ratings)		–0.004*** (3.011)							
All countries (outlooks)		–0.007*** (3.857)							
Domestic country (ratings and outlooks)			–0.021*** (3.447)	–0.028* (1.889)	–0.015*** (2.654)	–0.022** (2.504)	–0.020** (2.557)	–0.021*** (3.448)	–0.020*** (3.040)
Regional countries (ratings and outlooks)			–0.007*** (3.129)	–0.028*** (4.047)	0.001 (0.355)	–0.006** (2.226)	–0.007** (2.186)	–0.007*** (3.126)	–0.010*** (2.770)
Nonregional countries (ratings and outlooks)			–0.004*** (2.915)	–0.007** (2.231)	–0.001 (0.945)	–0.002 (0.999)	–0.005*** (2.883)	–0.004*** (2.755)	–0.006** (2.323)
Changes in U.S. interest rates									
Change in U.S. interest rates	0.029*** (2.714)	0.029*** (2.730)	0.028*** (2.699)	0.168*** (3.378)	0.015 (1.541)	0.028* (1.791)	0.029** (2.037)		
Change in U.S. interest rates: high ratings*								0.023 (1.534)	0.043 (1.613)
Change in U.S. interest rates: low ratings*								0.034** (2.328)	0.067** (2.445)
Number of observations	11,122	11,122	11,122	1,948	9,206	4,481	6,641	10,923	10,408
R-squared	0.005	0.005	0.006	0.021	0.002	0.007	0.006	0.006	0.006

*Significant at the 10 percent level.
**Signficant at the 5 percent level.
***Signficant at the 1 percent level.

Note: Table reports panel estimates with robust standard errors, using the White correction for heteroscedasticity. A constant is estimated but not reported. The instrumental variables estimation (specification 9) uses a third lag of the dependent variable as an instrument. The crisis periods are from December 1, 1994, to March 30, 1995; July 1, 1997, to January 30, 1998; August 1 to October 30, 1998; and January 1 to February 28, 1999. Countries are classified transparent or nontransparent countries based on the Mehrez and Kaufmann (2000) data. Countries with ratings above the median (Brazil, Chile, Malaysia, Mexico, Peru, and Taiwan [China]) are considered transparent. Countries with ratings below the median (Argentina, Colombia, Indonesia, the Philippines, Poland, the Republic of Korea, the Russian Federation, Thailand, Turkey, and Venezuela) are considered nontransparent. *t*-statistics are in parentheses.

Source: Authors' calculations.

expected: a rating or outlook upgrade (downgrade) decreases (increases) bond spreads. This result holds in all specifications. Though significant, the coefficient is small, with spreads changing about 0.6 percentage points following a rating or outlook announcement. The average absolute change of spreads in our sample is about 2 percentage points.

The coefficient on U.S. interest rates is statistically significant. The sign is positive, as expected. A hike in U.S. interest rates increases bond spreads. That is, higher U.S. rates increase domestic interest rates more than proportionally to compensate for the higher expected default risk, among other things. This result holds in almost all specifications.

We investigate separately whether changes in ratings have different effects from changes in outlooks, finding that both coefficients are statistically significant and with a negative sign (column 2). The coefficient on outlooks is significantly larger than the coefficient on ratings, suggesting that investors may anticipate rating changes, perhaps because countries are put on a watchlist before being downgraded.

We separate the effect of domestic- and foreign-country changes in ratings and outlooks (column 3). We use both changes in ratings and outlooks in the same variable to avoid studying the effects of a small number of changes, because there are relatively few changes in outlooks. We find that changes in ratings and outlooks have substantially stronger effects on the country being assessed than on other countries, with own-country effects averaging 2.1 percentage points. Still, rating and outlook changes do contribute to contagion, with ratings of foreign-country debt spilling over to domestic financial markets. These spillover effects range from 0.4 to 0.7 percentage points.

