

Rating Agency Actions Around the Investment-Grade Boundary

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It has been hard for policymakers to ignore the 2001–2002 defaults of firms that the credit rating agencies rated as investment-grade until shortly before the defaults. All three major rating agencies rated Enron Corporation at investment-grade until four days before its bankruptcy filing in 2001, then the largest in U.S. history. All three also rated WorldCom at investment-grade until 42 days before its bankruptcy filing in 2002, which then became the largest in history.¹

An interesting question, given these problems, is what level of perceived default risk the major agencies accept within their definition of investment-grade. The major agencies may have rated weak firms at investment-grade only because they perceived them to be at little risk of default.

We aim to improve our understanding of rating agency policies by examining agency ratings of firms' debt around the boundary between investment-grade and junk. Laws regulate holdings of debt with reference to its rating by firms recognized by the Securities and Exchange Commission (SEC) as nationally recognized statistical rating organizations (NRSROs). In 2001–2002 three firms held this status: Moody's, Standard & Poor's (S&P), and Fitch. We call them collectively the NRSROs. The SEC also granted NRSRO status to Dominion Bond Rating Service (DBRS) in February 2003.

We find two pieces of evidence about credit ratings. First, data on S&P's long-term

issuer ratings over 1985–2001 show a tendency for downgrades over the course of one day to travel more grades if they start from the lowest investment-grade, BBB–, than if they start from higher or lower grades.² While the downgrades of California's utilities and Enron from BBB– in 2001 contribute heavily to this result, the effect persists in S&P data when we exclude these events. It does not appear that S&P's ratings are more volatile at BBB– than at other grades. There is weak evidence in data from Moody's and Fitch that downgrades from the lowest investment-grade move particularly far.

The second fact arises from a comparison of rating changes from BBB– by S&P with the same firms' ratings by Egan-Jones Ratings (EJR) 21 to 70 days before a change. EJR is a non-NRSRO agency that has rated debt issues since 1995. Both S&P and EJR ratings use the same symbols and reflect qualitative assessments of firms' probability of defaulting, although the two firms may attach different meanings to the same rating symbol. Ordinary least squares regressions show robustly that, when S&P regraded a firm from BBB–, its new rating was correlated with the EJR earlier rating.³

There are at least two interpretations of the tendency for large downgrades to start from BBB– (we refer throughout to downgrades that cover many grades as *large* downgrades). One would be that the NRSROs tolerate substantial default risk within their definition of investment-grade, so that firms that fall below grade BBB– are at consider-

able risk of default and merit a multiple-grade downgrade. In "Playing Out the Credit Cliff Dynamic" [2001], however, S&P argues that multiple-notch downgrades from BBB- occur because private contracts and regulations impair some firms' operations if the NRSROs rate them at junk. Under this theory, the NRSRO downgrades from BBB- would necessarily travel several grades even if they allowed minimal default risk within their definition of BBB-.

There are also several possible interpretations of the comparison between S&P and EJR ratings. One is that EJR has better information than S&P. This seems unlikely, given that NRSROs have great resources and extensive access to firm managers. More plausibly, S&P and EJR have identical information, but attach different meanings to their symbols. The tendency for S&P's regrades to move toward EJR's prior ratings suggests that EJR defines its grade BBB- more narrowly than S&P, so that the boundaries of EJR's grade BBB- in terms of default probabilities lie strictly within those of S&P.

I. CREDIT RATING INDUSTRY

Our description of practices in the credit rating industry draws heavily on Cantor and Packer [1995]. It also discusses ratings triggers in debt contracts, which have received particular attention since Enron's collapse, and proposed reforms of the credit rating industry.

While anyone can issue credit ratings, at present the SEC grants NRSRO status to four firms. Since 1931, the Board of Governors of the Federal Reserve System, the Comptroller of the Currency, the SEC, and federal and state laws have regulated financial institutions' holdings of corporate debt in terms of credit rating. Since its introduction of the concept of NRSROs in 1975, the SEC has clarified that these laws refer only to ratings given by NRSROs. EJR is not an NRSRO, and thus its ratings have no regulatory implications. Banks, savings and loans, and other institutions are prohibited from holding debt that is not rated at investment-grade by at least one NRSRO. Debt rated below investment-grade is referred to as speculative-grade or junk debt.⁴

Egan-Jones Ratings (EJR) is newer and smaller than the major rating agencies. It first issued ratings in December 1995, while Moody's has rated securities since 1909, the S&P predecessor, Poor's, since 1916, and Fitch since 1924.⁵ EJR currently has ten employees, while S&P has 1,250, Moody's 800, Fitch 1,200, and DBRS 41.⁶

The major rating agencies originally received rev-

enue only from selling lists of their ratings. Soon these were easily copied. Since the early 1970s, the major agencies have charged rating fees to bond issuers, while continuing to receive revenues from sales of their ratings. U.S. firms need not pay to be rated, since both Moody's and S&P have a policy of rating all taxable securities in the U.S. domestic market registered by the SEC, but about 98% of U.S. bond issuers pay the major rating agency fees (see Kliger and Sarig [2000]).

EJR does not charge firms fees, but instead receives all its revenues from sales of ratings and analysis to investors. EJR also makes its ratings and opinions freely available to callers to its ratings desk.

Moody's and Fitch define their debt ratings as opinions about both the likelihood of default on a bond issue and how much of bond face value holders would recover in the event of a default. S&P defines its issuer ratings, and EJR its senior debt ratings, as opinions only on the likelihood of a default.

Exhibit 1 shows S&P's and Moody's long-term issuer and debt-rating symbols. Fitch and EJR use the S&P symbols. In a few cases, S&P awards ratings of SD (selective default) and R (a firm under regulatory supervision due to its financial condition), which we code as equivalent to D (Default).

Ferri, Liu, and Stiglitz [1999] term the scale in the last column a linear conversion of ratings, and also experiment with non-linear conversions. For simplicity, we use only the linear conversion.

