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Takeover Defenses and Credit Risk

Summary

Corporate takeover defenses have a theoretically ambiguous impact on credit risk because the effect of insulating management control from short-term market forces is itself uncertain. Greater defenses might increase credit risk if they lead to management entrenchment, inefficient operations, and uneconomic investments. In addition, greater defenses might decrease credit risk if they enable managers to pursue conservative business strategies more consistent with the interests of bondholders than of stockholders.

In this special comment, we analyze the relationship between takeover defenses and credit risk, measuring the extent to which variation in the number of takeover defenses in place across firms has been correlated with their vulnerability to both the risk of downgrade and default during the 1990-2003 period. Other findings include:

- The implications of prior academic research relating takeover defenses to credit spreads and stock returns are ambiguous. A greater number of takeover defenses have been shown to be associated with lower credit spreads prior to 1998 (and presumably lower credit risk), with lower stock returns during the 1990s (and perhaps higher credit risk), and with higher stock returns during the past five years (and perhaps lower credit risk).
- In contrast, our empirical results generally provide unambiguous (albeit weak) support for the view that more takeover defenses are associated with higher levels of credit risk.
 - A positive relationship between takeover defenses and credit risk was most manifest in our analysis of the risk of large (3-or-more notch) rating downgrades. Firms with particularly few takeover defenses (5 or fewer defenses, about 1/15 of the overall sample) experienced less than half the frequency of large downgrades observed for all other firms.
 - A positive relationship between defenses and credit risk is generally confirmed by our analysis of other measures of credit risk - the prevalence of defaults and large rating upgrades - although the estimated magnitudes of the effects and their statistical power are fairly weak.
- These results suggesting that stronger takeover defenses adversely impact credit risk should be interpreted with caution. The theoretical basis is ambiguous and the estimated magnitudes of the effects are modest. The impact of takeover defenses on credit risk for specific firms is likely to depend on their on specific contexts, suggesting that a case-by-case approach to the evaluation of the effects of takeover defenses on credit risk may be more useful than broad assumptions.

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Introduction

Stockholders and bondholders have an uneasy alliance as investors in a company. Both want the company to perform well and to bring cash in the door. Bondholders, though, want that cash flow to be certain and continuous while stockholders will often accept or even desire greater risk and a highly volatile cash flow, because their downside risk is capped while their upside opportunity is unlimited. To further exacerbate this conflict, the board of directors, who hire and can fire corporate management, generally are considered to have a fiduciary responsibility to stockholders (although in the United States, understandings of director duties vary somewhat, with some state laws authorizing or creating director duties to broader groups of stakeholders at least in certain circumstances—notably in the takeover context—and generally include an obligation to the company itself). One can easily imagine situations where firm management pursues strategies that benefit stockholders to the detriment of bondholders, most notably relating to leverage and financial strategy.

A major source of shareholder discipline on management is through the market for corporate control. If a board of directors sticks with managers who do not optimize the franchise from a shareholder perspective, an outside party can benefit by acquiring control, and putting in place a more effective management team. However, the board can insulate management somewhat through takeover defenses, giving greater scope for pursuing strategies not responsive to shareholder demands. If these are mistaken or poorly executed strategies, creditors as well as shareholders would be hurt, as the financial strength of the company is sapped over time. If these are sound but cautious strategies for the longer-term stability of the enterprise, and executed competently, bondholders might benefit from insulation of management from immediate shareholder demands.

This *Special Comment* provides a summary of our research into the empirical relationship between the extent of management insulation, as measured by the number of takeover defenses in place, and credit risk as measured by downgrade and default rates. It is the first to look at the relationship of defenses with realized credit risk instead of the perception of credit risk extracted from corporate bond prices.

Boards can insulate themselves and management from stockholders by adopting a range of takeover defenses. Many of these are put in place at the time a company goes public, or just before a broad public float of shares that will deprive the company of a controlling shareholder, and are enshrined into the company charter. Others are a matter of bylaws, which generally can be changed unilaterally by the board of directors without shareholder approval. The adoption of a shareholder rights plan (commonly called a "poison pill") is a common and potent defense which does not require shareholder approval in the United States and which is permitted in the charters of most public companies. This paper looks at the impact of these mechanical takeover defenses. Of course, firms can discourage takeovers through other means, including becoming highly leveraged. (Indeed, takeover defenses at least theoretically could free a board and management to adopt a more conservative financial strategy without worrying that this will make them vulnerable to a takeover.) Management can also perform with excellence and thereby drive the stock price up to a level unattractive to most raiders.