The results also provide evidence on a widely discussed issue in the contagion literature: whether contagion is regional or global. The crises of the 1990s and the speed with which a crisis in one country was transmitted throughout the region and even to other regions have spawned a still growing literature on contagion. Much of the research has centered on the role of financial links versus trade links.[9] But there is a growing interest in the geography of contagion. The Tequila crisis was confined largely to Latin America, and the crisis in Thailand spread mostly to Asian economies.[10]

We examine whether these regional spillovers are also present following rating and outlook changes. Our results shows that regional effects are stronger than those from nonregional countries: Within-region upgrades and downgrades led to an average increase in yields of 0.7 percentage points, whereas nonregional

9. Kaminsky and Reinhart (2000b) and Kaminsky and others (2000) point to the role of financial links and focus on the behavior of international banks and mutual funds. In contrast, Corsetti and others (2000) focus on the role of trade links.

10. Kaminsky and Reinhart (2000a) analyze why some crises become systemic whereas others are confined within national borders or are at most regional.

upgrades and downgrades triggered an average change in spreads of about 0.4 percentage points.

We use the last specification to examine the effect of rating and outlook changes during crisis and noncrisis periods (columns 4 and 5). Our results reveal that these changes have stronger effects during crises, with changes in domestic ratings of 2.8 percentage points during crises and 1.5 during noncrisis periods. Moreover, some of the variables are significant only in crises. Cross-country spillover effects are statistically significant only during crises, a result that is consistent with the evidence on contagion. Changes in U.S. interest rates are significant only during crises.

Our results also show that rating and outlook changes have different effects in transparent and nontransparent countries (columns 6 and 7). Nontransparent countries are affected by nonregional ratings and outlooks, whereas transparent countries are not.

We are also interested in the effect of changes in international financial markets on emerging economies. This topic has generated many articles following Calvo and others (1993), who brought to the limelight the close relation between the capital inflows episode to emerging markets during the early 1990s to monetary policy in the United States. Many have focused on the relation between capital flows or foreign exchange reserves and interest rates in financial centers. Some have focused on the links between returns in emerging markets and returns in financial centers. Others have focused on the effects of interest rate hikes on interest rates and bond spreads. These links were strong in the early 1990s, weakened somewhat in the mid-1990s, and reappeared in the late 1990s.

The changing relation between financial markets in emerging economies and financial centers is particularly clear in the research on the determinants of country premia, with some articles finding a positive relation and others finding no significant relation. Although understanding the determinants of this time-varying relation is beyond the scope of this article, we examine whether hikes in interest rates in financial centers are transmitted more strongly to vulnerable economies. We divide the sample into two equal parts based on sovereign credit ratings. The point estimates (column 8 of table 5) indicate that fluctuations in U.S. interest rates have about a 50 percent greater effect on more vulnerable economies (those with worse ratings) than on less vulnerable economies. Interestingly, countries with higher credit ratings are not affected in a statistically significant way by changes in U.S. interest rates, but economies with lower credit ratings are.

We use instrumental variables to try to control for potentially biased estimates (last column of table 5). Using the same specification reported in column 8, we find that the results on credit rating and outlook changes and those on changes in U.S. interest rates hold when estimating the equation with two-stage least squares.

The results of estimations of the same specifications using stock market returns as the dependent variable are very similar to those obtained for EMBI spreads, with some interesting differences (table 6). First, stock returns display more persistence than EMBI spreads, as shown in the estimates of the lagged dependent variable. Second, the magnitude of the point estimates for the other variables tends to be smaller, suggesting that ratings have stronger effects on the prices of the instrument they are assessing. Third, domestic ratings are significant only in nontransparent economies, suggesting that rating agencies do provide valuable signals in countries in which information is lacking.

Event Studies

In the panel estimations, we focused on the instantaneous response of bond and stock markets in emerging economies to changes in credit ratings and outlooks. To capture whether these changes persistently affect investors' mood, we rely on event study methods commonly used in the finance literature. The event study methodology also allows us to examine the claim that rating agencies behave procyclically, upgrading countries in good times and downgrading them during crises.

We examine the behavior of asset markets around the time of rating and outlook changes (10-day windows before and after changes). We look only at clean events, examining 103 domestic-country rating and outlook changes (56 upgrades and 47 downgrades) (table 7). Including foreign-country changes increases the number of changes to 653. Standard event study methodology requires linking rating events to abnormal returns. For this reason, we base the event study on the yield spreads between sovereign government debt and the benchmark instruments from industrial countries. For stocks we use the dollar "stock spreads" between emerging markets stock prices and the S&P 500 U.S. stock market index.

