Market Reactions to Callable and Noncallable Debt Issues

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Abstract

Financial theory claims that issuing callable debt rather than noncallable debt offers substantial advantages to the issuing firms. Yet our evidence shows that a substantial amount of noncallable debt exists, suggesting a deficiency in the theory. Our event study analysis found that market reactions to callable bond issues were not significantly different from zero. Thus, the prevalent claim that callable debt offers an advantage over noncallable debt is not supported. The market was found to react negatively the issuance of noncallable debt, short-term noncallable debt, short-term callable debt, and short-term debt. Therefore, short-term bonds appear to be a signal of negative private information and long-term debt issues appear to be a signal of positive information.

I. Introduction

Many authors claim that virtually all corporate bonds have a call feature written into the indenture agreement.[1] Thus, most research on corporate finance assumes that noncallable debt is an insignificant portion of the debt market and has attempted to show the advantages for the issuer of callable debt over noncallable debt.

If the hypothesized advantages of callable debt exist for all firms, we would expect to find no noncallable bonds being issued. But the empirical evidence offered in this paper shows that a significant amount of noncallable debt exists. Of the 6,736 public offerings of corporate debt issued during the 10-year period 1977 through 1986, nearly 17% of the dollar value of corporate bonds were noncallable. At a minimum, this evidence indicates that callable debt issues do not offer advantages for all firms. It also suggests that the proposed theoretical advantages of callable bonds may not be entirely adequate explanations of reality.

Prior research has found that the capital market responds differently to announcements that a firm is raising external capital, depending on whether the financing is to be met by issuing debt versus equity. In particular, raising external debt has been found to elicit no change or an insignificant decrease in the issuer's stock price, while equity issues have been found to substantially reduce share prices.[2] This is consistent with the notion that managers with good private information issue debt as opposed to equity.

The type of debt issued has also been hypothesized as a mechanism for revealing a manager's private information. In particular, managers with good private information have an incentive to issue either short-term noncallable or long-term callable debt because they know that the value of the debt is likely to be increased in the near future.[3] Firms with unfavorable private information have an incentive to issue straight long-term debt to avoid transaction costs, revaluation of credit worthiness that occurs with each rollover of short-term debt, and the increased interest cost of the call feature. Good firms, desiring to reveal their true worth, may be willing to pay the transactions costs associated with revaluation of credit worthiness that occurs with each rollover. Thus, issuing short-term noncallable or long-term callable debt may offer credible signals of high firm quality in a world with private information.

This paper tests the hypothesis that short-term noncallable and long-term callable debt convey a positive signal to investors. In addition, the debt issues were stratified in several other ways to determine if any debt subsets had a significant impact on the equity value of the firm.

In general, negative, but insignificant, wealth effects were found for all the debt together, for callable bonds, and for long-term debt. When the debt classes were segmented by both maturity and callability, insignificant effects were found for both long-term callable and noncallable debt classes, but a definite market response was observed within the short maturity class whether callable or noncallable. Inconsistent with Flannery's (1986) signaling models, nonsignificant negative abnor-

mal returns were associated with long-term noncallable debt and significant negative returns were associated with short-term noncallable debt.

The evidence was consistent with Robbins and Schatzberg's (1986) argument that long-term callable bonds dominate other categories of debt. That is, the market reactions to issues of long-term callable debt although statistically insignificant were statistically different from the market reactions to any of the short-term issues.

Theoretical models of the call feature and debt maturity assume that short-term means one period and long-term is two or three periods. Applying these models to practice requires interpretation of the meaning of the terms short-term and long-term. The evidence presented in this paper shows that both callable and noncallable debt issues had a wide variety of maturities, implying no clearcut empirical cutoff for short-term versus long-term. The tests reported in this paper assume that 10 years is the cutoff point. Repeating all the tests with short-term defined as 5 years or less and long-term as 20 years or more generated similar results.

The remainder of our paper is structured as follows. In Section II, the arguments concerning the advantages of callable debt are summarized. Section III provides empirical evidence showing that noncallable debt is a significant part of the debt market. An event study analysis, comparing the various stratifications of debt classes, follows in Section IV. Finally, Section V summarizes the findings.

II. Arguments in Favor of Issuing Callable Bonds

Several advantages of callable debt have been suggested in the literature. One argument is that uncertainty about future interest rates creates an advantage to issuing callable bonds. According to this argument, the call feature provides a firm's managers with the ability to refund an issue and take advantage of lower interest expenses.[4] Other advantages may result from agency problems associated with information asymmetries between borrowers and lenders, different risk tolerances of equityholders and debtholders, the need for managers to signal private information, differential tax rates between the borrower and the lender of funds, maturity preferences, and the opportunity to remove an undesirable protective covenant in the bond indenture.[5]

Justifying call options is difficult in a perfect market setting. If capital structure is irrelevant in such a framework, then the specifics of debt contracts cannot matter.[6] Market imperfections may create an advantage for including call features. For example, in the presence of private information, capital structure and the specific nature of debt contracts may affect the value of the firm.[7] Call options may be a contractual response to agency problems between debt and equity claimants. Risky debtholders broaden their collateral base when a firm improves its position. Therefore, when a firm with risky debt makes a profitable investment, part of the benefit goes to debtholders. Since equityholders are unable to reap the full benefits of additional investments, certain positive net present value projects may not be undertaken.[8] The agency cost of debt in this case is the foregone projects.