Some takeover defenses make the removal of existing management less attractive by making the procedure expensive. Examples include poison pills (which are show-stoppers—they would so dilute a potential acquirer that no one in their right mind would ever trigger a pill). Lesser additional expenses can be invoked by golden parachutes that guarantee management lucrative payouts upon a change in company control. Some takeover defenses simply make the takeover process more difficult. For example, having a staggered board of directors can cause an unwanted takeover attempt to last for at least two years, as only a portion of the board may be voted out during any given year, particularly since staggered election features in Delaware and elsewhere typically include a restriction on shareholder rights to remove directors. Few hostile takeovers can be sustained over such a long time period.

The Investor Responsibility Research Center (IRRC) has documented 24 different takeover defenses employed by firms or instituted by state statutes. Further, IRRC has made available the specific defenses employed by more than 1,500 companies from 1990 through 2003. This dataset has been the workhorse of the majority of academic research work in area and is also used in this *Special Comment*. The standard method for analyzing this data is to create a takeover index value for each company formed by simply counting the number of takeover defenses it employs. The list of defenses comprising the index is given in Exhibit A1 in the Appendix. Firms with larger values of the index are thought to have highly insulated management teams.

Probably the most publicized recent study on the impact of takeover defenses on shareholders is "Corporate Governance and Equity Prices," a 2003 study by Paul Gompers, Joy Ishii and Andrew Metrick (referred to here as the Gompers study). Colorfully, they labeled firms with five or fewer defenses "democrats," and conversely called companies with 14 or more defenses "dictators." These are the two tails of the bell curve, with "democrats" presumably placing a large degree of trust in shareholders and the shareholder franchise, while "dictators" are boards and managers who want to fend off the possibility of challenge in an open market for corporate control. We employ these terms in this study.

Exhibit D1 in the Appendix provides historical relationship between index values and other firm attributes, such as market capitalization and leverage, which can also act as substitutes for explicit takeover defenses.

Why Might Takeover Defenses Affect a Firm's Creditworthiness?

One might reasonably presume that takeover defenses should affect firm performance only in unusual situations, such as cases where firms are in imminent danger of being taken over. However, takeover defenses can also have substantive effects on credit risk in more normal situations, either through a direct (negative) impact on firm value by limiting demand for a firm's stock, or through an indirect impact on firm value and firm volatility through their effect on management incentives.

One common view of takeover defenses is that they can lead to entrenched management, aggravating the problem that managers may pursue their own interests at the expense of other stakeholders. In this view, takeover defenses can dull management's incentive to work hard or to invest in profit maximizing projects. Under this view, firms with a large number of takeover defenses are expected to perform poorly compared to their peers, and their stocks and bonds should be priced more cheaply.

On the other hand, when adopting takeover defenses, directors often say that takeovers are rarely stopped by defenses. Instead, they are merely delayed, allowing the management team to negotiate the best possible price for current shareholders. According to this view, takeover defenses benefit shareholders. In this case, the effect of takeover defenses on stock valuation could be positive and the effects on bond valuation and firm operating performance may be ambiguous.

Moreover, by insulating management somewhat from the short-term pressures emanating from the stock market, the adoption of takeover defenses might allow firm management to pursue longer term strategies. Managers often receive pressure from shareholders to take on more risky projects in the hopes of gaining large short-term returns on their stocks. According to this view, takeover defenses may benefit bondholders.¹

Takeover defenses might also affect the relationships between normal shareholders and institutional blockholders that hold a substantial portion of the outstanding stock. Recent work by Cremers, Nair, and Wei suggests that where there are few takeover defenses (and/or where covenant controls are not in place), power could shift to a core shareholder if one is present; else, the takeover defenses are more benign. Specifically, they found that having more takeover defenses led to strongly lower corporate bond yields for companies with at least one institutional blockholder owning at least 5% of the outstanding stock. In the absence of such a blockholder, more takeover defenses led to slightly higher corporate bond yields.

Prior Research Shows Defenses are Associated with Lower Credit Spreads, Lower Equity Returns Prior to 2000, and Higher Equity Returns After 1999

Prior academic research on the relationship between takeover defenses and stock and bond prices has had ambiguous implications for the relationship between defenses and credit risk. Some early research based on data from the 1990s indicates that takeover defenses may be detrimental to stockholders but beneficial to corporate bondholders. However, we find that the results relating to equity returns do not hold when the period of analysis is extended to the present, and the results for the bond market are unlikely to be robust to alternative empirical models and time periods. The empirical evidence emanating from the academic literature is, therefore, ambiguous with respect to the impact of takeover defenses and credit risk.

