July 2003

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What Happens To Fallen Angels? A Statistical Review 1982—2003

Summary

The number of fallen angels has risen sharply in the current credit cycle and the volume of new fallen angel debt continues to exceed that of new speculative-grade issues.[1] Further, fallen angel debt issues tend to be larger, have longer maturities, lower coupons, and fewer covenants than other, equally-rated, speculative-grade debt issues. Market participants therefore have a natural interest in understanding the nature and behavior of fallen angels. This report examines the credit risk and rating dynamics of these once investment-grade issuers. Briefly, we find:

- In comparison to other speculative-grade issuers with the same ratings, fallen angels are more risky (more likely to default and less likely to rise to investment grade) for the first two years after being downgraded to speculative grade, but they become relatively less risky than other speculative-grade issuers as time progresses.
- Since 1982, 1,035 companies have migrated from investment grade to speculative grade. On average, fallen angels are downgraded almost two rating notches as they enter speculative grade, fall another notch during the ensuing year, and rise back up a fraction of a notch over the next four years. Around this average, however, there is a wide variance in individual firm experience. To date, 136 fallen angels have defaulted, and 285 have returned to investment grade.
- During the two years after falling to speculative grade, fallen angels experience greater default risk than do firms in a control group of speculative grade issuers that had never been investment grade but had the same ratings as the fallen angels on the dates that they fell. After the second year, the marginal default rates of fallen angels equal those of the control group. These conclusions are consistent with previously published Moody's research showing that recently downgraded firms are more vulnerable to default than other firms.
- However, the likelihood of becoming a rising star (migrating to investment grade) is also greater for fallen angels than for firms rated speculative grade at issue. This is consistent with the conjecture that many fallen angels, after surviving a period of distress, possess the franchise strength needed to restore their profitability and the business incentives to repair their balance sheets.
- A fallen angel's relative likelihood of defaulting or returning to investment grade is strongly correlated with the ratings assigned on the day it is first downgraded from investment grade to speculative grade. Fallen angels initially rated Ba are more likely to return to investment grade and less likely to default than are other fallen angels.

1. *In 2002, $201 billion of new speculative grade debt came from fallen angels and only $61 billion came from high-yield issuers.*

Introduction

A fallen angel is defined as any investment-grade issuer whose rating is lowered to speculative grade. By the time of the downgrade, the creditworthiness of these companies has become seriously impaired and their debt obligations carry substantially greater risk of credit losses. If they survive, however, many of these issuers adjust their business models or enjoy strengths that enable them to regain investment-grade status.

After migrating to speculative grade, fallen angels may have an advantaged debt structure as compared to other speculative-grade companies. Their debt is usually comprised of larger, long-dated issues with relatively low coupons, thus decreasing their effective cost of capital. The debt also has fewer covenants to protect investors. One main result from this is that fallen angels should be able to issue even more debt secured by their assets, which are typically unencumbered.

Despite these possible advantages, fallen angels often must overcome several immediate obstacles. Speculative-grade companies have only limited access to commercial paper and other short-term debt markets. The companies must re-structure so as to not be as dependent on short-term debt. This includes significant changes to their business models in order to increase cash flow for paying short- and medium-term debt while returning to profit creation. Finally, the restructuring must be done while the companies are still experiencing the same difficult market conditions that caused them to fall to speculative grade.

Basic Rating Statistics

This study commences immediately after April 26th, 1982, when Moody's introduced the "1", "2" and "3" modifiers to its whole-letter rating scale. Exhibit A in the appendix shows one-year transition statistics for the sample period. For the full year data (excluding the 4-27-82 and 12-31-02 cohorts), 93.9% of investment-grade issuers are still investment grade at the end of the next year, 2.1% are speculative grade, 0.1% have defaulted, and 4.0% have had their ratings withdrawn. In the non-investment-grade sector, 3.1% of issuers rated as speculative grade on December 31st are upgraded to investment grade by the end of the next year, 5.2% default, and 8.2% have their ratings withdrawn. The fallen angel rate, defined as the number of fallen angels divided by the number of investment-grade issuers, varies from 0.68% for 1995 up to the record breaking 5.25% for the year 2002. The overall average is 2.4%.[2]

