# Pure Leverage Decreases: A Study of Two Junior-for-Senior Groups

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**Abstract**

*We examine 971 pure leverage decreases consisting of junior-for-senior transactions. This sample--which is unique in size and in the variety of junior and senior forms of borrowing that are included--enables us to extend the junior-for-senior research by testing for a wealth effect linked to adverse selection theory. This theory argues that the market penalizes firms when more junior claims are increased over more senior claims. Consistent with this theory, we find that common-for-nonconvertible debt transactions have significantly more negative announcement period returns than other less extreme junior-for-senior transactions. Regression tests further support an adverse selection effect by indicating that an observation's location within the common-for-nonconvertible debt group is a key explanatory variable in accounting for stock price behavior. In support of an adverse selection interpretation, we cannot link the significance of this variable to signaling effects premised on changes in fractional insider shareholdings or in relative debt levels.*

## INTRODUCTION

A "pure" leverage decrease, such as a junior-for-senior transaction, alters the firm's capital structure mix without directly modifying the asset structure. The mix is altered such that the new issue is junior--in terms of claims on cash flows--compared to the form of borrowing being retired. The junior claim is characterized by being more residual in nature and carrying less legal power to exact payment. Researchers find significant negative stock returns for firms announcing junior-for-senior transactions.[1] They generally conclude that the negative returns are best accounted for by signaling theory [e.g., Fama (1985), Leland and Pyle (1977), and Ross (1977)] premised on information asymmetry between insiders and outsiders.

In this paper, we extend the junior-for-senior research by testing for an adverse selection wealth effect. We begin by gathering a sample unique in size (n=971) and in the diversity of junior-for-senior transactions that are contained. For example, our transactions consist of both cash and noncash offerings and include five major forms of borrowing. We rank the forms of borrowing according to their priority of claims on cash flows. Based upon this ranking system, we are able to form two groups of junior-for-senior transactions. The first group consists entirely of the common-for-nonconvertible debt transactions. The second group encompasses the other junior-for-senior transactions. For this latter group, at least one form of borrowing being exchanged lies (in terms of claims on assets) between common stock and nonconvertible debt. These two groups enable us to test for a wealth effect predicted by adverse selection theory based in Myers (1984) and Myers and Majluf (1984).[2] This theory argues that the market penalizes a firm to the extent a more junior form of borrowing is chosen over a more senior form of borrowing. Consequently, common-for-nonconvertible debt transactions are predicted to have more negative stock returns than other less extreme junior-for-senior transactions.

Consistent with adverse selection theory, we find that the common-for-nonconvertible debt group has announcement period returns that are significantly more negative than the other junior-for-senior group. However, there are potential sample biases that may explain at least part of the difference in returns between groups. When we correct for these possible biases, support for our hypothesis (although somewhat weakened)

remains statistically significant. Regression tests also support adverse selection theory as we find that a simple dummy variable associated with an observation's location within the common-for-nonconvertible debt group is a key explanatory variable. In further support for adverse selection theory, we are unable to link the significance of this dummy variable to predictions premised on changes in proportional insider ownerships or in relative debt levels. We conclude that the forms of borrowing that are issued and retired convey information beyond that suggested by various mainline signaling theories.

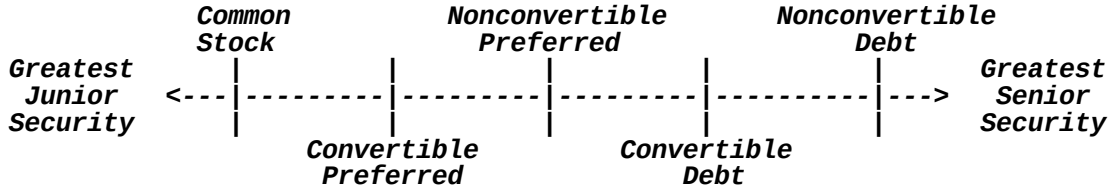
## DATA

We identify junior-for-senior announcements for the period between 1970 and 1989 from two primary sources: the *Investment Dealers' Digest* and *The Wall Street Journal*. Besides the latter two sources, we rely on the following sources to obtain descriptive data: *Compustat Annual Files*, *Moody's Industrial Manuals*, proxy statements, and the CRSP NASDAQ and CRSP NYSE/AMEX daily price and return files.

We obtain a working sample of 971 observations after requiring each observation to satisfy the following four screens.[3]

1. Each must be a security offering where the stated purpose is to reduce a form of borrowing that is senior to that being issued.
2. Each must be listed on the CRSP NASDAQ Return File or CRSP NYSE/AMEX Return File and have trading data to calculate its cumulative excess return (as described later).
3. Each must not be identified as a utility (since the announcement by a utility is typically known in advance).
4. Each must have a value between 0.5 and 100 percent when dividing its planned offering value by its equity value. (Equity value is the market value of common stock plus the liquidation value of preferred stock).[4]

Our pure leverage decrease sample includes five major forms of borrowing which can be ranked--in terms of priority of claims--by using the following continuum:




Using this continuum, we divide (for purposes of testing adverse selection theory) our sample into two junior-for-senior groups based upon the rankings of the junior and senior forms of borrowing for each transaction.

In our first group, we include 725 transactions that involve the two forms of borrowing located at the beginning and end of the continuum: common stock and nonconvertible debt. Thus, this first group comprises all of the common-for-nonconvertible debt transactions. Because this group simultaneously involves the greatest junior form and greatest senior form, we refer to it as the "greatest" group. Adverse selection theorists, such as Myers and Majluf (1984), predict that this group will be greeted by a more negative return than other junior-for-senior transactions since the market penalizes firms when more junior claims are increased over more senior claims. The Leland and Pyle (1977) and Ross (1977) signaling models have a similar prediction but for different reasons. Leland and Pyle (1977) suggest that "greatest" transactions signal greater negative news because these 725 transactions (relative to the remaining 246 transactions) are more likely to enable insiders to achieve lower residual ownership proportions. Ross (1977) argues that "greatest" transactions convey more negative information because managers of these firms are more apt to be lowering their relative debt levels.

