
Rating the Rating Agencies and the Markets

The discussion in the preceding chapters focused on the ability of a variety of indicators to signal distress and to pinpoint the vulnerability of an economy to banking or currency crises. In this chapter, we assess the ability of sovereign credit ratings to anticipate such crises. In addition, given the wave of sovereign credit ratings downgrades that have followed the crisis in Asia, we investigate formally the extent to which credit ratings are reactive. Along the way, we discuss a small but growing literature that examines the extent to which financial markets anticipate crises.

Do Sovereign Credit Ratings Predict Crises?

We attempt to evaluate the predictive ability of sovereign credit ratings using two approaches. First, we tabulate the descriptive statistics for the ratings along the lines of the “signals” approach and compare how these stack up to the other leading indicators we have analyzed. Second, we follow the approach taken in much of the literature on currency and, more recently, banking crises and estimate a probit model. Specifically, we estimate a series of regressions where the dependent variable is a crisis dummy that takes on the value of one if there is a crisis and zero otherwise and where the explanatory variable is the credit ratings.

Our exercise is very much in the spirit of Larraín, Reisen, and von Maltzan (1997), who, using Granger causality tests, assess whether credit ratings lead or follow market sentiment as reflected in interest rate differentials. These interest rate differentials reflect the ease or difficulty with

Table 4.1 Comparison of Institutional Investor sovereign ratings with indicators of economic fundamentals

Type of crisis and indicator	Noise-to-signal	Percent of crises accurately called	Difference between conditional and unconditional probability
Currency crisis			
Institutional Investor sovereign rating	1.05	31	5.4
Average of the top five monthly indicators	0.45	70	19.1
Average of the top three annual indicators	0.49	36	15.4
Banking crisis			
Institutional Investor sovereign rating	1.62	22	0.9
Average of the top five monthly indicators	0.50	72	9.1
Average of the top three annual indicators	0.41	44	16.3

which sovereign countries can tap international financial markets. In their analysis, they focus on the sovereign ratings of Moody's and Standard & Poor's; in what follows, we examine the behavior around financial crises of sovereign credit ratings issues by Moody's Investor Service and Institutional Investor (II).

The II sample begins in 1979 and runs through 1995. This gives us the opportunity to study 50 currency crises and 22 banking crises. There are 20 countries in this sample, with 32 observations per country for a total of 640 observations.¹ For the Moody's ratings, we have an unbalanced panel.² Here there are 21 currency crises and 7 banking crises. Because the II database encompasses a more comprehensive sample of crises, we will place more emphasis on these results.

Table 4.1 presents the basic descriptive statistics that we used in chapter 3 to gauge an indicator's ability to anticipate crises: namely, the noise-to-signal ratio, the percentage of crises accurately called, and the marginal predictive power (i.e., the difference between the conditional and unconditional probabilities). We compare II sovereign ratings to averages for the more reliable monthly and annual indicators of economic fundamentals.

1. The 20 countries are those in the Kaminsky and Reinhart (1999) sample: Argentina, Bolivia, Brazil, Chile, Colombia, Denmark, Finland, Indonesia, Israel, Malaysia, Mexico, Norway, Peru, the Philippines, Spain, Sweden, Thailand, Turkey, Uruguay, and Venezuela.

2. An unbalanced panel, in this case, refers to the fact that we do not have the same number of observations for all the countries.

The basic story that emerges from table 4.1 is that the credit ratings perform much worse for both currency and banking crises than do the better indicators of economic fundamentals. The noise-to-signal ratio is higher than one for both types of crises, suggesting a similar incidence of good signals and false alarms. Hence, not surprisingly, the marginal contribution to predicting a crisis is small relative to the top indicators; for banking crises the marginal contribution is nil. Furthermore, the percentage of crises called is well below those of the top indicators. Indeed, the II ratings compare unfavorably with even the worst indicators. For example, consider the performance of the terms of trade ahead of banking crises (shown in the last row of table 3.1). The terms of trade has a noise-to-signal ratio of about one, making it almost as noisy as the credit rating. Yet the terms of trade accurately called 92 percent of the crises in sample—so while it sends many false alarms, it misses few crises. The II ratings, on the other hand, score poorly on both counts as, in addition to being noisy, they miss anywhere between two-thirds and three-quarters of the crises, depending on which type of crisis we focus on.