Average Ratings Of Fallen Angels

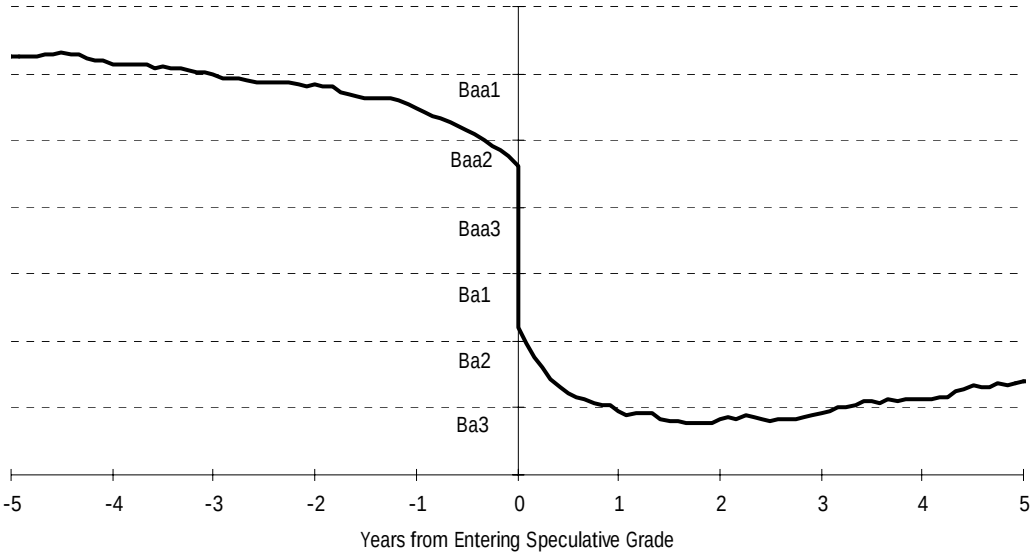
Since 1982, 1,035 companies have migrated from investment grade to speculative grade. Exhibit 1 shows the rating experience of the average fallen angel for five years after being downgraded to speculative grade. Fallen angels are downgraded almost two rating notches on average as they enter speculative grade, fall another notch during the subsequent two years, and rise back up a fraction of a notch over the next three years.[3]

Prior to entering the speculative grade, the issuers in our sample are typically in the low end of the investment-grade spectrum. Their average rating begins at about Baa1 but drops to about Baa2 prior to the event date and then to Ba2 on the event date. Contingent on not defaulting, and not having their ratings withdrawn, the average rating continues to fall for two more years to Ba3 before conducting about a half-notch reversal. *The effects of rating momentum are apparent in the first two years following the initial entrance to speculative grade but the average rating at five years is only slightly lower than that on the 'fall' date.* Rating momentum is a well-known phenomenon that affects rating changes in all rating categories.

2. *The cohort method, though, tends to understate the number of fallen angels because they do not adequately express the full information of the underlying time series. Many fallen angels default or have their ratings withdrawn due to mergers, and a few even return to investment grade before year-end.*

3. *To track the average rating of the issuers, we use an index method that helps to remove certain aspects due to the changing of the rating distribution over time. Average ratings in the past few years have been relatively low because of the high number of recent downgrades. Issuers that first became fallen angels in the past few years would therefore tend to pull down the short horizon measurements but they would not be available for measurements at longer horizons. To create the index, we fix the average ratings on the day of falling and then move progressively away from this day in monthly intervals. Issuers are chosen which have not had their ratings withdrawn during the month. The average rating change for these issuers is then added to the index of the previous month. For the purposes of this curve, an issuer in default is treated as having a C rating. The curve in Exhibit 1 therefore represents the cumulative sum of changes observed by the fallen angels. The effects of issuers falling in or out of the sample have been removed.*

