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The Impact of Seniority and Security Covenants on Bond Yields: A Note

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THEORETICAL RESEARCH ON THE rational pricing of covenants in corporate bonds has examined seniority and security covenants. Black and Cox [1] and Ho and Singer [8] use the option pricing model to show that senior debt should have a higher price than subordinated debt. Recent studies by Smith and Warner [10, 11] and Warner [13] document the widespread use of security covenants and argue that security reduces yield.

Despite the broad consensus that seniority/security covenants should reduce bond yields, *ceteris paribus*, empirical tests have failed to provide strong support for this view. Rather, prior studies [2, 3] have shown that security may actually increase the yield to maturity on debt. The research cited relied on multivariate statistical techniques to examine various factors affecting yields (or prices) within specific rating categories. Contrary findings regarding security were attributed to differences in risk among bonds in the same rating category.

The present note is a refinement of past empirical studies. By relying on a different test design, we alleviate difficulties inherent in bond ratings. Specifically, we study matched pairs of nonconvertible bonds, issued by the same company, that have similar features except for seniority/security covenants. Our results support the view that seniority/security covenants are rationally priced. The next section discusses our test design and data and Section II summarizes our findings.

I. Test Design and Sample

While recognizing the shortcomings of bond ratings, many empirical studies use them as a control for risk in studying the impact of covenants and other factors on bond yields (or prices). In a recent, published study, Boardman and McEnally [2] failed to detect a positive relationship between security covenants and prices. In only five of 16 regressions were the coefficients for the security dummy significant (at the 95% level) and in each case the sign was negative, indicating that security actually increased the yield to maturity on debt. Following a

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suggestion made by Cohan [3], who obtained a similar result in an earlier study,¹ the authors attributed this contrary result to a tendency for weaker credits within any rating category to be more likely to issue secured debt. The difficulties in relying on bond ratings were described more explicitly by Cohan [4] who found that an increase in call price increased a bond's yield to maturity, contrary to what was expected.

"... call price may be simply a 'proxy' variable for quality differences within each quality rating. If this is so, it doubtless means that a really satisfactory analysis between call price and yield cannot be made until ways and means have been found to hold quality more nearly constant." [4, p. 597]

To measure how covenants affect yields, it is necessary to construct a sample which controls as much as possible for all factors affecting yields other than the particular covenant under scrutiny. Prior research ([2, 3, 4, 5, 12], for example) has established that, among other factors, variability in operating earnings, debt-to-assets ratios, call price, and sinking funds, influence yields along with seniority/security covenants. Using bond ratings as an additional or primary control creates difficulties because covenants themselves affect ratings [7].

To incorporate the factors noted above and to avoid the difficulties inherent in bond ratings, this study tested the impact of seniority/security on matched pairs of nonconvertible bonds issued by the same company that were similar in all respects except for the seniority and security covenants. More specifically, each pair had a secured and unsecured bond or a senior and subordinated bond issued by the same company that were similar with respect to sinking fund, call price, coupon, and maturity. Both bonds in a pair were callable or neither was, and a sinking fund provision was either present or absent in each pair. When a pair contained either of these features, individual bonds were examined for differences that could create a bias. No reason to suspect bias was detected but differences might add noise to the data. Ideally, bonds in each pair would have been issued at the same time, with the same coupon, and with identical maturity dates. This degree of control was not feasible, so we relied on seasoned bonds which had no more than 100 basis points difference in coupon and no more than a one-year difference in maturity.

Moody's Manuals [6] were used to identify firms with rated debt and each company with secured/unsecured or senior/subordinated debt outstanding rated A or below, that met the criteria stated above, was included. Bonds rated higher than A were excluded because these firms were likely to have a low probability of financial distress and hence it would be more difficult to measure the pricing impact of seniority/security covenants. Some bonds were used in more than one pair. The final sample consisted of 86 pairs and was divided into two primary industrial groups—utilities and finance companies. Smaller subsamples were constructed for transportation and industrial firms. Quotes and yields were

¹ Cohan obtained this contrary result (i.e., security increased yield) only for a sample of industrial firms. For utilities and finance companies his results generally supported the hypothesized relationship.

