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The announcement impact of seasoned equity offerings on bondholder wealth

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A B S T R A C T

Previous studies document a negative return to equity on the announcement of an SEO. However, the effects of SEO announcements on bonds have received little attention. We find that bondholders experience a significant positive return on the announcement of an SEO and this effect is more pronounced for bonds with lower ratings. We examine alternate explanations for bond market reactions to SEO announcements including the leverage risk reduction, wealth transfer, and information signaling hypotheses. Overall, our results are most consistent with the leverage risk reduction hypothesis.

1. Introduction

The announcement impact of seasoned equity offerings (SEOs) on common stock returns has been the subject of considerable empirical research. The overwhelming evidence suggests that SEOs are associated with significant negative common stock returns on the order of −3.00% (Eckbo and Masulis, 1995). However, the impact of SEO announcements on other corporate securities has been a neglected area in the literature. The investigation of bondholder reactions to SEO announcements is important for several reasons. First, examining the impact of corporate events on securities other than common stock presents a more complete picture of the wealth impact of such events. To the extent that corporate policy announcements impact multiple classes of securities, understanding their motivation and efficacy requires that we analyze their valuation effects on these different securities. For example, a finding that SEOs are associated with positive returns to senior securities that outweigh the observed losses to common stockholders would suggest that SEOs are firm value maximizing events, albeit not shareholder wealth maximizing. Second, the agency literature suggests that corporate decisions may be motivated by wealth transfer considerations between various security classes. Recent evidence suggests that certain corporate events are associated with significant wealth transfer effects between common stockholders and bondholders (e.g., Maxwell and Rao, 2003 for spin offs; Warga and Welch, 1993 for LBOs; and Adams and Mansi, 2009 for CEO turnover). A similar effect may prevail for SEOs. A proper test of the wealth transfer effect requires that we study the impact of SEO announcements on both common stock and senior security returns. Finally, evidence regarding the announcement impact of SEOs on bondholders may help researchers discriminate between competing hypotheses that appear to explain observed stock returns. For example, the negative returns to shareholders from SEOs have been found to be consistent with cash flow signaling and adverse selection effects. The cash flow signaling model implies that SEOs are an indication of poor future earnings performance. Alternatively, the adverse selection model holds that firms issue common stock when they are overvalued. To the extent that the former and not the latter impacts bondholders, evidence from bondholder reactions would be useful in shedding light on which of the two hypotheses holds.

The authors are aware of only one published study that has examined SEO announcements on corporate bond returns (Kalay and Shimrat, 1987).[1] Kalay and Shimrat (1987) examine bond price reactions to a sample of SEO announcements from 1970–1982. They document a negative, but insignificant bond reaction on Day −1 and Day 0 [where Day 0 is the Wall Street Journal (WSJ) reporting date of the SEO announcement] with a sample of 25 and 23 bonds, respectively. How-

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[1] A related paper by Eberhart and Siddique (2002) examines long run (5 years) bond and stock returns following a sample of SEO announcements from 1980 to 1992.

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ever, by adopting a varying announcement interval from 1 to 7 days surrounding the announcement date (depending upon bond data availability for each announcement observation), they document a statistically significant negative bondholder reaction. Kalay and Shimrat (1987) conclude that the negative bond returns, along with the well documented negative common stock returns, are consistent with the view that SEO announcements signal adverse information about the firm's prospects. Kalay and Shimrat (1987) do not investigate the relative sensitivity of bond price reactions to firm and issue characteristics such as default risk of the firm, issue size, change in leverage, and bond maturity which may provide additional insights into which theories best explain security reactions to SEO announcements.

We study bondholder reactions to SEO announcements made from January 1990 to March 2002. Similar to prior research, we find equity returns are negative in response to an SEO announcement. For bonds, our results indicate that bondholders experience positive abnormal returns on the same announcement. We also document that bond reactions are inversely related to the bond ratings with non-investment grade bonds experiencing significantly positive abnormal returns while investment grade bonds do not exhibit any significant abnormal returns. Further, we find that bond returns are positively related to the percentage change in leverage. These results are inconsistent with the information signaling hypothesis of SEOs. We find no evidence that bond market and equity market reactions are inversely related, which is a principal implication of the wealth transfer hypothesis. Overall, our results are most consistent with a leverage risk reduction interpretation, where SEOs benefit bondholders through a reduction in the costs of financial distress engendered by the decrease in leverage associated with SEOs.

2. SEO announcement impact on bondholders

We present three hypotheses to explain potential bondholder reactions to SEO announcements including the leverage risk reduction hypothesis, the wealth transfer hypothesis, and the information signaling hypothesis. Table 1 presents a summary of our hypothesized sign on abnormal bond returns.

2.1. Leverage-risk reduction hypothesis

Since SEOs are associated with a decrease in leverage and, therefore, lower costs of financial distress, we hypothesize that existing bondholders should react positively to SEO announcements. Consistent with this view, Masulis (1980), in a study of exchange offers, documents that the directional impact on bondholder returns is the opposite of the change in leverage associated with the exchange offer. We expect the marginal impact of the downward shift in leverage to have the greatest impact on lower rated bonds as these bonds should benefit the most from any potential reduction in financial distress. Conversely, higher rated bonds, due to their superior protections and lower cost of financial distress, are expected to register either no impact or a slight positive impact on the announcement of an SEO. We also expect bondholder reactions to be stronger for SEOs leading to larger changes in leverage. Finally, we predict that longer maturity (duration) bonds will have a more positive impact than shorter maturity (duration) bonds given that the leverage reduction implications of SEOs for financial distress will be more meaningful for bonds that mature further out in time. These hypothesized effects are summarized in Table 1.