In our second group, we assign the remaining 246 junior-for-senior transactions. For these transactions, at least one of the forms of financing is ranked between common stock and nonconvertible debt. We refer to this group as the

"least" group. This group makes up eight classes of junior-for-senior transactions which are given below.[5]

27 common-for-convertible debt
6 common-for-nonconvertible preferred
6 common-for-convertible preferred
71 convertible preferred-for-nonconvertible debt
7 convertible preferred-for-convertible debt
26 nonconvertible preferred-for-nonconvertible debt
4 nonconvertible preferred-for-convertible debt
99 convertible debt-for-nonconvertible debt

From the above eight classes, we see that the "least" group contains only 39 (27+6+6) offerings where the net amount of common stock is being immediately increased, and 135 (27+71+7+26+4) where the net amount of debt is being immediately decreased. Thus, given the predictions of the Leland and Pyle (1977) and Ross (1977) signaling models, there is less likelihood that managers of firms in the "least" group can use transactions to signal negative news predicated on decreases either in fractional residual shareholdings or in debt levels.

In Table 1, we report descriptive data for the total sample and the two groups. Panel A reveals that our sample, like the sample of Hull and Moellenberndt (1994), is characterized by the inclusion of combination offerings, bank debt reductions, over-the-counter (OTC) firms, and private swaps.[6] Descriptive statistics for these four characteristics are reported since, as indicated by comparing the "greatest" group and "least" group columns, there is an unequal distribution of these characteristics between the two groups. Unless corrected, this may cause problems for tests that compare announcement period returns between the two groups.[7]

In Panel B, we give a time profile. This profile shows that observations for both groups are more prevalent for the 1982-1985 time period. The larger number of observations for these years is caused by tax legislation which encouraged private swaps between August 1981 and July 1984. The presence of relatively more private swaps for the "greatest" group explains why this group has 45 percent of its observations during this period compared to 33 percent for the "least" group.

Panel C reports statistics (mean, median, maximum, minimum, and standard deviation) for seven descriptive variables: firm value, planned offering value, and five relative size variables. The latter five variables are defined below.

PCE is the planned value of primary offering divided by equity value.
SHR is the planned percentage change in outstanding common shares.
SEN is the par value of the planned senior reduction divided by firm value.
LEV is the par value of the planned net reduction in debt divided by firm value.
PCH is the planned percentage of total common shares expected to be owned by insiders after the announcement divided by their percentage of total common shares owned before the offering.

As will be seen later, relative size variables are crucial for our regression tests when discriminating between support for an adverse selection effect and various signaling effects. These five particular variables represent the variety of relative size variables reported previously [e.g., Cornett and Travlos (1989), Finnerty (1985), and Hull and Moellenberndt (1994)]. Similar to others who have analyzed combinations offerings [e.g., Hull and Moellenberndt (1994) and Masulis and Korwar (1986)], the secondary offering component (since it does not impact the capital structure) is excluded when figuring values for relative size variables. Like Cornett and Travlos (1989), we calculate values for PCH under the assumption that insiders do not participate in the primary common stock offering.

**TABLE 1. Descriptive Data for 971 Junior-for-Senior Transactions, 1970-1989**

| Descriptive Data | *Total Sample* (n=971) | *"Greatest" Group*[a] (n=725) | "Least Group"[a] (n=246) |
|---|---|---|---|
| Panel A. Sample Characteristics | | | |
| Combination Offerings | 138 (14%)[b] | 131 (18%)[b] | 7 (3%)[b] |
| Primary Offering | 833 (86%) | 594 (82%) | 239 (97%) |
| Bank Debt Reductions | 300 (31%) | 240 (33%) | 60 (24%) |
| Nonbank Debt Reductions | 671 (69%) | 485 (67%) | 186 (76%) |
| OTC Listing | 212 (22%) | 179 (25%) | 33 (13%) |
| NYSE/AMEX Listing | 759 (78%) | 546 (75%) | 213 (87%) |
| Private Swaps | 222 (23%) | 192 (26%) | 30 (12%) |
| Non-Private Swaps | 749 (77%) | 533 (74%) | 216 (88%) |
| Panel B. Time Profile | | | |
| 1970 through 1973 | 145 (15%)[b] | 98 (14%)[b] | 47 (19%)[b] |
| 1974 through 1977 | 97 (10%) | 68 (9%) | 29 (12%) |
| 1978 through 1981 | 274 (28%) | 197 (27%) | 77 (31%) |
| 1982 through 1985 | 406 (42%) | 326 (45%) | 80 (33%) |
| 1986 through 1989 | 49 (5%) | 36 (5%) | 13 (5%) |
| Panel C. Descriptive Variables | | | |
| Firm Value[c] | 1440;358[d] | 1497;329[d] | 1271;455[d] |
| | 31658;4.4;3069 | 31658;5.7;3291 | 15559;4.4;2289 |
| Planned Offering Value[e] | 40;19 | 40;17 | 41;24 |
| | 1209;0.2;79 | 1209;0.2;85 | 597;0.4;56 |
| PCE[f] | 14.7;11.3 | 14.1;11.1 | 16.6;12.2 |
| | 95.2;0.5;13.8 | 95.2;0.5;13.2 | 78.3;0.5;15.4 |
| SHR[g] | 11.3;7.2 | 14.5;11.3 | 2.0;0.0 |
| | 96.6;0.0;13.3 | 96.6;0.5;13.4 | 52.9;0.0;7.5 |
| SEN[h] | -8.7;-6.6 | -8.5;-6.3 | -9.3;-7.1 |
| | -0.1;-53.7;8.1 | -0.2;-53.7;8.2 | -0.1;-37.6;8.0 |
| LEV[i] | -7.4;-5.1 | -8.5;-6.3 | -4.2;-1.0 |
| | 0.0;-53.7;8.0 | -0.2;-53.7;8.2 | 0.0;-37.4;6.5 |
| PCH[j] | 90.9;93.3 | 88.4;89.8 | 98.5;100.0 |
| | 100.0;50.9;9.2 | 99.6;50.9;8.8 | 100.0;65.4;5.4 |

[a] The "greatest" group consists of common-for-nonconvertible debt transactions, while the "least" group consists of those transactions that are not common-for-nonconvertible debt transactions.

