The Announcement Impact of Seasoned Equity Offerings on Bondholder Wealth

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Abstract

Previous studies document a negative and significant return to equity on the announcement of a seasoned equity offering. However, the effects of such an announcement on the firms other securities has received little attention. Using a sample of seasoned equity offerings made between 1980 and 2000 we analyze the effects of an SEO on the firm's bondholders. We find, on average, that bondholders enjoy a significantly positive return on the announcement of an SEO. This result is more pronounced for bonds with longer maturities and for bonds with lower bond ratings. We interpret these results as evidence in favor of the unanticipated leverage change hypothesis and the wealth transfer hypothesis. The results are inconsistent with the information-signaling hypothesis for SEOs. We also find strong evidence of a negative relationship between dollar losses to shareholders and dollar gains to bondholders. We interpret this as additional evidence that, at least in the case of SEOs, that the wealth transfer hypothesis best describes the data.

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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 percent (Eckbo and Masulis (1995)). However, the impact of SEO announcements on other corporate securities has been a neglected area of the literature. We feel that an investigation of bondholder reactions to SEO announcements is important for several reasons. First, examining the impact of corporate events on securities other than common stocks presents a more complete picture of the wealth impact of such events. To the extent corporate policy announcements have impacts on multiple classes of securities, understanding their motivation and efficacy requires that we analyze their valuation effects on the different securities. For example, a finding that SEOs are associated with positive returns to senior securities that outweighs 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 corporate events are associated with significant wealth transfer effects between common stockholders and bondholders (e.g., Maxwell and Rao (2003) for spin offs and Warga and Welch (1993) for LBOs). 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 on 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 in the case of SEOs have shown to be consistent with cash flow signaling and adverse selection effects. In brief the cash flow signaling model implies that SEOs are an indication of poor future earnings performance. The adverse selection model on the other hand holds the view 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 of which of the two hypotheses holds.

The authors are aware of only one published study that has examined the SEO announcements on corporate bond returns (Kalay and Shimrat (1987)). Kalay and Shimrat examine bond price reactions to a sample of SEO announcements between 1970 and 1982. They document a negative but insignificant bond reaction on day –1 and day 0 (where day 0 is the WSJ reporting date of the SEO announcement) with a sample of 25 and 23 bonds, respectively. However, by adopting a varying announcement interval from one up to 7 days around the announcement data (depending upon availability of the last bond price data before the announcement or the first available bond price data after the announcement date) they document that bond returns are statistically negative.[1] Kalay and Shamrat conclude that the negative bond

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[1] The interpretation of the varying intervals as used in Kalay and Shimrat is not the standard interpretation in event study methodology where a 2-day return might represent a 2-day cumulative return over say, day -1 and day 0, or the 3-day return might represent the cumulative return over three days, say, from day –1 through day 2. In Kalay and Shimrat the intervals represent varying lengths for each company depending upon the last bond price available before the announcement or the first available bond price after the announcement. For example, the one-day interval includes bonds that traded on day –1 and day 0 and the 2-day interval includes the 1-day interval bonds *plus* bonds that traded on day –1 and day 0, day –2 and day 0, or day –1

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 also 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 could provide additional insights into which theories best explain security reactions to SEO announcements.[2]

We study the bondholder reactions to SEO announcements made between January 1980 and March 2002. We are able to find daily bond price information on the Tradeline database for 70-100 SEO announcements for various intervals surrounding the announcement date. Our results reliably indicate that bondholders experience significant positive abnormal returns on SEO announcements. We also document that bond reactions are related to the maturity of the bond (as proxied by bond duration). Longer maturity bonds experience statistically stronger and more positive abnormal returns than shorter term bonds. Further, we find that the returns are inversely related to the bond ratings with non-investment bonds experiencing significantly positive abnormal returns while investment grade bonds do not exhibit any significant abnormal

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and day 1. Thus, for a firm that traded on day –2, day -1, day 0, and day 1 the 2-day interval return chosen is day –1 and day 0 even though this is not a "true" 2-day return. The varying interval for each company raises certain econometric issues, as the intervals are not common across the bonds.

