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Do Spin-offs Expropriate Wealth from Bondholders?

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ABSTRACT

A wealth transfer from bondholders to stockholders is one of several hypotheses used to explain stockholder gains on the announcement of a spin-off. However, previous empirical research has not found systematic evidence supporting the wealth expropriation hypothesis. Using a larger sample with comprehensive bond data, we find evidence consistent with wealth expropriation. Bondholders, on average, suffer a significant negative abnormal return during the month of the spin-off announcement. However, even accounting for the loss to the bondholders, the aggregate value of the publicly traded debt and equity increases on a spin-off announcement, suggesting that the wealth expropriation hypothesis is not a complete explanation of the stockholder gains. In explaining the magnitude of the losses to bondholders, we find they are a function of the loss in collateral in the spun-off subsidiary and the level of financial risk of the parent firm. Consistent with a loss to bondholders, firms are more likely to have their credit rating downgraded than upgraded after a spin-off. Additionally, consistent with the wealth transfer hypothesis, losses to bondholders tend to be more severe, the larger the gains to shareholders.

SPIN-OFFS ARE ACCOMPANIED by significant redeployment of assets among the parent and the spun-off firms as well as a recontracting of the relationships among the various stakeholders of the firm, including senior security holders, common stockholders, and management. This potentially leads to a wealth transfer from bondholders to stockholders. There are two potential sources of

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wealth transfer from bondholders. First, spin-offs may result in loss of collateral and liquidation value because assets have been reassigned to the spun-off firm. Second, bondholders can suffer a loss due to the elimination of coinsurance provided by multiple operating units whose cash flows are not perfectly positively correlated.

The empirical evidence on a wealth transfer surrounding spin-offs is mixed. Hite and Owers (1983) and Schipper and Smith (1983) find no evidence of a wealth transfer on the announcement of a spin-off, while Parrino (1997) finds a large wealth transfer from senior security holders to stockholders around the announcement of Marriott's spin-off. A close examination of the early studies by Schipper and Smith and Hite and Owers reveals that they are constrained by limited sample size and access to bond price data. This leaves open the question of whether the transfer of wealth between various claimants documented in the Marriott spin-off case is unique or whether it is prevalent in other spin-off announcements as well.

The purpose of this paper is to provide a comprehensive test of the wealth-transfer hypothesis using a sample of 80 spin-offs between 1976 and 1997. We find that bondholders on average suffer a negative abnormal return of 88 basis points in the month of the spin-off announcement. Consistent with previous studies, common stockholders experience an average gain of 2.9 percent during the announcement month and 3.6 percent over the two-day announcement window. In addition, we find that overall firm value increases by an average of 1.6 percent during the announcement month. Our results are consistent with a transfer of wealth from bondholders to common stockholders. However, given the overall increase in firm value, the wealth transfer is only a partial explanation of the gain to stockholders.

We also provide insights into the specific sources of wealth transfer from bondholders to stockholders. The loss of collateral, measured by the relative size of the spun-off firm, is positively related to stockholder returns and is negatively related to bondholder returns. Two other measures of collateral and potential liquidation costs, firm size and market to book ratio, also influence abnormal bond returns. Size, which captures potential liquidation costs, is positively related and market to book, which reflects relative collateral value of the firm, is negatively related to abnormal bond returns. We find no direct evidence of a debt coinsurance effect. While we find a significant difference in stock returns based upon the classification of the spin-off as being either same or cross industry, we do not find that bondholder returns are related to this designation. However, consistent with the collateral and coinsurance hypotheses, the risk of a firm's debt, measured by bond rating and leverage ratios, negatively influences bondholder returns.

As a supplementary test, we examine bond-rating changes following the announcement of a spin-off. There is a greater incidence of downgrades than upgrades, which is consistent with the negative reaction by bondholders at the time of the spin-off announcement. Finally, we find that greater losses to bondholders are associated with greater gains to stockholders, suggesting that stockholders capture some of the bondholders' losses.

I. Prior Literature and Development of Hypotheses

A. Motivations for Spin-offs

Previous studies find significant abnormal stock returns ranging from 2.9 percent to 3.3 percent on the announcement of a spin-off depending upon the benchmark index and event window.[1] These gains are attributed to improved managerial efficiency, reduced information asymmetry, and relaxed regulatory and tax constraints. The elimination of negative synergies is the most commonly cited reason for positive stock price reaction to spin-offs. Schipper and Smith (1983) argue that, just as there are economies of scale, there may be diseconomies of scale by combining disparate assets under one corporate umbrella. As the firm becomes more complex, the costs of decision management and decision control increase to the point where they may offset economies gained from increasing firm size. Hite and Owers (1983), Rosenfeld (1984), and Desai and Jain (1999), among others, note that spin-offs improve managerial efficiency by reducing the potential for misallocation of capital, eliminating cross subsidies, and enabling improved investment decisions. Krishnaswami and Subramaniam (1999) suggest that many spin-offs are motivated by the desire to mitigate the information asymmetry problem, as the market is forced to value the stock of a company that is really a portfolio of several dissimilar lines of businesses. The findings by Daley, Mehrotra, and Sivakumar (1997) and Desai and Jain (1999) that the announcement returns for focus increasing spin-offs are significantly greater than for the non-focus-increasing spin-offs are also consistent with an information asymmetry hypothesis.

Because spin-offs result in a redeployment of assets (and consequently cash flows) between the parent and the spun-off firm, unless the debt is also reallocated in an optimal manner, there is potential for a transfer of wealth from bondholders to stockholders. Hite and Owers (1983) and Schipper and Smith (1983) examine bond price reactions to spin-offs. Neither study finds support for the wealth transfer hypothesis; however, this could be due to severely limited sample size owing to the difficulty of obtaining bond prices. In a more recent study, Parrino (1997) examines the wealth transfer effect pertaining to the 1993 Marriott spin-off case. He finds a significant transfer of wealth from bondholders to stockholders and a decline in total firm value following the spin-off announcement. Hence, the previous literature leaves open the question of whether spin-offs are associated with wealth transfers. This is the principal hypothesis we test.

B. Sources of Wealth Transfer from Bondholders to Stockholders

B.1. Loss of Collateral and Liquidation Value

Debt holders are expected to be concerned about potential losses arising from collateral and liquidation value effects associated with assignment of assets from

[1] These studies include Hite and Owers (1983), Miles and Rosenfeld (1983), Schipper and Smith (1983), Linn and Rozeff (1985), Copeland, Lemgruber, and Mayers (1987), Vijh (1994), and Krishnaswami and Subramaniam (1999).

the parent to the spun-off unit. Galai and Masulis (1976) suggest that bondholders of the parent firm may suffer an erosion in value due to the loss of a portion of their collateral that has now been assigned to the spun-off firm. Further, liquidation cost, which is primarily determined by the collateral value of assets, is an important determinant of debt choice and the cost of debt in the capital structure literature (e.g., Harris and Raviv (1991), Shleifer and Vishny (1992), Alderson and Betker (1995)).