Next we assess the predictive ability of ratings via probit estimation. The dependent variable is a crisis dummy (banking and currency crises are considered separately), and the independent variable is the change in the credit rating in the preceding 12 months. The II ratings are allowed to enter with a lag. The basic premise underpinning the simple postulated model is as follows. If the credit rating agencies are using all available information on the economic fundamentals to form their rating decisions, then credit ratings should help predict crises because (as shown in the preceding chapter) macroeconomic indicators have some predictive power and the simple model should not be misspecified—that is, other indicators should not be statistically significant, since that information would already presumably be reflected in the ratings themselves. Thus the state of the macroeconomic fundamentals should be captured in a single indicator—the ratings.

Recent studies that have examined the determinants of credit ratings do provide support for the basic premise that ratings are significantly linked with selected economic fundamentals (Lee 1993; Cantor and Packer 1996a). For example, Cantor and Packer (1996a) find that per capita GDP, inflation, the level of external debt, and indicators of default history and of economic development are significant determinants of sovereign ratings. The question we seek to answer is whether these are the “right” set of fundamentals when it comes to predicting financial crises.

Table 4.2 presents the results of the probit estimation, using both the II ratings and the Moody’s ratings as regressors. The results shown in table 4.2 are based on the 12-month change in the ratings, but alternative time horizons ranging from 6-month changes to 18- and 24-month changes produced very similar results.³ The method of estimation corrected for

3. These results are not reported here but are available from the authors.

Table 4.2 Do ratings predict banking crises? (probit estimation with robust standard errors)

Independent variable	Coefficient	Standard error	Marginal effects	Probability	Pseudo R^2
12-month change in the Institutional Investor rating	-0.921	1.672	-0.070	0.421	0.004
12-month change in Moody's rating	-0.053	0.193	-0.001	0.770	0.001

Table 4.3 Do ratings predict currency crises? (probit estimation with robust standard errors)

Independent variable	Coefficient	Standard error	Marginal effects	Probability	Pseudo R^2
12-month change in the Institutional Investor rating	-0.561	1.250	-0.075	0.590	0.058
12-month change in Moody's rating	-0.22*	0.101	-0.009	0.013	0.021

*Denotes significance at the 5 percent level.

serial correlation and for heteroscedasticity in the residuals. For banking crises, the coefficients of the credit ratings have the anticipated negative sign—that is, an upgrade reduces the probability of a crisis. However, neither of the two credit-rating variables is statistically significant, and their marginal contribution to the probability of a banking crisis is very small.

These results would, on the surface, be at odds with the findings of Larraín, Reisen, and von Maltzan (1997), who find evidence that ratings “cause” interest rate spreads. Our interpretation, however, is that, while ratings may systematically lead yield spreads (they present evidence of two-way causality)—yield spreads are poor predictors of crises, as highlighted in tables 3.1 and 3.2. Hence the inability of ratings to explain crises is not inconsistent with the ability to influence spreads. This issue will be taken up later in this section.

The analogous exercise for currency crises is reported in table 4.3. Again, the estimated coefficients of the ratings have the anticipated negative sign. Only in the case of the Moody's rating, however, is the coefficient statistically significant at standard confidence levels. Even there, its marginal contribution to the probability of a currency crisis is quite small: a one-unit downgrade in the Moody's rating increases the probability of a currency crisis by about 1 percent. The fact that the II ratings behave differently from Moody's in the probit regression is consistent with other

research on ratings performance. Cantor and Packer (1996b), for example, provide extensive evidence of rating agency disagreements.

Why Do Credit Ratings Fail to Anticipate Crises?

As discussed in chapter 1, credit ratings and interest rate spreads may fail to anticipate a crisis either because lenders do not have access to timely and comprehensive information on the creditworthiness of the borrower or because lenders expect an official bailout of a troubled sovereign borrower. We now take up two related issues that could be associated with the poor performance of credit ratings as predictors of financial crises.