[b] Percentage of column total given in parenthesis.

[c] Includes values for equity and debt. Equity is the market value of common stock and the liquidation value of preferred stock. Debt is the book value of long-term debt and current liabilities. Values taken from sources nearest, yet prior, to announcement date.

[d] Mean and median are reported in the first row. Maximum, minimum, and standard deviation are reported in the second row. Values are in millions of dollars for the first two variables and percentages for the last five variables.

[e] For common stock offerings, the value (if not given by sources) is calculated by multiplying the price the day before the announcement times the planned number of new or primary shares.

[f] Planned value of primary offering divided by equity value.

[g] Planned percentage change in outstanding common shares.

[h] Par value of the planned senior reduction divided by firm value.

[i] Par value of the planned net reduction in debt divided by firm value.

[j] Planned percentage of total common shares expected to be owned by insiders after the announcement divided by their percentage of total common shares owned before the offering.

As seen in Panel C, statistics for the "greatest" and "least" groups are reasonably similar for firm value, planned offering value, PCE, and SEN. Statistics for SHR, LEV, and PCH are relatively less similar between groups. The dissimilarity for SHR and PCH reflects the less likely change in common stock for "least" transactions (e.g., SHR is zero percent and PCH is 100 percent when common stock is not the junior security). The dissimilarity for LEV reflects the less likely net change in debt for "least" transactions (e.g., LEV is zero if preferred stock is being retired or if the transaction is convertible debt-for-nonconvertible debt).

## METHODOLOGY AND STATISTICAL TESTS

We use the ordinary least squares (*OLS*) market model procedure described by Brown and Warner (1985) to test if a sample's announcement period excess return (ER), or cumulative excess return (CER), is significantly different from zero. We calculate *alphas* and *betas* using equal-weighted CRSP NASDAQ and CRSP NYSE/AMEX market indices for respective OTC and NYSE/AMEX firms. Our estimation period consists of days +41 to +240 after the announcement date (e.g., after event day 0). We choose a post-announcement estimation period since stock issues often occur during (or toward the end) of bull markets.[8]

When testing the null hypothesis that the mean excess return for the "greatest" group is less negative or equal to the mean return for the "least" group, we calculate a standard parametric one-tailed *t* statistic for testing the equality of the means of two non-paired samples. The research hypothesis is that the "greatest" group will have a greater negative return (e.g., the test statistic will be negative). Thus, a negative *t* statistic significant at the conventional five percent level offers support for adverse selection theory. When calculating t statistics, variances are assumed unequal if *F* values reject the hypothesis that portfolio variances are equal. We also give nonparametric Wilcoxon rank-sum *z* statistics to ascertain if parametric results are driven by outliers.

We use the *OLS* regression methodology to determine if an observation's location within either the “greatest” or "least" group can exercise a significant impact on stock returns. When regressing explanatory variables against CERs, we test the null hypothesis that an explanatory variable's coefficient is equal to zero. *OLS* robust *t* statistics, *F* values, $R^2$ values (adjusted and unadjusted), and variance inflation factors are calculated.[9] Robust *t* statistics are corrected using the White (1980) asymptotically consistent standard error estimates. We figure one-tailed *t* statistics for explanatory variables since each represents a capital structure theory having a definite prediction concerning the sign of the coefficient.

## EXCESS RETURN RESULTS

In Panel A in Table 2, we report daily excess stock return (ER) results for a period of five event days from days -2 through +2.[10] Although not reported in Table 2, there is a -2.59 percent mean cumulative excess return (CER) for the total sample for these five days. Most of this negative five-day CER occurs on the announcement day where the ER is -1.39 percent. We also find noticeable negative activity on days -1 and +1 where the ERs are -0.38 percent and -0.64 percent. The former can be explained by leakage (or late reporting), while the latter reflects the fact that for some observations the market can be closed at the time the announcement occurs.

In the last column in Panel A, we report that the "greatest" group has a more negative ER for each of the five days. In particular, for day 0, the mean ER for the "greatest" group is -0.85 percent more negative than the mean ER for the "least" group. This -0.85 percent difference is significant at the one percent level for both the parametric and nonparametric tests ($t$ = -3.72 and $z$ = -3.47). The similarity of these *t* and *z* statistics demonstrates that outliers do not explain the ER differences between groups.

**TABLE 2. Excess Stock Return Results for 971 Junior-for-Senior Transaction, 1970-1989**

| Event Day(s) | Total Sample (n=971) | "Greatest"[a] Group (n=725) | "Least"[a] Group (n=246) | Excess Return Comparison Between Groups |
|---|---|---|---|---|
| Panel A: Daily Excess Return Results | | | | |
| -2 | -0.12%;-1.51[b] | -0.18%;-1.90*[b] | 0.04%; 0.25[b] | -0.22%;-1.17;968[c] |
| | 45%;-2.92*** | 43%;-3.53*** | 51%;-0.26 | -1.18 |
| -1 | -0.38%;-4.36*** | -0.40%;-4.21*** | -0.31%;-1.56 | -0.09%;-0.47;372 |
| | 43%;-4.33*** | 43%;-3.97*** | 44%;-1.79* | -0.54 |
| 0[d] | -1.39%;-14.03*** | -1.61%;-13.94*** | -0.76%;-4.02*** | -0.85%;-3.72***;967 |
| | 30%;-12.36*** | 28%;-11.70*** | 36%;-4.46*** | -3.47*** |
| 1 | -0.64%;-6.90*** | -0.67%;-6.03*** | -0.54%;-3.37*** | -0.13%;-0.69;502 |
| | 40%;-6.26*** | 40%;-5.39*** | 40%;-3.19*** | -0.31 |
| 2 | -0.06%;-0.81 | -0.10%;-1.06 | 0.03%; 0.19 | -0.13%;-0.70;969 |
| | 46%;-2.79*** | 45%;-2.56*** | 46%;-1.15 | -0.36 |
| Panel B: Three-Day Cumulative Excess Return Results | | | | |
| -1,0,1 | -2.41%;-15.71*** | -2.68%;-15.25*** | -1.61%;-5.23*** | -1.07%;-3.06***;969 |
| | 28%;-13.90*** | 26%;-12.89*** | 33%;-5.48*** | -3.15*** |

Note: Three asterisks (***), two asterisks (**), and one asterisk (*) denote significance at the one, five, and ten percent levels.

