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Coupon Resets Versus Poison Puts: The Valuation of Event Risk Provisions in Corporate Debt

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This paper examines the valuation of the two major types of event risk indenture provisions, poison puts and coupon resets, on the debt of industrial companies. In contrast with earlier work by Crabbe (1991), we find that protection provided by poison put type of covenants is not valued by investors. The inclusion of coupon reset provisions, however, lowers the yield spread of new issued industrial bonds by 32 basis points. The yields on bonds with low credit quality ratings are reduced by including coupon reset provisions in the bond indentures.

I. INTRODUCTION

During the 1980's event risk became a topic of concern among bondholders, analysts, and investment bankers. Event risk refers to management actions or other events that increase the firms' leverage or otherwise increase the risk of a company. The record number of takeovers and corporate restructurings produced numerous instances of substantial capital losses for bondholders. Event risk has continued to be headline news in the 1990's, as evidenced by Marriott's plan to restructure into two companies, one burdened with almost all of the existing debt. As a result, *Moody's* downgraded Marriott's bonds to junk, and the price of the bond plunged from $1100 to $800 (Mitchell, 1992).

In order to protect themselves from potential capital losses due to event risk, bondholders sought protective covenants that would limit the financial effect of restructurings and other adverse managerial actions. Metropolitan Life Insurance Company, for example, declared that it would no longer purchase debt instruments without covenants that would protect it against event risk (Winkler & Herman, 1988). A recent article by Crabbe (1991) examined the pricing of new bonds that contained poison put provisions, which provide

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event risk protection. He concluded that put provisions significantly reduced the yield on new debt after controlling for differences in bond and issuer characteristics.

However, event risk covenants are not standard. The strength of protection and the value of poison put provisions depend upon the characteristics of the provision and the economic environment for restructuring. This study refines previous work by examining the differences in market valuation for the two major types of event risk protective covenants—poison puts and the more recently developed coupon resets. Poison puts are indenture provisions that require the issuing firm to repurchase debt at face value if a named event occurs. Coupon resets do not mandate that the bond issue be repurchased, instead they require that the bond interest rate be reset if there is a lowering in the *Moody's* or *Standard and Poor's* credit rating.

In addition, the study examines the impact of the RJR/Nabisco takeover on the pricing of event risk covenants. The RJR/Nabisco takeover is the largest ever and illustrates that even the largest companies are subject to takeover attempts. To many, it is considered a watershed event with respect to event risk.

This study extends Crabbe's sample period, November 1988 to December 1989, to include data from 1986 through 1990. This doubles the available sample of bonds with event risk protection, allowing us to examine the pricing of put provisions in bonds issued both pre- and post-RJR/Nabisco. The sample also allows us to examine coupon reset provisions which are not available to Crabbe. Additionally, this sample provides for an examination of more diverse covenants including both very strong and very weak event risk covenants that are not found in Crabbe's original sample.

Unlike Crabbe, the results of this paper indicate that poison put provisions are not valued by investors. In fact, our results indicate that, before the RJR/Nabisco takeover, bonds with poison put provisions sold at penalty yields. Bonds with coupon reset provisions, which appeared after the RJR/Nabisco takeover, however, sold at yields below similar bonds without event risk protection. Additional hypotheses tested in the paper are: (1) whether the value of event risk protection changes as the strength of the protection provided by the covenants change and (2) whether there is a relationship between credit quality and event risk protection.

The issue of the event covenant's value has particular implications for the individual investor as monitoring for the individual is a significant cost factor. Often the individual uses an intermediation device to avoid such costs. The existence of complex bond covenants limits the ability of individuals to monitor and evaluate management's actions with regard to bond holders' wealth (Smith & Warner, 1979). This classic agency/monitoring cost problem (Jensen & Meckling, 1976) is mitigated by effective put provisions.

Under such arrangements, management must maximize the wealth of shareholders subject to a constraint that limits the ability of shareholders to profit at the expense of bondholders.

The paper is organized as follows. Section II presents background of event risks covenants in corporate debt. Section III discusses the factors that are expected to affect the valuation of event risk covenants. Section IV develops the hypotheses to be tested. Section V describes the sample and data. Section VI contains the methods used to test the hypotheses. Section VII presents the findings and the final section reports the conclusions.