2.2. Wealth transfer hypothesis

The leverage risk reduction effect detailed above refers only to the impact of the SEO announcement on bondholder wealth without regard to the reaction of common stockholders to this event. It is conceivable that the reduced financial distress risk effect on bondholders comes at the expense of common stockholders. Galai and Masulis (1976) illustrate the possibility of intersecurity wealth transfers by viewing the common stock of a levered firm as a call option with an exercise price equal to the face value of a zero coupon bond. The current value of the firm is then equal to the discounted value of the bond and a call option (common stock). Using the Galai and Masulis (1976) framework, an SEO can result in a pure wealth transfer from shareholders to bondholders. Suppose that the SEO is used to finance an investment that reduces the overall variance of the firm (e.g., investment has less than perfect positive correlation with the existing business of the firm). Under these circumstances, the call option (i.e., common stock) will lose value. Alternatively, the lower variance will reduce the risk of ruin for bondholders resulting in a transfer of wealth from equity holders to debtholders.[2] It is important to note that the leverage risk reduction hypothesis discussed previously does not require that gains to bondholders come from a redistribution of wealth (i.e., the leverage risk reduction impact on bondholders may be independent of the redistribution effect). For example, common shareholders may react negatively to SEO announcements due to information signaling considerations while bondholders may react positively due to the leverage related effects noted previously. Thus, while the wealth transfer hypothesis requires an inverse relationship between bondholder and shareholder effects, the leverage risk reduction hypothesis does not.

The wealth redistribution hypothesis is troublesome in that it begs the question, "Why would managers deliberately engage in activity that transfers wealth from shareholders to senior security claimants?" The agency literature provides some insight into this. Jensen and Meckling (1976) suggest that because a significant portion of their human capital and personal wealth may be tied to the firm, managers may prefer a more conservative leverage ratio than is optimal from the shareholders' perspective, thereby transferring wealth from shareholders to senior security claimants. Alternately, debtholders may be able to exercise greater influence over management causing managers to engage in transactions favorable to debtholders, but detrimental to shareholders. For instance, management may be pressured into investing the issue proceeds in projects that are less risky than would be optimal from the shareholders' perspective. Incentives to do so would be especially strong in the case of firms at the cusp of financial distress or in danger of breaching certain covenants. Regardless of the underlying motivation, the primary prediction of the wealth transfer hypothesis is that bondholder and shareholder reactions to SEO announcements are inversely related. We also predict that the potential for wealth transfers to bondholders is greater when bondholders are likely to have greater bargaining power when influencing managerial decisions (i.e., firms that are closer to financial distress with lower bond ratings). Table 1 summarizes these anticipated effects.

2.3. Information signaling hypothesis

The SEO literature identifies information signaling as one of the dominant hypotheses to explain the observed negative returns to shareholders. The asymmetric information model of Miller and Rock (1985) asserts that unexpected external financing (e.g., SEOs) is indicative of unexpectedly lower current cash flows. In turn, this sends a negative signal to the market regarding the firm's current and future expected cash flows.

[2] Galai and Masulis (1976) do not specifically discuss the case of SEOs, but the same implications may be derived from the conglomerate merger and spin-off cases that they illustrate.

Table 1
Hypothesized effects on bond market returns.

Variable				
SEO announcement	Bond ratings	Bond duration	Leverage change	Equity returns
Panel A: leverage risk reduction hypothesis				
Positive returns	More positive bond returns for lower rated bonds	More positive bond returns for longer duration bonds	More positive bond returns the greater the change in leverage	No prediction
Panel B: wealth transfer hypothesis				
Positive returns, given that equity returns are negative	No prediction but the inverse relation with equity returns is expected to be stronger for firms with non-investment grade ratings	No prediction	No prediction	Inverse relation between bond and equity returns
Panel C: asymmetric information hypotheses				
Cash flow signaling				
Negative returns	More negative bond returns for lower rated bonds	More negative returns for longer duration bonds	More negative returns for larger issues (greater change in leverage)	Bond and stock reactions are positively related
Adverse selection				
No prediction	No prediction	No prediction	No prediction	No prediction

In the signaling model of Myers and Majluf (1984), managers acting in the interest of current shareholders issue new common stock when it is overvalued relative to their private information. Rational investors, knowing this to be the case, would bid down the price of the shares. While the cash flow signaling model of Miller and Rock (1985) and the adverse selection model of Myers and Majluf (1984) imply negative common stock returns for SEO announcements, they can be differentiated on the basis of additional implications the two models make. The cash flow signaling model of Miller and Rock (1985) implies that the greater the external financing, the more negative the announcement implications and the poorer the current and future earnings prospects of the firm. The Myers and Majluf (1984) model makes no similar predictions. The evidence to date reveals that stockholders react negatively to SEO announcements; however, cross-sectional evidence regarding a systematic relationship between the announcement impact and size of the offering is mixed. Masulis and Korwar (1986) find an inverse relationship between the announcement impact and the size of the offering while Mikkelson and Partch (1986) are unable to document any systematic effect. Additional studies have focused on financial variables other than announcement period returns to shed light on which of the hypotheses hold, but again the results have been mixed. Hansen and Crutchley (1990) document that abnormal earnings declines follow common stock offerings consistent with the cash flow signaling model while Brous (1992) and Jain (1992) report slight downward revisions in 1-year analysts' earnings forecasts following SEO announcements. Loughran and Ritter (1997) confirm significant declines in operating performance in the five years following SEOs with especially pronounced results for smaller firms. However, Healy and Palepu (1990) indicate that SEO announcements convey no new information about future earnings of the firm. Several studies (Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995) examine and report significant long run (up to 5 years) declines in stock returns following SEO announcements consistent with investors' overvaluation of the stock at the time of the stock issuance announcement. However, recent studies (e.g., Eckbo et al., 2000; Bayless and Jay, 2003) find that the long run studies may be flawed due to improper use of benchmarks and risk measurement.