[a] The "greatest" group consists of common-for-nonconvertible debt transactions, while the "least" group consists of those transactions that are not common-for-nonconvertible debt transactions.

[b] The first row reports the mean excess return followed by the traditional two-tailed *t* statistic (when testing if the mean excess return equals zero). The second row gives the percent of the sample that has a positive excess return followed by the two-tailed binomial *z* statistic (when testing if the percent equals 50 percent).

[c] The first row reports the following: the difference when subtracting the mean excess return for the "least" group from the mean excess return for the "greatest" group; the non-paired one-tailed *t* statistic (when testing the null hypothesis that the mean excess return for the "greatest" group is less negative or equal to the mean excess return for the "least" group); and, the degrees of freedom. The third row reports the *z* statistic for the one-tailed nonparametric Wilcoxon rank-sum test.

[d] Day 0 is the announcement day.

In Panel B, we give three-day CER results when using event days -1, 0, and +1. As seen in the previous panel, the ER for the total sample for each of these three days is statistically significant from zero at the one percent level for both the parametric and nonparametric tests.[11] As reported in the last column of Panel B, there is a -1.07 percent difference when subtracting the mean three-day CER for the "greatest" group from that for the "least" group. Parametric and nonparametric statistics reveal that the CER difference between groups is significant at the one percent level ($t$ = -3.06 and $z$ = -3.15).

Although not reported in detailed table format, we also examine the smaller negative CER for the "least" group by looking at the CER results for each of its eight junior-for-senior classes. The mean three-day CERs and *t* statistics (in parentheses) when testing if the CER for each class is equal to zero are given below.

| | |
|---|---|
| 27 common-for-convertible debt | -0.08% (-0.09) |
| 6 common-for-nonconvertible preferred | -1.31% (-1.67) |
| 6 common-for-convertible preferred | -0.45% (-0.34) |
| 71 convertible preferred-for-nonconvertible debt | -1.57% (-2.77) |
| 7 convertible preferred-for-convertible debt | -1.85% (-1.39) |
| 26 nonconvertible preferred-for-nonconvertible debt | -0.47% (-0.63) |
| 4 nonconvertible preferred-for-convertible debt | -8.08% (-1.89) |
| 99 convertible debt-for-nonconvertible debt | -2.15% (-4.25) |

As can be seen, the sample size for four of the eight junior-for-senior classes in the "least" group are much too small to make meaningful individual class inferences. Nonetheless, a general inference can be made: there appears to be a more negative market response when the class is convertible preferred-for-nonconvertible debt or convertible debt-for-nonconvertible debt. The CERs for these two classes are statistically significant at the one percent level--no other class is significant at the five percent level (or even the ten percent level). Assuming eventual conversion into common stock for these two convertible junior issues, then both classes can be viewed as consisting of "delayed" common-for-nonconvertible debt transactions. In this sense, it is not surprising that the statistical CER results for these two classes resemble those for the common-for-nonconvertible debt class (which makes up the "greatest" group).

Thus far, our results suggest that the market response is more negative when capital structure changes involve common-for-nonconvertible debt transactions. This finding is predicted by adverse selection theory. However, due to the nature of our sample characteristics (as described earlier and reported in Table 1), an argument can be made that the difference in CERs between groups is also consistent with the three signaling theories of Leland and Pyle (1977), Ross (1977), and Fama (1985).[12]

First, the difference in CERs is consistent with Leland and Pyle (1977) who predict a more negative return if the market perceives insiders are decreasing their common shares. As seen in Panel A in Table 1, junior-for-senior transactions in the "least" group are rarely a combination offering where principal owners (such as insiders) can sell their holdings through a registered secondary offering. Additionally, as noted previously, transactions in the "least" group seldom involve issuing common stock. Thus, insiders in this group are less equipped to lower their ownership proportions (by not participating) in the new stock issue.

Second, the more negative mean CER for the "greatest" group is supported by the debt level signaling model of Ross (1977) since (as reported in Panel C in Table 1) this group retires much larger amounts of debt. Finally, the signaling effect hypothesized by Fama (1985) may be a factor since (as seen in Panel A in Table 1) the "least" group is less likely to reduce nonbank debt. As argued by Hull and Moellenberndt (1994), the market will suspect that bank debt reductions are prompted by negative inside information obtained by bankers in the lending process.

Another explanation for return differences between the "greatest" and "least" groups can arise from the fact that (as seen in Panel A in Table 1) the "least" group consists of relatively fewer OTC listed firms. OTC observations involve smaller firms associated with less public and private information. For such firms, differential information theory [e.g., Verrechia (1980), and Bhushan (1989)] predicts that their announcements will be more unexpected. It follows that a negative event (such as an equity or equity-like offering) will be more surprising and thus more negative for OTC firms. However, any differential information effect caused by the prevalence of smaller OTC firms in the "least" group, may be offset since this group also contains relatively fewer private swaps which are larger firms.

To determine if potential sample biases influence the results reported in Table 2, we conduct tests comparing CERs between the "greatest" and "least" groups when observations having characteristics that are unevenly distributed between the two groups are eliminated. The last column in Table 3 reveals that the test eliminating combination offerings (Test 1) and the test deleting bank debt reductions (Test 2) cause test statistics with magnitudes ($t$ = -2.03 and $z$ = -2.16 for Test 1; $t$ =-2.05 and $z$ = -2.06 for Test 2) that are less than those reported in Panel B in Table 2 for the total sample ($t$ = -3.06 and $z$ = -3.15). Additionally, the five percent significance level reported for Tests 1 and 2 is less than the one percent level given for the total sample.