II. BACKGROUND INFORMATION ON PROTECTIVE COVENANTS

Bondholder Protection

The stockholder bondholder conflict has been studied by numerous authors, most notably Fama and Miller (1972). This area of research points out that the manager's primary responsibility is to maximize shareholder's wealth. In a study of contractual relationships with bondholders, Lehn and Poulsen (1991) find that courts generally rule that the company's board of directors does not have the responsibility of protecting bondholders. Bondholder protection against adverse actions of the corporation is limited to provisions of the bond indenture. Smith and Warner (1979) examine the indenture provisions of corporate bonds and find a wide variety of clauses regarding the rights and protection of bondholders. Depending on the design of the individual indenture provisions, the bondholder may have substantial or inconsequential protection against wealth transfers. Unless bond indentures have protective covenants, managers may increase shareholder wealth at the expense of bondholders by increasing the risk level of existing bonds in one of four ways:

1) increasing dividends to shareholders, beyond the level expected by bondholders;
2) selling additional bonds at the same or higher priority than existing bonds;
3) substituting risky assets for low risk assets; and
4) underinvesting in new projects where the payoff would be available to bondholders.

When determining the value of protection provided by the different types of event risk provisions, one must consider the terms of the covenant, the probability that the event risk covenant will be triggered, and the financial and operating characteristics of the firm. Another consideration is the potential for extreme financial burden from reissuing bonds for firms that have undergone a credit deterioration.

Bond covenants offer wide variation in the type and quality of event risk protection. Apart from the triggering requirement, the primary differences between the two major types of protection, coupon resets and put provisions, are the type of triggering events that activate the provision. Some coupon resets require only a change in rating or a change in rating below investment quality to become active. Poison put provisions, however, require both the occurrence of a named event and a decline in bond rating to trigger the covenant. Coupon resets generally provide high levels of protection, while poison puts tend to offer low levels of protection.

Event Risk Ratings

In order to provide bondholders with more information about event risk protection, *Standard and Poor's* (*S&P*) has developed a system to rank the quality of the protection provided by the covenants. This system provides five possible rankings with E1 indicating the highest quality protection against event risk and E5 indicating the weakest protection.

All bonds with an E1 event risk ranking are coupon reset type of event risk protection. These bonds include indenture provisions that require the firm to reset the coupon rate following a change in the firms bond credit rating. The cause of the downgrade is immaterial, so that all types of events are covered by these indenture provisions. The comprehensive

TABLE 1.
Bond Coupon Reset Provisions for Enron Corporation
9.5 Percent Credit Sensitive Notes Due 2001

S&P Credit Rating	*Moody's Credit Rating*	*Applicable Rate for Coupon Reset*	*Interest Rate Differential above AAA Rating (in basis points)*
Investment Grade			
AAA	Aaa	9.20%	—
AA+ to AA–	Aa1 to Aa3	9.30%	10
A+ to A–	A1 to A3	9.40%	20
BBB+ to BBB–	Baal to Baa3	9.50%	30
Noninvestment Grade			
BB+	Ba1	12.00%	280
BB	Ba2	12.50%	330
BB–	Ba3	13.00%	380

Source: Prospectus supplement for Enron Corporation, May 31, 1998.

scope of this type of coupon reset provides protection against ordinary credit erosion resulting from fundamental business deterioration as well as from leveraged buyouts or other events. However, the E1 ranking does not provide protection against all risk. Bonds are still subject to both liquidity and default risk.

The E1 protective covenant includes a schedule of coupon interest rates for each level of bond rating, and the triggering event is any change in the bond rating. The interest rate reset is largest as the bond rating crosses from investment to speculative grade. For example, Enron Corp., 9.5 percent credit sensitive notes due in 2001 were issued in June 24, 1989 with a *S&P* credit rating of BBB– and a *Moody's* rating of Baa3. The indenture provision provides that if the bond rating changes, the coupon rate for the bond will also change according to a set schedule. Table 1 shows that interest rate penalty yields are quite small when a credit declines within the investment grades. However, a substantial penalty applies when credit quality drops below investment grade.