Unless covenants protect bondholders from the loss of collateral, bondholders may suffer a loss that accrues to the benefit of the shareholders. Hence, the extent to which bondholders are affected by a spin-off is in part dependent on how debt is assigned to the parent and the spun-off firm. Generally management (who are presumably acting in the interest of shareholders) has complete control over how the debt is allocated unless explicitly limited by covenants.[2] Hite and Owers (1983) observe that, with the exception of secured debt, covenants rarely include outright prohibition of spin-offs. However, there are indirect controls on spin-offs through provisions regarding restricted payments, mergers and acquisitions, changes of control, and asset sale restrictions that are typically included in debt covenants. Conversations with investment bankers suggest that, even though covenants rarely prohibit spin-offs, the restrictive covenants allow bondholders to delay any restructuring, which usually allows for a more favorable disposition to bondholders.[3] This is consistent with the findings of Parrino (1997) in the Marriott spin-off. In the 1993 Marriott spin-off, the bondholders were able to delay the eventual spin-off and win more favorable terms in the spin-off, though they still suffered significant losses.

Several studies present empirical evidence on leverage changes associated with spin-offs. Dittmar (2003) finds that the actual debt ratio for the parent following the spin-off is significantly greater than that predicted by a cross-sectional model, but no such difference is found for the pre-spin-off parent firm or for the spun-off subsidiary. Mehrotra, Mikkelson and Partch (2003) document that spin-offs are associated with significant differences in the leverage of the two firms, although they do not find that parents or subsidiaries are consistently assigned more or less leverage as a result of the spin-off. Parrino (1997) finds that in the case of Marriott, the original spin-off plan would have allocated most of the debt to the parent firm that owned hotel properties but had a lower cash flow while the spun-off firm that managed hotel properties would have little debt and

[2] U.S. case law has consistently found that stockholder (management) obligations to debtholders are limited to the obligations set forth in the indenture agreements. See Lehn and Poulsen (1991) for a review of U.S. case law with respect to stockholder obligations to bondholders.

[3] From conversations with investment bankers, it seems to be a common practice to file a suit based on tangential covenant protections contained in the indenture agreements. This practice rarely works, but by filing the lawsuit, the bondholder has the ability to delay the impending transaction. Bondholders use the ability to delay the transaction as mechanism to force a more favorable disposition. Martin Fridson, Merrill Lynch, and Mark Shenkman and Mark Flanagan, Shenkman Capital Management, provided information regarding covenant uses and limitations in the event of a spin-off.

significantly higher cash flow. These findings on the allocation of debt in a spin-off suggest bondholders at the time of the spin-off announcement may be legitimately concerned about the potential loss of collateral. Consequently bondholders are expected to react negatively to the spin-off announcement.

B.2. Loss of Coinsurance

As long as the cash flows from the parent and subsidiary are not perfectly correlated, a spin-off would reduce the coinsurance to bondholders. John (1993) examines the optimality of the spin-off decision in the presence of risky debt. John's model implies that to the extent that a spin-off results in an unanticipated loss of coinsurance and investment flexibility, there will be a transfer of wealth from bondholders to shareholders.

Given the lower correlation in cash flows for cross-industry business segments, the loss of the coinsurance effect suggests that cross-industry spin-offs could yield potentially higher wealth transfer effects to shareholders compared to same-industry spin-offs. Thus, the findings of greater shareholder returns in the case of cross-industry spin-offs documented by Desai and Jain (1999) and Krishnaswami and Subramaniam (1999) could, at least partially, be attributed to greater potential for wealth transfer effects.

B.3. Collateral, Coinsurance and Financial Risk

We have argued above that collateral and coinsurance factors may play an important role in determining bondholder reactions to spin-off announcements. We expect these effects to be related to the financial risk of the firm. Kim and McConnell (1977) and Billett, King and Mauer (2003) argue that coinsurance is more beneficial for firms with riskier debt, and find empirical evidence consistent with this argument as it relates to mergers. A corresponding effect in the case of spin-offs implies that firms with riskier debt would face a larger loss due to the elimination of the coinsurance benefit. In a similar manner, given the importance of collateral increases as a firm approaches default, we theorize that firms with riskier debt are more likely to be adversely affected by loss of collateral. Thus to the extent that a firm is heavily leveraged, or alternately, has a low bond rating, we expect the collateral and coinsurance effects to be especially significant.

II. Data

A. Sample Selection Procedure

We use two sources to identify firms with possible spin-off announcements. Our initial source is the Center for Research in Security Prices (CRSP) database from which we identify instances of special stock distribution to current shareholders. CRSP identifies 315 instances of special stock dividend distributions between

January 1974 and December 1997.[4] For the 105 firms with no date associated with the special dividend, we search the 1974 to 1997 time period in Moody's Dividend Record to identify the date of the special dividend.

Securities Data Corporation (SDC) is the second source of spin-off announcements. From the SDC Mergers and Acquisitions database we identify 746 announcements of spin-offs, completion of spin-offs, and cancellations of spin-offs between 1980 and 1997. SDC may contain multiple announcements for the same spin-off (announcement and completion dates or announcement and cancellation dates).

Next, we eliminate firms from the SDC sample which are already included in the CRSP sample, multiple announcements of the same event in SDC, and non-spin-off transactions which are coded in a similar manner to spin-offs (i.e., equity carve-outs). We then screen the spin-off sample for availability of bond return data. Bond data is from the Lehman Brothers Bond Database (LBBD), which contains institutional transactions price data for Treasury and corporate bonds over the 1973–1997 time period and is considered to be more accurate than exchange traded price data.[5] After screening for bond and stock return data availability, we identify a possible sample of 190 spin-offs (75 from CRSP and an additional 115 from SDC).

The next step is to confirm the announcement date by searching Lexis/Nexis to find the earliest announcement of the spin-off. We then screen the data for the stated reason of the spin-off provided either in the spin-off announcement or in the firm's 10K or 10Q financial statement following the announcement. We exclude spin-offs which are directly related to a LBO/merger/acquisition (33), spin-offs which are not completed (18), proposed by utilities (13), events where no specific date can be identified (15), forced divestitures (4), or restructurings of financial claims (6). We also screen for company-specific confounding events that could influence security returns at the time of the spin-off announcement. We eliminate 21 spin-offs due to confounding announcements such as stock offerings, acquisitions, stock repurchases, restructurings with large layoffs, asset sales, rights offerings, and joint ventures that occur during the spin-off announcement month. The resulting final sample totals 80 spin-off announcements: 33 from CRSP and 47 from SDC. The sample includes one observation in the 1970s, 24 observations in the 1980s, and 55 observations in the 1990s. We are able to identify a stated reason(s) for the spin-off in 72 of the 80 firms in the sample. Firms often identify more than one reason for the spin-off. In our analysis of the sample, we find the following stated reasons for the spin-off: to increase focus or concentration (56 percent), the desire to have investors fairly value the different units (43 percent), increased financial flexibility or access to capital markets (22 percent), and relaxed regula-

[4] Specifically, these are stock dividends with a CRSP distribution code of 5773 or 5873 defined as stock dividends in the form of initial stock distribution in a different issue of common stock by the same company.

