Journal of Financial Economics 16 (1986) 143–187. North-Holland

CORPORATE MERGERS AND SECURITY RETURNS*

Debra K. DENNIS

Texas A & M University, College Station, TX 77843, USA

John J. McCONNELL

Purdue University, West Lafayette, IN 47907, USA

Received July 1983, final version received September 1985

An examination of rates of return and dollar value returns for various classes of merging firms' securities indicates that acquired companies' common stockholders, convertible and non-convertible preferred stockholders, and convertible bondholders gain in merger, as do acquiring companies' convertible preferred stockholders. Acquired companies' non-convertible bondholders and acquiring companies' convertible and non-convertible bondholders and non-convertible preferred stockholders neither gain nor lose. There is no evidence that acquiring companies' common stockholders lose and there is statistically reliable evidence that they gain. Additionally, the dollar value of both acquired and acquiring firms increase, as does the dollar value of the combined acquired and acquiring companies.

1. Introduction

Questions concerning the impact of merger on the market value of merging firms have occupied a prominent position in the literature of economics and finance for at least twenty-five years. In response to these questions, a number of carefully conducted empirical investigations have documented the effect of merger on the wealth of the common stockholders of merging firms. These studies test hypotheses which deal primarily with the effect of merger on the market value of the merging firms' common stock. A much smaller number of studies examine returns to the senior securities of merging firms. However, these studies examine returns only to non-convertible bonds, leaving unanswered the question of what effect the merger has on the market values of the firms' other senior securities. This paper fills that gap by examining the effect of merger on the wealth of the various classes of merging firms' securityholders: (1) common stockholders, (2) preferred stockholders, both convertible and non-convertible, and (3) bondholders, both convertible and non-convertible.

* This paper has benefited from helpful suggestions by Paul Asquith, Larry Dann, Espen Eckbo, Ronald Lease, Claudio Loderer, Scott Lummer, Paul Malatesta, Katherine Schipper and, especially, Michael Jensen.

0304-405X/86/$3.50

Prior papers by Mandelker (1974), Langetieg (1978), Dodd (1980), Asquith and Kim (1982), and Asquith (1983) examine returns to the common stocks of acquired firms either around the date of completion or the initial announcement of a merger. Each of these studies concludes that the common stocks of acquired firms earn positive and statistically significant abnormal returns. Papers by Mandelker (1974), Langetieg (1978), Dodd (1980), Asquith and Kim (1982), Asquith (1983), Malatesta (1983), Eckbo (1983), and Asquith, Bruner and Mullins (1983) examine returns to the common stocks of acquiring companies. With the exception of the papers by Dodd (1980) and Asquith, Bruner and Mullins (1983) each of these papers finds that abnormal returns to the common stocks of acquiring companies are not significantly different from zero. Dodd finds that the common stocks of acquiring firms generate small negative, but statistically significant abnormal returns, while Asquith, Bruner and Mullins find that the common stocks of acquiring firms generate small positive, but statistically significant abnormal returns.[1]

Additionally, Malatesta (1983) estimates the dollar value of abnormal returns to the common stocks of acquired and acquiring companies over various time periods prior to and including the month of board approval of the merger. Over the four-month interval prior to and including the month of board approval, Malatesta estimates the dollar value abnormal gain to the stockholders of acquired companies to be 19.67 million dollars with a t-statistic of 5.39, and he estimates the dollar value of the abnormal loss to the stockholders of acquiring companies to be 27.65 million dollars with a t-statistic of 1.84. For a smaller sample in which he could estimate the average dollar returns to the common stockholders of matched companies, Malatesta estimates the average abnormal return to common shareholders of the merging firms to be 16.2 million dollars per firm over the two-month interval encompassing the board approval month and the prior month. The t-statistic associated with this estimate is 2.07, so that, on average, the combined dollar value gains to common shareholders of merging firms is significantly greater than zero. However, Malatesta (1983, p. 171) goes on to note that '[t]he significance of the abnormal dollar return to combined equity over months -1 to 0 is driven by the significance of gains to the acquired firms involved'. He estimates the acquired firm's average abnormal gain to be 18.6 million dollars with a t-statistic of 5.41 and the acquiring firm's average abnormal return to be 13.8 million dollars with a t-statistic of 0.91.

A related set of literature examines returns to the common stocks of bidder and target firms involved in takeovers that are accomplished by means of intercorporate tender offers. A major distinction between mergers and tender

[1] Schipper and Thompson (1983) examine returns to a sample of conglomerate acquirers around the announcement of acquisition programs. They find significantly positive abnormal performance associated with the announcement of acquisition programs.

offer takeovers is that mergers typically are the result of negotiations between receptive management teams, whereas takeovers by means of tender offers often involve hostile management groups. Studies of intercorporate tender offers by Bradley (1980), Bradley, Desai and Kim (1983, 1984), and Dodd and Ruback (1977) conclude that common stockholders of both bidder and target firms earn statistically significant returns in tender offers.

Additionally, Bradley, Desai and Kim (1984) estimate the dollar value gains to the stockholders of a sample of bidder and target firms involved in intercorporate tender offers. They estimate the average dollar value gain to the matched pairs of common stocks to be 32.1 million dollars. Of this amount, on average, 5.8 million dollars is received by the stockholders of bidder firms and 26.2 million dollars is received by the stockholders of target firms.

Two previous papers examine returns to the senior securities of merging firms. Kim and McConnell (1977) examine monthly returns to the non-convertible bonds of twenty acquiring firms and nineteen acquired firms that participated in conglomerate mergers (as designated by the Federal Trade Commission) over the period 1960 through 1973. They examine returns around the month in which the mergers were consummated. They find that abnormal returns to non-convertible bondholders in and around the month of merger are not significantly different from zero.

Asquith and Kim (1982) examine returns around the initial announcement data for a sample of mergers that occurred over the period 1960 through 1978. They examine daily as well as monthly returns for a sample of non-convertible bonds issued by firms involved in conglomerate mergers only. Their samples include eleven acquiring firms and six acquired firms when daily data are used and twenty-eight acquiring and twenty-two acquired firms when monthly data are used. They, too, find that abnormal returns to non-convertible bonds are not significantly different from zero.[2]

Asquith and Kim (1982) also examine returns to the common stocks of the firms in their sample. The results here are generally consistent with those found by other investigators for mergers: Abnormal returns to the common stocks of acquired firms are positive and statistically significant; abnormal returns to the common stocks of acquiring firms are not significantly different from zero.[3]

This study expands upon prior investigations by examining returns to all classes of merging firms' senior securities in addition to the returns to their common stock. As it turns out, our results are different from, but not necessarily incompatible with those of prior studies.

[2]Eger (1983) has also examined returns to non-convertible bonds of a sample of firms involved in conglomerate mergers.

[3]Jensen and Ruback (1983) provide a comprehensive summary of the results of various merger and tender offer studies. Jensen and Ruback conclude that the overall evidence indicates that '... target firm shareholders benefit, and that bidding firm shareholders do not lose' (p. 47).

The format of the analysis is as follows. After describing the samples and data used, we examine daily rates of return for each class of securities for both acquired and acquiring firms around the announcement dates of a sample of mergers that took place over the period 1962 through 1980. The daily rates of return are then converted into dollar changes in market value. Changes in the total dollar value of the entire firm and changes in the dollar value of each class of securities are analyzed for both acquired and acquiring companies. Further, the changes in the dollar values of the securities of pairs of acquired and acquiring companies are summed to provide a measure of the total dollar change in market value of the combined firms due to the merger. Finally, some cross-sectional regressions are estimated to investigate the relationship between the common stock returns and the senior security returns of merging firms. The paper concludes with a summary of the results.