[2] Eberhart and Siddique (2002) also examine bond returns around SEOs but they use monthly bond returns. Further, their focus is on the relationship between long run (5 years) bond and stock returns following SEO announcements from which they draw implications for long run wealth transfers between the two classes of securities.

returns. These results are inconsistent with the information-signaling hypothesis of SEOs. Our results support the view that SEOs benefit bondholders through a reduction in the costs of financial distress engendered by the decrease in leverage associated with SEOs and that this benefit, at least in part, may be attributed to a transfer of wealth from common stockholders.

1. SEO announcement impact on bondholders

We present several hypotheses to explain potential bondholder reactions to SEO announcements including the unanticipated leverage change hypothesis, wealth transfer hypothesis, and information signaling hypothesis.

A. Unanticipated leverage change hypothesis

SEOs result in significant infusion of equity capital to the firm. To the extent such infusion of equity represents an unanticipated change in leverage one should expect a significant bondholder reaction. 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. More recently, Maxwell and Stephens (2003) document a positive bondholder reaction to a sample of open market repurchases which are presumed to increase firm leverage. 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. 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. On the other hand higher rated bonds, because of their better 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 bonds will have a more positive impact than shorter maturity bonds given that the leverage reduction implications of SEOs for financial distress will be more meaningful for bonds with further out in time.

B. Wealth transfer hypothesis

The leverage effect detailed above refers only to the impact of the SEO announcement on bondholder wealth without regard to the reaction of common stockholders to the event. It is conceivable that the leverage effect on bondholders comes at the expense of common stockholders. The wealth transfer may occur because the SEO tilts the firm to a less than optimal debt leverage with a concomitant loss of tax shield and other leverage derived benefits to the shareholders of the firm. This loss is then captured by debtholders (and possibly other claimants) who benefit from the lower risk of default associated with the reduction in leverage. In a perfect wealth transfer the losses experienced by shareholders are exactly offset by gains to debtholders (and other claimants). It is important to note that the unanticipated leverage hypothesis does not require that the gains to bondholders come from a redistribution of wealth, i.e., the leverage 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.

The wealth distribution 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 that is not optimal from the shareholder's 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. 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 wealth transfer hypothesis predicts that *dollar* gains to bondholders are inversely related to the *dollar* losses to the shareholders from SEO announcements. We also predict that the potential for wealth transfers to bondholders is greater when the pre-SEO announcement leverage is high (or interest coverage ratio is low) as bondholders are likely to have a greater bargaining power in influencing managerial decisions.

C. 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 is indicative of unexpectedly lower current cash flows. In turn this sends a negative signal to the market about the firm's current and future expected cash flows. Under this model SEOs, and for that matter any unexpected external financing, sends a negative signal to the market.

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 implies that the larger the external financing the more negative the announcement implications and the worse the current and future earnings prospects of the firm, whereas the Myers and Majluf model makes no similar predictions. The evidence to date reveals that stockholders react negatively to SEO announcements, however cross-sectional evidence on a systematic relationship between the announcement impact and size of the offering is mixed. Masulis and Korwar (1986) find that an inverse relation between the announcement impact and size of the offering while Mikkelson and Partch (1986) are unable to document any systematic effect. Other studies have focused on financial variables other than announcement period returns to shed light on which of the hypotheses hold but here again the evidence has 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 one-year analysts' earnings forecasts following SEO announcements. Loughran and Ritter (1997) document significant declines in operating performance in the five years following SEOs with especially pronounced results for the smaller firms. However, Healy and Palepu (1990) document that SEO announcements convey no new information about future earnings of the firm. Several studies (e.g., Loughran and Ritter (1995) and 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, in a recent study Eckbo, Masulis, and Norli (2000) find that the long run studies may be flawed through improperly controlling for risk.