[5] The difficulty of finding accurate bond data is well known, but Elton et al. (2001), as part of their analysis, compare the bond price information in the LBBD and CRSP and conclude the LBBD is comparable in accuracy to the CRSP data. See Hong and Warga (2000) for a discussion of the Lehman Brothers Bond Database.

tory constraints (5 percent). Overall, focus, valuation or both are identified as the stated reason in 78 percent of the sample.

B. Sample Characteristics

Table I contains descriptive statistics for the final sample of spin-off announcements. Panel A provides financial information regarding the sample. The typical sample firm is large, with a mean market capitalization of $7.65 billion, a total asset base of $12.35 billion, and $8.56 billion in sales. Panel B contains capital structure information. The average ratio of interest-bearing debt to total assets is 0.32, while the average ratio of interest-bearing debt to market capitalization of equity is 0.65. The LBBD covers on average 67 percent of the total debentures and long-term notes reported in COMPUSTAT.

Panel C provides data on the LBBD sample of bonds used in the study. LBBD has information on 311 individual bond issues outstanding during the event month. The mean issue size is $201.99 million with a yield to maturity of 8.7 percent and a duration of 6.4 years. The mean number of bonds per firm is 3.9. Panel D contains information about the relative size of the spin-off. The first two measures of relative size are based on segment information of the subsequently spun-off unit from the parent firm's financial statements before the spin-off. The spun-off firm represents 24.7 percent of the pre-spin-off firm's assets and 27.1 percent of its operating earnings. An alternative measure of relative size used in previous studies is based on the relative market capitalization of the spun-off firm at the time of the actual spin-off. Using this measure, the average size of the spin-off is 25.6 percent of the parent firm's capitalization at the time of the announcement. This is close to the means of 31 percent reported by Krishnaswami and Subramaniam (1999) and 29 percent by Vijh (1994). Finally, Panel E shows that 80 percent of the spin-offs fall into the cross-industry category, while the mean length of time between the initial announcement of the spin-off and the subsequent completion of the divestiture is 5.63 months.

III. Abnormal Bond, Stock and Firm Returns

A. Abnormal Bond Returns

Similar to Handjinicolaou and Kalay (1984) and Maxwell and Stephens (2003), we use a mean-adjusted return model accounting for changes in the term structure to calculate abnormal bond returns. The LBBD database, the source of bond returns data, contains only monthly data; consequently our test of the announcement impact on bondholder wealth is restricted to the month of the spin-off announcement. The use of monthly bond returns biases our study against finding any significant effects. LBBD defines monthly bond returns as the change in the price plus accrued interest. To account for changes in bond returns related to shifts in the term structure, we calculate a bond's premium monthly holding period return for the announcement month as the bond's monthly return minus the return on a duration equivalent Treasury security. The expected premium bond

Table I

Descriptive Statistics for Sample Companies

This table provides descriptive statistics about the bonds and companies contained in the sample. Shown are the mean and median values for a number of bond and firm level variables for the full sample. The firm level variables shown in Panels A and B are calculated from CRSP and COMPUSTAT databases. Financial statement variables are for the parent firm in the fiscal year end prior to the announcement month. The market capitalization of the parent is the market value of equity of the parent company as of the month preceding the spin-off announcement month. The bond information in Panel C is from LBBD and pertains to the month of the event. Amount of issue in Panel C is the mean face value of bond across all bond issues in the sample. In Panel D, different measures of the size of the spin-offs are provided. The assets (operating profits) for the spin-off are collected from the firm's segment data for the fiscal year end before the spin-off. Market capitalization of the spun-off firm is the market value of equity of the spin-off unit at the end of the first month in which the stock is traded. In Panel E, the time to complete spin-off is the length of time from the first announcement of the spin-off to its eventual completion.

	Mean	Median
Panel A: General Financial Information		
Sales ($MM)	8,559.5	4,153.0
Total assets ($MM)	12,348.8	5,258.2
Net income ($MM)	367.35	174.4
Market capitalization—Parent ($MM)	7,645.7	3,546.9
Panel B: Capital Structure Information		
Interest-bearing debt/total assets	0.322	0.301
Interest-bearing debt/market value equity	0.646	0.374
Total amount of bonds outstanding (LBBD)/COMPUSTAT debentures and long-term notes	0.669	0.534
Panel C: Bond Data from LBBD (Number of Issues = 311)		
Number of bond issues per firm	3.9	3.0
Yield to maturity (%)	8.66	8.34
Duration	6.41	6.10
Amount of issue ($MM)	201.99	175.00
Panel D: Measures of the Size of Spin-off		
Assets of subsidiary/assets of parent firm ($N = 70$)	0.247	0.195
Operating earnings of the subsidiary/operating earnings of the parent firm ($N = 52$)	0.271	0.218
Market cap of the subsidiary/market cap of the parent firm ($N = 79$)	0.256	0.184
Panel E: Other Information		
Percentage of cross-industry spin-offs	80%	
Time to complete spin-off (months)	5.63	5.10

*Firms with negative operating earnings or negative segment operating earnings are excluded from the calculation.

return in the announcement month is estimated as the average premium bond return for the previous three months (the estimation period). After estimating the expected return, the abnormal bond return is calculated as the premium bond return in the announcement month minus the expected bond return.

The majority of firms in the sample have multiple bond issues. There are two methods to deal with multiple bond issues.[6] First, we can treat each bond as a separate observation (referred to as the "all bond" sample). Second, we can treat each firm as a separate observation (referred to as the "firm" sample). Using the latter approach, firm bondholder returns are measured as a weighted average (based upon the market values) of the abnormal returns to the different bond issues. Given the likely high correlation between returns of bonds issued by the same firm, the "all bond" sample would inflate the t-statistics and more heavily weight firms with multiple issues in the sample. On the other hand, since a firm's bond returns are not perfectly correlated, the "firm" sample approach overestimates the standard error and biases the t-statistics downward. Therefore, while both the "all bond" and the "firm" bond returns are reported for the full sample, we only report the more conservative weighted-average methodology in the latter parts of the paper.

Similar to Maxwell and Stephens (2003), we examine the significance of the abnormal bond returns using both parametric and nonparametric test statistics. The parametric statistics are calculated using standard event study methodology by standardizing the abnormal bond return by the standard deviation in the estimation period. To check for robustness of our findings, we also examine the statistical significance of the abnormal bond returns using a nonparametric test statistic (the Wilcoxon Signed Rank Test).

A concern with using a mean-adjusted model is that events in the estimation period, -1 to $-y$ months relative to the announcement month, can lead to a biased expected return. By focusing on a short window to estimate the mean expected return, there is a greater probability that the expected return would be biased by an event. On the other hand, a longer time horizon to estimate the mean expected return could lead to incorrect estimation of the bond's current expected return as the credit spread changes over time. We use a three-month time period to estimate the expected bond return. To check for the robustness of our findings and any potential biases, we also estimate the mean expected return over longer time periods (four, five, and six months). Though not reported, our results are qualitatively invariant to the time period used to estimate the mean expected return.

