



An empirical analysis of the determinants and pricing of corporate bond clawbacks

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ABSTRACT

This paper presents empirical analysis of the factors that affect a firm's decision to use a clawback provision in debt and the yield impact of including the clawback provision. The results show that relatively smaller firms with low credit rating and low profitability favor the usage of clawback provisions. We also find that debt with clawback provisions have the highest yield spread followed by callable bonds and straight debt. Convertible bonds that offer investors the option to convert to equity have lower yield spread. This implies that issuers can trade off flexibility for higher interest cost and that the clawback feature may be a significant financial innovation which reduces information asymmetry and creates an entry point for small firms to gain access to the public bond markets.

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1. Introduction

The corporate debt market has experienced numerous innovations over the past several decades. These innovations range from inclusion of specific covenants in the debt contract to the bundling of debt issues with some options that can be exercised either by the issuer or the investor. Examples include callable bonds, convertible bonds, clawbacks, puttable bonds, Liquid Yield Option Notes (LYON), Preferred Equity Redemption Cumulative Stocks (PERCS), Debt Exchangeable for Common Stock or Dividend Enhanced Convertible Securities (DECS)¹, and other hybrid offerings. These innovations have attracted the attentions of academic researchers, both theoretical and empirical. Most of the studies focus on the rationale for these financial innovations, what kinds of companies issue such hybrid securities, how the innovations benefit the issuer and/or the investors, and the impact of the innovations on the cost of financing and the issuing company's performance.

The focus of this paper is on one of the corporate bond innovation of the 90s, the *clawback provision*, an innovation that has not been given much attention in academic research. A *clawback provision* in debt contracts “gives the issuer an option to redeem a specified fraction of the bond issue within a specified period at a predetermined price and with funds that must come from a subsequent equity offering” (Goyal, Gollapudi and Ogden (GGO hereafter), 1998, p. 301). Clawback provisions allow an issuer to mitigate wealth transfer effects arising from the issuance of new equity.

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¹ PERCS, DECS, LYON and other designations representing securities with different financial innovations are registered trade marks of the financial institutions that created them. See Arzac (1999), McConnell and Schwartz (1999), Finnerty (1988) and Smithson and Chew (1999).

The volume of debt issues with clawbacks have grown from \$436 million in 1991 to \$43.5 billion in 2002. To our knowledge only one paper, *GGO (1998)*, examines the usage of clawback provisions based on a small sample during the early development of the market innovation. We argue that this provision may be increasingly important and beneficial for small firms that have relatively more information asymmetry compared to large firms.

When new equity is issued there is generally a marked improvement in the information environment surrounding the firm, particularly for newer or private firms issuing initial public offerings (*Schipper and Smith, 1986*). This leads to lower monitoring costs for bondholders and a consequent wealth transfer from shareholders to bondholders. The consequences of this wealth transfer are potential investment distortions that may result in underinvestment problems for the firm. Clawback provisions allow shareholders to recapture a portion of this wealth transfer by redeeming a portion of the outstanding debt using the equity proceeds.² Our analysis seems to suggest that the clawback provision is a useful technique and financial innovation which allows smaller firms significant protection from the underinvestment and wealth transfer problems that may exist in public markets.

Previous studies of bond innovations argue that these innovations give options either to the issuer or the investors, reduce information asymmetries, reduce agency problems, or shift risk. There are very limited empirical studies of the bond innovations and each is limited to analysis of one feature or the other.³ *GGO (1998)* examines clawback provisions in corporate debt based on the underlying theoretical foundation that clawback provisions enable shareholders to mitigate wealth transfers to bondholders. They find that clawback provisions are more prevalent in debt issued by private firms, unregulated firms, and firms with less tangible and less liquid assets. They also find that issuers pay 86 basis points higher median yield on bonds with clawback provisions.

Our study significantly extends the *GGO (1998)* study and contributes to the literature on financial innovations in several different ways. First, in comparison to the earlier study, our sample is significantly larger (1422 issues with clawback provisions compared to 85 issues in the GGO study, and a total of 8137 issues overall compared to 170 issues in the GGO study), covers a longer time period (1992–2002 as against March 1992 to June 1994 in the earlier study), and includes bonds with callable, convertible, puttable, and clawback provisions.⁴ Given that clawback provisions first started appearing in bond issues around 1991, the longer time period also enables us to address issues relating to inter-temporal differences in the usage and yield effects of the clawback provision, and differences arising from the integration of the clawback provision into corporate debt as innovative effects diffuse over time. Second, we analyze the yield comparisons of bonds with callable, puttable, convertible, and clawback provisions unlike the GGO study that used a control sample of straight bonds for comparative analyses. Also, we provide comparative impact of the different hybrid features on the yields of the bonds. Given that most hybrid bond issues in our sample contain more than one feature, we control for these features using comparative analyses which exploits the type of debt used by firms. Third, our data also includes details of various types of bond covenants that each bond issue has, and unlike the GGO study we control for these covenant details in our analyses in examining the clawback provision. In addition, we partition our sample by asset size to detect the likelihood of debt use for each category and find that information asymmetry (based on the size of the firm) plays a key role.

We also examine clawback issuers' subsequent actions relating to their debt management. We find that only a small fraction of the firms actually exercise the clawback provision. However, it appears that even for the firms that do not exercise the clawback provision, clawbacks could provide them with some flexibility at a later stage in renegotiating their debt contracts.

Overall, our analysis adds to the scant literature on the usage and effects of the clawback provisions in corporate debt. Our results support the view that the impact of the special provisions on the bond yields depends on the relative importance of the option to the issuer or the investor and their ability to shift risk. Provisions that favor the issuer tend to increase the yield and provisions that provide additional protection to the investor tend to reduce the yield. Our results demonstrate how corporate bond issuance and the use of financial innovation may reduce agency costs, the costs arising from conditions of information asymmetry, and in mitigating wealth transfer effects arising from these costs. In general the agency problems and the information asymmetries that result from corporate bond issuance process tend to be more severe for smaller firms relative to larger firms. Our study's findings are consistent with the view that the concentration of the clawback feature among smaller firms with low credit rating and low profitability allows firms with greater information asymmetry to gain access to the public bond markets.

Our findings suggest that including the clawback provision, while costly to issuers ex-ante, at the time of issue, benefits them in several ways. First, since clawback provisions are exercised within a relatively short time period subsequent to the bond issue, it serves as a signal that the firm expects its financial condition to improve significantly in the short term. Second, when firm prospects do improve, potential benefits that may accrue to bondholders at the expense of shareholders are mitigated by the issuer

² A question can arise as to how clawback provisions are different from conventional call provisions since call provisions in debt can also allow the firm to redeem debt. There are several important differences between the two. Call provisions allow the issuer to redeem any portion of the outstanding bond issue. Clawback provisions however, contractually specify the amount of outstanding bonds that can be redeemed. Call provisions are typically exercisable after a 5 to 10 years call deferment period. However, clawback provisions are exercisable immediately and typically expire after the first 3 years. Most important, call provisions allow considerable flexibility in the firm's choice of funds used for redemption. However, bonds with clawback provisions can be redeemed only with proceeds from an equity offering; the exercise of a clawback requires firms to issue equity (*GGO, 1998*). See also for example, *Bodie and Taggart (1978)*, *Crabbe and Helwege (1994)*, *Kish and Livingston (1992)* and *Thatcher (1985)* on the usage of call provisions to mitigate underinvestment problems.

³ An exception is *Chava, Kumar and Warga (2007)* that analyzes the yield differences of including 54 specific covenants in non-financial corporate bond issues.

⁴ As subsequent analyses show, these sample numbers include bonds with overlapping provisions. We also perform the analyses based on non-overlapping samples. The number of bonds which have only the clawback provision is 829 and the total non-overlapping sample size is 6978. Still our sample is significantly larger than that of the GGO study.

exercising the clawback provision.⁵ Third, inclusion of the clawback provision provides a valuable tool that issuers subsequently can (and do) use to renegotiate existing bond contracts at more favorable terms, even if they do not exercise the clawback provision. For these reasons, we believe that the clawback provision is a financial innovation that is likely to continue to be used by issuers. The usage of this provision during the time period of our study and during the current financial crisis provides preliminary evidence consistent with this view. We also posit that the value of clawback provisions may actually be greater under conditions of stock market illiquidity, for both high-yield debt issuers and issuers of higher quality debt. For both these types of issuers, including clawback provisions may actually be seen as a signal of potential near term strength in financial condition, making their debt more attractive to investors even though the current value of the equity is distressed. In essence, the clawback provision is a signal of the expectation of an improving financial condition of the firm, which shows a future equity offering to reduce the outstanding debt.

The rest of the paper is organized as follows. Section 2 provides a brief review of significant corporate bond innovations during the 1990s and explores the rationale for and factors associated with usage of clawback provisions. Section 3 presents the data sample and descriptive statistics of the corporate bond market. The primary focus is on the dynamics of the usage of clawbacks over time and the type of borrower. Section 4 describes the methodology and empirical results by the type of corporate debt. Section 5 concludes the paper.

2. Clawback provisions and other financial innovations

Finnerty (1988), Arzac (1999) and Smithson and Chew (1999) posit that innovations in the debt securities add value through their abilities to reallocate risk to investors that are better prepared to manage it, reduce agency costs, reduce transaction costs, reduce taxes, complete the market by meeting special investor needs, or reduce information asymmetries. While hybrid securities involve one or more option features, most empirical studies focus on analysis of one specific feature. For example, a LYON is a zero coupon bond that is convertible, puttable and callable. Convertible bonds give the investor the right to convert the debt or preferred stock to the issuer's common stock. Convertible bonds also have embedded call options, which the issuer can exercise and either redeem the bonds before maturity or force the investor to convert. Brennan and Schwartz (1988) state the rationale for the popularity of convertible bonds in their insensitivity to the issuing company risk. A convertible has straight bond component whose value is inversely related to company risk and a call option component whose value is directly related to company risk. This feature of convertibles mitigates the agency problem between debt holders and equity holders because if the company engages in risky projects, the creditors have the option to share in the upside potential by converting their debt to equity. Because of this creditors accept lower interest rate on convertibles which reduces the chance of financial distress on the part of the issuer. The information and transaction costs of issuing convertibles are also lower than those for equity issue. Because of these features, convertibles are more popular among young growth companies with high risk, low credit rating, high demand for investment capital and limited ability to raise debt capital. They prefer convertibles because of low debt service costs and lower dilutive impact.⁶

Similar to convertible debts, clawback debts also play a special role among their own clientele. As discussed earlier, GGO (1998) found that clawback provisions are more prevalent in debt issued by private firms, unregulated firms, and firms with less tangible and less liquid assets. One aspect that GGO (1998) did not emphasize in their study was the growth of the use of the clawback provisions and a rationale for its existence.