If the bonds are callable, Bodie and Taggart (1978) have argued that the debtholders' gains are limited by the call price. With a call option, investment incentives are more consistent with firm value maximization since the potential gain to bondholders is fixed.

In an empirical study, Thatcher (1985) found that default risk is a major reason for the inclusion of the call option and that firms with high debt to asset ratios have an increased probability of using the call feature. But short-term debt may provide investment incentives similar to callable debt. With short-term debt, the terms of the debt contract are regularly renegotiated to reflect the firm's current position. The essential difference between short-term debt and long-term callable debt arises only with respect to uncertainty about the date of prepayment.

Flannery (1986) developed a model where managers signal private information about the value of the firm's assets through the choice of debt maturity. Flannery's model predicts that the issuance of short-term noncallable or long-term callable debt will be viewed more favorably by the capital market then issuance of long-term straight debt. Flannery claims that low private valuation "type" firms prefer to issue long-term debt to avoid the transaction costs and the revaluation of credit worthiness that occurs with each rollover. High valuation types, desiring to reveal their true worth, are willing to pay the transaction costs associated with rolling over short-term debt in order to avoid being pooled with low quality firms and being forced to have a higher cost of debt. Short-term noncallable or long-term callable debt both offer credible signals of high firm quality.[9]

In a signaling model hinging on managerial contracts, Robbins and Schatzberg (1986) also found that short-term debt is a signal for the "good" prospects of a firm, but that long-term callable debt has superior risk sharing attributes. They further argued that both noncallable debt and equity are dominated securities and therefore signal bad news.[10]

III. Documentation of the Existence of Noncallable Debt

A. The Relative Frequency of Noncallable Bond Issues

Our evidence suggests that noncallable debt has been overlooked under the mistaken notion that it accounts for an insignificant portion of the debt market. For the 10-year period 1977-1986, all public issues of corporate debt listed in *Moody's Bond Survey* were examined. During this period a total of 6,736 corporate debt issues were floated totaling $638 billion. The evidence is summarized in Table 1.

Table 1
Callable and Noncallable Debt Issue Summary

Dollar Amount of Issues by Year: ($billions)			
Year	Callable Debt	Noncallable Debt	Total Debt
1977	$ 21.8 (91.9%)	$ 1.9 (8.1%)	$ 23.7
1978	18.7 (92.6%)	1.5 (7.4%)	20.2
1979	25.3 (96.5%)	0.9 (3.5%)	26.2
1980	34.9 (91.8%)	3.1 (8.2%)	38.0
1981	39.2 (89.9%)	4.4 (10.1%)	43.6
1982	35.3 (74.6%)	12.0 (25.4%)	47.3
1983	40.3 (82.4%)	8.6 (17.6%)	48.9
1984	55.5 (81.2%)	12.8 (18.8%)	68.3
1985	81.3 (76.0%)	25.6 (24.0%)	106.9
1986	178.5 (83.1%)	36.4 (16.9%)	214.9
Total	$530.8 (83.2%)	$107.2 (16.8%)	$638.0

Number of Issues by Year:			
Year	Callable Debt	Noncallable Debt	Total Debt
1977	248 (93.9%)	16 (6.1%)	264
1978	211 (95.9%)	9 (4.1%)	220
1979	232 (97.1%)	7 (2.9%)	239
1980	363 (93.8%)	24 (6.2%)	387
1981	381 (90.5%)	40 (9.5%)	421
1982	433 (79.6%)	111 (20.4%)	544
1983	515 (85.1%)	90 (14.9%)	605
1984	590 (85.1%)	103 (14.9%)	693
1985	1,088 (86.5%)	170 (13.5%)	1,258
1986	1,841 (87.5%)	264 (12.5%)	2,105
Total	5,902 (87.6%)	834 (12.4%)	6,736

The percentage of corporate bond issues that were noncallable during the 10-year period, 1977-1986, ranged from 2.9% to over 20% (average 12.4%). As a percentage of the dollar amount of issues during the same time period, the range was even higher, from 3.5% to over 25% (average 16.8%). The dollar amount of noncallable debt was also substantial, ranging from a low of $900 million in 1979 to over $36 billion in 1986 (average $10.7 billion). See Table 1 for a complete summary of the callable and noncallable debt issues by dollar amounts and number of issues on a yearly basis for the period 1977-1986.