The evidence supports the hypothesis that rating agencies may have exacerbated the boom-bust pattern in emerging markets (figures 3 and 4). Upgrades tend to occur when markets are rallying and downgrades when emerging markets are collapsing. Bond spreads, for example, rose by as much as 7 percent in the 10 days before downgrades, and stock market spreads increased by as much as 4 percent. In both cases, the effect is statistically significant. Rallies were more muted in the days leading up to rating upgrades, with bond spreads barely declining and stock spreads increasing about 2 percent.

Similar results hold for changes in foreign-country ratings and outlooks. The results suggest that upgrades of other countries' debt trigger important declines in yield spreads and substantial increases in stock market prices. Likewise, foreign downgrades are followed by increases in EMBI spreads and declines in the domestic stock market relative to that of the U.S. market. As expected, the change in spreads is smaller in this case; domestic-country rating and outlook changes have larger effects on financial markets than foreign-country changes. Relative

TABLE 6. Panel Regression Estimates
(dependent variable: log change in stock prices)

	Alternative specifications								
Explanatory variable	1	2	3	Crisis periods 4	Noncrisis periods 5	Transparent countries 6	Nontransparent countries 7	8	Independent variable 9
Lagged dependent variable	0.088***	0.088***	0.087***	0.098***	0.074***	0.022	0.126***	0.088***	0.333
	(4.458)	(4.448)	(4.406)	(3.047)	(2.946)	(0.557)	(6.127)	(4.399)	(1.565)
Changes in ratings and outlooks									
All countries	0.003***								
(ratings and outlooks)	(5.119)								
All countries (ratings)		0.002***							
		(2.970)							
All countries (outlooks)		0.004***							
		(4.882)							
Domestic country			0.009***	0.017**	0.002	0.008	0.009***	0.009***	0.006
(ratings and outlooks)			(2.837)	(2.323)	(1.010)	(1.310)	(2.582)	(2.836)	(1.517)
Regional countries			0.004***	0.010***	0.000	0.004***	0.004***	0.004***	0.003***
(ratings and outlooks)			(4.029)	(4.187)	(0.295)	(2.954)	(2.803)	(4.051)	(2.713)
Nonregional countries			0.001**	0.001	0.001	0.000	0.002***	0.002**	0.001*
(ratings and outlooks)			(2.382)	(0.950)	(1.495)	(0.202)	(2.682)	(2.444)	(1.884)
Changes in U.S.interest rates									
Change in U.S. interest rates	–0.009**	–0.009**	–0.009**	–0.005	–0.011***	–0.011**	–0.008		
	(2.481)	(2.521)	(2.481)	(0.232)	(3.030)	(1.969)	(1.638)		
Change in U.S. interest rates: high ratings*								–0.007	–0.006
								(1.218)	(0.920)
Change in U.S. interest rates: low ratings*								–0.012**	–0.011*
								(2.184)	(1.750)
Number of observations	21,788	21,788	21,788	4,330	17,521	8,898	12,890	21,247	20,508
R-squared	0.010	0.010	0.010	0.019	0.006	0.002	0.020	0.011	0.011

*Significant at the 10 percent level.
**Signficant at the 5 percent level.
***Signficant at the 1 percent level.

Note: Table reports panel estimates with robust standard errors, using the White correction for heteroskedasticity. A constant is estimated but not reported. The instrumental variables estimation (specification 9) uses a third lag of the dependent variable as an instrument. The crisis periods are from December 1, 1994, to March 30, 1995; July 1, 1997, to January 30, 1998; August 1 to October 30, 1998; and January 1 to February 28, 1999. Countries are classified as transparent or nontransparent countries based on the Mehrez and Kaufmann (2000) data. Countries with ratings above the median (Brazil, Chile, Malaysia, Mexico, Peru, and Taiwan [China]) are considered transparent. Countries with ratings below the median (Argentina, Colombia, Indonesia, the Philippines, Poland, the Republic of Korea, the Russian Federation, Thailand, Turkey, and Venezuela) are considered nontransparent. T-statistics are in parentheses.