Given the above mixed evidence, bond reactions to SEO announcements may provide a clearer picture as to which of 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 announcement should have a symmetric impact on bondholders consistent with the reaction by common shareholders. Thus, SEO announcements would be viewed negatively by senior security claimants, including bondholders. Further, we would anticipate the negative reaction to bondholders to be stronger for larger SEO offerings, longer 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 lower priority of claim over assets and earnings will be impacted more strongly by reduced future earnings prospects. On the other hand, 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.

2. Data and Descriptive Statistics

The primary sample of SEO observations consists of 8165 announcements by 5231 firms from Security Data Corporation's SEO file during the time period January 1980 through March 2002. The bond sample is 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 following 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. Of these 397 firms, 129 are common with the primary SEO dataset. We then screen for bonds among these 129 common firms that actually trade around the SEO announcements and identify 313 bonds issued by 83 firms.

Because the Tradeline dataset is limited to bonds with maturity dates following 1995, we supplement our sample with bond price data from various issues of the Wall Street Journal (WSJ). Specifically, we search for SEO announcing firms whose bonds have maturity dates prior to 1996 (and hence would not be included in Tradeline). We limit our focus to SEOs with announcement dates after 1989. We collect closing prices for a total of 71 days – an estimation period comprising 45 days (the period between event days -60 and -16 inclusive) plus an event period comprising 12 days (the period between event days -1 and -10 inclusive). We identify additional information such as bond ratings and issue par amounts from Moody's Industrial

Manuals. The resulting sample of WSJ bonds is 108, issued by 46 firms. After screening out WSJ bonds that do not trade around the event date and adding the remaining bonds from the Tradeline sample, we have a total of 235 bonds issued by 111 firms.

Table 1, Panel A presents descriptive statistics for these bond issues. Sample firms have a mean (median) of 2 (1) bond issues per firm, ranging from a minimum of 1 to a maximum of 14 issues. On average (median) the yield-to-maturity on the event day is 10.2 (9.6) percent, with a sample range from 3.8 to 21.6 percent. The mean duration for bonds in the sample (for all issues across all announcements) is 6.3 (median = 5.5) with a range from 0.6 to 16.1. The average par amount is approximately $156 million (median = $109 million). These characteristics are broadly similar to sample descriptive statistics of other recent bond event studies (eg. see Maxwell and Rao [2002]).

The second half of Panel A partitions the sample according to bond characteristics. Of the 235 bond issues, about two-thirds are investment grade (Moody's rating of Baa or higher).[3] Long term senior debentures make up approximately one-third of the sample, subordinate debentures comprise about 10 percent, slightly more than one-third are short term notes, and the balance are either unidentified or listed as "other" (e.g. refunding debt).

Table 1, Panel B presents general financial and capital structure information. The sample firms equity has an average (median) market value of $5.6 ($1.9) billion. The mean and median return on equity is 3.9 and 5.9 percent, respectively. Approximately 70 percent of assets are supported with debt, slightly less than half of which is long-term debt. The seasoned equity offer raises $509 ($179) million on average (median). There are an average of 2 bonds for each issuing firm. The average yield to maturity of the bonds is 10.4% and their duration is 6.01 years.

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

3. Empirical Methodology

A. Stock return methodology

The stock price reaction to each SEO announcement is estimated using the single index market model. The event returns are centered on the announcement date provided by SDC. The market model parameters are estimated using the CRSP equal-weighted index over the estimation period extending from -60 trading days prior to the proxy mailing date to -16 days prior, resulting in a 45-day estimation period for each firm. We calculate standard z-statistics (Brown and Warner, 1980) to test whether daily average abnormal returns on each event day are significantly different from zero. The test statistic is defined as:

(1) $$Z_t = \overline{A}_t \sqrt{N}$$

where $\overline{A}_t$ is the mean abnormal return for the portfolio of N stocks on each event day.