Rating agencies communicate their opinions through their ratings, their watch lists, and in news releases and conversations with investors. When they announce that a firm is on their watch lists, agencies signal they are reviewing its rating. Watch listings may have positive, negative, or neutral outlooks, indicating the likely direction of any future rating change. Rating agencies do not guarantee that a watch listing will be followed by a regrade or that regrades will be preceded by watch listings.

Ratings triggers are agreements between a firm and individual creditors that make the schedule of the firm's debt repayments contingent on an agency's ratings. Often these triggers make debt payable immediately if either S&P or Moody's downgrade the firm's senior unsecured debt below investment-grade, although they could refer to any grade. Some triggers have referred only to these agencies' ratings and not to Fitch's. To date no ratings triggers have been written referring to EJR's ratings.

Creditors have expressed concern that they never heard of rating triggers attached to other creditors' claims.

EXHIBIT 1

Standard & Poor's Long-Term Issuer Ratings and Egan-Jones, Fitch, and Moody's Long-Term Senior Debt Ratings

	S&P/EJR/Fitch	Moody's	Numeric Scale
Investment-Grade	AAA	Aaa	22
	AA+	Aa1	21
	AA	Aa2	20
	AA-	Aa3	19
	A+	A1	18
	A	A2	17
	A-	A3	16
	BBB+	Baa1	15
	BBB	Baa2	14
	BBB-	Baa3	13
Speculative-Grade	BB+	Ba1	12
	BB	Ba2	11
	BB-	Ba3	10
	B+	B1	9
	B	B2	8
	B-	B3	7
	CCC+	Caa1	6
	CCC	Caa2	5
	CCC-	Caa3	4
	CC	Ca	3
	C	C	2
	D		1

Standard & Poor's defines D as its default grade, while Moody's says bonds rated Caa1 through C may be in default.

Since Enron's default S&P has investigated and reported on rating triggers in other firms' debt contracts and has encouraged firms to remove them.⁷

The Supreme Court has ruled that credit ratings are opinions protected by the First Amendment's free speech clause. This would appear to preclude investors and issuers from suing agencies for issuing particular ratings and to preclude governments from compelling private agencies to award particular ratings. Thus governments may regulate the credit rating industry only in an indirect manner.

The Senate Government Affairs Committee's "Financial Oversight of Enron" [2002] proposes that greater oversight by the SEC be made a precondition of that body granting agencies NRSRO status. The major agencies have consistently argued against regulation of their industry on the grounds that their independence is crucial to the credibility of their analysis with market participants.⁸

II. LITERATURE REVIEW

Researchers have asked whether outside observers can anticipate agency rating actions. The consistent finding of downward momentum in the major agencies' ratings suggests the history of a firm's rating would help outside observers predict future changes in its rating. Downward

momentum obtains if, of all firms rated, say, A, those that were previously downgraded to A are more likely to be downgraded from A than those that were previously upgraded to A.

Carty and Fons [1993] find downward momentum in Moody's ratings, and Bangia, Diebold, and Schuermann [2002] and Lando and Skodeberg [2002] find similar momentum in S&P's ratings. Löffler [2002] interprets ratings momentum as suggesting that major agencies' rating-grade boundaries overlap in terms of default probabilities. He suggests agencies create such overlaps of their boundaries because they wish to avoid quick reversals of rating changes. If agencies' rating-grade boundaries did not overlap, and firms' default probabilities followed random walks, ratings changes would often be quickly reversed.

Measures of default risk based on market prices may also allow outside observers to anticipate changes in the major agencies' ratings. Kealhofer [2003] argues that EDF, a default predictor based on equity prices developed by the KMV Corporation, predicted defaults by U.S. companies from 1990 through 1999 better than Moody's or S&P's ratings.⁹ Jarrow and Turnbull [2000] register various criticisms of KMV's method of modeling default risk.

If KMV's ratings were indeed superior predictors of defaults, S&P and Moody's ratings would tend to move

toward those previously issued by KMV. Thus, Kealhofer's results make our finding that S&P's regrades from BBB—moved toward EJR's prior ratings less surprising. The tendency for large downgrades to start from the lowest investment-grade, and the degree to which EJR appears to have anticipated some of these changes, however, may be surprising.

III. DATA

We take Moody's, S&P's, Fitch's, and EJR's rating actions from the Bloomberg system. Bloomberg takes these data directly from the rating agencies. The NRSROs' actions are examined from an arbitrary starting date of 1985. EJR first issued ratings in December 1995.

Moody's awards different types of long-term ratings, and we analyze several types of them separately. Of the changes to Moody's long-term ratings Bloomberg lists from 1985 through 2001, the most common types are ratings of senior unsecured debt (37% of all changes), subordinated debt (16%), issuers (11%), bank loan debt (7%), senior implied issuers (6%), and senior secured debt (6%).

For a small number of firms, Bloomberg lists multiple ratings of the same type on the same day, which in most cases are identical ratings. All duplicate ratings are dropped from the data used here, which thus include at most one rating of each type for any firm on any one day.

A firm and its subsidiaries may have ratings of the same type that may move similarly. Thus, not all observations in these data are independent, although our regressions treat them as independent. Without information on subsidiary relationships, it does not appear possible to control for them. These comments on duplicated ratings and subsidiaries apply also to the data on S&P and Fitch.

Of Bloomberg data on S&P's changes to firms' long-term ratings, 51% are changes to long-term local currency issuer ratings, and 46% are changes to long-term foreign currency issuer ratings. Firms' local and foreign currency ratings are typically identical. Changes to local currency issuer ratings are analyzed below. Results using foreign currency issuer ratings are very similar.

A small number of changes from or to ratings based on public information only, to which S&P adds the suffix *pi*, are omitted. S&P typically does not modify these ratings with plus or minus signs. Consequently, it is difficult to state how many grades separate BBB*pi*, for example, from other grades.

Bloomberg indicates fewer changes to long-term ratings by Fitch than by S&P or Moody's. Of these, 59%

of those over 1985–2001 were changes to senior unsecured debt ratings. We analyze only this type of rating because the sample sizes of ratings of other types are small.