Given the above mixed evidence, bond reactions to SEO announcements may provide a clearer picture as to which of the two signaling hypotheses hold, assuming SEO announcements are associated with signaling considerations. As noted by Kalay and Shimrat (1987), the cash flow signaling hypothesis (but not the adverse selection hypothesis) predicts that SEO announcements should have a symmetric impact on bondholders consistent with the reaction by common shareholders. This implies that SEO announcements are viewed negatively by senior security claimants, including bondholders. Further, we would anticipate the negative reaction to bondholders to be stronger for larger SEO offerings (or a larger change in leverage), longer maturity (duration) bonds, and lower rated bonds. According to Miller and Rock (1985), larger offerings may signal a greater shortfall in current and future earnings. Lower future earnings prospects would be associated with greater potential loss for longer maturity bonds as opposed to short maturity bond holders whose exposure is limited to the near term. Finally, lower rated bonds that may not be secured or have a lower priority of claim over assets and earnings will be impacted more strongly by reduced future earnings prospects. Alternatively, the adverse selection model of Myers and Majluf (1984) which assumes that SEOs are motivated by management's desire to issue equity when it is overpriced makes no predictions about bondholder reactions. Thus, a finding of significant negative bondholder reaction would support the declining cash flow version of the information signaling hypothesis rather than the adverse selection version of the information signaling model. These effects are summarized in Table 1.

3. Data and descriptive statistics

The primary sample of SEO observations consists of 4871 announcements from Security Data Corporation's SEO file from January 1990 to March 2002. The bond sample is, in part, drawn from Tradeline.com (a subsidiary of Sungard Market Data Services), a vendor of historical daily price data for a wide range of exchange traded securities. The debt component of the Tradeline database consists of virtually all long-term and short-term corporate debentures, subordinate debentures, and notes traded on the NYSE and AMEX with maturity dates after 1995, and includes daily closing price, coupon rate and periodicity, maturity dates, Standard and Poors' and Moody's bond ratings, total par value, and daily trading volume. Specifically, Tradeline contains daily prices for 349 long-term corporate debentures and subordinate debentures issued by 187 firms and 426 corporate notes issued by 259 firms. In all, Tradeline has daily bond price data for one or more bonds issued by a total of 397 different firms.

Because the Tradeline dataset is limited to bonds with maturity dates after 1995, we supplement our sample with bond price data from various issues of the WSJ. Specifically, we search for SEO announcing firms whose bonds have maturity dates prior to 1996 (and would not be included in Tradeline). The WSJ yields an additional 108 bonds issued by 46 firms.

After screening the Tradeline and WSJ data for bonds with price data available during both the estimation period and the event window, we have a sample of 188 bonds issued by 68 firms that cover 99 separate firm/SEO announcements.[3] We collect closing prices for a total of 48 days, an estimation period comprising 45 days (the period between event Days −60 and −16 inclusive) plus an event period comprising three days (the period between event Days −1 and +1 inclusive) where Day 0 is the SEO announcement date. We identify additional information such as bond ratings and issue par amounts from Moody's Industrial Manuals.

Table 2 presents descriptive statistics for our sample of SEOs. Panel A offers SEO characteristics and general financial information for the firms in our sample. The sample firms' equity has an average (median) market value of $5.0 ($2.3) billion.[4] The mean and median return on equity is 3.4% and 10.8%, respectively.[5] Approximately 68% of assets are supported with debt, slightly less than half of which is long-term debt. Similar to DeAngelo et al.'s (2007) findings for mature firms issuing an SEO, we find that our sample firms have relatively low Altman's *Z*-scores (Altman, 1968). The mean and median *Z*-scores are 1.9 and 1.5, respectively. The seasoned equity offer raises $443 ($160) million on average (median). As a percentage of total assets, the mean and median offering is equal to 7.1% and 3.9%, respectively.

Table 2, Panel B presents descriptive statistics for the traded bonds. Sample firms have a mean (median) of 1.9 (1) bond issues per firm, ranging from a minimum of 1 to a maximum of 7 issues. On average (median), the yield-to-maturity on the event day is 10.4% (10.0), with a sample range from 3.8% to 17.8%. The average bond duration on the event day is 5.7 years (median = 5.2) with a range from 0.8 to 11.4 years. The average par value is approximately $143 million (median = $100 million). These characteristics are broadly similar to sample descriptive statistics of other recent bond event studies (Maxwell and Rao, 2003). The use of SEO proceeds is also reported in Panel B. None of the firms report that the funds will be used to retire debt or reduce leverage. Sixty-one percent of the sample firms report that the SEO proceeds will be used for "Acquisition of Securities" or "Acquisition Finance." The balance of the firms indicate that the proceeds will be used for "Capital Investment Funds," "Capital Expenditures," or "General Corporate Purposes." The sample bonds are fairly liquid. Over the combined estimation and announcement window of 48 days (45 day estimation period + 3 day announcement window), the average bond traded on 40 days (median = 43 days) with a minimum number of trading days of 4 and a maximum of 45. The second half of Panel B specifies the variety of bond types in the sample. Of the 188 bond issues, about 61% are investment grade (Moody's rating of Baa or higher).[6]

4. Empirical method: Calculating abnormal stock and bond returns

The abnormal stock price reaction to each SEO announcement is calculated by subtracting the return on the value-weighted CRSP index from each day's relative price change (i.e., market-adjusted returns).[7] We cumulate the daily market-adjusted returns to arrive at the multiple day CAARs reported.

