

The Long-Term Performance of Corporate Bonds (and Stocks) Following Seasoned Equity Offerings

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Previous studies document negative long-term abnormal stock returns following seasoned equity offering (SEO) issuances and conclude that markets are inefficient. Other studies, however, argue that these results are a manifestation of risk mismeasurement (i.e., the bad-model problem), not market inefficiency. We test the efficient market hypothesis (EMH) and avoid the bad-model problem by examining the long-term performance of our sample firms' bonds and stocks following their SEOs. Our results are inconsistent with the EMH. We also provide evidence that SEOs transfer wealth from shareholders to bondholders because SEOs reduce default risk.

There is considerable controversy surrounding the existence of long-term abnormal stock returns following seasoned equity offering (SEO) issuances. Many studies [e.g., Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), and Jung, Kim, and Stulz (1996)] report a five-year period of underperformance for firms' stocks following their SEOs. If the models of expected stock returns used in these studies are correct, then their findings of a delayed stock market reaction to SEOs are inconsistent with the efficient market hypothesis (EMH). Fama (1998), however, argues that long-term abnormal return measures are particularly vulnerable to incorrectly estimating expected returns due to the mismeasurement of risk(s) (i.e., the bad-model problem). He concludes that previously documented "abnormal" returns following SEOs are a manifestation of risk mismeasurement, not market inefficiency. Recent studies by Eckbo, Masulis, and Norli (2000; henceforth EMN), and Brav, Geczy, and Gompers (2000; henceforth BGG)

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support Fama's (1998) conclusion by finding generally insignificant long-term abnormal stock returns following SEOs with their respective models of expected stock returns.

As suggested by BGG (245), however, additional work is needed in comparing their model with EMN's model. Loughran and Ritter (2000) also argue that many expected stock return models, such as those used by BGG (and, by implication, EMN), have no power to test the EMH.¹ In short, the debate over the existence of long-term abnormal stock returns following SEOs appears to be unsettled, primarily due to disagreements over the appropriate method of estimating expected stock returns.

Our article makes several contributions to the literature. We provide the first analysis of firms' long-term bond returns following their SEOs. We find a five-year (positive) delayed bond price response to their SEOs. This result is consistent with the lengthy delay previously documented in the stock market, and it does not depend on any particular model of expected stock returns. We explain why bondholder wealth may rise following SEOs.

Of course, our abnormal bond return tests still depend on our method of estimating expected bond returns. There is a lesser controversy about estimating expected bond returns (versus expected stock returns), but the bad-model problem (for bonds in this case) still exists. Therefore, we test a null hypothesis of the EMH that a firm's raw stock returns should be significantly higher than its raw bond returns because its stocks are riskier than its bonds. This test of the EMH avoids the need to rely on any particular method of estimating expected stock *or* bond returns. Over our 18-year sample period, we find no evidence that our sample firms' raw stock returns are significantly greater than their raw bond returns. Instead, we generally find that their raw bond returns are greater than their raw stock returns. In contrast, the overall stock market returns are significantly higher than the overall bond market returns during our sample period (the same result holds for firms that do not issue SEOs during our sample period). Thus, our findings are not the result of an unusual period where bonds do better than stocks.

We also directly address the bad-model problem for stocks by estimating our sample (SEO) firms' abnormal stock returns using the BGG and EMN models of expected stock returns. Our sample period differs from the periods examined by BGG and EMN (for data availability reasons, explained later). Consequently, we should not expect to replicate perfectly their findings. Our sample period still spans 18 years, however, and it covers multiple business cycles. We should find insignificant abnormal stock returns over this period if the EMH holds, and the EMN and BGG findings of insignificant long-term abnormal stock returns are not unique to their samples. We find consistently significant negative long-term abnormal stock returns. Hence, even the most

¹ Ahn and Shivdasani (1999) also argue that the true abnormal stock returns following SEOs are significantly negative. See Armitage (1998) for a recent review of this literature.

recently proposed models of expected stock returns do not drive our sample firms' abnormal stock returns to insignificance.

We also report evidence of a wealth transfer effect following SEOs. *Ceteris paribus*, an SEO decreases a firm's debt ratio and consequently its risk of default. Lower default risk reduces the value of the put option that bondholders implicitly sell to shareholders [Black and Scholes (1973)], and it transfers wealth from shareholders to bondholders. Therefore, the wealth transfer hypothesis predicts that SEOs produce positive abnormal bond returns and negative abnormal stock returns.

There are two versions of the wealth transfer hypothesis. The pure wealth transfer hypothesis predicts that the abnormal firm returns (i.e., the combination of the abnormal stock and bond returns) are insignificantly different from zero. That is, the sample firms' positive abnormal bond returns fully offset their negative abnormal stock returns. The partial wealth transfer hypothesis predicts that the abnormal firm returns are significantly negative. So the partial wealth transfer hypothesis is consistent with the argument that managers time an SEO issuance to exploit windows of opportunity when the firm (not just the stock) is overvalued.²

If the EMH holds, any wealth transfer effect (pure or partial) should occur quickly and completely after the SEO announcement. Because we find evidence of a five-year delayed response to SEOs in the corporate bond market, we focus on whether there are wealth transfer effects with the long-term returns.³ With this focus, our results on the negative long-term abnormal stock returns and positive long-term abnormal bond returns support the (pure or partial) wealth transfer hypothesis. Our raw stock and bond return results cited earlier are also consistent with a (pure or partial) wealth transfer effect because they support our findings of positive long-term abnormal bond returns and negative long-term abnormal stock returns.

Our tests that distinguish between the pure and partial wealth transfer hypotheses are supportive of a partial wealth transfer effect. That is, we find that our sample firms' long-term abnormal firm returns are significantly negative following their SEOs. Moreover, we perform a cross-sectional regression

² The managerial timing hypothesis states that managers issue SEOs to benefit existing shareholders [see Loughran and Ritter (2000) for a recent discussion of this hypothesis in the context of long-term abnormal return tests]. Of course, any wealth transfer from a firm's shareholders to its bondholders is not in the interest of current shareholders. Managers may issue SEOs, despite any wealth transfers, to reduce their "employment risk" (i.e., with a lower default risk, managers lower the risk that they will lose their jobs in the event of default). Amihud and Lev (1981) posit employment risk reduction as a managerial motive for conglomerate mergers (a corporate event that, like SEOs, can reduce a firm's default risk). A thorough investigation of why managers choose to issue SEOs, however, is beyond the scope of this article.

³ Kalay and Shimrat (1987) is the only published study that examines bond returns around SEOs. They find *negative* short-term abnormal bond returns around SEO announcements and conclude that SEOs do not cause a wealth transfer. Their results, however, are not directly comparable to ours in two respects. First, Kalay and Shimrat do not examine long-term returns following SEOs. Second, their sample consists of exchange-listed bonds, and there are many well-known problems with the quality of these data [e.g., Warga and Welch (1993)]. We avoid this data problem by using an institutional over-the-counter bond data set that was not available at the time of the Kalay and Shimrat study.

of their abnormal stock returns on their abnormal bond returns, and we find more support for the partial wealth transfer hypothesis.

