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## **Default and Migration Rates for Private Equity-Sponsored Issuers**

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## Summary

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This *Special Comment* examines historical default, credit loss and migration rates for North American speculative-grade non-financial issuers owned by private equity sponsors. The main findings are:

- The impact on an issuer's creditworthiness of being acquired by a private equity sponsor varies with the issuer's rating just prior to being acquired. Specifically, issuers rated Ba just prior to being acquired experience double the default risk of other Ba-rated issuers, while issuers rated B just prior to being acquired experience a roughly 75% higher default risk than other B-rated issuers. Although based on a relatively small sample of firms, issuers rated Caa-C just prior to being acquired have a much lower risk of default than other Caa-C-rated issuers, suggesting a potential white-knight role for private equity sponsors.
- Similarly, around the time they are acquired, downgrade-to-upgrade ratios for issuers acquired by sponsors are much higher for issuers rated Ba prior to being acquired than they are for issuers rated B or Caa-C prior to being acquired.
- Assessing the creditworthiness of firms that have become sponsored is challenging because such acquisitions are often accompanied by changes in the firms' financial structures, management expertise, and management incentives. We find, however, that Moody's has on average adjusted ratings appropriately after private equity takeovers. In particular, we find that default rates by rating after an issuer has become sponsored are similar to default rates for similarly-rated non-sponsored issuers. Additionally, after controlling for rating, we find that recovery rates on defaulted securities are similar for sponsored and non-sponsored issuers, implying similar credit losses.
- While some differences in default rates across the issuers of individual sponsors are evident in the data, these variations in credit performance appear statistically insignificant in the sense that the knowledge of an issuer's rating (without necessarily the knowledge of its particular sponsor) appears sufficient for predicting its likelihood of default.

## Introduction

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The rapid growth of leveraged buyouts over the past several years has revived debate over the impact that such transactions have on the companies acquired by private equity sponsors. From an equity return perspective, the debate usually focuses on the potential benefits and costs associated with sponsor ownership. Often-cited potential benefits include a longer-term view by management, greater management and industry experience, improved efficiency and stricter monitoring of management performance. Often-cited potential costs include a shorter-term view by management, less management and industry experience, a greater appetite for risk and an increased focus on equity returns.

From a debt investor perspective, however, while the benefits and costs of sponsor ownership cited above still apply, the consensus view seems to be that increases in leverage associated with leveraged buyouts usually increases the credit risk of existing debt and, therefore, are bad for debt holders. Certainly, there are many high-profile examples of investment grade issuers being transformed into deep speculative grade issuers via leveraged buyouts. In this *Special Comment*, though, our focus is on speculative grade issuers where a majority of equity sponsors' capital is invested and where the impact on creditworthiness may be more ambiguous.

Among speculative grade issuers, we find that issuers acquired by private equity sponsors do indeed typically experience much higher downgrade rates and default rates than other non-sponsored issuers. However, we also find significant variation in the impact on issuers' creditworthiness as a result of being acquired by a private equity sponsor. For example, we find that increases in downgrade and default risk are highest for those issuers rated Ba prior to being acquired by a private equity sponsor, while the increases in downgrade and default risk for B-rated issuers are more modest. For distressed issuers rated Caa-C prior to being acquired by a sponsor, downgrade and default risks are actually materially lower than for similarly rated non-sponsored issuers, suggesting a white-knight role for private equity sponsors.

While being acquired by a private equity sponsor increases default risk and often results in downgrades for healthy speculative-grade issuers, an important issue for investors assessing the creditworthiness of such issuers is whether Moody's ratings appropriately reflect the credit effects of becoming sponsored. In other words, are actual downgrades sufficient to reflect actual increases in expected default rates and credit losses? We find that, controlling for rating, default rates for sponsored issuers and non-sponsored issuers are roughly similar, suggesting that Moody's ratings do appropriately reflect the credit implications inherent in sponsorship.

Finally, we assess whether the credit performance of sponsored firms varies in a statistically significant manner with the identity of the sponsor. Credit performance may differ by sponsor to the extent sponsors differ in terms of expertise, financial strategy, or due to other factors. We examine the default rates of issuers owned by the largest sponsors in our sample, as measured by the number of issuers they own, and find no evidence that credit performance differs across the largest individual sponsors in our sample.

## Study Design and Data

Matched data sets of sponsored and non-sponsored issuers are created from 2,972 North American non-financial speculative-grade firms over the period 1987-2005. We examine the "sponsor-designation-field" in Loan Pricing Corporation's DealScan database to identify whether a loan at origination is sponsored or non-sponsored.<sup>1</sup> Once an issuer is identified as sponsored, we treat that issuer as sponsored thereafter, since we are measuring the long-term impacts of private equity sponsorship. Exhibit 1 shows, that of the 2,972 total issuers in the sample, 1,940 (65%) are always designated as non-sponsored issuers, 582 (20%) become sponsored at some point in time after entering the sample, and 450 (15%) are always sponsored.