The impact of SEO announcements on daily bond returns follows the methodology developed by Handjinicolaou and Kalay (1984) and other related work (Jayaraman and Shastri, 1988) and is essentially a mean-adjusted return model. A growing body of recent research (Maxwell and Stephens, 2003; Maxwell and Rao, 2003) tests the announcement impact of corporate events on bond prices with monthly bond return data from the Lehman Brothers Bond Database (LBBD) database. By using daily returns data, we avoid the potential problem of confounding events occurring during the event month and, consequently, have a more precise measure of the information content of the event reflected by the change in bond prices. We control for the impact of unexpected changes in the term structure of interest rates by matching each corporate bond to a Treasury bond on the announcement day. Previous research has matched corporate bonds to Treasury bonds subjectively using maturity and coupon rate. A more precise measure of the sensitivity of a given bond to interest rate movements is provided by the bond's duration (Kraft and Munk, 2007). We calculate the duration for each corporate and Treasury bond on each announcement date and identify matching corporate/Treasury bond pairs by minimizing the absolute difference between the corporate bond and Treasury bond durations. In the event there is not a trade price on the event day to calculate duration, we use the first available trade price prior to the event day and identify a matching Treasury bond based on that day's duration. The trade-to-trade return spread between each corporate bond and the matching Treasury bond (the "premium return") is the corporate bond's return minus the corresponding return of the matched Treasury bond. Since some bonds trade infrequently, we estimate daily corporate bond returns by following the procedure described by Handjinicolaou and Kalay (1984). Multiple day returns are scaled into one day equivalents by dividing the multiple day returns by the number of trading days that that the bond did not trade. To mitigate the influence of extreme price movements on the results, we exclude from the estimation and event periods ±1% from the tails of the abnormal return distribution.

Following Handjinicolaou and Kalay (1984) and related research (e.g., Jayaraman and Shastri, 1988), we estimate the expected return premium on bond *i* from the realized premium returns in the 45 day estimation period from Day −60 to Day −16. The estimation period mean premium bond return is calculated as:

$$\mu_i = \frac{\sum_{k=2}^{K_i}\left(\frac{p_{i,n(i,k)}}{n(i,k)-n(i,k-1)}\right)}{K_i - 1} \tag{1}$$

where, $n(i,k)$ is the event time date of the kth trade on bond i; $p_{i,n(i,k)}$ the premium bond return between the $(k-1)$ and kth trade; and K_i is the number of estimation period trades on bond i.

[3] All issues are primary issues only. Several firms announce multiple SEOs during the sample period. Eight firms issue two, two firms issue three, three firms issue four, one firm issues five, and one firm makes seven issues during our sample period. This yields 99 separate firm/SEO announcements for 68 firms. Because of the potential lack of independence across observations, we use a corrected covariance matrix to estimate levels of significance. Because of the paucity of trading in bonds, it is not unusual to find bonds that have no price data during the Day −1 to Day +1 event window and/or during the estimation period.

[4] The average and median market value of our sample firms is several times larger than other studies that use SEO announcements (Elliott et al., 2008). This is not particularly surprising given that we require that our sample firms have relatively liquid, traded debt. This constraint biases our sample toward larger firms. Given prior evidence, our sample and results are likely to be conservative.

[5] We pre-condition the sample by removing several firms that are clearly distressed firms in order to have a sample that is more representative of the average ongoing firm. Even after that removal, it could be argued that several firms have an exceptionally bad year prior to the SEO; however, our results remain qualitatively similar without these firms.

[6] We employ a 9-way rating classification scale where Aaa = 1, Aa1 – Aa3 = 2, A1 – A3 = 3, etc.

[7] In unreported results, we obtain similar results when a market model is used to adjust stock returns.

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Table 2
Descriptive statistics for sample companies and bonds.

	Mean	Median	Min	Max
Panel A: general financial information and SEO characteristics (N = 99, number of SEOs)				
Market value of equity ($000,000)	4992	2282	77	38,221
Net sales ($000,000)	8247	4224	23	122,081
Return on equity (%)	3.4	10.8	−118.8	41.3
Total liabilities/total assets (%)	67.6	68.8	37.6	88.1
Long-term debt/total assets (%)	33.0	33.8	9.9	70.4
Times interest earned	1.4	0.8	−28.9	38.2
Altman's *Z*-score	1.9	1.5	−1.1	6.1
Market to book ratio	2.1	1.5	0.33	11.1
Proceeds of equity offer ($0,00,000)	443	160	10	9960
SEO proceeds/total long-term debt (%)	22.4	14.4	1.2	127.4
Panel B: bond characteristics				
Number of bond issues per firm/SEO	1.9	1	1	7
Yield to maturity (%)	10.4	10.0	3.8	17.8
Duration	5.7	5.2	0.8	11.4
Amount of issue ($mil.)	143	100	1	955
Moody's rating	–	Baa3	C	Aa1
Trading frequency (trading days during estimation period)	39.9	43	4	45
Use of SEO proceeds	Percent of sample			
"*Acquisition of securities*"	33			
"*Acquisition finance*"	28			
"*Capital expenditures*"	4			
"*Capital investment fund*"	18			
"*General corporate purposes*"	2			
Missing	15			
	No. issues	Proportion of sample		
Investment grade (Aaa – Baa)	115	0.61		
Non-investment grade (Ba – Caa)	66	0.35		
Non-rated	7	0.04		
Total number of bond issues in sample	188			

This table provides descriptive statistics for the sample of SEOs and bonds used in the study. Panel A displays selected firm-level variables and SEO characteristics. Panel B presents bond sample information and pertains to the day of the event. Duration refers to modified duration.