Cumulative average abnormal returns (CAARs) for various windows around the event date are then calculated. To gauge the significance of each window's CAAR, we report the cross-sectional standard deviation t-statistic discussed by Brown and Warner (1985), who report that this test is well-specified for event date variance increases. The estimated variance of CAAR between event dates T_1 and T_2 is calculated as

(2) $$\hat{\sigma}^2_{CAAR(T_1,T_2)} = \frac{1}{N-1}\sum_{i=1}^{N}\left(CAR_{i(T_1,T_2)} - \frac{1}{N}\sum_{j=1}^{N}CAR_{j(T_1,T_2)}\right)^2$$

and the event window test statistic is calculated as

(3) $$t_{CAAR} = \frac{CAAR(T_1,T_2)}{\hat{\sigma}_{CAAR(T_1,T_2)}/\sqrt{N}}$$

where N = number of stocks and CAR_i is the ith firm's event period cumulated excess stock return over the window (T_1,T_2). We also report non-parametric rank test statistics (Corrado,

1989) as well as generalized sign test significance levels (Cowan, 1992) for daily and event window excess returns to test the null that the fraction of positive event period returns is the same as in the estimation period.

B. Bond return methodology

The impact of SEO announcements on daily bond returns follows the methodology developed by Handjinicolaou and Kalay (1984) and other related work (e.g. Jayaraman and Shastri, 1988) and is essentially a mean-adjusted return model. A growing body of recent research (e.g. Maxwell and Stephens, 2002; Maxwell and Rao, 2002) tests the announcement impact of corporate events on bond prices with monthly bond return data from the 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. Extant research in the literature 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. 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 a duration, we use the first available trade price prior to event day and identify a matching T-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 truncate the top five largest positive and negative abnormal returns in the event period from the sample.

Following Handjinicolaou and Kalay and related research (e.g. Jayaraman and Shastri (1988)), we estimate the expected return premium on bond *i* and the standard deviation of returns s_i from the realized premium returns in the 45-day estimation period from day -60 to day -16. The estimation period premium bond return and variance, respectively, are calculated as

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

(5) and $$s_i^2 = \frac{\sum_{k=2}^{K_i}\left[\frac{(p_{i,n(i,k)} - \mu_i(n(i,k)-n(i,k-1)))^2}{n(i,k)-n(i,k-1)}\right]}{K_i - 2}$$

where $n(i,k)$ = event time date of the *k*th trade on bond i;

$p_{i,n(i,k)}$ = premium bond return between the (*k*-1)st and *k*th trade;

K_i = number of estimation period trades on bond *i*

Daily event period standardized excess returns for bond *i* are then calculated as:

(6) $$A_{i,n(i,k)} = \frac{p_{i,n(i,k)} - \mu_i(n(i,k)-n(i,k-1))}{s_i\sqrt{n(i,k)-n(i,k-1)}}$$

Since some firms have multiple bond issues outstanding at the time of the announcement, we convert the standardized excess returns for multiple issues into a single value-weighted excess return for each firm using the each bond issue's par amount as the weights. The statistical significance of the excess returns on each day t in the event period is measured by the z-statistic given in (1), where $\overline{A}_t$ is the equally-weighted mean standardized excess return for all of the firm-bonds that traded on each event day. We assess the significance of event window CAARs with the t-statistic described by (3) above, where N = number of firms and CAR_i is the ith firm's event period cumulated value-weighted excess bond return over the window (T_1, T_2).

4. Univariate and Bivariate Analysis

A. Abnormal stock and bond returns

Of the 8,165 SEO announcements contained in the SDC database, we find stock return data from CRSP for 7,147 observations. Table II presents the day –1 to day +1 event window abnormal returns for both the sample firms equity as well as bonds. The stock price reaction for all 7,147 firms announcing an SEO is a negative 2.3 percent (significant at the one percent level). The sign and magnitude of the reaction is consistent with an extensive literature (e.g. Mikkelson and Partch, 1986; Asquith and Mullins, 1986; Masulis and Korwal, 1986; Denis, 1991) that ascribes a negative wealth effect to seasoned equity offerings. When the sample is limited to only those firms for which bond price data is available (Panel B), the stock price reaction is somewhat less negative, however it is still significantly negative, at -1.2 percent (significant at the one percent level).