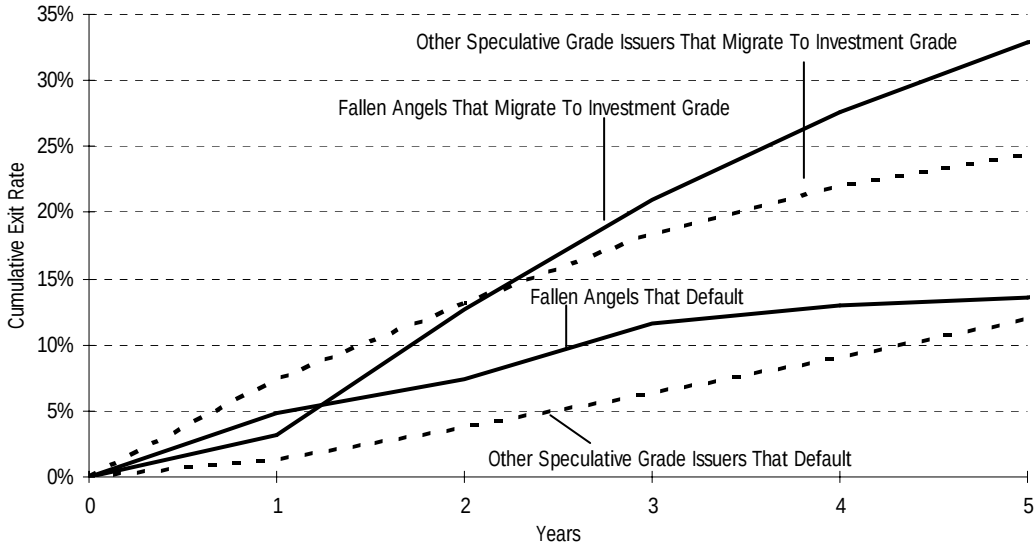
Exhibit 1: Average Rating Index Around The Event Date



Cumulative Default And Migration Rates

The average rating in Exhibit 1 does not portray the wide variety of outcomes experienced by fallen angels. After an issuer falls to speculative grade, it can exit fallen angel status in three distinct ways: it can default, have its rating withdrawn (WR), or it can migrate back to investment grade.[4] The weighted-average, cumulative rates at which speculative-grade issuers (both fallen angels and original issue) migrate to investment grade and default are displayed in exhibit 2.

Exhibit 2: Cumulative Rates At Which Speculative-Grade Issuers Exit Speculative Grade



For the purposes of comparison, a control sample was created to represent 'other speculative-grade issuers' in the exhibit. The control sample issuers were chosen to have the same rating distribution as that of the fallen angels. For each fallen angel, another issuer with the same rating as the fallen angel date was randomly chosen from the available rated universe. *This control group had the same number of issuers and the same rating distribution as the fallen angels, and the ratings are measured on the same dates as the fallen angels. One main difference is that the control group was not expected to and did not display rating momentum.* [5]

4. *The methods for extracting marginal and weighted average cumulative migration and default rates are presented in the appendix.*
5. *Control issuers were followed for five years creating sets of control exit rates. Enough random control sets were created so as to be able to measure averages and standard errors. The averages were graphed in Exhibit 2 and reported in Exhibit C.*

Probability That Speculative-Grade Issuers Migrate To Investment Grade

The likelihood of becoming a rising star (migrating to investment grade) is greater for fallen angels than for firms rated speculative grade at issue. In their first year, fallen angels were less likely to migrate to investment grade but, by the third year, they were much more likely to become "prodigal sons" that returned to the folds of the investment-grade universe. Underlying these cumulative exit rates, the marginal investment-grade migration rates were significantly higher in the second through fifth year but significantly lower in the first year.

