THE INFLUENCE OF MARKET CONDITIONS ON POISON PUT USE IN CONVERTIBLE BONDS

Claudia Kocher, University of Michigan - Dearborn
Hei Wai Lee, University of Michigan – Dearborn
Karen Strandholm, University of Michigan – Dearborn

ABSTRACT

The objective of this study is to increase understanding of why poison put covenants are included in convertible bond contracts. We compare characteristics of convertible bond issuers who used poison puts with those who did not for the period from 1986 to 2002. We focus our analysis on two sub periods, 1988-1990 and 1991-1998, which were characterized by dramatically different financial market conditions. Our results show that almost all convertible bond issuers used poison put covenants during the late 1980s, a period of extremely high event risk. In contrast, poison put users differed from nonusers during the sub period of 1991-1998, with users having lower operating profit margins and higher capital expenditure ratios than nonusers. Given recent growing interest in bond covenants that address event risk, the findings of this study provide useful insights to practitioners.

JEL: G24; G32

KEYWORDS: Poison put provisions, Change of control covenants, Convertible bonds

INTRODUCTION

Poison put covenants are designed to protect bondholders from wealth losses due to leverage-increasing events. Sometimes referred to as change of control provisions, they were used heavily by both convertible and nonconvertible bond issuers in the late 1980s. There was a drastic decline in the use of poison put covenants among nonconvertible bond issuers when the leveraged buyout boom ended in 1989. However, convertible bond issuers continued to adopt this provision in their bond offerings until the late 1990s.

Most empirical studies on poison put covenants focus on their use in nonconvertible bonds during the period of 1986-1990. The work of Nanda and Yun (1996) is the first that examines poison put use in convertible bonds. They examine stock price reaction to the announcement of convertible bond issuance for poison put users and nonusers during the period of 1987-1992. They find that poison put users experienced less negative price reactions than nonusers upon announcement of their convertible bond offerings. Our work builds on Nanda and Yun (1996) by examining financial characteristics of firms that issued convertible bonds with versus without poison put provisions over an extended sample period of 1986-2002.

Recent empirical work documents major differences in financial market condition for the 1980s and the 1990s. Holmstrom and Kaplan (2001) show that leveraged buyout activities increased sharply in the 1980s, peaked in 1988 and "virtually disappeared in the 1990s." They also note that although merger activities increased steadily through the 1990s, the mergers did not share the common features of high leverage and hostility that characterized mergers in the 1980s. For instance, they find that management contested 20%-40% of tender offers in the 1980s versus 15% in the first half of the 1990s. In addition, there was a drastic increase in bondholder concern about wealth losses due to claim dilution in the late 1980s. Kaplan and Stein (1993) report that one third of the leveraged buyouts (LBOs) occurring in the second half of the 1980s experienced financial distress. This high failure rate, along with the collapse of

the junk bond market, coincided with the end of the LBO boom. In addition, a related difference between the 1980s and 1990s is that nonfinancial firms were net retirers of equity in the 1980s and net issuers of equity in the 1990s (Holmstrom and Kaplan, 2001).

In light of the differences in financial market condition between the 1980s and 1990s, we further examine the use of poison puts by convertible bond issuers for two sub periods, 1986-1990 and 1991-2002. We compare characteristics of convertible bond issuers who use versus those who do not use poison puts. Our results show differences between poison put users versus nonusers for both sub periods. For the early sub period, the only significant difference between the users versus nonusers is firm size, with poison put users being larger than nonusers. For the later sub period, the poison put users have worse operating profitability and larger capital expenditures than the nonusers. This suggests that poison put users are poor performers, and their poor operating performance may lead them to be targets for a leveraged restructuring. In addition, we note that poison put use in convertible bonds declined in the late 1990s. For the period between 2000 and 2002, we find no firms issuing convertible bonds with poison puts. The decline may have been influenced by the abundance of capital provided by investors interested in buying bonds (Currie, 2005). This rising demand for bonds weakened the bargaining power of bond investors. In addition, low interest rates may have led to low default rates, which in turn caused bondholders to be less aggressive in demanding poison puts and other change of control covenants as part of the bond contracts (Covell, 2006).

Regardless of the reason for the decline in use of poison puts in the late 1990s, there are indications that interest in this provision has reemerged since mid 2000s. For example, the business press reported concern about the credit status of many bond issues that lack protective covenants, such as poison puts **(**"Ferrovial success," 2006; "$3.8bn bid," 2005; "Issuers weigh," 2005). Moody's Investor Service, in a Special Comment published in September 2006, expressed the view that poison puts and other change of control covenants "remain critical for bondholder protection". (Moody's Investor Service, 2006, p.3) These business articles suggest rising concern about bondholder wealth losses due to activities of private equity firms and leveraged buyout groups.

Recent articles discuss the deterrent effect poison puts are having on takeover activity (Berman, 2009; Grover, 2009). Since corporate borrowing rates are high, it is costly for firms to finance redemption of existing bonds when poison puts are triggered. Amylin is cited as an example of a firm that may be pushed into default if a poison put covenant is triggered and the firm must borrow funds to redeem existing debt (Grover, 2009). The current credit environment is putting a spotlight on poison puts and illustrating the strength of this covenant in a tight credit environment. In addition, there appears to be increasing interest in poison puts among market participants such as bond investors, stockholders and managers. According to Moody's (2006), poison put use has been cyclical and has often lagged the concerns the covenants are designed to address. The insights provided by this research will contribute to the growing body of knowledge related to this covenant.

Section 2 summarizes the literature on agency conflicts of debt and equity related to event risk and the use of change of control covenants, such as poison puts. Section 3 develops hypotheses to explain differences in financial characteristics of convertible bond issuers who adopt poison put covenants versus those who do not. In Section 4, we discuss the construction of our sample, and the methodologies and variables that we use to compare the financial characteristics of sample firms. Sections 5 and 6 present and discuss the results, and conclude the paper.