Panel C and D of Table II present the cumulative average excess returns for the traded bond portfolio. In Panel C, firms with multiple bonds are value-weighted for a firm-level excess bond return. For the –1 to +1 event window, the average firm-level bond return is a positive percent. While this average is not significantly different from zero, more than 55 percent of the firms had bonds with positive returns. At the individual bond level, the average return is a positive and significant 0.27 percent (p-value = 0.01). Of the 261 bonds observations, approximately 58% of them are positive. Clearly, on average, there is an inverse relationship between stock and bond returns for firms that announce a seasoned equity offering. This evidence is consistent with the unanticipated leverage change hypothesis as well as the wealth transfer hypothesis. It is contrary to the information signaling hypothesis.

B. Bond Quality and Duration

To differentiate between the unanticipated leverage change and wealth transfer hypotheses, we further examine the bond returns. Panels A and B of Table III bisects the bond returns by the bond rating, for both the bond and firm-level data, respectively. Bonds with a rating of Ba or less (non-investment) are grouped together and bonds with a rating of Baa or greater are classified as investment grade. For both the bond-level and the firm-level samples, the non-investment grade sample has positive and significant mean returns, while the investment grade sample is positive (negative) and insignificantly different from zero for the bond-level (firm-level) bond returns. The means of the two subsamples are significantly different from one another for both samples. The median is only significantly different for the bond-level sample.

Panels C and D of Table III show the bond returns when the samples are bisected by duration. Panel C presents the bond-level sample and Panel D presents the firm-level returns.

Both samples are divided at the median duration. In Panel C, both the mean and median for both sub-samples are significantly positive and the return on the sub-sample of bonds with a duration above the median is greater than the short duration sub-sample. However, the difference between the long duration and the short duration sub-samples is insignificant. At the firm-level (Panel D) neither mean nor median of either sub-sample are significant.

In summary, non-investment grade bonds have a significantly more positive reaction to an SEO announcement than investment grade bonds. Bonds with longer duration generally, though not statistically significant, have a more positive reaction to SEO announcements. Both results are consistent with both the unanticipated leverage change and wealth transfer hypotheses, however, they do not allow us to separate the two.

C. *Relative Issue Size and Change in Firm Leverage*

In Table IV we analyze the effect of the size of the SEO and the change in the firm's leverage on the excess bond returns. We divide the sample of excess bond returns at the median of the relative size of the SEO (measured as the primary proceeds divided by total assets). Generally, the large SEOs have higher excess returns (both in terms of mean and median) than the smaller issues. The difference between the means and the medians of the two sub-samples are significantly different from one another (at the 10 and 5 percent levels respectively). However, only the mean of the large SEO sub-sample is significantly different from zero.

When the bond returns are sorted by the change in leverage and divided at the median of the same variable, those firms that experienced the greatest change in leverage, had a positive and significant excess return. The difference of the bond returns between the small change in leverage and the large change in leverage sub-samples is marginally significant (using the mean).

5. Multivariate Analysis

In Table V we analyze the relationship of the excess bond returns with the previously considered variables in a multivariate setting. Equation 7 presents the regression model:

$$(7) \qquad BondRet_i = \alpha + \beta_1 BondQ_i + \beta_2 \log(MV)_i + \beta_3 StkRet_i + \beta_4 IssueSize_i + \beta_5 ChgLev_i + \varepsilon_i$$

,where $BondRet_i$ is the excess bond return from day –1 to day +1, $BondQ_i$ is the quality of the bond (1=highest quality, 9=lowest quality), $log(MV)_i$ is the natural log of the market value of equity, $StkRet_i$ is the abnormal stock return from day –1 to day +1, $IssueSize_i$ is the primary proceeds of the issue divided by total assets, and $ChgLev_i$ is the percentage change in the level of total debt relative to total assets. We estimate Equation 7 for the firm-level and bond-level samples. At the firm level, we find that bond quality, abnormal return on equity, and change in percent debt are all positive and significantly related to the excess return on bonds. The lower quality the bond (indicated by a higher number), the greater the excess return on bonds. The greater the percentage change in debt, the greater the excess return on bonds. Paradoxically, we also find a positive relationship between the abnormal return on equity and the excess return on bonds. The univariate analysis clearly indicates a negative relationship, however this result could be driven by a secondary relationship between returns on equity and debt. That is, there may be a positive relationship related to the overall perception of the SEO. If the SEO is thought to be less negative by the shareholders, then the bondholders enjoy a more positive reaction, and vice versa. We leave this result for further analysis in the next model. The bond-level model follows the firm-level model generally, however, only the coefficient on bond quality is significantly different from zero.