The vast majority of previous research on takeover defenses has focused on the equity markets. Some papers indicate a negative relationship between the number of takeovers defenses and company performance, as measured by either stock returns or earnings growth during the 1990s. Specifically, firms with the fewest defenses were found to earn 9.3% more per year in stock returns than did those with the most defenses between 1990 and 1999.² Our own analysis of the correlation between stock returns and takeover defenses is present in the Appendix in Exhibit C1. Consistent with the previous studies, we find that democrats earned 8.9% greater annual stock returns than dictators during the 1990s. Perhaps surprisingly, though, we find that firms with the fewest defenses earned 14.7% lower annual returns for the period 2000 to 2003.³

1. See Stein (1988) for a discussion of takeover defenses and manager myopia.

2. For example, see Gompers, Ishii, and Metrick (2003). Cremers and Nair (2004) finds that the abnormal returns found by Gompers, et. al. are only important for firms with at least one large shareholder, defined as owning at least five-percent of the company.

3. The robustness of the findings of Gompers, et. al. have also been challenged by Brown and Caylor (2004), but they used a smaller dataset with only one cohort of data. These contradictory results appear to suggest that the observed relationships between defenses and returns have been spurious, without any structural interpretation or predictive content. Alternatively, these results could indicate that the market anticipated that stronger defenses would ultimately lead to poor performance and required a risk premium to hold stocks of companies with strong defenses; these companies therefore earned excess returns during the bull market but their fortunes were overwhelmed by the actual (expected) risk in the later period.

Relatively little research has been done on the relation between takeover defenses and bond pricing. Recent research on the relationship between the takeover index and corporate bond spreads finds the larger the number of takeover defenses, the narrower the firm's credit spread on its bonds. Each additional takeover defense was associated with a large decrease in spreads - by 20 to 33 basis points - depending on the study.⁴ The magnitude of this effect seems to indicate that much of the power of the underlying tests came from low-grade bonds, and the results might therefore only be important for a small portion of the fixed income market. Further, this finding, if it holds, suggests that fixed income investors in higher-risk securities are willing to pay a premium for the presence of takeover defenses even though they have been found to negatively affect share price. Finally, the previous studies on bond spreads did not fully account for endogeneity -- the fact that higher rated firms with lower expected credit spreads are more likely to have adopted greater takeover defenses." Moody's study, on the other hand, examines each rating category separately.

Rather than focus on the effect of defenses on bond and stock prices - which can at best only reveal the market's perception of their impact on credit risk - our paper focuses directly on the relationship between takeover defenses and realized credit risk.

More Defenses Are Associated With Higher Downgrade Rates and Higher Default Rates

Our sample is described in Exhibit 1. During the 1990-2003 period, we track 1,058 companies, with an average of about seven years of data on each. In total, we have 7,023 annual observations in which a company could have experienced a rating change or outright default. In order to focus on large, unforeseen credit events, we define a rating upgrade or downgrade for the purposes of this study as a movement of at least three alpha-numeric rating notches over the course of a single year. In our sample, for example, there were 304 total downgrades of three or more notches, representing 254 unique issuers. Though there were over 1,400 bond defaults among Moody's-rated issuers during the 14-year period, data on corporate takeover defenses is available only for a limited number of large, public, and relatively highly rated companies. We are therefore able to identify only 69 defaulting companies in our sample. The results for downgrade rates are, therefore, likely to be both economically and statistically more meaningful than the results for default rates, especially for the investment-grade firms.

Exhibit 1: Sample Description and Frequencies of Credit Events

	Total Observations				Unique Issuers			
	Annual Observations	Large Downgrades	Large Upgrades	Defaults	Issuers	Large Downgrades	Large Upgrades	Defaults
Overall	7,023	304	78	69	1,058	254	70	69
Investment Grade	4,689	144	28	6	644	132	27	6
Speculative Grade	2,334	160	50	63	597	144	45	63

Exhibit 2 provides various one-year credit event rates - downgrade, upgrade and default rates - by rating category associated with firms that had different levels of takeover defenses in place.⁵ Following Gompers, the table groups firms into four categories - democrats, middle-low, middle-high and dictators - which correspond to firms with takeover defenses that number fewer than or equal to 5, greater than 5 but less than 10, greater than 9 but less than 14 and greater than 13, respectively. Exhibit 3 presents the number of observations for each rating and takeover index category pair.⁶

4. For example, see Klock, Mansi, and Maxwell (2004) and Cremers, Nair, and Wei (2004). The scarcity of bond data means that results in studies are strongly influenced by the structure of controls used and cannot identify significant effects within individual rating categories.

5. Credit event rates by rating category for the entire Moody's universe are also provided in the Appendix for comparison. Credit event rates and takeover defenses are also reported separately for the 1990s and post-1990s in the Appendix. The major difference in results between the two time periods is that stronger takeover defenses were associated with additional credit risk more for investment-grade firms in the 1990s and more for speculative-grade firms after 1999.

6. The number of observations can be used to calculate significance. For example, the difference in downgrade rates for Ba democrats and middle-high firms is (7.90 - 2.90) = 5.00%. This corresponds to a t-statistic of 2.83 indicating that the difference is strongly significant (< 1%).