2. Sample selection and data

To conduct the analysis, an initial sample of mergers which occurred between 1962 and 1980 was constructed from the Federal Trade Commission's *Statistical Report on Mergers and Acquisitions* (1974) and the Conference Board's monthly *Announcements of Mergers and Acquisitions* (1965–1980). The original sample included mergers involving firms with assets of $10 million or more but excluded banks, railroads, and public utilities. In order for the securities of firms involved in the merger to be included in the final sample, several other criteria had to be met:

1. An announcement of the impending merger had to appear in the *Wall Street Journal* and to be referenced in the *Wall Street Journal Index*. Mergers were excluded if the acquiring firm had made a tender offer for the shares of the acquired firm any time over the two-year period preceding the merger announcement or if the merger negotiations were complicated by antitrust proceedings of the U.S. Department of Justice.
2. The merger had to be successfully consummated.
3. The securities of an acquiring firm were included only if the book value of the assets of the acquired firm amounted to at least $70 million or 5 percent of the book value of the assets of the acquiring firm.
4. Either the acquiring or the acquired firm must have had outstanding a class of senior securities that was publicly traded on the date in which the announcement of the impending merger appeared in the *Wall Street Journal*.
5. The senior securities had to be actively traded around the initial announcement date of the merger. To be precise, to be included in the sample, a security had to trade at least once over a sixteen-day period beginning fifteen trading days prior to the day on which the announcement of the

merger appeared in the *Wall Street Journal* and ending on the day on which the announcement appeared. And, the security had to trade at least once over a twelve-day period beginning the first trading day after the announcement appeared in the *Journal* and ending twelve trading days later.

6. The common stock of an acquiring or an acquired firm was included only if the firm also had outstanding an actively traded senior security.

These criteria were used to screen the sample to increase the likelihood that any valuation effects associated with the merger would be detectable in security prices. In this, as in most other 'event' studies, there is a presumption that much of the significant information concerning the event in question is impounded in security prices at a single point in time. For this reason, we only include mergers for which it is possible to identify a reliable initial announcement data. This does not mean that valuation effects are absent from mergers in which it is not possible to identify an initial announcement date, but our tests are less likely to detect valuation effects in those cases. For similar reasons, acquiring firms are omitted if the acquired firm is small relative to the acquiring firm. That is, there may well be a valuation effect when a relatively large firm acquires a relatively small one, but the valuation effects may be similarly small and our statistical procedures may not be sufficiently powerful to detect them. Finally, because a major focus of this paper is the effect of a merger on the value of the merging firms' senior securities, we only include a firm if it had publicly and actively traded senior securities outstanding around the initial date of the merger announcement. Again, this does not mean that valuation effects are not present when senior securities are not publicly traded, it means only that our tests will not detect them.

Despite our efforts to select a sample that increases the likelihood of discovering any valuation effects associated with a merger, it is still probable that any valuation effect we do discover will be a downward biased estimate of the 'true' valuation effect. This is true because there is likely to be some leakage of information (at least in some cases) prior to the initial announcement and because all uncertainty regarding the outcome of a proposed merger is not resolved at the initial announcement date [Asquith (1983)].

For firms in the sample, publicly traded debt and preferred stock issues were identified from the *Commercial and Financial Chronicle*, Standard and Poor's *Bond Guide* and Standard and Poor's *Security Owner's Stock Guide*. For each of the senior securities in the sample, closing prices were obtained for each day on which trading occurred during a period of twenty-nine days beginning sixteen days before the announcement date and ending twelve days after the announcement date. For bonds, closing prices were obtained from the *Wall Street Journal*. For preferred stocks, closing prices were obtained from the Standard and Poor's *NYSE*, *ASE*, and *OTC Daily Stock Price Record*. These prices were used to calculate daily rates of return for each of the senior

Table 1

Number of common stocks and convertible and non-convertible senior securities of acquired and acquiring companies in the sample of 132 mergers over the period 1962–1980.

	Sample size			
	Acquiring (94 firms represented in the sample)		Acquired (81 firms represented in the sample)	
Type of security	Firms	Securities	Firms	Securities
Common stock	90	90	76	76
Convertible preferred stock	41	70	22	25
Convertible bonds	30	33	36	40
Non-convertible preferred stock	26	32	19	21
Non-convertible bonds	39	67	21	27

securities in the sample. Bond rates of return were computed to include daily accrued interest. Preferred stock rates of return include dividend payments on the ex-dividend day. The amounts and dates of dividend and interest payments were obtained from the Standard and Poor's *Daily Stock Price Records* and Standard and Poor's *Bond Guide*.

For those firms in the sample whose common stocks were traded on the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX) around the date of the merger announcement, daily rates of return were taken from the CRSP daily returns file. If a common stock was not traded on the NYSE or the AMEX, the common stock is not included in the analysis that follows even though the firm's senior security is included.

In conducting the tests that follow, two adjustments are made to the data. First, in several cases a merging firm has more than one issue of a class of senior securities outstanding. In those instances, the returns for the two securities are averaged and treated as a single observation for a single security.[4] Second, if a security does not trade on a given day, that day is treated as a missing observation and a return is computed for the next day on which the security does trade.

Table 1 is a frequency distribution of the firms and securities in the sample. The final sample includes securities of firms involved in 132 mergers. The sample includes at least one class of senior securities of 81 acquired firms and 94 acquiring firms. Of the 132 mergers, there are 42 in which a senior security of both the acquired and acquiring firm is included in the sample. Of the 81

[4]For example, if a merging company has outstanding two issues of convertible preferred stock, the returns for the two securities are averaged and treated as a single observation. This procedure minimizes the possibility that the results will be unduly influenced by one firm with multiple securities and it reduces the contemporaneous correlation among observations.

acquired firms, 22 have at least one convertible preferred stock in the sample, 36 have at least one convertible bond, 19 have at least one non-convertible preferred stock, and 21 have at least one non-convertible bond in the sample. Because some companies have multiple issues of senior securities outstanding there are more securities than firms. Thus, the sample includes 25 issues of convertible preferred stock, 40 issues of convertible bonds, 21 issues of convertible preferred stock, and 27 issues of non-convertible bonds issued by acquired firms.

Of the acquiring firms, 41 have at least one convertible preferred stock in the sample, 30 have at least one convertible bond, 26 have at least one non-convertible preferred stock, and 39 have at least one non-convertible bond in the sample. The sample includes 70 convertible preferred stocks, 33 convertible bonds, 32 non-convertible preferred stocks, and 67 non-convertible bonds issued by acquiring firms.

Finally, the sample includes the common stock of 76 acquired companies and 90 acquiring companies. The common stocks of five acquired companies and four acquiring companies are not included in the sample because they were not listed on either the NYSE or the AMEX at the time of the merger announcement.

3. Empirical methodology

To assess the effect of merger announcements on security prices, each class of securities for both acquired and acquiring companies is formed into a portfolio and cross-sectional average daily rates of return are analyzed. Thus, five portfolios are formed for acquired companies and five portfolios are formed for acquiring companies – one portfolio each for common stock, convertible preferred stock, convertible debt, non-convertible preferred stock, and non-convertible debt.

Two approaches have been widely used to analyze security returns in event studies. One approach is the comparison period or mean-adjusted returns procedure developed by Masulis (1980). Implementation of the mean-adjusted returns procedure requires that a time series mean security return be estimated over a time period during which security returns are presumed to be unaffected by information regarding the event in question. Security returns during the 'event period' are then compared with the 'normal' mean return and any difference between the comparison period mean return and the event period return is labelled the 'abnormal' return due to the event in question. The drawback to using the mean-adjusted returns procedure in this study is that a number of prior investigations have indicated that leakage of information may influence security returns of firms involved in mergers for as much as 60 days or more prior to the merger announcement. Thus, returns over that period may yield a biased estimate of a normal mean return.

An alternative methodology is the market-adjusted returns procedure. Implementation of the market-adjusted returns procedure involves a comparison of security returns during the event period with the return of an appropriate (risk-adjusted) market index. Any difference between the security return and the (risk-adjusted) market return is labelled the abnormal or excess return due to the event in question. The drawback to using the market-adjusted returns procedure for this study is that the appropriate market index to use for analyzing returns for the various classes of senior securities is not clear.