Exhibit 1

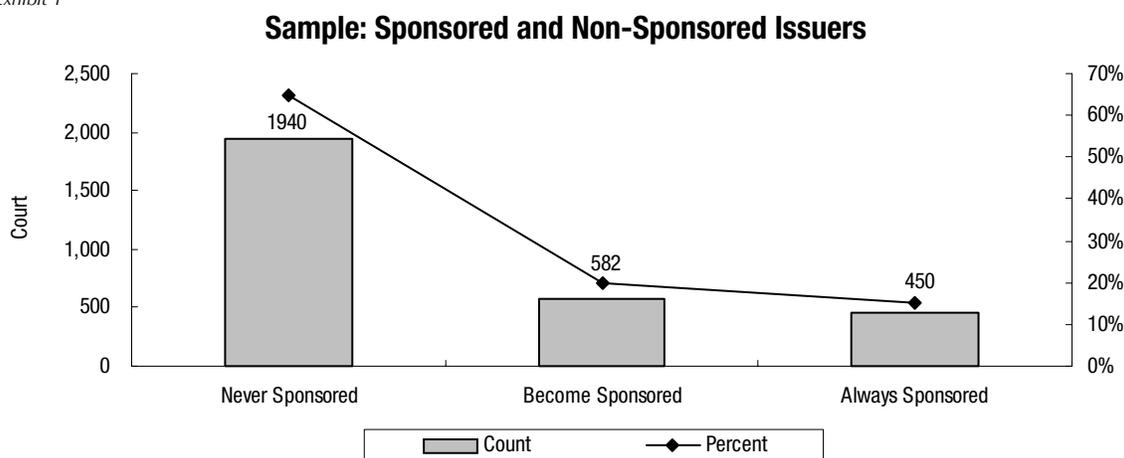
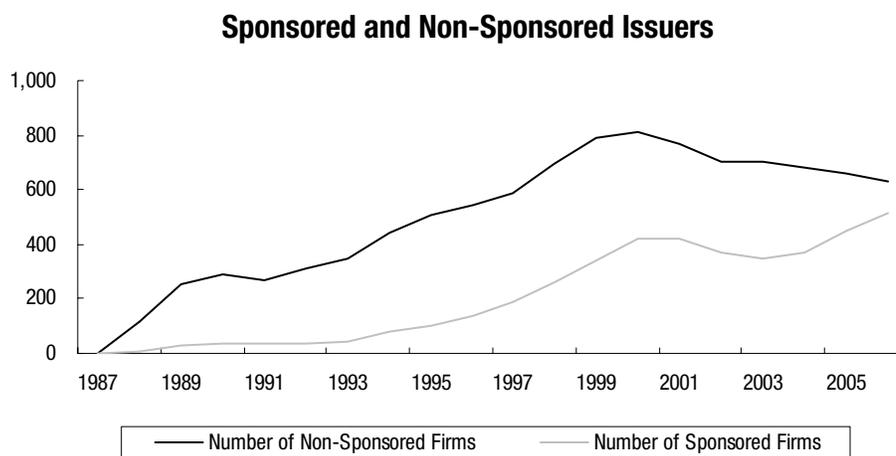


Exhibit 2 shows the count of sponsored and non-sponsored issuers in the sample from 1987 through 2005. The number of sponsored issuers increases steadily as does their share of the total number of issuers, reaching 45% by the end of 1995. At the end of 2005, there are a total of 1,146 issuers in the sample, comprising approximately 80 percent of all North American speculative-grade non-financial issuers rated by Moody's.

Exhibit 2



1. If the loan is sponsored, the sponsor-designation field also identifies the name of the sponsor.

Exhibit 3 shows the industry representation in the sample, with industrials being the most represented industry at 37 percent of the total issuers in the sample. Exhibit 4 provides the percentage of sponsored issuers within each industry. For example, sponsored issuers account for 50 percent of the total issuers in the consumer goods industry, while they account for only 13 percent of the issuers in the utilities industry.

Exhibit 3

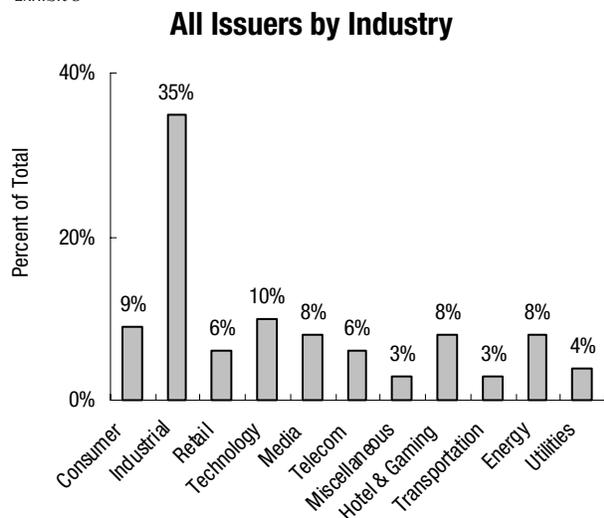
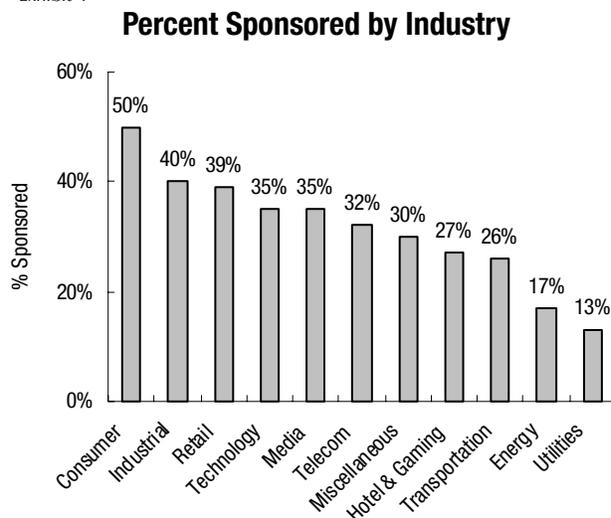
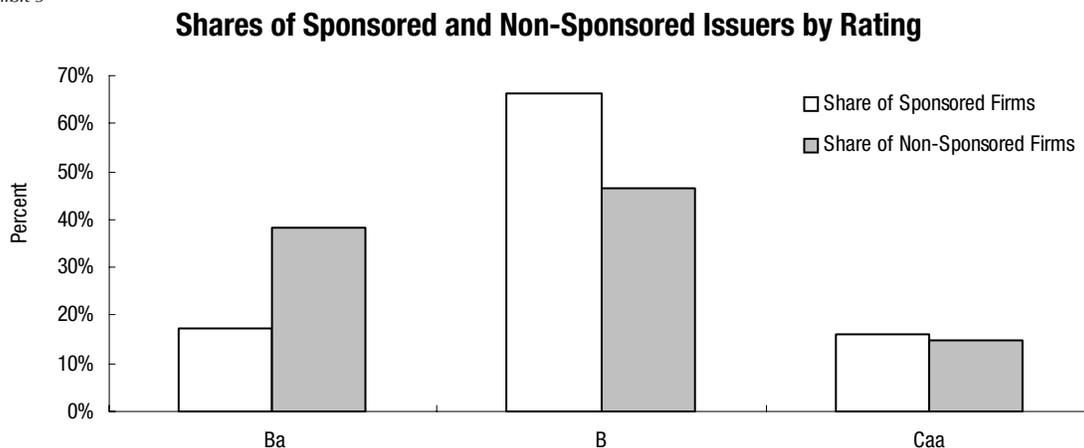