Daily event window abnormal returns for bond *i* are then calculated as:

$$A_{i,n(i,k)} = p_{i,n(i,k)} - \mu_i(n(i,k) - n(i,k-1)) \tag{2}$$

For firms with multiple bond issues, we convert the excess returns for multiple issues into a single value-weighted excess return weighted by each bond issue's proportional par amount. Daily event period abnormal returns are cumulated over a three day (−1, +1) event window to create a cumulative abnormal return (*CAR*) for each firm. We assess the significance of event window cumulative average abnormal returns (*CAAR*s) using the cross-sectional standard deviation test (Brown and Warner, 1985):

$$t_{CAAR} = \frac{CAAR(T_{-1}, T_{+1})}{\hat{\sigma}_{CAAR(T_{-1},T_{+1})}/\sqrt{N}} \tag{3}$$

where, N = the number of observations, $CAAR(T_{-1}, T_{+1})$ is the mean CAR_i over the (−1,+1) event window, and $\hat{\sigma}_{CAAR(T_{-1},T_{+1})}$ is the event window *CAAR* standard deviation. In addition to assessing the significance of firm-level bond abnormal returns, we also present results using disaggregated individual bond-level returns. At the bond-level, abnormal returns and their significance are assessed in a manner similar to that outlined above except that multiple bond issues belonging to the same firm are treated as independent observations instead of being weighted to a firm-level bond return.

5. Univariate and bivariate analysis

5.1. Abnormal stock and bond returns

Table 3 presents the [−1,+1] and [−1,0] day event window abnormal returns for both the sample firms' equity as well as bonds.

Table 3
Event period abnormal stock and bond returns around SEO announcement dates.

	CAAR	Positive: negative	*N*	*t*-Stat
Panel A: abnormal stock returns – firm/SEO-level				
[−1, +1]	−0.0120	32:67	99	−2.98[a]
[−1,0]	−0.0110	34:65	99	−3.52[a]
Panel B: abnormal bond returns – firm/SEO-level				
[−1,+1]	0.0030	56:43	99	1.76[c]
[−1,0]	0.0045	51:36	87	2.48[b]
Panel C: abnormal bond returns – bond-level				
[−1,+1]	0.0037	114:74	188	3.16[a]
[−1,0]	0.0051	117:59	176	4 24[a]

This table presents the mean cumulative abnormal returns, the number of positive and negative abnormal returns, number of observations, and the *t*-statistic for significance of the abnormal returns. Panel A presents day −1 to day +1 cumulative abnormal stock returns. Panels B and C present day −1 to day +1 cumulative abnormal bond returns; Panel B averages (value-weighted) all bonds for each firm/SEO observation, while Panel C weights each bond return equally.

[a] Significantly different from zero at the 1% level, respectively.
[b] Significantly different from zero at the 5% level, respectively.
[c] Significantly different from zero at the 10% level, respectively.

The average stock price reaction for all 99 firm/SEO announcements, with bond data, is significant at −1.20% (*t*-stat = −2.98) for the [−1,+1] window and a slightly lower −1.10% (*t*-stat = −3.52) for the [−1,0] window. The sign of the reaction is consistent with existing literature (Mikkelson and Partch, 1986; Asquith and Mullins, 1986; Masulis and Korwar, 1986; Denis, 1991) that ascribes a negative wealth effect to equity owners on the announcement of a seasoned equity offering. However, as our sample is comprised of large firms, the magnitude of the negative reaction is more conservative than an unconstrained sample of SEOs.

Table 4
Bivariate analysis of excess bond returns by bond quality and duration.

Mean (median)	Pos:neg	Mean (Median)	Pos:neg	Difference of column 1 and 3
Non-investment grade (<Baa)		Investment grade (⩾Ba)		
Panel A: bond-level: sample bisected by bond rating				
0.0066[a]	43:23	0.0019	64:51	*p*-Value = 0.06
(0.0045)[b]		(0.0009)		*p*-Value = 0.11
Panel B: firm/SEO-level: sample bisected by bond rating				
0.0079[a]	25:11	0.0001	30:33	*p*-Value = 0.03
(0.0060)[b]		(−0.0015)		*p*-Value = 0.19
Short duration (<median)		Long duration (>median)		
Panel C: bond-level: sample bisected by duration				
0.0034[a]	55:39	0.0040[b]	57:37	*p*-Value = 0.83
(0.0022)		(0.0027)[b]		*p*-Value = 0.77
Panel D: firm-level: sample bisected by duration				
0.0011	24:26	0.0047	32:18	*p*-Value = 0.29
(-0.0005)		(0.0030)[c]		*p*-Value = 0.11

This table presents bond excess returns for the event window, day −1 to day +1, classified by bond characteristics. Panels A and B (C and D) divide the overall sample based upon bond ratings (bond duration) at the time of the SEO for both the bond-level data and the firm/SEO-level data, respectively. The mean (median) and number of positive and number of negative observations within each subsample are presented in the first four columns. The *p*-value for a test of the difference of the mean and median is reported in column 5.
[a] Significantly different from zero at the 1% level, respectively.
[b] Significantly different from zero at the 5% level, respectively.