TABLE 7. Number of Clean Events, by Country

Country	Total events	Upgrades	Downgrades
Latin America			
Argentina	4	1	3
Brazil	8	6	2
Chile	3	2	1
Colombia	7	1	6
Mexico	5	3	2
Peru	2	2	0
Venezuela	7	3	4
Total	36	18	18
East Asia			
Indonesia	6	2	4
Korea, Rep. of	10	9	1
Malaysia	12	5	7
Philippines	5	4	1
Taiwan (China)	0	0	0
Thailand	8	1	7
Total	41	21	20
Eastern Europe			
Poland	6	6	0
Russian Federation	14	8	6
Turkey	6	3	3
Total	26	17	9
Grand total	103	56	47

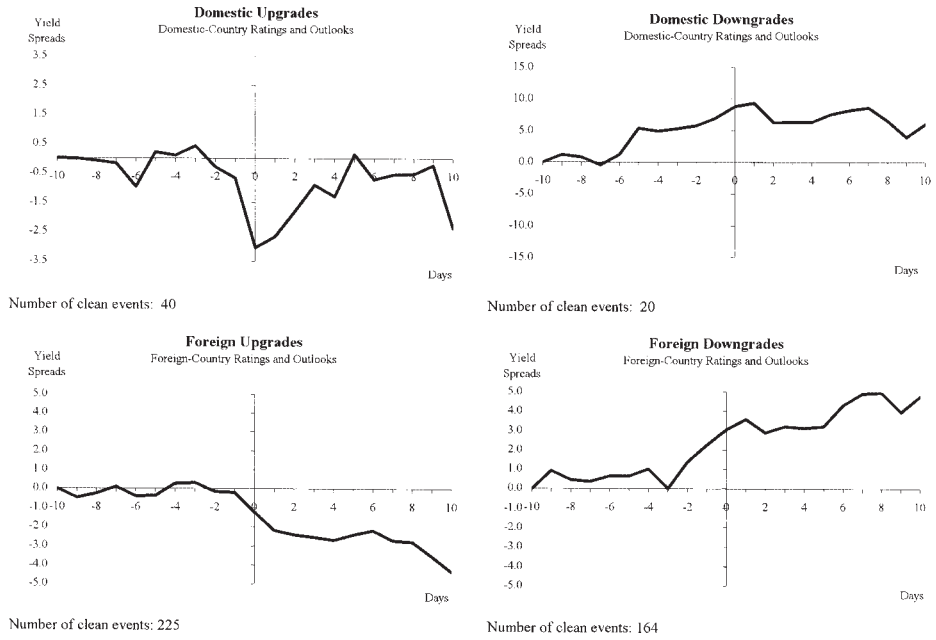
Source: Author calculations.

to domestic-country changes, foreign-country rating and outlook changes appear to have more persistent effects, as if market participants had anticipated these changes to a lesser extent than the changes in domestic-country ratings. Overall, these event studies suggest important spillover effects of changes in ratings, with financial markets in emerging economies jointly rallying or collapsing following rating changes.

These results could be interpreted as indicating that rating agencies are behaving procyclically. Rating agencies decide to downgrade (upgrade) a country when the prices of its financial instruments go down (up). Alternatively, the behavior of prices in the days preceding rating and outlook changes could reflect an anticipation effect. Market participants anticipate the behavior of rating and outlook changes, so markets discount those events.

We are inclined to interpret the results as evidence of procyclical behavior by rating agencies. Anecdotal evidence suggests that market participants do not try to anticipate the actions of rating agencies but that these agencies follow market sentiment closely. Moreover, our results are consistent with the findings in Reinhart (2001), who examines whether rating agencies actions anticipated the