Table I
Tests of Effectiveness of Control for Coupon Rates and Maturity

Subsample	Number of Pairs	Mean Coupon	<i>t</i> -Statistic and Significance Level for Coupons		Means Difference in Days to Maturity	<i>t</i> -Statistic and Significance Level for Maturity	
			<i>t</i>	Significance		<i>t</i>	Significance
Finance ^a	22						
Senior		8.0636					
Subordinated		8.0966					
Difference ^b		-0.0330	-0.276	0.2150	-0.9545	-0.029	0.0226
Transportation ^c	1						
Secured		3.250					
Unsecured		3.500					
Difference		-0.250	N/A	N/A	-90.000	N/A	N/A
Utilities	55						
Secured		5.7909					
Unsecured		5.9264					
Difference		-0.1355	-2.368	0.9785	-15.0360	-0.611	0.4565
Industrial ^c	8						
Secured/Senior		8.1025					
Unsecured/ Subordinated		7.7969					
Difference		0.2156	N/A	N/A	7.2500	N/A	N/A
Pooled Sample	86						
Secured/Senior		6.5494					
Unsecured/ Subordinated		6.6273					
Difference		-0.0779	-1.481	0.8577	-10.233	-0.522	0.4173

^a Finance firms exclusively use subordination while utilities and transportation rely only on security. Examining interindustry effects is beyond the scope of this paper. However, systematic differences among industries is consistent with the work of Smith and Warner [10, 11] and others.

^b Difference is secured/senior minus unsecured/subordinated.

^c Subsample size is too small for any meaningful tests.

obtained monthly from *Moody's Bond Record* for the period of January 1972 to June 1981.² Many previous studies have relied on yield to maturity instead of price in studying the impact of various covenants. However, yield to maturity may create a bias because it is an imprecise measure. (See [2] for discussion.) To confirm our belief that such a bias is not a concern for this study, several of our tests reported below were rerun using price in place of yield to maturity and the results were unchanged.

II. Summary of Results

Features of the sample are reported in Table I, including mean values for coupon rates and term to maturity. Since some difference was permitted for coupon and

² Although the use of quotes is well established in bond research, it must be recognized that quotes are imperfect proxies for market prices since they may represent opinions of bond traders rather than recent transaction prices.

Table II
Summary of Monthly Tests on Full Sample

A: By Months				
	Number of Months	Average Number of Pairs/Month	Number of Observations	
Full Sample	114	55	6271	
Months in which mean senior/secured yield is lower	112			
Months in which mean senior/secured yield is greater than or equal to subordinated/unsecured	2			
Months in which senior/secured yield is significantly <i>lower</i> at 95% level using <i>t</i> -test	79			
Months in which senior/secured yield is significantly <i>higher</i> at 95% level using <i>t</i> -test	0			
Observations for which senior/secured yield exceeds subordinated/unsecured by 50 basis points or more			653 (10.4% of total)	
B: By Industry				
Industry ^a	Months	Total Months Senior/Secured Yield Lower	Total Months Senior/Secured Yield Greater or Equal	Total Months Senior/Secured Yield Significantly Lower
Finance	114	101	13	20
Utilities	114	108	6	71
Industrials	114	98	16	15

^a Transportation is not reported separately as the sample size is too small.

maturity, Student's *t* and Mann-Whitney tests were conducted for the full sample and for the subsample of utilities and finance companies. With one exception, the tests showed no significant differences in coupon or maturity at the 95% level. The exception was the coupon difference of 13.55 basis points between secured and unsecured debt for the subsample of utilities which was significant according to the *t*-tests. Additional testing was conducted and, while these tests were unable to reject the possibility of some coupon bias, it is unlikely that the small difference in coupon is driving the larger difference in yields reported below.³

³ One test involved reconstructing the utility sample allowing only a 50 basis points difference in coupon. While still significant, the mean coupon difference was less than eight basis points. We also checked for a possible correlation between maturity and coupon and found no evidence of significant correlation. Finally, we retested using duration in place of maturity.