One rationale for the use of clawbacks may be the trade-off between borrowing private debt from a bank or the “arm's length” public debt of the bond markets. Public debt has been portrayed by Carey et al. (1993) as being more suitable for transparent firms or firms with less information asymmetry problems. Private debt issued to banks is suitable for less transparent firms that benefit from the monitoring and screening functions of banks. As documented by Berger and Udell (1998) banks have the ability to use their screening and monitoring service to perform an information asymmetry reduction role for the firm. However, Rajan (1992) argues that banks can use private debt to monitor the firm and control its investment decisions. This phenomenon is particularly acute for small firms that seek to reduce the underinvestment and wealth transfer problems that may exist in capital formation process. We argue that clawbacks provide an effective mechanism for firms to mitigate these issues and allow for a special type of arm's length debt that gives the issuer an additional alternative to the pros and cons of using private debt.

Information asymmetries are generally greater for smaller firms. Factors such as fewer analyst following, and potential scarcity of resources to reduce information asymmetries exacerbate this problem. In addition to size, prior research also documents that firms with poor credit ratings also suffer from problems of high information asymmetries. Prior research (for example, Bodie and Taggart, 1978; Thatcher, 1985; Crabbe and Helwege, 1994) shows that firms have used the call provision to mitigate information asymmetry problems. The clawback provision however may be more attractive to certain firms, particularly if a firm has the likelihood of issuing equity in the near term. Call provisions generally have long deferment periods. The average term for clawback exercise however is generally shorter, less than 3 years on average (GGO, 1998). Issuance of equity is generally considered a signal of potential good news. The clawback provision also has the advantage to shareholders that potential wealth gains for bondholders

⁵ D. Jerry Paul, former portfolio manager at Invesco High-Yield Fund, points out that generally, IPO's convey positive news, which should lead to higher bond prices. However, he feels that clawback provisions significantly reduce the benefit that could accrue to bond investors (Laderman, 1997). Similar views were also expressed by Bennett J. Goodman, managing director at Donaldson, Lufkin, and Jenrette Inc., who believes that while clawbacks are advantageous to the issuers, investors accept clawback provisions if higher yields could be had for these issues (Laderman, 1997).

⁶ Jen, Choic and Lee (1999) extend Brennan and Schwartz (1988) argument and provide empirical evidence. Stock price reaction to equity issue announcement averages -3% but it is -2% for convertible issue announcement and even lower for a sub-sample of growth firms.

arising from lower monitoring costs consequent to equity issuance are lowered by retiring a portion of the debt with the equity proceeds. For these reasons, small firms and firms with lower credit ratings may prefer using the clawback provision when they access public debt markets. Accessing debt markets with clawback debt may not however be costless for these firms. Bondholders recognize the benefits to issuers and shareholders from these clawback provisions and price such debt accordingly. Debt with clawback features is therefore expected to be more costly than straight debt and convertible debt.

Given that debt with clawback features are likely to be issued by smaller firms and firms with lower credit ratings we also expect that clawback debt issues are likely to have more restrictive debt covenants than other types of debt. Having more restrictive debt covenants likely benefits both investors and issuers. Investors benefit because the restrictive covenants provide better safeguards to them for investing in firms with lower credit quality. In turn, issuers may benefit because these covenants may lead to a lower cost of debt. In the succeeding sections we investigate the pros and cons of this expanding financial innovation and provide details of our empirical tests.

3. Data and sample description

Our sample consists of 8137 corporate bond issues made during the period 1992–2002 (both years inclusive) for which all data required for our analyses are available. Our sample is constructed using bond issue data from the Fitch Investment Securities data base. Bond issue characteristics, such as covenants, spread, size of issue, maturity, rating, etc. are obtained from the Fitch Investment Securities database. Financial and accounting data, such as total assets of the issuer, leverage ratios, return on assets, etc. are obtained from the Compustat data base. Table 1 shows the frequency distribution of clawback debt by year and industry classification of the issuer. It also shows average issue size in dollars and average spread of its yield over corresponding maturity matched Treasury bonds, by year and industry.

As Panel A of Table 1 shows, there were only four issues with clawback provisions raising \$436 million in 1992. The number gradually increased and clawbacks became popular in the later parts of 1990s. The largest number of clawback issues occurred in 1998 with 351 bonds raising a total of \$73.7 billion. The average issue size for the entire sample of 1422 issues is \$230 million. The

Table 1

Distribution and characteristics by year and industry of debt with clawback features – 1992–2002.

Panel A: Distribution by year of issue					
Year	# of issues	(%)	Mean (\$)	Total (\$)	SPREAD
1992	4	0.28%	109	436	555
1993	18	1.27%	182	3276	489
1994	21	1.48%	175	3675	412
1995	27	1.90%	173	4671	593
1996	69	4.85%	185	12,765	458
1997	237	16.67%	208	49,296	424
1998	351	24.68%	210	73,710	476
1999	244	17.16%	215	52,460	542
2000	108	7.59%	331	35,748	580
2001	169	11.88%	281	47,489	513
2002	174	12.24%	250	43,500	491
Total	1422	100.00%	\$230	\$327,026	Mean – 491
Panel B: Distribution by industry of issue					
Industry	# of issues	(%)	Mean (\$)	Total (\$)	SPREAD
Mining	57	4.01%	178	10,146	434
Food	20	1.41%	170	3400	447
Textiles	106	7.45%	198	20,988	497
Chemicals	40	2.81%	214	8560	513
Pharm	6	0.42%	200	1200	356
Extractive	123	8.65%	183	22,509	437
Manufacturing	215	15.12%	167	35,905	483
Computers	65	4.57%	327	21,255	575
Transportation	350	24.61%	317	110,950	527
Utilities	29	2.04%	259	7511	475
Retail	136	9.56%	189	25,704	454
Financial	24	1.69%	203	4872	494
Ins./Real estate	15	1.05%	161	2415	455
Services	216	15.19%	223	48,168	485
Other	20	1.41%	176	3520	531
Total	1,422		\$230	\$327,103	Mean – 491

Panel A presents number of issues with clawbacks, mean (in \$ millions), and total amount of proceeds by year. The total amount of proceeds represents the aggregate dollar volume in millions for each sample year. SPREAD is the offering–yield–spread over a comparable maturity matched treasury bond measured in basis points. Panel B describes the number of issues with clawbacks, the mean and total amount of proceeds by industry category. The total amount of proceeds represents the aggregate dollar volume for the each industry category in Panel B.

Note: A slight difference in totals is due to rounding in the calculations.

average spread for the clawback sample is 491 basis points. As Panel B reports, the number of debt issues with clawback provisions is highest in the transportation industry with 350 issues followed by services and manufacturing. In addition, the transportation industry leads in terms of dollar amount raised with clawback debt at \$110.95 billion followed by services at \$48.2 billion, and manufacturing at \$35.9 billion over the sample period. Panel B also shows that the usage of clawback provisions is distributed

Table 2

Sample descriptive statistics by borrower size groups.

		Small	Medium	Large	All
<i>Panel A – Full sample</i>					
Contract characteristics					
Amount of proceeds (\$ millions)	*	\$128 (\$100)	\$249 (200)	\$810 (300)	\$396 (193)
Maturity (in years)	*	10.5 (9.90)	11.2 (9.98)	10.7 (7.02)	10.8 (9.81)
SPREAD	*	339 (359)	216 (174)	101 (87)	384 (350)
CLAW Spread	*	514 (494)	458 (434)	444 (438)	492 (463)
CALL Spread	*	381 (408)	313 (359)	76 (55)	340 (379)
CONV Spread	*	25 (11)	60 (46)	160 (139)	20 (18)
STRAIGHT Spread	*	208 (135)	155 (126)	105 (88)	132 (108)
PUT Spread	*	91 (102)	7 (36)	62 (10)	5 (27)
CLAW Period		2.72 (2.88)	2.76 (2.92)	2.84 (2.82)	2.87 (3.01)
DSEN	*	34%	70%	89%	64%
DSSENS	*	60%	24%	7.5%	30%
D144A	*	25%	23%	8.4%	19%
DCOV	*	63%	67%	71%	67%
Sample size		2713	2712	2712	8137
Borrower characteristics					
Total assets (\$ millions)	*	477 (423)	3322 (2787)	82,531 (20,840)	28,773 (2787)
LEV	*	51% (47%)	36% (33%)	27% (28%)	38% (35%)
LIQR	*	41% (40%)	31% (27%)	25% (22%)	34% (31%)
ROA	*	−3.29% (1.77%)	1.01% (2.53%)	2.12% (1.38%)	0.00% (1.79%)
RATING	*	CCC (B)	BB (BB)	A (A)	BB (BB)
DINV	*	11.57%	50%	88%	50%
Bond types					
Clawbacks	*	32%	19%	1.36%	17%
Callable	*	81%	45%	16%	47%
Convertible	*	25%	13%	7%	15%
Straight	*	16%	53%	83%	50%
Puttable	*	3%	7.5%	6%	5%
<i>Panel B – Non-overlapping samples</i>					
Contract characteristics					
Amount of proceeds (\$ millions)	*	141 (110)	189 (150)	396 (250)	247 (150)
Maturity (in years)	*	9.48 (10.00)	8.63 (10.00)	7.94 (10.00)	8.64 (10.00)
SPREAD	*	341 (343)	170 (107)	110 (82)	200(119)
CLAW Spread	*	505 (481)	450 (424)	493 (481)	491 (463)
CALL Spread	*	343 (351)	208 (130)	96 (77)	264 (224)
CONV Spread	*	140 (112)	126 (58)	186 (142)	143 (112)
STRAIGHT Spread	*	179 (121)	126 (92)	108 (82)	124 (91)
CLAW Period		2.86 (3.01)	2.92 (3.02)	2.93 (2.99)	2.88 (3.01)
DSEN	*	48%	73%	85%	70%
DSSENS	*	41%	10%	10%	19%
D144A	*	35%	16%	6%	18%
DCOV	*	55%	59%	72%	63%
Sample size		2079	2439	2460	6978
Borrower characteristics					
ASSETS	*	771 (699)	4770 (4358)	60,056 (23,727)	23,069 (4922)
LEV	*	50% (45%)	35% (33%)	26% (28%)	36% (34%)
LIQR	*	35% (34%)	27% (24%)	24% (20%)	30% (25%)
ROA	*	−1.75% (2.01%)	1.86% (2.50%)	2.03% (1.33%)	0.85% (1.83%)
RATING	*	B(B)	BBB (BBB)	A (A)	BBB (BBB)
DINV	*	28.23%	73.72%	92.20%	66.68%
Bond types					
Clawbacks	*	29%	8%	1%	12%
Callable	*	41%	21%	10%	23%
Convertible	*	2%	0%	0%	1%
Straight	*	27%	71%	89%	64%
Total		100%	100%	100%	100%