LITERATURE REVIEW

There are two basic types of agency problems within a firm. The first is the conflict between stockholders and bondholders that is created when stockholders expropriate the wealth of bondholders through inappropriate investment and financing decisions (Jensen and Meckling, 1976; Bae, Klein, and Padmaraj, 1994). The second is the agency problem created between stockholders and managers when managers expropriate the wealth of stockholders through activities such as consuming perquisites or entrenching themselves at the expense of the stockholders (Jensen and Meckling, 1976; Shleifer and Vishny, 1989).

Firms can reduce the stockholder–bondholder agency problem by using restrictive covenants, issuing convertible debt, or by simultaneously holding stock and bonds of the same company (Jensen and Meckling, 1976; Lehn and Poulsen, 1991; Bae, Klein, and Padmaraj, 1994). An event risk covenant is an example of a restrictive covenant and poison puts are the most common form of event risk covenant (Lehn and Poulsen, 1991). Poison puts are designed to allow bondholders to redeem their bonds prior to their maturity, often for par value plus a specified premium, in the event of changes in corporate control resulting in increased leverage or changes in firm policy that result in a substitution toward riskier projects (Nanda and Yun, 1996). By giving power to bondholders to redeem the bonds early under these circumstances, the ability of stockholders to shift wealth from bondholders to stockholders is limited, which in turn lowers the agency costs of debt that otherwise would be borne by stockholders. This is commonly referred to as the stockholder wealth maximization hypothesis. Cook and Easterwood (1994) and Roth and McDonald (1999) compare stock price performance for poison put users versus nonusers. They focus on nonconvertible bond issuers. Their results show lower market-adjusted stock returns for poison put users, providing support for the hypothesis that poison puts decrease stockholder value and entrench managers by making leveraged restructuring events more costly. Nanda and Yun (1996) examine poison put use by convertible bond issuers. They compare stock price performance for poison put users versus nonusers. They find that convertible bond issuers who use poison puts have a significantly more positive stock market reaction than convertible issuers who do not use poison puts. Their results are consistent with poison puts increasing firm value by decreasing agency conflicts between stockholders and bondholders.

Bae, Klein and Padmaraj (1997) compare characteristics of issuing firms that are users versus nonusers of event risk covenants for a sample of nonconvertible bonds issued between 1986 and 1990. Their results suggest that the firms with the most severe agency problems of debt and the highest potential for takeover are most likely to use event risk covenants. We examine convertible bond issuers using a similar approach in this research. Our study period is longer, however, extending from 1986-2002.

HYPOTHESIS DEVELOPMENT

In this section, the testable hypotheses are developed. We begin by examining issues associated with claim dilution. Next, we examine financial distress. The third issue examined is asset substation.

Claim Dilution

Existing bondholders' claims are diluted if additional debt of equal or higher priority claim is added to a firm's capital structure. Nash, Netter and Poulsen (2003) note that event risk is an extreme form of claim dilution due to the additional debt that is incurred with leveraged buyouts, hostile takeovers, or other leveraged restructuring events. Claim dilution was found by Asquith and Wizman (1990) and Warga and Welch (1993) who document significant wealth losses for existing bondholders in leveraged takeovers.

The corporate restructuring literature provides insight regarding characteristics of firms with a high risk of claim dilution. Palepu and Wruck (1992) show that, among firms involved in leveraged payouts to shareholders, those that face explicit or rumored hostile takeover activity have lower operating profit ratios and higher capital expenditure ratios. These "poor performers" or "defensive" firms are at high risk for claim dilution due to a leverage-increasing event. John, Lang and Netter (1992) find that firms with poor performance related to product markets increase capital expenditures. Denis and Kruse (2000) find that even during periods when overall leveraged restructuring activity is low, firms with poor performance are involved in corporate restructuring events that improve performance. Overall, the literature suggests that firms facing product market pressure are at risk for a leverage-increasing restructuring event and thus face relatively high risk of claim dilution.

According to Jensen (1986), firms with excess free cash flow and few investment opportunities can increase value through a leverage-increasing restructuring that forces managers to use cash in a disciplined manner. The bondholders of these firms face a high risk of claim dilution. Lehn and Poulsen (1991) find that firms with prior takeover threats are likely to include poison puts in their bond contracts. They acknowledge that this could indicate support for either shareholder wealth maximization or entrenchment.

Firms with poor performance, few investment opportunities or excess free cash flow may be at risk for a leveraged restructuring. Bondholders of these firms may experience wealth decreases due to claim dilution if a leveraged restructuring occurs. *Therefore, we hypothesize those firms with the most severe claim dilution problem use poison puts.*

Financial Distress

Financial distress risk may influence the use of poison puts by stockholders and bondholders (Jensen and Meckling, 1976). In fact, Nash, Netter and Poulsen (2003) examine bonds (both convertible and nonconvertible) and find that firms with a higher level of financial distress risk use poison put covenants more frequently. Firms at risk for financial distress have little room for the additional leverage brought on by a restructuring event. If a leverage-increasing event occurs, the ability of a firm to pay its debts as they become due, including subordinated bond debt, decreases. Poison puts give bondholders the ability to elevate the priority of their debt, increasing the likelihood that the debt will be paid in full.

Because poison puts can be used strategically by bondholders to extract payments from stockholders in excess of the contracted payment (David, 2001), it is even more likely that bonds issued by firms in financial distress contain poison puts. Poison puts, in effect, give bondholders a first claim on the firm's available funds following an event risk. A firm may be forced to sell assets, face higher borrowing costs or file for bankruptcy if bondholders exercise the poison puts in their bond contracts (David, 2001). In this instance of financial distress, some bondholders may be able to extract a premium in exchange for not putting the bonds.