B. Abnormal Stock Returns

Abnormal stock returns are calculated using the market model with the CRSP equally weighted index as the market portfolio on both a daily and monthly basis. The estimation period for the daily market model coefficients is 255 trading days ending 30 days before the announcement date. The estimation period for the

[6] Eberhart and Siddique (2002) discuss the problems associated with using each bond as a separate observation or calculating a firm level bond return for companies with multiple bond issues as a separate observation.

monthly market model is 60 months ending 1 month before the event month. For daily data we report the cumulative abnormal returns (CAR) over a two-day announcement period (0, 1). For monthly data we report the abnormal return for the announcement month, similar to the case of bonds.

C. Abnormal Aggregate Firm Returns

If the wealth gains to stockholders are roughly equal to the wealth loss to bondholders, then spin-offs are arguably pure wealth-transferring events with no wealth creation. On the other hand, if the wealth gain to stockholders is larger than the loss to creditors, then the wealth transfer hypothesis provides only a partial explanation for the abnormal returns to stockholders. If the wealth gain to equity holders is smaller than the loss to creditors, then it would appear that the potential wealth transfer gains from bondholders are mitigated by other costs engendered by the spin-off. To examine the overall impact of the announcement, we calculate the percent abnormal change in the market value of publicly traded debt and equity during the announcement month.

Consistent with Eberhart and Siddique (2002) and Maxwell and Stephens (2003), we focus only on publicly traded securities. Consequently our measure of aggregate returns to publicly traded debt and equity is only an approximation of aggregate firm returns. While it is possible to calculate aggregate firm returns by assuming that nontraded securities in a given security type (e.g., long-term debt) exhibit returns similar to publicly traded securities of the same general type, we believe this would overestimate any loss to bondholders. For example, most firms have nontraded long-term debt that includes secured debt (mortgage loans, real estate liens, construction loans, equipment notes, etc.), capitalized lease obligations, and revolving credit agreements. The change in underlying price of these securities is probably limited given the secured nature of these contracts and therefore could bias the results if they are assumed to react similarly to traded debt securities.

The abnormal change in the value of the equity is the abnormal stock return multiplied by the firm's previous month's market equity capitalization. To match the periodicity of the bond data, the monthly abnormal stock return is used in the calculation. Next, we quantify the abnormal change in the market value of the interest-bearing debt as the abnormal bond return times the prior month's market value of debt from the LBBD database. To examine the statistical significance of the change in the value of the firm, we rely on both nonparametric test statistics and a parametric Student t-statistic based upon the variance in the event period.

IV. Empirical Results

A. Abnormal Returns for the Full Sample

Table II provides information on the excess return to bondholders, the excess return to stockholders, and the relative change in aggregate value on the announcement of a spin-off. Over a two-day event window, we find an abnormal re-

Table II

Excess Bond, Stockholder, and Aggregate Returns on the Announcement of a Spin-off

This table documents the abnormal bond and stock returns as well as the estimated percentage change in the aggregate value of the traded debt and equity in the month of the spin-off announcement. The abnormal bond returns (ABR) are calculated using a mean-adjusted model. To account for changes in the term structure, the expected return for the bond is calculated as the premium over a Treasury bond with similar duration. "All bond" bond returns are bond returns calculated by treating every bond issue as a separate observation, while "Firm" bond returns are calculated by treating each firm as a separate observation, that is, individual bonds returns for a given firm are averaged according to their capitalization before calculating the sample average bond return. The abnormal stock returns (ASR) are calculated using the market model (CRSP Equally Weighted Index). The percentage change in the aggregate value of the firm is calculated as $((ABR_{i,t} \times D_{i,t-1}) + (ASR_{i,t} \times E_{i,t-1}))/(D_{i,t-1} + E_{i,t-1})$ where D and E are equal to the market values of debt and equity, respectively, and t is the announcement month. Statistical significance is tested using both parametric and nonparametric tests. Under the mean excess return in parentheses is the z-statistic probability, calculated using the estimation period standard deviation. Under the median excess return in parentheses is the nonparametric Wilcoxon sign rank z-statistic probability. Under the number of positive and negative excess returns in the sample is the statistical significance of the nonparametric sign test. Statistically significant returns, at a minimum 10% confidence level, are denoted in bold.

	Mean Excess Return	Median Excess Return	Excess Returns % Positive: % Negative
Abnormal monthly bond returns ($n = 80$):			
"Firm" premium bond return (%)	**−0.878**	**−0.266**	32% : **68%**
	(0.000)	(0.000)	(0.000)
"All bond" premium bond return (%)	**−0.629**	**−0.239**	33% : **67%**
	(0.000)	(0.000)	(0.000)
Abnormal stock returns ($n = 79$):			
Daily—CAR using market model (%)	**3.585**	**2.568**	75% : **25%**
	(0.000)	(0.000)	(0.000)
Monthly—market model (%)	**2.892**	**2.509**	62% : **38%**
	(0.000)	(0.000)	(0.000)
Aggregate change in debt and equity ($n = 79$)	**1.585**	**1.198**	62% : **38%**
	(0.017)	(0.009)	(0.001)

turn of 3.59 percent for stockholders where the t-statistic and the two nonparametric tests are all significant at the one percent level. The monthly abnormal stock returns are lower. For the "firm" and "all bond" samples, both the mean (−0.88 percent and −0.63 percent) and median (−0.27 percent and −0.24 percent) abnormal bond returns are negative and significant at the one percent level. The "all bond" more heavily weights firms with multiple bond issues, which are typically larger firms with higher bond ratings. This is consistent with the higher abnormal bond returns in the "all bond" sample. The aggregate value of the firm increases by 1.59 percent on average with a median of 1.20 percent; the t-statistic and Wilcoxon Signed Rank Test indicate significance at the five and one percent levels, respectively.

The results indicate that debt holders suffer abnormal losses in the month of the announcement of a spin-off. These losses are small relative to the gains enjoyed by the stockholders, but the losses are significant relative to the expected return to bondholders. When accounting for the relative amounts of traded debt and equity in the capital structure, the aggregate value of the firm increases in the announcement month. This suggests that spin-offs on average increase the aggregate value of the firm, but some of the increase in value to stockholders is a wealth transfer from bondholders.

B. Impact of Loss of Collateral

As suggested by Galai and Masulis (1976), a spin-off may negatively impact bondholders due to the loss of collateral. In the capital structure literature, collateral risk of a firm is a function of the collateralizable assets owned by the firm and the marketability of those assets. The latter attribute depends on asset specificity and the liquidity of the secondary market for assets—aspects that are difficult to measure and therefore generally ignored in empirical work. Collateralizable assets are measured by fixed assets or the sum of fixed assets and inventory, usually scaled by total assets (e.g., Titman and Wessels (1988), Harris and Raviv (1991)). In our case, we are interested in the potential loss of collateral from the spin-off; therefore, an appropriate measure would be the proportion of fixed assets of the spin-off unit to the total fixed assets of the parent firm. Unfortunately, the segment data do not capture the fixed assets of the spin-off unit. We are therefore constrained to using the total assets (identifiable assets) of the spin-off subsidiary in measuring the potential loss of collateral. However, unless the ratio of fixed assets to total assets for spin-off units are systematically different than for the parent firm as a whole, this should not result in any biases.