In summary, our results suggest that the lengthy delayed stock price reaction to SEOs is not attributable to the bad-model problem for three reasons.⁴ First, we find similar evidence of a delayed reaction in our sample firms' bonds (where no expected stock return model is used). Second, we report that our sample firms' raw bond returns are generally higher than their raw stock returns (a result contrary to the EMH that does not depend on any particular model of expected stock or bond returns). Third, we find significantly negative long-term abnormal stock returns for our sample firms following their SEOs, even when we use the most recently proposed models of expected stock returns. These results against the EMH hold across a variety of methods recommended in the literature [i.e., event-time (buy-and-hold) returns, calendar-time returns, equal-weighted returns, value-weighted returns].⁵ We also find that some of the wealth loss to shareholders following SEOs represents a wealth transfer to bondholders. So our sample firms' negative long-term abnormal stock returns following their SEOs overstate the degree of their firm overvaluation as of their SEO issuance month. Their long-term abnormal firm returns, however, are still significantly negative.

In the next section we discuss the data; we describe the empirical methods in Section 2. We present the empirical results in Section 3 and summarize the paper in Section 4.

1. Data

1.1 Sample selection process

Our sample of SEO issuance dates is purchased through Securities Data Corporation (SDC) and consists of all primary industrial SEOs issued from January 1, 1980, through December 31, 1992. The initial sample consists of 1368 SEOs issued by 1083 firms. To be included in our sample, the firm must be listed on the Center for Research in Security Prices (CRSP) NYSE-AMEX or Nasdaq files with data available during the SEO issuance month. Each firm must also have bonds listed in the Lehman Brothers Fixed Income Database with data available during the SEO issuance month. As discussed in Warga and Welch (1993), this database contains monthly prices (and other data)

⁴ Many other studies document long-term underperformance or overperformance of stocks following other corporate events [e.g., Eberhart, Altman, and Aggarwal (1999)].

⁵ An event-time return is a return computed as of an event month following a firm's SEO issuance [where event month (i.e., event period) 0 is the SEO issuance month; so the calendar period is irrelevant except that the SEO issuance must occur between 1980 and 1992]. As will be discussed, we use buy-and-hold returns in event time, and we refer to this measure as the event-time return metric. Calendar-time returns (also called the calendar-time return metric) are portfolio returns computed as of a particular calendar period (e.g., the average return in January 1988 for our sample firms' stocks following their SEOs; so a firm's event period is irrelevant as long as the calendar period is within the 60-month period following the firm's SEO). We compute the calendar-time returns using value and equal-weighted portfolio returns. We discuss all these measures in more detail in Section 2.

from institutional trades for nonconvertible bonds, and it is more comprehensive than exchange-listed data. Because the Lehman bond prices are from institutional trades, they represent larger transactions than could have been undertaken with the exchanges. Since the Warga and Welch (1993) study, many other studies have used the Lehman database [e.g., Blume, Lim, and MacKinlay (1998), Fedenia, Sorescu, and Warga (1999), Flannery and Sorescu (1996), Sweeney, Warga, and Winters (1997)].

We also need a positive book value of equity available (as of the SEO issuance) from Compustat to compute abnormal stock returns in some of our event-time tests. Finally, we need the book value of debt to compute our sample firms' abnormal firm returns. These requirements result in a sample of 189 SEOs issued by 140 firms.⁶

Requiring firms to have traded debt decreases our sample size and tilts it toward larger firms. The average market value of equity for our sample firms is \$2173 million (median = \$1023 million) in 1997 dollars. During the same period, the average market value of equity for SEO firms with publicly traded stocks (1368 SEOs, including those issued by firms with publicly traded bonds) is \$509 million (median = \$127 million) in 1997 dollars.

Because our sample firms are relatively larger, they may have negative abnormal stock returns following SEOs that are smaller in magnitude than for the (full) sample of 1368 SEOs. To check this possibility, we compute the 60-month abnormal stock returns for both samples, using the returns to the CRSP value-weighted index as the estimate of expected returns and, as will be discussed, the event-time return metric. The (full) sample has an average 60-month abnormal stock return of -50.63% and a median abnormal stock return of -84.17% . The average 60-month abnormal stock return for our (sub)sample of 189 SEOs is -13.01% and their median abnormal stock return is -24.54% .

In summary, to investigate the bond performance of firms conducting SEOs we must limit the sample to firms with publicly traded bonds. Even with a sample of larger firms, we still find abnormal stock returns that are large in magnitude and statistically significant. Moreover, the abnormal dollar losses in our (sub)sample are much larger in magnitude with an average dollar loss to shareholders over the 60-month period following the SEO of \$525 million (median = \$94 million) (1997) dollars. For the (full) sample of 1368 SEOs, the average dollar loss to shareholders is \$168 million, and the median is \$57 million (1997) dollars. In this sense, the abnormal stock returns that we

⁶ In an earlier version of the article, we include utilities and financial institutions (this sample size is 258 SEOs issued by 176 firms) and find qualitatively similar results. We exclude these firms to be consistent with most prior studies in this area. We redo the tests using one SEO per firm and continue to find significantly positive abnormal bond returns and significantly negative abnormal stock returns.

Table 1
Distribution of sample of 189 seasoned equity offerings: 1980–92

Year	Number of offerings	Median S&P bond rating	Median market/book	Number of SEOs on the NYSE	Number of SEOs on the AMEX	Number of SEOs on the Nasdaq
1980	10	B+	2.05	7	2	1
1981	13	BBB	1.36	10	1	2
1982	8	BBB	1.12	8	0	0
1983	31	BBB+	1.18	31	0	0
1984	2	BBB–	1.40	2	0	0
1985	18	BB	1.24	15	0	3
1986	18	BBB	1.22	15	1	2
1987	16	BB+	1.30	15	0	1
1988	3	BBB–	1.26	3	0	0
1989	4	BB+	1.43	3	0	1
1990	8	BBB	2.76	8	0	0
1991	24	BB	0.97	23	1	0
1992	34	BBB–	1.36	32	1	1
Total	189	BBB–	1.30	172	6	11

The seasoned equity offerings (SEOs) in our sample of 189 SEOs issued by 140 industrial firms between January 1980 and December 1992 are summarized by year.

report are arguably of greater interest than the results reported in previous studies with samples of smaller firms.⁷

1.2 Descriptive statistics

Descriptive statistics for the sample are shown in Tables 1 and 2. As shown in Table 1, the number of SEOs varies year to year, similar to previous studies. For example, Spiess and Affleck-Graves (1995) find that 1984, 1988, and 1989 are the years with the fewest number of SEOs in the 1980s; this observation is true for our sample also. The median debt rating is BBB– in the month before the SEO, and the median market-to-book ratio is 1.30 as of the SEO issuance. Consistent with their relatively large size, most of our SEOs are for firms listed on the NYSE (i.e., 172 on the NYSE; 6 on AMEX, and 11 on Nasdaq).