Most bonds that qualify for an E2 ranking also have a coupon reset structure.[1] Bonds with E2 rankings require a designated event in addition to a rating downgrade to speculative grade before triggering the protection. If the bond already has a speculative grade credit rating, a downgrade of one full rating category will trigger the coupon reset. Bondholders must absorb any loss from credit deterioration within the range of investment quality ratings. The scope of the designated events for E2 bonds is broad and may include: acquisition of a specified percentage of voting control, change in majority of the board of directors, merger, consolidation, asset transfer, specified types of acquisitions, and large special dividends or stock repurchases. The specified thresholds for these events are sufficiently low so that they provide protection against major changes in credit quality, including changes brought about by a series of transactions over a multi-year period.

The E3 bonds generally have poison put type structures and are protected against many of the same events as E2 bonds.[2] The thresholds for triggering the E3 covenants, however, are high enough that the bond can fall below investment grade as a result of an event or series of events that will not trigger the protection. The E3 ranking bonds generally include put at par provisions triggered by designated events in conjunction with a rating downgrade from investment grade to speculative grade by *Moody's* and/or *S&P*. Some E3 bonds are also

triggered if the rating is withdrawn or if a speculative bond is downgraded one full rating category. Bondholders must absorb any loss from credit deterioration within investment grade. Most E3 bonds require that rating changes occur a minimum of 90 days before or after the designated event to trigger the protective covenant. The lack of a designated event covering acquisitions by the issuers may keep a bond from qualifying at a higher ranking.

Most E4 ranked bonds are similar in structure to those found in the E3 category. These bonds allow the holder to put the issue at par with the occurrence of designated events and a rating downgrade below investment grade. The event thresholds allowed under an E4 bond, however, are generally higher than those of E3. Thus, the company can undertake actions which cause a deterioration in credit quality to speculative grade without triggering the put. Often the protection is not triggered unless the bond has a speculative rating by both *Moody's* and *S&P*. In some cases, such as UAL and Coastal Corporation, the put is triggered by a change in control along with a rating downgrade.

Bond's with E5 rankings provide very little or no protection to bondholders. These bonds allow a put at par in the event of a change in control that is not approved by a majority of continuing directors. Generally, board approval is ultimately granted even in the case of initially hostile takeovers; therefore, the probability of triggering this put is low. Many credit damaging events, such as major recapitalizations, special dividends and debt financed acquisitions are not covered. Armstrong World Industries, for example, issued an E5 ranked bond for which the put protection requires the directors to first pass a resolution stating that the relevant event risk indenture article applies to the debentures. Thus, there is no assurance that the protective provisions will be activated.

III. THE POISON PUT OPTION AND FACTORS WHICH INFLUENCE ITS VALUE

Theoretical Development

The valuation of options that provide protection to bondholders when there is a violation of an indenture covenant has been studied by Black and Cox (1976) and Mason and Bhattacharya (1981). Bicksler and Chen (1992) extend previous work on protective covenants by developing a theoretical model to specifically examine the valuation of bonds with event risk provisions. They argue that the value of a bond with an event risk provision has well defined upper and lower boundaries.

If no event occurs and the firm remains solvent, the value of the bond is simply the set of cash flows promised at the inception of the security. If a specified event occurs, the value of the security equals the repurchase price specified in poison put or the capitalized value of the bond with a reset interest rate. If the company has insufficient assets to fully redeem the bond issue, the value of the security equals the value of the firm. Given that there is some probability of triggering the provision and a positive firm value, the addition of an effective event risk provision may increase the issue price of the bond.

The RJR/Nabisco Effect

Because expectations play a major role in the valuation process, a large unexpected event is likely to change substantially investor perceptions of the probability that unprotected bondholders will suffer capital losses. Such an event occurred in October of 1988 when

RJR/Nabisco management announced a leveraged buyout offer and a few weeks later Kohlberg, Kravis, and Roberts (KKR) launched a successful $25 billion takeover of RJR/Nabisco—the largest takeover ever. During the takeover, the value of the firm's debt declined by $800 million or almost 40 percent.[3] In many ways the RJR/Nabisco takeover is a watershed event because of the magnitude of bondholder losses even for the largest of companies. The size of the transaction and the fact that management completed a major financing program only months before they announced their intention to take the company private, appeared to have increased bondholder concern about event risk. For the five months following the takeover, the average weekly volume of new investment grade corporate bonds fell from $555 to $255 million.[4] Also, following the takeover, stronger poison put as well as coupon reset provisions were developed and companies increased the use of event risk protection in new bond issues.[5]

IV. HYPOTHESES

The value of a poison put provision depends in part on expectations about the environment for corporate control when the bond is issued. We posit that prior to the RJR/Nabisco takeover, investors' fear of event risk was lower. Based on the *S&P* event risk rankings, the pre-RJR/Nabisco event risk covenants provided only limited protection. Following the RJR/Nabisco takeover, the frequency of event risk provisions increased and the quality of the protection provided by the provisions improved.