Exhibit 2: Annual Large Downgrade, Large Upgrade, and Default Rates by Rating Category (1990 – 2003)

	Downgrades				Upgrades			
	Democrats	Middle Low	Middle High	Dictators	Democrats	Middle Low	Middle High	Dictators
Aaa	0	3.5%	0	.	0	0	0	.
Aa	1.7%	2.8%	1.4%	0	0	0	0.5%	0
A	2.4%	2.6%	2.8%	1.7%	0	0.2%	0.1%	0.0%
Baa	0	3.1%	4.7%	3.1%	1.4%	1.0%	1.4%	0.4%
Ba	2.9%	6.0%	7.9%	7.6%	2.9%	1.8%	1.7%	1.5%
B	4.5%	7.4%	8.2%	7.3%	2.3%	3.3%	2.5%	0
IG	1.4%	2.9%	3.4%	2.4%	0.5%	0.6%	0.7%	0.2%
SG	3.5%	6.5%	8.0%	7.5%	2.6%	2.4%	1.9%	0.9%

	Defaults			
	Democrats	Middle Low	Middle High	Dictators
Aaa	0	0	0	.
Aa	0	0	0	0
A	0	0	0	0
Baa	0	0.1%	0.4%	0.4%
Ba	1.4%	1.5%	1.5%	1.5%
B	4.5%	4.3%	6.4%	2.4%
IG	0.0%	0.1%	0.2%	0.2%
SG	2.6%	2.5%	3.0%	1.9%

Exhibit 3: Number of Observations for Each Average Calculated in Exhibit 2

	Total Number of Annual Observations				Unique Issuers			
	Democrats	Middle Low	Middle High	Dictators	Democrats	Middle Low	Middle High	Dictators
Aaa	9	57	48	0	3	11	8	0
Aa	58	181	218	4	11	31	44	2
A	82	580	1,108	180	20	131	198	36
Baa	71	769	1,096	228	29	186	274	46
Ba	139	670	657	66	57	228	204	28
B	88	392	281	41	36	162	113	15
IG	220	1,587	2,470	412	52	291	405	71
SG	227	1,062	938	107	76	318	257	34

Note: Democrats employ five or fewer defenses; Middle-low companies employ 6 to 9 defenses; Middle-high companies employ 10 to 13; and dictators employ 14 or more.

The association of takeover defenses with downgrade rates appears fairly strong. The probability of a downgrade increases as the number of takeover defenses increases for all rating categories. For issuers rated single A or below, as well as for investment-grade and speculative-grade credits in aggregate, "high" firms were more likely to be downgraded than "middle-low" firms with the same rating and middle-low firms are more likely to be downgraded than democrats with the same rating. The majority of this effect, however, is isolated in the democrats' column, and democrats comprise only about 5% of the overall sample. Moreover, in contrast to general result that more takeover defenses lead to more downgrades, we find that dictators had lower downgrade rates than middle-high firms. Again, we see that the positive relationship between defenses and downgrade risk is primarily driven by the democrats. Democrats rated Baa and lower had lower downgrade rates than firms one to two rating categories higher. For example, Baa democrats were downgraded slightly less often than typical Baa firms.

The relationship of the takeover index with upgrades follows the opposite pattern. More takeover defenses correspond to lower upgrade rates and the relationship is driven primarily by the behavior of the dictators. However, there are many fewer upgrade observations overall, so the results are not as statistically significant as those for downgrades.

Default risk also appears to be higher for firms with greater numbers of takeover defense although the relationship is much weaker than that observed for downgrades. As there are only 69 defaults in the sample, it is difficult to extract meaningful results. Still, the relationship is strongest for the B-rated firms, where the majority of defaults originate.

It is, of course, possible that our results relating takeover defenses and credit for may be spurious, reflecting only differences in the prevalence of takeover defenses across industries and differences in industry credit risk. However, we believe this is unlikely because the proportion of firms in each industry does not change significantly across the takeover groupings.

Probit Regressions: The Positive Relationship is Statistically Significant

In this section, we further explore the relationship reveal between credit risk and takeover defenses suggested in Exhibit 2 through regression analysis. We estimate a number of probit regressions that take the following form:

$$\text{Probability of Downgrade, Upgrade, or Default} = \Phi(\alpha + \beta * \text{takeover} + \text{controls}' B) + \mathcal{E}$$

Unlike a standard regression, the use of Φ , the cumulative normal function, constrains the output to be between zero and one, much like a probability. Defenses in the regression are the number of takeover defenses in use by a firm at the beginning of the year. The dependent variable is one or zero depending on whether the firm experienced a credit event or not during the year. The coefficients for the control variables are not shown in the exhibit, so as to focus attention on effects of takeovers on credit risk.⁷ The controls consist of annual dummies to compensate for the changing credit environment as well as rating dummies in the left hand panel to account for the different levels of volatility across the rating spectrum.