Many of the two-digit SIC code industries are represented in our sample as shown in Table 2. The Industrial, Machinery, Comp. Eq. industry (SIC code 35) with 20 SEOs has the largest representation, followed by the Oil and Gas Extraction industry (SIC code 13) with 19 SEOs. In short, the data show that no single industry dominates our sample distribution.

The average debt ratio (i.e., $D/(D + S)$) for our sample firms is 42.83% at the beginning of the year the SEO occurs. All the debt ratios discussed in this section are based on the estimated market value of debt (where the estimation procedure will be described), and the market value of equity. For each SEO, we compute the average debt ratio (using annual data over the

⁷ We use the simple market-adjusted returns merely for the purpose of comparing the abnormal stock returns for our sample to the (full) sample. The abnormal return results in event-time we report in Section 3 are based on the matched-stocks method as recommended by Lee (1997).

Table 2
Distribution of seasoned equity offerings 1980–92 with traded stocks and bonds by their industries

Two-digit SIC code	Number of SEOs
35 (Industrial, machinery, comp. eq)	20
13 (Oil & gas extraction)	19
20 (Food & kindred products)	14
28 (Chemicals & allied products)	14
33 (Primary metal industries)	12
37 (Transportation equipment)	12
26 (Paper & allied products)	10
36 (Electronics, electric)	7
10 (Metal mining)	6
45 (Transportation by air)	6
34 (Fab. of metal ex mach, etc.)	5
54 (Food stores)	5
61 (Non-dep. credit institutions)	5
70 (Hotels, other lodging places)	5
80 (Health services)	5
15 (Building construction)	4
27 (Printing published & allied)	4
30 (Rubber & misc plastics products)	4
50 (Durable goods—wholesale)	4
59 (Miscellaneous retail)	4
Other (each two-digit SIC code has fewer than four SEOs)	24

The seasoned equity offerings (SEOs) in our sample of 189 SEOs issued by 140 industrial firms between January 1980 and December 1992 are summarized by two-digit SIC codes (for all industries with at least four firms).

five-year period following the SEO) and subtract it from the debt ratio at the beginning of the year the SEO occurs. The average change across our SEOs is a significant decrease of 3.20 percentage points.

The decrease in our sample firms' debt ratios subsequent to their SEOs is accompanied by an increase in their bond ratings over the same period. On average, the change is an increase of one rating from BBB– to BBB; this change is notable because our average sample bond moves from junk-bond status to investment-grade status.⁸ For our subsample of 73 cases where the SEO is used to buy back debt, the bond rating increase is three changes; that is, from BB– to BBB– on average.⁹

2. Methods

Our raw and abnormal return tests in event-time (and calendar-time) provide evidence on the EMH and the (pure and partial) wealth transfer hypothesis. Therefore, we discuss the tests of these hypotheses together.

2.1 Abnormal and raw return tests in event-time

For our abnormal return tests in event-time, we present the bond and stock returns separately and then combined to compute the abnormal firm returns.

⁸ See Grullon, Michaely, and Swaminathan (forthcoming) for evidence of bond rating increases following dividend increases.

⁹ SDC provides information on the use of SEO proceeds for SEOs issued after 1984.

Because many firms have multiple bonds, treating the abnormal returns to individual bonds as independent sample points biases the standard errors downward because of the high correlation among bonds from the same firm. To avoid this bias, we construct a sample of “one” bond per firm using a value-weighted average of each of the firm’s bond returns each month (we do the same type of computation for the duration and bond rating). Using one bond per firm biases the standard error estimate upward because bonds from the same firm are not correlated perfectly. Despite this bias, all our long-term abnormal bond returns are highly significant.

Following Warga and Welch (1993), we estimate the expected return on a firm’s one bond each month as the return on a bond portfolio with the same (letter) rating and a duration within four years of the firm’s one bond duration. Though bond ratings are known to lag a firm’s true change in default risk [e.g., Wakeman (1981)], any potential lag works against our finding of positive abnormal bond returns because our sample firms’ debt ratios are decreasing on average, and their bond ratings are improving on average over the five-year period following the SEO issuance. If there are lags in the bond rating adjustments, it means that our matched-bond portfolios are riskier on average than our sample firms’ bonds (because our sample firms’ true bond ratings are higher than what their current ratings reflect). With relatively higher risk, our matched bonds should have a higher expected return, and this possibility works against finding the positive abnormal bond returns that we find. Thus, any adjustment lag in bond ratings causes a downward bias in our abnormal bond return measure. As a robustness check, we compute our sample firms’ abnormal bond returns using matched-bond portfolios with one rating above our sample firms’ bond ratings (the duration matching procedure is the same), and we find that their abnormal bond returns are higher.

For the expected stock returns, we present the results with the matched-stocks method as recommended by Lee (1997). Lyon, Barber, and Tsai (1999) discuss the biases in long-term abnormal return tests, and they recommend the single matched-stock method of computing expected returns. Therefore, as a check, we estimate the expected stock returns for our sample firms using the single matched-stock method. With this method, their abnormal stock returns are negative, large in magnitude, and have a statistical significance that is qualitatively the same as reported below with Lee’s (1997) method.

As already described, our abnormal bond return measure is based on portfolio benchmark returns. Lyon, Barber, and Tsai (1999) show how these types of abnormal return measures in event-time are subject to a skewness bias. When we use the bootstrapped skewness-adjusted *t*-statistic that they present, our sample firms’ abnormal bond returns remain significantly positive.

For the stocks and bonds, we compute the raw and expected buy-and-hold return over each event period (i.e., through the last month in the event period or the delisting month, whichever comes first), and the abnormal return is the difference. Buy-and-hold returns avoid the well-known problem with

cumulating arithmetic returns in long-term event-time studies [e.g., Conrad and Kaul (1993)]. The average (median) abnormal return is based on the cross-sectional average (median) of these differences, and the cross-sectional variance is used to construct the standard errors. We also estimate the abnormal returns with a one-year buy-and-hold strategy with rebalancing to equal weights after each subsequent year.

The abnormal firm return (AR_V) is a weighted average of the abnormal stock and bond return:

$$AR_V = \frac{D}{V}[R_D - E(R_D)] + \frac{S}{V}[R_S - E(R_S)] \quad (1)$$

where D is the market value of the firm's total interest-bearing debt (i.e., long-term debt + current portion of long-term debt + notes payable), S is the market value of the firm's stock, V is the firm value ($S + D$), and the expected returns are noted with the familiar expectation operator; S and D are measured as of the beginning of the SEO year. The market value of the firm's total debt is estimated by multiplying the book value of the total (interest-bearing) debt by a value-weighted average of the ratio of market price to book value of each of the firm's traded bonds.¹⁰

To test the EMH without having to use any particular model of expected stock or bond returns, we test the standard presumption that a firm's stocks are riskier than its bonds, and consequently its stocks should have higher raw returns than its bonds. We compute the event-time (buy-and-hold) raw returns on the stocks and on the bonds and test for significant differences.