The first hypothesis tests whether investors' perception of event risk changed following the RJR/Nabisco takeover. If investors perceive that there is a high probability of triggering the event risk covenant and that the covenant provides adequate protection, then the inclusion of the event risk covenant should reduce the cost of borrowing. If investors believe that the probability of the triggering event is low or that the event risk provision provides ineffective protection, the event risk covenant should not affect the bond's yield. Finally, if the inclusion of a protective covenant provides a signal that the potential for event risk is high and the protection to bondholders is low, investors will demand a higher yield for bonds containing these indentures. We posit that the economic environment for takeovers should affect the market for takeover protection. Therefore, following the RJR/Nabisco takeover, companies providing effective protection against event risk may issue new debt at lower yields.

The second hypothesis tests whether the value of an event risk provision is related to the type of event risk covenant. Specifically, coupon resets provide stronger protection, and issues with stronger event risk protection should provide greater value for the bondholder. Therefore, bonds with coupon reset covenants should have lower yields than bonds with poison put covenants.

The third hypothesis tests whether the value of a poison put provision is related to the quality of the event risk protection provided in the bond indenture. Poison put provisions contain a wide range of protection and, again, stronger protection should reflect greater value for the bondholders. Therefore, bonds with higher poison put rankings should have lower yields than bonds with lower poison put rankings.

The fourth hypothesis tests whether the value of the event risk covenant is greater for bonds with lower credit ratings. The impact of a change in the bond quality rating is relatively small as long as the bond maintains an investment grade rating. Coupon reset bonds have a

larger reset provision when the bond changes from investment to speculative grade. Puttable bonds have triggering events that require the reduction of bond ratings to less than investment grade and the occurrence of a designated event. Because lower rated bonds are more likely to fall below investment grade, an event risk provision may be more valuable than a provision on a similar bond with a high credit rating.

V. DESCRIPTION OF THE SAMPLE AND THE DATA

To examine the value of event risk protection, a sample of 65 industrial bonds and notes with event risk covenants is identified from *S&P CreditWeek*. In addition, a control sample of 163 corporate bonds, not identified with event risk covenants by *S&P CreditWeek*, is identified from *Moody's Bond Record*. The total sample consists of 228 bonds issued between January of 1987 and June of 1990 for which full data was available. Utility, financial institutions, and government bonds are excluded from the sample, as regulation can affect the probability of restructuring. Also, to better match the characteristics of the two samples, the sample excludes bonds with maturities less than five years, issue sizes less than $45 million or greater than $350 million, and *S&P* default ratings ranging above AA– and below BB+. Also excluded from the sample are mortgage bonds, zero coupon bonds, and bonds for which complete data are not available. Firm specific information is obtained from the *S&P Bond Guide*, *Moody's Bond Record*, and *Disclosure*. Yields on Treasury securities are collected from the *Federal Reserve Statistical Release H.15 (519): Selected Interest Rates*.

Table 2 reports the descriptive statistics for the total sample as well as for coupon reset, poison put, and control subsamples. The yield spread over treasury is calculated by subtracting the yield on a Treasury security from that of an industrial bond at issue, each with the same maturity and sale date. We find that the yield off treasury for coupon reset bonds and poison put bonds is slightly higher than for the control sample. The size of coupon reset bond issues is larger than that of the poison puts or control sample. Compared with the control sample, poison put bonds are more likely to have a sinking fund provision and less likely to have a call provision. The coupon reset bonds, however, tend not to have either sinking funds or call provisions. The coupon reset bonds tend to have the longest term to maturity, although both types of event risk bonds have longer terms to maturity than the control sample. Companies issuing bonds with coupon resets tend to be larger than those offering poison puts, but companies issuing bonds with event risk provisions tend to be smaller than firms in the control sample.