We identify two measures of the size of collateral loss. The primary measure is the relative asset size of the spin-off subsidiary (before the spin-off) to the pre-spin-off parent, and the secondary measure is the relative market capitalization of the spun-off firm to the pre-spin-off parent. To calculate the first measure, segment data must be available from the firm's financial statements before the spin-off and the assets of the spun-off subsidiary must be clearly defined. We are able to do this for 70 firms or 88 percent of the sample. We then divide the identifiable assets of the subsidiary by the total assets of the parent firm for the year before the spin-off announcement. Using this as a measure of the loss of collateral, the average size is 24.7 percent with a median value of 19.5 percent for the sample. In view of the number of firms with missing data due to limited availability of segment data, we use a secondary measure of collateral loss. Most of the literature on spin-offs uses market capitalization as a measure of spin-off size. We use this measure as a proxy for collateral loss for the sample without segment data. The secondary measure of collateral loss is calculated as the market capitalization of the spun-off firm (at the time of the spin-off) divided by the market capitalization of the pre-spin-off parent firm (at the time of the announcement). The resulting average size of the spin-off for the full sample is 25.6 percent with a median of 18.4 percent. Relying on this measure of collateral loss, we split the sample into large

and small spin-offs. A large spin-off is categorized as being greater than or equal to 20 percent of the parent (41 firms) while a small spin-off is defined as being less than 20 percent of the parent (38).[7] Panel A in Table III shows the results.

In comparing the abnormal bond returns across the relative spin-off size categories, we find strong statistical evidence of loss to bondholders equal to -1.46 percent in large spin-offs. We also find negative abnormal bond returns for small spin-offs, but their magnitude is lower at -0.24 percent. In testing if large spin-offs incur larger losses to bondholders, we find statistically significant differences in means though insignificant differences in the medians. In the case of stock returns, we find a systematic positive relation between common stock announcement returns and the relative size of spin-offs. For large spin-offs, the average CAR is 4.64 percent, and for small spin-offs, the average CAR is 2.58 percent. The differences are statistically significant at the 10 percent level for both the mean and median. We find positive firm returns for both the small and large spin-off segment. However, the differences between the samples are insignificant. Overall, the evidence is consistent with the idea that a potentially greater loss of collateral is more detrimental to bondholders in a spin-off.

C. Impact of Coinsurance

We next examine the effect of coinsurance on bondholder returns during a spin-off. The coinsurance effect is a function of the correlation between the spin-off unit's cash flows and the cash flows of the parent firm without the spin-off unit. It is also influenced by the size of the spin-off unit's cash flows relative to the rest of the firm, that is, the spin-off unit's cash flows may have a low or negative correlation with the parent firm cash flows, but if the spin-off segment is very small, the coinsurance effect may be inconsequential. However, including a size measure of the cash flows is problematic since it would be highly correlated with the measure for collateral. Consequently, to assess the coinsurance effect we focus on the correlation of cash flows between the spun-off segment and the parent firm. The coinsurance effect is captured by a measure of correlation commonly found in the literature. If the spun-off firm and the parent are in the same two-digit SIC code, it is classified as a same-industry spin-off. If the parent and subsidiary are in different two-digit SIC codes or the subsidiary is the international operations of the parent, it is classified as a cross-industry spin-off. Using this classification, 80 percent of the sample is cross industry. This compares to 75 percent in Krishnaswami and Subramaniam (1999) and 71 percent in Daley et al. (1997).

In Panel B of Table III, we examine the abnormal stockholder and bondholder returns for same- and cross-industry spin-offs and then compare the differences between samples. We find that cross-industry spin-offs are associated with larger abnormal stock returns (4.20 percent compared to 0.96 percent). However, when examining the abnormal bond returns, we find no difference across the samples.

[7] We are unable to accurately identify the size of one of the spin-offs.

Table III

Abnormal Stock, Bond, and Firm Returns

This table presents the mean and median abnormal stock, abnormal bond ("firm" method of computing bond returns), and abnormal firm returns parsed by the loss of collateral (relative size of spin-off), by the type of spin-off (same versus cross industry), and by the risk of the firm's debt (investment- vs. non-investment-grade rating). The mean is reported first and the median follows. Under the mean excess return in parentheses is the z-statistic probability, calculated using the estimation period standard deviation. Under the median excess return in parentheses is the nonparametric Wilcoxon sign rank z-statistic probability. The statistical significance of the differences is estimated using the parametric t-test (assuming unequal group variances) for the means and the nonparametric Mann–Whitney test for the medians. All returns are expressed in percent, and p-values are in parentheses. Statistically significant returns, at a minimum 10% confidence level, are denoted in bold.

Sample Description	Abnormal Stock Returns	Abnormal Bond Return Firm Weighted Average	Abnormal Firm Returns
Panel A: Segmented by the Size of the Spin-off			
Abnormal returns for the sample spin-offs	**4.635**	**−1.463**	1.385
classified as a large spin-off, greater than	(0.000)	(0.000)	(0.195)
20% of the firms total assets ($n = 41$)	**4.558**	**−0.353**	0.380
	(0.000)	(0.000)	(0.121)
Abnormal returns for the sample	**2.575**	**−0.235**	**1.796**
of spin-offs classified as a small spin-off,	(0.000)	(0.000)	(0.024)
less than 20% of the firms total assets ($n = 38$)	**1.943**	**−0.232**	**2.295**
	(0.000)	(0.050)	(0.040)
Difference in the abnormal returns for	**2.060**	**−1.228**	−0.411
the large spin-offs minus the abnormal	(0.055)	(0.048)	(0.755)
returns for the small spin-offs	**2.615**	−0.121	−1.915
	(0.096)	(0.272)	(0.924)
Panel B: Same versus Cross-Industry Spin-offs			
Abnormal returns for the sample	**4.200**	**−0.740**	**2.637**
of firms spin-offs classified as a	(0.001)	(0.000)	(0.000)
cross-industry spin-off ($n = 64$)	**4.015**	**−0.343**	**2.909**
	(0.000)	(0.000)	(0.000)
Abnormal returns for the	0.962	**−1.428**	**−2.833**
sample of spin-offs	(0.391)	(0.003)	(0.089)
classified as a same-	0.398	0.006	−1.654
industry spin-off ($n = 16$)	(0.561)	(0.597)	(0.073)
Difference in the abnormal	**3.238**	0.688	5.470
returns for cross-industry	(0.015)	(0.602)	(0.004)
spin-offs minus the abnormal	**3.617**	−0.337	**4.563**
returns for same-industry spin-offs	(0.017)	(0.209)	(0.003)

Panel C: Spin-offs Segmented by Risk of the Firm			
Abnormal returns for sample of spin-offs with a senior debt rating of investment grade for the parent ($n=64$)	**3.818**	**−0.469**	**1.962**
	(0.000)	(0.000)	(0.010)
	2.684	**−0.240**	**2.518**
	(0.000)	(0.002)	(0.005)
Abnormal returns for sample of spin-offs with a senior debt rating of noninvestment grade for the parent ($n=16$)	**2.670**	**−2.511**	0.024
	(0.000)	(0.000)	(0.989)
	1.634	**−1.240**	−0.531
	(0.083)	(0.000)	(0.791)
Difference in the abnormal returns for the sample of investment-grade firms minus the abnormal returns of the noninvestment-grade firms	1.148	**2.042**	1.938
	(0.196)	(0.068)	(0.148)
	1.050	**1.000**	3.049
	(0.319)	(0.015)	(0.183)

For aggregate changes in firm value, cross-industry spin-offs are associated with significantly larger gains.