The Bloomberg system lists EJR's senior unsecured debt ratings and the accompanying written comments, but these ratings are available through the Bloomberg system only to subscribers to Egan-Jones Ratings. We omit a few firms for which these announcements are chronologically inconsistent, probably due to omissions.¹⁰ EJR's ratings are matched to those of S&P by precise firm name, except when takeovers create ambiguity as to whether the rated entities are the same, where we exclude the observation. EJR rates fewer firms than S&P, both because it rates only parent companies, not subsidiaries, and because it rates fewer parent companies than S&P.

IV. GRADES TRAVELED BY SINGLE-DAY DOWNGRADES

A downgrade from BBB– to B– travels six grades. We examine this measure rather than a standard transition matrix, as all elements of the latter over short periods would be very close to either zero or one, since the proportion of ratings changing on a given day is very small.

Exhibit 2 shows the average size in notches of single-day downgrades by S&P in Bloomberg data from 1985 through 2001. The entries show the average number of grades traveled by downgrades that started from each grade (henceforth the *average size of downgrades*). The last two rows present p-values from tests of whether downgrades from BBB– differed in size on average from downgrades from grades A, A–, BBB+, and BBB (test 1) and from downgrades from grades BB+, BB, BB–, and B+ (test 2).

Tests 1 and 2 are constructed as follows. Letting Y be the size of a downgrade, $Y - 1$ has an approximately Poisson distribution, but with a greater variance. The negative binomial distribution is a generalization of the Poisson distribution that allows for greater-than-Poisson variance. If $Y - 1$ has a negative binomial distribution, then

$$\begin{aligned} \Pr[Y - 1 = y | x_i] &= \frac{e^{-\mu_i} \mu_i^y}{y!} \\ \mu_i &= \exp(x_i' \beta + v_i) \\ v_i &\sim \text{Gamma}(1/\alpha, 1/\alpha) \end{aligned} \quad (1)$$

where α can be estimated from the data. This distribution reduces to the Poisson if $\alpha = 0$. Negative binomial

EXHIBIT 2

Size in Grades of S&P's Downgrades of Long-Term Local Currency Issuer Ratings—1985-2001

	1	2	3	4	5	6	7
Country	World					U.S.	Foreign
Period	1985-2001		1985-2001*	1985-1994	1995-2000	1985-2000	
	Size	N	Size	Size	Size	Size	Size
Starting Grade							
AAA	1.54	144	1.55	1.55	1.61	1.67	1.51
AA+	1.49	179	1.52	1.64	1.52	1.56	1.56
AA	1.55	342	1.55	1.77	1.42	1.63	1.44
AA-	1.49	404	1.49	1.77	1.38	1.65	1.28
A+	1.53	467	1.52	1.73	1.43	1.61	1.39
A	1.69	539	1.70	2.09	1.51	1.89	1.43
A-	1.49	460	1.49	1.74	1.43	1.52	1.53
BBB+	1.46	366	1.48	1.82	1.35	1.51	1.48
BBB	1.46	303	1.48	1.67	1.47	1.55	1.43
BBB-	1.97	299	1.79	2.24	1.71	1.76	1.93
BB+	1.74	235	1.65	2.24	1.65	1.79	1.74
BB	1.59	274	1.62	1.78	1.61	1.58	1.8
BB-	1.55	385	1.54	1.95	1.56	1.59	1.64
B+	1.68	594	1.69	1.75	1.68	1.63	1.95
B	2.27	413	2.27	2.21	2.35	2.42	1.93
B-	2.37	315	2.34	2.33	2.45	2.51	2.28
CCC+	3.14	208	3.11	2.4	3.04	2.97	2.94
CCC	2.99	141	3.06	1	3.11	3.25	2.09
CCC-	2.23	64	2.24	2	2.42	2.48	2.14
CC	1.99	143	1.99	1	2	1.98	2
Test 1 p-value	0.00		0.00	0.17	0.01	0.24	0.00
Test 2 p-value	0.00		0.04	0.33	0.12	0.22	0.47

*Omitting January and November 2001.

Note: Test 1 H_0 : Downgrades from BBB- are of the same size on average as downgrades from grades BBB, BBB+, A-, and A.

Test 2 H_0 : Downgrades from BBB- are of the same size on average as downgrades from grades BB+, BB, BB-, and B+.

H_1 for each test: Downgrades from BBB- are of a different size on average from downgrades from the specified grades.

Tests use negative binomial regressions.

regressions of $Y_i - 1$ are estimated using maximum likelihood, letting

$$x_i' \beta = \beta_1 + \beta_2 Z_i + \beta_3 Upper_i + \beta_4 Lower_i \quad (2)$$

where $Z = 1$ if the starting grade is BBB- and 0 otherwise; $Upper = 1$ if the starting grade is A, A-, BBB+, or BBB, and 0 otherwise; and $Lower = 1$ if the starting grade is BB+, BB, BB-, or B+, and 0 otherwise.

Test 1 is the likelihood-ratio test that $\beta_2 = \beta_3$ and Test 2 that $\beta_2 = \beta_4$. Given the structure of these tests, a rejection of the null implies that the downgrade sizes differ significantly, but does not imply that downgrades from BBB- were larger than others.

Column 1 of Exhibit 2 shows the average sizes of S&P's downgrades of all world corporations over 1985-

2001. Downgrades that started from BBB- were larger on average than those from all higher grades and the four lower grades, but were smaller than those from grades B through CC. Tests 1 and 2, reported in the last two rows, show that downgrades from BBB- differed in size on average from those from both the higher and lower four grades at a high level of significance. Column 2 shows the number of downgrades from each grade.

S&P's heavy downgrades from BBB- of California's utilities and their subsidiaries in January 2001 and of Enron and its subsidiaries in November 2001 contribute heavily to the pattern in column 1. To remove these episodes, column 3 repeats column 1, but omits downgrades during January and November 2001.

Again downgrades from BBB- were larger than those from all higher grades and from some lower grades,

and differed significantly in size from those from the upper and lower four grades. Thus the pattern of S&P's large downgrades, particularly starting from grade BBB-, does not reflect only its large downgrades of California's utilities and of Enron from this grade.