This table presents mean and median values (in parenthesis) for several key variables in our sample categorized by the size of the issuer. Issuers are grouped into three equal categories based on total assets size. Claw Spread, Call Spread, Conv Spread, Straight Spread, and Put Spread represent SPREAD for issues with clawback features, callable debt, convertible debt, Straight debt, and puttable debt respectively. The Claw Period represents the number of years from the date of issue within which the clawback provision can be exercised. See Appendix A for description of the other variables. * indicates significant mean variation across the categories at ($p < 0.05$) using ANOVA.

Table 3a

Descriptive statistics by type of bond issue.

Panel A – Full sample							
		Clawbacks	Callable bonds	Conv. bonds	Straight bonds	Puttable bonds	Full sample
<i>Contract characteristics</i>							
Amount of proceeds (\$ millions)	*	230 (190)	222 (164)	292 (144)	565 (200)	493 (297)	396 (193)
Maturity (years)	*	9.06 (9.73)	11.44 (9.96)	12.04 (7.51)	10.32 (8.84)	21 (20)	10.8 (9.81)
SPREAD	*	492 (463)	340 (379)	20 (18)	132 (108)	5 (27)	384 (350)
DSEN	*	47%	41%	26%	87%	76%	64%
DSENS	*	46%	54%	73%	8%	22%	30%
D144A	*	38%	25%	22%	12%	22%	19%
DCOV	*	64%	64%	72%	71%	69%	67%
Sample size		1422	3850	1207	4101	446	8137
<i>Borrower characteristics</i>							
Total assets (\$ millions)	*	1581 (780)	11543 (853)	23,387 (869)	44,299 (9359)	19,940 (5115)	28,773 (2787)
LEV	*	59% (56%)	43% (39%)	34% (32%)	31% (31%)	28% (28%)	38% (35%)
LIQR	*	32% (29%)	37% (35%)	49% (48%)	29% (25%)	34% (32%)	34% (31%)
ROA	*	−3.92% (−0.05%)	−2.08% (1.21%)	−5.02% (2.28%)	2.53% (2.19%)	2.84% (3.42%)	0.00% (1.79%)
RATING	*	CCC (B)	CCC (B)	CCC (B)	BB (BB)	BB (BB)	BB (BB)
DINV	*	2.46%	20%	26%	79%	65%	50%
% by small firms	*	61%	57%	55%	11%	16%	33%
% by medium firms	*	36%	32%	29%	35%	46%	33%
% by large firms	*	3%	11%	16%	55%	38%	33%

This table presents mean and median values (in parenthesis) for several key variables for the sample between January 1, 1992 and December 31, 2002. Descriptive statistics are presented by type of bond issue. Data are obtained from the Fitch Investment Database and Compustat. Dollar figures are in millions. See Appendix A for a full description of each bond type. * indicates significant mean variation across the categories at ($p < 0.05$) using ANOVA.

Note: Please note that each category is not mutually exclusive, hence the number of observations across categories cannot sum to the total.

across a wide spectrum of industry classifications. The pharmaceuticals group has the smallest usage of clawback provisions in our sample with six issues and a dollar volume of \$1.2 billion overall.⁷

Table 2 provides descriptive statistics on contract characteristics, borrower characteristics, and bond types partitioned by borrower size groups. Panel A reports the descriptive statistics for our full sample of 8137 and Panel B reports for the non-overlapping issues of 6978.⁸ The full sample is grouped into three equal number of observations based on asset size. The small firm group has average asset size of \$477 million. The medium and large size groups have average assets of \$3322 million and \$82,531 million respectively. Average amount of proceeds from debt issue increases with the size of the issuer. The average issue size is \$128 million for smaller issuers, \$249 million for medium size issuers and \$810 million for issuers in the largest group. This is consistent with both the scale effect and the view that information asymmetry decreases with the size of the firm. Spread also decreases as size of issuer increases suggesting that larger firms are more transparent. Small firms are inherently riskier and hence the yield on their debt should be higher. The spread averages 339 basis points for small firms, 216 basis points for medium firms and 101 basis points for large firms. The spread on debts with clawback features is the highest than on any other debt feature for all size groups. For the small size group, spread is 514 basis points on bonds with clawback provision.⁹

The implication of the higher spread is that small firms are able to gain access to the public bond markets, even with a higher cost of capital, but have the option to mitigate the higher cost of capital and the underinvestment problem with the option to issue future equity proceeds. Comparing across similar size categories, for example, the spread is 381 basis points for callable bonds for small firms, 25 basis points for convertible bonds, 91 basis points for puttable bonds and 208 basis points for straight bonds. This pattern is not consistent across size categories. Callable bonds have high spread in the small and medium size groups but smaller spread than convertibles and straight bonds for large companies. The Claw, Call, Conv, and Straight Spreads however are significantly different when compared across the various size categories.

The average time period within which the clawback option can be exercised is slightly less than three years, which is consistent with the findings of GGO (1998). Of bonds issued by small firms, 34% are senior, but the proportion is higher for medium and large firms at 70% and 89% respectively. Small firms issue a higher proportion (60%) of their debt as senior and secured while the

⁷ The frequency of clawback bonds, average capital raised and average yield spread by year of issue and industry follow similar patterns for those issues that have only the clawback provision (i.e., 829 issues that have only clawback provisions and no other features such as puts, convertibility, etc.). We don't report the sample distribution for non-overlapping cases to reduce redundancy.

⁸ We use the term "non-overlapping" sample to denote the sample of bonds that are either straight bonds or have only the callable, convertible, or clawback feature.

⁹ The size categories in Panel B of Table 2 are based on those of the full sample. The descriptive statistics for the non-overlapping sample are qualitatively very similar to those in the full sample (Panel A). The major differences are (1) puttable bonds disappear when overlaps are eliminated. In the full sample, puttable bonds constitute 5% of the cases. (2) The average asset sizes increase in the small and medium size categories. (3) Average credit ratings improve in the small and medium size categories. (4) Proportions of investment grade issues increase in each size category. In the full sample, 50% of the issues are investment grade; when the overlapping cases are excluded, proportion of investment grade issues increases to 67%. (5) The proportion of callable bonds decreases comparatively. (6) The sample size for convertible bonds decreases to only 53 cases. The patterns of the contract characteristics, borrower characteristics and bond types remain very similar. Also, as can be observed in Panel B, except for CONV Spread and CLAW period, there exists significant ($p < 0.05$ or better) differences across the various size categories for all other variables.

Table 3b

Descriptive statistics by type of bond issue.

Panel B – Non-overlapping samples						
		Clawbacks	Callable bonds	Convertible bonds	Straight bonds	Full sample
<i>Contract characteristics</i>						
Amount of proceeds (\$ millions)	*	245 (200)	150 (100)	133 (100)	284 (200)	247 (150)
Maturity (Years)	*	9.77 (10)	9.51 (10)	8 (7)	8.13 (10)	8.64 (10)
SPREAD	*	491 (463)	264 (224)	143 (112)	124 (91)	200 (119)
DSEN	*	50%	45%	25%	83%	70%
DSENS	*	42%	41%	74%	7%	19%
D144A	*	69%	15%	53%	10%	18%
DCOV	*	35%	50%	40%	72%	63%
Sample size		829	1610	53	4486	6978
<i>Borrower characteristics</i>						
Total assets (\$ millions)	*	1684 (800)	7067 (1507)	15,364 (550)	32,855 (8894)	23,069 (4922)
LEV	*	60% (57%)	41% (38%)	35% (33%)	30% (31%)	36% (34%)
LIQR	*	33% (30%)	34% (31%)	53% (50%)	27% (23%)	30% (25%)
ROA	*	−4.7% (−1.38%)	0.54% (2.04%)	−46.25% (0.00%)	2.54% (2.00%)	0.85% (1.83%)
RATING	*	B(B)	BB (BB)	CC (CCC)	BBB (A)	BBB (BBB)
DINV	*	4%	43%	21%	87%	67%
% by small firms	*	73%	54%	77%	13%	30%
% by medium firms	*	25%	31%	13%	38%	35%
% by large firms	*	2%	15%	9%	49%	35%

This table presents mean and median values (in parenthesis) for several key variables for the sample between January 1, 1992 and December 31, 2002. Descriptive statistics are presented by type of bond issue. Data are obtained from the Fitch Investment Database and Compustat. Dollar figures are in millions. See Appendix A for a full description of each bond type. * indicates significant mean variation across the categories at ($p < 0.05$) using ANOVA.