The model presented in Table VI allows us to differentiate between the unanticipated leverage change and the wealth transfer hypothesis. The sample is limited to only those firms that experienced a negative abnormal return to equity. We estimate the coefficients on Equation 8, as follows:

$$(8) \qquad \Delta DollarEq_i = \alpha + \beta_1 \Delta DollarDebt_i + \beta_2 Size_i + \varepsilon_i$$

,where $\Delta DollarEq_i$ is the dollar change in the value of equity (abnormal return on equity times the market value of equity before the issue announcement), $\Delta DollarDebt_i$ is the dollar change in the value of the traded debt (excess return on bonds times the total face value of traded bonds), and $Size_i$ is a measure of the size of the firm (we use two measures, total assets and the sum of the market value of equity and total liabilities).

Clearly, if there is a transfer of wealth from equity to bondholders, we expect to find a negative and significant coefficient on the dollar change in debt. In both Models I and II the coefficient on the dollar change in debt is negative and significant at the one percent level. This result unmistakably leads to the conclusion that the wealth transfer hypothesis holds for our sample of firms and helps to resolve the paradox found in estimating Equation 7. Given the level of the coefficient, we can state that for every \$13 loss to shareholders, bondholders gain about \$1.

6. Summary and Conclusions

We use the announcement of seasoned equity offerings as a laboratory to study the effect of an SEO on other classes of securities, the potential transfer of wealth across these different classes of securities, and to help differentiate between competing hypotheses that attempt to explain the negative announcement effect at the time of an SEO announcement. Daily price data for both equity and debt securities allow us to measure price changes at the exact date of announcement. Our primary finding, that upon an SEO announcement the firms bonds enjoy a positive and significant return, is consistent with both the unanticipated leverage hypothesis and the wealth transfer hypothesis. This result suggests that the risk of potential bankruptcy for bondholders is reduced when leverage is decreased. It is also evidence against the information-signaling hypothesis, which predicts a negative effect on bondholders.

Further, we find that long-term bonds have statistically stronger and more positive abnormal returns than short-term debt and bond returns are inversely related to the bond ratings. That is, the unanticipated reduction in leverage has the greatest impact on those bondholders who must wait longer for the return of their principal and for those bondholders who face greater risk. The combined results are additional evidence against the information-signaling hypothesis.

The general finding for unanticipated leverage and wealth transfer hypothesis holds in a mulitivariate setting as well. Finally, to unambiguously demonstrate that at least a portion of the loss to shareholders is transferred as gains to bondholders, we analyze the dollar change in value of each security. The result is a significant and negative relationship between the dollar change in the value of equity and the dollar change in value of debt. For every $13 dollars lost by shareholders, bondholders gain $1.

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Table I

Descriptive Statistics for Sample Companies and Bonds

This table provides descriptive statistics for the bonds and companies contained in the sample. Shown are the mean and median values for a number of bond and firm level variables used in the analysis. The firm level variables shown in Panel A and B are calculated from the COMPUSTAT database. The bond information in Panel C is from the Tradeline database and pertains to the day of the event. Amount of issue in Panel C is the mean face value of bonds across all bond issues in the sample.