The raw stock return distribution has positive skewness (e.g., 3.23 for the 60-month return), whereas the raw bond return distribution has virtually no skewness (e.g., -0.05 for 60-month return). The finance literature often emphasizes the median over the mean when a sample distribution is skewed. For example, many studies focus on median operating performance measures because of the skewness in these distributions [e.g., Loughran and Ritter (1997), Mikkelsen, Partch, and Shah (1997)]. Kothari and Warner (1997) also note how the use of nonparametric tests are a promising alternative to the traditional parametric tests (i.e., testing for significantly positive average abnormal returns) in long-term event-time tests.¹¹ Therefore, we focus on the median raw return difference for these tests (though we also present the average raw returns, and they bolster the median results).

As an additional test, we remove outliers until the difference in the skewness of the raw (60-month) stock and raw bond return distributions is minimized, and then compute the difference in the average and median raw

¹⁰ Most firms' short-term debt does not trade (i.e., notes payable), and this debt may be more accurately priced than the long-term debt. We find, however, qualitatively similar results if we assume that the notes payable portion of each firm's debt has no abnormal return.

¹¹ Harvey and Siddique (2000) show how conditional skewness can affect expected stock returns.

returns. This difference is minimized when the sample size is 154 SEOs; at this point, the skewness in the bond return distribution is -0.30 , and the stock return distribution skewness is -0.23 . We refer to this sample as the skewness-adjusted sample.

2.2 Abnormal and raw return tests in calendar-time

Fama (1998) and Mitchell and Stafford (2000) argue that the EMH can be incorrectly rejected, independent of the method of estimating expected returns, with the event-time return metric. For example, the event-time returns have a cross-sectional dependence problem that biases the standard error downward and, consequently, biases tests using this return metric toward an incorrect rejection of the EMH. On the other hand, Barber and Lyon (1997) show that calendar-time returns are biased predictors of buy-and-hold returns (i.e., the calendar-time returns do not precisely measure investor experience). Moreover, Lyon, Barber, and Tsai (1999) demonstrate that the calendar-time method is generally misspecified in random samples. Loughran and Ritter (2000) argue that the calendar-time return metric has low power.

Besides the debate over the use of event-time versus calendar-time returns, there is a debate regarding the use of value-weighted calendar-time returns versus equal-weighted calendar-time returns. Loughran and Ritter (2000), for example, argue that equal weighting is better because it does not obscure the mispricing that is more likely to occur with smaller firms (as value weighting does). On the other hand, EMN argue that value weighting is more appropriate because it more accurately gives the total wealth effects experienced by investors. As noted earlier, we conduct (equal-weighted and value-weighted) calendar-time return tests in addition to the event-time return tests.

With the calendar-time returns, we compute the cross-sectional average return each calendar month for all the sample firms within the 60-month period following their SEO issuance. We then regress these portfolio returns on the risk factors in the model of expected returns, and the intercept (i.e., α) is our measure of abnormal returns. We compute expected stock returns to our sample firms using the Fama and French, EMN, and BGG models; we compute their market-adjusted stock returns using the CRSP value-weighted index. For our measure of their abnormal bond returns, we use the Elton, Gruber, and Blake (1995; hereafter EGB) six-factor bond asset pricing model. We also compute the market-adjusted returns of our sample firms' bonds using the Lehman Corporate Bond Index. To correct for any heteroscedasticity, we present our results with the returns and factors standardized by the monthly (cross-sectional) standard deviations.¹² We also present the alphas without any standardization of the returns but with the standard errors corrected for heteroscedasticity and autocorrelation.

¹² Fama (1998) recommends standardization as a means of adjusting for any heteroscedasticity, and he mentions the Jaffe (1974) and Mandelker (1974) correction. With this method of correction, we find results similar to those presented later.

Because our results show that our sample firms' bonds overperform and their stocks underperform, we form a portfolio each month for which we go long their bonds and short their stocks. Then we regress this portfolio return on the (nonredundant) risk factors in the BGG and EGB models. A significantly positive alpha with this portfolio is consistent with bond overperformance and stock underperformance.¹³

For our raw return tests, the calendar-time return metric avoids the extreme skewness problem that exists with the event-time return metric because the calendar-time returns are not compounded. Therefore, we focus on the average returns with the calendar-time tests, but we also compute the median returns, and they are qualitatively similar (not surprising because there is much less of a skewness problem with this return metric).

To summarize the predictions of the EMH and wealth transfer hypotheses across the various tests: The EMH predicts that our sample firms' abnormal stock, bond, and firm returns should be insignificantly different from zero. Moreover, the EMH predicts that their raw stock returns should be significantly greater than their raw bond returns. The EMH also predicts that their long bond/short stock portfolio has an insignificant alpha. The (partial and pure) wealth transfer hypothesis predicts positive abnormal bond returns and negative abnormal stock returns (so any result where our sample firms' raw stock returns are not significantly higher than their raw bond returns is consistent with this hypothesis). The pure wealth transfer hypothesis predicts insignificant abnormal firm returns, whereas the partial wealth transfer hypothesis predicts significantly negative abnormal firm returns.

2.3 Cross-section regression tests

As an additional test of the pure versus partial wealth transfer hypothesis, we estimate the following cross-section regression:

$$AR_S = \alpha + \beta[AR_D] + \varepsilon \quad (2)$$

where AR_D is the abnormal dollar return to the bondholders, and AR_S is the abnormal dollar return to the shareholders. The null for the pure wealth transfer hypothesis is that $\alpha = 0$ and $\beta = -1$ jointly (that is, each dollar wealth loss to shareholders is a wealth gain to bondholders). The null for the partial wealth transfer hypothesis is that the abnormal gains to bondholders do not explain fully the abnormal losses to shareholders. Hence, a significantly negative coefficient estimate for both α and β is consistent with this hypothesis.¹⁴

¹³ We thank one of the referees for suggesting this test.

¹⁴ The likely change in other factors following an SEO does not change the fact that bondholders benefit from the leverage decrease due to the SEO. For example, an unexpected increase in market volatility may cause an unexpected increase in the volatility of the firm's rate of return, and this change benefits shareholders at the expense of bondholders, *ceteris paribus*. Nevertheless, the bondholders are still better off than they would be without the debt ratio decrease subsequent to the SEO. Thus, random changes in other factors do not change the wealth transfer hypothesis prediction that SEOs benefit bondholders at the expense of shareholders, *ceteris paribus*.