Exhibit 4



The data in Exhibit 5 illustrate that sponsored issuers tend to be lower rated on average than non-sponsored issuers, with over 65 percent of sponsored firms rated single B, versus less than 50 percent of non-sponsored firms.<sup>2</sup> In contrast, non-sponsored issuers are more than twice as likely as sponsored issuers to be rated Ba.

Exhibit 5



2. The referenced rating is the issuer's actual or estimated senior unsecured rating. It is this senior unsecured rating that is also used below in examining issuers' default, credit loss and rating migration rates.

## Credit Effects of Becoming Sponsored

### RATING MIGRATION RATES

We examine rating migration rates for non-sponsored issuers and issuers that "switch" from being non-sponsored to becoming sponsored via an acquisition by a sponsor. Exhibit 6 presents downgrade-to-upgrade ratios for a control group of non-sponsored issuers versus "switchers" for the period twelve months prior to the sponsor date to the sponsor date.<sup>3</sup> Exhibit 7 shows the actual percentages of issuers that had their ratings downgraded, upgraded, or remained unchanged.<sup>4</sup>

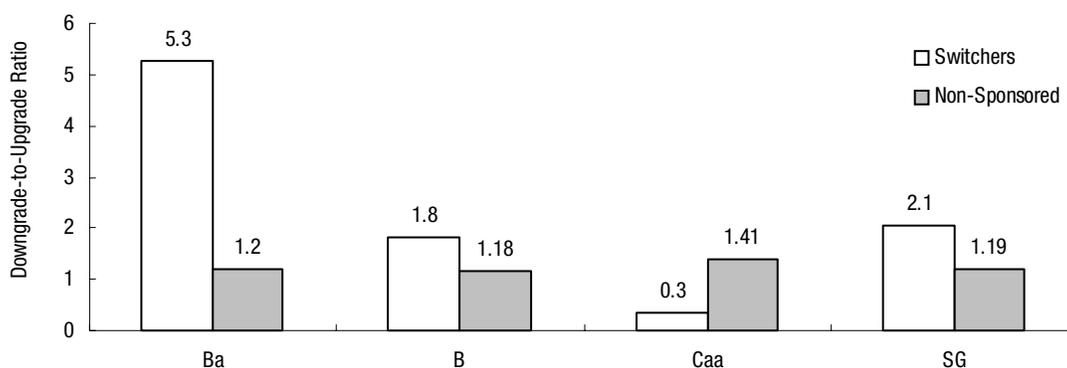
For example, the data in Exhibit 6 show that "switchers" rated Ba twelve months prior to their sponsor date experience a downgrade-to-upgrade ratio equal to 5.3 versus 1.2 for Ba issuers that remained non-sponsored.<sup>5</sup> The data in Exhibit 7 also show that the Ba switchers' downgrade-to-upgrade ratio is driven by a downgrade rate more than double that for the control group of non-sponsored issuers, and an upgrade rate almost half that for the non-sponsored issuers. Additionally, for those issuers whose ratings do change, the magnitude of the average downgrade is 2.0 rating notches for both switchers and non-sponsored issuers, while the size of the average upgrade for switchers is only 1.0 notches versus 1.7 notches for non-sponsored issuers.

Similar results for B-rated switchers are presented in Exhibits 6 and 7, although the difference in the downgrade-to-upgrade ratios between switchers and non-sponsored issuers is much smaller than for Ba-rated switchers. Taken together, the results indicate significantly higher downgrade rates and lower upgrade rates for Ba and B issuers in the twelve months prior to these issuers becoming sponsored. Similar to the Ba-rated results, the magnitudes of the average downgrades are roughly similar for switchers and non-sponsored issuers, while the average upgrade is only 1.0 notches for switchers versus 1.8 notches for non-sponsored issuers.

Interestingly, the results suggest a potential white-knight role for private equity sponsors that acquire distressed issuers rated Caa-C. The data in Exhibits 6 and 7 indicate an almost three times higher upgrade rate for Caa-C rated switchers than for the similarly-rated control group of non-sponsored issuers.<sup>6</sup> It should be noted, however, that the sample size of Caa-C switchers is a relatively small sixteen issuers. For these sixteen issuers, the magnitude of the average downgrade was equal to that of the non-sponsored issuers at 2.0 notches, while the average upgrade was 2.0 notches versus 1.7 notches for non-sponsored issuers.

Exhibit 6

#### Downgrade-to-Upgrade Ratios 12 Months Prior to Sponsor Date to Sponsor Date



3. The control groups of non-sponsored issuers are those issuers with the same rating as the group of sponsored issuers twelve months prior to the sponsor date.