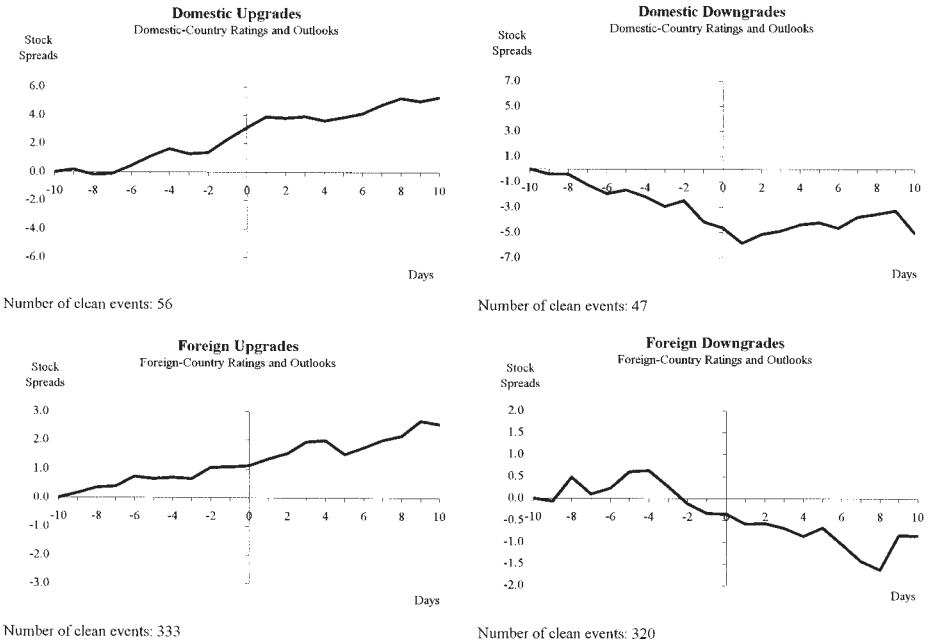
FIGURE 3. Even Studies of EMBI spreads



Note: Figure displays spreads between local sovereign debt yields and benchmark instruments from industrial countries (in logs, normalized to 0 on day –10).

Source: Authors' calculations.

FIGURE 4. Event Studies of Stock Market Indices



Note: Figure displays spreads between local stock market index and the U.S. S&P 500 (in logs, normalized to 0 on day –10).

Source: Authors' calculations.

crises of the 1990s. With a large sample of countries and crises, she concludes that far from being leading indicators of crises, rating changes are lagging indicators of financial collapses. In contrast, the aftermath of rating changes is uneventful, with sovereign bond yield spreads and stock spreads remaining largely unchanged after announcements and both spreads maintaining the gains or losses observed in the days preceding the rating changes.

V. Conclusions

Most of the research on the effects of credit ratings on financial markets has focused on quantifying the effects of changes in sovereign ratings on sovereign risk, as measured by the yield spread of domestic instruments relative to benchmark instruments in industrial countries. In this article, we expand the data set not only to update previous tests but to test new hypotheses about the effects of changes in sovereign rating and outlook on financial markets in emerging economies. The data set we assembled enabled us to test the spillover effects across securities and countries, among other things, and to provide a more complete characterization of the relation between credit ratings and financial markets.

We draw six conclusions about the effect of credit ratings on financial markets. First, changes in ratings and outlook significantly affect bond and stock markets, with average yield spreads increasing 2 percentage points and average stock returns declining about 1 percentage point in response to a domestic downgrade. Outlook changes appear to be at least as important as rating changes.

Second, rating changes contribute to contagion or spillover effects, with rating changes of bonds in one emerging market triggering changes in both yield spreads and stock returns in other emerging economies. As in the case of contagious crises, the spillover effects of rating changes are stronger at the regional level (see, for example, Kaminsky and Reinhart 2000b).

Third, changes in credit ratings and outlooks have a stronger effect on both domestic markets and foreign financial markets during crises. Spillover effects are also stronger during crises. This evidence supports crisis-contingent theories of how shocks are transmitted internationally. Masson (1998) shows how a crisis in one country may coordinate investors' expectations, shifting them from a good equilibrium to a bad equilibrium and thus triggering a crash in the other economy's financial markets. Rating and outlook changes could provide this coordinating signal.

Fourth, as expected, rating changes have a stronger effect on more nontransparent economies than on transparent ones, as these changes reveal more information about nontransparent countries.