The results are presented in Exhibit 4. The generally positive coefficient estimates on the takeover index for the downgrade and the default regression suggest that stronger defenses increase credit risk (as do the generally negative coefficients in the upgrade regressions). The results on downgrades are the most consistent: all the estimated coefficients in the downgrade columns are positive - for the overall sample and the investment-grade and speculative-grade sub-samples, both with and without controlling for ratings.

Exhibit 4: Estimated Coefficients on the Takeover Index from Probit Regressions Relating the Takeover Defense Index to Credit Risk: 1990-2003

	With Rating Dummies			Without Rating Dummies		
	Downgrades	Upgrades	Defaults	Downgrades	Upgrades	Defaults
Overall	0.023	-0.001	0.011	0.009	-0.022	-0.031
t-statistic	2.12	0.00	0.54	0.84	1.30	1.71
Investment Grade	0.011	0.016	0.060	0.013	0.019	0.060
t-statistic	0.71	0.56	1.04	0.86	0.69	1.04
Speculative Grade	0.036	-0.011	0.003	0.036	-0.014	-0.004
t-statistic	2.43	-0.43	0.14	2.23	-0.58	-0.21

However, aside from the effects of takeovers on speculative-grade issuer downgrade rates, few of these results appear to be significant based on standard statistical measures. Estimated coefficients are generally thought to be significantly different from zero if the associated t-statistic exceeds about 2.0.

The estimated effects of takeover defenses on upgrade rates and downgrade rates are generally not statistically significant because of the scarcity of events. Having said that, the sign on the overall results are as expected: stronger defenses are associated with fewer upgrades and more frequent defaults when rating dummies are included as control variables.

One of the most significant features of the data revealed in Exhibit 2 is that the probability of a credit event is significantly smaller for dictators than would be expected from a simple linear relationship. This is true for downgrades, upgrades, and defaults as well within the investment-grade firms and speculative-grade sub-samples. We explored several different potential explanations for this anomaly, such as the possibility that certain low-volatility industries were over-represented in the dictator group, but we were unsuccessful in "making the anomaly go away." Exhibit 5 highlights this anomaly by re-estimating the relationship between credit events and the takeover defense index and an additional control dummy indicator which takes the value of one when the takeover index is 14 or higher (i.e., the firm is a dictator). The probit regression also controls for ratings and the year of the observation. The specific model presented is:

$$\text{Probability of Downgrade, Upgrade, or Default} = \Phi(\alpha + \beta * \text{takeover} + \gamma * \text{dictator} + \text{controls}' B) + \mathcal{E}$$

The positive effect of increases in the takeover index on downgrade rates now appears stronger. Although there is now an estimated decrease in the downgrade rate once the number of takeovers reaches 14. For upgrade rates, it now appears the negative effect of stronger takeover defenses is due entirely to the behavior of the dictators who are much less likely to be upgraded than similarly rated credits. The result for defaults closely corresponds to those for downgrades but they remain statistically insignificant.

7. Alternative specifications are analyzed in the Appendix where market capitalization, leverage, operating margin, firm age, and interest coverage were also used for controls. The estimated effects of defenses on credit risk in the presence of these additional controls are somewhat stronger than those presented in Exhibit 4.

Exhibit 5: Estimated Coefficients on the Takeover Index and a Dictator Indicator Variable from Probit Regressions Relating These Variables to Credit Risk: 1990-2003

	Downgrades		Upgrades		Defaults	
	Takeover Defense Index	Dictator Dummy Variable	Takeover Defense Index	Dictator Dummy Variable	Takeover Defense Index	Dictator Dummy Variable
Overall	0.033	-0.223	0.014	-0.440	0.017	-0.110
t-statistic	2.62	-1.74	0.70	-1.56	0.73	-0.43
Investment Grade	0.024	-0.235	0.048	-0.620	0.069	-0.110
t-statistic	1.34	-1.43	1.37	-1.59	0.87	-0.21
Speculative Grade	0.044	-0.175	-0.002	-0.331	0.010	-0.250
t-statistic	2.36	-0.81	-0.08	-0.76	0.39	-0.70

Conclusion - Greater Takeover Defenses Have Been Associated With Increased Credit Risk, but the Relationship Appears Weak

Credit risk is found to have been positively related to the number of takeover defenses. Having more takeover defenses led to more defaults and more large downgrades for both investment-grade and speculative-grade firms. Further, more defenses led to fewer large upgrades. These effects are present, even after controlling for credit ratings.