4. The sponsor date refers to the first loan origination date at which an issuer issues a syndicated loan backed by a private equity sponsor.

5. The total sample of switchers with Moody's ratings twelve months prior to their sponsor date and at the sponsor date is 180. 32% (58) of these issuers were rated Ba 12 months prior to their sponsor date, 59% (106) were rated B, and 9% (16) were rated Caa-C.

6. Interestingly, downgrade-to-upgrade ratios for Ba- and B-rated switchers and non-switchers are very similar in the twelve months after the sponsor date, indicating that analysts change switchers' ratings relatively quickly to fully reflect the negative implications of being acquired by private equity sponsors. However, downgrade-to-upgrade ratios for potential white-knight Caa-C switchers remain much lower relative to non-switchers, indicating analysts are perhaps more conservative in executing rating actions until the issuer exhibits actual improvements in creditworthiness following the acquisition.

Exhibit 7

### Rating Migration Rates 12 Months Prior to Sponsor Date to Sponsor Date

	"Switchers" to Sponsored			Non-Sponsored		
	DNG	UNCH	UPG	DNG	UNCH	UPG
Ba	36.2%*	56.9%*	6.9%*	16.4%	70.1%	13.5%
B	18.9%*	69.8%	11.3%*	15.3%	72.0%	12.7%
Caa-C	12.5%	56.3%*	31.3%*	15.7%	72.3%	12.1%
SG	23.9%*	64.4%*	11.7%	16.1%	70.4%	13.5%

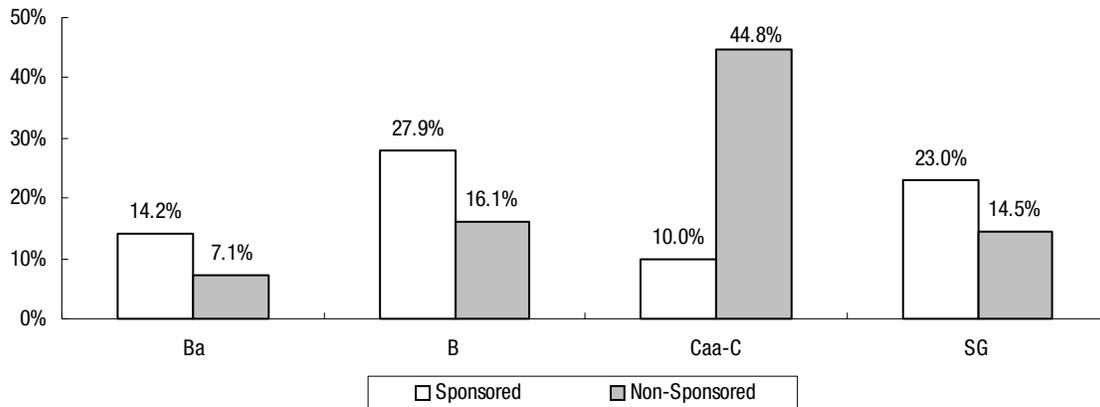
\* indicates the difference between the "switchers" rate and the control group's rate is statistically significant at the 95% confidence level

### DEFAULT RATE RESULTS

Exhibit 8 shows three-year cumulative default rates for two static pools of issuers: 1) issuers that switch from being non-sponsored to sponsored sorted by their rating six months prior to their sponsor date and 2) issuers that always remain non-sponsored sorted by their rating when they first enter the sample.<sup>7</sup> For example, the results show that issuers rated Ba that are subsequently acquired by a private equity sponsor in the following six months experience a three-year cumulative default rate of 14.2%, double the default rate for Ba issuers that are not subsequently acquired by a sponsor. Clearly, these results signal that becoming sponsored materially increases the probability of default for issuers rated Ba or B six months prior to being acquired by a private equity sponsor. Interestingly, in line with the rating migration results above, distressed issuers rated Caa-C that are acquired by sponsors exhibit a relatively low probability of default, consistent with a white knight role for sponsors.<sup>8</sup>

Exhibit 8

### Sponsored Default Rates by Rating Prior to Becoming Sponsored



7. For the switchers, the three-year cumulative default rate is measured from the date at which the issuer becomes sponsored. For the non-sponsored sample, the default rate is measured from the date at which the issuer first enters the sample.

8. However, this result is based on a relatively small sample of twelve issuers.

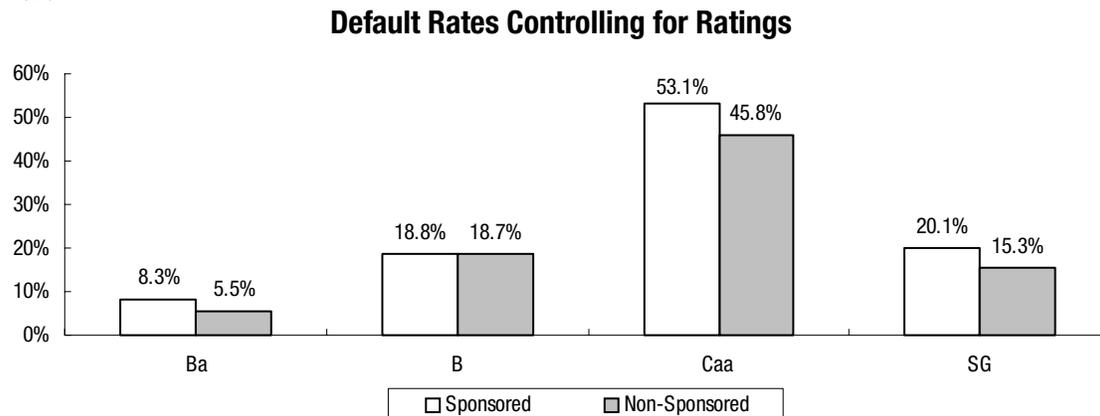
## Do Ratings Reflect Effects of Sponsorship?