**TABLE 3. Announcement Period Stock Return Results for Various Samples of Junior Security Offerings that Reduce Outstanding Senior Forms of Borrowing**

The description of the samples tested follow. Test 1 deletes the 138 combination offerings. Test 2 eliminates the 300 bank debt reductions. Test 3 removes the 212 OTC listed firms. Test 4 omits the 222 private swaps. Test 5 deletes the 676 observations having at least one of the following characteristics: a combination offering, a bank debt reduction, an OTC listing, or a private swap.

| Test Number | *Total* Sample | *"Greatest"*[a] Group | *"Least"*[a] Group | Excess Return Comparison Between Groups |
|---|---|---|---|---|
| | (n=833) | (n=594) | (n=239) | |
| Test 1 | -2.16%;-13.56***[b] | -2.36%;-12.84***[b] | -1.65%;-5.29***[b] | -0.71%;-2.03**;831[c] |
| | 29%;-12.23*** | 27%;-11.00*** | 32%;-5.50*** | -2.16** |
| | (n=671) | (n=485) | (n=186) | |
| Test 2 | -2.06%;-11.51*** | -2.29%;-10.87*** | -1.47%;-4.35*** | -0.82%;-2.05**;669 |
| | 30%;-10.31*** | 29%; -9.40*** | 34%;-4.40*** | -2.06** |
| | (n=759) | (n=546) | (n=213) | |
| Test 3 | -2.22%;-14.02*** | -2.45%;-13.47*** | -1.61%;-5.15*** | -0.84%;-2.41***;757 |
| | 27%;-12.45*** | 26%;-11.21*** | 31%;-5.55** | -2.30** |
| | (n=749) | (n=533) | (n=216) | |
| Test 4 | -2.62%;-14.34*** | -3.01%;-14.06*** | -1.64%;-4.83*** | -1.37%;-3.45***;747 |
| | 28%;-12.31*** | 25%;-11.48*** | 33%;-4.90*** | -3.68*** |
| | (n=295) | (n=163) | (n=132) | |
| Test 5 | -1.97%; -7.91*** | -2.38%; -7.22*** | -1.46%;-3.88*** | -0.92%;-1.85**;293 |
| | 31%; -6.70*** | 28%; -5.56*** | 33%;-3.83*** | -1.74** |

Note: Three asterisks (***), two asterisks (**), and one asterisk (*) denote significance at the one, five, and and ten percent levels.

[a] The "greatest" group consists of common-for-nonconvertible debt transactions, while the "least" group consists of those transactions that are not common-for-nonconvertible debt transactions.

[b] The first row reports the mean three-day CER followed by the traditional two-tailed *t* statistic (when testing if the mean three-day CER equals zero). The second row gives the percent of the sample that has a positive mean three-day CER followed by the two-tailed binomial *z* statistic (when testing if the percent equals 50 percent).

[c] The first row reports the following: the difference when subtracting the mean three-day CER for the "least" group from the mean three-day CER for the "greatest" group; the non-paired one-tailed *t* statistic (when testing the null hypothesis that the mean three-day CER for the "greatest" group is less negative or equal to the mean three-day CER for the "least" group); and, the degrees of freedom. The third row reports the *z* statistic for the one-tailed nonparametric Wilcoxon rank-sum test.

In the last column of Table 3, we show that omitting OTC firms (Test 3) or private swaps (Test 4) gives statistics significant at the one percent level. The decrease in the magnitude of statistics for Test 3 and the increase for Test 4 are consistent with a differential information effect related to the size of the announcing firm. For example, as just alluded to, differential information theory suggests that announcements by smaller OTC firms are more revealing (and thus more negative); or, similarly, the announcements by larger firms, e.g., firms undergoing private swaps, are less revealing (and thus less negative).

In Test 5, we simultaneously eliminate all observations (combination offerings, bank debt reductions, OTC firms, and private swaps) that can possibly bias our tests. As seen in the last column, omitting these observations produces a mean CER difference between groups of -0.92 percent. This difference is associated with test statistics ($t$ = -1.85 and $z$ = -1.74) that are significant at the five percent level. Of noteworthy importance, the -0.92 percent difference is similar to the -1.07 percent difference reported for the total sample in Panel B in Table 2. Thus, deleting all observations that cause potential sample biases not only produces

significant statistics, but also does not substantially alter the CER difference between groups. In conclusion, we find that potential biases cannot overturn our support for an adverse selection effect.

## REGRESSION RESULTS

We now use the *OLS* regression methodology to further examine the implication (in terms of market response) of an observation's location within the two groups. Our general regression model is:

$$CER = b_0 + b_1TYP + b_2RSZ + b_3COM + b_4BAN + b_5LIS + b_6SWA,$$

where

CER is the three-day cumulative excess return expressed in decimal form;
TYP = 1 if "least" transaction (e.g., not common-for-nonconvertible debt), else 0;
RSZ is the relative size variable (see Panel C in Table 1) that may be included in the test;
COM = 1 if combination offering, else 0;
BAN = 1 if senior reduction not identified as a bank debt reduction, else 0.
LIS = 1 if listed on CRSP NYSE/AMEX Return File, else 0; and,
SWA = 1 if a private swap, else 0.

The dummy variable TYP is tested to capture the impact of an observation's location within the "greatest" and "least" groups. Both adverse selection theory and signaling theory (predicated on decreases in fractional insider shareholdings or in relative debt levels) predict a positive coefficient for TYP. This prediction holds even for tests that delete observations suspected of causing the "greatest" group to have greater signaling effects due to sample biases.[13]

Leland and Pyle (1977) predict a negative coefficient for COM since insiders are suspected of "unloading" their shares through the secondary component. This is particularly true for the 138 combination offerings in our sample where the secondary sales average about half of primary sales. Fama (1985) hypothesizes a positive coefficient for BAN as bank debt reductions are likely to convey negative news by bankers.[14] Positive coefficients are expected for LIS and SWA since NYSE/AMEX and private swap observations represent firms that are relatively larger in size. Since more information exists for these firms, their junior-for-senior announcements should be less revealing (and thus less negative).