However, these results suggesting that stronger takeover defenses adversely impact credit risk should be interpreted with great caution. Their theoretical basis is ambiguous and the magnitudes of the discovered effects are modest. Further, the use of takeover defenses by firms continues to change and so results based on previous years might not hold in the future. For example, firms currently employ more takeover defenses than they did ten years ago. Also, the effect and meaning of takeover defenses depends highly on the specific circumstances of each firm as well as the firm's overall corporate governance structure. The impact of takeover defenses will therefore be highly contingent on specific context, suggesting that a case-by-case approach may be more useful than broad assumptions of impact on credit quality.

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Appendices

A. List of Takeover Defenses

The takeover defenses are fully described in Gompers, et. al. (2003)⁸. Delay defenses are intended to slow down the takeover process. Protection and other defenses are intended to increase the cost of a takeover. Voting defenses are intended to diminish the likelihood of a takeover coming to a vote. Finally, state defenses are laws in the state of incorporation.

Exhibit A1: List of Takeover Defenses

Delay	Protection	Voting
Blank Check Classified Board Special Meeting Written Consent	Compensation Plans Contracts Golden Parachutes Indemnification Liability Severance	Bylaws Charter Cumulative Voting Secret Ballot Supermajority Unequal Voting

Other	State
Anti-Greenmail Directors' Duties Fair Price Pension Parachutes Poison Pill Silver Parachutes	Anti-Greenmail law Business Combination Law Cash-Out Law Directors' Duty Law Fair Price Law Control of Share Acquisitions Law

B. Aggregate Downgrade, Upgrade, and Default Rates for Moody's Corporate Bond Issuers

If the probability of a credit event did not depend on rating category, we would not need to control for ratings in our tests. Exhibit B1 shows that the probability of a credit event increases monotonically from higher ratings to lower ratings and so we need to control for ratings in all any test that we conduct. In other words, lower rated firms are in all ways more volatile.

Exhibit B1: Credit Risk 1990 - 2003

	Downgrades	Upgrades	Defaults
Aaa	1.71%	0.00%	0.00%
Aa	2.13%	0.21%	0.00%
A	2.40%	0.10%	0.00%
Baa	3.67%	0.94%	0.27%
Ba	6.10%	1.78%	1.53%
B	6.39%	2.21%	5.11%
Caa-C	11.46%	3.13%	28.13%

8. A preliminary version of the Gompers, et. al. paper can be found at www.ssrn.com.

C. Stock Returns and the Takeover Index

Exhibit C1 shows the excess stock returns for each of the four takeover categories.⁹ The far left results correspond to those presented by Gompers, et. al. (2003) and the difference between dictators and democrats of 8.9% per year is consistent with their results. Firms with fewer takeover defenses earned much higher returns than their compatriots. They also earned higher returns per unit of stock return variability as expressed by the Sharpe ratios. The middle two columns represent an update of the study for the four-year period beginning in January 2000. The results here are dramatic and opposite to those during the nineties. Dictators earned 14.7% more per year than democrats. When the two periods are combined, as in the far right columns, there is no longer a strong relationship between defenses and stock returns.

Exhibit C1: Average Excess Stock Returns and Sharp Ratios by Number of Takeovers

	1990 - 1999		2000 - 2003		1990 - 2003	
	Excess Return	Sharpe Ratio	Excess Return	Sharpe Ratio	Excess Return	Sharpe Ratio
Democrats	23.5%	1.36	1.3%	0.68	16.9%	1.17
Middle Low	22.9%	1.39	4.3%	0.59	17.4%	1.17
Middle High	20.4%	1.21	7.2%	0.66	16.4%	1.04
Dictators	14.7%	1.17	16.0%	0.87	15.1%	1.09

For comparison with Exhibit C1, we provide the average, value-weighted returns for portfolios created based on Moody's ratings in Exhibit C2. The portfolios are rebalanced monthly so as to adjust for firms which migrate to other rating categories, default, or have their ratings withdrawn. The far left columns correspond in timing to Gompers, et. al. (2003) study on takeover defenses. The spread of about 20% between the extremes contrasts strongly with the Gompers, et. al. results, and, unlike the Gompers findings, the negative relationship between ratings and returns holds for each sub-period.