The historical data shows that fallen angels that survive the initial distress that prompted their downgrades often possess the franchise strength and the business incentives needed to restore their profitability and to repair their balance sheets. For example, on January 31st, 1989, Moody's downgraded RJR Nabisco from A1 to Ba2. RJR Nabisco was near the tail end of a take—over battle that saddled the company with $23 billion in debt and $3 billion in annual interest payments. The buyout costs caused the company to record losses throughout the first year and the low interest coverage made the company a ripe candidate for possible default. The next three years saw RJR Nabisco restructure, increase equity, decrease debt, and gain new lines of credit. December 9th, 1992 saw the company return to an investment-grade rating of Baa3. After weathering severe credit risk, RJR Nabisco had returned to a stable credit position.

Probability That Speculative-Grade Issuers Default

During the two years after falling to speculative grade, fallen angels experience greater default risk than do firms in a control group of speculative grade issuers that had never been investment grade but had the same ratings as the fallen angels on the dates that they fell. After the second year, the marginal default rates of fallen angels equal those of members of the control group. These conclusions are consistent with previously published Moody's research showing that recently downgraded firms are more vulnerable to default than other firms. For defaulting fallen angels, the downward credit trend is too strong to overcome by franchise value or business model. Further, these firms face immediate obstacles including loss of access to short-term credit, restructuring, and difficult market conditions.

Because of their large size and their ultimate demise, fallen angels that default capture much attention. Unlike the prodigal sons that returned to investment grade, there have been many different causes of default for these companies, including fraud for Enron and WorldCom, classic failed leveraged-buy outs such as Federated Department Stores, and unwise acquisitions such as Conseco.[6]

Exiting From Speculative Grade: Evidence From Migration Patterns

Fallen angels are riskiest right after being downgraded, becoming less risky as time progresses (assuming they do not default). The following section examines whether migration patterns provide any information to indicate which issuers are more likely to default, which are most likely to return to investment grade, and which are likely to remain as speculative grade.

Exhibit 3 shows the distribution of fallen angels – which rating categories they come from and to which they go. The origination ratings are measured on the day prior to falling and the destination ratings are measured on the day of falling. The entries in the final column and the final row represent the percentage of all fallen angels that started in that row or ended in that column. For example, 66% of all fallen angels were rated Baa3 immediately prior to being downgraded. The vast majority of fallen angels originate from the Baa ratings (94%) and end in the Ba ratings (91%). *These results are consistent with rating transition patterns in the other rating categories* – single notch rating changes occur roughly twice as often as double notch rating changes and several times more than larger notch rating changes (source: Moody's *Special Comment* Default and Recovery Rates of Corporate Bond Issuers: A Statistical Review of Moody's Ratings Performance, 1920-2002).

6. *Some references estimate that a little less than 50% of all LBO's in the late eighties ultimately defaulted due to the high costs of servicing the acquisition debt.*

Exhibit 3: Origination And Destination Of Fallen Angels

Origination	Destination										Percentage Of All Fallen Angels
	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	
Aaa	—	—	—	—	—	—	—	—	—	—	**—**
Aa1	1	—	1	—	—	—	—	—	—	—	**0%**
Aa2	—	—	1	—	1	—	—	—	—	—	**0%**
Aa3	—	—	—	2	—	—	—	—	—	—	**0%**
A1	8	7	2	2	—	—	—	—	—	—	**2%**
A2	3	5	3	2	—	1	—	—	—	—	**1%**
A3	6	7	5	5	—	—	—	—	—	—	**2%**
Baa1	35	15	12	7	2	—	—	—	—	—	**7%**
Baa2	155	31	17	8	8	2	—	1	—	—	**21%**
Baa3	368	184	70	34	12	3	1	7	1	—	**66%**
Percentage Of All Fallen Angels	**56%**	**24%**	**11%**	**6%**	**2%**	**1%**	**0%**	**1%**	**0%**	**—**	

A fallen angel's relative likelihood of defaulting or returning to investment grade is strongly correlated with the ratings assigned on the day it is first downgraded from investment grade to speculative grade. In other words, the likelihood of a fallen angel regaining an investment-grade rating is positively correlated with its distance to the investment-grade threshold on the date its rating is cut to speculative grade. Fallen angels whose rating are initially cut to Ba are more likely to return to investment grade and less likely to default than are other fallen angels.