Because greater absolute magnitudes for the RSZ variables are expected to be associated with greater negative signaling [e.g., as hypothesized by Leland and Pyle (1977) and Ross (1977)], a negative coefficient is predicted when RSZ is PCE or SHR and a positive coefficient is hypothesized when RSZ is SEN, LEV, or PCH.[15] Replacing TYP with RSZ variables is important to help ascertain if any significant coefficients for TYP can be attributed to the fact observations in the "greatest" group undergo greater capital structure changes--particularly, those related primarily to changes in residual insider ownership and outstanding debt. It is also important to test RSZ variables without TYP included as these variables can be significantly correlated with TYP. This significant correlation is especially true when RSZ is SHR, LEV, or PCH (these are the three variables that specifically focus on changes in common stock or debt). For the total sample, Pearson and Spearman *rhos* between TYP and any of the latter three RSZ variables are all greater than 0.22 and significant at the one percent level. Finally, RSZ variables should not be used together as *rhos* between any two of these five variables are all greater than 0.45.

**TABLE 4. Regression Results for 971 Junior-for-Senior Transactions, 1970-1989**

The general regression model is:

$$CER = b_0 + b_1TYP + b_2RSZ + b_3COM + b_4BAN + b_5LIS + b_6SWA, \text{ where}$$

CER is the three-day cumulative excess return expressed in decimal form;
TYP = 1 if "least" transaction (e.g., not common-for-nonconvertible debt), else 0;
RSZ is the relative size variable (see Panel C in Table 1) that may be included in the test;
COM = 1 if combination offering, else 0;
BAN = 1 if senior reduction not identified as a bank debt reduction, else 0.
LIS = 1 if listed on CRSP NYSE/AMEX Return File, else 0; and,
SWA = 1 if a private swap, else 0.

For the first seven columns, the first row reports estimated coefficients; the second row gives robust *t*-statistics using the White (1980) heteroskedasticity adjustment procedure; and, the third row records variance inflation factors. Except for the constant term ("CONSTANT"), the *t* test is one-tailed. Three asterisk (***), two asterisks (**), and one asterisk (*) indicate significance at the one, five, and ten percent levels. The next to the last column reports unadjusted and adjusted $R^2$ values (the latter in parentheses), while the final column gives *F* values.

| CONSTANT $b_0$ | TYP $b_1$ | RSZ $b_2$ | COM $b_3$ | BAN $b_4$ | LIS $b_5$ | SWA $b_6$ | $R^2$ ($Adj\ R^2$) | F |
|---|---|---|---|---|---|---|---|---|
| Panel A. Without RSZ | | | | | | | | |
| -0.033 | 0.009 | | -0.013 | 0.008 | 0.003 | 0.004 | 0.033 | 6.61*** |
| -7.24*** | 2.28*** | | -2.54*** | 2.10** | 0.59 | 1.26* | (0.028) | |
| 0.00 | 1.12 | | 1.14 | 1.19 | 1.11 | 1.30 | | |
| Panel B. RSZ = PCE | | | | | | | | |
| -0.032 | 0.009 | -0.004 | -0.013 | 0.008 | 0.002 | 0.004 | 0.033 | 5.52*** |
| -5.56*** | 2.32*** | -0.28 | -2.56*** | 2.09** | 0.48 | 1.01 | (0.027) | |
| 0.00 | 1.12 | 1.31 | 1.14 | 1.19 | 1.20 | 1.45 | | |
| -0.029 | | 0.014 | -0.015 | 0.009 | 0.003 | 0.001 | 0.028 | 5.62*** |
| -5.46*** | | 0.70 | -3.02*** | 2.43*** | 0.51 | 0.34 | (0.023) | |
| 0.00 | | 1.32 | 1.09 | 1.17 | 1.22 | 1.36 | | |
| Panel C. RSZ = LEV | | | | | | | | |
| -0.034 | 0.009 | -0.005 | -0.013 | 0.008 | 0.003 | 0.005 | 0.033 | 5.51*** |
| -6.01*** | 2.27*** | -0.21 | -2.54*** | 2.10** | 0.61 | 1.27* | (0.027) | |
| 0.00 | 1.19 | 1.35 | 1.14 | 1.19 | 1.22 | 1.41 | | |
| -0.030 | | -0.008 | -0.015 | 0.008 | 0.003 | 0.002 | 0.028 | 5.56*** |
| -5.58*** | | -0.37 | -2.97*** | 2.42*** | 0.64 | 0.51 | (0.023) | |
| 0.00 | | 1.26 | 1.09 | 1.17 | 1.22 | 1.28 | | |
| Panel D. RSZ = PCH | | | | | | | | |
| -0.039 | 0.008 | 0.008 | -0.013 | 0.008 | 0.002 | 0.004 | 0.033 | 5.52*** |
| -2.16** | 1.89** | 0.38 | -2.56*** | 2.09** | 0.50 | 1.00 | (0.027) | |
| 0.00 | 1.56 | 1.73 | 1.14 | 1.19 | 1.18 | 1.52 | | |
| -0.055 | | 0.023 | -0.015 | 0.009 | 0.002 | 0.001 | 0.030 | 5.56*** |
| -3.24*** | | 1.44* | -2.88*** | 2.29*** | 0.44 | 0.22 | (0.025) | |
| 0.00 | | 1.23 | 1.09 | 1.18 | 1.17 | 1.28 | | |

In Table 4, we report the robust *OLS* regression results.[16] Panel A gives results when the total sample is tested and an RSZ variable is not used. Although the adjusted and unadjusted $R^2$ values are modest, the *F* value of 6.61 is significant at the one percent level. Variance inflation factors are all well below values conventionally accepted as signifying multicollinearity. All coefficients have their predicted signs with TYP and COM significant at the one percent level, and BAN significant at the five percent level.

The significant positive coefficient for TYP supports the adverse selection notion that the forms of borrowing being issued and retired (as represented by our classification into either the "greatest" group or the

"least" groups) influences announcement period returns. The results for TYP also lend support for the signaling models of Leland and Pyle (1977) and Ross (1977). The results for COM and BAN are consistent with the respectively signaling models of Leland and Pyle (1977) and Fama (1985). The coefficient signs for LIS and SWA are consistent with a differential information effect related to firm size. However, LIS is not significant, while SWA is only marginally significant at the ten percent level.