Both procedures are employed in the statistical analysis that follow. For convenience we have chosen to report and discuss the results based upon the market-adjusted returns procedure. However, both methodologies yielded similar results.[5]

The market-adjusted returns procedure is implemented as follows. For each security, daily market-adjusted returns are calculated as

$$MAR_{jt} = R_{jt} - R_{mt}, \tag{1}$$

where R_{jt} is the raw return of security j on event day t and R_{mt} is the return of an appropriate market index on the same calendar day. In event time, the day on which a merger announcement appears in the *Wall Street Journal* is numbered event day 0. Trading days prior to the merger announcement are numbered event days -1, -2, and so on, and event days following the merger announcement are numbered event days $+1$, $+2$, and so on. The market index used in the analysis of common stock returns, convertible preferred stock returns, and convertible bond returns is the value-weighted index of NYSE and AMEX stocks taken from the CRSP daily returns tape. The market index used in the analysis of non-convertible preferred stocks and non-convertible bond returns is the Dow-Jones Industrial Bond Index taken from the *Wall Street Journal*.[6]

[5] The results are similar, but not identical. For senior securities the comparison period used to compute the average 'normal' return encompasses the period beginning fifteen days prior to the merger announcement and ending five days prior to the merger announcement and the period beginning four days after the merger announcement and ending twelve days after the announcement. In three samples leakage of information prior to the announcement date appears to have affected security returns over the comparison period. In those samples, the comparison period mean appears to be an upward biased measure of the 'normal' daily return. This 'bias' reduced the magnitude of 'excess' security returns around the merger announcement date, but the ability to reject (or not reject) the null hypothesis appeared to be unaffected. That is, in those cases in which the market-adjusted returns procedure leads to statistical rejection of the null hypothesis, the mean adjusted returns procedure also permitted rejection of the null hypothesis.

[6] Brown and Warner (1985) conduct simulations with daily returns and conclude that the market model procedure, the market-adjusted returns procedure and the comparison period procedure have approximately equal power in rejecting the null hypothesis when it is false. With our data it is not possible to estimate the market model for senior securities, although we could use this procedure for common stocks. For consistency we have chosen to employ the market-adjusted returns procedure and the comparison period procedure for all samples.

As noted previously, in many cases senior securities (and occasionally common stocks) do not trade every day so that the daily return on the day on which the security does trade is actually a multiple-day return. In those cases, a multiple day market return is also computed as

$$R_{mt} = (1 + R_{mt})(1 + R_{mt-1}) \ldots (1 + R_{mt-i}) - 1, \tag{2}$$

where i is the number of trading days between event day t and the last previous trade in security j and the multiple-day market return calculated by eq. (2) is used in eq. (1) in calculating daily market-adjusted returns.

The calculations in eq. (1) yield a time series of market-adjusted returns for each security. If a security did not trade on a particular event day, the time series contains a zero for that day. Cross-sectional average daily market-adjusted returns are then computed for each class of securities as

$$\overline{MAR}_t = \sum_{j=1}^{N} MAR_{jt}/N_t, \tag{3}$$

where N is the number of securities in the sample and N_t is the number of securities that traded on event day t (i.e., N_t is the number of valid observations on event day t).[7] Additionally, cross-sectional average market-adjusted returns are summed to yield a cumulative market-adjusted return for event day t as

$$CMAR_t = \sum_{t-T}^{t} \overline{MAR}_k, \tag{4}$$

where T is some number of event days prior to day t.

To test the null hypothesis that the average daily market-adjusted return on event day t is equal to zero, a t-statistic is computed as

$$t = \overline{MAR}_t / \left(\sigma_t \sqrt{N_t} \right), \tag{5}$$

where

$$\sigma_t = \left[\sum_{j=1}^{N} MAR_{tj}^2 - \frac{1}{N_t} \left(\sum_{j=1}^{N} MAR_{tj} \right)^2 \right]^{1/2} \tag{6}$$

[7]We note again that in this context the number of securities actually refers to the number of firms having securities in the sample because returns of multiple securities issued by the same firm are averaged and treated as a single security with a single return.

is the cross-sectional standard deviation of market-adjusted returns on event day t. It is common to refer to the two-day interval encompassing days -1 and 0 as the announcement period. Day 0 is the *Wall Street Journal* publication day, but the announcement may actually have occurred on the prior day. To analyze this two-day announcement period return, the day -1 and day 0 market-adjusted returns are summed for each security and a t-statistic is calculated according to eqs. (5) and (6). Under the null hypothesis of no abnormal security performance, t is distributed according to the t-distribution with $N_t - 1$ degrees of freedom.

To test the null hypothesis that the $CMAR$ over an interval of T days in length is equal to zero, a t-statistic is computed as

$$t_T = CMAR_T / \left(\sigma_T \sqrt{T}\right), \tag{7}$$

where

$$\sigma_T = \left[\left(\sum_{t-T}^{t} \left(\overline{MAR}_k - \frac{CMAR_T}{T} \right)^2 \right) \Big/ T \right]^{1/2},$$

where T is some number of event days prior to event day t and $CMAR_T$ is the cumulative market-adjusted return over the T-day interval beginning with event day $t - T$ and ending with event day t. Under the null hypothesis of no abnormal performance t_T is distributed unit normal with T degrees of freedom.

4. Results

We first present the results of the statistical analysis of the daily rates of return for the various classes of securities of the acquired and acquiring companies. The daily returns are then converted to changes in the dollar market values of the various classes of securities in the samples and a statistical analysis of the dollar value changes is presented.

In the following subsections, tables 2 through 13 present the analysis of the daily rates of return. The tables are divided into two panels. In panel A, column 1 identifies each event day relative to event day 0, column 2 contains average daily raw returns, column 3 gives the number of valid security returns on each event day, column 4 presents the average daily market index returns, column 5 presents average daily market-adjusted returns (MAR's), column 6 gives the cumulative market-adjusted returns ($CMAR$'s), and column 7 shows the percentage of daily security returns that are greater than the market index

return on each event day.[8] Panel B presents cumulative market-adjusted returns for various time intervals preceding the merger announcement date along with their corresponding t-statistics. Panel B also presents a 'total announcement period raw return' which we describe later.

4.1. Daily rates of return for acquired companies' securities

Table 2 presents results for acquired companies' common stocks. The market-adjusted returns (MAR's) on days -1 and 0 are 4.50% and 4.06%, respectively. With t-statistics of 4.04 and 4.52, respectively, the null hypothesis of no abnormal return can be rejected at the 0.01 level of significance for each day. The two-day announcement period MAR of 8.56% has a t-statistic of 7.07 which also allows rejection of the null hypothesis at the 0.01 level of significance. Cumulative market-adjusted returns ($CMAR$'s) calculated over other intervals prior to, including and following the announcement period are consistent with those calculated over the announcement period. Over the interval beginning with event day $t = -19$ and ending with event day $t = 0$ the $CMAR$ is 16.67%; over the interval $t = -6$ through $t = 0$ the $CMAR$ is 13.33%; and over the interval $t = -6$ through $t = +6$ the $CMAR$ is 13.74%. For each interval the null hypothesis of no effect can be rejected at the 0.05 level of significance. The t-statistics are 2.86, 3.17, and 2.54, respectively. Additionally, there appears to be some leakage of information prior to the announcement date. Over the interval $t = -19$ through $t = -2$ the $CMAR$ is 8.11% with a t-statistic of 3.00 which allows rejection of the null hypothesis at the 0.01 level of significance. Given the results of prior studies these results are not surprising: Common stockholders of acquired firms gain in mergers.

Results for convertible preferred stocks are presented in table 3 and results for convertible bonds are presented in table 4. In both cases the results are similar to those for common stocks.

For convertible preferred stocks the day -1 and day 0 market-adjusted returns (MAR's) are 3.85% ($t = 1.40$) and 4.31% ($t = 4.08$), respectively. The magnitudes of the MAR's are similar to those for common stocks, but, because of the smaller sample sizes, the t-statistics are somewhat lower. Nevertheless, the t-statistic for the two-day announcement period MAR is 3.43 which easily allows rejection of the null hypothesis at the 0.01 level of significance. One difference between the convertible preferred stock returns and the common

[8] The percentage of daily security returns which exceed the market index on each event day is presented primarily to complete the set of information regarding security performance. Statistical tests of the null hypothesis that the percentage of daily security returns which exceeded the market index return was not greater than 50% were also conducted. However, the results of the tests are generally consistent with the t-statistics reported and discussed in the text so a formal discussion of these tests has been omitted. Nevertheless, given the data in the tables, the interested reader could independently conduct such a test.

Table 2

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 76 acquired companies' common stocks over the period 1962–1980.