### DEFAULT RATES

While being acquired by a sponsor materially increases the probability of default for an issuer, an outstanding issue is whether Moody's ratings appropriately reflect this increased risk. Although the migration rate results presented above indicate that issuers acquired by sponsors do indeed experience relatively high downgrade rates, the issue is whether these higher downgrade rates, as well as the magnitude of the downgrades, appropriately incorporate the increased default and credit loss risks.

The results in Exhibit 9 shed further light on this issue by showing monthly cohort-based three-year cumulative default rates for sponsored and non-sponsored issuers, which reflect the ratings once Moody's analysts know that an issuer has become sponsored.<sup>9</sup> The results indicate that the three-year cumulative default rate for B-rated sponsored issuers, which account for approximately two-thirds of all sponsored issuers, is almost identical to the default rate for non-sponsored issuers, indicating Moody's analysts appropriately rate B-rated sponsored issuers. For Ba and Caa-C issuers, which account for roughly one-third of sponsored issuers, the results indicate that default rates are modestly higher for sponsored issuers, although only for Ba issuers is the magnitude large enough to suggest any potential inaccuracy in ratings.<sup>10, 11</sup>

Exhibit 9



While the default rates in Exhibit 9 control for rating, they do not control for either industry or cohort effects. In other words, they do not control for the possibility that the sponsored and non-sponsored pools of issuers may have unequal exposures to various industries and time periods. We use regression analysis to control for such industry and cohort-based effects and the detailed results are presented in the Appendix. The summary findings of those results, however, are shown in Exhibit 10 and indicate that once ratings, industry and cohort effects are considered, there is no statistically significant difference between default rates on sponsored and non-sponsored issuers.

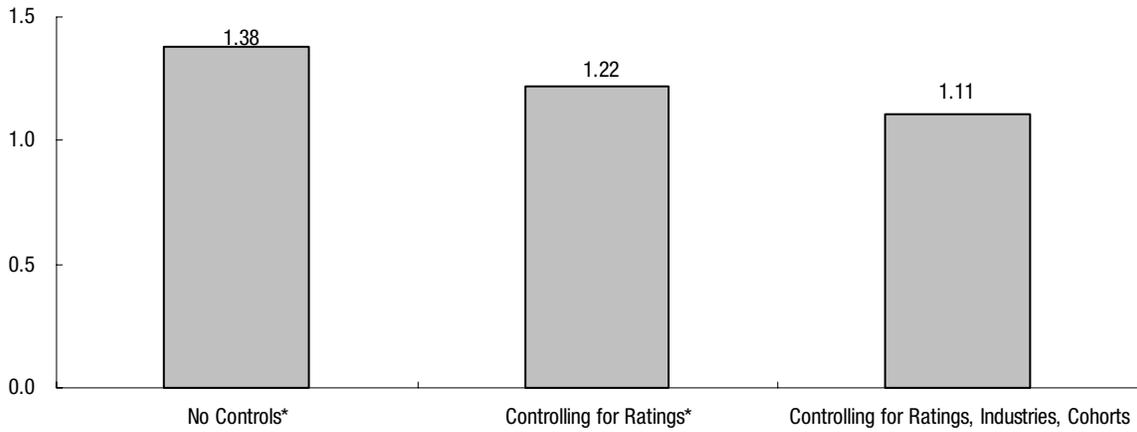
9. Specifically, on the sponsor date the issuer is thereafter treated as sponsored and included in the monthly cohorts used to calculate three-year cumulative default rates.

10. For the speculative-grade category as a whole, although sponsored default rates are higher than for non-sponsored issuers, this result partially reflects that sponsored issuers tend to be lower rated than non-sponsored issuers, as reflected in Exhibit 5.

11. Moody's idealized loss tables require at least a 30% differential in default rates to justify a one-notch differential in ratings. See "The Binomial Expansion Method Applied to CBO/CLO Analysis," December 1996 (SF5066).

Exhibit 10

### Regression Results: Ratio of Sponsored to Non-Sponsored Default Rates



\* indicates statistically significant

### CREDIT LOSS RATES

Given the cohort-based default rates calculated above, overall credit loss rates for sponsored and non-sponsored issuers can be compared by examining recovery rates for issuers that default. Exhibit 11 presents recovery rates for defaulted sponsored and non-sponsored issuers as measured by trading prices on their senior unsecured bonds thirty days after the default date. These recovery rates are similar across both ratings and between sponsored and non-sponsored issuers. Overall credit loss rates can be calculated by multiplying default rates by loss given default rates (i.e. one minus the recovery rate). These loss rates are presented in Exhibit 12, and similar to the default rates in Exhibit 9, signal roughly similar credit loss rates for sponsored and non-sponsored issuers by rating.