Columns 4 through 7 test for this pattern in subsamples of the S&P data. Column 4 examines downgrades over 1985-1994. In this period, downgrades from BBB- were larger than those from all higher and some lower grades, but did not differ significantly in size from those from the higher or lower four grades. The fewer rating changes in this period reduce the power of tests 1 and 2 somewhat.

Column 5 shows similar results for 1995-2000. Downgrades from BBB- were larger on average than those from all higher and some lower grades. Tests 1 and 2 show that downgrades from BBB- differed significantly in size from downgrades from the higher four grades but not from the four lower grades.

Columns 6 and 7 split data for 1985-2000 into U.S. and foreign subsamples. Downgrades from BBB- did not differ significantly in size from those from other grades in this U.S. subsample. In the foreign subsample, downgrades from BBB- were again larger than those from all higher and some lower grades. They differed significantly in size from downgrades from the four higher grades although not from downgrades from the four lower grades.

Overall, there is something of a pattern for S&P's large single-day downgrades to start from BBB- rather than the higher or lower four grades. This pattern persists even when the California utility and Enron cases are eliminated. It also prevails in some subsamples of the 1985-2001 data, although it is not always statistically significant. Results using S&P's long-term foreign currency issuer ratings are not shown but were very similar.¹¹

Exhibit 3 repeats this partition using Moody's data. Columns 1 and 2 examine Moody's rating of world corporations' senior unsecured debt. Column 1 shows that over 1985-2001, downgrades from the lowest investment-grade, Baa3, on average traveled more grades than those from the higher but not lower grades. The difference in size from downgrades from the higher four grades is statistically significant. Column 2 shows that the same results hold if downgrades from January and November 2001, and thus those of California's utilities and Enron, are omitted from the data.

Columns 3-9 examine other types of Moody's long-term ratings. Column 3 shows that over 1985-2001 Moody's downgrades of issuer ratings from Baa3 traveled more grades on average than those from all higher and

most lower grades. Column 4 shows that this result disappears when January and November 2001 are excluded from the sample.

Columns 5 and 6 examine subordinated debt ratings. Downgrades from Baa3 differed significantly in size from those from the four higher but not lower grades over 1985-2001, including or excluding January and November 2001. Column 7 shows no such pattern among Moody's ratings of bank loan debt.

Columns 8 and 9 show that Moody's downgrades of senior secured debt from Baa3 were larger than those from all higher and most lower grades, and that they differed significantly in size from downgrades from the four higher and lower grades, whether or not the sample includes January and November 2001.¹²

Overall Moody's long-term debt ratings show a fairly consistent tendency for downgrades from Baa3 to be larger than downgrades from higher grades. Only among downgrades of senior secured debt have downgrades from Baa3 been robustly larger than those from lower grades also. Thus there is less of a tendency for large downgrades to start from Baa3 rather than other grades than is evident in S&P's ratings.

Exhibit 4 examines changes to Fitch's ratings. Fitch rates fewer firms than Moody's or S&P. Column 1 shows that among world firms over 1985-2001 Fitch's downgrades from grade BBB- were substantially larger on average than downgrades from most higher grades, but not than downgrades from lower grades. The difference in downgrade sizes between those from BBB- and those from the four higher grades is highly significant.

Column 3 shows the same is true in Fitch data for 1985-2000. Columns 4 and 5 show that no significant differences are apparent if the 1985-2000 data are divided into U.S. and foreign samples, although here the small sample sizes reduce the power of tests 1 and 2 drastically.

Overall the Fitch data show a tendency for downgrades from BBB- to travel more grades than downgrades from higher but not lower grades.

One might infer from Exhibits 2-4 that the credit quality of firms rated BBB- is more volatile than the quality of firms rated at the neighboring grades. In this case, upgrades from grade BBB- would be expected to travel more grades than upgrades from neighboring grades.

Exhibit 5 compares the size of S&P's and Moody's upgrades from each grade of all world firms from 1985 through 2001. We see no tendency for S&P's upgrades from BBB- to be larger than upgrades from neighboring grades. Thus, in S&P data firms rated BBB- do not appear

EXHIBIT 3

Size in Grades of Moody's Downgrades of Issuer Ratings by Starting Grade and Rating Type—1985-2001

	1	2	3	4	5	6	7	8	9
Rating Type	Senior Unsecured Debt		Issuer Rating		Subordinated Debt		Bank Loan Debt	Senior Secured Debt	
Period	1985-2001	1985-2001*	1985-2001	1985-2001*	1985-2001	1985-2001*	1985-2001	1985-2001	1985-2001*
Starting Grade									
Aaa	1.46	1.46	1.56	1.56	1.33	1.33	..	2.00	2.00
Aa1	1.70	1.70	1.65	1.65	1.16	1.16	2.00	1.35	1.35
Aa2	1.53	1.51	1.22	1.23	1.51	1.48	2.00	1.48	1.48
Aa3	1.41	1.41	1.32	1.33	1.36	1.37	..	1.37	1.37
A1	1.50	1.50	1.31	1.30	1.19	1.18	1.29	1.27	1.11
A2	1.43	1.41	1.55	1.47	1.35	1.35	1.80	1.54	1.57
A3	1.57	1.58	1.51	1.52	1.68	1.68	1.33	1.48	1.48
Baa1	1.50	1.50	1.89	1.94	1.58	1.59	1.60	1.67	1.66
Baa2	1.41	1.42	1.19	1.19	1.76	1.76	1.26	1.74	1.51
Baa3	1.77	1.63	2.23	1.58	1.98	1.98	1.56	2.32	1.94
Ba1	1.84	1.79	1.75	1.75	2.16	2.09	1.62	1.59	1.58
Ba2	1.95	1.94	1.91	1.91	1.74	1.75	1.53	1.65	1.50
Ba3	1.58	1.58	1.60	1.64	1.83	1.84	1.55	1.42	1.43
B1	1.52	1.51	1.65	1.67	1.62	1.63	1.63	1.45	1.41
B2	1.73	1.70	1.92	1.92	1.34	1.33	1.66	1.69	1.67
B3	2.10	2.10	1.99	2.01	2.42	2.41	1.69	2.19	2.16
Caa1	2.20	2.20	2.01	1.97	2.22	2.23	1.60	2.15	2.19
Caa2	1.96	1.96	2.03	2.05	2.00	2.00	1.25	1.86	1.86
Caa3	1.24	1.25	1.29	1.27	1.24	1.21	2.00	1.28	1.40
Test 1 p-value	0.00	0.00	0.00	0.81	0.00	0.00	0.14	0.00	0.02
Test 2 p-value	0.43	0.33	0.02	0.46	0.23	0.20	0.80	0.00	0.00

*Omitting January and November 2001.