A. Time Series of Daily Returns

(1) Event day	(2) Average raw return (%)	(3) Number of observations	(4) Average market index return (%)	(5) Average market-adjusted return (%)	(6) Cumulative market-adjusted return (%)	(7) Percentage of returns greater than market index return
−19	0.56	76	−0.01	0.56	0.56	57.9
−18	0.59	76	0.03	0.55	1.11	59.2
−17	−0.03	76	−0.01	−0.01	1.10	48.7
−16	0.26	76	0.05	0.21	1.31	55.3
−15	−0.79	76	0.10	−0.89	0.42	35.5
−14	0.10	76	0.01	0.09	0.52	50.0
−13	0.35	76	−0.01	0.36	0.88	57.9
−12	0.52	76	0.08	0.44	1.32	59.2
−11	0.25	76	0.01	0.24	1.56	54.0
−10	0.16	76	0.03	0.13	1.69	52.6
−9	1.67	75	0.00	1.67	3.37	54.7
−8	0.14	76	0.12	0.02	3.38	46.1
−7	−0.01	76	0.03	−0.04	3.34	46.1
−6	0.59	76	−0.01	0.60	3.94	54.0
−5	0.69	76	0.09	0.60	4.55	46.1
−4	0.45	76	0.20	0.25	4.80	48.7
−3	1.54	76	−0.02	1.56	6.36	68.4
−2	1.79	74	0.03	1.75	8.11	62.2
−1	4.57	72	0.07	4.50	12.61	69.4
0	3.96	75	−0.10	4.06	16.67	70.7
+1	0.52	76	−0.05	0.58	17.25	48.7
+2	−0.32	76	0.03	−0.36	16.89	48.7
+3	−0.09	76	0.15	−0.23	16.66	44.7
+4	0.31	76	−0.04	0.35	17.00	56.6
+5	−0.11	76	−0.09	−0.02	16.98	42.1
+6	0.21	75	0.11	0.10	17.08	52.0
+7	0.29	76	0.14	0.15	17.23	52.6
+8	−0.03	76	0.12	−0.15	17.08	44.7
+9	0.47	76	0.07	0.40	17.48	48.7
+10	0.20	76	0.09	0.11	17.59	54.0
+11	−0.07	76	0.07	−0.14	17.45	57.9
+12	0.66	76	−0.01	0.67	18.12	64.5
+13	−0.06	76	−0.01	−0.06	18.07	52.6
+14	0.47	76	0.02	0.44	18.51	46.1
+15	0.40	76	0.07	0.32	18.84	55.3
+16	0.36	76	0.10	0.27	19.11	55.3
+17	−0.25	76	0.09	−0.34	18.77	47.4
+18	−0.23	76	0.00	−0.23	18.54	48.7
+19	0.00	76	−0.05	0.05	18.58	51.3
+20	0.17	76	0.12	0.05	18.63	48.7

B. Summary Statistics of Daily Returns

Number of securities in the sample = 76
Number of firms in the sample = 76

Cumulative market-adjusted returns:

Day −19 through day −2	= 8.11%;	*t*-statistic = 3.00
Day −19 through day 0	= 16.67%;	*t*-statistic = 2.86
Day −6 through day 0	= 13.33%;	*t*-statistic = 3.17
Day −1 through day 0	= 8.56%;	*t*-statistic = 7.07
Day −1	= 4.50%;	*t*-statistic = 4.04
Day 0	= 4.06%;	*t*-statistic = 4.52
Day −6 through day +6	= 13.74%;	*t*-statistic = 2.54
Total announcement period raw return	= 8.84%;	*t*-statistic = 6.63

Table 3

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 22 acquired companies' convertible preferred stocks over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	−0.61	12	0.20	−0.81	−0.81	41.6
−14	0.08	13	0.01	0.07	−0.74	38.4
−13	0.97	13	−0.29	1.26	0.53	61.5
−12	−1.18	14	0.15	−1.33	−0.81	28.5
−11	0.01	14	0.01	−0.01	−0.81	50.0
−10	0.42	14	−0.07	0.49	−0.32	64.2
−9	0.69	15	−0.23	0.92	0.60	46.6
−8	−0.36	14	0.53	−0.89	−0.29	28.5
−7	−0.75	14	0.10	−0.85	−1.13	35.7
−6	0.21	14	−0.16	0.36	−0.77	64.2
−5	−0.47	11	−0.03	−0.44	−1.21	27.2
−4	1.12	14	0.11	1.01	−0.20	50.0
−3	0.81	13	−0.26	1.07	0.87	69.2
−2	1.12	15	−0.07	1.19	2.06	60.0
−1	3.92	14	0.06	3.85	5.91	57.1
0	4.37	20	0.07	4.31	10.22	80.0
+1	1.02	16	0.00	1.01	11.23	50.0
+2	−0.12	16	0.02	−0.14	11.10	43.7
+3	0.13	17	0.19	−0.05	11.04	29.4
+4	0.39	17	0.18	0.22	11.26	58.8
+5	−0.74	16	−0.22	−0.52	10.74	56.2
+6	−0.01	15	0.12	−0.12	10.62	46.6
+7	−0.69	15	0.31	−1.00	9.62	46.6
+8	0.21	13	−0.22	0.43	10.05	53.8
+9	−0.19	14	0.24	−0.42	9.62	28.5
+10	−0.00	13	0.12	−0.12	9.50	76.9
+11	−0.20	14	−0.04	−0.15	9.35	35.7
+12	0.82	12	0.23	0.58	9.93	50.0

B. Summary Statistics of Daily Returns

Number of securities in the sample = 25
Number of firms in the sample = 22

Cumulative market-adjusted returns:

Day −15 through day −2	= 2.06%;	t-statistic = 0.64
Day −15 through day 0	= 10.22%;	t-statistic = 1.67
Day −6 through day 0	= 11.35%;	t-statistic = 2.61
Day −1 through day 0	= 8.16%;	t-statistic = 3.43
Day −1	= 3.85%;	t-statistic = 1.40
Day 0	= 4.31%;	t-statistic = 4.08
Day −6 through day +6	= 11.75%;	t-statistic = 2.22

Total announcement period raw return = 5.99%; t-statistic = 2.55

Table 4

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 36 acquired companies' convertible bonds over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	0.24	18	0.32	−0.08	−0.08	38.8
−14	0.31	23	0.18	0.13	0.06	39.1
−13	0.22	20	0.15	0.07	0.12	45.0
−12	0.33	23	−0.03	0.35	0.48	56.5
−11	0.02	24	−0.05	0.08	0.55	45.8
−10	0.67	24	−0.04	0.71	1.26	54.1
−9	0.63	24	0.19	0.44	1.70	54.1
−8	−0.26	23	−0.13	−0.12	1.58	47.8
−7	0.47	22	−0.07	0.54	2.11	77.2
−6	0.40	27	0.09	0.31	2.42	48.1
−5	0.85	24	−0.05	0.90	3.32	62.5
−4	0.62	25	0.47	0.15	3.47	48.0
−3	1.52	23	−0.00	1.52	4.99	60.8
−2	0.68	23	0.12	0.56	5.56	56.5
−1	2.94	27	−0.06	3.00	8.56	74.0
0	3.01	32	0.33	2.69	11.25	62.5
+1	0.06	32	0.03	0.03	11.28	43.7
+2	−0.31	24	0.03	−0.34	10.94	41.6
+3	−0.15	28	0.21	−0.36	10.58	35.7
+4	0.21	26	0.07	0.14	10.73	53.8
+5	0.12	25	−0.07	0.18	10.91	44.0
+6	0.43	27	0.31	0.12	11.03	48.1
+7	0.15	26	−0.03	0.18	11.21	50.0
+8	−0.32	24	0.13	−0.45	10.76	33.3
+9	0.58	29	0.12	0.46	11.22	55.1
+10	0.18	25	−0.00	0.18	11.41	52.0
+11	−0.06	25	−0.06	0.00	11.41	56.0
+12	0.29	25	0.03	0.26	11.67	64.0

B. Summary Statistics of Daily Returns

Number of securities in the sample = 40
Number of firms in the sample = 36

Cumulative market-adjusted returns:

Day −15 through day −2	= 5.56%;	t-statistic = 3.51
Day −15 through day 0	= 11.25%;	t-statistic = 3.11
Day −6 through day 0	= 9.13%;	t-statistic = 3.25
Day −1 through day 0	= 5.69%;	t-statistic = 4.61
Day −1	= 3.00%;	t-statistic = 3.73
Day 0	= 2.69%;	t-statistic = 2.07
Day −6 through day +6	= 8.92%;	t-statistic = 2.38

Total announcement period raw return = 5.12%; t-statistic = 4.04

stock returns is that the convertible preferred stock data do not exhibit an information leakage effect prior to about day −4. By day −4 the *CMAR* is only −0.20%. Over the period $t = -15$ through $t = -2$ the *CMAR* is only 2.06%. With a *t*-statistic of 0.64 this amount is not statistically different from zero at the 0.05 level of significance. Thus, for this sample, most of the abnormal performance occurs over the time interval immediately surrounding the announcement period. For example, the *CMAR* over the period $t = -6$ through $t = 0$ is 11.35% ($t = 2.61$) and over the interval $t = -6$ through $t = +6$ the CMAR is 11.75% ($t = 2.22$).