Note: Unlike in Panel A, the sum of the number of observations in each category adds up to the total when the overlapping observations are excluded.

proportion for medium and large firms is 24% and 7.5% respectively. Given the high risk of small firms, it makes sense to provide security on debt issue to mitigate the risk and reduce information asymmetry. Consistent with the pattern observed in the markets in the 1990s our sample also shows that smaller firms also are taking advantage of section 144A provisions, with 25% of the issues by smaller firms falling in this category compared to 23% and 8.4% for medium and larger firms respectively.

The leverage ratio, measured as total long term debt over total assets, is 51% for small firms, 36% for medium sized firms and 27% for large firms. Small firms have a greater proportion of liquid assets in their balance sheet than medium and large firms but small firms report lower profit (ROA) than the other two categories. The average credit rating of small firms is CCC, which increases to BB for medium sized firms and to A for large firms. This is also consistent with the risk structure of the three categories. Consistent with this only about 12% of the debt issues by small firms are investment grade, while the proportion of investment grade issues are 50% and 88% for medium and large firms respectively. Clawbacks, callable and convertible bonds are relatively more popular among small sized firms than among large firms. This is consistent with the theory that small growth firms with high level of risk prefer these provisions as a way of transferring risk or mitigating the impact of informational asymmetries. Straight and puttable bonds are relatively more popular among larger companies.¹⁰

Tables 3a and 3b provide more descriptive data for the different types of bond issues in the sample. Panel A reports based on the full sample and Panel B reports results by excluding the overlapping observations of bond types. The two panels are qualitatively very similar with few exceptions. Bonds with clawback features are characterized by relatively smaller issue sizes, shorter maturities, and higher default spread than the straight bonds. Callable bonds have features closer to clawbacks. Puttable bonds have the smallest average spread. In Panel B, there are no puttable bonds. Straight bonds have the smallest credit spread followed by convertibles.

Issuers of clawbacks are smaller in size, have relatively higher leverage, and lower profitability than the other groups. Clawback issuers have comparable lower ratings (CCC average) as callable and convertible debt issuers. Straight and puttable bond issuers have stronger financial reportage. As Panel B shows, the credit ratings and percentage of investment grade issues improve in each category, except for the convertibles.¹¹ The patterns of the distributions are similar in the two panels.

Since GGO (1998) hypothesize that clawback provisions are likely to be more widely prevalent for firms with greater information asymmetries, we examine the ratings categorization of the various types of bonds in the sample. Table 4 shows the distribution of bond ratings across various types of issues in our sample. Greater proportions of clawback, callable and convertible

¹⁰ The sample used in these analyses consists entirely of public firms for which Compustat data is available. In constructing this sample, we excluded 804 private firms for which no accounting data were available. For these private firms we find that 225 issues (app. 28%) had clawback provisions. Comparing these 804 private firms to our sample of 8137 public firms across contract terms as a robustness test, we find that in general public firms have significantly ($p < 0.05$) larger debt proceeds (mean value of \$308 million vs. \$198 million), significantly ($p < 0.05$) higher credit quality (BBB vs. BB), significantly ($p < 0.05$) lower credit spreads (176 basis points vs. 274 basis points), and not significantly different (at conventional levels) in maturity (11.55 years vs. 11.85 years).

¹¹ Tests of significance in mean differences across the various bond categories in Table 3 (both panels A and B) reported in the table also show that the differences are statistically significant at $p < 0.01$ for all variables in the table. Thus, contract and borrower characteristics are different for bond classifications based on whether the bonds have the clawback, call, convertible, or put provisions, or if the bonds are straight bonds with none of these features.

Table 4

Ratings distribution by type of bond issue.

Ratings characteristics	Clawbacks	Callable bonds	Conv. bonds	Straight bonds	Puttable bonds	Full sample
AAA	0.00%	1.00%	0.00%	2.27%	2.69%	1.50%
AA	0.00%	1.55%	1.00%	7.97%	4.26%	4.79%
A	0.00%	8.18%	10.60%	37.26%	21.30%	22.89%
BBB	1.90%	9.09%	14.66%	31.80%	36.77%	20.61%
BB	11.46%	10.40%	8.29%	8.04%	12.33%	9.26%
B	54.85%	33.61%	18.31%	4.29%	7.40%	18.47%
CCC	8.72%	5.79%	5.72%	1.00%	1.35%	3.17%
CC	2.18%	1.04%	1.00%	0.00%	0.00%	1.00%
C	1.00%	1.00%	0.00%	0.00%	0.00%	0.0002%
D	9.92%	5.90%	2.32%	2.17%	1.79%	3.94%
Nonrated	9.63%	23.22%	38.03%	5.22%	11.88%	14.37%
INVESTMENT GRADE (BBB and above)	2.46%	19.58%	26.18%	79.30%	65.02%	50%
Sample size	1422	3850	1207	4101	446	8137

This table presents mean Standard and Poor's rating by the type of bond issue. Data are obtained from the Fitch Investment Database.

bonds are rated below investment grade. For clawbacks, only 2.46% are rated investment grade. Straight and puttable bonds have 79% and 65% of their issues rated investment grade.¹²

Our analyses in contrast to the *GGO (1998)* study also explicitly consider the effect of including debt covenant provisions. *Table 5* provides details of the extent of usage of various debt covenants in various types of bond issues in our sample. Covenants that restrict mergers, employee control of the issuer, investor control of the issuer and senior debt use are more prevalent in all the categories. In fact, prevalence of covenants restricting mergers is the same for clawbacks and straight bonds (63%). Covenants that restrict total debt, common stock sale, common stock transfer, investment policy, transfer and sale of assets, are most associated with clawback bonds than the other types of issues. Similarly, the prevalence of covenants relating to restrictions on investor control of issues is the smallest (38%) for issues with clawback provisions and for convertible issues.

In general, bonds with clawback provision are relatively more popular among small, risky, less profitable and low rated firms. They have high default spread compared to other categories of bonds in the sample. Callable bonds have closely related features as clawbacks. Straight and puttable bonds have features on the opposite end of the spectrum.

These descriptive statistics are consistent with our discussion earlier relating to the rationale for and usage of clawback provisions. Credit spreads are the highest for issues with clawback provisions suggesting both higher degrees of credit risk and also that clawback provisions may potentially benefit issuers. Issuers using clawback provisions are small and characterized by a high degree of credit risk as evidenced by the small asset size and low bond ratings. The data are also consistent with these firms having higher information asymmetries. In addition, the prevalence of higher levels of debt covenants such as those that restrict mergers, employee control of the issuer, investor control of the issuer and senior debt use in issues with clawback provisions are also consistent with our discussion earlier. These covenants provide safeguards for investors willing to invest in riskier firms and also benefit issuers through potential lowered cost of debt.

In the next section we discuss multivariate regression analysis results that control for these features for their impact on the cost of debt.

4. Multivariate analysis

4.1. A model for debt choice and corporate bond pricing

Prior research on corporate debt has mainly focused on two separate areas: the type of debt and the corporate bond pricing. Typically, in a debt choice model, the choice of debt is a function of a set of borrower's observable risk, information proxies, and a set of time and industry control variables. In a typical corporate debt pricing model, bond spreads are a function of a set of bond and borrower characteristics (observable risk and information effects) as in *GGO (1998)*.

In our analysis the type of debt may not be exogenous but could be endogenously determined by several factors. If there is a correlation between factors such as for example, issue size and the type of debt, the coefficient on the type of debt (DCLAW) in an ordinary least squares estimation with the corporate bond spread as the dependent variable may be biased. This selectivity bias may also be generated by other issue specific characteristics such as rating, and contract features. Moreover, this selectivity bias may also be enhanced by issuer specific characteristics. Hence, using ordinary least squares estimation under these conditions may not be appropriate. To overcome this estimation bias problem, we use an extension of the two-stage estimator suggested by

¹² As reported in Panel B of Tables 3 the average ratings and proportions of investment grade issues improve for each bond category, except for convertibles. Other descriptive statistics presented in *Tables 4 and 5* have qualitatively very similar results when the overlapping issues are excluded. We reports results based on the full sample only to reduce redundancy.

Table 5

Covenant distribution by type of bond issue.

Covenant characteristics	Variable	Clawbacks	Callable bonds	Conv. bonds	Straight bonds	Puttable bonds	Full sample
Restricts mergers	DMERGE	63%	58%	61%	63%	61%	60%
Restricts dividends	DDIV	2.60%	6.01%	5.63%	2.10%	1.12%	4.05%
Restricts total debt	DDEBT	62.37%	32%	2.23%	7.90%	4.26%	19.59%
Restricts common stock sales	DSTCKISS	5.56%	2.72%	1.00%	1.00%	1.00%	1.56%
Restricts common stock transfer	DSTCKSLT	18.07%	9.55%	1.66%	4.87%	1.12%	7.02%
Restricts investment policy	DINVEST	4.07%	2.60%	1.00%	1.00%	0.00%	1.64%
Requires a minimum net worth	DNETWORK	1.00%	1.00%	1.00%	1.24%	0.00%	1.03%
Requires a minimum net earnings	DNTEARN	0.00%	1.00%	0.00%	1.00%	0.00%	1.00%
Restricts sale of assets	DASC	54.15%	23.89%	1.74%	2.21%	1.00%	12.70%
Restricts senior debt	DSENBDBT	3.65%	1.92%	1.00%	1.00%	0.00%	1.02%
Restricts investor control of issue	DVPP	38%	45%	38%	91%	66%	69%
Restricts employee control of issue	DVPPE	97%	85%	79%	96%	93%	91%
Restricts fixed charges	DFIXCHRG	1.48%	1.00%	0.00%	0.00%	0.00%	1.00%
Restricts leverage ratio	DLEVTEST	1.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Restricts senior debt use	DNPC	46%	28%	5.21%	53%	29%	40%
Sample size		1422	3850	1207	4101	446	8137

This table shows the prevalence of different types of covenants by the type of bond issue. The figures reported are average proportions for each category. For example, on average 63% of issues with clawback provisions contain covenants that restrict merger, but only 2.6% contain covenants that restrict dividends. Data are obtained from the Fitch Investment Database.