These statistics offer very powerful evidence that noncallable corporate debt was an important source of funds. These facts strongly suggest that the issuance of callable debt does not offer advantages over the issuance of noncallable debt for all issuers. If substantial advantages existed for all firms, we would expect to find no noncallable debt. Section IV provides a stronger test for the hypothesized advantages of callable debt.

B. Maturities of Callable versus Noncallable Debt Issues

Since the option to call long-term debt allows the firm to reduce the true maturity of a debt issue, one should expect callable debt issues to have longer maturities than noncallable debt issues on average. The maturity distributions for both callable and noncallable bond issues over the 1977-1986 period are summarized numerically in the frequency distribution found in Table 2.

For the entire 10-year period, the average maturity for the callable issues is 19.0 years with a standard deviation of 9.1 years. For the noncallable group, the average is significantly less. The noncallable mean maturity is 8.0 years with a standard deviation of 6.1 years. The majority, but not all, of noncallable debt has short to intermediate term maturities. For example, only 7.7% of the noncallable debt issues have maturities of 20 or more years. Since noncallable bonds have a wide range of maturities and sizable amounts of callable debt have short and intermediate maturities, the evidence is not consistent with the view that short maturity noncallable debt is simply a substitute for long-term callable debt.

C. Long-term vs Short-term Bonds: A Question of Interpretation

Theoretical models of the call feature typically assume 2 or 3 periods to be long-term and 1 period to be short-term.[11] Adapting these theoretical models to practice is

not a straight forward process. Several interpretations of the models are possible.

Table 2
Summary of Debt Issue Maturities

Maturity in Years	Callable Debt # issues	% issues	Noncallable Debt # issues	% issues
< 5	136	2.3%	216	25.9%
5 - 9.9	681	11.5	332	39.8
10 - 14.9	1463	24.8	205	24.8
15 - 19.9	655	11.1	17	2.0
20 - 24.9	773	13.1	25	3.0
25 - 29.9	719	12.2	13	1.6
> = 30	1475	25.0	26	3.1
Total	5902	100.0%	834	100.0%

Maturity in Years	Callable Debt $ amounts	% amounts	Noncallable Debt $ amounts	% amounts
< 5	13.6	2.6%	26.1	24.9%
5 - 9.9	69.4	13.3	39.0	37.3
10 - 14.9	138.1	26.4	26.2	25.0
15 - 19.9	50.1	9.6	2.4	2.3
20 - 24.9	50.8	9.7	4.8	4.6
25 - 29.9	59.5	11.4	1.7	1.6
> = 30	141.3	27.0	4.5	4.3
Total	522.8	100.0%	104.7	100.0%

note: Total dollar amount differs from Table 1 because debt without a defined maturity were not included in the tabulations ($8 billion for callable debt and $2.5 billion for noncallable debt).

note: Dollar amounts in $billions.

A literal interpretation of the theoretical models is that they should apply for 1, 2, and 3 year bonds. Since most callable bonds are call protected for an average of about 5 years, a slightly less literal interpretation is that the theoretical models apply for several years beyond five years, perhaps meaning maturities of up to 10 years.[12]

Under a nonliteral interpretation, long-term might mean in excess of 10 years, perhaps as long as 20 or 30 years. Short-term might mean less than 10 years. Perhaps, the average length of call protection might be used as a measure of short-term (i.e. about 5 years) and long-term might mean some multiple of 5 years.

We examined the maturities of callable and noncallable bonds to see whether the data provide some clear answer as to the appropriate break between long-term and short-term maturities. Looking at Table 2, callable and noncallable bonds had a wide variety of maturities. Surprisingly, corporations issued a sizable amount of relatively short-term callable bonds. For example, 2.3% of the number of callable bonds had maturities of less than 5 years, 11.5% had maturities of 5 to 9.9 years, and 24.8% had maturities of 10 to 14.9 years. A similar distribution based upon the dollar amount of issues shown in the bottom section of Table 2 reveals that 2.6% of the callable debt issues had maturities less than 5 years, 13.3% had maturities of 5 to 9.9 years, and 26.4% had maturities of 10 to 14.9 years. While the average maturity of noncallable debt was shorter, Table 2 shows a wide distribution of maturities for noncallable debt. Thus, the data do not provide simple definitions for short- and long-term.

The appropriate extrapolation of the theoretical models to reality has important implications in empirical testing. If the literal interpretation of the theories is used and long-term is defined 2 or 3 years, then how can we explain the large number of bonds with longer maturities? If the nonliteral interpretation is used and long-term is more than 10 years, or perhaps 20 to 30 years, then how can the wide distribution of maturities for callable and noncallable bonds be explained? Since there are no obvious answers to these questions, the event study analysis reported within the next section was carried out using two different definitions of short- and long-term.[13] For both definitions of short-term and long-term, similar results were obtained.