In general, poison puts provide bondholders with additional negotiating power. This is especially important when financial distress risk is high. *Therefore, we hypothesize that firms with high financial distress risk use poison puts.*

Asset Substitution

Asset substitution refers to a situation where firms issue bonds to fund safe projects and then substitute high-risk projects after they have obtained the funding from bondholders. Asset substitution decreases the value of existing bonds because the increased risk involved with the substituted project decreases the likelihood of repayment. However, asset substitution increases the value of stockholder equity because

stockholders get the benefit of the high variance project without having to pay the entire cost associated with the project. Jensen and Meckling (1976) suggest that a convertible feature may reduce stockholder incentives to switch to high variance projects. If the firm switches to a high variance project, the convertible bondholders are compensated for the risk involved by gaining a higher value for their conversion option. However, they experience a decline in nonconvertible bond value. For firms with the most severe asset substitution problems, the conversion option may not be sufficient to compensate the bondholders for the decline in the nonconvertible bond value. These bondholders are likely to structure contracts so that they share in the equity gains if the firm does well and have put options for protection if there is a decline in the bond value. *Therefore, we hypothesize that firms with severe asset substitution problems use poison puts.*

DATA AND METHODOLOGY

We identified all convertible bonds issued by NYSE, AMEX, and NASDAQ firms between 1986 and mid-2002 for which financial statement data are available on Standard and Poor's Research Insight COMPUSTAT database. Data on bond issuances are obtained from Security Data Company. The preliminary database includes 229 issuers of convertible bonds with poison puts and 397 issuers of convertible bonds without poison puts. Each firm is included only once per fiscal year, regardless of the number of bonds issued in the same year. Since almost no convertible bond issuers used poison puts in 1999-2002, we excluded these years in the final sample. We also excluded 1986-1987 from the final sample because the initial poison put covenants were significantly weaker than the poison puts used after 1987. Nanda and Yun (1996) discuss the weakness of the early covenants and omit bonds issued prior to 1988 from their sample. The final sample includes 211 convertible bond issuances with poison puts and 107 convertible bond issuances without poison puts.

The percentage of convertible bonds with poison puts changes over time. Poison puts were first used in convertible bonds in 1986 and skyrocketed in 1989, with 80.5% of the issuers including a poison put. During the period 1991-1994, over two thirds of the issuers included poison puts in their convertible bond issues. Poison put users included issuers of investment grade bonds. This was different from the nonconvertible bond market, where investment grade issuers stopped using poison puts after early 1990. During the period 1995-1998, the use of poison put covenants declined slightly, and their use in investment grade convertible bonds began declining. Between 1999 and 2000, their use dropped off steeply and then disappeared by 2001. Table 1 presents data on convertible bond issuance and poison put use.

We employ two empirical methods to compare convertible bond issuers who use poison puts with those who do not. First, we apply the difference in means t-test and the difference in medians z-test to the explanatory variables individually. Then, we apply logistic regression analysis to further examine the partial impacts of the explanatory variables on the decision to use versus not use poison puts in convertible bond contracts. In the logistic analysis, the dichotomous dependent variable has a value of zero for convertible bond issuers not using poison puts and one for convertible bond issuers using poison puts.

We use two variables, operating profit margin (OPERPROFIT) and capital expenditure ratio (CAPEXPEN), to proxy for the risk of claim dilution. A low OPERPROFIT and a high CAPEXPEN suggest that the firm may be investing in projects that destroy value (Palepu and Wruck, 1992). OPERPROFIT also proxies for the risk of financial distress (Bae, Klein and Padmaraj, 1997).

OPERPROFIT is calculated by dividing operating income before depreciation, depletion and amortization by sales at the fiscal year end preceding the bond issuance. CAPEXPEN is calculated by dividing annual

capital expenditures (from the statement of cash flows) by total assets at the fiscal year end preceding the bond issue. Based on Papelu and Wruck (1992), firms with low OPERPROFIT and high CAPEXPEN are poor performers and more likely to be takeover targets. This puts them at risk for claim dilution and financial distress. We expect convertible bond issuers with poor operating performance to use poison puts.

Table 1: Information on Convertible Bonds and Use of Poison Puts

Year	Number of publicly issued convertible bonds in sample	Number of convertible bonds with poison puts	% of convertible bonds with poison put	Number of publicly issued convertible bonds with an investment grade rating	% of investment grade convertible bonds with poison puts
1986	125	10	8.0%	13	23%
1987	89	4	4.5%	14	29%
1988	25	7	28.0%	7	57%
1989	41	33	80.5%	11	91%
1990	26	23	88.5%	11	100%
1991	33	24	72.7%	12	58%
1992	46	36	78.3%	10	60%
1993	51	35	68.6%	9	56%
1994	12	8	66.7%	4	50%
1995	16	6	37.5%	4	25%
1996	31	19	61.3%	7	43%
1997	22	15	68.2%	4	25%
1998	15	5	33.0%	5	0%
1999	14	2	14.3%	6	0%
2000	17	2	11.8%	6	0%
2001	57	0	0.0%	16	0%
2002 (First 6 mos.)	6	0	0.0%	3	0%

Table 1 shows the number of convertible bonds issued each year of the study period. In addition, information regarding the frequency of poison put use, the issuance of investment grade convertible bonds, and the use of poison puts in investment grade convertible bonds is provided.

We examine alternative variables for claim dilution - a measure of free cash flow (FCF) and a measure of investment opportunities, the firm's market to book ratio (M/B). We follow the procedures used in Lehn and Poulsen (1989) to calculate FCF. We calculate M/B by dividing the market value of total common equity by the book value of total common equity. Both measures are from the fiscal year end preceding the bond issuance. Firms with high free cash flow and few investment opportunities are likely to be takeover targets. Thus, these firms are at risk for claim dilution and are expected to include poison puts in their convertible bond indentures.