D. Impact of the Risk of the Firm's Debt.

The loss of coinsurance, cash flows, and assets would be greatest for firms with greater financial risk, as they are closer to the default boundary. To test this hypothesis, we use bond ratings to proxy for financial risk. Consistent with Kim and McConnell (1977) and Billet et al. (2002), we break down the sample into two subsets: firms rated investment grade and firms rated noninvestment grade at the time of the spin-off announcement.[8]

Panel C of Table III shows the abnormal returns to various security holders when firms are classified into investment and noninvestment bond groups as well as the differences in returns between the two groups. Bondholders of both investment- and noninvestment-grade firms suffer significant losses. However, firms with a noninvestment-grade rating suffer statistically significant larger losses. This differential bond return between the two groups of firms supports the view that wealth loss is potentially greater for firms with high-risk bonds.

Examining the stock returns, both the investment- and noninvestment-grade firms' CARs are positive and statistically significant at the one percent level. When examining the aggregate returns, the investment-grade sample has a positive change in firm value at the one percent level. In contrast, the noninvestment-grade sample has a positive mean and negative median aggregate return, and neither is statistically significant. However, there is no statistically significant difference in the CARs or aggregate firm abnormal returns between the noninvestment- and investment-grade samples. Evidently the larger losses to noninvestment-grade bondholders do not translate to a greater transfer of wealth to

[8] We defined firms into investment- and noninvestment-grade categories based on their most senior debt rating. In our sample, there are no firms with multiple bond issues that are rated both investment and noninvestment grade.

shareholders. However, this conclusion is tentative, as the results may be confounded by other effects such as size of the firm or relative size of the spin-off. In subsequent cross-sectional analysis we control for such effects.

E. Rating Changes After the Announcement of a Spin-off

The negative bondholder returns during the announcement month imply that investors' perception of the underlying default risk including the probability of default and/or the costs associated with default (i.e., collateral value or liquidation costs) of the bonds is increasing. If this is the case, we would expect rating agencies to modify their ratings accordingly. Hence, as a confirmation of our previously reported findings of negative announcement period returns to bondholders, we analyze the rating changes for the parent firm after the spin-off. Given that on average it takes over five months for a spin-off to be completed and given the general lag in bond rating changes, we track Standard and Poor's senior debt ratings for the parent firm in the month before the spin-off announcement and compare it to the parent firm's rating 12 months after the announcement. Specifically we examine the percentage of firms that have their senior bond ratings subsequently upgraded or downgraded; for example, a firm rated AA at the time of the announcement may be subsequently downgraded to AA – 12 months after the spin-off announcement. Rating changes are available for 77 firms after 12 months.[9] We use a Sign Test to test whether firms are more likely to be downgraded than upgraded after a spin-off. In Table IV, we report the results for the full sample and for the univariate subsamples.

For the full sample, after 12 months, downgrades occur in 23.4 percent of the sample, while 11.7 percent of the sample is upgraded, with the difference being statistically significant at the 5 percent level. Further segmenting the spin-offs into small and large spin-offs, we document that firms with relatively large spin-offs are more likely to see their bonds downgraded. For the small spin-offs, we observe close to a symmetric distribution of upgrades and downgrades after 12 months. When focusing on the larger spin-offs, after one year, 32.5 percent are downgraded and only 12.5 percent are upgraded. In comparing the results for the cross- versus same-industry samples, we find the cross-industry spin-offs are more likely to be downgraded and less likely to be upgraded than the same-industry spin-offs. When partitioning the sample by financial risk, we do not find the expected results, as the noninvestment-grade bonds are downgraded less and upgraded slightly more than investment-grade bonds. In summary, we find that, on average, firms announcing a spin-off are more likely to have their bonds downgraded than upgraded in the year following the spin-off announcement. The results using bond ratings to proxy for changes in firm risk are consistent with the bondholder price reactions documented in the previous sections.

[9] In three of the spin-offs, Standard and Poor's rating are unavailable and Moody's rating are utilized instead.

Table IV
Standard and Poor's Debt Rating Changes for Spin-offs

This table shows the change in Standard and Poor's debt rating of the parent firm's most senior debt from before the announcement of a spin-off to 12 months after the announcement. A rating change is defined as the change in the minor debt rating of the firm; for example, a rating change includes a firm rated AA at the time of the announcement and AA – 12 months after the announcement. Rating changes are shown for the full sample and subsamples classified by the size of the spin-off (relative to the percentage of assets in the subsidiary), if the spin-off is same or cross industry, and the risk of the firm's debt (investment versus noninvestment). The statistical significance of the differences in the upgrades versus downgrades is tested using a sign test.

	Downgraded	Unchanged	Upgraded
All ($N=77$)	23.4%[a]	64.9%	11.7%
Spin-off category by size of the spin-off			
Small ($\leq 20\%$)	13.5%	73.0%	10.8%
Large ($>20\%$)	32.5%[b]	55.0%	12.5%
Spin-off category by type of spin-off			
Same Industry	20.0%	53.3%	26.7%
Cross Industry	24.2%	67.7%	8.1%
Spin-off category by risk			
Investment Grade	26.2%[b]	62.3%	11.5%
Noninvestment Grade	12.5%	75.0%	12.5%

Significance levels at the 5 and 10 percent levels are denoted by [a] and [b] respectively.

F. Pooled Cross-sectional Analysis

The univariate analyses indicate that a number of factors may influence returns on the announcement of a spin-off. In this section we estimate pooled cross-sectional regressions to test the joint impact of several factors that appear to influence bond and stock returns.

To examine the loss of collateral, we include an indicator variable for the relative size of assets in the spin-off unit (zero if the subsidiary represents less than or equal to 20 percent of the parent's total assets and one if the subsidiary represents more than 20 percent of the parent's total assets) to test if larger spin-offs are associated with greater losses to bondholders. In addition, we consider market to book and firm size to capture additional elements of bankruptcy/liquidation costs associated with spin-offs. Market-to-book ratio captures future growth opportunities and the extent of intangible assets in the firm. Titman and Wessels (1988) note that while growth opportunities are capital assets, they are not collateralizable. Alderson and Betker (1995) observe that firms with a high degree of intangible assets are associated with high liquidation costs. We hypothesize that the loss of collateral (via the spin-off) is especially severe for high market-to-book firms that are associated with potentially high liquidation costs. Consequently, we expect high market to book firms to be subject to greater losses to bondholders. Studies on capital structure use firm size to proxy for direct costs of

bankruptcy (e.g., Agrawal and Knoeber (1996), Titman and Wessels (1988)). The literature suggests the existence of economies of scale in bankruptcy costs documented by an inverse relation between direct costs of bankruptcy (scaled by firm value or total assets) and firm size (Warner (1977), Betker (1997)). We hypothesize that the potential increase in direct costs of bankruptcy from the spin-off will be smaller for larger firms than for smaller firms. We use the log of market capitalization of the parent firm as proxy for firm size.