Panel B and C of Table 3 present the cumulative average excess returns for the traded bond portfolio. In Panel B, SEO announcements by firms with multiple bonds are value-weighted for a firm/SEO announcement excess bond return. For the [−1,+1] and [−1,0] event window, the average firm announcement bond return is positive and significant at 30 (t-stat = 1.76) and 45 (t-stat = 2.48) basis points, respectively. At the individual bond-level, the average return is a slightly stronger, 37 and 51 basis points for the two event windows, respectively. Of the 188 bond observations, approximately 60% of them are positive. In sum, the evidence from both the individual bond-level and firm-level abnormal returns is consistent with the leverage risk reduction hypothesis, as well as the wealth transfer hypothesis. However, this evidence does not, on the face of it, rule out the possibility of the signaling hypothesis. It is conceivable that the observed positive bond return is composed of a highly positive effect from either the leverage risk reduction effect and/or a transfer of wealth to bond holders and a slightly negative impact to firm value, conditional on the SEO announcement.

5.2. Bond quality and duration

Panels A and B of Table 4 bisect the bond returns by the bond rating for both the bond-level and firm/SEO-level announcement data, respectively. Bonds with a rating of Ba or worse (non-investment grade) are grouped together and bonds with a rating of Baa or better are classified as investment grade. For both the bond-level and the firm/SEO-level samples, the non-investment grade samples have positive and significant excess returns (for both the mean and median), while the investment grade sample is not different from zero for the bond- and firm/SEO-level sample. For both samples, the mean return of the non-investment grade bonds is significantly different from that of the investment grade bonds.[8]

In a recent paper, DeAngelo et al. (2007) suggest that SEOs are primarily motivated by a ''liquidity squeeze'' and not by other considerations such as capital structure rebalancing, adverse selection, etc. Additionally, they make the point that the liquidity squeeze for mature firms, which presumably characterizes our sample, is attributable to financial distress considerations rather than other liquidity constraints such as need for capital expenditures. To see whether our bond rating results are due to a liquidity effect, we bifurcate the sample by Altman's Z-score (unreported results). Those firms with a Z-score greater than 1.8 are considered to be in the 'gray zone' or better (scores above three are considered healthy), while less than 1.8 is indicative of a potential bankruptcy risk. Within both groups, firms with non-investment grade bonds experience a return that is significantly greater than firms with investment grade bonds. Irrespective of the firm's financial health, it appears that non-investment grade bonds enjoy significantly higher returns than investment grade bonds.

Panels C and D of Table 4 illustrate the excess bond returns when the samples are bisected by duration for the bond-level and firm-level samples, respectively. Both samples are divided at the median duration. We find that, in general, longer lived bonds elicit a more favorable response to an SEO announcement. However, we do not find a statistically significant difference between the short and long duration bonds.

5.3. Change in firm leverage

In Table 5, Panels A and B, we analyze the effect of the change in the firm's leverage on excess bond returns. We divide the sample of excess bond returns at the median of the leverage change variable (measured as SEO proceeds as a percentage of total long-term debt). Panel A (B) presents the bond-level (firm-level) returns. At the firm-level, we document significant positive returns for firms in the greatest leverage change group and insignificant returns for the least leverage change group. Both the mean and median returns for the least leverage change group are less than that of the greatest leverage change group; however, these are significant only at the 0.19 level. At the bond-level, median returns are qualitatively lower for the least leverage change group as compared to the greatest leverage change group. Overall, the results in this table provide qualitative support for the leverage risk reduction hypothesis.

[8] In unreported results, we also examine bond rating changes in the interval from one year before to one year after the SEO announcement. We do this for the full sample and the investment grade and non-investment grade subsamples. For the full sample, on average, we do not document any change in the rating. However for the subsample of non-investment (investment) grade bonds, we observe a statistically significant increase (decrease) in ratings. The result for the non-investment grade bonds complements the observed decrease in yield for these bonds and is also consistent with the leverage risk reduction hypothesis. We thank an anonymous reviewer for suggesting this additional test.

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Table 5
Bivariate analysis of excess bond returns by leverage change and equity returns.

Mean (median)	Pos:neg	Mean (Median)	Pos:neg	Difference of column 1 & 3
Least proceeds as a percent of long-term debt (<median)		Greatest proceeds as a percent of long-term debt (>median)		
Panel A: bond-level: sample bisected by change in leverage				
0.0040[b]	56:38	0.0034[b]	56:38	p-Value = 0.91
(0.0018)[c]		(0.0031)[a]		p-Value = 0.38
Panel B: firm-level: sample bisected by change in leverage				
0.0014	25:24	0.0045[b]	31:19	p-Value = 0.19
(0.0002)		(0.0035)[b]		p-Value = 0.19
Negative equity return		Positive equity return		
Panel C: bond-level: sample bisected by positive/negative equity return				
0.0027[b]	70:55	0.0056[a]	42:21	p-Value = 0.25
(0.0021)[b]		(0.0042)[a]		p-Value = 0.64
Panel D: firm-level: sample bisected by positive/negative equity return				
0.0021	36:32	0.0048	32:12	p-Value = 0.46
(0.0011)		(0.0025)		p-Value = 0.67

This table presents bond excess returns for the event window, day −1 to day +1, classified by leverage change during the year of the SEO announcement (Panels A and B) and by whether the equity market return surrounding SEO announcements is positive or negative (Panels C and D). The mean (median) and number of positive and number of negative observations within each subsample are presented in the first four columns. The p-value for a test of the difference of the mean and median is reported in column 5.
[a] Significantly different from zero at the 1% level, respectively.
[b] Significantly different from zero at the 5% level, respectively.