Note: All downgrades from Moody's grade Ca travel one notch by definition.

Tests 1 and 2 are described in Exhibit 2.

to have particularly volatile default probabilities.

Moody's upgrades from Baa3 have traveled more grades than upgrades from higher but not lower grades (at the 5% significance level). Thus Moody's data provide some support for the view that firms rated Baa3 have more volatile default risks than higher-graded firms. This would not explain why Moody's downgrades of senior secured debt ratings from Baa3 were larger than downgrades from both higher and lower grades, however.

Alternatively, one might infer from Exhibits 2-4 that credit ratings tend to stick at grade BBB- for some time, and in some cases fall sharply later. To explore this possibility, we calculate in Exhibit 6 the number of firm-days spent at each grade over 1985-2001 using Bloomberg data. Bloomberg data on S&P's ratings begin in 1960, and all these data are used to identify firms whose ratings remained constant and thus for which S&P took no rating actions between 1985 and 2001. It is possible that some firms' ratings have remained constant since before 1960

and thus are omitted from this calculation of firm-days at each grade during 1985-2001.¹³

Columns 1 and 2 show the average number of U.S. and foreign firms rated at each grade from 1985 through 2001, calculated by dividing the firm-day total at each grade by 6,208, the number of days in 1985-2001. No tendency for firms to bunch at grade BBB- is apparent.

Columns 3 and 4 show the average length of firm spells at each grade in U.S. and foreign samples. This is the number of firm-days at each grade divided by the number of regrades away from that grade. Spells at BBB- were longer than those at BB+, but shorter than those at BBB and higher grades. Thus there is no general tendency for spells at BBB- to be longer than spells at neighboring grades.¹⁴

We have noted at least two competing interpretations of the apparent tendency for downgrades from BBB- to be larger than downgrades from higher and in some cases lower grades. One is that the NRSROs set the lower

EXHIBIT 4

Size in Grades of Fitch's Downgrades of Senior Unsecured Debt Ratings—1985-2001

	1	2	3	4	5
Country	World			U.S.	Non-U.S.
Period	1985-2001		1985-2000	1985-2000	
	Size	N	Size	Size	Size
Starting Grade					
AAA	2.36	28	2.33	3.73	1.38
AA+	1.32	38	1.19	1.23	1.17
AA	1.44	93	1.38	1.45	1.33
AA-	1.28	144	1.28	1.43	1.08
A+	1.32	138	1.22	1.34	1.12
A	1.43	136	1.45	1.52	1.38
A-	1.65	112	1.42	1.38	1.47
BBB+	1.32	84	1.34	1.46	1.07
BBB	1.43	58	1.42	1.50	1.18
BBB-	2.25	48	1.89	1.79	2.50
BB+	2.00	24	2.13	2.17	2.00
BB	2.27	30	2.09	2.25	1.00
BB-	2.46	26	2.63	2.55	2.80
B+	2.29	21	2.36	2.63	2.00
B	2.63	16	2.56	2.00	3.25
B-	2.29	17	2.20	2.25	2.00
CCC+	1.25	4	1.00	1.00	..
CCC	1.00	13	1.00	1.00	1.00
CCC-	..	0	..	..	..
CC	..	0	..	..	..
Test 1 p-value	0.00		0.03	0.13	0.16
Test 2 p-value	0.98		0.34	0.15	0.75

Note: All downgrades from Fitch's grade C travel one notch by definition. Tests 1 and 2 are described in Exhibit 2.

boundary of grade BBB- at a high enough default risk level that firms they rate BBB- would need only a small deterioration in credit quality for their default risk to be consistent with a considerably lower rating. Another is that negative shocks to firms rated BBB- necessitate large downgrades, no matter how much default risk the NRSROs tolerate within grade BBB-.

V. STANDARD & POOR'S AND EGAN-JONES RATINGS

Further evidence that may help us choose between interpretations of downgrades from BBB- is available in examination of contemporary ratings by Egan-Jones Ratings. We compare the grades to which S&P regraded firms from BBB- and Egan-Jones' ratings of the same firms in

EXHIBIT 5

Average Size in Grades of Upgrades of Long-Term Local Currency Issuer Ratings (S&P) and Senior Unsecured Debt Ratings (Moody's) by Starting Grade—1985-2001

	1	2	3	4
Agency	S&P		Moody's	
Starting Grade	Size	N	Size	N
AA	1.40	40	1.26	74
AA-	1.17	84	1.23	144
A+	1.18	164	1.12	225
A	1.29	256	1.24	245
A-	1.39	279	1.28	270
BBB+	1.42	250	1.35	231
BBB	1.52	315	1.62	269
BBB-	1.53	283	1.51	283
BB+	1.48	237	1.53	233
BB	1.49	222	1.54	171
BB-	1.55	244	1.76	148
B+	1.65	254	1.65	150
B	1.74	152	1.85	127
B-	1.97	75	2.54	100
CCC+	2.24	41	1.12	33
CCC	2.89	28	2.39	77
CCC-	2.71	14	1.33	3
CC	3.85	20	6.20	20
C	4.50	2	5.33	3
Test 1 p-value	0.90		0.05	
Test 2 p-value	0.19		0.28	

the three to ten weeks before the S&P regrades. The agencies use the same rating symbols and define their ratings as opinions on the probability that firms will default on their debt.¹⁵

S&P and EJR may not attach the same interpretation to any letter grade. Indeed, assuming both S&P and EJR have the same opinions about firms' likelihood of default, systematic differences in their ratings would reveal the differences in their interpretations of each grade.