We estimate this cross-section regression in a simultaneous system of equations where each event period's abnormal returns (e.g., 1-month, 3-month . . . 60-month) are treated as a separate equation.¹⁵ To appeal to the *ceteris paribus* conditions called for in the wealth transfer hypothesis, we focus on our subsample of 73 SEOs for which the proceeds are used to repurchase the firm's debt (i.e., pure capital structure change). The standard errors are adjusted for heteroscedasticity and dependence across equations.

3. Empirical Results

3.1 Abnormal and raw return tests in event-time

The performance of our sample firms' stocks following their SEOs is shown in panel A of Table 3. As with previous studies [e.g., Spiess and Affleck-Graves (1995)], the abnormal stock returns to our SEOs are small and can even be positive in the first month or so. After this period, their average and median abnormal stock returns are negative in every month and decline continuously. As of the 60th month, their abnormal stock returns are large in magnitude with a median of -25.96% and a mean abnormal stock return of -22.65% (both measures are significant at the 5% level or better).

Panel B of Table 3 shows our sample firms' abnormal bond returns over each event period. As with their abnormal stock returns, their abnormal bond returns are small initially but begin to rise consistently in magnitude afterward. Their abnormal bond returns are always positive and significant from the third month on. For the 60-month period, their median and average abnormal bond returns are 12.84% and 16.01% and are significant at the 1% level.

For the (total) firm value, the abnormal returns to our SEOs are presented in panel C of Table 3. Their average and median abnormal firm returns are higher than their abnormal stock returns in every period. As of the 60th month, their average abnormal return is -6.49% . Although their mean abnormal return is insignificant, their median abnormal return is a highly significant -8.94% . Figure 1 shows the median abnormal bond returns, abnormal stock returns, and the abnormal firm returns to our sample firms over the 60-month period. Their abnormal bond returns almost mirror their abnormal stock returns, such that their abnormal firm returns are closer to the horizontal axis than their abnormal stock returns. This result is consistent with the partial wealth transfer hypothesis because it suggests that much (though not all) of the shareholder wealth loss represents a wealth transfer to bondholders. The negative abnormal firm returns to our SEOs are also consistent with the argument that the typical sample firm, not just the stock, is overvalued as of their SEO issuance month. Their firm overvaluation is not as great as their stock overvaluation (i.e., the negative abnormal stock returns

¹⁵ We also present the results using percentage returns given the large variation in our sample firms' market capitalizations.

Table 3
Abnormal stock, bond, and firm returns in event-time

Months	Panel A Abnormal stock returns (%)		Panel B Abnormal bond returns (%)		Panel C Abnormal firm returns (%)	
	Median	Mean	Median	Mean	Median	Mean
1	-0.51 (0.47)	-0.18 (0.82)	-0.02 (0.77)	0.90 (0.05)	-0.34 (0.96)	0.37 (0.60)
3	0.03 (1.00)	0.52 (0.70)	0.34 (0.10)	0.89 (0.06)	0.00 (0.90)	0.39 (0.74)
6	-2.50 (0.15)	-1.72 (0.94)	0.35 (0.00)	1.91 (0.00)	-0.97 (0.25)	-0.47 (0.78)
12	-4.41 (0.06)	-8.84 (0.77)	0.60 (0.00)	3.25 (0.00)	-1.81 (0.18)	-0.26 (0.92)
24	-13.83 (0.00)	-13.27 (0.01)	3.15 (0.00)	5.45 (0.00)	-6.68 (0.00)	-6.13 (0.07)
36	-16.21 (0.00)	-18.28 (0.00)	6.06 (0.00)	8.59 (0.00)	-7.14 (0.00)	-9.29 (0.03)
48	-20.14 (0.00)	-22.63 (0.00)	9.37 (0.00)	10.78 (0.00)	-12.28 (0.00)	-10.65 (0.04)
60	-25.96 (0.00)	-22.65 (0.03)	12.84 (0.00)	16.01 (0.00)	-8.94 (0.00)	-6.49 (0.33)

Buy-and-hold returns in excess of a benchmark are computed in percentages as

$$\left(\left[\prod_{t=1}^T (1 + R_{it}) \right] - \left[\prod_{t=1}^T (1 + E(R_{it})) \right] \right) \times 100$$

where T is the holding period or the delisting month (whichever comes first), R_{it} is the return on the security in the t th month following the seasoned equity offering (SEO), and $E(R_{it})$ is the expected return on the security in the t th month following the SEO. For stocks, the expected return is an equally weighted average of five firms' stocks that have the lowest sum of the absolute percentage differences between the sizes and book-to-market ratios (as of the beginning of the SEO year) of the issuing firm and the matched stocks. If the matched stock is delisted, the remaining months are filled in with the CRSP value-weighted index. For bonds, the expected return is the return of a portfolio of bonds with the same rating and closest duration to the firm's bond (if a firm has more than one bond, we use the value-weighted average of its bond returns, durations, and ratings each month). The abnormal firm return is a weighted average of the firm's abnormal stock and bond returns (where the weights are the firm's equity and debt ratio as of the SEO issuance). The average (median) abnormal return is based on the cross-sectional average (median) of these differences, and the cross-sectional variance is used to construct the standard errors. Mean abnormal returns are judged by t -tests, and median abnormal returns by the signed ranks tests. p -values are in parentheses.

are attributable partly to the abnormal firm value decline and partly to the wealth transfer), but the significance of their negative long-term abnormal firm returns are consistent the market's delayed reaction to managerial timing [e.g., Loughran and Ritter (2000)]. That is, the market does not account fully for their firm overvaluation (revealed by the managers' decision to issue the SEO) as of their SEO issuance.

As noted earlier, we also estimate our sample firms' abnormal stock and bond returns using a one-year buy-and-hold strategy with rebalancing to equal weights after each subsequent year. When we rebalance each year out to five years, their average abnormal stock return is -22.40% (median = -25.09%), both significant at the 1% level. Their average and median abnormal bond returns are 14.07% and 11.70%, both significant at the 1% level.

Our SEO firms' raw stock and bond returns in event-time are shown in Table 4. Their average and median raw bond returns are consistently higher than their average and median raw stock returns for the sixth month period

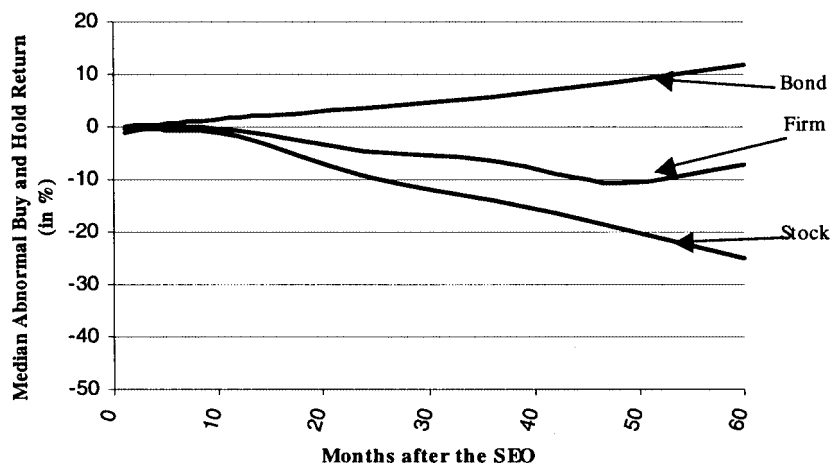


Figure 1
Abnormal stock, bond, and firm returns following SEOs

and beyond; the difference in the median returns is significant from month 12 through month 60 (also see Figure 2). Their average raw bond returns are not always significantly higher than their average raw stock returns from month 12 through month 60, but recall that we should be finding that their raw stock returns are significantly higher than their raw bond returns if the EMH holds, and this result never occurs. Following each SEO issuance, the average annual return on the CRSP value-weighted index is 10.73%, whereas the average annual return on the Lehman Corporate Bond Index is 7.57%. Therefore, our results do not appear to be the consequence of event periods where bonds do better than stocks.