Exhibit 11

### Recovery Rates for Sponsored and Non-Sponsored Defaulters

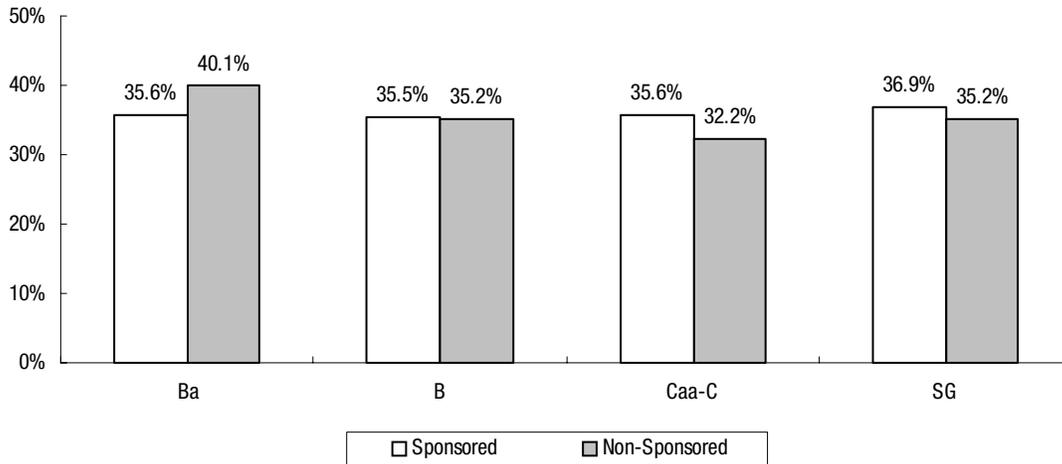
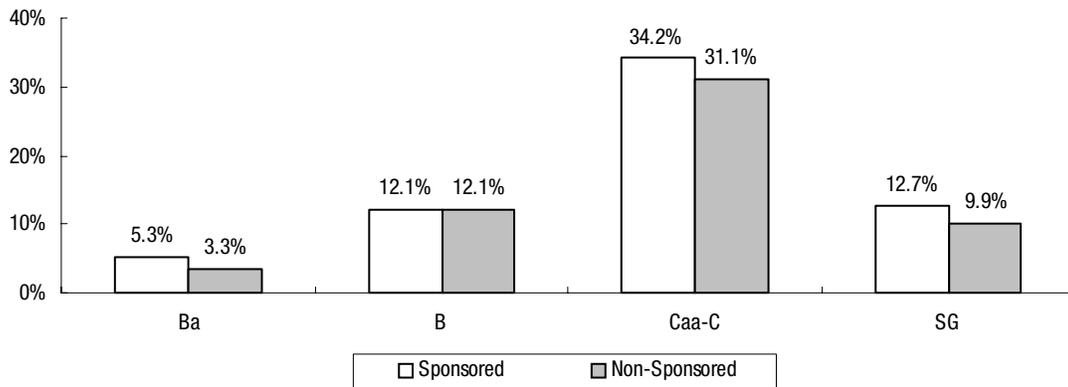


Exhibit 12

### Regression Results: Ratio of Sponsored to Non-Sponsored Default Rates



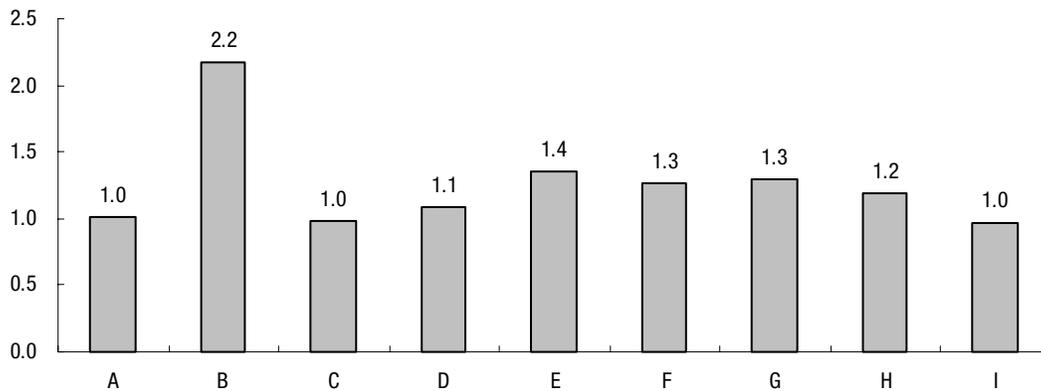
### Do Default Rates Differ by Individual Sponsors?

We can also observe whether default rates of sponsored firms vary materially with the identity of the sponsor. Default rates may differ by sponsor to the extent sponsors differ in terms of expertise, financial strategy, or other factors.

Exhibit 13 shows the ratios of default rates for the firms of the nine largest individual sponsors in our sample (i.e. those that owned at least forty unique issuers) to the overall default rate for our total sample of sponsored and non-sponsored issuers. The results indicate that the issuers of all nine sponsors exhibit default rates that are at least as high as the total sample default rate, with seven of the nine sponsors' firm default rates within 30 percent of the total sample default rate. However, Sponsor B's default rate is more than double the total sample default rate.

Exhibit 13

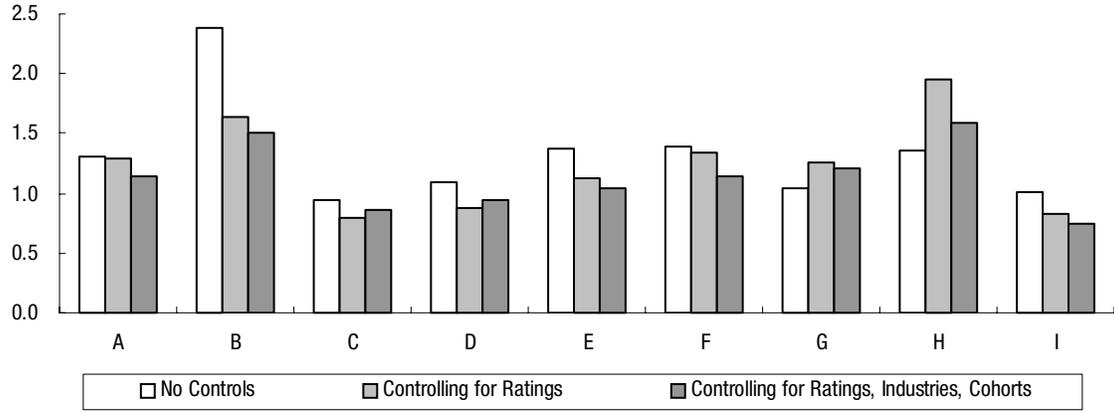
### Ratio of Individual Sponsor Default Rates to Total Sample Default Rates