Interest coverage (TIE) and Altman's Z-score (ZSCORE), a bankruptcy prediction measure, are also used as proxies for financial distress (Nash, Netter and Poulsen, 2003). Firms with lower TIE and lower ZSCORE are likely to have greater likelihood of financial distress. These firms have little ability to withstand the addition of new debt that characterizes a leveraged restructuring. We expect convertible issuers with low TIE and ZSCORE to use poison puts.

The level of leverage is measured by the debt to total capital ratio (DEBTRAT), which is calculated by dividing book value of long-term debt by invested capital for the fiscal year end preceding the bond issuance. Based on the previous analysis, one of the characteristics of firms that have claim dilution or financial distress problems is high leverage. Highly leveraged firms dilute the claims of subordinated debt and increase the likelihood of financial distress. This is consistent with the finding of Nanda and Yun (1996) that issuers with higher leverage include poison puts in convertible debt offering. We expect a positive relation between DEBTRAT and poison put use for convertible issuers.

Firm size (FIRM SIZE) and debt level (DEBTRAT) are used as proxy variables for the agency problem of asset substitution. Firms with the most severe asset substitution problems are the smallest firms and those with the highest levels of leverage (Bae, Klein and Padmaraj, 1997). Small firms have less public information available, leading to greater information asymmetry between outside investors and firm insiders. This creates opportunities to switch from safe to risky projects after debt proceeds are obtained. High leverage is related to the asset substitution problem also. If a risky project has a negative outcome, the highly leveraged firm has little flexibility to address the resulting decrease in cash flows.

Natural logarithm of total assets at the end of the previous fiscal year (FIRM SIZE) is used as a measure of firm size. Given our hypothesis that firms with the most severe agency problems related to asset substitution have high event risk, we expect a negative relation between FIRM SIZE and poison put use and a positive relation between DEBTRAT and poison put use for convertible issuers.

RESULTS

The results are presented in two parts. The first section presents the results of the univariate analysis. The second section presents the results of the logistic regression analysis.

Univariate Analysis

We compare convertible bond issuers who use poison puts to issuers who do not. Table 2 presents mean and median values of the variables that are calculated for poison put users and nonusers. In columns two and three, mean values are listed first and median values are listed below the mean values for each variable. Column four, labeled "difference tests", presents the t-statistic (p-value in parentheses) for the means test and the z-statistic (p-value in parentheses) for the medians test for each variable. The results in Table 2 focus on the entire study period for which adequate data is available (1988-1998).

Convertible bond issuers who use poison puts have lower operating profit ratios (OPERPROFIT) and higher capital expenditure ratios (CAPEXPEN) than convertible issuers who do not use poison puts. The mean value of OPERPROFIT for convertible issuers using poison puts is .0969 while the mean value for nonusers is .1627. This difference in means is statistically significant at the 10% level, with a t-statistic of 1.79 and p-value of .0753. Medians for the OPERPROFIT variable are .1133 and .1437, respectively, for convertible issuers who use versus those who do not use poison puts. The difference in medians is statistically significant at the 5% level, with a z-statistic of 2.397 and a p-value of .0166. Capital expenditure ratios (CAPEXPEN) are higher for convertible issuers who use poison puts. The mean value of CAPEXPEN for poison put users is .1116 while the mean value for nonusers is .0837. The t-statistic for the difference of means test is -2.36 with a p-value of .0192. The median values of CAPEXPEN are .0774 for poison put users and .0558 for nonusers, respectively. The z-statistic is -1.494 with a p-value of .1351.

Our findings of lower operating profitability and higher capital expenditures for convertible issuers who use poison puts relative to nonusers are consistent with the claim dilution hypothesis. In other words, these firms are at risk for a leverage-increasing hostile takeover, and managers may perceive that a poison put covenant will reassure bondholders and hence reduce the overall cost of debt. Our results are consistent with arguments by Palepu and Wruck (1992) and John, Lang and Netter (1992) that firms with poor performance have high risk of claim dilution, even during years when overall leveraged restructuring activity is low.

We find no significant differences in other variables that proxy for agency problems of free cash flow, financial distress risk, and agency problems related to asset substitution. Firm size, debt ratio, free cash

flow, market to book ratio, times interest earned and Altman's Zscore are all similar for both groups of convertible bond issuers.

Table 2: Comparisons of Means and Medians for Study Variables for Entire Sample Period 1988-1998

Variables	**Convertible Issuers who do not use Poison Puts**	**Convertible Issuers who use Poison Puts**	**Difference Tests** t-stats (p-values) for means; z-stats (p-values) for medians;
FIRM SIZE	5.822	6.097	-1.090 (.2758)
	5.475 (N = 92)	6.124 (N = 202)	-1.005 (.3151)
DEBTRAT	35.941	36.400	-0.100 (.9240)
	32.274 (N = 92)	33.653 (N = 202)	-0.251 (.8017)
OPERPROFIT	.1627	.0969	1.790 (.0753)*
	.1437 (N = 91)	.1133 (N = 201)	2.397 (.0166)**
CAPEXPEN	.0837	.1116	-2.360 (.0192)**
	.0558 (N = 88)	.0774 (N = 199)	-1.494 (.1351)
FCF	.0521	.0512	0.050 (.9569)
	.0747 (N = 86)	.0690 (N = 197)	0.128 (.8985)
M/B	3.751	3.100	1.140 (.2581)
	2.566 (N = 86)	2.286 (N = 188)	1.300 (.1938)
TIE	14.24	9.678	1.380 (.1709)
	6.106 (N = 85)	4.555 (N = 193)	1.429 (.1529)
ZSCORE	4.118	4.570	-0.790 (.4329)
	3.302 (N = 86)	3.273 (N = 188)	0.000 (1.000)