Heckman (1979) and developed by Ham (1982) for the corporate bond pricing model resulting in a two-stage least-square (2SLS) system:

$$D_i^* = \beta_1 Z_i' + \varepsilon_i \quad (1)$$

$$S_i = \beta_4 X_i' + \delta_1 \lambda_1 + \delta_2 \lambda_2 + \delta_3 \lambda_3 + \delta_4 \lambda_4 + \mu_i \quad (2)$$

Eq. (1) represents debt choice model and Eq. (2) is the corporate bond pricing model.

$D_i = 1$ if $D_i^* > 0$, else $D_i = 0$. D_i^* is the unobservable benefits (costs) from choosing the type of debt, D_i is the firms observed debt choice, Z_i is a vector of variables determining the debt choice. S_i is the observed corporate bond spread, and X_i is a vector of exogenous variables determining the corporate bond pricing. Also, ε_i and μ_i are normally distributed disturbances. Similar to GGO (1998) in the first-stage we estimate probit regressions with the type of debt as the dependent variable. This specification takes into account the fact that the debt choice of the firm is endogenous and λ_i (the Inverse Mills Ratio (IMR_i)) produced by the debt choice model) provides a measure of the marginal benefit of using different types of debt on the bond spreads.¹³ Specifically, λ_1 captures the endogenous nature of using issues with clawback as the type of debt, while λ_2 , λ_3 , and λ_4 capture the endogenous nature of callable, straight and convertible bonds, respectively. This allows us to explicitly control for the interdependence between the types of debt in the corporate bond pricing model using a two-stage least-square procedure.

One focus of the paper is to investigate the association between firm characteristics and the corporate debt choice of the firm. Therefore, attention is placed on the first model. The functional form for the debt choice equation is:

$$\begin{aligned} \text{DCLAW} = & \alpha_0 + \beta_1(\text{LASSET}) + \beta_2(\text{ROA}) + \beta_3(\text{LEV}) + \beta_4(\text{LIQR}) + \beta_5(\text{DINV}) \\ & + \beta_6(\text{D144A}) + \beta_7(\text{DJUN}) + \beta_8(\text{DJUNS}) + \beta_9(\text{DSEN}) + \beta_{10}(\text{DSENS}) \\ & + \beta_{11}(\text{DSS}) + \beta_{12}(\text{DSUB}) + \beta_{13}(\text{DMERGE}) + \beta_{14}(\text{DDIV}) + \\ & \beta_{15}(\text{DDEBT}) + \beta_{16}(\text{DSTCKISS}) + \beta_{17}(\text{DSTCKSLT}) + \\ & \beta_{18}(\text{DINVEST}) + \beta_{19}(\text{DNETWORK}) + \beta_{20}(\text{DNTEARN}) + \\ & \beta_{21}(\text{DASC}) + \beta_{22}(\text{DSENBDBT}) + \beta_{23}(\text{DVPP}) + \beta_{24}(\text{DVPPE}) + \\ & \beta_{25}(\text{DFIXCHRG}) + \beta_{26}(\text{DLEVTEST}) + \beta_{27}(\text{DNPC}) + \varepsilon_i. \end{aligned} \quad (3)$$

DCLAW is a variable that captures the choice of debt. In order to examine the characteristics of issues and issuers that use clawbacks and other provisions in their analyses, we carry out probit regression analyses separately for the various types of issues. Our analysis uses four categories to capture the choice of debt, where DCLAW, DCONV, DCALL, and DSTRAIGHT are coded 1 if they are corporate bond issues with clawback provisions, callable issues, convertible issues, and straight bond issues respectively, and are coded 0 otherwise. Our issue characteristics include the various debt covenant restrictions that each issue has (for example, restrictions on mergers, dividends, total debt, senior debt, investment policies, sale of assets, etc.). As discussed earlier, some of

¹³ The approach described herein has been extensively used to examine a variety of problems where simultaneous equation bias is an issue. For an example, see Ham (1982). Also note that if δ_1 , δ_2 , δ_3 , and δ_4 are not significantly different from zero then the analysis reduces to a standard OLS approach. This is consistent with Heckman (1979) and was actually proposed by Heckman (1979).

these covenants provide safeguards for investors and benefits for issuers. The inclusion of some of these covenants may in some cases be mandated by investor demands and influence issuers decision to include features such as the clawback or call provision. Detailed descriptions of these variables are provided in [Appendix A](#). Our issuer characteristics include factors such as total assets, return on assets, leverage, and liquidity. These issue and issuer characteristics serve in some cases as controls. In others, they can proxy for tests of theoretical issues underlying the motivation of firms to include clawback and other provisions in debt. For example, we expect that smaller firms and firms whose credit quality is low are more likely to include clawback provisions. Factors such as total assets, return on assets, leverage, and liquidity proxy for these conditions.

We estimate in a second stage the following model representing the corporate bond pricing equation:

$$\begin{aligned} \text{SPREAD} = & \alpha_0 + \beta_1(\text{LAMT}) + \beta_2(\text{LMAT}) + \beta_3(\text{D144A}) + \beta_4(\text{DAAA}) + \\ & \beta_5(\text{DAA}) + \beta_6(\text{DA}) + \beta_7(\text{DBBB}) + \beta_8(\text{DBB}) + \beta_9(\text{DB}) + \beta_{10}(\text{DCCC}) + \\ & \beta_{11}(\text{DCC}) + \beta_{12}(\text{DC}) + \beta_{13}(\text{DD}) + \beta_{14}(\text{LASSET}) + \beta_{15}(\text{ROA}) + \\ & \beta_{16}(\text{LEV}) + \beta_{17}(\text{LIQR}) + \beta_{18}(\lambda_1) + \beta_{19}(\lambda_2) + \beta_{20}(\lambda_3) + \beta_{21}(\lambda_4) + \\ & \beta_{22-35}(\text{DIND2} - \text{DIND15}) + \beta_{36-45}(\text{D93} - \text{D02}) + w_i \end{aligned} \quad (4)$$

Initial offering spreads measured by SPREAD represents the observed component of the corporate bond pricing. Observable risk and information proxies, non-price bond terms, and control variables are defined in previous equations. We expect LAMT to be negatively related to SPREAD and LMAT to be positively related to the spread.

We also expect 144A issues to be positively related to the SPREAD given private placements are in general less transparent than public issues.

Table 6

Results of probit regression by type of bond.

	IPO clawbacks		Callable bonds		Convertible bonds		Straight bonds	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
INTERCEPT	−2.06	3.77*	1.45	5.64*	−1.16	2.55*	−1.34	5.18*
LASSET	−0.08	3.95*	−0.09	7.29*	0.03	1.70	0.08	5.88*
ROA	0.00	0.97	0.00	0.67	0.00	0.86	0.00	0.26
LEV	0.75	7.82*	0.00	0.11	0.00	0.74	0.00	0.54
LIQR	0.01	3.37*	0.01	4.72*	0.01	2.55*	−0.01	4.42*
DINV	−1.13	11.21*	−0.52	10.73*	−0.05	0.77	0.59	12.10*
D144A	1.51	17.40*	0.21	4.05*	0.10	1.64	−0.31	5.83*
DJUN	−7.90	0.00	5.44	0.00	−4.61	0.00	−5.49	0.00
DJUNS	0.96	1.12	1.19	2.83*	0.79	1.32	−1.47	3.29*
DSN	0.39	0.75	0.28	1.19	0.62	1.41	−0.36	1.52
DSNS	0.45	0.87	0.91	3.86*	1.34	3.05*	−1.11	4.66*
DSS	0.47	0.90	0.29	1.18	−0.48	0.94	−0.31	1.26
DSUB	−6.52	0.00	1.35	2.02*	1.71	2.61*	−1.31	1.94
DMERGE	−0.73	5.65*	−0.32	−5.88*	0.24	3.61*	0.34	6.10*
DDIV	−0.36	2.15*	0.07	0.67	−0.33	2.69*	−0.22	1.93
DDEBT	1.56	13.40*	0.08	1.06	−1.86	15.03*	−0.03	0.37
DSTCKISS	0.69	4.52*	0.35	2.04*	−0.25	0.93	−0.48	2.51*
DSTCKSLT	0.13	1.46	0.16	1.98*	−0.32	2.29*	−0.09	1.08
DINVEST	0.02	0.13	−0.01	0.07	−0.20	0.67	0.07	0.43
DNETWORTH	−0.27	1.09	−0.26	1.44	−1.00	1.98*	0.33	1.76
DNETEARN	0.15	0.28	0.06	0.21	−6.33	0.00	−0.03	0.14
DASC	1.00	10.84*	0.44	4.60*	−1.14	6.98*	−0.44	4.37*
DSENEBT	0.41	2.16*	0.46	1.49	−0.07	−0.26	−0.34	1.01
DVPP	−0.37	3.10*	−1.37	19.39*	−2.09	23.92*	1.53	20.20*
DVPPE	0.49	3.83*	0.32	3.73*	1.02	10.43*	−0.47	5.17*
DFIXCHRG	0.77	2.29*	0.11	0.38	−0.01	0.02	−0.03	0.09
DLEVTEST	0.42	1.00	0.29	0.64	−7.05	0.00	−0.19	0.41
DNPC	0.17	2.08*	−0.66	12.19*	−1.27	15.43*	0.68	12.29*
Pseudo R ²	55%		42%		45%		46%	
N	8137		8137		8137		8137	
Event number	1422		3850		1207		4101	
% correct	89%		84%		92%		85%	

This table presents the determinants of the type of corporate bond issue for clawbacks, callable, convertible and straight corporate bonds, respectively. The dependent variable is a dummy variable for the type of corporate bond issue. Each respective probit has a different dependent variable for the corporate bond category. For example DCLAW is coded 1 if the issue is a clawback, 0 otherwise; DCALL is coded 1 if the issue is callable, 0 otherwise. DCONV is coded 1 if the issue is convertible, 0 otherwise. DSTRAIGHT is coded 1 if the issue is a straight bond with no other features, 0 otherwise. # of Events represents the number of issues with the specific features for each respective probit regression. For example, 1422 is the number of issues with clawback provisions, 3850 is the number of issues with call provisions. Please refer to [Appendix A](#) for full description of the variables.