The ratios of default rates in Exhibit 13, however, do not control for issuer ratings nor do they control for industry or cohort effects. In the Appendix, to control for these effects, we employ regression analysis to compare the default rates of the issuers owned by the largest individual sponsors with the overall default rate for all of the other issuers in the sample. The specifications of the regressions and the detailed results are presented in the Appendix, while the summary results are shown in Exhibit 14. Although the summary results indicate some variation in the point estimates of the ratios of individual-sponsor default rates to total-sample default rates, there is no evidence that these differences are collectively significant as indicated by a standard F-test.

Exhibit 14

### Ratio of Individual Sponsor Default Rates to Total Sample Default Rates



## Related Research

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### **Special Report:**

[The Binomial Expansion Method Applied to CBO/CLO Analysis, December 1996 \(SF5066\)](#)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

## Appendix: Default Rate Regression Analysis

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### SIMILAR DEFAULT RATES FOR SPONSORED AND NON-SPONSORED ISSUERS

Exhibit A1 presents the detailed regression results used to assess relative default rates on sponsored and non-sponsored issuers. The dependent variable in the regressions is the default rate on individual loans and bonds - taking on the value zero when there is no default and taking on the value one in the event of default.

Three different regression models are presented in Exhibit A1. In Model A, the only independent variable is a dummy variable for whether the issuer is sponsored. In effect, the coefficient on the sponsor dummy indicates the differential impact that being sponsored has on the default rate without controlling for rating, industry, or cohort effects. The estimation method for Model A is ordinary least squares. Model B adds to Model A by including dummy variables for the alpha-numeric rating of the issuer, effectively controlling for rating effects. Model B is specified in a non-linear manner to allow for sponsor effects to vary across rating categories. Model C adds to Model B by also controlling for industry and cohort effects that may vary across rating levels. The estimation method for Models B and C is non-linear least squares.<sup>12</sup>

Since individual issuers are represented in multiple cohorts they materialize as multiple observations in the regressions. As a result, although the coefficient estimates are unbiased, the standard errors of these estimates are understated. Findings of "insignificance" are therefore likely to be valid, but findings of "significance" are not necessarily valid. In order to correct this problem, we employ Monte Carlo bootstrapping techniques to randomly draw issuers from the sample with replacement in order to generate valid standard errors.

The coefficients on the sponsor dummy variables are the coefficients of particular interest in this analysis. They indicate the estimated differential in default rates on sponsored issuers relative to non-sponsored issuers. The results for Model C in Exhibit A1 indicate no statistically significant differences in default rates between sponsored and non-sponsored issuers once ratings, industries, and cohorts are controlled for, as indicated by t-statistics that are less than two.

### SIMILAR DEFAULT RATES FOR THE LARGEST INDIVIDUAL SPONSORS

Exhibit A2 presents the detailed regression results used to assess default rates on each of the nine individual largest sponsors relative to the default rate for all of the other issuers in the sample. The regression specifications are similar to the specifications used in Exhibit A1 to examine relative default rates on sponsored versus non-sponsored issuers. Here, however, we estimate Models A-C nine separate times for each of the individual sponsors using the entire sample of issuers, and including a dummy variable for the specific sponsor being examined. The coefficient estimates for each individual sponsor dummy variable measures its overall default rate relative the default rate for all other issuers in the sample. Focusing on the Model C results, which control for ratings, industries and cohorts, only Sponsors B and H have default rates marginally significantly different from the default rates of the other issuers in the sample. However, a standard F-test indicates that, collectively, we can strongly reject the hypothesis that there exist differences in default rates across the largest individual sponsors in our sample.

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12. While probit estimation is an alternative estimation technique given the binary dependent variable, the non-linear specification and the bootstrapping techniques required to generate valid standard errors (described below) made probit estimation impractical.

## Exhibit A1

### Similar Default Rates For Sponsored and Non-Sponsored Issuers

**Model A:** Default Rate =  $\beta_0 + \beta_1 * \text{Sponsor}$

**Model B:** Default Rate =  $(\beta_0 + \beta_1 * \text{Ba2} + \beta_2 * \text{Ba3} + \beta_3 * \text{B1} + \beta_4 * \text{B2} + \beta_5 * \text{B3} + \beta_6 * \text{Caa1} + \beta_7 * \text{Caa2} + \beta_8 * \text{Caa3} + \beta_9 * \text{Ca-C}) * (1 + \gamma_0 * \text{Sponsor})$

**Model C:** Default Rate =  $(\beta_0 + \beta_1 * \text{Ba2} + \beta_2 * \text{Ba3} + \beta_3 * \text{B1} + \beta_4 * \text{B2} + \beta_5 * \text{B3} + \beta_6 * \text{Caa1} + \beta_7 * \text{Caa2} + \beta_8 * \text{Caa3} + \beta_9 * \text{Ca-C}) * (1 + \gamma_0 * \text{Sponsor} + \gamma_1 * 1987 + \gamma_2 * 1988 + \gamma_3 * 1989 + \gamma_4 * 1990 + \gamma_5 * 1991 + \gamma_6 * 1992 + \gamma_7 * 1993 + \gamma_8 * 1994 + \gamma_9 * 1995 + \gamma_{10} * 1996 + \gamma_{11} * 1997 + \gamma_{12} * 1998 + \gamma_{13} * 2000 + \gamma_{14} * 2001 + \gamma_{15} * 2002 + \gamma_{16} * 2003 + \gamma_{17} * \text{consumer} + \gamma_{18} * \text{energy} + \gamma_{19} * \text{hotel} + \gamma_{20} * \text{misc} + \gamma_{21} * \text{media} + \gamma_{22} * \text{retail} + \gamma_{23} * \text{tech} + \gamma_{24} * \text{telecom} + \gamma_{25} * \text{transport} + \gamma_{26} * \text{utility})$