*This table focuses on the entire study period for which adequate data is available and presents a comparison of mean and median values of the study variables for convertible bond issuers who do not use poison puts versus convertible bond issuers who do use poison puts. For the cells in the middle two columns, the top number is the mean value of the explanatory variable and the bottom number is the median value. The number in parentheses gives the number of firms with data needed to calculate that variable. The last column on the right shows the t statistic and the corresponding p-value for the difference between the means (top value) and the z statistic and the corresponding p-value for the difference between the medians (bottom value). ***, ** and * indicate significance at the 1, 5 and 10 percent levels respectively.*

Variable Definitions:
FIRM SIZE = natural logarithm of book value of total assets at the fiscal year end preceding bond issuance.
DEBTRAT = book value of long-term debt divided by invested capital at the fiscal year end preceding bond issuance.
OPERPROFIT = operating income before depreciation, depletion and amortization divided by sales at fiscal year end preceding bond issuance.
CAPEXPEN= annual capital expenditures (from statement of cash flows) divided by total assets at fiscal year end preceding bond issuance.
FCF = free cash flow, as calculated by Lehn and Poulsen (1989), divided by book value of total assets at fiscal year end preceding bond issuance.
M/B = market value of total common equity divided by book value of common equity at the fiscal year end preceding bond issuance.
TIE = times interest earned ratio calculated as operating income before depreciation divided by annual interest expense at fiscal year end preceding bond issuance.
ZSCORE = Altman's Zscore, as calculated by Standard and Poor's Research Insight database.
N/PP = total number of convertible bond issuers and number of issuers that use poison puts.

Table 3 presents mean and median values for convertible bond issuers with poison puts and without poison puts for the sub period of 1988-1990. The results for this sub period differ from the results for the complete study period, 1988-1998. Specifically, there is no significant difference between mean and median values for OPERPROFIT and CAPEXPEN, as was true for the overall study period. The only variable that is significantly different for the sub period is FIRM SIZE. The mean of FIRM SIZE is 6.218 for the convertible bond issuers who use poison puts, and 4.835 for the convertible issuers who do not use poison puts. The difference of means t-statistic is -3.14 with a p-value of .003. The t-statistic is significant at the 1% level. The median of FIRM SIZE is 6.363 for the poison put users and 4.893 for the nonusers. The difference of medians z-statistic is -2.725 with a p-value of .0064 for the median test. Again, the t-statistic is significant at the 1% level. This finding is not supportive of our hypotheses that claim dilution, financial distress or asset substitution problems cause firms to use poison puts in their convertible bond offering in the late 1980s.

Table 4 shows that poison put users have lower OPERPROFIT (differences in means and medians are significant at 5% and 1% levels, respectively) and higher CAPEXPEN (significant for difference in means only at 10% level) than nonusers in the later sub period, 1991-1998. These variables suggest relatively poor performance for the convertible bond issuers using poison puts. However, analysis of the

other variables suggests that while poison put users on average may have poor performance relative to nonusers, they do not appear to have high financial distress risk. TIE for the poison put users is lower than for the nonusers, 11.5 versus 14.6, but neither ratio is close to the level of financial distress. This is in contrast to the findings of Nash, Netter and Poulsen (2003) that poison put users have higher financial distress risk than nonusers. Nash, Netter and Poulsen examined a sample of both nonconvertible and convertible bond contracts and issuers. Finally, our results show no difference in investment opportunities between poison put users and nonusers. Jensen's free cash flow hypothesis (1986) states that firms with large amounts of free cash flow and few investment opportunities are likely targets for leverage-increasing restructuring events. These firms would be at risk for the claim dilution associated with such an event and thus likely to use poison puts. We see no difference between poison put users and nonusers for FCF and M/B.

Table 3: Comparisons of Means and Medians for Study Variables for Sub period 1988-1990

Variables	**Convertibles without Poison Puts**	**Convertibles with Poison Puts**	**Difference Tests** t-stats (p-values) for means; z-stats (p-values) for medians;
FIRM SIZE	4.835	6.218	-3.14 (.0031)***
	4.893 (n = 26)	6.363 (n = 61)	-2.725 (.0064)***
DEBTRAT	36.115	40.617	-0.480 (.6316)
	27.391 (n = 26)	36.051 (n = 61)	-1.328 (.1813)
OPERPROFIT	0.090	0.073	0.150 (.8803)
	0.109 (n = 26)	0.128 (n = 60)	-0.467 (.6406)
CAPEXPEN	0.085	0.114	-1.390 (.1678)
	0.046 (n = 25)	0.086 (n = 60)	-1.114 (.2654)
FCF	-0.009	0.022	-0.640 (.5218)
	0.049 (n = 26)	0.051 (n = 59)	.0716 (.9429)
M/B	5.176	3.208	1.460 (.1492)
	2.608 (n = 24)	2.290 (n = 56)	1.455 (.1458)
TIE	13.282	5.423	1.460 (.1474)
	4.373 (n = 25)	4.493 (n = 59)	-0.237 (.8125)
ZSCORE	3.370	3.471	-0.130 (.8972)
	2.653 (n = 24)	2.522 (n = 57)	0.0717 (.9429)

*This table focuses on the earlier sub period and presents a comparison of mean and median values of the study variables for convertible bond issuers who do not use poison puts versus convertible bond issuers who do use poison puts. For the cells in the middle two columns, the top number is the mean value of the explanatory variable and the bottom number is the median value. The number in parentheses gives the number of firms with data needed to calculate that variable. The last column on the right shows the t statistic and the corresponding p-value for the difference between the means (top value) and the z statistic and the corresponding p-value for the difference between the medians (bottom value). ***, ** and * indicate significance at the 1, 5 and 10 percent levels respectively.*

Variable Definitions:
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CAPEXPEN= annual capital expenditures (from statement of cash flows) divided by total assets at fiscal year end preceding bond issuance.
FCF = free cash flow, as calculated by Lehn and Poulsen (1989), divided by book value of total assets at fiscal year end preceding bond issuance.
M/B = market value of total common equity divided by book value of common equity at the fiscal year end preceding bond issuance.
TIE = times interest earned ratio calculated as operating income before depreciation divided by annual interest expense at fiscal year end preceding bond issuance.
ZSCORE = Altman's Zscore, as calculated by Standard and Poor's Research Insight database.
N/PP = total number of convertible bond issuers and number of issuers that use poison puts.