It is useful to highlight several differences between subsamples in order to understand the pattern of event risk protection used by firms. Transportation companies have a greater representation in each of the event risk protection subsamples, while companies involved in the trade classification tend not to issue event risk protection. The differences between the event risk sample and the control sample indicate that companies in sectors most vulnerable to event risk are more likely to include poison put protection than companies in other sectors.[6]

The coupon reset sample is fairly evenly distributed across all represented credit quality categories. The poison put sample, however, is heavily concentrated in the A and BBB credit quality categories and does not contain any low rated (BB) bonds. The control sample contains bonds of each credit quality, but the majority of the bonds are rated A.

Table 3 illustrates the effect of the RJR/Nabisco takeover on the development of protective covenants. Prior to the takeover all protective covenants were rated either E4 or

TABLE 2.
Characteristics of New Debt Issues by Event Risk Protection from January 1987 to June 1990

Characteristics	*Total Sample*	*Coupon Reset Sample*	*Poison Put Sample*	*Control*
Sample size	228	10	55	163
Yield spread over treasury (mean %)[a]	1.20	1.33	1.40	1.13
Size of issue ($ millions)	162.7	196.5	158.0	163.9
Presence of sinking fund (%)	7.9	0.0	12.7	6.7
Presence of call provision (%)	38.2	0.0	29.1	43.6
Time to maturity (years)	13.2	19.7	15.0	12.3
Firm's total assets ($ billions)	11.2	6.8	4.1	13.9
Yield on a 10 year T-bond (%)	8.5	8.4	8.4	8.5
Industry of issuer (%)[b]				
Manufacturing	53.9	40.0	63.6	51.5
Transportation	6.6	20.0	18.2	1.8
Trade	13.6	10.0	3.6	17.2
Other	25.9	30.0	14.5	29.4
Standard & Poor's credit Rating (%)[c]				
AAA	0.0	0.0	0.0	0.0
AA	10.5	20.0	7.3	11.0
A	53.1	40.0	40.0	58.3
BBB	33.3	20.0	52.7	27.6
BB	3.1	20.0	0.0	3.1
S&P event protection ranking (%)				
E1	2.6	60.0	0.0	0.0
E2	1.8	30.0	1.8	0.0
E3	15.8	10.0	60.0	0.0
E4	3.5	0.0	14.5	0.0
E5	4.8	0.0	20.0	0.0

Notes: [a] We subtract the yield on the Treasury security with the same maturity and sold on the same day to adjust for term-structure effects.
[b] We exclude utilities, financial institutions, and government issues to reduce the impact of regulation on the sample.
[c] We limit the control sample to bonds with *S&P* ratings between AA– and BB+ so that the control sample reflects the poison put sample.

E5 and, thus, provided investors with low event risk protection. After the takeover, 82.5 percent of the puts were rated E3 or better. Thus, it appears that after the RJR/Nabisco takeover, the design and quality of event risk covenants changed, providing bonds with better event risk protection than previously available.

TABLE 3.
Type of Event Risk Protection Relative to the RJR/Nabisco Takeover

Type of Event Risk Protection	*Pre-RJR/Nabisco Takeover*		*Post-RJR/Nabisco Takeover*		*Total*	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
HIGH (E1)[a]	0	0	6	9.5	6	7.3
MED (E2 and E3)	0	0	46	73.0	46	56.1
LOW (E4 and E5)	19	100	11	17.5	30	36.6
TOTAL	19	100	63	100	82	100

Note: [a] All E1 ranked bonds are coupon resets

VI. EMPIRICAL MODEL AND TESTS

In this section we examine empirically the effect of event risk protection on yield spreads of newly issued bonds.

The Empirical Model

To test our hypotheses we first develop a model to explain the yield spread over treasury. Previous studies suggest that new issue yields depend on the industry of the issuer (*IND*), the bond rating of the issue (*RATE*), the presence of call provisions (*CALL*), presence of sinking fund provisions (*SINK*), the years to maturity (*YRMAT*), the size of the company (*ASSET*), and the level of interest rates at the time of sale (*TYLD*) (see Blackwell & Kidwell, 1988; Ederington, 1976; and Sorensen, 1979 for discussions of the determinants of interest cost for corporate bonds). These variables are used as control variables (*CONTROLS*) in the OLS regression models testing the effect of poison put provisions.