Model A				Model B				Model C			
	Coeff.	SE	t-stat		Coeff.	SE	t-stat		Coeff.	SE	t-stat
Intercept	0.138	0.01	21.09	Intercept	0.028	0.01	3.84	Intercept	0.046	0.01	3.56
Sponsor	0.053	0.01	3.74	Sponsor	0.221	0.09	2.52	Sponsor	0.114	0.06	1.81
				Ba2	-0.003	0.01	-0.34	Ba2	-0.003	0.02	-0.17
				Ba3	0.052	0.01	4.74	Ba3	0.072	0.02	3.94
				B1	0.096	0.01	8.18	B1	0.132	0.02	6.59
				B2	0.139	0.01	9.31	B2	0.190	0.02	7.90
				B3	0.207	0.02	11.06	B3	0.291	0.03	9.24
				Caa1	0.350	0.03	10.92	Caa1	0.466	0.05	9.32
				Caa2	0.410	0.04	11.20	Caa2	0.582	0.06	8.96
				Caa3	0.514	0.05	9.36	Caa3	0.669	0.08	7.91
				Ca-C	0.568	0.06	9.94	Ca-C	0.843	0.09	9.57
								1987	-0.376	0.22	-1.72
								1988	0.042	0.18	0.23
								1989	0.387	0.18	2.17
								1990	0.377	0.16	2.32
								1991	-0.082	0.13	-0.61
								1992	-0.266	0.12	-2.19
								1993	-0.438	0.10	-4.49
								1994	-0.591	0.08	-7.66
								1995	-0.572	0.06	-8.81
								1996	-0.550	0.06	-8.59
								1997	-0.440	0.06	-7.46
								1998	-0.205	0.04	-5.18
								2000	-0.093	0.03	-2.73
								2001	-0.220	0.05	-4.73
								2002	-0.453	0.05	-8.84
								2003	-0.552	0.05	-10.28
								consumer	0.061	0.10	0.59
								energy	-0.269	0.11	-2.43
								hotel	-0.093	0.09	-1.05
								misc	-0.229	0.15	-1.58
								media	-0.100	0.10	-1.02
								retail	0.333	0.15	2.22
								tech	-0.205	0.09	-2.28
								telecom	0.118	0.10	1.17
								transport	0.198	0.18	1.13
								utility	-0.096	0.22	-0.44

## Exhibit A2

### Similar Default Rates For Individual Sponsors

**Model A:** Default Rate =  $\beta_0 + \beta_1 * \text{SponsorX}$

**Model B:** Default Rate =  $(\beta_0 + \beta_1 * \text{Ba}_2 + \beta_2 * \text{Ba}_3 + \beta_3 * \text{B}_1 + \beta_4 * \text{B}_2 + \beta_5 * \text{B}_3 + \beta_6 * \text{Caa}_1 + \beta_7 * \text{Caa}_2 + \beta_8 * \text{Caa}_3 + \beta_9 * \text{Ca} - \text{C}) * (1 + \gamma_0 * \text{SponsorX})$

**Model C:** Default Rate =  $(\beta_0 + \beta_1 * \text{Ba}_2 + \beta_2 * \text{Ba}_3 + \beta_3 * \text{B}_1 + \beta_4 * \text{B}_2 + \beta_5 * \text{B}_3 + \beta_6 * \text{Caa}_1 + \beta_7 * \text{Caa}_2 + \beta_8 * \text{Caa}_3 + \beta_9 * \text{Ca} - \text{C}) * (1 + \gamma_0 * \text{SponsorX} + \gamma_1 * 1987 + \gamma_2 * 1988 + \gamma_3 * 1989 + \gamma_4 * 1990 + \gamma_5 * 1991 + \gamma_6 * 1992 + \gamma_7 * 1993 + \gamma_8 * 1994 + \gamma_9 * 1995 + \gamma_{10} * 1996 + \gamma_{11} * 1997 + \gamma_{12} * 1998 + \gamma_{13} * 2000 + \gamma_{14} * 2001 + \gamma_{15} * 2002 + \gamma_{16} * 2003 + \gamma_{17} * \text{consumer} + \gamma_{18} * \text{energy} + \gamma_{19} * \text{hotel} + \gamma_{20} * \text{misc} + \gamma_{21} * \text{media} + \gamma_{22} * \text{retail} + \gamma_{23} * \text{tech} + \gamma_{24} * \text{telecom} + \gamma_{25} * \text{transport} + \gamma_{26} * \text{utility})$

**Coefficient estimates for individual sponsor dummy:**

	Model A	Model B	Model C
Sponsor A	0.299	0.288	0.145
Sponsor B	<b>1.384*</b>	0.643	<b>0.511*</b>
Sponsor C	-0.064	-0.209	-0.139
Sponsor D	0.095	-0.121	-0.059
Sponsor E	0.371	0.124	0.054
Sponsor F	0.391	0.342	0.153
Sponsor G	0.050	0.264	0.212
Sponsor H	0.364	<b>0.954*</b>	<b>0.588*</b>
Sponsor I	0.010	-0.172	-0.260

\* indicates statistically significant at 95% confidence level

F-tests for the joint significance of individual sponsor effects are insignificant for Models A, B, and C with p-values equal to 48.6%, 18.1% and 17.7%, respectively.

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