Overall, the univariate results suggest that poison put use in the early sub period was reactionary. Investors saw wealth expropriation from existing bondholders in leveraged buyouts and hostile takeovers and demanded protection from leverage-increasing events. Poison put use in convertible bonds during the later sub period, 1991-1998, appears to be associated with relatively poor operating performance. The users are takeover targets because a restructuring is needed to improve operations. This is somewhat different from a restructuring that is motivated by excess free cash flow. Our hypothesis that convertible bond issuers at risk for claim dilution use poison puts is partially supported. Firms at risk for a leveraged restructuring due to poor operating performance appear likely to include poison puts in their convertible

bond contracts. However, firms at risk for a leveraged restructuring due to excess free cash flow and/or small size do not appear more likely to include poison puts. We speculate that the poor performers (lower OPERPROFIT and higher CAPEXPEN) waste excess cash flow in projects with low returns. In addition, our results do not support the hypothesis related to financial distress. The poison put users are not significantly different from the nonusers with respect to the financial distress variables, TIE and ZSCORE. Finally, there is no support for the hypothesis that convertible bond issuers with agency problems related to asset substitution are more likely to include poison puts in their bond contracts.

Table 4: Comparisons of Means and Medians for Study Variables for Sub Period 1991-1998

Variables	**Convertibles without Poison Puts**	**Convertibles with Poison Puts**	**Difference Tests** t-stats (p-values) for means; z-stats (p-values) for medians;
FIRM SIZE	6.211	6.044	0.570 (.5680)
	6.194 (n = 66)	5.957 (n = 141)	0.345 (.7301)
DEBTRAT	35.872	34.578	0.250 (.8061)
	33.101 (n = 66)	32.391 (n = 141)	0.345 (.7300)
OPERPROFIT	0.192	0.107	2.380 (.0182) **
	0.154 (n = 65)	0.112 (n = 141)	3.440 (.0006) ***
CAPEXPEN	0.083	0.110	-1.900 (.0589) *
	0.056 (n = 63)	0.062 (n = 139)	-0.455 (.6495)
FCF	0.077	0.064	1.160 (.2467)
	0.080 (n = 63	0.071 (n = 138)	0.806 (.4203)
M/B	3.200	3.054	0.380 (.7056)
	2.549 (n = 62)	2.257 (n = 132)	0.614 (.5390)
TIE	14.636	11.551	0.850 (.3970)
	6.312 (n = 60)	4.863 (n = 134)	1.549 (.1213)
ZSCORE	4.407	5.048	-0.860 (.3886)
	3.342 (n = 62)	3.441 (n = 131)	-0.258 (.7963)

*This table focuses on the later sub period and presents a comparison of mean and median values of the study variables for convertible bond issuers who do not use poison puts versus convertible bond issuers who do use poison puts. For the cells in the middle two columns, the top number is the mean value of the explanatory variable and the bottom number is the median value. The number in parentheses gives the number of firms with data needed to calculate that variable. The last column on the right shows the t statistic and the corresponding p-value for the difference between the means (top value) and the z statistic and the corresponding p-value for the difference between the medians (bottom value). ***, ** and * indicate significance at the 1, 5 and 10 percent levels respectively.*

Variable Definitions:
FIRM SIZE = natural logarithm of book value of total assets at the fiscal year end preceding bond issuance.
DEBTRAT = book value of long-term debt divided by invested capital at the fiscal year end preceding bond issuance.
OPERPROFIT = operating income before depreciation, depletion and amortization divided by sales at fiscal year end preceding bond issuance.
CAPEXPEN= annual capital expenditures (from statement of cash flows) divided by total assets at fiscal year end preceding bond issuance.
FCF = free cash flow, as calculated by Lehn and Poulsen (1989), divided by book value of total assets at fiscal year end preceding bond issuance.
M/B = market value of total common equity divided by book value of common equity at the fiscal year end preceding bond issuance.
TIE = times interest earned ratio calculated as operating income before depreciation divided by annual interest expense at fiscal year end preceding bond issuance.
ZSCORE = Altman's Zscore, as calculated by Standard and Poor's Research Insight database.
N/PP = total number of convertible bond issuers and number of issuers that use poison puts.

Logistic Regression Analysis

Results of three logistic regressions are presented in Table 5. Separate regressions are run for the entire study period and for the two sub periods. The initial model includes variables representing firm size, debt ratio, operating profit margin, level of capital expenditures, and investment opportunities. Consistent with the univariate results, operating profit is negatively related while capital expenditure ratio is positively related to the likelihood of using a poison put. These results are weaker for the early sub period (1988-1990) and stronger for the later sub period. For the early sub period, firm size is positively related to the likelihood of using a poison put covenant. This is consistent with the univariate results. Convertible bond issuers with poor operating performance appear likely to include poison puts in their bond contracts. Debt level and investment opportunities appear unrelated to the likelihood of including a poison put in the convertible bond contract.