The first one relates to the distinction between default and financial crises. The credit rating agencies themselves often argue that sovereign credit ratings are meant to provide an assessment of the likelihood of sovereign default. Hence to the extent that a domestic banking crisis or a currency crisis is decoupled from the probability of sovereign default, credit ratings should not *a priori* be expected to predict currency or banking crises. For example, the three Nordic countries included in our sample had both currency and banking crises in the 1990s, yet default on sovereign debt was never a likely event.

Whatever the merits of this argument for industrialized economies, it looks less persuasive for developing countries and transition economies—where many default episodes have been preceded by banking and/or currency crises.⁴ Latin America's experience in the early 1980s attests to this pattern. Furthermore, had it not been for large-scale rescue packages under the auspices of the International Monetary Fund (IMF), Mexico in 1994-95 and Indonesia, South Korea, and Thailand in 1997-98 would probably have been new additions to this list.

While more research on this default versus crisis distinction is warranted, one simple implication is that the rating agencies should do better in predicting currency and banking crises in developing countries (since financial crises are more closely linked to the probability of sovereign default there than in industrial countries). To examine this issue empirically, we reestimated our simple model of crises and ratings, excluding industrial countries from the sample. The results, shown in tables 4.4 and 4.5, are not appreciably different from those for the full sample. For banking crises, neither of the ratings variables are statistically significant.⁵

4. The IMF's *World Economic Outlook* of April 2000 notes that sovereign risk and devaluation tend to move together in the case of emerging economies.

5. We do not place much weight on the Moody's results, as the number of banking crises is very small. In future work, it would be interesting to test whether Moody's bank financial strength ratings (which are meant to capture the health of banks independent of the likelihood of a government bailout) are better predictors of banking crises. However, as these ratings

Table 4.4 Do ratings predict banking crises for emerging markets?
(probit estimation with robust standard errors)

Independent variable	Coefficient	Standard error	Marginal effects	Probability	Pseudo R^2
12-month change in the Institutional Investor rating	-0.827	2.346	-0.052	0.871	0.002
12-month change in Moody's rating	-0.075	0.413	-0.001	0.864	0.001

Table 4.5 Do ratings predict currency crises for emerging markets? (probit estimation with robust standard errors)

Independent variable	Coefficient	Standard error	Marginal effects	Probability	Pseudo R^2
12-month change in the Institutional Investor rating	-0.753	1.430	-0.093	0.690	0.048
12-month change in Moody's rating	-0.34*	0.161	-0.026	0.011	0.041

*Denotes significance at the 5 percent level.

For currency crises, the II ratings remain insignificant, while Moody's ratings are significant but with a quite small marginal effect (below 3 per cent).

The second issue challenges the basic notion that credit ratings should be expected to be leading indicators. Because rating agencies receive fees from the borrowers they rate and because downgrades can subject the agencies to charges of having precipitated a crisis, some have argued—including in the Asian crisis—that credit ratings are apt to behave as lagging indicators of crises, with downgrades coming on the heels of crises. The anecdotal evidence surrounding the events in Asia seems to point in this direction (table 4.6). Only in the case of Thailand did there appear to be any substantive anticipatory action downgrades.

To examine this issue more formally, we test whether the presence of a banking or currency crisis helps to predict credit rating downgrades. In other words, our dependent and independent variables now switch roles. For the II ratings, where we have available a continuous time series, we regress the six-month change in the credit rating index on the financial crisis dummy lagged by six months.⁶ The method of estimation is general-

were only introduced in 1995, the time series is not yet long enough to encompass many banking crises.

6. We want to examine whether the rating changes follow immediately after the crisis, but as the index is only published twice a year this ability to discriminate is not possible.