IV. Event Study Analysis

To test the hypothesis that particular varieties of debt issues may generate market reactions, a series of event studies were conducted and the results are shown below. First, the impact of all the debt issues together was considered. Then all callable bonds, all noncallable bonds, all short-term bonds, and all long-term bonds were analyzed. In addition, callable and noncallable bonds were broken down into short-term and long-term groups.

A. Data

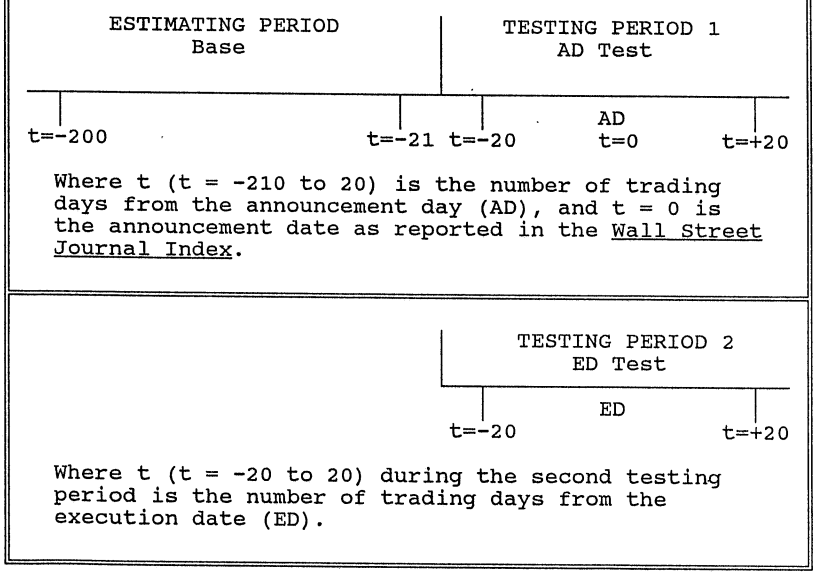
Daily stock returns were compiled from the CRSP Daily Returns tape. To avoid the problem of announcement day effects, the test date chosen was the filing date with the Securities and Exchange Commission (SEC). Filing dates were obtained from *Investor's Dealers Digest*. Since some announced security issues are withdrawn, the market's reaction may not occur with the actual announcement but with the resolution of uncertainty on the issue date.

A corporate debt issue was included in the sample if the following requirements were met:[14](1) The issuer was on the 1987 CRSP Daily Return Tape; (2) The debt issue occurred during the period 1981 through 1986; (3) An SEC filing date was obtained; (4) Only industrial debt issues were utilized, i.e. no international, financial, or public utility debt issues; and (5) The debt issue was a fixed-rate coupon bearing bond, i.e. no zero coupons, no floating rate debt, and no convertible debt.[15] These requirements reduced the initial sample of 6736 debt issues to 631 usable issues. Restricting the event study sample to firms listed on the CRSP Daily Return Tape means that only firms listed on the New York or American Stock Exchanges were utilized.

Using the methodology of Brown and Warner (1985), a base period was established for calculating a standard against which the test period returns were measured. The base period utilized covers 80 trading days. It starts 120 trading days before and ends 20 trading days prior to the announcement date, AD, for each firm. The announcement date is the registration date with the SEC.

By utilizing a 20-day buffer, the effects of any information leakage was captured. The testing for excess returns was calculated at two points in time. The announcement date was used for centering all the firms on a common date for the first testing period. This period starts 20 trading days prior and continues for 20 trading days past the announcement date and was used to test the effects of excess returns resulting from the announcement of the debt issue. This 41 day period surrounding the announcement date falls within the range commonly used in event studies. This process was repeated for testing excess returns around the execution date. Figure 1 depicts the time frame associated with the event study portion of the analysis.

Figure 1
Event Time Frame



B. Event Study Model

Using the CRSP *Value Weighted Index with Dividends*, the residuals, average residuals, and cumulative average residuals (CARs) were estimated in the methodology of Brown and Warner (1985). A 2-day excess return is reported for each test as a means of capturing the announcement and the actual debt issue effects. Day t=0 is the day the news of the event (either the announcement or the actual issuance) was published in the financial press. In most cases, the news was released on the previous day, t=-1, and reported the next day. If the debt issue was announced before the market closed, then the market's response to the news actually predated the publication by one day. If the news was obtained after the market closed, the market responded the next day and the reaction was indeed on day 0. Excess returns are also reported over the periods -/+ 20 trading days, -/+ 10 trading days, -/+ 5 trading days, -/+ 1 trading day, and -1 through +5 trading days to test for information leakage.

Significant t-values for the respective cumulative test periods indicate abnormal shareholder returns. A positive trend in t-values shows a gain to shareholders from the debt issues. Similarly, a negative trend implies that shareholders were worse off from the debt issues.[16]

C. Test Results

The impact of various stratifications of debt issues was analyzed. The market reaction was measured for combined debt, for callable and noncallable debt, and for short and long maturity debt. In addition, callable and noncallable bonds were broken down into short-term and long-term groups.