Table III
Summary of Tests for Pooled Data

A: By Industry						
Industry	Cases	Senior/ Secured Mean Yield	Subordi- nated/Un- secured Mean Yield	Difference in Mean Yield ^a	t-Statistic	Significance Level
Finance	700	10.61	11.06	-0.45	-9.993	0.9995
Transportation	97	10.61	10.89	-0.28	-1.499	0.8500
Utilities	4932	10.04	10.38	-0.34	-19.813	0.9995
Industrials	542	9.97	10.29	-0.32	-7.129	0.9995
Total	6271					

B. By Rating Class									
Class	Industry Composition	Average Sample Size	Mean Yield—June						
			1973	1974	1975	1976	1978	1979	
1. Mortgage A	Utilities, 1 industrial	23	7.646	9.104	10.008	9.899 ^b	8.826	11.173 ^b	
2. Senior A	Finance, Utilities, 3 in- dustrials	12	7.744	9.358	9.855	9.226 ^b	8.882	10.222 ^b	
3. 1st Mortgage Baa	Utilities, 1 transportation	14	7.601 ^b	9.463 ^b	10.387	10.395	9.280	11.039	
4. Senior Baa	Utilities, 1 industrial	21	8.114 ^b	9.725 ^b	10.266	11.351	9.319	11.283	
5. Subordinated Baa	Finance	5	— ^c	— ^c	— ^c	— ^c	9.700	10.866	
6. 1st Mortgage Ba	Utilities	6	7.713 ^b	10.028 ^b	10.552 ^b	9.858 ^b	8.640 ^b	— ^c	
7. Senior Ba	Utilities	11	7.867 ^b	9.363 ^b	10.915 ^b	11.102 ^b	9.541 ^b	— ^c	

^a Difference is senior/secured minus subordinated/unsecured.

^b Mann-Whitney test shows significant difference between these two classes at 80% level or higher.

^c Eliminated due to insufficient observations.

Paired comparisons on yields were conducted for each month from January 1972 through June 1981 on an average of 55 pairs each month.⁴ Summary statistics for the full sample of 6,271 paired observations are presented in Panel A of Table II. It is seen that in 112 of 114 months senior/secured debt carried a lower mean yield than otherwise similar subordinated/unsecured debt. The yields were significantly lower at the 95% level in 79 months and in no month were they significantly higher. These results support the view that seniority/security covenants are rationally priced.⁵ Panel B of Table II gives a further breakdown by individual industry. The number of months in which senior/secured debt carries a lower yield is reduced only slightly with disaggregation. Panel A of Table III displays a cross-sectional test by industry and the results again support the view that seniority/security covenants are rationally priced.⁶

⁴ The full sample consisted of 86 pairs but not all bonds were outstanding for the entire period and in some cases bonds satisfied the criteria for only part of the period.

⁵ Table II shows that for about 10% of the observations senior/secured yields were higher by 50 basis points or more. Additional analysis indicated that most of these were accounted for by six companies and the only factor that seemed to be common was that actual debt usage was lower than the amount permitted by other covenants. Bond traders advised that the observed yield differential probably means that the bonds were not available in meaningful quantities at the quoted yields.

⁶ We must be cautious in interpreting the results in Table III because the cross-section test pools successive observations for each pair which may bias the *t*-test.

To test whether relying on bond ratings would have produced the same result, we broke up the pairs and reclassified bonds by security/seniority within each rating class as shown in Panel B of Table III. For each of the seven categories created, we found the mean yield in June of six selected years—1973 through 1979 excluding 1977. In the paired comparisons described above, these six years showed the strongest support for rational pricing of seniority/security covenants. We wanted to see whether using ratings as a control would alter these results. Reading down each column in Table III, Panel B, there are 19 possible comparisons. Nine attain significance at the 80% level or higher: six of these are in the predicted direction and three are not.

These results fail to conform to our earlier findings and show the confounding effects of using ratings. Security/seniority lowers yield, but relying on ratings as a control does not support this view. Indeed, it leads one to infer that investors do not value these covenants, i.e., that they are not rationally priced.

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