Table 5: Logistic Regression Analysis of Poison Put Use in Convertible Bonds

	1988-1998			1988-1990			1991-1998		
Variables	A	B	C	A	B	C	A	B	C
Intercept	0.1907	.3785	-0.7022	-3.0298	-1.8692	-1.6512	1.1014	1.1423	1.4739
	(.7398)	(.4687)	(.2105)	(.0068)***	(.0812)*	(.1257)	(.1191)	(.0829)*	(.0366)*
FIRM SIZE	0.0306	0.0873	0.0567	0.5054	0.5074	0.5007	-0.0970	-0.0394	-0.0847
	(.6873)	(.2755)	(.4902)	(.0244)**	(.0071)***	(.0065)***	(.3491)	(.6705)	(.3844)
DEBTRAT	0.0094			0.0117			0.0098		
	(.1354)			(.4094)			(.1782)		
OPERPROFIT	1.1670			-1.1290			-2.3909		
	(.0763)*			(.1332)			(.0461)**		
CAPEXPEN	4.6196			10.4160			3.9535		
	(.0070)***			(.0303)**			(.0381)**		
FCF		0.1902			-.3272			-1.0670	
		(.8757)			(.8567)			(.6085)	
M/B	0.0515	-0.0402	-0.0461	-0.0946	-0.0587	-0.0638	-0.0014	-0.0176	-0.0289
	(.1849)	(.2652)	(.2037)	(.1928)	(.3294)	(.2852)	(.9841)	(.7771)	(.6514)
TIE			-0.0073			-0.0182			-0.0050
			(.1833)			(.1521)			(.4456)
N/PP	267/185	268/184	259/179	78/55	79/55	77/54	189/130	189/129	182/125

*Logistic regression analysis is used to examine the partial impacts of the explanatory variables on the decision to use versus not use poison puts in convertible bond contracts. The dependent variable equals one for convertible bond issuers using poison puts and zero for convertible bond issuers not using poison puts. Three models are examined for the full study period and the two sub periods. Model A includes variables representing firm size, leverage, operating profit, capital expenditures, and investment opportunities. Model B includes variables related to agency problems of free cash flow. Model C includes variables related to financial distress and investment opportunities. The first figure in each cell is the regression coefficient. The second figure is the p-value. ***, ** and * indicate significance at the 1, 5 and 10 percent levels respectively.*

Variable Definitions:
Firm Size = natural logarithm of book value of total assets at the fiscal year end preceding bond issuance.
Debt Ratio = book value of long-term debt divided by invested capital at the fiscal year end preceding bond issuance.
Operprofit = operating income before depreciation, depletion and amortization divided by sales at fiscal year end preceding bond issuance.
Capexpen = annual capital expenditures (from statement of cash flows) divided by total assets at fiscal year end preceding bond issuance.
FCF = free cash flow, as calculated by Lehn and Poulsen (1989), divided by book value of total assets at fiscal year end preceding bond issuance.
M/B = market value of total common equity divided by book value of common equity at the fiscal year end preceding bond issuance.
TIE = times interest earned ratio calculated as operating income before depreciation divided by annual interest expense at fiscal year end preceding bond issuance.
N/PP = total number of convertible bond issuers and number of issuers that use poison puts.

Regression B includes variables related to the agency problem of free cash flow. The free cash flow measure and the market to book ratio are both statistically insignificant. As for model A, the firm size variable has a positive and significant coefficient for the sub period of 1988-1990. Regression C includes variables related to times interest earned and investment opportunities. The results suggest that poison put use is not motivated by financial distress concerns or influenced by existing investment opportunities.

CONCLUSION

This research compares characteristics of two groups of convertible bond issuers: those who used poison put covenants in their bond issues versus those who did not. Our results show systematic differences in the characteristics of these two groups of firms, especially for the later sample years. The most important differences are that convertible bond issuers using poison puts, for the sub period of 1991-1998, have lower operating profit margin and higher capital expenditures. It appears that the extreme financial market conditions of the late 1980s motivated almost all convertible issuers to include poison put covenants in their convertible bond issues. The 1990s, however, were quite different. Merger activities steadily increased but without the extreme leverage and resistance from management that characterized the earlier sample years. In the 1990s, convertible issuers who used poison puts were those with relatively poor operating performance. These firms were more likely to be a merger target or sell off assets with low returns, increasing risk for bondholders.

There are several limitations to the results of this research. First, the data on convertible bonds only goes through 2002. A follow-up study that examines more recent poison put use in convertible bonds would be a useful addition to the literature. In addition, a comparison of poison put use in convertible bonds versus nonconvertible bonds would provide deeper insight into the role of these covenants in reducing agency conflicts of debt and equity. Finally, an examination of the effect of different interest rate and credit environments on the value of poison put covenants is needed.

Frequent comments on the current need for event risk covenants, and specifically poison put covenants, can be found in the financial press in 2005 and 2006. In early 2007, a Wall Street Journal article (Richardson and Ng, 2007) noted that more bond investors are demanding covenants that allow them to get their money back if a leveraged restructuring occurs. This study provides a description of the evolving nature of the use of poison put covenants in convertible bonds during the late 1980s and 1990s. This previous experience with a relatively new type of bond covenant will be useful to practitioners as they consider adding poison puts to new debt issues.

REFERENCES

Asquith, P. and Wizman, T. (1990), Event risk covenants, and bondholder returns in leveraged buyouts. *Journal of Financial Economics*, 27, 195-213.

Bae, S. C., Klein, D.P., and Padmaraj, R. (1994), Event-risk bond covenants, agency costs of debt and equity and stockholder wealth. *Financial Management*, 23, 28-41.

Bae, S. C., Klein, D.P., and Padmaraj, R. (1997), Firm characteristics and the presence of event risk covenants in bond indentures. *The Journal of Financial Research*, 20, Fall, 373-388.