We use Bloomberg data to construct a dataset of all S&P upgrades and downgrades of world firms from BBB- that had concurrent ratings by EJR, from December 1995, when EJR first issued ratings, through October 2002. Of the 587 firms S&P regraded from BBB- during this period, the Bloomberg system quotes EJR ratings for 126 firms up to 35 days before the S&P regrades and for 119 firms 70 days before the regrades.

Many of S&P's regrades lack EJR coverage because they are subsidiaries of firms EJR rated. The sample of 126 firms includes Edison International, PG&E Corp., and

EXHIBIT 6

Average Number of Firms at Grade and
Average Spell Length for S&P Long-Term
Local Currency Issuer Ratings—1985-2001

	1	2	3	4
	No. of Firms		Spell Length (days)	
Country	U.S.	Non-U.S.	U.S.	Non-U.S.
AAA	55.4	45.0	5,207	4,165
AA+	32.2	25.8	2,249	1,841
AA	89.5	48.0	2,231	2,205
AA-	108.6	55.6	2,195	2,067
A+	160.5	55.7	2,425	1,694
A	180.1	69.0	2,113	1,488
A-	127.9	52.8	1,647	1,395
BBB+	129.8	44.3	1,759	1,796
BBB	135.6	68.8	1,776	1,599
BBB-	102.9	34.4	1,511	1,396
BB+	60.3	15.8	1,019	950
BB	77.7	42.1	1,287	1,152
BB-	100.1	22.7	1,295	926
B+	157.4	20.1	1,435	788
B	64.9	22.2	898	821
B-	27.7	6.5	607	391
CCC+	12.3	2.2	394	263
CCC	5.8	3.2	277	368
CCC-	1.8	0.8	208	226
CC	2.9	1.4	149	198
C	0.1	0	176	0

Average firms at grade $i = (\text{Firm Days})_i / 6208$; Average spell length at grade $i = (\text{Firm Days})_i / (\text{Regrades from } i)$. Regrades to "No Rating" are treated as censored spells and thus are not in the denominator of spell length. Average spell length is rounded to the nearest day.

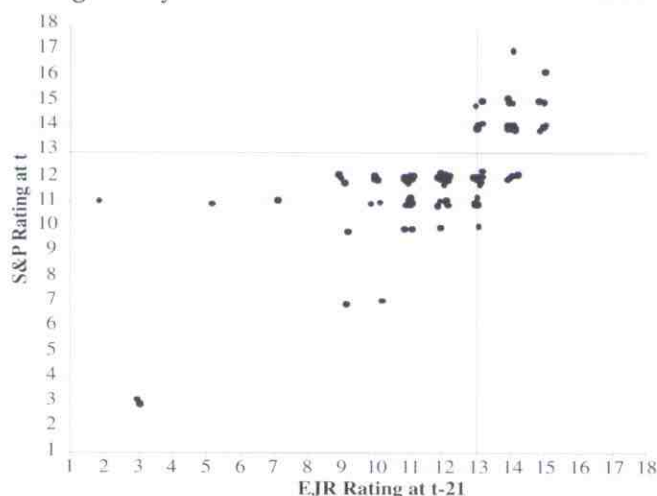
Enron Corp., but not these firms' subsidiaries.¹⁶

Exhibit 7 plots the ratings for these 126 firms. The y-axis shows S&P's rating of these firms at the end of the day it changed each firm's rating from BBB-, and the x-axis shows EJR's rating at the end of the day 21 days earlier. Letter grades are converted to numbers using the scale in Exhibit 1, so BBB- corresponds to 13, and lower numbers represent junk ratings. The horizontal line denotes S&P's grade BBB- and the vertical line EJR's grade BBB-.

As many firms had the same (x, y) values, each data point is randomly disturbed slightly to show how many observations lie at each point. This shows that most of S&P's up- and downgrades traveled only one grade, and that many of these regrades moved to EJR's rating of 21 days earlier. The two firms at the lower left-hand corner are the California utilities, PG&E Corp. and Edison International. A positive correlation between S&P's rating after

EXHIBIT 7

S&P Grade at End of Regrades from BBB- and EJR
Rating 21 Days Earlier—December 1995–October 2002



Firms' long-term local currency issuer ratings (S&P) and senior unsecured debt ratings (EJR). Data Source: Bloomberg.

regrading from BBB- and EJR's rating 21 days earlier is apparent.

Exhibit 8 explores this correlation in more detail. The regressions in Exhibit 8 are based on the specification:

$$S_i = \alpha + \beta E_{i,j} + \varepsilon_i \quad (3)$$

where S_i is S&P's rating of firm i at the end of the day it regraded it from BBB-, and $E_{i,j}$ is EJR's rating of the same firm at the end of the day j days earlier.

If EJR's ratings had no predictive content for S&P's regrades, $\beta = 0$. Therefore $\beta > 0$ would indicate that EJR's ratings had predictive content. β could overstate this predictive content because the data used here would exclude the times that EJR's rating of a firm differed from BBB- but S&P's rating remained at that grade. $\beta > 0$, however, would reliably show that S&P's regrades from BBB- moved in the direction of EJR's earlier ratings. If so, then assuming both agencies assigned the same default probability p to each firm, this would imply that the boundaries of EJR's grade BBB- in terms of p lie strictly within those of S&P.

Alternatively, one could assume that both firms have the same grade boundaries, but that Egan-Jones systematically had superior information that allowed it to detect when firm default risks had crossed a grade boundary sooner. This latter explanation seems implausible, however, as the NRSROs employ large staffs and have exten-

EXHIBIT 8

OLS Regressions of S&P Long-Term Local Currency Issuer Ratings on Egan-Jones Senior Unsecured Debt Ratings—1996-October 2002

	1	2	3	4
	Days Before S&P Downgrade From BBB-			
	21	35	70	21
Egan-Jones Rating	0.63 (0.05)	0.42 (0.1)	0.34 (0.11)	0.84 (0.06)
p-value	[0.00]	[0.00]	[0.00]	[0.00]
R ²	0.53	0.13	0.07	0.61
N	126	126	119	126
	Omitting PG&E Corp. and Edison International			
Egan-Jones Rating	0.49 (0.06)	0.55 (0.07)	0.49 (0.09)	0.84 (0.06)
p-value	[0.00]	[0.00]	[0.00]	[0.00]
R ²	0.37	0.34	0.22	0.61
N	124	124	117	124

Column 4: Is rating higher than, equal to, or lower than BBB-? All regressions include constants. Standard errors are in parentheses.

sive access to firms' management.