Fifth, domestic-country rating upgrades do take place following market rallies, whereas downgrades occur after market downturns. This evidence is consistent

with the notion that rating agencies may be contributing to the instability of financial markets in emerging economies. Our results may explain why the effects of upgrades and downgrades do not appear to be large in economic terms, although they are statistically significant. Rating agencies provide bad news in bad times and good news in good times, reinforcing investors' expectations. Rigobon (1997), among others, note that this type of news is not very informative to investors, so markets do not react very strongly to it.

Finally, fragile economies, as measured by low credit ratings, are more severely affected by changes in U.S. interest rates than other economies. In fact, interest rate hikes in financial centers fuel increases in sovereign risk by 50 percent more in vulnerable economies than in countries with higher ratings.

Several potential extensions to this research would improve the understanding of the effects of credit ratings and outlooks. It would be interesting to study whether different ratings agencies affect markets differently. To do so, researchers may need to collect more data to run tests that are statistically meaningful. Another important issue to examine is whether coordinated rating changes across agencies convey stronger signals about a country's health than isolated rating changes and thus trigger more dramatic reactions in financial markets.

An additional extension would be to build better models with which to explain the movements of financial markets in emerging economies. We are still far from explaining daily volatility in either developing countries or mature markets, with the R^2 in most studies tending to be very low.

It is also important to examine the effects of sovereign rating changes on a broader set of securities. For example, sovereign ratings may have a stronger affect on firms with large foreign exposure because sovereign default and currency crises are closely associated (Reinhart 2001). Several researchers have suggested that instability due to "liability dollarization" can be reduced by granting access to security markets in mature markets. Stulz (1999), for example, claims that when firms in emerging market list on stock exchanges in industrial economies they become more accountable and transparent, reducing adverse selection and moral hazard and alleviating liquidity problems that firms in emerging markets often face. One way of testing this hypothesis would be to examine whether sovereign ratings have less of an effect on firms listed on industrial country stock markets.

Regarding the procyclicality of rating upgrades and downgrades, it would be interesting to understand how rating agencies behave beyond the 10-day window analyzed here. This would shed light on how lasting their effects persist.

TABLE A-1. Range of Possible Ratings Assigned by Each Rating Agency to Sovereign Debt

Moody's			S&P			Fitch-IBCA		
Rating	Number	Outlook	Rating	Number	Outlook	Rating	Number	Outlook
Aaa	8.00	Positive	AAA	8.00	Positive	AAA	8.00	Positive
Aa1	7.33	Negative	AA+	7.33	Negative	AA+	7.33	Negative
Aa2	7.00	Stable	AA	7.00	Stable	AA	7.00	Stable
Aa3	6.66		AA–	6.66		AA–	6.66	
A1	6.33		A+	6.33		A+	6.33	
A2	6.00		A	6.00		A	6.00	
A3	5.66		A–	5.66		A–	5.66	
Baa1	5.33		BBB+	5.33		BBB+	5.33	
Baa2	5.00		BBB	5.00		BBB	5.00	
Baa3	4.66		BBB–	4.66		BBB–	4.66	
Ba1	4.33		BB+	4.33		BB+	4.33	
Ba2	4.00		BB	4.00		BB	4.00	
Ba3	3.66		BB–	3.66		BB–	3.66	
B1	3.33		B+	3.33		B+	3.33	
B2	3.00		B	3.00		B	3.00	
B3	2.66		B–	2.66		B–	2.66	
Caa1	2.33		CCC+	2.33		CCC+	2.33	
Caa2	2.00		CCC	2.00		CCC	2.00	
Caa3	1.66		CCC–	1.66		CCC–	1.66	
Ca	1.33		CC	1.33		CC	1.33	
C	1.00		SD	1.00		C	1.00	

Note: The numbers assigned are the ones used to construct figure 2.
Source: Bloomberg.