C1. Preliminary Tests

To test the hypothesis that shareholders' wealth is not affected by the issuance of debt, CARs were calculated for the total sample of 631 testable debt issues. Table 3 presents the results for the six test periods around both the announcement date and the execution date. The CARs were primarily negative, but none of the tests in either the announcement or execution periods produced CARs that were significantly different from zero. Thus, when the debt offerings were analyzed as a group, no significant impact on the firm's stock value was detected. These results are consistent with previous research.

The results from partitioning the sample into callable and noncallable debt issues was also found to generate an insignificant impact on shareholders' wealth. Both subsamples, callable and noncallable, generated CARs that were not statistically different from zero in either the announcement or the execution periods as shown in Table 3. In addition, although not reported in the table, a comparison of the CARs from the callable and noncallable bond stratifications was found to be insignificant. That is, the market did not respond differently to the issuance of either callable or noncallable debt.[17]

Besides the call feature, debt maturity has been suggested as a market signal for firm quality. Short-term debt has been construed to be a positive signal. To test the impact of maturity, the total sample was divided into short and long maturities. Short-term was defined as debt issues with less than 10 years maturity. Similarly, long-term was defined as debt issues having maturities of 10 years or longer. A different maturity cut-off point was also utilized for classifying short and long maturities without a significant effect on the CAR's generated.[18]

As reported in Table 3, the CARs were not significantly different from zero for either the announcement or execution periods for the long maturity stratification. Several of the execution test periods within the short maturity subsample did produce significant CARs. But when a comparison of the short and long maturity debt stratifications was made, the maturity subsamples were not statistically different from each other in either the announcement or the execution test periods.[19]

C2. Short versus Long Maturities: Callable Debt

Theoretical models of the call feature suggest that long-term bonds should be callable, and consequently short-term bonds should be noncallable. If these theories are correct, any short-term bonds that are callable should be inferior issues and should have negative CARs when issued.

The CARs, reported in Table 4 for both the short and long maturity callable bonds, were found not to differ from zero during any of the announcement test periods. Execution test results, also reported in Table 4, were insignificant except for the +/- 1 interval for short maturity callable bonds. A comparison of the CARs generated from the short- and long-term callables was also made and the t-values for the difference tests are shown in Table 4. No differences in the market responses to short- or long-term callable debt were detected as shown by the insignificant t-values.

C3. Short versus Long Maturity: Noncallable Debt

Flannery's (1986) signalling model suggests that short maturity noncallable bonds should be a positive signal to the market and long maturity noncallable bonds should be a negative signal. The announcement period results in Table 5 indicated significantly negative CARs during 5 of the 6 test periods for the long-term noncallable debt subsample. Nonsignificant results were detected

Table 3
Preliminary Tests

Announcement Period: Interval	All Debt CAR	Callable CAR	Noncallable CAR	Short Maturity CAR	Long Maturity CAR
-20 to +20	-1.1693	-1.5156	+0.0124	-0.3818	-1.5374
	(-0.4157)	(-0.4349)	(+0.0029)	(-0.3865)	(-0.4106)
-10 to +10	-0.5296	-0.3956	-0.9871	-0.9637	-0.3267
	(-0.2631)	(-0.1602)	(-0.3239)	(-1.3632)	(-0.1219)
- 5 to + 5	-0.4396	-0.4562	-0.3829	-0.5154	-0.3575
	(-0.3017)	(-0.2554)	(-0.1736)	(-1.2028)	(-0.1843)
- 1 to + 1	+0.1147	+0.2845	-0.4646	-0.0960	+0.2132
	(+0.1508)	(+0.3049)	(-0.4034)	(-0.3593)	(+0.2105)
- 1 to + 5	-0.4186	-0.5143	-0.0921	+0.0080	-0.6180
	(-0.3602)	(-0.3609)	(-0.0523)	(+0.0196)	(-0.3995)
- 1 to 0	-0.0346	+0.0779	-0.4190	-0.1397	+0.0144
	(-0.0557)	(+0.1023)	(-0.4455)	(-0.6403)	(+0.0174)
Execution Period: Interval	**All Debt CAR**	**Callable CAR**	**Noncallable CAR**	**Short Maturity CAR**	**Long Maturity CAR**
-20 to +20	-0.4798	-1.1288	+1.7351	+1.3019	-1.3126
	(-0.1705)	(-0.3277)	(+0.4075)	(+1.3182)	(-0.3486)
-10 to +10	-0.6302	-1.1476	+1.1357	+0.6239	-1.2164
	(-0.3130)	(-0.4656)	(+0.3727)	(+0.8826)	(-0.4514)
- 5 to + 5	-0.7662	-1.2651	+0.9364	+1.0972**	-1.6372
	(-0.5258)	(-0.7091)	(+0.4246)	(+2.1448)	(-0.8395)
- 1 to + 1	+0.4294	+0.3810	+0.5934	+0.5106*	+0.3914
	(+0.5643)	(+0.4093)	(+0.5152)	(+1.9112)	(+0.3843)
- 1 to + 5	-0.5727	-0.9199	+0.6122	+0.9035**	-1.2627
	(-0.4927)	(-0.6464)	(+0.3480)	(+2.2140)	(-0.8117)
- 1 to 0	+0.3305	+0.2647	+0.5549	+0.4207)*	+0.2883
	(+0.5319)	(+0.3480)	(+0.5901)	(+1.9286)	(+0.3467)