One further statistic was computed for this (and other senior security) sample(s). Senior securities tend not to trade on a daily basis. Thus, the two-day announcement period return does not reflect any announcement effect for securities that do not trade during the two-day announcement period. To obtain a return that captures an announcement effect for each security, a 'total announcement period raw return' was computed for each security based on the last trade prior to event day $t = -1$ and the closing price on the day of the first trade following event day $t = 0$. The average of these total announcement period raw returns is reported in panel B of the various tables along with its corresponding *t*-statistic. For the convertible preferred stock sample, the total announcement period raw return is 5.99% with a *t*-statistic of 2.55.

For convertible bonds the day −1 and day 0 *MAR*'s are 3.00% ($t = 3.73$) and 2.69% ($t = 2.07$), respectively. The two-day announcement period *MAR* is 5.69% with a *t*-statistic of 4.61. Over the interval $t = -15$ through $t = 0$ the *CMAR* is 11.25% ($t = 3.11$); over the interval $t = -6$ through $t = 0$ the *CMAR* is 9.13% ($t = 3.25$); and over the interval $t = -6$ through $t = +6$ the *CMAR* is 8.92% ($t = 2.38$). As with common stocks, convertible bonds appear to exhibit an information leakage effect. Over the interval $t = -15$ through $t = -2$ the *CMAR* is 5.56% ($t = 3.51$). Finally, the total announcement period raw return is 5.12% with a *t*-statistic of 4.04. Thus, each of these various statistics permits rejection of the null hypothesis of no effect at least at the 0.05 level of significance. Overall, then, the daily rates of return indicate that both classes of acquired companies' convertible senior securityholders gain in merger.

The results for acquired companies' non-convertible senior securities are presented in tables 5, 6 and 7. As with the three classes of securities analyzed so far, the non-convertible preferred stocks indicate positive abnormal performance around the merger announcement date, but the results for the non-convertible bonds do not.

For non-convertible preferred stocks the day −1, the day 0 and two-day announcement period market-adjusted returns are 0.20%, 3.62% and 3.82% with *t*-statistics of 0.17, 3.36 and 2.10, respectively. Thus, the day 0 and the two-day *MAR*'s permit rejection of the null hypothesis at the 0.01 and 0.05 level of significance, respectively.

As with other samples of acquired companies' securities, there appears to be an information leakage effect prior to the merger announcement day. Over the

Table 5

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 19 acquired companies' non-convertible preferred stocks over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	−0.15	12	−0.02	−0.13	−0.13	58.3
−14	−0.14	11	0.02	−0.17	−0.30	36.3
−13	0.36	13	0.01	0.36	0.06	53.8
−12	0.58	13	−0.01	0.59	0.65	61.5
−11	0.15	12	0.16	−0.01	0.63	58.3
−10	0.28	13	−0.00	0.28	0.91	53.8
−9	0.28	12	−0.03	0.31	1.23	58.3
−8	0.16	13	0.02	0.13	1.36	76.9
−7	0.43	15	0.03	0.40	1.77	66.6
−6	0.19	14	−0.03	0.22	1.98	64.2
−5	−0.22	15	−0.03	−0.20	1.79	40.0
−4	2.27	15	0.04	2.23	4.01	66.6
−3	−0.15	11	−0.06	−0.09	3.92	54.5
−2	1.29	9	0.10	1.19	5.11	66.6
−1	0.14	15	−0.06	0.20	5.31	60.0
0	3.65	16	0.03	3.62	8.93	75.0
+1	2.41	17	−0.03	2.44	11.37	70.5
+2	0.85	14	−0.00	0.85	12.22	57.1
+3	3.07	15	−0.04	3.10	15.33	73.3
+4	−0.16	11	−0.09	−0.07	15.25	54.5
+5	−0.55	14	0.08	−0.63	14.63	28.5
+6	0.06	14	−0.06	0.11	14.74	57.1
+7	−0.06	16	−0.18	0.11	14.85	68.7
+8	0.22	12	0.12	0.09	14.94	58.3
+9	0.48	11	−0.01	0.48	15.43	54.5
+10	0.33	12	−0.02	0.35	15.78	58.3
+11	0.00	13	−0.00	0.00	15.78	38.4
+12	−0.09	9	0.05	−0.14	15.64	44.4

B. Summary Statistics of Daily Returns

Number of securities in the sample = 21
Number of firms in the sample = 19

Cumulative market-adjusted returns:

Day −15 through day −2	= 5.11%;	t-statistic = 2.18
Day −15 through day 0	= 8.93%;	t-statistic = 2.27
Day −6 through day 0	= 7.17%;	t-statistic = 2.04
Day −1 through day 0	= 3.82%;	t-statistic = 2.10
Day −1	= 0.20%;	t-statistic = 0.17
Day 0	= 3.62%;	t-statistic = 3.36
Day −6 through day +6	= 12.97%;	t-statistic = 2.68

Total announcement period raw return = 4.97%; t-statistic = 2.21

Table 6

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 21 acquired companies' non-convertible bonds over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	.23	9	−0.02	0.25	0.25	66.7
−14	0.40	9	0.02	0.39	0.63	66.6
−13	−0.07	9	−0.03	−0.04	0.59	66.6
−12	0.02	9	0.17	−0.14	0.45	44.4
−11	0.08	6	0.14	−0.05	0.39	50.0
−10	0.16	10	0.08	0.08	0.47	40.0
−9	−0.43	12	−0.05	−0.38	0.09	33.3
−8	−0.30	9	−0.09	−0.21	−0.12	44.4
−7	0.51	11	0.06	0.45	0.33	45.4
−6	−0.31	12	0.01	−0.32	0.01	33.3
−5	−0.24	9	0.04	−0.28	−0.27	55.5
−4	0.01	12	0.02	−0.00	−0.27	41.6
−3	−0.09	9	0.06	−0.14	−0.42	44.4
−2	0.11	8	−0.04	0.15	−0.27	62.5
−1	−0.05	13	0.16	−0.21	−0.48	53.8
0	0.43	14	0.19	0.24	−0.24	78.5
+1	0.56	12	0.09	0.48	0.24	75.0
−2	−0.05	13	0.03	−0.08	0.17	53.8
+3	0.34	11	−0.09	0.43	0.59	81.8
+4	−0.60	8	−0.17	−0.43	0.17	37.5
+5	−0.20	15	−0.04	−0.17	−0.00	40.0
+6	−0.03	14	−0.08	0.05	0.05	57.1
+7	0.26	13	−0.04	0.31	0.36	69.2
+8	−0.26	10	−0.19	−0.07	0.29	40.0
+9	0.23	10	0.21	0.03	0.32	30.0
+10	0.33	12	−0.11	0.44	0.76	75.0
+11	−0.25	11	−0.05	−0.20	0.56	27.2
+12	0.05	10	0.09	−0.04	0.52	70.0

B. Summary Statistics of Daily Returns

Number of securities in the sample = 27
Number of firms in the sample = 21

Cumulative market-adjusted returns:

Day −15 through day −2	= −0.27%;	t-statistic = −0.29
Day −15 through day 0	= −0.24%;	t-statistic = −0.24
Day −6 through day 0	= −0.56%;	t-statistic = −1.06
Day −1 through day 0	= 0.03%;	t-statistic = 0.08
Day −1	= −0.21%;	t-statistic = −0.68
Day 0	= 0.24%;	t-statistic = 0.78
Day −6 through day +6	= −0.28%;	t-statistic = −0.29

Total announcement period raw return = 0.35%; t-statistic = 1.25

Table 7

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 15 acquired companies' non-convertible bonds with ratings BBB or below over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	0.31	8	−0.05	0.36	0.36	87.5
−14	0.40	9	−0.05	0.45	0.81	66.6
−13	−0.52	7	−0.04	−0.47	0.34	28.5
−12	0.02	9	0.21	−0.19	0.15	44.4
−11	0.08	6	−0.00	0.09	0.24	50.0
−10	0.33	9	0.07	0.26	0.49	44.4
−9	−0.25	10	0.06	−0.30	0.19	50.0
−8	−0.31	8	−0.05	−0.26	−0.07	50.0
−7	0.51	11	0.01	0.50	0.43	54.5
−6	−0.29	11	0.02	−0.32	0.11	45.4
−5	0.14	8	0.11	0.03	0.15	37.5
−4	0.01	12	−0.01	0.02	0.17	41.6
−3	0.10	9	0.12	−0.02	0.15	33.3
−2	0.11	8	0.02	0.09	0.24	75.0
−1	0.08	11	0.18	−0.09	0.14	54.5
0	0.37	12	−0.07	0.45	0.59	83.3
+1	0.58	10	0.06	0.52	1.11	60.0
+2	−0.06	11	0.10	−0.16	0.95	45.4
+3	0.34	11	−0.10	0.44	1.39	72.7
+4	−0.83	6	−0.04	−0.79	0.60	50.0
+5	−0.22	12	−0.01	−0.20	0.40	41.6
+6	−0.04	12	−0.08	0.05	0.44	66.6
+7	−0.01	11	−0.06	0.05	0.49	54.5
+8	−0.30	9	−0.20	−0.10	0.39	33.3
+9	0.26	9	0.01	0.25	0.64	33.3
+10	0.26	11	−0.05	0.31	0.95	63.6
+11	−0.13	9	−0.02	−0.11	0.85	33.3
+12	0.06	9	0.18	−0.12	0.73	55.5

B. Summary Statistics of Daily Returns

Number of securities in the sample = 19
Number of firms in the sample = 15

Cumulative market-adjusted returns:

Day −15 through day −2	= 0.24%;	*t*-statistic = 0.22
Day −15 through day 0	= 0.59%;	*t*-statistic = 0.35
Day −6 through day 0	= 0.16%;	*t*-statistic = 0.28
Day −1 through day 0	= 0.35%;	*t*-statistic = 0.89
Day −1	= −0.09%;	*t*-statistic = −0.33
Day 0	= 0.45%;	*t*-statistic = 1.90
Day −6 through day +6	= 0.01%;	*t*-statistic = 0.74

Total announcement period raw return = 0.48%; *t*-statistic = 1.43

period $t = -15$ to $t = -2$ the cumulative market-adjusted return is 5.11% ($t = 2.18$). There are also some peculiarly high returns immediately following the merger announcements. On days $+1$, $+2$ and $+3$ the average raw returns are 2.41%, 0.85% and 3.07%, respectively. These relatively large post-announcement returns could be due to the fact that some of the securities in the sample did not trade during the two-day announcement period. The total announcement period raw return lends some credence to this conjecture. The total announcement period raw return is 4.97% which is 1.15% greater than the two-day announcement period raw return. The t-statistic for the total announcement period raw return permits rejection of the null hypothesis at the 0.05 level of significance ($t = 2.21$). The large post-announcement returns also show up in the *CMAR* over the interval $t = -6$ through $t = +6$. Over this interval, the *CMAR* is 12.97% which, with a t-statistic of 2.68, is significantly different from zero at the 0.01 level.

For non-convertible bonds the day -1, the day 0 and the two-day market-adjusted returns are -0.21%, 0.24% and 0.03%, respectively, with t-statistics of -0.68, 0.78 and 0.08. Additionally, over the period $t = -15$ through $t = 0$ the *CMAR* is -0.24% ($t = -0.24$). Over the period $t = -6$ through $t = 0$ the *CMAR* is -0.56% ($t = -1.06$). Thus, none of these statistics permit rejection of the null hypothesis at even the 0.10 level of significance. As with the non-convertible preferred stock sample, the day $+1$ raw return is relatively large. The day $+1$ raw return of 0.56% is the largest daily average return over the period examined. Some of this return appears to be due to non-trading during the announcement period, because the total announcement period raw return is 0.35%. However, with a t-statistic of 1.25, even this return does not permit rejection of the null hypothesis at any reasonable level of significance. Similarly, the *CMAR* over the interval $t = -6$ through $t = +6$ is -0.28% ($t = -0.29$). Thus, none of these results indicate that non-convertible bondholders of acquired companies earn statistically significant abnormal rates of return around the dates of merger announcements.

A merger will have a positive effect on the value of non-convertible bonds (or any senior security) only if the merger reduces the probability of default of future interest and principal payments on the security. To the extent that the bonds in the sample were nearly default-free prior to the merger, there would be no positive abnormal performance due to the merger. Thus, any positive wealth effect is more likely to be manifest in the returns of the relatively risky bonds. To consider this issue, bonds rated AAA, AA, and A were deleted from the non-convertible bond sample and the various statistics were recomputed. The results for this smaller subsample – the number of securities is 19 and the number of firms is 15 – are reported in table 7.

The results indicate a slightly different effect for this riskier bond sample. Specifically, each of the *MAR*'s and *CMAR*'s is more positive for this subsample than for the full sample. The day -1, the day 0 and the two-day

announcement period *MAR*'s are −0.09%, 0.45% and 0.35% with corresponding *t*-statistics of −0.33, 1.90 and 0.89. The *CMAR* over the interval $t = -15$ through $t = 0$ is 0.59% ($t = 0.35$); the *CMAR* over the interval $t = -6$ through $t = 0$ is 0.16% ($t = 0.28$); the *CMAR* over the interval $t = -6$ through $t = +6$ is 0.01% ($t = 0.74$); and the total announcement period raw return is 0.48% ($t = 1.43$). Of these returns, only the announcement day *MAR* is different from zero at the 0.10 level of significance. Thus, while there is some evidence that non-convertible bondholders of acquired companies gain in merger, the evidence is weak. Furthermore, if non-convertible bondholders of acquired companies do gain, the gains are not pervasive nor are they very large.

In sum, the daily rate of return data indicate that common stockholders are not the only class of acquired companies' securityholders to gain in merger. On average, gains are also earned by convertible and non-convertible preferred stockholders and convertible bondholders.

4.2. Treatment of acquired companies' senior securities in merger

Because of the significant gains to common stockholders that are documented in this and previous studies, the significant wealth increases received by convertible senior securityholders are more reassuring than surprising. However, because of the lack of significant returns to non-convertible bonds documented here and in previous studies, the significant returns earned by non-convertible preferred stocks are somewhat more surprising.

The explanation of the differential effect of merger announcements on the various classes of senior securities may lie in the differential treatment accorded them in the final terms of the merger. When a merger is announced and the market price of the common stock of the acquired company increases, presumably the convertibility feature will lead to an increase in the market price of the convertible securities as well. However, it is the final terms of the merger agreement that ultimately determine the market value of the convertible security. As a result of the merger, the common stock of the acquired firm will disappear. As a consequence, the acquired companies' convertible securities must be retired for cash or by means of an exchange offer for a class of securities of the acquiring company.

To determine the fate of each class of securities, we examined the terms of the mergers in the sample. For the sample of convertible preferred stocks of acquired companies, eight were exchanged for a class of convertible preferred stock of the acquiring company, four were exchanged for the common stock of the acquiring company, one was redeemed for cash, and the remainder were exchanged for some combination of common stock, preferred stock, debentures, warrants, and cash. For the sample of acquired firms' convertible bonds, fifteen were exchanged for a new convertible bond issue of the acquiring company, six were redeemed for cash and the remainder were exchanged for

some combination of common stock, preferred stock, convertible bonds, and cash.