Exhibit C2: Average Excess Stock Returns by Takeovers Rating Category

	1990 - 1999		1990 - 2003		2000 - 2003	
	Excess Return	Sharpe Ratio	Excess Return	Sharpe Ratio	Excess Return	Sharpe Ratio
Aaa	19.5%	1.56	12.2%	1.20	-4.6%	0.27
Aa	16.6%	1.10	12.5%	0.93	2.7%	0.48
A	17.6%	1.12	14.3%	0.97	6.4%	0.58
Baa	20.1%	1.00	16.0%	0.88	5.9%	0.56
Ba	27.3%	1.40	24.9%	1.23	19.0%	0.80
B	37.3%	1.68	32.0%	1.65	19.3%	1.56

D. Empirical Predictors of the Takeover Index

What characteristics of a firm make it more likely to adopt a larger number of takeover defenses than other firms? When examining individual firms, it is important to recognize that other firm attributes have long been recognized as takeover defenses in their own rights. For example, firms with large market capitalizations are much more difficult to buy. Further, highly leveraged firms are typically unattractive takeover targets. The traditional takeover target is often described as being relatively small, having low leverage, and underperforming its peers.

Exhibit D1 summarizes our findings on the relationship between the takeover index and other variables. The dependent variable is the takeover index.¹⁰ We have included two variables for age because, since about 1982, firms have been slowly acquiring takeover defenses. There are few differences in the defense structure of a thirty-year old company and a forty-year old company, other company aspects being held constant. The historical default rates

9. These average annualized stock returns correspond to investing in value-weighted portfolios re-balanced monthly. The takeover index is assumed to be constant between data updates, consistent with the existing practices.

10. There are several methods for conducting this regression, most of which overstate the importance of the variables used. We conducted the regression once for each cohort of the GIM index (1990, 1993, 1995, 1998, 2000, and 2002) and averaged the coefficients and t-statistics. The results for the pooled regression are similar except that the t-statistics were approximately three times larger. When the method of Fama and MacBeth (1973) was used, the t-statistics were approximately six times higher than those reported.

The main conclusion from this table is that the magnitude of the takeover index varies predictably but that the low R2 indicates that the index is sufficiently independent of other credit risk related variables that including these variables in our methodology would be useful but not necessary. Market capitalization appear to be substitutes for takeover defenses though leverage is only very weakly so. Older firms definitely have more defenses. The variable representing Moody's corporate bond ratings were transformed so that the variable in the regression actually represents the default rate for the category. To conduct this transformation, we replaced the alphanumeric rating (Aaa to C) with its historical, one-year default rate. These one-year default rates were smoothed slightly along an exponential curve to ensure that all ratings had positive default probabilities, even if the probabilities were essentially negligible. Surprisingly, there is a strong relationship between default risk and the takeover index. Higher rated firms have more takeover defenses.

Exhibit D1: Predicting the Number of a Firm's Takeover Defenses

Variable	Coefficient	T-stat
Constant	14.36	9.33
Historical Default Rates by Rating Category	-0.31	-3.68
Ln(Market Cap)	-0.33	-3.37
Age (years)	0.10	3.40
Old (Age > 20)	1.44	4.09
Leverage > 50%	-0.55	-1.33
	Adjusted-R ²	8.45%

E. Empirical Results for Sub-Samples and Extended Control Sets

Exhibits E1 and E2 repeat Exhibits 2 and 3 for the periods of January 1990 through December 1999 and January 2000 through December 2003.

Exhibit E1: Annual Large Downgrade, Large Upgrade, and Default Rates by Rating Category

1990 - 1999	Downgrades				Upgrades				Defaults			
	Democrats	Middle Low	Middle High	Dictators	Democrats	Middle Low	Middle High	Dictators	Democrats	Middle Low	Middle High	Dictators
Aaa	0	4.9%	0	—	0	0	0	—	0	0	0	—
Aa	2.0%	0.7%	0.6%	0	0	0	0	0	0	0	0	0
A	0	2.0%	2.3%	1.4%	0	0.2%	0.1%	0.0%	0	0	0	0
Baa	0	1.2%	3.0%	2.0%	0	1.0%	1.6%	0.7%	0	0.2%	0.2%	0
Ba	2.7%	4.9%	4.9%	7.0%	1.8%	1.6%	1.8%	2.3%	1.8%	1.6%	1.5%	2.3%
B	5.1%	4.0%	4.8%	8.7%	3.4%	3.0%	2.7%	0	5.1%	5.9%	7.5%	4.3%
Investment Grade	0.6%	1.6%	2.3%	1.7%	0.0%	0.5%	0.7%	0.3%	0.0%	0.1%	0.1%	0.0%
Speculative Grade	3.5%	4.6%	4.8%	7.6%	2.3%	2.0%	2.0%	1.5%	2.9%	2.9%	3.0%	3.0%