Exhibits 4 presents the total number of fallen angels that have ultimately defaulted, approximately 13% of the sample. This includes fallen angels from all periods of the study so the default characteristics of the more recent fallen angels may not yet be fully recognized by the data. This is evident from the issuers that fell directly from A1 having a 37% chance of default and those that fell to B3 having an 83% chance of default. For issuers that originated below A1, there is no strong "origination" pattern. The default rates for A2 through Baa3 do not show any patterns and are not significantly different from each other. There is a strong "destination" effect, though. The lower the rating at which the issuer ended, the higher was its ultimate default rate. *Issuers that fall to lower ratings or those that fall further tend to have higher default rates.*

Exhibit 4: Fallen Angels That Ultimately Default

Origination	Destination										Percentage of Fallen Angels from Ex.3 In Each Rating Category
	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	
Aaa	—	—	—	—	—	—	—	—	—	—	**—**
Aa1	—	—	—	—	—	—	—	—	—	—	**—**
Aa2	—	—	—	—	1	—	—	—	—	—	**50%**
Aa3	—	—	—	—	—	—	—	—	—	—	**—**
A1	4	1	1	1	—	—	—	—	—	—	**37%**
A2	—	—	—	1	—	1	—	—	—	—	**14%**
A3	—	1	—	2	—	—	—	—	—	—	**13%**
Baa1	5	2	1	2	1	—	—	—	—	—	**15%**
Baa2	18	7	4	—	2	1	—	—	—	—	**14%**
Baa3	26	24	11	10	3	3	—	3	—	—	**12%**
Percentage Of Fallen Angels From Ex. 3 In Each Rating Category	**9%**	**14%**	**15%**	**27%**	**30%**	**83%**	**—**	**38%**	**—**	**—**	**13%**

Approximately 28% of the fallen angels ultimately returned to investment grade. Of these 285 prodigal sons, 9 ultimately in turn defaulted.[7] There is both an "origination" pattern and a "destination" pattern for migrations to investment grade. The origination pattern appears strong while the destination pattern is mainly apparent in the high Ba1 return rate. *In summary, the higher was the issuer rated prior to and after downgrade to speculative grade, the more likely the firm was to return to investment grade.*

7. *These are Guangdong Enterprises Ltd., ASARCO Inc., Conseco, Inc., Federal—Mogul, Kmart, MCI Communications, Fruit of the Loom, Inc., Owens Corning, and Polaroid Corp.*

Exhibit 5: Fallen Angels That Ultimately Migrate To Investment Grade

Origination	Destination										Percentage of Fallen Angels from Ex.3 In Each Rating Category
	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	
Aaa	—	—	—	—	—	—	—	—	—	—	**—**
Aa1	—	—	—	—	—	—	—	—	—	—	**—**
Aa2	—	—	1	—	—	—	—	—	—	—	**50%**
Aa3	—	—	—	1	—	—	—	—	—	—	**50%**
A1	1	6	1	—	—	—	—	—	—	—	**42%**
A2	—	3	1	1	—	—	—	—	—	—	**36%**
A3	6	—	3	2	—	—	—	—	—	—	**48%**
Baa1	12	3	5	1	—	—	—	—	—	—	**30%**
Baa2	58	2	5	2	4	—	—	—	—	—	**32%**
Baa3	110	36	15	5	1	—	—	—	—	—	**25%**
Percentage Of Fallen Angels From Ex. 3 In Each Rating Category	**32%**	**20%**	**28%**	**20%**	**22%**	**—**	**—**	**—**	**—**	**—**	**28%**

Conclusion

The average behavior of fallen angels over the past twenty years shows that they are in some senses riskier and in other senses less risky than other similarly rated speculative grade credits. In the short term, they face higher levels of default risk and lower probability of migrating to investment grade. As time passes, fallen angels that have not defaulted are more likely to return to investment grade and less likely to default.