Panel A: Sample Bond Characteristics

	Mean	Min	Median	Max
Number of bond issues per firm	2.108	1	1	14
Event-day yield to maturity	0.102	0.038	0.096	0.180
Event-day duration	6.260	0.637	5.803	16.090
Amount of issue ($Mill.)	155.992	0.460	109.000	1200
Moody's rating	Baa	Caa	Baa	Aaa
No. of firms in sample	111			
No. of bond issues	235			
	No. Issues	Proportion of bond sample		
Investment grade (Aaa - Baa)	152	0.672		
Non-investment grade (Ba – Caa)	74	0.327		
Nonsubordinate debentures	73	0.327		
Subordinate debentures	23	0.103		
Notes	81	0.363		
Other	46	0.206		

Panel B: General Financial Information

	Mean	Median
Market value of equity ($000,000)	5,628.42	1,862.46
Net sales ($000,000)	9,738.68	4,494.91
Return on equity (%)	3.88	5.94
Proceeds of equity offer ($000,000)	509.55	178.50
Panel C: Capital Structure Information		
Total liabilities as a percent of assets	69.98	72.55
Total long-term debt as a percent of assets	33.52	31.89
Times interest earned	0.83	0.70

Table II
Event Period Abnormal Stock and Bond Returns Around SEO Announcement Dates

Table II, Panel A presents day –1 to day +1 cumulative abnormal returns for all firms that announced seasoned equity offerings over the 1980-2001 period. Panel B presents day –1 to day +1 cumulative abnormal returns for firms that announced a SEO and had price data for bonds from the Tradeline database. Panels C and D present cumulative abnormal bond returns for the sample of firms described in Panel B. Panel C averages (value-weighted) all bonds for a single firm, while Panel D weights each bond return equally.

	CAAR	Positive: Negative	Total	t-stat
Panel A: Abnormal stock returns, all Seasoned Equity Offerings				
[-1, +1]	-0.0234	2142:5004	7147	-34.701 [a]
Panel B: Abnormal Stock Returns (for sample of firms announcing a Seasoned Equity Offerings and with one or more bond issues that trade during the event window)				
[-1, +1]	-0.0118	36:95	131	-3.647 [a]
Panel C: Abnormal Bond Returns – Firm Level (for sample of firms announcing an SEO)				
[-1, +1]	0.0022	76:62	138	1.27
Panel D: Abnormal Bond Returns – Bond Level (for sample of firms announcing an SEO)				
[-1, +1]	0.0027	151:110	261	2.83 [a]

[a,b] Significantly different from zero at the one percent and five percent levels, respectively.

Table III
Bivariate Analysis of Excess Bond Returns by Bond Quality and Duration

Table IV presents bond excess returns for a window from day –1 to day +1. Panels A through D divide the overall sample based upon bond ratings, bond duration at the time of the SEO, size of the SEO relative to total firm assets, and change in the firm's leverage, respectively. The mean (median) and number of positive and number of negative observations within each sub-sample 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.

Mean (Median)	Pos:Neg	Mean (Median)	Pos:Neg	Difference of Column 1 & 3
Panel A: Bond-Level: Sample Bisected By Bond Rating				
Non-Investment Grade (<Baa)		Investment Grade (≥Ba)		Difference
0.0047 [a] (0.0039) [a]	59:35	0.0013 (0.0011)	84:71	*p*-value = 0.03 *p*-value = 0.09
Panel B: Firm-Level: Sample Bisected By Bond Rating				
Non-Investment Grade (<Baa)		Investment Grade (≥Ba)		Difference
0.0046 [b] (0.0015)	29:24	-0.0005 (0.0005)	31:34	*p*-value = 0.05 *p*-value = 0.29
Panel C: Bond-Level: Sample Bisected By Duration				
Short Duration (< median)		Long Duration (> median)		Difference
0.0027 [a] (0.0020) [a]	64:48	0.0035 [b] (0.0038) [a]	71:42	*p*-value = 0.17 *p*-value = 0.16
Panel D: Firm-Level: Sample Bisected By Duration				
Short Duration (< median)		Long Duration (> median)		Difference
0.0024 (0.0015)	29:26	0.0014 (-0.0000)	24:24	*p*-value = 0.31 *p*-value = 0.38

[a, b] Significantly different from zero at the one percent and five percent levels, respectively.