To examine the impact of coinsurance, an indicator variable is included for cross-industry variables. To control for financial risk we use several measures of leverage. We examine the effect of leverage ratios on the bond returns (measured by total interest-bearing debt to the book and market value of equity) with the hypothesis that greater leverage is associated with larger bondholder losses. We also examine the specific nature of a firm's long-term debt on bondholder returns. Controlling for leverage, bondholder returns should be negatively related to the percentage of long-term unsecured debt in the capital structure (measured as the percentage of long-term notes and debentures in total amount of interest-bearing debt).

Table V presents the pooled cross-sectional regression estimates. Models 1 and 2 provide regression estimates for the abnormal bond returns. The intercept is negative and statistically significant in both models. The spin-off size variable is negative and statistically significant in both models. The negative relation is consistent with the idea that large spin-offs are associated with larger losses to bondholders. Both firm size and market-to-book coefficients have the expected signs. Market-to-book ratio is negative, consistent with the notion that the loss of collateral from the spin-off is more severe for firms with higher potential liquidation costs. The significant positive coefficient for firm size supports the hypothesis that the anticipated impact of spin-off on direct bankruptcy costs is less for larger firms than it is for smaller firms. The cross-industry dummy variable is insignificant in the bond regressions. When examining the measures of risk to bondholders, the two leverage ratios, debt-to-equity and debt-to-market value of equity, have a statistically significant negative coefficient. The percentage of long-term unsecured debt in the capital structure is insignificant in the models. Taken as a whole, greater financial risk is associated with greater losses to bondholders. Overall, the regression results suggest that abnormal bond returns on spin-offs are influenced by the loss of collateral and by financial risk. However, no indication is found that the sample designation of same- versus cross-industry spin-offs provides explanatory power.

G. Transfer of Wealth from Bondholders to Stockholders

Our emphasis here is on providing more definitive evidence that the previously documented losses to bondholders around spin-off announcements are consistent with a wealth transfer. The observed gain to common stockholders and losses to bondholders suggests that shareholders are benefiting at the expense of bondholders. However, it is conceivable that the observed loss to bondholders could be merely a wealth loss that is not necessarily associated with a transfer of wealth to stockholders. The wealth transfer hypothesis requires that wealth is being transferred from one claimholder to another.

Table V

Pooled Cross-sectional Regression Analysis

This table examines the cross-sectional relation between abnormal bond and stock returns and explanatory variables. Abnormal bond returns are based on the "firm" bond return calculation, while abnormal stock returns are based on the market model methodology. The *p*-values for the significance of the coefficients are shown in parentheses. The last row shows the adjusted *R*-squares and the model *F*-statistic probability in parentheses. Statistically significant coefficients, at a minimum 10% confidence level, are denoted in bold.

	Panel of Dependent Variables			
	Abnormal Bond Returns During the Announcement Month		Abnormal Stock Returns During the Two-day Announcement Period	
Independent Variables	Model 1	Model 2	Model 3	Model 4
Intercept	**−3.777**	**−2.781**	−2.050	−3.158
	(0.011)	(0.058)	(0.397)	(0.223)
Collateral variable				
Indicator variable for a large spin-off based upon total assets (>20.0%)	**−1.372**	**−1.329**	**2.206**	**1.950**
	(0.022)	(0.021)	(0.031)	(0.063)
Firm size − log of market capitalization	**0.589**	**0.557**	0.161	0.279
	(0.002)	(0.002)	(0.565)	(0.334)
Market-to-book	**−0.248**	**−0.292**	0.000	0.000
	(0.003)	(0.001)	(0.941)	(0.752)
Coinsurance variable				
Indicator variable for a cross-industry spin-off based upon two digit SIC codes	0.622	0.316	**2.858**	**3.420**
	(0.397)	(0.656)	(0.027)	(0.011)
Measures of risk to bondholders				
Debt-to-book equity	**−0.272**		**0.816**	
	(0.092)		(0.004)	
Debt-to-market value of equity		**−0.859**		**1.025**
		(0.006)		(0.069)
Percentage of notes and debentures in total debt	−0.647	−0.869		
	(0.648)	(0.526)		
Adjusted *R*-square	**0.190**	**0.243**	**0.170**	**0.108**
	(0.000)	(0.000)	(0.000)	(0.022)

We test this hypothesis in two ways. First, if wealth is being expropriated, the factors that are associated with larger losses to bondholders (loss of collateral, loss of coinsurance, and increased financial risk) should be associated with larger gains to stockholders. Second, if there is a wealth transfer, we expect to find a negative relation between the abnormal change in the stock value and bond value, that is, larger losses to bondholders are associated with larger gains to stockholders (Maxwell and Stephens, 2003).

The cross-sectional regression estimates for common stock returns results are in Table V, models 3 and 4. In the models, we incorporate the independent vari-

Table VI

Relation between Abnormal Changes in Stock Values and Bond Values

This table examines the cross-sectional relation between the abnormal change in the stock market value versus the abnormal change in the bond market value around a spin-off announcement. The abnormal change in the stock value is the CAR times the market value of equity. The abnormal change in the bond value is the abnormal "firm" bond return times the market value of debt outstanding. The total firm value is the market value of equity plus debt. The *p*-values for the significance of the coefficients are shown in parentheses. The last row shows the adjusted R-squares and the model F-statistic probability in parentheses. Statistically significant coefficients, at a minimum 10% confidence level, are denoted in bold.

Independent Variables	Dependent Variable: Abnormal Change in the Market Value of Equity
Intercept	**223.623** (0.004)
Abnormal change in the market value of debt	**−4.863** (0.072)
Market value of debt and equity	**0.060** (0.000)
Adjusted R^2	**0.699** (0.000)

ables in the abnormal bond returns analysis. If the wealth transfer hypothesis holds, we should observe coefficients that are the opposite of those hypothesized for bond returns. Larger spin-offs, as measured by assets, are related to larger gains to stockholders. We find that cross-industry spin-offs are associated with significantly greater stock returns. However, this variable was not significant when regressed on bond returns. Using either measure of leverage, financial risk is positively related to stockholder gains. Neither the size nor market-to-book variables is statistically significant. Given the difference in the sign for some of the common factors which influence bond and stock returns (size of the spin-off and financial risk), the results are consistent with but not sufficient evidence of a wealth transfer from bondholders to stockholders during the announcement of a spin-off.

In a more direct test of the wealth transfer hypothesis, we regress the abnormal changes in the value of the stock versus the abnormal changes in the value of the bonds in Table VI. To account for the size of the firm, the overall market value of the firm (market value of traded debt and equity) is included in the regression. We find a negative relation between the abnormal change in the stock and bond value, though the results are only significant at the 10 percent level. Overall, given the results from the cross-sectional regressions and the direct test, we find evidence consistent with a wealth transfer.

V. Conclusions

There are a number of non-mutually exclusive theories to explain stockholders' gains from a spin-off. One of these theories is that stockholders may gain from a

spin-off announcement as a result of wealth expropriation from senior security claimants. Prior empirical research on the validity of this hypothesis yields inconclusive results. We believe the ambiguity in previous results is due to small sample sizes stemming from the difficulty of obtaining bond price data. In this paper, we reexamine the role of wealth expropriation between bondholders and stockholders around spin-off announcements using a larger sample and conclude that some but not all the gain to stockholders is associated with a wealth transfer from the bondholders.