In the next three panels, we demonstrate that the introduction of RSZ variables does not substantially alter any of the statistical results given in Panel A. When RSZ variables are used with TYP, the first rows for Panels B, C, and D report that coefficients for PCE, LEV, and PCH are all insignificant. When TYP is deleted, the second rows for Panels B, C, and D show that PCE and LEV remain insignificant, while PCH is now marginally significant at the ten percent level. The latter finding offers some evidence that TYP may be capturing changes in ownership proportions of insiders. We would expect this given that insiders for firms in the "least" group are not typically positioned to use the junior issue to change their common stock ownership proportions. Although not reported, the results for SHR and SEN (like those for PCE and LEV) are also insignificant with small magnitudes for their respective coefficients. This is true when tested with or without TYP present. In conclusion, the results for the relative size tests indicate that the significant support for TYP is due to adverse selection theory (as opposed to signaling theory associated with changes in insider holdings or in debt levels).[17]

Although not reported in table format, we conducted other regression tests. For example, we test the sample used for Test 5 reported in Table 3 (where combination offerings, bank debt reductions, OTC firms, and private swaps are all deleted). Similar results are found for TYP and RSZ variables with the exception that PCH is no longer significant. We also performed other deletion tests. For example, the deletion of both combination offerings and bank debt reductions (which are the two deletions mostly likely to cause unequal signaling) leaves our results generally unchanged, e.g., TYP retains its significance while RSZ variables (including PCH), LIS, and SWA are insignificant. The results of these tests call into question our earlier (weak) inference that TYP may be capturing changes in ownership proportions of insiders.

In conclusion, the relative size results are somewhat surprising given the significant correlation that exists between TYP and RSZ variables. Since relative size variables (which are traditionally hypothesized to capture signaling effects) are not an important explanatory factor, it appears as if the forms of borrowing being issued and retired exercise some sort of combined effect--that the market perceives as more important than the sheer relative magnitude of the capital structure change.[18] In a nutshell, our results suggest (with or without potential sample biases removed) a dummy variable representing the "greatest" and "least" group in itself influences the market's response to pure leverage decrease announcements. Thus, we conclude that the wealth effect suggested by adverse selection theory is a significant and important determinant of our announcement period stock price behavior.

## SUMMARY AND CONCLUSIONS

We examine 971 pure leverage decreases consisting of junior-for-senior transactions. Our sample is unique in terms of its size and the variety of classes of junior-for-senior transactions that are included. In our sample, we include five major forms of borrowing which we rank in terms of priority of claims. Based upon our rankings, we form two groups. The "greatest" group comprises the 725 common stock offerings that reduce nonconvertible debt. The "least" group includes the remaining 246 offerings that are <u>not</u> common-for-nonconvertible transactions.

As suggested by adverse selection theory, we hypothesize that announcement period stock returns for the "greatest" group will convey more negative information. However, testing this hypothesis may be biased unless we control for sample characteristics that are unevenly distributed between the two groups. We find that the mean announcement period stock return for the "greatest" group is significantly more negative than

the return for the "least" group. We show that the difference in returns between groups can fall somewhat when tests are corrected for suspected samples biases. In particular, deleting combination offerings and bank debt reductions decreases the unequal signaling between groups. Nonetheless, the potential sample biases appear to collectively explain only a small part of the return difference between groups.

Regression tests offer further evidence that an observation's classification within one of the two groups influences the market response to junior-for-senior announcements. Surprisingly enough, the magnitude of the relative size of the junior-for-senior transaction does not appear to explain excess stock returns. This is true even when correcting for possible sample biases. We conclude that the forms of borrowing being issued and retired convey in themselves information that is valuable. Since this information goes beyond that hypothesized by the signaling models of Leland and Pyle (1977) and Ross (1977), we are left to infer that an adverse selection effect is highly instrumental in explaining the different returns between the two groups.

# NOTES

[1] Junior-for-senior researchers (and details concerning their sample) include the following. Masulis (1983) analyzes 41 noncash offerings (both exchange offers and recapitalizations) that include 9 common-for-debt, 9 preferred-for-debt, and 23 common-for-preferred transactions. Pinegar and Lease (1986) examine 30 common-for-preferred exchange offers. Cornett and Travlos (1989) investigate 114 noncash offerings (both private swaps and exchange offers) consisting of 8 preferred-for-debt and 106 common-for-debt transactions. Copeland and Lee (1991) consider 127 noncash offerings (both private swaps and exchange offers) composed of 88 common-for-debt, 11 preferred-for-debt, and 28 common-for-preferred transactions. Studies consisting entirely of private swaps [e.g., Finnerty (1985), Owers and Rogers (1985), and Israel, Ofer, and Siegel (1989)] focus almost exclusively on common-for-debt transactions. Hull (1994) investigates 9 noncash and 147 cash junior-for-senior transactions (these 156 transactions consist mostly of common-for-debt transactions). Hull and Moellenberndt (1994) examine 209 noncash and 287 cash common-for-nonconvertible debt transactions. Finally, two studies look only at OTC common-for-nonconvertible transactions. Hull and Fortin (1993/1994) investigate 150 cash transactions, while Hull and Pinches (1994/1995) analyze 12 noncash and 165 cash transactions.

[2] Among some of the extensions of Myers and Majluf (1984) are Narayanan (1988), Noe (1989), Lucas and McDonald (1990) and Choe, Masulis, and Nanda (1994).

[3] In our sample, we include 108 observations where the Wall Street Journal Index notes other firm announcements (that may or may not impact stock prices) for event days -3 through +3. These observations are kept since their deletion does not alter our empirical findings. Like prior research [e.g., Masulis (1983) and Hull and Moellenberndt (1994)], we keep observations (n=23) where sources indicate plans to use cash from the current assets account to partially supplement the reduction of senior securities.

[4] We find that our empirical results are unaltered for parameters other than 0.5 percent and 100 percent. For example, a range from 2 percent to 50 percent yields similar findings.