Note: * – Statistically significant at 5% level.

Most extant research includes a battery of financial ratios, firm characteristics, and credit ratings to proxy for borrower's risk. Many of these variables are often not statistically significant [See Blackwell and Winters, 1997; Berger and Udell, 1995, to some extent Carey et al., 1998, and Strahan, 1999]. What have consistently shown to be significant are the leverage of the firm, cash flows profitability, and credit rating indicators. Therefore, we include the dummy variables for the rating (DAAA-DD) and LEV to proxy for borrower's credit risk. Bonds with poor credit ratings and higher LEV are expected to have greater SPREAD. We expect a negative relation between ROA and bond spreads indicating that borrowers with better economic viability have lower cost of capital. We also use total assets (log of assets or LASSET) as a measure of firm's asymmetric information and expect a negative relation between asset size and bond spreads.

The variable of particular interest to us is λ_i , our proxy for effects of the type of debt used. The coefficient captures the additional information revealed by a specific borrower's decision to use a specific type of debt (an indication of whether self-selection bias concerning debt choice exists). As extensively presented in the literature, informational considerations are recognized to determine both the dynamics of corporate competition and the pricing of bonds. We expect a positive relationship between λ_i , obtained from using DCLAW as the dependent variable in estimating the first stage probit regression, and SPREAD. This should reflect the willingness of firms to pay a higher cost of capital to gain access to the corporate bond markets while retaining the option to reduce benefits to bondholders by issuance of equity to retire a portion of the debt. This is the key rationale for the usage of clawback features in debt contracts.

4.2. Empirical results

We estimate the above models for the full sample as well as for the sample excluding overlapping bond type cases. Tables 6 and 7 present results of the bond choice model (Eq. (3)) estimation and the debt price model (Eq. (4)) estimation respectively for the full sample. Tables 8 and 9 present corresponding results for the non-overlapping sample observations. For the full sample, four probit regression estimates are provided one each for clawbacks, callable bonds, convertibles and straight bonds. Overall, all models have reasonable explanatory power as evidenced by the Pseudo R-squares ranging from 42% for callable bonds to 55% for clawback debt. Similarly, the predictive ability for these models is also high as evidenced by the % of observations correctly

Table 7
Multivariate regression results controlling for selectivity by corporate bond type.

	Full sample		IPO clawbacks		Callable bonds		Straight bonds	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
INTERCEPT	321.17	9.23*	833.46	7.76*	84.36	1.92	125.35	3.83*
LAMT	−0.03	0.14	14.07	1.69	−0.01	0.03	6.03	3.35*
LMAT	35.34	7.14*	−190.54	6.24*	151.64	9.13*	24.93	4.87*
D144A	46.04	6.78*	8.73	0.67	80.69	7.74*	94.94	10.34*
DAAA	−200.75	11.25*			−70.86	1.68	−189.57	6.41*
DAA	−152.01	12.05*	−154.12	1.72	−117.59	4.90*	−116.65	4.42*
DA	−133.06	11.75*	−54.55	0.77	−83.58	4.63*	−86.74	3.37*
DBBB	−91.63	8.18*	−112.91	2.97*	−50.22	2.66*	−37.72	1.47
DBB	−1.25	0.11	−134.89	4.93*	73.11	4.24*	8.17	0.30
DB	64.25	5.82*	−77.92	3.21*	120.82	8.18*	96.37	3.33*
DCCC	105.90	6.24*	−2.27	0.08	187.91	8.21*	87.10	1.97*
DCC	108.73	5.62*	84.19	2.15*	211.00	7.62*	17.98	0.46
DC	126.46	3.97*	54.14	0.93	180.87	4.14*	100.42	1.45
DD	119.37	521.13*	43.01	1.13	270.22	7.75*	60.84	1.69
LASSET	−25.73	14.90*	−11.64	1.83	−27.21	7.90*	−9.32	4.47*
ROA	−0.13	3.05*	0.06	0.56	−0.11	2.00*	−0.14	1.23
LEV	0.04	0.71	79.93	3.74*	0.12	1.18	0.08	1.14
LIQR	−0.02	2.13	−0.01	0.59	0.01	0.06	−0.02	3.76*
IMR1	27.18	4.94*						
IMR2	−22.53	2.42*						
IMR3	−49.57	5.02*						
IMR4	−186.56	26.96*						
YEAR DUM	YES		NO		NO		NO	
INDUSTRY DUM	YES		YES		YES		YES	
F-value	102.87		11.71		80.37		51.58	
Adjusted R ²	43%		17%		34%		15%	
N	8137		1422		3850		4101	

This table presents the determinants of the initial offering spread for different types of corporate bonds. The dependent variable is original offering spread (SPREAD) which is defined as the offering yield minus a comparable Treasury bond yield. Each respective category has the offering spread for that category only as the dependent variable. LAMT is the log of the issue amount. LMAT is the log of the issue maturity. LASSET is the log of total assets. ROA is the return on assets. LEV is the leverage ratio measured as total long-term debt to total assets, LIQ is the proportion of liquid assets in total assets, DAAA is coded 1 if the Standard and Poor's rating is AAA, or if the Moody's rating is Aaa, 0 otherwise. Similarly each credit rating category is converted to its respective dummy variable. D144A is a dummy variable coded 1 if the issue is a 144A, 0 otherwise. IMR is the inverse mill ratio for each respective category and is obtained from the first stage probit analysis. IMR1 through IMR4 is respectively the instrumental fitted value for IPO clawbacks, Callable bonds, Straight bonds and Convertible bonds. Year and industry dummy variable are included in each model but are not reported to save space. See Appendix A for a full definition of all variables.

Note: * – Statistically significant at 5% level.

Table 8

Probit regression of type of bond for non-overlapping sample.

	IPO clawbacks		Callable bonds		Straight bonds	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
INTERCEPT	−1.18	2.16*	1.16	5.72*	−2.22	10.60*
LASSET	−0.17	6.99*	−0.18	11.33*	0.27	16.30*
ROA	0.00	0.87	0.00	1.07	0.00	0.31
LEV	0.59	4.88*	0.00	0.68	0.00	1.31
LIQR	0.01	3.63*	0.01	6.01*	−0.01	7.36*
DINV	−1.15	11.74*	−0.53	9.01*	0.84	14.86*
D144A	1.39	14.71*	−1.39	20.24*	0.41	6.10*
DJUNS	−4.30	1.38	0.95	1.42	−1.46	3.28*
DSN	0.42	0.85	1.02	6.39*	−1.07	6.73*
DSNS	0.49	0.99	1.54	9.37*	−1.91	11.43*
DSS	0.62	1.22	1.17	6.89*	−1.21	7.15*
DSUB	−6.64	0.00	8.53	0.00	−8.48	0.00
DMERGE	−0.81	5.00*	−0.90	14.62*	1.12	16.83*
DDIV	−0.50	2.96*	0.24	3.00*	−0.13	1.42
DDEBT	1.25	8.32*	0.21	2.81*	−0.48	6.05*
DSTCKISS	0.50	2.81*	−0.15	0.95	−0.45	2.15*
DSTCKSLT	0.25	2.21*	−0.10	1.06	−0.28	2.66*
DINVEST	−0.08	0.49	0.39	2.93*	−0.55	3.16*
DNETWORTH	−0.64	1.82	0.09	0.49	0.37	1.82
DNTEARN	−6.79	0.00	−1.26	9.12*	1.29	9.08*
DASC	0.56	4.01*	−0.62	4.79*	−0.50	3.20*
DSENBET	−0.52	1.30	0.26	0.89	−0.26	0.65
DVPP	−0.44	2.80*	−0.70	6.73*	1.05	8.76*
DVPPE	0.60	4.49*	0.18	1.78	−0.58	4.98*
DFIXCHRG	−0.28	0.40	−0.72	1.57	−0.87	1.62
DLEVTEST	0.07	0.11	−0.22	0.43	−0.08	0.11
DNPC	0.27	2.49*	−0.67	11.19*	0.60	9.06*
Pseudo R ²	54%		28%		48%	
N	6978		6978		6978	
Event number	829		1610		4101	
% correct	92%		83%		86%	

This table presents the determinants of the type of corporate bonds for clawbacks, callable, and straight corporate bonds, respectively. The dependent variable is a dummy variable for the type of corporate bond issue. Each respective probit has a different dependent variable for the corporate bond category. Each category is mutually exclusive of the other and meant as a robustness test of our larger sample. For example DCLAW is coded 1 if the issue is an IPO clawback, 0 otherwise; DCALL is coded 1 if the issue is callable, 0 otherwise. DSTRAIGHT is coded 1 if the issue is a straight bond with no other features, 0 otherwise. Please refer to Appendix A for full description of the variable names.

Note: * – Statistically significant at 5% level.

classified (89% for clawbacks). For the non-overlapping sample, three probit regression estimates are provided as the convertible and puttable samples became too small when overlapping bond types are excluded.

Table 6 presents results of the bond choice model for the full sample. Examining individual variables, Size measured by log of assets (LASSET) has significant negative effect on the probabilities of issuing clawback debt and callable bonds, and significant positive effect on the probability of issuing straight bonds. The results for clawbacks and callable bonds are consistent with our expectations. Small firms facing greater information asymmetry and high risk of undervaluation opt for the type of debt that allows them the option to redeem the debt subsequently. Large firms however, can issue straight debt without much undervaluation. The influence of size on convertible issuance is positive but statistically insignificant.