Moody's ratings on fallen angels are a powerful signal of whether the issuer is likely to default or become a prodigal son (migrate back to investment grade.) Firms with lower ratings after migration to speculative grade are more likely to default. Those with higher ratings before and after migration are more likely to be able to leverage their franchise value and return to investment grade.

Appendix A: Transition Statistics

The following table presents the one-year transition characteristics for all annual cohorts commencing after April 26, 1982. The percentage of fallen angels is greater than that for speculative-grade issuers because many fallen angels go on to default or have their rating withdrawn before year-end. A few even return to investment grade.

Exhibit A: One—Year Transition Statistics For All Cohorts In The Sample Period

Cohort Date	Transition From Investment Grade						Transition From Speculative Grade				
	Start	IG	SG	Default	WR	Angels	Start	IG	SG	Default	WR
4—27—82	1,017	984	18	1	14	18	334	7	308	5	14
12—31—82	1,058	1,017	17	0	24	17	355	12	302	13	28
12—31—83	1,096	1,051	23	1	21	25	370	12	330	12	16
12—31—84	1,219	1,136	32	0	51	36	447	22	389	16	20
12—31—85	1,333	1,209	49	4	71	57	554	19	463	30	42
12—31—86	1,381	1,256	33	0	92	37	740	19	637	29	55
12—31—87	1,404	1,313	30	0	61	32	849	24	718	29	78
12—31—88	1,478	1,368	46	4	60	56	866	24	725	47	70
12—31—89	1,567	1,483	30	0	54	31	876	15	675	82	104
12—31—90	1,633	1,531	42	1	59	44	725	21	553	70	81
12—31—91	1,740	1,602	22	0	116	21	644	20	513	29	82
12—31—92	1,851	1,707	10	0	134	11	670	40	536	22	72
12—31—93	2,022	1,923	17	0	82	17	820	16	717	15	72
12—31—94	2,195	2,115	14	0	66	15	979	26	851	29	73
12—31—95	2,413	2,305	16	0	92	18	1,075	42	924	17	92
12—31—96	2,639	2,502	55	0	82	67	1,241	59	1,041	24	117
12—31—97	2,842	2,668	83	1	90	96	1,548	47	1,309	50	142
12—31—98	3,001	2,857	62	1	81	68	1,815	62	1,541	98	114
12—31—99	3,183	3,023	46	4	110	50	1,894	66	1,611	111	106
12—31—00	3,301	3,117	68	4	112	79	1,774	54	1,425	181	114
12—31—01	3,451	3,118	157	15	161	182	1,606	20	1,311	131	144
12—31—02	3,356	3,214	56	0	86	58	1,580	11	1,443	47	79
Average		**93.9%**	**2.1%**	**0.1%**	**4.0%**	**2.4%**		**3.1%**	**83.5%**	**5.2%**	**8.2%**

The 4-27-82 cohort covers the period through 12-31-82. The 12-31-02 cohort covers through 7-14-2003.

Appendix B: Calculating Rating Transition, Withdrawal, & Default Rates

The appendix in the *Special Comment* Default and Recovery Rates of Corporate Bond issuers outlines how to calculate weighted-average cumulative default rates using marginal default rates calculated from several cohorts. The advantage of the outlined method is that the marginals can be calculated using all available data (i.e., the one-year marginal default rate includes information from the most recent year and this updated marginal is used to calculate the twenty—year weighted average cumulative default rate). The alternative would be to base all long-term calculations only on ratings that existed many years ago.

The calculations in the current *Special Comment* require the modeling of two separate and absorbing "exit" rates. Once an issuer defaults or has its rating enter investment grade or withdrawn, the issuer is considered to have permanently exited the cohort. Using the method outlined in the previous *Special Comment* would lead to a weighted—average cumulative "exit" rate but would not directly lead to the investment-grade exit rate or the default exit rate.