Note: Sample sizes were as follows: All Debt (n=631), Callable (n=488), Noncallable (n=143), Short Maturity (n=201), and Long Maturity (n=430).
Note: Significance levels for testing the hypothesis that the CAR's differ from 0 are indicated as follows:
* Significant at 10% level using a two-tail test.
** Significant at 5% level using a two-tail test.
*** Significant at 1% level using a two-tail test.
Note: All tests for the differences in the CARs comparing the callable/noncallable debt samples and the short/long maturity debt samples generated insignificant t-values.
Note: Values in the parentheses ( ) indicate t-values.

for short maturity noncallable debt in all test periods except +/-20 days, which showed a positive bias. The negative market reaction to long-term noncallable debt is reinforced by the significant t-values from the difference test of the CARs.

During the execution period test, significantly positive CARs were detected for five of the six test periods for the short-term noncallable debt issues as shown in Table 5. For the long-term noncallable debt issues, the CARs were insignificant during all six test periods. This suggests that the market perceived a difference in the issuance of short- and long-term noncallable debt. As predicted by Flannery's model, long-term noncallable debt announcements offered negative information, while the actual issuance of short-term noncallable debt was perceived as positive information.

C4. Long-term Callable Debt versus Other Debt Types

In a signalling model based upon managerial contracts, Robbins and Schatzberg (1986) have argued that long-term callable bonds should dominate both long- and short-term noncallable debt as well as all short-term debt. To test this claim, this section compares the market response of long-term callable debt to: (a) long-term noncallable debt, (b) short-term noncallable debt, (c) all short-term debt, and (d) all noncallable debt. The results, shown in Table 6 for both the announcement and the execution period tests, fail to detect any statistical difference in the CARs for all six test periods.[20] These tests are inconsistent with Robbins and

Table 4
Callable Bonds--Short vs Long Maturity

Announcement Period: Interval	Short Maturity CAR	Short Maturity t-value	Long Maturity CAR	Long Maturity t-value	t-value difference
-20 through +20	-2.0608	-1.3076	-1.3838	-0.3363	-0.1536
-10 through +10	-1.1181	-0.9913	-0.2209	-0.0750	-0.2845
- 5 through + 5	-0.3865	-0.4734	-0.4731	-0.2220	+0.0379
- 1 through + 1	+0.1922	+0.4508	+0.3068	+0.2756	-0.0961
- 1 through + 5	+0.2899	+0.4452	-0.7087	-0.4169	+0.5485
- 1 through 0	-0.0145	-0.0416	+0.1003	+0.1103	-0.1179
Execution Period: Interval	**Short Maturity CAR**	**Short Maturity t-value**	**Long Maturity CAR**	**Long Maturity t-value**	**t-value difference**
-20 through +20	-0.8950	-0.5678	+1.6180	+0.3933	-0.5705
-10 through +10	-0.3265	-0.2894	+1.5040	+0.5109	-0.5806
- 5 through + 5	-0.7896	-0.9672	+1.7618	+0.8269	-1.1182
- 1 through + 1	-1.0436	-2.4479**	-0.2212	-0.1988	-0.6901
- 1 through + 5	-0.9037	-1.3877	+1.3607	+0.8006	-1.2441
- 1 through 0	-0.5434	-1.5611	-0.1973	-0.2172	-0.3556

note: Short maturity callable debt sample (n=95)
Long maturity callable debt sample (n=393)

note: Difference calculation equals Short Maturity Callable Debt CAR minus Long Maturity Callable Debt CAR

note: Significance levels for testing the hypothesis that the CAR's differ from 0 are indicated as follows:

* Significant at 10% level using a two-tail test.
** Significant at 5% level using a two-tail test.
*** Significant at 1% level using a two-tail test.

Schatzberg's theoretical conclusions that long-term callable debt dominates all other methods for raising funds. There were no significant differences between long-term callable debt and any other category of debt.

V. Conclusion

Our evidence shows that substantial amounts of noncallable debt were issued during the 10-year period 1977-1986. A series of event studies were conducted to test for market reactions to varieties of debt issues. The CARs were insignificant for the following categories: all bonds, callable bonds, noncallable bonds, short maturities, long maturities, short maturity callables, and long maturity callables. Additional tests were conducted on Robbins and Schatzberg's contention that long-term callable debt offers significant advantages over all other forms of debt. The tests found no support for the Robbins and Schatzberg position.