We examine the wealth transfer hypothesis using a sample of 80 spin-off announcements made between 1976 and 1997 for firms with both stock and bond price data. For our sample of spin-off announcements, bondholders on average suffer a statistically significant negative abnormal return of 88 basis points in the month of the announcement while stockholders, on average, gain a statistically significant 3.6 percent. When examining the change in the aggregate value of the firm, we find that it increases on average a statistically significant 1.59 percent. These results suggest that spin-offs, on average, may expropriate wealth from bondholders, but this is only a partial explanation of the gain to stockholders.

We also test for factors that influence relative wealth changes for bond- and stockholders. We find that the loss of collateral to bondholders is a significant explanatory variable in explaining cross-sectional losses to bondholders and stockholders. Larger potential losses of collateral are associated with larger losses (gains) to bondholders (stockholders). In both the univariate and cross-sectional tests, we find no difference in the returns to bondholders based on whether the spin-off is cross versus same industry, though we do find this classification influences stockholder returns. The degree of financial risk also influences the loss to bondholders. In a univariate analysis, losses are greater for noninvestment-grade firms than for firms with investment grade ratings. We also find a negative relation between the leverage ratios and abnormal bond returns in the regression analysis. This is consistent with the idea that the increased gains to stockholders of firms with greater leverage is due to the higher degree of wealth transfer from bondholders. The negative reaction by bondholders to a spin-off announcement is confirmed by an analysis of bond rating changes after the announcement of the spin-off. Firms have a higher likelihood of being downgraded than of being upgraded after the spin-off.

Finally, we directly test the wealth transfer hypothesis by regressing changes in stock versus bond values. We find some evidence, though only significant at the 10 percent level, that changes in stock values are negatively related to changes in bond values. In sum, our results indicate that spin-offs are viewed negatively in the bond markets and that part of the overall gain associated with a spin-off is in fact a wealth transfer from bondholders to stockholders.

REFERENCES

Agrawal, Anup, and Charles R. Knoeber, 1996, Firm performance and mechanism to control agency problems between managers and shareholders, *Journal of Financial and Quantitative Analysis* 31, 377–397.

Alderson, Michael J., and Brian L. Betker, 1995, Liquidation costs and capital structure, *Journal of Financial Economics* 39, 45–71.

Betker, Brian L., 1997, The administrative costs of debt restructurings: Some recent evidence, *Financial Management* 26, 56–68.

Billett, Matthew T., Dolly King, and David C. Mauer, 2003, Bondholder wealth effects in mergers and acquisitions: New evidence from the 1980s and 1990s, *Journal of Finance*, forthcoming.

Copeland, Thomas E., Eduardo F. Lemgruber, and David Mayers, 1987, Corporate spin-offs: Multiple announcement and ex-date abnormal performance, in T. E. Copeland, ed. *Modern Finance and Industrial Economics* (Basil Blackwell, New York).

Daley, Lane, Vikas Mehrotra, and Ranjini Sivakumar, 1997, Corporate focus and value creation: Evidence from spin-offs, *Journal of Financial Economics* 45, 257–281.

Desai, Hemang, and Prem Jain, 1999, Firm performance and focus: Long-run stock market performance following spin-offs, *Journal of Financial Economics* 54, 75–101.

Dittmar, Amy, 2003, Capital structure in corporate spin-offs, *Journal of Business*, forthcoming.

Eberhart, Allan, and Akhtar Siddique, 2002, The long-term performance of corporate bonds (and stocks) following seasoned equity offerings, *Review of Financial Studies*, 15, 1385–1406.

Elton, Edwin, Martin Gruber, Deepak Agrawal, and Christopher Mann, 2001, Explaining the rate spread on corporate bonds, *Journal of Finance* 56, 247–277.

Galai, Dan, and Ronald W. Masulis, 1976, The option pricing model and the risk factor of stock, *Journal of Financial Economics* 3, 53–82.

Handjinicolaou, George, and Avner Kalay, 1984, Wealth redistributions or changes in firm value: An analysis of returns to bondholders and stockholders around dividend announcements, *Journal of Financial Economics* 13, 35–63.

Harris, Milton, and Artur Raviv, 1991, The theory of capital structure, *Journal of Finance* 46, 297–356.

Hite, Gailen L., and James E. Owers, 1983, Security price reactions around corporate spin-off announcements, *Journal of Financial Economics* 12, 409–436.

Hong, Gifford, and Arthur D. Warga, 2000, An empirical study of bond market transactions, *Financial Analysts Journal* 56, 32–46.

John, Teresa A., 1993, Optimality of spin-offs and allocation of debt, *Journal of Financial and Quantitative Analysis* 28, 139–160.

Kim, E. Han, and John J. McConnell, 1977, Corporate mergers and the co-insurance of corporate debt, *Journal of Finance* 32, 349–365.

Krishnaswami, Sudha, and Venkat Subramaniam, 1999, Information asymmetry, valuation, and the corporate spin-off decision, *Journal of Financial Economics* 53, 73–112.

Lehn, Kenneth, and Annette Poulsen, 1991, Contractual resolution of bondholder-stockholder conflicts in leveraged buyouts, *Journal of Law and Economics* 34, 645–673.

Linn, Scott C., and Michael S. Rozeff, 1985, The effect of voluntary spin-offs on stock prices: The agency hypothesis, *Advances in Financial Planning and Forecasting* 1, 265–292.

Maxwell, William F., and Clifford S. Stephens, 2003, The wealth effects of repurchases on bondholders, *Journal of Finance* 58, 895–920.

Mehrotra, Vikas, Wayne Mikkelson, and Megan Partch, 2003, The design of financial policies in corporate spinoffs, *Review of Financial Studies*, forthcoming.

Miles, James A., and James D. Rosenfeld, 1983, The effect of voluntary spin-off announcements on shareholder wealth, *Journal of Finance* 38, 1597–1606.

Parrino, Robert, 1997, Spin-offs and wealth transfers: The Marriott case, *Journal of Financial Economics* 43, 241–274.

Rosenfeld, James D., 1984, Additional evidence on the relation between divestiture announcements and shareholder wealth, *Journal of Finance* 39, 1437–1448.

Schipper, Katherine, and Abbie Smith, 1983, Effects of recontracting on shareholder wealth: the case of voluntary spin-offs, *Journal of Financial Economics* 12, 437–467.

Shleifer, Andrei, and Robert W. Vishny, 1992, Liquidation values and debt capacity: A market equilibrium approach, *Journal of Financial Economics* 47, 1343–1366.

Titman, Sheridan, and Roberto Wessels, 1988, The determinants of capital structure choice, *Journal of Finance* 43, 1–20.

Vijh, Anand M., 1994, The spin-off and merger ex-date effects, *Journal of Finance* 49, 581–609.

Warner, Jerold B., 1977, Bankrupting costs—Some evidence, *Journal of Finance* 32, 337–347.