5.4. Equity returns

Panels C and D of Table 5 presents bond returns for the sample classified by positive/negative equity returns at the time of the SEO announcement. Panel C (D) presents results using bond-level (firm-level) returns. According to the wealth transfer hypothesis, bondholder and equity market reactions should be inversely related. We expect wealth transfer to be most evident when equity returns are negative. Thus, we would expect more positive bond returns for the subsample of SEO announcements that exhibit negative equity returns. The evidence does not support such a view. While both subsamples exhibit significantly positive bond-level returns, the negative equity return subsample actually experiences a less positive bond return, contrary to the wealth transfer hypothesis expectations. We obtain qualitatively similar results with firm-level returns.

In sum, the univariate and bivariate results yield the following. Bonds, in general, are associated with significant positive returns upon SEO announcements. Bond returns are significantly more positive for lower rated bonds. There is weak evidence of more positive bond returns for longer duration bonds and qualitatively higher bond returns for SEOs leading to a greater change in leverage. Additionally, we find qualitatively less positive bond returns for SEOs associated with negative equity returns. These results are most consistent with the leverage risk reduction hypothesis. In the next section, we explore whether these findings hold up in a multivariate setting.

6. Multivariate analysis

In Table 6, we analyze the relationship of the excess bond returns with the previously considered and additional control variables in a multivariate setting. Eq. (4) presents the regression model:

$$\begin{aligned} BondRet_i = \alpha + \beta_1 Non\text{-}invest_i + \beta_2 StkRet_i \\ + \beta_3 StkRet_i * Non\text{-}invest_i + \beta_4 ChgLev_i + \beta_5 Dur_i \\ + \beta_6 log(AsyInfo)_i + \beta_7 log(MV)_i \end{aligned} \quad (4)$$

where $BondRet_i$ is the excess bond return from Day −1 to Day +1. $Non\text{-}invest_i$ is a bivariate variable with a value of one if the bond is rated as non-investment grade, and zero otherwise. $StkRet_i$ is the abnormal stock return from Day −1 to Day +1. $StkRet_i * Non\text{-}invest_i$ is the interaction of stock return and a dummy variable for non-investment grade rating. The interaction term is introduced to test whether wealth transfer is more prevalent for lower rated firms where management's desire to appease bondholders' liquidity concerns and concern for their own survival is stronger. $ChgLev_i$ is the SEO proceeds as a percentage of total long-term debt, and Dur_i is the bond's duration.[9] $Log(AsyInfo)_i$ is used to capture the degree of transparency across the sample firms. If there is a great deal of asymmetric information between investors and managers regarding the firm's intrinsic value, then the SEO may reveal more information to investors than for those firms with less information disparity between these parties. We use two proxies to capture this affect. The first measure is the percentage change in the median analyst earnings estimate, from prior to after the SEO announcement. This is computed by subtracting the post-SEO median earnings estimate from the pre-SEO estimate, scaled by the latter. The second measure of transparency is the coefficient of variation of the earnings estimate. $Log(MV)_i$ is the natural log of the market value of equity and is used as a control variable for firm size. We include year dummies to control for fixed effects (unreported). Eq. (4) is estimated only for the firm/SEO-level data.

Model 1 only includes the non-investment grade dummy, abnormal return on equity, the interaction between bond quality and return on equity, and the proceeds as a percentage of long-term debt variables. Model 2 adds bond duration and market value of equity. Models 3 and 4 include one of the asymmetric information proxies. The coefficient on $Non\text{-}invest_i$ is significantly positive in all models. This finding confirms the bivariate results, namely that upon an SEO announcement, non-investment grade bonds experience a more positive return than investment grade bonds. It is consistent with the leverage risk reduction hypothesis, but does not rule out a wealth transfer effect. Duration is positive and insignificant in all of the models. This variable is, at best, weakly significant in the bivariate setting. We find a negative relationship between $ChgLev_i$ and the abnormal bond returns. While this is counter to the bivariate results in Table 5, the relationship is insignificant. Consistent with the bivariate results, we find that

[9] We exclude issue size from the model since both it and the percentage change in leverage proxy for the leverage risk reduction effect. When we replace change in leverage with issue size, the results are qualitatively similar. In unreported results, we use the proceeds as a percentage of total assets and obtain qualitatively similar results.

Table 6
Multivariate analysis of excess bond returns around SEO announcement dates.

Independent variables	Firm-level data			
	Model 1	Model 2	Model 3	Model 8
Non-investment grade	**0.0068**[b]	**0.0084**[c]	**0.0091**[b]	**0.0096**[b]
	(0.02)	**(0.07)**	**(0.04)**	**(0.05)**
Equity abnormal return	0.0788	0.0779	0.0611	0.0758
	(0.29)	(0.27)	(0.40)	(0.27)
[Equity abnormal return] × [Non-investment grade]	−0.0440	−0.0375	−0.0351	−0.0201
	(0.59)	(0.62)	(0.66)	(0.79)
Change in percent debt	−0.0046	−0.0054	−0.0014	−0.0045
	(0.45)	(0.41)	(0.84)	(0.51)
Duration	–	0.0010	0.0013	0.0010
		(0.27)	(0.19)	(0.29)
Log of market value	–	<0.0001	0.0002	0.0001
		(0.99)	(0.93)	(0.97)
Percentage change in median earnings estimate	–	–	−0.0340	–
			(0.18)	
Coefficient of variation for earnings estimate	–	–	–	−0.0004
				(0.69)
Constant	−0.0023	−0.0029	−0.0030	−0.0282
	(0.31)	(0.25)	(0.20)	(0.23)
Adjusted R^2	0.0163	0.0170	0.0490	0.0139
F-stat	2.04	2.92	2.58	3.50
Number of observations	99	99	95	96

This table presents cross-sectional regressions where the dependent variable is the day −1 to day +1 excess return on a firm's bond(s). The independent variables are non-investment grade, a dummy variable taking on the value of one if the bond is non-investment grade and zero if the bond is investment grade, the abnormal return on equity, an interaction between equity abnormal return and the bivariate bond rating variable, proceeds as a percent of long-term debt, bond duration, log of the market value of equity, two proxies for asymmetric information: (1) percentage change in median earnings estimate and (2) coefficient of variation for earnings estimates. We also include year dummies to allow for fixed effects; however, the coefficients are not reported. *P*-values are reported in parentheses.