For the control model, we estimate the yield spread over treasury (*SPD*) using the full sample as follows:

$$SPD = \beta_0 + \beta_1 IND + \beta_2 RATE + \beta_3 SINK + \beta_4 CALL + \beta_5 YRMAT + \beta_6 ASSET + \beta_7 SIZE + \beta_8 TYLD + \varepsilon_i . \quad (1)$$

The value of coupon reset and poison put provisions is estimated while controlling for the RJR/Nabisco takeover with the model:

$$SPD = CONTROLS + \beta_9 RJR + \beta_{10} RESET + \beta_{11} PUT + \beta_{12} PUT^{*} RJR + \varepsilon_i . \quad (2)$$

We estimate the relation between the yield spread and the degree of event risk protection provided in the bond with the model:

$$SPD = CONTROLS + \beta_9 RJR + \beta_{10} RESET + \beta_{13} MED + \beta_{14} LOW + \beta_{15} LOW^{*} RJR + \varepsilon_i . \quad (3)$$

We estimate the relation between yield spread, the inclusion of a coupon reset provision, and the degree of credit quality with the model:

$$SPD = CONTROLS + \beta_9 RJR + \beta_{10} RESET + \beta_{16} RESET^{*} A + \beta_{17} RESET^{*} BBB + \beta_{18} RESET^{*} BB + \varepsilon_i , \quad (4)$$

where:
- SPD = yield spread of the issue over treasury of the same maturity.
- IND = zero or one variables for industry, where transportation (*TRAN*), trade (*TRADE*) and miscellaneous classification (*MISC*) equal one and manufacturing is the reference group.
- $RATE$ = zero or one variables for bond ratings, where A, BBB, and BB are all equal to one, and AA is the reference group.
- $SINK$ = one if the issue has a sinking fund, and zero if it does not.
- $CALL$ = one if the issue is callable, and zero if it is not.
- $YRMAT$ = the natural logarithm of the issue's maturity in years.
- $ASSET$ = the dollar size of the company's total assets in billions.

SIZE = the dollar size of the bond issue.
TYLD = the average daily interest rate on ten-year and longer U.S. Treasury bonds on the date of the bonds issue.
RESET = one if the issue has a coupon reset provision, and zero if it does not.
PUT = one if the issue has a poison put provision, and zero if it does not.
RJR = one if the bond is issued following the takeover, and zero if preceding.
MED = one if the bond's poison put ranking is E2 or E3, and zero otherwise.
LOW = one if the bond's poison put ranking is E4 or E5, and zero otherwise.

Discussion of the Variables

Because most of the model's control variables have been used in previous studies, see equation (1), the discussion here is limited to the variables that test our hypotheses. Equation (2) adds the *RJR* variable to test whether the RJR/Nabisco takeover affected the yield spread on new issue bonds. We believe that the RJR/Nabisco takeover caused a basic shift in the premium investors' demand for bearing event risk when purchasing new bond issues. Thus, we expect $\beta_9 > 0$. The price differential between coupon reset and poison put provisions is tested by including the *RESET* and *PUT* variables. Because put provisions were issued before and after the RJR/Nabisco takeover, the interactive variable *PUT*RJR* is included in the model. As stronger event risk covenants were issued following RJR, we expect $\beta_{12} > \beta_{11}$. Additionally, as *S&P* ranks coupon resets as providing stronger protection than poison puts we expect $\beta_{10} < (\beta_{11} + \beta_{12})$.

Equation (3) analyzes the price differential between different poison put covenants. To test this effect, variables representing the strength of the poison put protection are examined (*RESET*, *MED* and *LOW*, with *RJR*LOW* representing the post RJR low covenant ranking). In addition, *RJR* is included to control for changes in the environment for corporate control. If the coefficients on the test variables decrease as the put provisions become stronger, investors demand higher yields for bonds with lower event risk protection. Thus, we expect $(\beta_{14} + \beta_{15}) > \beta_{13} > \beta_{10}$.

Equation (4) analyzes the effect of a bond's credit rating on pricing coupon reset provisions. To test this effect, three interactive variables are analyzed (*RESET*A*, *RESET*BBB*, and *RESET*BB*). The cross product variables test how the value of event risk protection changes with the credit quality rating. If coupon reset provisions provide greater protection for lower quality bonds, then the relation between yield and the cross products will decrease with bond quality. Thus we expect $\beta_{16} > \beta_{17} > \beta_{18}$.