Similarly, because non-convertible preferred stock represents an equity position in the company and because an independent equity position disappears in the merger, non-convertible preferred stocks are typically retired in a merger. For our sample of acquired companies' non-convertible preferred stocks, six were redeemed for cash, six were exchanged for a new issue of convertible or non-convertible preferred stock, one was exchanged for common stock, one was exchanged for a new debenture, three were exchanged for a combination of securities and cash, and we were unable to determine the outcome for the remaining four securities. In those cases in which the securities are redeemed for cash, the security is either called at its call price or redeemed at face value. Because the security's market price is typically below its call price or face value, the cash redemption price reflects a premium over the current market price. In those cases in which the security is exchanged for a new class of securities, the exchange offer typically involves an 'exchange premium' to induce securityholders to participate in the exchange. Although the exact terms of a merger agreement are not known at the time of the initial merger announcement, presumably the prices of convertible preferred stocks and bonds and non-convertible preferred stocks adjust to capture, at least in part, the expected premiums that may be received if the merger is successfully consummated.

The treatment accorded convertible securities and non-convertible preferred stocks in merger can be contrasted with that accorded non-convertible bonds. In no case in our sample were non-convertible bonds of acquired companies retired or redeemed as a result of the merger and in no case were the terms of the bond changed as a result of the merger. The debt obligations were merely assumed by the acquiring company and the bonds continued to be outstanding on the same terms as they were prior to the merger. It is this difference in treatment among the senior securities that explains their differential reaction to merger announcements.

Regardless, however, of the mechanism by which the gains are received, the evidence indicates that common stocks, convertible and non-convertible preferred stocks, and convertible bonds of acquired companies earn positive and statistically significant market-adjusted returns around the time of merger announcements. There is some evidence that non-convertible bonds also earn positive market-adjusted returns, but the evidence is relatively weak.

4.3. Daily rates of return for acquiring companies' securities

Table 8 presents results for acquiring companies' common stocks. For this sample the results are somewhat ambiguous (which is not surprising given the ambiguous results of prior studies). The market-adjusted returns on day -1,

day 0 and the two-day announcement period are 0.22%, −0.34% and −0.12% with corresponding t-statistics of 0.81, −1.48 and −0.33. The cumulative market-adjusted returns over the interval $t = -19$ to $t = 0$ is 1.70% with a t-statistic of 1.45 and the cumulative marketed-adjusted return over the interval $t = -6$ through $t = 0$ is 1.58% with a t-statistic of 2.05. Only the *CMAR* over the interval $t = -6$ through $t = 0$ is different from zero at even the 0.10 level of significance. This result does suggest that the common stockholders of acquiring firms gain around the merger announcement date. However, the market-adjusted return on the announcement day itself is negative, but not statistically significantly different from zero. We should note one peculiarity in the results: On each of the first six days following the merger announcement the common stock returns are positive and generally 'large'. Over these six days the average raw returns are 0.26%, 0.34%, 0.28%, 0.50%, 0.19% and 0.63%. These large post-announcement returns show up in the *CMAR* over the interval $t = -6$ through $t = +6$. Over this interval the *CMAR* is 3.24%. With a t-statistic of 3.90 this amount is different from zero at the 0.01 level of significance. Furthermore, the increase in the cumulative market-adjusted return following the announcement day, is not due to non-trading of the common stocks because each security trades on each of the trading days surrounding the merger announcement. Overall, then, the data indicate that acquiring companies' common stockholders do not lose in merger and there is some statistically reliable evidence that the stockholders of acquiring companies gain in merger. However, a large part of that gain occurs in the days immediately following the initial announcement of the impending merger.[9]

The results for acquiring companies' convertible preferred stocks and convertible bonds are presented in tables 9 and 10. The results for these two samples are somewhat contradictory. The data indicate that convertible preferred stocks earn positive and statistically significant returns around merger announcement dates, but convertible bonds do not.

For the convertible preferred stock sample the market-adjusted returns on day −1, day 0 and the two-day announcement period are 0.54%, 0.03% and 0.57% with corresponding t-statistics of 1.05, 0.06 and 1.17. The *CMAR* over the interval $t = -15$ through $t = 0$ is 4.83% with a t-statistic of 4.29; the *CMAR* over the interval $t = -6$ through $t = 0$ is 2.77% with a t-statistic of 3.73; and the total announcement period raw return is 0.83% with a t-statistic of 1.48. Additionally, as with acquiring companies' common stocks, the average raw returns and the market-adjusted returns tend to be positive and relatively large in the period immediately following the merger announcement.[10]

[9]It is possible that the large returns following the merger announcement occur because market participants have not yet determined whether the merger will be successful. In the first few days following the announcement, the outcome may become more certain which leads to further stock price increases.

[10]It could be argued that the increase in the *CMAR* over the period following the merger is due to the use of an inappropriate market index. However, the raw returns over this period are so large that virtually any reasonable index would show positive market-adjusted returns. Thus, the use of

The *CMAR* over the interval $t = -6$ through $t = +6$ is 4.56% with a t-statistic of 4.40. Thus, these data indicate that acquiring companies convertible preferred stocks earn positive and statistically significant market-adjusted returns around the time of merger announcements.

Acquiring companies' convertible bond returns, on the other hand, are very similar to those for common stocks. The *MAR*'s for day -1, day 0 and the two-day announcement period are 0.24%, -0.43% and -0.19% with t-statistics of 0.63, -0.97 and -0.40. The *CMAR* over the interval $t = -15$ through $t = 0$ is 2.43% with a t-statistic of 1.39; the *CMAR* over the interval $t = -6$ through $t = 0$ is 0.23% with a t-statistic of 0.18; and the total announcement period raw return is -0.18% with a t-statistic of -0.41. Additionally, as with common stocks, on each of the first six trading days following the merger announcement, the average raw returns and the average *MAR*'s tend to be positive and relatively large. However, over the interval $t = -6$ through $t = +6$ the *CMAR* of 2.45% is not significantly different from zero ($t = 1.46$). Thus, on the one hand, because the *CMAR*'s over the interval $t = -15$ through $t = 0$ and over the interval $t = -6$ through $t = +6$ are relatively large, there is some hint that acquiring companies' convertible bonds earn positive abnormal returns around merger announcements. On the other hand, the announcement day *MAR* itself is negative. Furthermore, the t-statistics for none of the various *MAR*'s or *CMAR*'s permit rejection of the null hypothesis at any reasonable level of significance. Apparently, then, on average, acquiring companies' convertible bondholders neither gain nor lose in merger.

Results for acquiring companies' non-convertible preferred stocks are presented in table 11. The results for non-convertible bonds are presented in tables 12 and 13. As with convertible preferred stocks and convertible bonds, the results for the two classes of non-convertible senior securities are mildly contradictory. There is some hint in the data that non-convertible preferred stocks earn positive market-adjusted returns around merger announcement dates and that non-convertible bonds earn negative market-adjusted returns.

For acquiring companies' non-convertible preferred stocks, the day -1, day 0 and two-day announcement period *MAR*'s are 0.05%, 0.59% and 0.64% with corresponding t-statistics of 0.23, 1.53 and 1.89. The *CMAR* over the interval $t = -15$ through $t = 0$ is 1.09% ($t = 1.02$); the *CMAR* over the interval $t = -6$ through $t = 0$ is 0.34% ($t = 0.45$); the *CMAR* over the interval $t = -6$ through $t = +6$ is 0.29% ($t = 0.27$); and the total announcement period raw return is 0.79% ($t = 1.80$). Thus, only the two-day announcement period return permits rejection of the null hypothesis at the 0.10 level of significance.

an inappropriate market index does not appear to be the complete explanation for the increase in the *CMAR* following the merger announcement. Additionally, non-trading does not appear to be the full explanation because the initial post-announcement raw return is only 0.83%. Finally, we checked the data on a security-by-security basis and the large returns do not appear to be due to a few outlier observations.