Leverage (LEV) is positive and significant at $p < 0.05$ for the clawback debt but is not significant at conventional levels for other categories. This is consistent with firms having high leverage resorting to using the clawback provision. The proportion of issuer's liquid assets (LIQR) has significant positive effect on the issuances of clawbacks, callables and convertibles, and negative effect on the issuance of straight debt. Borrowers that are rated investment grade (DINV) are more likely to issue straight debt than the other three categories. The coefficient of DINV is negative and statistically significant at $p < 0.05$ for both clawbacks and callable debt, but positive and significant at $p < 0.05$ for straight debt. This is consistent with our expectations that clawback features are used by firms characterized by high information asymmetries, since information asymmetries are generally higher for non investment grade debt. The coefficient of D144A is also positive and significant at $p < 0.05$ for clawback and callables but is negative and significant at $p < 0.05$ for straight debt. Taken together with the results for DINV, this is consistent with firms characterized by high information asymmetries using the Section 144A route to get better terms from institutional investors, while firms that are of higher credit quality prefer the public markets. The coefficient for convertibles is positive but statistically insignificant.

One feature of our study in contrast to the GGO (1998) study is that we explicitly control for several covenant features in our analyses of clawback debt. The results relating to these debt covenants in Table 6 are illuminative. Contractual restrictions such as debt issue restriction (DDEBT), common stock sale restriction (DSTCKISS), asset sale restrictions (DASC), senior debt restriction (DSENBET), employee control restriction (DVPPE), senior debt use restriction (DNPC) and fixed charges restrictions (DFIXCHRG) have positive influences on the probability of issuing clawbacks. The coefficients of these variables are positive and significant at

Table 9

Multivariate regression with selectivity by corporate bond type on spread for the non-overlapping sample.

	Full sample		IPO clawbacks		Callable bonds		Straight bonds	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
INTERCEPT	378.44	11.58*	916.10	8.74*	353.11	8.40*	139.81	4.20*
LAMT	−0.01	0.04	3.57	0.46	−0.03	0.21	8.99	4.87*
LMAT	30.54	6.21*	−155.67	5.31*	44.59	2.90*	12.69	2.43*
D144A	54.53	8.30*	6.40	0.53	57.77	4.55*	97.47	11.08*
DAAA	−179.91	9.45*			−150.47	4.21*	−155.03	4.99*
DAA	−187.16	14.88*	−136.68	1.66	−183.59	8.71*	−156.79	5.91*
DA	−183.14	16.17*	−52.82	0.80	−167.97	9.59*	−135.55	5.24*
DBBB	−145.21	12.85*	−105.78	2.99*	−107.05	6.09*	−90.52	3.50*
DBB	−42.35	3.51*	−132.54	5.04*	12.47	0.73	−42.62	1.57
DB	42.35	3.81*	−75.01	3.29*	55.20	3.68*	49.05	1.71
DCCC	74.40	4.52*	22.12	0.78	64.42	2.70*	38.71	0.91
DCC	90.75	4.93*	89.03	2.45*	115.36	4.49*	−39.22	1.02
DC	88.13	2.91*	73.94	1.37	31.77	0.77	50.66	0.77
DD	57.34	2.88*	39.36	1.12	114.59	2.91*	6.87	0.20
LASSET	−25.72	15.52*	−20.58	3.41*	−20.35	6.11*	−5.82	2.83*
ROA	−0.10	2.59*	0.07	0.72	−0.14	2.95*	−0.13	1.27
LEV	0.01	0.42	70.72	3.56	0.12	1.72	0.09	1.31
LIQR	−0.01	1.15	−0.03	1.15	0.01	0.79	−0.02	2.91*
IMR1	48.65	4.96*						
IMR2	19.06	2.01*						
IMR3	−5.11	0.54						
YEAR DUM	YES		NO		NO		NO	
INDUSTRY DUM	YES		YES		YES		YES	
F-value	105.74		9.12		64.11		44.49	
Adjusted R ²	45%		23%		40%		14%	
N	6978		829		1610		4101	

This table presents the determinants of the initial offering spread for different types of corporate bonds. The dependent variable is original offering spread (SPREAD) which is defined as the offering yield minus a comparable Treasury bond yield. Each respective category has the offering spread for that category only as the dependent variable. LAMT is the log of the issue amount. LMAT is the log of the issue maturity. LASSET is the log of total assets. ROA is the return on assets. LEV is the leverage ratio measured as total long term debt to total assets, LIQ is the proportion of liquid assets in total assets, DAAA is coded 1 if the Standard and Poor's rating is AAA, or if the Moody's rating is Aaa, 0 otherwise. Similarly each credit rating category is converted to its respective dummy variable. D144A is a dummy variable coded 1 if the issue is a 144A, 0 otherwise. IMR is the inverse mill ratio for each respective category and is obtained from the first stage probit analysis. IMR1 through IMR3 is respectively the instrumental fitted value for IPO clawbacks, Callable bonds, and Straight bonds. Year and industry dummy variable are included in each model but are not reported to save space. See Appendix A for a full definition of all variables.

Note: * – Statistically significant at 5% level.

$p < 0.05$ for clawback debt. Similar results are also generally observed for callable debt. In contrast, the coefficients for these variables are either negative or negative and significant at $p < 0.05$ for straight debt. This is again consistent with the fact that investors demand significant protection from issuers of clawback debt given the lower credit quality and higher information asymmetries associated with these issuers. Merger restrictions (DMERGE), dividend payment restriction (DDIV) and investor control restrictions (DVPP) have significant negative effect on the chance of issuance of clawbacks. These variables have more or less the same effect on callable bond issuance, but most of them have the opposite effect on the choice of straight debt. Again, these debt covenant features illustrate the dynamic nature of the debt contracting process with both investors and issuers trying to have (or not have) covenants that are beneficial (potentially harmful) to them. These results also are consistent with issuers of clawback debt having weaker credit quality than issuers of straight debt, and hence perhaps having to accept significant covenant restrictions from investors in their debt.

Table 7 presents the results of the spread regression (Eq. (4)). The first column reports results for the full sample and the other columns are for clawbacks, callable and straight bonds. For completeness year and industry fixed effects are controlled for in the analysis but are not reported in the table. The year effects are significant in the full sample regression but insignificant in the sub-samples, while the industry effects are significant in all the regressions.¹⁴

An examination of the individual coefficients shows that the size of the issue (LAMT) has positive and significant coefficient only for straight bonds. Maturity (LMAT) also has positive and significant effect on spread for the full sample and callable and straight bonds. The coefficient of LMAT is negative and statistically significant for the clawbacks. The coefficient of D144A is positive and significant at $p < 0.05$ for the full sample, callable and straight bonds indicating that if the issue is privately placed, the spread is higher. The coefficient of D144A is not significant for clawback issues suggesting that these issues do not incur higher borrowing costs even if they opt for placement with institutional investors. This is consistent with the results discussed in Table 6 earlier, showing widespread usage of this method by issuers of debt with clawback features.

¹⁴ Our regression analysis on puttable bonds produced inconsistent results due to the sample size and was excluded due to the inconsistent and conflicting results. We included the puttable bonds in the descriptive analysis for completeness and to give the reader a comprehensive view of the option features typically available in the corporate bond market. Results for convertible bonds (available with the authors) are not presented in Table 7 since yield effects for convertibles are not the primary focus of this study.

The dummy variables representing credit rating have signs consistent with theory. Those rated BBB and above have lower spread and those rated below BBB have higher spread. This is consistent through all the sample categories. The size of the issuer (LASSET) has significant negative coefficients in all the regressions. This is consistent with results in Table 2 and the theory that large companies are well known and face lower degree of information asymmetry. Profitability of the issuer measured by ROA has significant negative coefficient in the full sample and callable regressions, but insignificant in the other sub-samples.

The focus of our attention in these regressions is on the inverse mills ratios (IMR). IMR1 measures the impact of clawback provision on the yield spread. Its coefficient is 27.18 and significant at 5% level. This means, relative to the other provisions in the debt contract, inclusion of clawback provision increases the yield. Thus, while clawback features may provide the ability to issuers to mitigate wealth transfers from shareholders to bondholders, issuers ex-ante pay more for this protection. However, and more importantly, assuming that both issuers and investors are rationale utility maximizing decision makers, the economic significance of the higher cost of capital indicates that issuers do not view this cost as prohibitive in return for the flexibility available to them. For small firms the clawback provision may be a feature that provides them an important capital market function and allows their growth to be protected, managed and maintained among well established firms and financiers.

For empirical comparisons the coefficients on IMR2, IMR3 and IMR4 that represent respectively the callable, straight and convertible issues have significant negative coefficients. The magnitudes of the coefficients indicate the relative yield differences of each provision. For example the coefficient of IMR3, is -49.57 and of IMR4, -186.56 . This means straight debt has lower yield than the callable and clawbacks but higher yield than convertibles. The convertibles have the lowest yield because IMR4 has the smallest coefficient. The results are consistent with our hypothesis and expectation, but remind us that given that straight debt is generally issued by larger, more transparent, and more credit worthy firms, these firms use the core functions of the corporate bond market and use straight debt to their advantage.¹⁵ On the other hand, small and medium size firms are more likely to use the innovations of the corporate bond market to mitigate agency problems and informational asymmetry. Our results for the clawback bonds show that this flexibility is appropriately priced by the market and is consistent with the results in the GGO (1998) study.

Table 8 presents results of the estimation of Eq. (3) for the non-overlapping samples. The results are similar to those in Table 6 for the full sample. The estimations are for only clawbacks, callables and straight bonds. Due to slight change in sample size and the elimination of overlapping bond types, some variables coefficients changed. Leverage, covenant that restricts stock transfer (DSTCKSLT), and senior debt use restriction dummy (DNPC) are positive and statistically significant in the non-overlapping sample regression for clawback. This strengthens the results. On the other hand, the dummy variable indicating fixed charges coverage restriction (DFIXCHRG) is negative and statistically insignificant. The pseudo R-squared is 54% in this estimation also.