2000 - 2003	Downgrades				Upgrades				Defaults			
	Democrats	Middle Low	Middle High	Dictators	Democrats	Middle Low	Middle High	Dictators	Democrats	Middle Low	Middle High	Dictators
Aaa	0	0	0	—	0	0	0	—	0	0	0	0
Aa	0	11.1%	4.4%	0	0	0	1.7%	0	0	0	0	0
A	10.5%	4.7%	4.0%	2.4%	0	0	0	0	0	0	0	0
Baa	0	6.9%	7.2%	5.2%	3.7%	1.5%	1.7%	0	0	0	0.7%	1.3%
Ba	3.8%	8.0%	14.7%	8.7%	4.9%	3.0%	1.9%	3.6%	0	1.3%	1.5%	0
B	3.4%	11.1%	11.9%	5.6%	0	5.0%	2.0%	0	3.4%	2.6%	5.2%	0
Investment Grade	4.2%	6.4%	5.7%	4.1%	1.4%	0.9%	1.0%	0.0%	0.0%	0.0%	0.4%	0.8%
Speculative Grade	3.6%	9.4%	13.6%	7.3%	2.6%	3.8%	2.0%	2.1%	1.8%	1.9%	3.0%	0

Exhibit E2: Number of Observations

1990 - 1999	Total Observations				Unique Issuers			
	Democrats	Middle Low	Middle High	Dictators	Democrats	Middle Low	Middle High	Dictators
Aaa	6	41	38	0	2	9	6	1
Aa	49	145	173	2	10	29	36	1
A	63	452	783	138	18	106	158	30
Baa	54	509	668	151	23	130	171	38
Ba	113	445	453	43	48	172	142	18
B	59	202	147	23	22	80	55	8
Investment Grade	172	1,147	1,662	291	46	230	303	60
Speculative Grade	172	647	600	66	60	220	167	22
2000 - 2003	Democrats	Middle Low	Middle High	Dictators	Democrats	Middle Low	Middle High	Dictators
Aaa	3	16	10	0	1	5	5	1
Aa	9	36	45	2	5	12	19	1
A	19	128	325	42	7	55	122	15
Baa	17	260	428	77	11	111	192	28
Ba	26	225	204	23	16	105	99	12
B	29	189	134	18	15	99	69	8
Investment Grade	48	440	808	121	21	163	294	40
Speculative Grade	55	414	338	41	26	178	145	18

Exhibit E3 repeats Exhibit 5 for the periods of January 1990 through December 1999 and January 2000 through December 2003.

Exhibit E3: Probit Regressions for Sub-Samples

	Downgrades		Upgrades		Defaults	
	Takeover Defense Index	Dictator Dummy Variable	Takeover Defense Index	Dictator Dummy Variable	Takeover Defense Index	Dictator Dummy Variable
1990 - 1999						
Overall	0.033	-0.112	0.038	-0.398	-0.025	-0.025
t-statistic	1.88	-0.66	1.45	-1.31	-0.95	-0.07
Investment Grade	0.042	-0.273	0.084	-0.645	-0.037	-4.129
t-statistic	1.70	-1.23	1.80	-1.53	-0.35	0.00
Speculative Grade	0.021	0.180	0.022	-0.244	-0.011	0.069
t-statistic	0.84	0.63	0.64	-0.51	-0.38	0.17
2000 - 2003						
Overall	0.034	-0.359	-0.029	-4.952	0.073	-0.354
t-statistic	1.79	-1.84	0.82	0.00	1.71	-0.85
Investment Grade	0.002	-0.190	-0.011	-4.868	0.192	-0.342
t-statistic	0.08	-0.78	-0.20	0.00	1.38	-0.53
Speculative Grade	0.070	-0.577	-0.043	-5.106	0.059	-5.569
t-statistic	2.52	-1.75	-0.96	0.00	1.24	0.00

Exhibit E4 repeats the probit regressions with the control variables market cap, age, and leverage included. This dataset is more limited in that it only has 209 downgrades, 57 upgrades, and 33 defaults. Of these, only 120, 20, and 4 originated from investment-grade respectively.

Exhibit E4: Probit Regressions with a Larger Set of Control Variables

	Downgrades		Upgrades		Defaults	
	Takeover Defense Index	Dictator Dummy Variable	Takeover Defense Index	Dictator Dummy Variable	Takeover Defense Index	Dictator Dummy Variable
1990 - 2003						
Overall	0.045	-0.228	0.057	-0.791	0.085	-0.021
t-statistic	2.71	-1.52	2.11	2.10	2.25	-0.06
Investment Grade	0.030	-0.322	0.109	-0.766	—**	—
t-statistic	1.43	-1.69	2.24	1.82	—	—
Speculative Grade	0.081	0.050	0.010	—*	0.098	-0.221
t-statistic	2.84	0.18	0.31	—	2.28	0.48

* Regression results were unachievable for specifications that included the dictator dummy.

** Results unachievable.

Related Research

Special Comments:

[U.S. and Canadian Corporate Governance Assessment, August 2003 \(78666\)](#)

[Moody's Findings on Corporate Governance in the U.S. and Canada, October 2004 \(89113\)](#)

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.

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