[a] Significantly different from zero at the 1% level, respectively.
[b] Significantly different from zero at the 5% level, respectively.
[c] Significantly different from zero at the 10% level, respectively.

bond returns are not inversely related to *StkRet*. The interaction term $StkRet_i * Non\text{-}invest_i$ is also not significant, indicating that we do not find wealth transfer to be operational in situations where bondholders are likely to have the greatest bargaining power (i.e., when they are closer to financial distress). The lack of a systematic inverse relationship between bond returns and stock returns, and the interaction of stock returns with bond quality, casts doubt on the validity of the wealth transfer hypothesis.

Models 3 and 4 add a measure for asymmetric information to the first two models in order to capture the potential that an SEO announcement may signal future prospects for the firm. The first measure, the percentage change in the median earnings estimate, proxies for the change in earnings expectations conditioned on the SEO announcement. In this context, for an increase in earnings expectations, the SEO announcement can be interpreted as value increasing. If the SEO announcement indicates a value increase, both equity and debtholders benefit and vice versa. We expect a positive coefficient on this variable. However, as Model 3 confirms, empirically, we find a negative, albeit insignificant, coefficient.

Our second variable related to firm transparency captures a slightly different concept. This variable is the coefficient of variation (CV) in analyst earnings estimates. The purpose of this variable is to capture the ex-ante effect of information asymmetry between investors and managers upon the bond reaction to an SEO. If the signaling hypothesis holds, the SEO announcement transmits a negative signal to investors. For greater investor uncertainty regarding the value of the firm, the announcement may play a more important role. Thus, our expectation is that for those firms with high levels of information asymmetry, the SEO announcement will more negatively affect both equity and bondholders. As Model 4 demonstrates, we do not find any relationship.

Our combined evidence from the univariate, bivariate, and multivariate tests suggests that bond announcement returns are most consistent with the leverage risk reduction hypothesis. The significant positive announcement returns to bondholders is inconsistent with the information signaling interpretation commonly associated with previously documented negative equity returns for SEOs. The lack of a systematic relationship between bond returns and measures of information asymmetry provide further confirmation that signaling is not a likely consideration when interpreting bond reactions to SEOs. We also dispel the wealth transfer hypothesis on the basis that we are unable to document an inverse association between bond and stock announcement returns. The positive bond announcement returns, coupled with greater positive bond returns for lower rated bonds, larger leverage change (bivariate tests), and duration (bivariate tests), however, are as predicted by the leverage risk reduction hypothesis.

7. Summary and conclusions

We examine the impact of an SEO announcement on bondholders, and the potential transfer of wealth across these different classes of securities, in an effort to differentiate between competing hypotheses that attempt to explain the previously documented negative announcement return to shareholders. Daily price data for both equity and debt securities allow us to measure price changes at the exact date of announcement. Our initial finding of significant positive excess returns to bondholders is consistent with both the leverage risk reduction hypothesis and, potentially, the wealth transfer hypothesis. Our results are in contrast to those of Kalay and Shimrat (1987) who find negative abnormal bond returns using a more limited sample of bonds. This result suggests that the risk of potential bankruptcy for bondholders is reduced when leverage is decreased. It is also evidence that the information signaling hypothesis does not appear to dominate, contrary to previous findings. However, we cannot exclude information signaling entirely based solely on the univariate results.

We further examine the relationship between an SEO announcement and its impact on the firm's fixed income securities by bi-furcating the sample on various bond and firm characteristics. We find that bond returns are inversely and significantly related to bond ratings. Additionally, we find that SEOs associated with larger changes in leverage are related to positive bond reactions. These results provide additional evidence consistent with a leverage risk reduction effect. The more positive response to low quality bonds can also be viewed as evidence against the signaling hypothesis, as this hypothesis implies that these bonds should carry a greater risk of default and, as such, should react negatively. We do not find confirmation that bond and shareholder reactions are inversely related, a necessary condition for the wealth transfer hypothesis to stand. Alternatively, we find that bond returns are qualitatively less positive when equity announcement returns are negative. Thus, our bivariate results suggest that bond returns around SEO announcements are most consistent with the leverage risk reduction hypothesis.

These general findings for the leverage risk reduction hypothesis also holds true in a multivariate setting. We include two variables that proxy for the amount of information asymmetry between investors and managers, but do not find them to be significant. Our combined evidence supports the view that bond returns around SEOs are best explained by the leverage risk reduction hypothesis.

We offer two caveats related to our research design. First, our study, due to necessity, is limited to firms that have traded debt. These firms are typically large, mature companies and, as noted by DeAngelo et al. (2007), may have unique liquidity considerations in their motivation to engage in SEOs. Thus, our results may not carry over to the broad cross-section of seasoned equity issuers. Second, while the leverage risk reduction hypothesis appears to be the most reasonable explanation for bond announcement returns which are the focus of our study, it does not resolve the research uncertainty surrounding the equity market reaction to SEOs. Our study casts doubt on the wealth transfer and information signaling hypotheses, but does not provide an alternate explanation for the negative equity returns surrounding SEO announcements.

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