Columns 1-3 of Exhibit 8 estimate Equation (3) using ordinary least squares for $j = 21, 35$, and 70 . The first panel uses all the available firm-episodes, while the second panel omits PG&E and Edison International. As we note above, the regressions using $j = 70$ are for a smaller sample size.

In the upper panel, a positive and significant $\hat{\beta}$ is estimated whether EJR's ratings are recorded 21, 35, or 70 days prior to S&P's regrades. The estimated $\hat{\beta}$ falls as j increases, consistent with the idea that firms' default risks started in or close to EJR's grade BBB- but migrated away from it over time.

To test whether these results are sensitive to whether regrades are measured in grades traveled, arguably a poor metric for their economic importance, in column 4 $S_{i,j}$ and $E_{i,j}$ are coded as 1 = above BBB-, 0 = BBB-, and -1 = below BBB-. The significant coefficients on EJR's rating 21 days before S&P's regrade in column 4 in both panels indicate that the results of columns 1 are not sensitive to the metric used to measure the "size" of each regrade.

Regressions such as (3) are also run controlling for S&P's watch-list ratings j days prior to S&P's regrades from BBB-. In these regressions also the coefficients on EJR's earlier ratings are positive and statistically significant. They are not reported here, since controlling for S&P's watch-list ratings does not seem necessary to test whether EJR's implicit boundaries of grade BBB- lie inside those of S&P.

In this sample, S&P's regrades of the California utilities, PG&E Corp. and Edison International, traveled farthest from BBB-. Therefore these downgrades might be expected to affect the estimated $\hat{\beta}$ substantially. The lower panel of Exhibit 8 omits these two firms, and shows that $\hat{\beta}$ is still significantly positive at $j = 21, 35$, and 70 . Therefore the result that S&P's regrades moved toward EJR's earlier ratings does not depend on the inclusion of these cases.

Exhibit 8 could overstate the ability of outside observers to predict changes in S&P's ratings, because there are many rating agencies and EJR could merely be one that guessed luckily in this sample. The p-values associated with EJR's prior ratings in Exhibit 8 show, however, that the odds of EJR's producing this correlation through random guessing would have been low. And as we argue above, the effect of momentum in the NRSRO ratings would also have helped EJR predict the direction of S&P's regrades from BBB-.

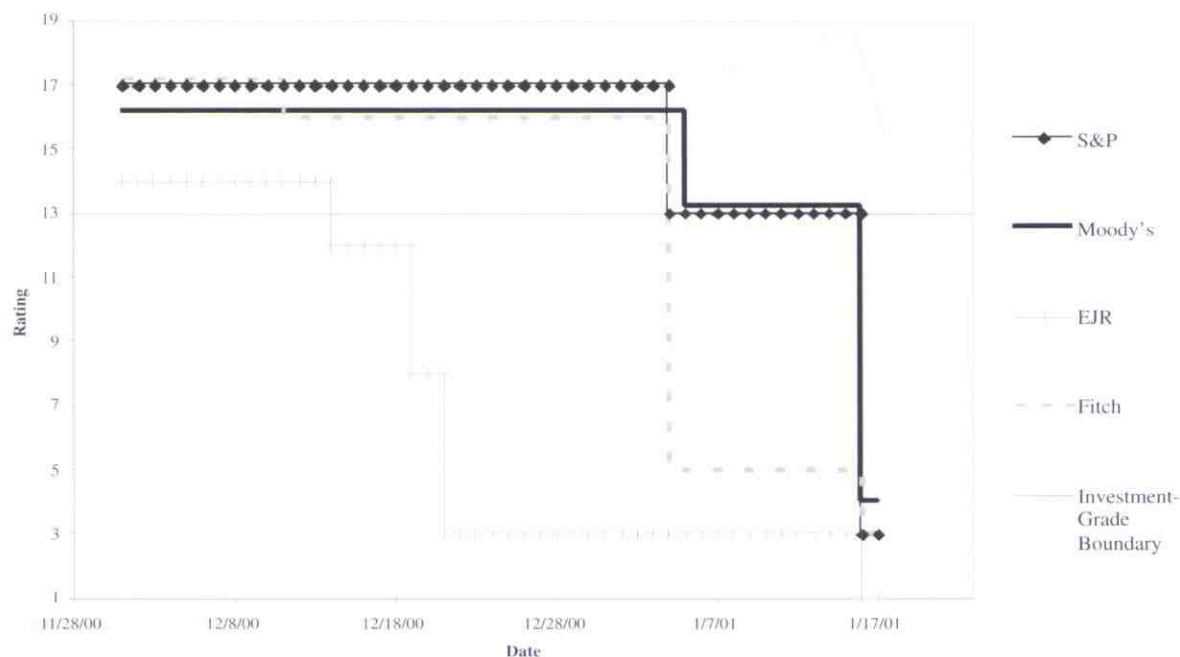
Since the California utilities episode represents an extreme example of large downgrades from BBB- that EJR anticipated beforehand, further information on this episode may help explain how our two main results might arise. Exhibit 9 shows the S&P, Moody's, Fitch, and EJR ratings of Edison International in 2000-2001, again using the numerical scale of Exhibit 1.

The four agencies' ratings of PG&E Corp. are almost identical (Fitch does not rate PG&E Corp. but does rate its subsidiary, Pacific Gas & Electricity Corporation). It was known at the time that downgrades to junk by S&P or Moody's would trigger clauses in the utilities' debt contracts that would likely force the utilities into default, but that no triggers were attached to Fitch's or EJR's ratings (see *The Wall Street Journal*, January 5, 2001, p. A3).