Table 9 presents the results of the spread probit regression for the non-overlapping sample. The results are qualitatively very similar to those in Table 7. The issue amount, maturity, credit ratings, assets, leverage, profitability and liquidity variables all have the same signs and statistical significance as in the full sample estimates. The IMRs also show the same pattern. The coefficients of IMR1, IMR2 and IMR3 are 48.65, 19.06 and -5.11 respectively. The coefficients of IMR1 and IMR2 are significant at 5% level. These indicate that clawback bonds have higher yields than callable bonds, which in turn have higher yields than straight bonds.

5. Conclusion

Our study focuses on the clawback provisions in corporate debt, a relatively newer innovation. We find that it has provided small firms with access to the public bond markets, simultaneously also providing them the ability to mitigate wealth transfer effects to bondholders. We document the characteristics of firms that use the clawback feature and find that small, less profitable and low rated companies prefer using clawbacks more than the other companies. These results are consistent with firms that have high informational asymmetries using clawback features to reduce wealth transfers to bondholders.¹⁶

Our study also documents for the first time the role of covenants in the markets relating to clawback debt. We document that contractual restrictions such as debt issue restrictions, common stock sale restrictions, asset sale restrictions, senior debt restrictions, employee control restrictions and fixed charges restrictions are more widely prevalent in clawback debt. Similar results are also generally observed for callable debt. In contrast, these covenants are less widely prevalent in straight debt. Merger

¹⁵ It is important to note that one luxury of size is a simple and easy to understand capital structure.

¹⁶ As stated earlier, we also examine the exercise of the clawback provision. Manually collecting and combining data from a variety of sources, we obtained information on a sub sample of 200 issues that had included the clawback provision in their debt. We find that approximately 10% of these actually exercised the clawback option. In all these cases, the remaining debt amount (not including the clawback provision) was retired by additional corporate actions such as a tender offer or an exchange offer for the remaining outstanding debt. We observe a variety of strategic behaviors by firms. For example, firms that use the clawback provision and issue equity to retire the clawback debt subsequently issue additional debt to retire the remaining debt. Having lowered their leverage ratio by issuing equity and retiring a portion of the debt, these firms now take advantage of their improved financial position to negotiate more favorable terms for their debt. Some of the firms that do not exercise the clawback provision also take some corporate actions to retire their debt or substitute it with other debt with more favorable terms. They do this through an exchange or tender offer. Presumably, these firms use the leverage of the clawback provision which allows them to negotiate more favorable terms with bondholders. Yet another category of firms, particularly firms in financial distress, are observed not to exercise the clawback provision. However, these firms seeking debt relief were observed to retire their debt under forced conditions such as a consent solicitation. Overall, we observe that having included the clawback provision firms that subsequently improve their financial position in general take advantage of the flexibility that the provision allows at a later date to reduce their borrowing costs, negotiate more favorable conditions and improve their capital structure. These results are consistent with firms having high informational asymmetries using the clawback provision as a costly signal to subsequently secure some advantages. While we note these important observations, at this moment, the paucity of data prohibits us from performing systematic analyses of these actions and their impact on firm performance.

restrictions, dividend payment restrictions, and investor control restrictions are less widely used in clawback and callable debt, but our evidence shows that most of them are more used with straight debt. Again, these debt covenant features are illustrative of the dynamic nature of the debt contracting process and show both investors and issuers using covenants to safeguard their interests. These results also are consistent with issuers of clawback debt having weaker credit quality and more information asymmetries than issuers of straight debt, and hence perhaps having to accept significant covenant restrictions from investors in their debt.

The fundamental features of companies that favor clawbacks, callables and convertibles are similar. Convertibles offer option to the investors and reduce the issuer's yield spread, while clawbacks and callables give the option to redeem early to the issuer and increase the yield spread. There appears to be a trade-off decision on the part of the issuer. Issuers can allow themselves greater flexibility and pay a higher yield with clawbacks or give more options to investors and get lower spread by issuing convertibles. All issuers desire the flexibility given by the public debt markets. Our analyses suggest that large transparent firms with inherently smaller growth rates and simpler capital cost structures tend to use straight corporate debt, while the growth rate of opaque small firms is supported by the use of features such as clawbacks in debt contracts.

Overall, our results suggest that the clawback provision is a financial innovation that benefits and is increasingly being used by high-yield issuers. As discussed earlier, inclusion of the clawback provision serves as a signal of potential near term improvements in financial condition for the issuer. An interesting question is whether issuers will continue to use this provision, particularly given the distressed conditions currently prevailing in financial markets. Debt issuance has slowed down considerably given current financial market conditions. However, we expect that issuers would continue to use clawback provisions once financial markets stabilize and corporate debt issuance returns to normal levels. While future research could examine this issue empirically, our view is that the value of clawback provisions may actually be greater under conditions of market illiquidity, for both high-yield debt issuers and issuers of higher quality debt. For both these types of issuers, including clawback provisions may actually be seen as a signal of potential near term strength in financial condition, making their debt more attractive to investors. Discussions with financial analysts of fixed income securities provide some support for this view.¹⁷

Our analyses are limited to bonds issued by public companies. There are a significant number of private companies that also issue these debts with special features such as clawback. Our limitation is due to the unavailability of financial and other data on the private companies. Extension of this study based on clawbacks issued by privately owned companies will have significant contribution to the literature because the privately owned companies face even greater degrees of information asymmetry. We leave this and the analysis of stock price reaction to the exercise of clawback option by the issuer to further research.

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Appendix A. Descriptions of variables used

Variable	Description
D144A	Coded 1 if the bond is a 144A offering, 0 otherwise.
DAAA–DD	Coded 1 if the Standard and Poor's rating is AAA+ through AAA–, or if the Moody's rating is Aaa, 0 otherwise. Similarly, each dummy variable is coded for the respective rating category. For example, DBB is the dummy variable for the bonds rated BB by Standard and Poor or Moody.
DASC	A dummy variable coded 1 indicating that asset sales are restricted, 0 otherwise.
DCALL	A dummy variable coded 1 if the bond issue is callable, 0 otherwise.
DCLAW	A dummy variable coded 1 if the bond issue contains an IPO clawback, 0 otherwise.
DCONV	A dummy variable coded 1 if the bond issue is convertible, 0 otherwise.
DCOV	A dummy variable coded 1 if the bond offering contains a covenant, 0 otherwise.
DDEBT	A dummy variable coded 1 indicating that the issuer is restricted from issuing funded debt greater than one year in maturity or that the issuer is restricted from incurring additional debt, or the issuer is restricted in the use of subordinated debt, 0 otherwise.
DDIV	A dummy variable coded 1 indicating that dividend payments may be restricted, 0 otherwise.
DFIXCHRG	A dummy variable coded 1 indicating that fixed charges are restricted, 0 otherwise.
DIND2–DIND14	Dummy Variables (coded 1 or 0) representing Industry SIC codes of the debt issuing firm
DINV	A dummy variable coded 1 indicating the bond issue is rated investment grade, 0 otherwise.
DINVEST	A dummy variable coded 1 indicating that investment policy is restricted, 0 otherwise.

¹⁷ Interestingly, our current discussions with financial analysts confirm the viewpoint expressed a few years back by other analysts, that overall, clawback features benefit issuers at the expense of investors by mitigating wealth transfer effects. The analysts also believe that given current extremely tight credit market conditions, both high yield debt issuers, and more credit worthy issuers may be inclined to use clawback provisions to signal to markets their expected near term improvements in financial condition.

Appendix A (continued)

Variable	Description
DJUN	A dummy variable coded 1 if the bond offering is junior debt, 0 otherwise.
DJUNS	A dummy variable coded 1 if the bond offering is junior secured debt, 0 otherwise.
DLEVTST	A dummy variable coded 1 indicating the leverage ratio is restricted, 0 otherwise.
DMERGE	A dummy variable coded 1 indicating that a consolidation or merger of the issuer with another entity is restricted, 0 otherwise.
DNETWORT	A dummy variable coded 1 indicating a minimum net worth requirement, 0 otherwise.
DNPC	A dummy variable coded 1 indicating the use of senior debt is restricted, 0 otherwise.
DNTEARN	A dummy variable coded 1 indicating a minimum net earning requirement, 0 otherwise.
DPUT	A dummy variable coded 1 if the bond issue is puttable, 0 otherwise.
DSEN	A dummy variable coded 1 if the bond offering is senior debt, 0 otherwise.
DSENDEBT	A dummy variable coded 1 indicating that senior debt is restricted, 0 otherwise.
DSENS	A dummy variable coded 1 if the bond offering is senior subordinated, 0 otherwise.
DSS	A dummy variable coded 1 if the bond offering is senior secured, 0 otherwise.
DSTCKISS	A dummy variable coded 1 if the issuer's common stock sales are restricted, 0 otherwise.
DSTCKSLT	A dummy variable coded 1 if the issuer's common stock transfers are restricted, 0 otherwise.
DSTRAIGHT	A dummy variable coded 1 if the bond issue is a straight bond, 0 otherwise.
DSUB	A dummy variable coded 1 if the bond offering is subordinated debt, 0 otherwise.
DVPP	A dummy variable coded 1 indicating investor control is restricted, 0 otherwise.
DVPPE	A dummy variable coded 1 indicating employee control is restricted, 0 otherwise.
IMR1–IMR4, λ_1 – λ_4	The inverse Mills Ratio obtained from first-stage probit regressions, using DCLAW, DCALL, DSTRAIGHT, and DCONV as the dependent variable, respectively.
LAMT	The natural log of the size of issue.
LASSET	The log of total assets of the firm in the year of debt issue.
LEV	Leverage ratio defined as total long-term debt divided by total assets in the year of debt issue.
LIQR	The liquid ratio defined as current assets divided by total assets in the year of debt issue.
LMAT	The natural log of the years to maturity of the issue.
ROA	The return on assets of the firm in the year of debt issue.
SPREAD	The credit spread measured in basis points and defined as the difference between the yield on the reference bond less the risk-free interest rate for the same maturity.
YXX	A dummy variable indicating the year of issue (XX = 1992–2002), respectively.

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