Finally, as noted earlier, there exists significant positive skewness in our sample firms' raw stock return distribution, and this skewness distorts the average. With the skewness-adjusted sample, we find that the average and median raw bond return to our SEO firms is consistently higher than their average and median raw stock return with every period, as shown in the last two columns of Table 4. Their average and median differences (i.e., *DIFF*) are also significant from month 6 and beyond. In short, the skewness problem in the raw stock returns works against finding the kind of strong results we find against the EMH. When we correct for the skewness problem with the skewness-adjusted sample, the results only get stronger.

3.2 Calendar-time test results

Table 5 shows our calendar-time test results. To present our broad range of results as succinctly as possible, we do not present the factor loadings. These loadings, however, are generally similar in size, sign, and significance to those reported in previous studies and are available on request.

Table 4
Raw stock and bond returns in event-time

Months	Raw stock return (%)		Raw bond return (%)		Median DIFF (%)	Mean DIFF (%)	Skewness- adjusted median DIFF (%)	Skewness- adjusted mean DIFF (%)
	Median	Mean	Median	Mean				
1	1.20	1.95	1.04	1.72	0.54 (0.77)	-0.22 (0.83)	-0.01 (0.86)	-0.58 (0.63)
3	3.67	4.40	2.62	3.13	0.51 (0.88)	1.27 (0.43)	-0.14 (0.88)	-0.40 (0.79)
6	1.68	6.32	6.17	6.75	-4.04 (0.24)	-0.44 (0.85)	-4.18 (0.07)	-3.63 (0.10)
12	3.49	10.35	11.76	12.30	-7.45 (0.01)	-1.95 (0.55)	-11.53 (0.00)	-8.54 (0.00)
24	8.30	17.60	24.64	25.61	-15.18 (0.00)	-8.01 (0.07)	-23.03 (0.00)	-19.58 (0.00)
36	19.70	30.01	39.94	41.29	-15.30 (0.00)	-11.28 (0.03)	-28.60 (0.00)	-29.21 (0.00)
48	25.23	46.93	51.47	53.59	-20.32 (0.01)	-6.66 (0.39)	-33.71 (0.00)	-36.34 (0.00)
60	40.54	65.11	62.47	66.91	-16.85 (0.01)	-1.80 (0.85)	-37.40 (0.00)	-42.99 (0.00)

With the event-time tests, we compute the buy-and-hold raw returns on the stocks and bonds, and test for significant differences:

$$DIFF_{it} = \left(\prod_{t=1}^T [1 + R_{RAWSTK_{it}}] - \prod_{t=1}^T [1 + R_{RAWBOND_{it}}] \right) \times 100$$

where $R_{RAWSTK_{it}}$ is the raw stock return for firm i in period t , and $R_{RAWBOND_{it}}$ is the raw bond return for firm i in period t . The raw stock and bond returns reported are buy-and-hold returns. The cross-sectional variance is used to construct the standard errors. The raw stock return distribution has significantly positive skewness (3.23 for the 60-month return). Therefore, we focus on the difference in the median raw return. As an additional test, we remove outliers until the difference in the skewness of the (60-month) raw stock and raw bond return distributions is minimized and then compute the difference in the average (and median) raw returns. This difference is minimized when the sample size is 154 seasoned equity offerings (SEOs); at this point, the skewness in the bond return distribution is -0.30, and the stock return distribution skewness is -0.23. We refer to this sample as the skewness-adjusted sample. The significance levels for median of the difference between stock and bond returns are constructed using the signed ranks test. We do not perform significance tests for the raw stock and bond returns. p -values are in parentheses.

Panels A through D show the abnormal returns to our sample firms. We first discuss their abnormal stock and bond returns (i.e., the alphas). Their standardized returns are shown in panels A and B; with equal-weighting (panel A), and value-weighting (panel B), their abnormal stock returns are significantly negative with every model (i.e., Fama and French, BGG, EMN, and market-adjusted). Moreover, their abnormal bond returns are significantly positive with every model (i.e., the EGB model and market-adjusted). With their unstandardized returns in panels C and D, the sign and significance levels of their abnormal stock and bond returns are virtually the same as in panels A and B. The only difference is that their stock alpha is insignificant with the Fama and French model using value-weighted returns (panel D).

Why do we find significantly negative abnormal stock returns even with the BGG and EMN models? One reason may be that our sample composition (i.e., the firms must have traded debt) differs from BGG and EMN. As noted earlier, however, our requirement that the firms have traded debt tilts our

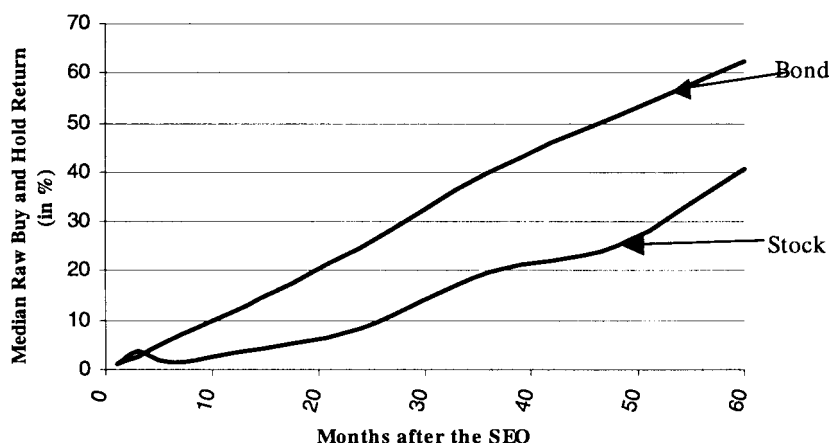


Figure 2
Raw bond and stock returns following SEOs

sample toward larger firms, and this should work against finding significant long-term abnormal stock or bond returns.