Among the four agencies shown in Exhibit 9, it is striking that the two whose ratings had no legal consequences reduced their ratings to low junk before those of the two agencies whose junk ratings did have legal consequences. Indeed, S&P and Moody's maintained their ratings of BBB- until Edison's subsidiary, Southern California Edison, missed a payment to bondholders on Jan-

EXHIBIT 9

S&P, Moody's, Fitch, and Egan-Jones Ratings of Edison International—2000-2001



Edison's long-term local currency issuer rating (S&P) and its senior unsecured debt ratings (other). Data Source: Bloomberg.

uary 16, 2001. The ratings in Exhibit 9 are consistent with an interpretation that S&P and Moody's tolerated a considerable degree of default risk within their definitions of grade BBB- in this case.

Overall, it is assuredly the case that S&P's regrades from BBB- moved in the direction of the EJIR earlier ratings. That this occurred often suggests that this tendency reflects systematic differences between the two firms' rating policies rather than a few lucky guesses by EJIR. It appears likely that EJIR defined its grade BBB- more narrowly than S&P.

The data we examine here, however, may overstate EJIR's ability to anticipate S&P's regrades from BBB-, since they would omit firm-episodes when S&P maintained a rating of BBB- while EJIR's rating moved away from BBB-. Such episodes would not contradict the conclusion that EJIR defines its grade BBB- more narrowly than S&P.

VI. CONCLUSION

This research finds some tendency that Standard & Poor's and Moody's start their multiple-notch downgrades from their lowest investment-grade rather than from neighboring grades. This pattern exists in some although

not all subsamples of the data that omit the agencies' heavy downgrades of California's utilities, Enron, and their subsidiaries from BBB- in 2001.

Different interpretations of this regularity are possible. One would be that the NRSROs set the lower threshold of their grade BBB- at a fairly high default probability. Alternatively, large downgrades from BBB- could occur because regulations and contracts imply that junk ratings impede firms' operations. In this case, the size of downgrades from BBB- would not be informative about the lower threshold agencies set for this grade.

A comparison of S&P and EJIR ratings shows that, conditional on S&P's upgrading or downgrading a firm from BBB-, its new grade was correlated with the grade EJIR had awarded at least ten weeks earlier. This suggests that S&P defines its grade BBB- more broadly in terms of default probabilities than EJIR. It also suggests that S&P's large downgrades from BBB- did not occur immediately after negative surprises to firms, but rather after a steady accumulation of bad news that EJIR's ratings reflected.

It is not surprising that other rating agencies appear able to predict rating actions by the nationally recognized agencies. To some extent, the NRSROs signal their future actions through changes to their watch lists and in other statements. It would still be interesting to know, how-

ever, if only the NRSRO watch lists and other commentary, and not their rating changes, incorporate new information.

Given policymakers' recent concerns, further research into the circumstances in which the NRSROs might appear slow to signal firm problems would be valuable. We examine only whether a non-recognized agency anticipated an NRSRO's rating changes from BBB-, Might non-recognized agencies anticipate the NRSROs' regrades from other grades also?

ENDNOTES

This article was written while he was an economist at the Federal Reserve Bank of Kansas City.

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¹Bankruptcydata.com lists the 22 largest bankruptcies from 1980 to the present (http://www.bankruptcydata.com/Research/15_Largest.htm).

²To be succinct, we refer to BBB- throughout as the lowest investment-grade rating. In Moody's scale, the lowest investment-grade rating is Baa3.

³Both firms issue separate analyses of the prospects that bondholders will recover the value of their bonds in the event of a bankruptcy.

⁴Junk bonds are also referred to as high-yield or below-investment-grade bonds.

⁵Poor's Publishing Company merged with Standard Statistics to form Standard & Poor's in 1941.

⁶Sources are Fitch: website as of December 11, 2002; S&P and Moody's: SEC testimony of November 2002, at www.sec.gov; EJR: conversation with Sean Egan, December 5, 2002; DBRS: *The New York Times*, February 25, 2003, p. C9. The S&P figure refers to U.S. staff only.

⁷Both the rating agencies and Enron's management at the time were unaware of one trigger relating to Enron's debt until the creditor exercised it. See "Financial Oversight of Enron" [2002, p. 114] See also "Identifying Rating Triggers" [2002].

⁸See Standard & Poor's and Moody's statements at the SEC hearings of November 15 and 21, 2002, at www.sec.gov.

⁹Stephen Kealhofer, John McQuown, and Oldrich Vasicek founded KMV in 1989. Moody's acquired the firm in April 2002.

¹⁰For example, in some cases Bloomberg lists an announcement by EJR downgrading a firm from BB+ to BB and a subsequent announcement downgrading it from BB- to B+. Thus

the rating's path from BB to BB- is omitted.

¹¹Subjecting S&P's downgrades of foreign currency issuer ratings to the tests shown in Exhibit 2, those from BBB- differed in average size from those starting from the higher and lower four grades at the 5% significance level in the world sample over 1985-2001 including or excluding January and November 2001 and in the world sample over 1995-2000, but not in the other subsamples.

¹²Downgrades of Moody's senior implied issuer ratings are not shown, since few of these started from investment-grades, and thus comparisons of average downgrade sizes are difficult.

¹³For example, Bloomberg quotes S&P as rating General Electric Co at AAA on 11/23/1981. S&P did not change this rating after 1981, so data over 1985-2001 show no S&P ratings of GE. Thus it is necessary to examine Bloomberg data from before 1985 to know how S&P rated GE between 1985 and 2001.

¹⁴Regrades to "Not Rated" are treated as censored observations, and are thus not included in the denominator.

¹⁵This is true of S&P's issuer ratings, used here; their *issue* ratings reflect prospects for recovery in the event of bankruptcy.

¹⁶If EJR chose only to rate firms where it felt it could predict S&P's subsequent rating action, these regression results would overestimate EJR's predictive ability for a firm selected at random. Egan-Jones states that its decisions on which firms to rate are driven entirely by the demands of its investor clients.

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