VII. FINDINGS

Table 4 presents the empirical results. Equation (1) contains only the control variables. For brevity, the discussion of the control variables is kept to a minimum. The model explains 45 percent of the interissue variations in the yield spread. The coefficient on *TRAN* is positive and significant at the five percent level, indicating that the yield for transportation companies is greater than that for manufacturing company issues. Although not all the credit rating coefficients are significant, they do increase monotonically as the credit quality declines.

TABLE 4
Ordinary Least-squares Regressions Testing the Effect of Event Risk Protection on Initial Yield Over Treasury (SPD) for Bonds Issued from January 1987 to June 1990

CONTROL VARIABLES

Equations	β_0	*TRAN*	*TRADE*	*MISC*	*A*	*BBB*	*BB*	*SINK*	*CALL*	*YRMAT*	*ASSET*	*SIZE*	*TYLD*
Equation 1													
Beta	1.29	0.27	0.15	0.05	0.19	0.60	2.07	0.15	0.05	0.20	–0.01	0.01	–0.13
t-Value	2.61*	2.08*	1.55	0.75	1.77	5.26*	10.20*	1.22	0.72	3.52*	–1.56	2.40*	–2.04*
Equation 2													
Beta	1.10	0.20	0.21	0.10	0.18	0.55	2.17	0.14	0.11	0.15	–0.01	0.01	–0.12
t-Value	1.88	1.55	2.18*	1.45	1.72	4.97*	10.87*	1.05	1.59	2.35*	–1.83	2.40*	–1.86

TEST VARIABLES

Equations	*RJR*	*RESET*	*PUT*	*PUT*RJR*	*ADJ* R^2
Equation 1					
Beta	—	—	—	—	0.45
t-Value	—	—	—	—	
Equation 2					
Beta	0.26	–0.35	0.37	–0.38	0.49
t-Value	3.44*	–2.21*	2.55*	–2.34*	

CONTROL VARIABLES

Equations	β_0	*TRAN*	*TRADE*	*MISC*	*A*	*BBB*	*BB*	*SINK*	*CALL*	*YRMAT*	*ASSET*	*SIZE*	*TYLD*
Equation 3													
Beta	1.13	0.22	0.20	0.09	0.17	0.54	2.16	0.15	0.11	0.16	–0.01	0.01	–0.12
t-Value	1.93	1.67	2.15*	1.32	1.71	4.82*	10.87*	1.13	1.58	2.38*	–1.83	2.38*	–1.92
Equation 4													
Beta	1.08	0.20	0.13	0.04	0.17	0.58	2.70	0.19	0.08	0.20	–0.01	0.01	–1.11
t-Value	1.96	1.63	1.46	0.54	1.69	5.36*	12.54*	1.55*	1.30	1.90*	–2.25*	3.68*-	–1.83*

TEST VARIABLES

Equations	*RJR*	*RESET*	*MED*	*LOW*	*LOW*RJR*	*RESET*AA*	*RESET*A*	*RESET*BBB*	*RESET *BB*	*ADJ* R^2
Equation 3										
Beta	0.26	–0.36	0.13	0.40	–0.18	—	—	—	—	0.50
t-Value	3.45*	–2.24*	0.57	2.55*	–0.82	—	—	—	—	
Equation 4										
Beta	0.22	—	—	—	—	–0.23	0.25	–0.31	–2.22	0.55
t-Value	3.52*	—	—	—	—	–0.74	1.10	–1.04	–6.20*	

Note: *Different from zero at the 5 percent level.

The estimated coefficients on *SIZE*, *YRMAT* and *TYLD* have the expected sign and are significant. The estimated coefficients on the remaining control variables are not significant.

Equation (2) tests whether investors' perception of event risk changes after the RJR/Nabisco takeover. In addition, the regression tests the difference in the value of event risk protection before and after the takeover. The estimated coefficient on *RJR* is positive and significant and indicates that bond prices are negatively affected by the RJR/Nabisco takeover. Following the takeover, new bond issues sold at yields 26 basis points more than similar bonds issued prior to the takeover. This suggests that the RJR/Nabisco takeover caused a shift in investor perceptions of event risk. More than likely, this occurred because investors became more aware of the magnitude of losses that bondholders can suffer because of event risk.