To check if our results are somehow unique to our sample of firms with publicly traded bonds, we estimate the abnormal stock returns for the full sample of 1368 SEOs (including but not limited to those with publicly traded debt) using the Fama and French, EMN, and BGG models. With each model, the standardized equal-weighted returns, unstandardized equal-weighted returns, and standardized value-weighted returns have significantly

Table 5
Abnormal and raw returns computed in calendar-time tests (all alphas [i.e., abnormal returns] and raw returns are expressed in percent)

Security and model	A Equal-weighted returns (standardized)	B Value-weighted returns (standardized)	C Equal-weighted returns (unstandardized)	D Value-weighted returns (unstandardized)
AR_S using FF model	-0.81 (0.01)	-0.90 (0.00)	-0.50 (0.09)	-0.24 (0.51)
AR_S using BGG	-0.82 (0.01)	-0.97 (0.00)	-0.57 (0.00)	-0.47 (0.05)
AR_S using EMN	-1.74 (0.00)	-1.16 (0.01)	-2.08 (0.00)	-1.42 (0.01)
Mkt-adjusted stock returns	-0.36 (0.00)	-0.55 (0.03)	-0.22 (0.03)	-0.19 (0.09)
Mkt-adjusted bond returns	1.09 (0.00)	1.57 (0.00)	0.46 (0.00)	0.67 (0.00)
AR_B using EGB	1.28 (0.00)	1.03 (0.00)	0.17 (0.07)	0.22 (0.05)
Raw stock	0.86 (0.00)	2.70 (0.00)	0.99 (0.00)	1.04 (0.00)

Table 5
(continued)

Security and model	A Equal-weighted returns (standardized)	B Value-weighted returns (standardized)	C Equal-weighted returns (unstandardized)	D Value-weighted returns (unstandardized)
Raw bond	1.66 (0.00)	2.15 (0.00)	1.07 (0.00)	0.91 (0.00)
Long bond	-0.67 (0.31)	1.27 (0.02)	0.57 (0.01)	0.79 (0.00)
short stock				

This table presents the raw and abnormal returns for the sample of 189 SEOs issued during the January 1980 to December 1992 period using a calendar-time return metric. The stock and bond returns cover the period January 1980 to December 1997. As explained, the Fama-French (1993; FF), Brav-Gezcy-Gompers (2000; BGG), Eckbo-Masulis-Norli (2000; EMN), and Elton-Gruber-Blake (1995; EGB) alphas represent the intercepts (abnormal returns) obtained from a time-series regression of a portfolio of stock or bond returns (net of the risk-free rate) on systematic factors:

$$FF: R_{Stockpt} - R_{ft} = \alpha + b(R_{mt} - R_{ft}) + sSMB_t + hHML_t + \varepsilon_{pt},$$

$$BGG: R_{Stockpt} - R_{ft} = \alpha + b(R_{mt} - R_{ft}) + sSMB_t + hHML_t + pPR12_t + \varepsilon_{pt},$$

$$EMN: R_{Stockpt} - R_{ft} = \alpha + \beta_1(R_{mt} - R_{ft}) + \beta_2(\Delta RPC_t) + \beta_3(Baa - Aaa)_t \\ + \beta_4(UI_t) + \beta_5(20y - 1y)_t + \beta_6(TBILLSpr_t) + \varepsilon_{pt},$$

$$EGB: R_{Bondpt} - R_{ft} = \alpha + \beta_1(UnxGDP_t) + \beta_2(UnxCPI_t) + \beta_3(DefaultRP_t) \\ + \beta_4(BondMktRet_t) + \beta_5(R_{mt}) + \beta_6(Term_t) + \varepsilon_{pt},$$

where $R_{Stockpt}$ is the average raw return for stocks in calendar month t (where a sample stock is included if month t is within the 60-month period following its SEO), R_{ft} is the one-month Treasury bill return, R_{mt} is the CRSP value-weighted market index return, SMB_t is the return on a portfolio of small stocks minus the return on a portfolio of large stocks, HML_t is the return on a portfolio of stocks with high book-to-market ratios minus the return on a portfolio of stocks with low book-to-market ratios. We follow the procedures explained in Fama and French (1993) for forming the SMB and HML factors. For the EMN model, ΔRPC is the percent change in the real per capita consumption of nondurable goods, $Baa - Aaa$ is the difference in the monthly yield changes on bonds rated Baa and Aaa by Moody's, UI is unanticipated inflation, $(20y - 1y)$ is the return difference between Treasury bonds with 20 years to maturity and 1 year to maturity, and $TBILLSpr$ is the return difference between 90-day and 30-day Treasury bills. We estimate each factor (e.g., the use of factor mimicking portfolios) following the procedures discussed in EMN. For the BGG model, $PR12$ is the return on high-momentum stocks minus the return on low-momentum stocks as discussed in Carhart (1997). BGG also estimate the model with HML^* , which is the book-to-market factor excluding NYSE stocks [because of Loughran's (1997) finding that the book-to-market factor is concentrated in Nasdaq and AMEX stocks]. Even without this adjustment, however, they fail to reject the null of efficiency in many cases. For the EGB model, R_{Bondpt} is the average raw bond return for month t (i.e., the cross-sectional average of each firm's one bond return; where a sample firm is included if month t is within the 60-month period following its SEO), $UnxGDP$ is the unexpected change in gross domestic product, $UnxCPI$ is the unexpected change in the consumer price index, $DefaultRP$ is the default risk premium, $BondMktRet$ is the return on the Lehman Corporate Bond Index, and $Term$ is the slope of the term structure. We follow the estimation procedures discussed in EGB for the estimation of each factor. The alpha for the portfolio of long bond and short stock is obtained by a time-series regression of the difference on a composite factor model:

$$R_{Bondpt} - R_{Stockpt} = \alpha + b(R_{mt} - R_{ft}) + sSMB_t + hHML_t + pPR12_t + \beta_1(UnxGDP_t) \\ + \beta_2(UnxCPI_t) + \beta_3(DefaultRP_t) + \beta_4(BondMktRet_t) + \beta_6(Term_t) + \varepsilon_{pt}.$$

In panels A and B, we standardize all the returns and risk factors each month by the cross-sectional standard deviation of all the returns in the portfolio each month (the standardized alphas discussed later have been multiplied by the average standard deviation for comparison purposes). In panels C and D, we do not standardize the returns, but we correct the standard errors for heteroscedasticity and autocorrelation. The market-adjusted stock return is computed in excess of the value-weighted CRSP index return, and the market-adjusted bond return is computed in excess of the Lehman Corporate Bond Index return. We compute these market-adjusted returns and the raw returns as single portfolios using standardized and unstandardized returns. AR_S is the abnormal stock return (i.e., alpha), and AR_B is the abnormal bond return (again, alpha). The second lines (in parentheses) represent the p -values.

negative alphas (except for the standardized value-weighted returns with the Fama and French model). The alphas are consistently insignificant only with the unstandardized value-weighted returns. The results are available on request.