Berman, Dennis K. (2009), 'Poison puts' undercut mergers. Wall Street Journal, April 14, C3.

Cook, D. O., and Easterwood, J.C. (1994), Poison put bonds: an analysis of their economic role. *Journal of Finance*, 1905-1920.

Covell, S., Bondholders wince as issuers turn to the bank-debt market. *The Wall Street Journal*, January 30, 2006, C8.

Currie, A. (2005), Watch out, financial engineers are about. *Euromoney*, London, June, page 1.

David, A. (2001), Pricing the strategic value of putable securities in liquidity crises. *Journal of Financial Economics*, 59, 63-99.

Denis, D. and Kruse, T. (2000), Managerial discipline and corporate restructuring following performance declines. *Journal of Financial Economics*, 55, 391-424.

Ferrovial success isn't assured in its potential bid to buy BAA. (2006, February 9) *The Wall Street Journal Online.*

Grover, Ronald (2009), Fighting takeovers by playing the debt card. Business Week, April 9, http://www.businessweek.com/magazine/content/09_16/b4127033231436.htm.

Holmstrom, B. and Kaplan, S.N. (2001), Corporate governance and merger activity in the United States: Making sense of the 1980s and 1990s. *The Journal of Economic Perspectives*, 15 (2), Spring, 121-144.
Issuers weigh the case for stronger bond covenants. (2005, June), *International Financial Review*, p. 1.

Jensen, M.C. (1986), Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review*, 76, May, 323-339.

Jensen, M. C., and Meckling, W.H. (1976), Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 8, 305-360.

John, K., Lang, L. and Netter, J. (1992), The voluntary restructuring of large firms in response to performance decline. *Journal of Finance*, 47, July, 891-917.

Kaplan, S. N. and Stein, J. (1993), The evolution of buyout pricing and financial structure in the 1980s. *Quarterly Journal of Economics*, 108 (2), 313-358.

Lehn, K. and Poulsen, A. (1989), Free cash flow and stockholder gains in going private transactions. *Journal of Finance*, 44, July, 771-787.
Lehn, K. and Poulsen, A. (1991), Contractual resolution of bondholder-stockholder conflicts in leveraged buyouts. *Journal of Law and Economics*, October, 645-674.

Moody's Special Comment (September 2006), Request for comment on Moody's indenture covenant research and assessment framework. Global Credit Research, 1-14.

Nanda, V., and Yun, Y. (1996), Financial innovation and investor wealth: A study of the poison put in convertible bonds, *Journal of Corporate Finance* 3, 1-22.

Nash, R. C., Netter, J. M. and Poulsen, A.B. (2003), Determinants of contractual relations between shareholders and bondholders: investment opportunities and restrictive covenants. *Journal of Corporate Finance*, 9, 201-232.

Palepu, K. G. and Wruck, K.H. (1992), Consequences of leveraged shareholder payouts: Defensive versus voluntary recapitalizations. Working Paper 93-006, Harvard Business School, August.

Richardson, K. and Ng, S. (2007), Debt-driven deals shake up holders of highly rated bonds. *Wall Street Journal*, February 8th, C1.

Roth, G., and McDonald, C. G. (1999), Shareholder-management conflict and event risk covenants. *The Journal of Financial Research*, 22, Summer, 207-225.

Shleifer, A. and Vishny, R.W. (1989), Management entrenchment: the case of manager-specific investments. *Journal of Financial Economics*, 25, 123-139.

Warga, A. and Welch, I. (1993), Bondholder losses in leveraged buyouts. *The Review of Financial Studies*, 6, 959-983.

$3.8bn bid may junk ISS bonds as loan mart cheers. (2005, April 1) *Euroweek*, p1.

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BIOGRAPHY

Claudia Kocher, Ph.D., is an Associate Professor of Finance at University of Michigan-Dearborn. She received a Ph.D. in Finance from Michigan State University. Her current research interests include corporate debt contracts, financial management of health care organizations, and finance pedagogy. She has published in refereed finance and business education journals including *Journal of Applied Business Research, Financial Practice and Education, Journal of Financial Education, and Health Care Management Review.* She can be reached at: Department of Accounting and Finance, College of Business, The University of Michigan – Dearborn, 19000 Hubbard Drive , Dearborn, MI, 48126, (313) 593-5506, ckocher@umd.umich.edu

Hei Wai Lee, Ph.D., CFA, is a Professor of Finance and the Director of MS-Finance at The University of Michigan – Dearborn. He received a Ph.D. in Finance from The University of Illinois. His current research interests include seasoned security issuance and IPOs, international analyst research, cross-listing of foreign firms, value premium anomaly, valuation and capital market research. He has published in refereed finance and business journals and proceedings including *Financial Management, Financial Review, Journal of Business Finance and Accounting, Journal of Business Research, Journal of Financial Research, and Quarterly Review of Economics and Finance*, among others. He can be reached at: Department of Accounting and Finance, College of Business, The University of Michigan – Dearborn, 19000 Hubbard Drive, Dearborn, MI, 48126, (313) 593-5524**,** heiwail@umd.umich.edu

Karen Strandholm**,** Ph.D., JD, is an Associate Professor of Strategic Management at The University of Michigan – Dearborn. She received a Ph.D. in Strategy from Indiana University. Her current research interests include strategy and the environment and strategy and market orientation. She also does pedagogy research. She has published in refereed strategy and business journals and proceedings including *Journal of Business Research, Entrepreneurship Theory and Practice, and Journal of Education for Business*, among others. She can be reached at: Department of Management Studies College of Business, The University of Michigan – Dearborn, 19000 Hubbard Drive, Dearborn, MI, 48126, (313) 593-1268, kstrandh@umd.umich.edu.