TABLE A-2. Time Span of EMBI Spreads, Stock Returns, and Sovereign Ratings, by Country

	EMBI Spreads		Stock Returns		Sovereign Ratings	
Country	Initial date	End date	Initial date	End date	Initial date	End date
Argentina	April 30, 1993	June 30, 2000	Jan. 3, 1992	June 30, 2000	Jan. 1, 1990	June 30, 2000
Brazil	Dec. 31, 1991	June 30, 2000	Jan. 23, 1992	June 30, 2000	Jan. 1, 1990	June 30, 2000
Chile	—	—	Jan. 2, 1992	June 30, 2000	Dec. 7, 1992	June 30, 2000
Colombia	—	—	Jan. 2, 1996	June 30, 2000	Jan. 1, 1990	June 30, 2000
Indonesia	—	—	Nov. 5, 1991	June 30, 2000	Dec. 7, 1992	June 30, 2000
Korea, Rep. of	April 30, 1998	June 30, 2000	June 30, 1995	June 30, 2000	Jan. 1, 1990	June 30, 2000
Malaysia	—	—	June 30, 1995	June 30, 2000	Jan. 1, 1990	June 30, 2000
Mexico	Dec. 31, 1991	June 30, 2000	Jan. 2, 1995	June 30, 2000	Dec. 18, 1990	June 30, 2000
Peru	May 30, 1997	June 30, 2000	Jan. 2, 1996	June 30, 2000	Feb. 5, 1996	June 30, 2000
Philippines	Jan. 4, 1993	Jan. 30, 1997	Jan. 4, 1993	June 30, 2000	June 30, 1993	June 30, 2000
Poland	Jan. 17, 1995	June 30, 2000	April 3, 1996	June 30, 2000	June 1, 1995	June 30, 2000
Russian Fed.	Dec. 31, 1997	June 30, 2000	Dec. 1, 1993	June 30, 2000	April 11, 1994	June 30, 2000
Taiwan (China)	—	—	Jan. 2, 1996	June 30, 2000	Jan. 1, 1990	June 30, 2000
Thailand	—	—	Jan. 2, 1996	June 30, 2000	Jan. 1, 1990	June 30, 2000
Turkey	—	—	June 30, 1995	Dec. 30, 1999	May 5, 1992	June 30, 2000
Venezuela	Dec. 31, 1991	June 30, 2000	April 23, 1996	June 30, 2000	Jan. 1, 1990	June 30, 2000

—Not applicable.
Source: Bloomberg and JP Morgan.

References

Anderson, T., and C. Hsiao. 1982. "Formulation and Estimation of Dynamic Models Using Panel Data." *Journal of Econometrics* 18(1):47–82.

Calvo, G., and E. Mendoza. 2000. "Rational Contagion and the Globalization of Securities Markets." *Journal of International Economics* 51(1):79–114.

Calvo, G., L. Leiderman, and C. Reinhart. 1993. "Capital Inflows and Real Exchange Rate Appreciation in Latin America: The Role of External Factors." *Staff Papers International Monetary Fund* 40(1):108–51.

Cantor, R., and F. Packer. 1996. "Determinants and Impact of Sovereign Credit Ratings." Federal Reserve Bank of New York. *Economic Policy Review* 2(2):37–53.

Corsetti, G., P. Pesenti, and N. Roubini. 2000. "Competitive Devaluations: A Welfare-Based Approach." *Journal of International Economics* 51(1):217–41.

Cruces, J. 2001. "Statistical Properties of Sovereign Credit Ratings." Universidad de San Andrés, Buenos Aires, Argentina.

Dooley, M. 1998. "A Model of Crises in Emerging Markets." NBER Working Paper 6300. National Bureau of Economic Research, Cambridge, Mass.

Eichengreen, B., and A. Mody. 1998. "What Explains Changing Spreads on Emerging Market Debt: Fundamentals or Market Sentiment?" NBER Working Paper 6408. National Bureau of Economic Research, Cambridge, Mass.

Erb, C., C. Harvey, and T. Viskanta. 1996a. "Expected Returns and Volatility in 135 Countries." *Journal of Portfolio Management* 22(3):46–58.

———. 1996b. "The Influence of Political, Economic and Financial Risk on Expected Fixed Income Returns." *Journal of Fixed Income* 6(1):7–31.

———. 1996c. "Political Risk, Financial Risk and Economic Risk." *Financial Analysts Journal* 52(6):28–46.

Ferri, G., G. Liu, and J. Stiglitz. 1999. "The Procyclical Role of Rating Agencies: Evidence from the East Asian Crisis." *Economic Notes* 28(3):335–55.