The results noted above suggest that the significantly negative abnormal stock returns we find using the EMN and BGG models do not appear to be an

artifact of the requirement that our firms have traded debt. As already noted, our sample period differs from BGG and EMN, so we should not expect to replicate perfectly their findings. Nevertheless, we should not find significant abnormal returns if markets are efficient, and the EMN and BGG models are applicable to different samples. So EMN and BGG do not appear to have resolved fully the EMH controversy in this area because we find significant abnormal stock returns using their models with a different sample.

The raw return tests in Table 5 show that our SEO firms' equal-weighted standardized (panel A), and unstandardized (panel C) raw bond returns are higher than their raw stock returns; though not shown in the table, the difference in their standardized returns is significant. With the standardized and unstandardized value-weighted returns (panels B and D), their raw stock returns are higher than their raw bond returns, but not significantly so. Again, recall that we should find that our raw stock returns are significantly higher than our raw bond returns if the EMH holds. During our 18-year sample period, the average monthly return on the CRSP value-weighted index is 1.35%, whereas the average monthly return on the Lehman Corporate Bond Index is a significantly lower 0.57%. Hence, our results are not attributable to some unusual calendar-time period where bonds do better than stocks.

As a further test, we examine the raw stock and bond returns to firms that do not conduct an SEO during our sample period (and have traded stocks and bonds). With this sample, the raw stock returns are significantly greater than the raw bond returns with all four methods presented in Panels A through D of Table 5 (i.e., standardized equal-weighted returns, standardized value-weighted returns, unstandardized equal-weighted returns, unstandardized value-weighted returns; the results are not shown but are available on request). In short, the non-SEO firms' raw stock and bond returns are consistent with what we would expect under the EMH; our SEO firms' raw stock and bond returns are invariably different.

The difference between our SEO firms' raw stock and bond returns can be thought of as the unconditional return to a portfolio where we go long their bonds and short their stocks. In the last row of Table 5, we show the abnormal returns to this portfolio using a model of expected returns that combines the (nonredundant) factors in the BGG stock model and the EGB bond model. In three out of four cases (panels B through D), the alpha is significantly positive; with the other case, the alpha is insignificant (panel A). These findings are consistent with all our previous findings of positive abnormal returns to SEO firms' bonds and negative abnormal returns to their stocks.

Finally, the cross-section regression results are shown in Table 6. With the dollar and percentage abnormal returns, the intercept is significantly negative, suggesting that our sample firms' shareholders lose even when their bondholders do not gain, so we reject the null of a pure wealth transfer (i.e., $\alpha = 0$ and $\beta = -1$). The significantly negative slope coefficient estimates, however, are consistent with a partial wealth transfer effect.

Table 6

Cross-section regressions of abnormal stock returns on abnormal bond returns with sample of seasoned equity offerings (SEOs) where the SEO proceeds are used to change capital structure

Measurement	α	β	Wald for $\alpha = 0$	Wald for $\beta = -1$	Wald for $\alpha = 0$ and $\beta = -1$
Abnormal percentage returns	-0.05 (0.00)	-0.49 (0.00)	20.64 (0.00)	22.74 (0.00)	35.99 (0.00)
Abnormal dollar returns	-88,337.20 (0.00)	-1.12 (0.00)	34.42 (0.00)	1.02 (0.31)	36.37 (0.00)

We estimate the cross-section regressions in a simultaneous system of equations using the following equations:

$$AR_{Si1} = \alpha + \beta AR_{Di1} + \varepsilon_{i1}$$

$$AR_{Si3} = \alpha + \beta AR_{Di3} + \varepsilon_{i3}$$

$$\vdots$$

$$AR_{Si48} = \alpha + \beta AR_{Di48} + \varepsilon_{i48}$$

$$AR_{Si60} = \alpha + \beta AR_{Di60} + \varepsilon_{i60}$$

where AR_{Di1} is the abnormal return to firm i 's bondholders in the first month following the SEO, and AR_{Si1} is the abnormal return to firm i 's shareholders in the first month. The remaining equations show the abnormal returns for the third month following the SEO, and so on. We estimate the results using abnormal percentage returns and using abnormal dollar returns. In the presence of a pure wealth transfer effect from stockholders to bondholders, $\alpha = 0$ and $\beta = -1$. Therefore, we estimate Wald tests of these hypotheses independently as well as jointly. The standard errors are adjusted for cross-section heteroscedasticity and dependence across equations. p -values are in parentheses.

4. Summary and Conclusions

Why does it take the stock market so long to incorporate the information in SEO issuances? Recent studies by EMN and BGG argue that the long-term underperformance of stocks following SEOs [as documented in Loughran and Ritter (2000), among other studies] is attributable to bad models of expected stock returns, not market inefficiency. With their respective models of expected stock returns, EMN and BGG show that long-term abnormal stock returns following SEOs are insignificantly different from zero. Loughran and Ritter (2000), however, argue that many models, such as the BGG model (and by implication the EMN model), do not provide true tests of the EMH.

In short, there is an important debate surrounding tests of the EMH in this area, and the primary point of contention is the appropriate model of expected stock returns. We avoid the bad-model problem for stocks by examining long-term abnormal bond returns for our sample of SEOs. We find evidence of a five-year delayed (positive) response in their bond returns following their SEO issuances. Though our abnormal bond return results do depend on models of expected bond returns, there is less controversy regarding expected bond returns relative to the debate regarding expected stock returns. Moreover, we find that our sample firms' raw bond returns are generally *greater* than their raw stock returns. This finding is inconsistent with the standard

presumption that a firm's stocks are riskier than its bonds and, consequently, should have significantly higher returns if the stock and bond markets are efficient (none of our results show that our sample firms' raw stock returns are significantly higher than their raw bond returns). Most important, this finding does not depend on any particular model of expected stock or bond returns. These results against the EMH are robust across alternative methods posited in the literature (i.e., event-time returns, calendar-time returns, equal-weighted returns, value-weighted returns). We also find significantly negative abnormal stock returns to our sample firms using the BGG and EMN models. So even the most recently proposed models of expected stock returns do not drive our sample firms' abnormal stock returns to insignificance. In summary, we provide evidence against the EMH that avoids the bad-model problem or directly addresses it.

Finally, an SEO should benefit a firm's bondholders at the expense of its shareholders, *ceteris paribus*, because an SEO reduces the firm's default risk. We focus on whether there are wealth transfer effects with the long-term returns because we find evidence of a five-year delayed response to SEOs in the stock and bond markets. The results cited on the long-term abnormal (and raw) stock and bond returns support the wealth transfer hypothesis, in addition to providing evidence against the EMH. We combine each firm's abnormal stock and bond returns to compute their abnormal firm returns. The significantly negative abnormal firm returns that we report are consistent with a partial wealth transfer effect. We also find support for a partial wealth transfer effect when we examine the relation between the abnormal stock and bond returns to our sample firms. Hence, part of the long-term wealth loss to shareholders following SEOs represents a wealth transfer to bondholders, but the overall firm value still appears to be overvalued as of the SEO issuance month.

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