The process for making these calculations can be generalized from a two-period model. The number of issuers available for measurement in the two periods are I_1 and I_2. In the first period, d_1 percent of the issuers default, and ig_1 migrate to investment grade. The equivalent percentages for period two are d_2, and ig_2. Note that $I_2 = I_1 (1 - d_1 - ig_1)$. We are interested in finding the two—period default rate, D_2, which is the total number of defaulters divided by the initial number of issuers, I_1. This can be written as:

$$D_2 = \frac{I_1 d_1 + I_2 d_2}{I_1} = d_1 + d_2(1 - d_1 - ig_1) = d_1(1 - d_2) + d_2(1 - ig_1)$$

The second and third equalities are achieved through substitution of the relationship between I_2 and I_1 and rearranging respectively. The extension to a third period is as follows (using the same notation):

$$D_3 = D_2(1 - d_3) + d_3(1 - IG_2)$$

The same methodology has been used to derive the cumulative withdrawal rates W_2 and the cumulative investment-grade migration rates, IG_2.

The marginals are calculated using an issuer-weighted method. If one assumes that the probabilities of exit are constant through time then the issuer-weighted method is the most efficient method for estimating the marginal exit rates. If we use the notation m_{yi_d} to represent the number of issuers from cohort y that defaulted in the i^{th} year after cohort formation and n_{yi} to represent the number of issuers that are still in the cohort at the beginning of the i^{th} year in cohort y, then the i^{th} year marginal default rate (d_i) is calculated as:

$$d_i = \frac{\sum_y m_{yi\_d}}{\sum_y n_{yi}}$$

The marginal investment-grade rates and the marginal rating withdrawal rates are calculated similarly. There is one other slight adjustment made to the number of issuers. They are adjusted to account for the fact that issuers withdraw their ratings during the measurement periods. Withdrawn ratings are considered to be neutral events and not directly related to credit. To adjust for withdrawn ratings, we reduce the size of the cohort contemporaneously by one-half the number of withdrawn ratings during the period. They are completely removed for the next period.

Exhibit B presents the marginal default and migration to investment-grade rates for the sample studied. Exhibit C converts the marginal exit rates into cumulative exit rates. These cumulative exit rates are plotted in Exhibit 2.

Exhibit B: Marginal Rates For Exiting Speculative Grade

	Fallen Angels		Control Group	
Horizon	Migration to Investment Grade	Default	Migration to Investment Grade	Default
1	**3.2%**	**4.9%**	**7.4%**	**1.4%**
2	**10.3%**	2.8%	**6.4%**	2.5%
3	**10.4%**	**5.2%**	**6.2%**	**3.2%**
4	**9.8%**	1.9%	**4.9%**	3.7%
5	**8.9%**	**1.2%**	**3.5%**	**4.1%**

Significant difference at the 1% level in bold.

Exhibit C: Cumulative Rates For Exiting Speculative Grade

	Fallen Angels		Control Group	
Horizon	Migration to Investment Grade	Default	Migration to Investment Grade	Default
1	**3.2%**	**4.9%**	**7.4%**	**1.4%**
2	12.6%	**7.5%**	13.2%	**3.7%**
3	**20.9%**	**11.6%**	**18.4%**	**6.3%**
4	**27.5%**	**12.9%**	**22.0%**	**9.1%**
5	**32.8%**	13.6%	**24.5%**	11.9%

Significant difference at the 1% level in bold.

Related Research

Special Comment

Default & Recovery Rates of Corporate Bond Issuers 1920-2002, February 2003, #77471
Measuring The Performance Of Corporate Bond Ratings, April 2003, #77471
Moody's Rating Actions And Reviews - Quarterly Update July 2003, July 2003, #78722
Default Flood Waters Recede in Second Quarter, July 2003, #78865

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Report Number: 78912

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