Frankel, J., S. Schmukler, and L. Serven. 2000. "Global Transmission of Interest Rates: Monetary Independence and the Currency Regime." World Bank Working Paper 2424. World Bank, Washington, D.C.

Hand, J., R. Holthausen, and R. Leftwich. 1992. "The Effect of Bond Rating Agency Announcements on Bond and Stock Prices." *Journal of Finance* 157(2):733–52.

Herrera, S., and G. Perry. 2000. "Determinants of Latin Spreads in the New Economy Era: The Role of U.S. Interest Rates and Other External Variables." Latin American and the Caribbean Region, World Bank, Washington, D.C.

Kamin, S., and K. von Kleist. 1999. "The Evolution and Determinants of Emerging Market Credit Spreads in the 1990s." International Finance Discussion Paper 1999-653. Federal Reserve Board, Washington, D.C.

Kaminsky, G., and C. Reinhart. 2000a. "The Center and the Periphery: The Globalization of Financial Turmoil." IMF Working Paper, International Monetary Fund, Washington, D.C., forthcoming.

———. 2000b. "On Crises, Contagion, and Confusion." *Journal of International Economics* 51(1):145–68.

Kaminsky, G., and S. Schmukler. 1999. "What Triggers Market Jitters?" *Journal of International Money and Finance* 18(4):537–60.

———. 2001. "Emerging Markets Instability: Do Sovereign Ratings Affect Country Risk and Stock Returns?" World Bank Policy Research Working Paper 2678. World Bank, Washington, D.C. Available online at http://www.worldbank.org/research.

Kaminsky, G., R. Lyons, and S. Schmukler. 2000. "Managers, Investors, and Crisis: Mutual Fund Strategies in Emerging Markets." NBER Working Paper 7855. National Bureau of Economic Research, Cambridge, Mass.

Krugman, P. 1998. "Saving Asia: It Is Time to Get Radical." *Fortune* (September 7):74–80.

Larrain, G., H. Reisen, and J. von Maltzan. 1997. "Emerging Market Risk and Sovereign Credit Rating." OECD Development Centre Technical Paper 124. Organisation for Economic Co-operation and Development, Paris.

Masson, P. 1998. "Contagion: Monsoonal Effects, Spillovers, and Jumps between Multiple Equilibria." International Monetary Fund Working Paper WP/98/142. IMF, Washington, D.C.

Mora, N. 2001. "Sovereign Credit Ratings: Guilty Beyond Reasonable Doubt?" Department of Economics, MIT, Cambridge, Mass.

McKinnon, R., and H. Pill. 1997. "Credible Economic Liberalizations and Overborrowing." *American Economic Review* 87(2):189–93.

Mehrez, G., and D. Kaufmann. 2000. "Transparency, Liberalization, and Banking Crises." World Bank Policy Research Working Paper 2286. World Bank, Governance, Regulation, and Finance, World Bank Institute, Washington, D.C.

Reinhart, C. 2001. "Do Sovereign Credit Ratings Anticipate Financial Crises? Evidence from Emerging Markets." School of Public Affairs, University of Maryland, College Park.

Reisen, H., and J. von Maltzan. 1999. "Boom and Bust and Sovereign Ratings." OECD Development Centre Technical Paper 148. Organisation for Economic Co-operation and Development, Paris.

Richards, A. 1996. "Winner-Loser Reversals in National Stock Market Indices: Can They Be Explained?" *Journal of Finance* 52(5):2129–44.

Richards, A., and D. Deddouche. 1999. "Bank Rating Changes and Bank Stock Returns: Puzzling Evidence from Emerging Markets." IMF Working Paper. International Monetary Fund, Washington, D.C.

Rigobon, R. 1997. "Informational Speculative Attacks: Good News Is No News." Sloan School of Management, MIT, Cambridge, Mass.

Rouwenhorst, G. 1998. "International Momentum Strategies." *Journal of Finance* 53(1):267–84.

Stiglitz, J. 2000. "Capital Market Liberalization, Economic Growth, and Instability." *World Development* 28(6):1075–86.

Stulz, R. 1999. "Globalization of Capital Markets and the Cost of Capital: The Case of Nestle." *Journal of Applied Corporate Finance* 8(3):30–38.