Table 4.6 Rating agencies' actions on the eve and aftermath of the Asian crises, June-December 1997

Country	Date	Events and action taken
Hong Kong	20-23 October	Stock market plunges as speculators attack Hong Kong dollar.
	30 October	Moody downgrades Hong Kong banks on concerns about property exposure.
Malaysia	14 July	Ringit falls as central bank abandons support.
	18 August	S&P cuts ratings from "positive" to "stable."
	25 September	S&P changes outlook to negative.
South Korea	8 June	S&P and Moody change outlook from "stable" to "negative."
	22 October	Finance minister announces small-scale bank bailout and government takeover of Kia Motors.
	24 October	S&P downgrades government debt.
	27 October	Moody downgrades government debt.
	27 November	Moody downgrades ratings.
	3 December	IMF pact.
	10 December	Moody downgrades ratings.
	11 December	S&P downgrades ratings.
Thailand	September 1996	Moody downgrades short-term government debt.
	February 1997	Moody puts government debt under review.
	April	Moody cuts ratings but still rates government debt "investment grade." S&P reaffirms rating.
	June	S&P reaffirms rating.
	13 August	Government seeks IMF bailout; S&P puts ratings under review.
	3 September	S&P cuts rating to A-.
	October	Moody and S&P downgrade government debt.
	4 November	Prime minister resigns.
27 November	Moody lowers ratings to near junk.	

Source: Goldstein (1998a).

ized least squares, correcting for heteroskedasticity and serial correlation in the residuals. For the Moody's ratings, the dependent variable is three-month changes in the rating, while the explanatory variable is the financial crisis dummy lagged three months. The latter specification should allow us to glean more precisely whether downgrades follow rapidly after crises take place. For the Moody's ratings, our dependent variable assumes the

Table 4.7 Do financial crises help predict credit rating downgrades? (dependent variable = 11 6-month changes in sovereign rating, estimated using OLS with robust standard errors)

Independent variable	Coefficient	Standard error	Probability value	Pseudo R^2
Banking crisis dummy	-0.009	0.019	0.61	0.01
Currency crisis dummy	-0.04*	0.014	0.005	0.06

Table 4.8 Do financial crises help predict credit rating downgrades? (dependent variable = Moody's 3-month changes in sovereign rating, estimated using ordered probit)

Independent variable	Coefficient	Standard error	Probability value	Pseudo R^2
Banking crisis dummy	-0.11	0.90	0.901	0.001
Currency crisis dummy	-0.27*	0.14	0.048	0.02

* = Significant at the 5 percent level.

value of minus one, zero, or one depending on whether there was a downgrade, no change, or an upgrade, respectively. We therefore estimate the Moody's ratings regression with an ordered probit technique.

The results of the estimation are summarized in tables 4.7 and 4.8. For banking crises, the historical experience through 1995 does not support the proposition that credit-rating agencies behaved in a "reactive" manner. In contrast, our results suggest that currency crises help predict credit downgrades for both the Institutional Investor and Moody's ratings. That is, as the explanatory variable increases (from zero to one when there is a crisis), ratings fall. However, while the coefficients are significant at standard confidence levels, their marginal predictive contribution is small. For example, in the case of Moody's ratings, a currency crisis increases the likelihood of a downgrade by only 5 percent.

Our results are consistent with the findings of Larraín, Reisen, and von Maltzan (1997), who find evidence of two-way causality between sovereign ratings and market spreads. That is, not only do markets react to changes in the ratings, but the ratings systematically react (with a lag) to market sentiment.

Do Financial Markets Anticipate Crises?

The empirical tests presented here on sovereign credit ratings and financial crises need to be supplemented with tests on the ratings and larger

samples to determine whether our findings are robust. Nevertheless, we do not find surprising the evidence suggesting that sovereign ratings fail to anticipate banking and currency crises and are instead adjusted ex post. Kaminsky and Reinhart (1999) show that domestic-foreign interest rate differentials are not good predictors of crises, particularly currency crises. This result is reenforced in tables 3.1 and 3.2. Similarly, Goldfajn and Valdés (1998) use survey data on exchange rate expectations (culled from the *Financial Times*) to test whether market expectations are adept at foreseeing financial crises. Using a broad array of crises definitions and approaches, their answer is a negative one and much along the lines of what we have found for the sovereign ratings. We concluded tentatively that if one is looking for early market signals of crises, it would be better to focus on equity returns rather than market exchange rate expectations and sovereign ratings.