CARs were positive for short maturity noncallables and negative for long maturity noncallables. This evidence supports Flannery's hypothesis that the market perceives short-term noncallable debt as a positive signal and long-term noncallable debt as a negative signal.

VI. Suggestions for Future Research

Our paper documents the existence of a substantial amount of noncallable debt which could be used in future research in three areas of debt financing: 1. Valuation of the call option, 2. Firm characteristics, and 3. Market reactions. Although numerous studies have been undertaken on the valuation of the call option, utilizing a callable and noncallable matched debt sample offers a unique opportunity for investigating the problem from a different perspective. Testing for systematic differences in the characteristics of firms issuing callable and noncallable debt also offers the opportunity to gain additional insight into the debt decision. Finally, by extending the market reaction section to include the study of shelf registrations, multiple announcements, and/or multiple debt offerings has the potential to advance the understanding of the market's reaction to debt offerings.

This paper has benefitted from the comments of seminar participants at the University of Florida and Lehigh University. The comments of Michael Brennan, David Brown, Mark Flannery, and Chris James have been very beneficial.

Table 5
Noncallable Debt--Short vs Long Maturity

Announcement Period: Interval	Short Maturity CAR	Short Maturity t-value	Long Maturity CAR	Long Maturity t-value	t-value difference
-20 through +20	+2.1644	+1.8006*	-4.1563	-2.0991**	+2.7287***
-10 through +10	+0.4102	+0.4768	-2.9934	-2.1124**	+2.0531**
- 5 through + 5	+0.2041	+0.3277	-2.0645	-2.0130**	+1.8908*
- 1 through + 1	-0.3069	-0.9438	-0.9163	-1.7109*	+0.9727
- 1 through + 5	+0.1565	+0.3151	-0.0843	-0.9830	+1.0038
- 1 through 0	-0.2130	-0.8022	-1.0091	-2.3076**	+1.5562

Execution Period: Interval	Short Maturity CAR	Short Maturity t-value	Long Maturity CAR	Long Maturity t-value	t-value difference
-20 through +20	+2.8864	+2.4017**	-1.5631	-0.8669	+2.0535**
-10 through +10	+1.6530	+1.9218*	-0.3462	-0.2683	+1.2892
- 5 through + 5	+1.1951	+1.9198*	+0.1952	+0.2090	+0.8908
- 1 through + 1	+0.6945	+2.1363**	+0.3037	+0.6228	+0.6666
- 1 through + 5	+0.8463	+1.7042*	-0.0584	-0.0784	+1.0105
- 1 through 0	+0.6827	+2.5720	+0.1887	+0.4740	+1.0321

note: Short maturity noncallable debt sample (n=106)
Long maturity noncallable debt sample (n=37)

note: Difference calculation equals Short Maturity Callable Debt CAR minus Long Maturity Callable Debt CAR

note: Significance levels for testing the hypothesis that the CAR's differ from 0 are indicated as follows:

* Significant at 10% level using a two-tail test.
** Significant at 5% level using a two-tail test.
*** Significant at 1% level using a two-tail test.

*****Notes*****

1. See Barnea, Haugen, and Senbet (1980), Bodie and Friedman (1978), Bodie and Taggart (1978, 1980), Boyce and Kalotay (1979), Marshall and Yawitz (1980), Robbins and Schatzberg (1986), and Van Horne (1984).
2. See Eckbo (1986), Masulis (1980), McConnell and Schlarbaum (1981), McConnell and Muscarella (1985), Dann and Mikkelson (1984), and James (1987).
3. See Flannery (1986) for the theoretical justification of debt maturity choices.
4. For example, Pye (1966), Elton and Gruber (1972), Bodie and Friedman (1978), Bodie and Taggart (1978, 1980), and Van Horne (1980, 1984) all list the uncertainty of interest rates as the primary reason for the existence of callable bonds.
5. For example, see Barnea, Haugen, and Senbet (1980, 1981) for agency costs associated with asymmetric information, risk taking, and growth; Bodie and Friedman (1978) for risk taking; Leland and Pyle (1976) and Flannery (1986) for signaling; Boyce and Kalotay (1979), Van Horne (1984), and Marshall and Yawitz (1980) for taxes; Robbins and Schatzberg (1986) for maturity; Kidwell (1976) for standard indentures; Pye (1966) on restrictive covenants; and James (1987) for the uniqueness of bank loans.
6. For example see Modigliani and Miller (1958) and Kraus (1973).
7. For example see Barnea, Haugen, and Senbet (1980, 1981).
8. See Myers (1977), Bodie and Taggart (1978, 1980) and Aivazian and Callen (1980).
9. See Myers and Majluf (1984) for a summary of related signaling arguments.
10. Wall (1988) finds the Robbins/Schatzberg model hinges upon very restrictive assumptions and is therefore not applicable in the real world. See Robbins and Schatzberg (1988) for a counter-argument to Wall's position.
11. See Bodie and Taggart (1978), Boyce and Kalotay (1979), Flannery (1986), and Robbins and Schatzberg (1986).
12. Our results showed that during the period 1977 through 1986 that call restrictions averaged 5.3 years and 2.9 years for refunding and redeeming restrictions respectively.
13. The text reports the results for short-term defined as less than 10 years and long-term defined as 10 years or longer. The other stratification was short-