Table IV
Bivariate Analysis of Excess Bond Returns by SEO Issue Size and Leverage Change

Table IV presents bond excess returns for a window from day –1 to day +1. Panels A through D divide the overall sample based upon bond ratings, bond duration at the time of the SEO, size of the SEO relative to total firm assets, and change in the firm's leverage, respectively. The mean (median) and number of positive and number of negative observations within each sub-sample 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.

Mean (Median)	Pos:Neg	Mean (Median)	Pos:Neg	Difference of Column 1 & 3
Panel A: Bond-Level: Sample Bisected By Relative Size of Issue (as a percent of assets)				
Small Issue (< median)		Large Issue (> median)		Difference
0.0004 (0.0008)	42:38	0.0031 [b] (0.0032)	48:31	*p*-value = 0.07 *p*-value = 0.03
Panel B: Firm-Level: Sample Bisected By Relative Size of Issue (as a percent of assets)				
Small Issue (< median)		Large Issue (> median)		Difference
-0.0017 (-0.0025)	14:27	0.0015 (0.0030)	-0.0017 (-0.0025)	14:27
Panel C: Bond-Level: Sample Bisected By Change in Leverage				
Small Change in Leverage (< median)		Large Change in Leverage (> median)		Difference
-0.0008 (0.0008)	40:34	0.0031 [b] (0.0024) [b]	46:35	*p*-value = 0.09 *p*-value = 0.11
Panel D: Firm-Level: Sample Bisected By Change in Leverage				
Small Change in Leverage (< median)		Large Change in Leverage (> median)		Difference
-0.0033 (0.0030)	14:25	0.0026 (0.0025)	23:19	*p*-value = 0.04 *p*-value = 0.07

[a, b] Significantly different from zero at the one percent and five percent levels, respectively.

Table V
Multivariate Analysis of Excess Bond Returns and Abnormal Stock Returns Around SEO Announcement Dates

Table V, Panel A and Panel B, presents cross-sectional regressions where the dependent variable is the day –1 to day +1 excess return on a firm's bond and the day –1 to day +1 abnormal return on a firms' equity, respectively. The independent variables are Bond Rating, a proxy for Moody's bond rating (1= highest rating, 9= lowest rating), log of the market value of equity, the abnormal return on equity, the relative size of the issue (as a percent of assets), and change in the percentage of debt. P-values are reported in parentheses.

Independent Variables	Models	
	Firm Level Data	Bond Level Data
Bond Rating	0.0051 [b] (0.03)	0.0040 [a] (0.01)
Log Market Value	0.0019 (0.31)	0.0020 (0.07)
AR on Equity	0.0329 [b] (0.05)	0.0405 (0.12)
Relative Size of Issue	0.0130 (0.59)	0.0217 (0.27)
Change in Percent Debt	0.0238 [b] (0.05)	0.0124 (0.30)
Constant	-0.0377 (0.11)	-0.0330 [b] (0.03)
Adjusted R2	0.0634	0.0549
Number of Observations	81	151

[a, b] Significantly different from zero at the one percent and five percent levels, respectively.

Table VI
Analysis of Changes in Equity and Debt Values
(Firm Level Data)

Table VI presents cross-sectional regressions where the dependent variable is the change in the dollar value of a firm's equity. The independent variables are the change in the dollar value of all the firm's traded bonds, and a measure of firm size (we report two size measures: the sum of the market value of equity plus the total value of liabilities and the total value of assets). Only those observations where the abnormal return to shareholders were negative are used. P-values are reported in parentheses.

Independent Variables	Models	
	I	II
Value Change in Debt	-12.7724 (0.01)	-13.0452 (0.01)
Sum of Equity plus Liabilities	0.0048 (<0.01)	--
Total Assets	--	0.0041 (<0.01)
Constant	-39.9644 (<0.01)	-58.2256 (<0.01)
Adjusted R2	0.5033	0.3842
Number of Observations	52	52