The variables *RESET* and *PUT* examine the event risk protection provided by the two major types of event risk covenants. Before the RJR takeover, bonds with put provisions (*PUT*) had yields of 37 basis points more than similar bonds without event risk protection. The positive and significant coefficient on *PUT* suggests that the presence of a put provision signaled that these bonds had higher expected event risk and/or that these poison puts provided bondholders with inadequate event risk protection. We know from Table 3, however, that all bonds in the sample during this period were rated E4 and E5 and, thus, had low levels of event risk protection.

After the RJR/Nabisco takeover, bonds with reset provisions (*RESET*) had yields of 35 basis points less than similar bonds without event risk protection. These bonds were highly rated, the majority of which were rated as E1, the highest level of event risk protection available. For poison put bonds sold after the RJR/Nabisco takeover (*PUT*RJR*), the coefficient is negative and significant. These bonds sold for only one basis point ($\beta_{11} + \beta_{12}$) less than similar bonds without event risk protection. This reflects the changing composition of puttable bonds following the RJR/Nabisco takeover. After the takeover, stronger poison put provisions were used.

Equation (3) examines how bond yields change with event risk quality rankings. The findings indicate an inverse relationship; that is, as event risk quality declines bond yields increase monotonically. Reset bonds, which are all highly ranked, sell for 36 basis points less than similar bonds without event risk protection. Poison put bonds with medium event risk protection (*MED*) sell at yields which are not significantly different from similar bonds without event risk protection. Poison put bonds with low event risk protection (*LOW*), have yields of 40 basis points more than similar bonds without event risk protection, over the sample period; the cross product variable *LOW*RJR* is not statistically significant.

Equation (4) estimates the value of reset type covenants for bonds with different credit ratings. The coefficients on the cross product variables tend to decrease as the credit rating of the bonds decline. However, only the cross-product for bonds with reset type event risk protection and low credit quality (*RESET*BB*) is statistically significant. This suggests that the value of event risk protection is greater for bonds with lower credit ratings.

VIII. SUMMARY

This paper examines the valuation of the two major types of event risk indenture provisions on corporate debt—poison puts and coupon resets. Overall, we find that investors place a positive value on coupon resets—they reduce yields on bonds by 35 basis points—and place

virtually no value on poison puts. We also find that the RJR/Nabisco takeover was a watershed event with respect to the design, the pricing, and the frequency of event risk protection in corporate debt.

More specifically, before the RJR/Nabisco takeover, bonds with poison put provisions had low event risk protection, and these bonds sold for penalty yields compared to similar bonds without event risk protection. After the takeover, bonds had stronger event risk protection, and bonds with put provisions sold for about the same yields as bonds without protection.

Bonds with the more recently developed coupon reset provisions sell for less than unprotected bonds. In addition, we find that the quality of the event risk protection, as measured by event risk rankings, significantly affects the yield on new bonds. Bonds with high event risk rankings sell at lower yields than similar bonds without event risk protection, bonds with medium event risk rankings do not have their yields lowered, and bonds with low event risk rankings sell at penalty yields. Finally, holding event risk rankings constant, we find that the value of event risk protection is greater for bonds with low credit ratings.

This research indicates that the market values high quality puts, all else held constant. This is a significant factor for individual investors who do not have the resources for monitoring bondholder stock holder conflicts. With a high quality put provision a bondholder may reduce the effort in monitoring. This reduction in monitoring costs, assuming economies of scale in monitoring, differentially advantages small versus large investors.

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NOTES

1. Only one poison put type of provision in our sample has been ranked E2.
2. United Technologies issued an E3 rated coupon reset bond that is triggered by a designated event and a rating downgrade of one full category by both *S&P* and *Moody's*, or any downgrade that results in speculative grade ratings from both agencies.
3. See Frank (1989).
4. See Winkler and White (1989).
5. Based on our sample no coupon resets or poison put covenants ranked higher than E4 were issued prior to the RJR/Nabisco takeover.
6. Salomon Brothers has argued that industrial, transportation, and natural gas pipeline companies as industrial sectors most vulnerable to event risk (D'Amico, 1990).

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