[5] We have zero convertible preferred-for-nonconvertible preferred transactions and 34 junior-for-senior transactions that involve more than two forms of borrowing. The results that we report do not depend upon the inclusion of these 34 transactions. In terms of putting each of these 34 transactions into one of the eight classes, we classify each transaction based upon which two forms are dominant. Of these 34, there are 21 where one of the two forms is warrants. In each of these 21 cases, the warrants are attached to an offering used to retire nonconvertible debt. The 21 junior offerings (with attached warrants) are composed of 11 common, 6 convertible preferred, and 4 nonconvertible debt. The latter 4 are classified as convertible debt. The remaining 13 observations (that include more than two forms of borrowing) consist of 8 observations where two different junior forms of borrowing are retiring nonconvertible debt, and 5 common stock offerings where two different senior forms of borrowing are retired.

[6] It is possible for an observation to be a combination offering, a bank debt reduction, and an OTC firm (occurs 32 times). A private swap is rarely involves a combination offering (occurs twice) or an OTC firm (occurs 13 times), and is never a bank debt reduction. Like prior research [e.g., Hull and Fortin (1993/1994) and Hull and Moellenberndt (1994)], we classify an observation as a combination offering when the primary component of the common stock offering is accompanied by registered secondary component that is at least ten percent of the combined primary and secondary components.

[7] In our sample, we have 33 noncash transactions classified by our sources as "exchange offers". This small number makes it more difficult to suspect a sample bias due to exchange offers. Nonetheless, we deleted these 33 observations and repeated all of our tests reported in this paper. All of our results were unchanged.

[8] The empirical results reported in our study are robust to the following methodological variations: *alphas* and *betas* using the Scholes and Williams (1977) procedure; a 200 day estimation period consisting of days -220 to -21 before the initial announcement; the CRSP NASDAQ and CRSP NYSE/AMEX value-weighted market indices; and, the mean adjusted and market-adjusted models.

[9] Variance inflation factors are calculated to ascertain multicollinearity possibilities. See Belsley, Kuh, and Welsch (1980) for more details on the relationship between variance inflation factors and multicollinearity.

[10] Extending the event period for days immediately beyond the five days reported in Table 2 adds nothing noteworthy to our analysis.

[11] Although we use three-day CERs in reporting our results, similar findings occur if two-day CERs for days 0 and +1 are used.

[12] Although not considered as likely, there are other theories that can potentially explain the different CERs found between groups. For example, optimal capital structure models [e.g., agency models based in Jensen and Meckling (1976) or tax shield/financial distress models such as Kim (1978)] predict a negative effect for common-for-nonconvertible debt transactions if these transactions cause the firm to move further from its optimal debt-to-equity ratio. Additionally, the corporate tax model of Modigliani and Miller (1963) hypothesize a negative CER if these "greatest" transactions cause a greater net decrease in debt (this theory implies that bankruptcy and agency costs do not impact firm value). Also, the issuance expenses model of Hull and Fortin (1993/1994) predicts greater negative CERs if issue costs are greater for common-for-nonconvertible debt transaction. The negative response increases as the cost per new share and the relative size of the offering increases. Finally, wealth redistribution theory [e.g., Galai and Masulis (1976)] predicts a greater negative CERs if "greatest" transactions cause greater shifts in wealth from senior claimants to junior claimants.

[13] We also tested the dummy variable TYP, when TYP = 0 includes not only common-for-nonconvertible debt but also those two classes that have more negative CERs (e.g., the convertible preferred-for-nonconvertible debt and convertible debt-for-nonconvertible debt). We also tried a series of dummy variables representing various groups of classes (as opposed to the two groups for which results are reported) for which differences in CERs exist. The results of these tests produce weaker statistical results than are reported for the simple division into the two groups that we use.

[14] COM is identical to the variable used by Hull and Moellenberndt (1994), and similar to the variable used by Masulis and Korwar (1986). Both studies report significant negative coefficients. BAN is identical to the variable used by Hull and Pinches (1994/1995) and similar to the variable used by Hull and Moellenberndt (1994). Both studies find significant positive coefficients.

[15] Traditionally, RSZ variables are used in regression tests by pure leverage decrease studies [e.g., Cornett and Travlos (1989), Finnerty (1985), and Hull and Moellenberndt (1994)] as well as other security offering studies [e.g., Masulis and Korwar (1985), and Mikkelson and Partch (1986)] where the purpose of the offering involve changes in either the asset structure or the capital structure (or both). For both sets of studies, RSZ variables are hypothesized to capture some sort of negative signaling effect (or effects). It is possible for RSZ variables to also capture agency effects. However, for our pure leverage decrease tests, the nature of the agency effect is hard to predict, e.g., a negative agency effect from insiders lowering their residual ownership proportions can be offset by a positive agency effect from reducing onerous debt covenants.

[16] The reported regression results that follow are similar if we use other methodological variations. These variations include standardized CERs, two-day CERs including event days 0 and +1, standard *OLS t* statistics, and weighted least squares. We find no evidence that outliers (e.g., values that are three standard deviations removed from the average value) for relative size variables alter our findings.

[17] The results for TYP are potentially consistent with the free cash flow theory of Jensen (1986). This theory predicts a positive coefficient since a wealth effect decreases in the looseness of the commitment bonding the payment of future cash flows. Replacing nonconvertible debt with common stock is the junior-for-senior class most apt to cause managers to squander excess cash on poor investment opportunities. However, the precise focus of the free cash flow theory is the magnitude of a firm's undistributed cash flow beyond that required to fund projects with positive net present value. The magnitude of this undistributed or free cash flow is hypothesized to be positively related with managerial inefficiency. Thus, the free cash flow theory predicts that firms with greater relative magnitudes of free cash flow will have greater negative CERs for leverage decrease announcements. When testing free cash flow variables suggested by extant research [e.g., see Lehn and Poulsen (1989) or Gupta and Rosenthal (1991)], we find insignificant results. Consequently, we conclude that our results for TYP are explained by adverse selection theory as opposed to free cash flow theory.

[18] RSZ variables are also generally insignificant when we use our general model to separately test the "greatest" and "least" groups. For these tests, RSZ variables exhibit significance when combinations of other explanatory variables (especially COM and BAN) are deleted from tests. The latter result is generally true for similar tests conducted on our total sample. Thus, a significant coefficient finding for an RSZ variable (unlike TYP) appears to hinge upon its capacity to proxy for effects captured by other variables. If so, researchers should be aware of the potential error-in-variables problem when using relative size variables.

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