Table 6
Long-term Callables vs Other Debt Types

Announcement Period: Interval	Long-term Noncallable CAR*	Short-term Noncallable CAR*	All Short-term CAR*	All Noncallable CAR*
-20 through +20	+2.7724	-3.5483	-1.0020	-1.3962
	(+0.6072)	(-0.8278)	(-0.2368)	(-0.2358)
-10 through +10	+2.7725	-0.6311	+0.7427	+0.7661
	(+0.8485)	(-0.2057)	(+0.2452)	(+0.1808)
- 5 through + 5	+1.5914	-0.6772	+0.1422	-0.0902
	(+0.6729)	(-0.3050)	(+0.0649)	(-0.0294)
- 1 through + 1	+1.2232	+0.6137	+0.4028	+0.7714
	(+0.9904)	(+0.5293)	(+0.3519)	(+0.4816)
- 1 through + 5	+0.0955	-0.8652	-0.7167	-0.6166
	(+0.0506)	(-0.4885)	(-0.4099)	(-0.2520)
- 1 through 0	+1.1094	+0.3133	+0.2400	+0.5193
	(+1.1002)	(+0.3309)	(+0.2568)	(+0.3971)

Execution Period: Interval	Long-term Noncallable CAR*	Short-term Noncallable CAR*	All Short-term CAR*	All Noncallable CAR*
-20 through +20	-0.0549	-4.5044	-2.9199	-3.3532
	(-0.0122)	(-1.0511)	(-0.6902)	(-0.5664)
-10 through +10	-1.1577	-3.1570	-2.1279	-2.6397
	(-0.3601)	(-1.0293)	(-0.7028)	(-0.6230)
- 5 through + 5	-1.9570	-2.9569	-2.8590	-2.6982
	(-0.8412)	(-1.3321)	(-1.3048)	(-0.8799)
- 1 through + 1	-0.0825	-0.4732	-0.2893	-0.3721
	(-0.0679)	(-0.4082)	(-0.2528)	(-0.2323)
- 1 through + 5	-1.3022	-2.2070	-2.2642	-1.9729
	(-0.7017)	(-1.2464)	(-1.2953)	(-0.8065)
- 1 through 0	+0.0086	-0.4853	-0.2233	-0.3575
	(+0.0067)	(-0.5127)	(-0.2390)	(-0.2734)

Note: * CARs reported in table measure the difference in Long Maturity Callable Debt CAR minus Alternative Debt CAR.

Note: All tests of the hypothesis that the CAR's differ from 0 were insignificant. Values in the parentheses ( ) indicate t-values.

term was 5 years or less and long-term was 20 years or more.

14. The maturity distribution of the event study data set was similar to that outlined within Table 2 for the total debt sample.
15. Zero coupon, floating rate, and convertible debt issues were not included within the event study analysis due to their unique characteristics. For example, zero coupon bonds were excluded because of their unusual call features. Most are callable at par, see Narayanan and Lim (1989). A large proportion of floating rate debt has put options included, see Chatfield and Moyer (1986).
16. See Brown and Warner (1985, p 29) for a description of the test statistic calculations.
17. See Miles and Rosenfeld (1983, p. 1603) for a description of the test statistic calculations used in the analysis of the differences in CARs from two subsets.
18. Similar results were obtained when intermediate maturities were eliminated, i.e. short maturities were defined as debt issues of 5 years or less and long maturities as debt issues of 20 years or longer.
19. The t-values for the difference of the CARs from the short and long maturity subsamples during the announcement period were: 0.2984 (-20/+20), -0.2298 (-10/+10), -0.1285 (-5/+5), -0.2952 (1/+1), 0.3913 (-1/+5), and -0.1802 (-1/0). During the execution period the t-values were: 0.6717 (-20/+20), 0.6606 (-10/+10), 1.3563 (-5/+5), 0.1131 (-1/+1), 1.3469 (-1/+5), and 0.1539 (-1/0).
20. The other tests that complete the full matrix of comparison combinations, short-term debt versus noncallable debt, short-term callable debt versus long-term noncallable debt, short-term callable versus short-term noncallable, and short-term callable versus long-term callable also generated insignificant results and therefore were not included in Table 6.

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