Table 8

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 90 acquiring companies' common stocks over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−19	−0.11	90	0.12	−0.22	−0.22	46.6
−18	−0.21	90	0.06	−0.27	−0.50	42.2
−17	0.34	90	0.10	0.24	−0.25	53.3
−16	0.35	90	0.06	0.29	0.04	53.3
−15	0.39	90	0.14	0.24	0.28	56.6
−14	0.04	90	0.09	−0.06	0.22	47.7
−13	−0.27	90	0.01	−0.29	−0.06	48.8
−12	0.25	90	0.03	0.22	0.15	55.5
−11	0.23	90	0.05	0.18	0.33	47.7
−10	0.00	90	0.01	−0.01	0.32	46.6
−9	−0.26	90	−0.01	−0.25	0.07	41.1
−8	0.06	90	0.01	0.05	0.12	47.7
−7	−0.01	90	−0.01	0.00	0.12	47.7
−6	0.33	90	0.02	0.31	0.43	52.2
−5	0.65	90	0.05	0.60	1.03	58.8
−4	0.34	89	0.10	0.24	1.26	55.0
−3	−0.00	90	−0.04	0.04	1.30	57.7
−2	0.44	90	−0.08	0.52	1.82	54.4
−1	0.29	90	0.06	0.22	2.04	52.2
0	−0.30	90	0.04	−0.34	1.70	40.0
+1	0.26	90	0.08	0.18	1.87	50.0
+2	0.34	90	0.14	0.20	2.07	55.5
+3	0.28	90	0.09	0.19	2.27	51.1
+4	0.50	90	0.11	0.38	2.65	51.1
+5	0.19	90	−0.02	0.21	2.86	58.8
+6	0.63	89	0.13	0.50	3.36	55.0
+7	−0.18	90	0.11	−0.29	3.07	43.3
+8	−0.20	90	0.04	−0.24	2.82	35.5
+9	0.27	90	0.06	0.21	3.03	45.5
+10	0.17	90	−0.00	0.17	3.20	50.0
+11	0.17	90	−0.02	0.19	3.40	51.1
+12	0.04	90	−0.04	0.08	3.48	50.0
+13	−0.31	90	−0.05	−0.26	3.22	45.5
+14	−0.02	90	0.09	−0.11	3.11	55.5
+15	0.40	90	0.06	0.34	3.45	53.3
+16	0.46	90	0.18	0.28	3.73	54.4
+17	−0.08	90	0.08	−0.16	3.57	46.6
+18	−0.09	90	0.02	−0.11	3.46	46.6
+19	−0.08	90	−0.12	0.04	3.49	52.2
+20	−0.11	90	−0.02	−0.09	3.40	52.2

B. Summary Statistics of Daily Returns

Number of securities in the sample = 90
Number of firms in the sample = 90

Cumulative market-adjusted returns:

Day −19 through day −2	= 1.82%;	*t*-statistic = 1.69
Day −19 through day 0	= 1.70%;	*t*-statistic = 1.45
Day −6 through day 0	= 1.58%;	*t*-statistic = 2.05
Day −1 through day 0	= −0.12%;	*t*-statistic = −0.33
Day −1	= 0.22%;	*t*-statistic = 0.81
Day 0	= −0.34%;	*t*-statistic = −1.48
Day −6 through day +6	= 3.24%;	*t*-statistic = 3.90

Total announcement period raw return = −0.12%; *t*-statistic = −0.32

Table 9

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 41 acquiring companies' convertible preferred stocks over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	0.44	24	0.19	0.25	0.25	54.1
−14	0.38	30	0.02	0.36	0.61	56.6
−13	−0.24	34	−0.07	−0.17	0.44	44.1
−12	−0.21	27	0.05	−0.26	0.18	55.5
−11	0.53	28	0.25	0.28	0.46	53.5
−10	0.38	29	−0.15	0.53	0.99	58.6
−9	0.50	31	0.28	0.21	1.20	61.2
−8	0.58	28	0.07	0.51	1.72	60.7
−7	0.20	30	−0.14	0.34	2.05	53.3
−6	0.39	31	0.01	0.38	2.43	61.2
−5	0.29	31	−0.22	0.51	2.94	61.2
−4	0.28	28	0.07	0.21	3.16	53.5
−3	1.05	31	0.11	0.94	4.10	70.9
−2	0.28	30	0.12	0.17	4.26	46.6
−1	0.72	28	0.18	0.54	4.80	60.7
0	0.17	33	0.14	0.03	4.83	39.3
+1	0.17	29	0.07	0.10	4.93	44.8
+2	0.16	31	0.06	0.09	5.02	41.9
+3	0.49	30	0.17	0.32	5.34	43.3
+4	0.59	24	0.09	0.50	5.84	58.3
+5	0.00	32	0.04	−0.04	5.81	65.6
+6	0.97	29	0.16	0.80	6.61	55.1
+7	0.48	31	0.19	0.29	6.90	54.8
+8	0.45	28	0.05	0.41	7.31	39.2
+9	0.67	30	0.30	0.36	7.67	53.3
+10	0.20	30	0.03	0.17	7.85	56.6
+11	0.13	30	0.07	0.06	7.90	46.6
+12	−0.03	29	0.16	−0.19	7.71	51.7

B. Summary Statistics of Daily Returns

Number of securities in the sample = 70
Number of firms in the sample = 41

Cumulative market-adjusted returns:

Day −15 through day −2	= 4.56%;	*t*-statistic = 4.00
Day −15 through day 0	= 4.83%;	*t*-statistic = 4.29
Day −6 through day 0	= 2.77%;	*t*-statistic = 3.73
Day −1 through day 0	= 0.57%;	*t*-statistic = 1.17
Day −1	= 0.54%;	*t*-statistic = 1.05
Day 0	= 0.03%;	*t*-statistic = 0.06
Day −6 through day +6	= 4.56%;	*t*-statistic = 4.40

Total announcement period raw return = 0.83%; *t*-statistic = 1.48

Table 10

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 130 acquiring companies' convertible bonds over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	0.56	13	0.18	0.39	0.39	46.1
−14	0.92	16	0.16	0.76	1.15	62.5
−13	−0.15	15	0.16	−0.30	0.84	33.3
−12	0.95	17	0.20	0.75	1.59	70.5
−11	0.29	16	0.09	0.20	1.80	56.2
−10	0.07	19	−0.19	0.26	2.06	52.6
−9	−0.01	16	−0.51	0.51	2.57	56.2
−8	−0.10	17	−0.01	−0.09	2.48	52.9
−7	−0.32	16	−0.04	−0.28	2.20	43.7
−6	−0.26	14	−0.27	0.01	2.21	57.1
−5	−0.91	17	−0.05	−0.87	1.34	41.1
−4	0.36	20	0.09	0.27	1.61	45.0
−3	1.00	22	0.52	0.48	2.10	63.6
−2	0.62	17	0.11	0.51	2.61	64.7
−1	−0.14	22	−0.38	0.24	2.86	45.4
0	−0.16	20	0.27	−0.43	2.43	50.0
+1	0.06	15	0.23	−0.17	2.26	33.3
+2	0.64	14	0.17	0.47	2.73	42.8
+3	0.34	16	0.34	−0.00	2.72	37.5
+4	−0.24	17	−0.54	0.29	3.02	52.9
+5	0.80	19	0.16	0.64	3.66	63.1
+6	1.20	22	0.21	0.99	4.65	59.0
+7	−0.14	18	0.03	−0.17	4.48	55.5
+8	−1.10	17	−0.03	−1.07	3.41	35.2
+9	0.42	18	−0.11	0.53	3.94	50.0
+10	0.03	16	0.23	−0.20	3.74	43.7
+11	−1.13	15	0.02	−1.15	2.58	20.0
+12	−0.05	16	−0.04	−0.01	2.57	56.2

B. Summary Statistics of Daily Returns

Number of securities in the sample = 33
Number of firms in the sample = 30

Cumulative market-adjusted returns:

Day −15 through day −2	= 2.61%;	*t*-statistic = 1.60
Day −15 through day 0	= 2.43%;	*t*-statistic = 1.39
Day −6 through day 0	= 0.23%;	*t*-statistic = 0.18
Day −1 through day 0	= −0.19%;	*t*-statistic = −0.40
Day −1	= 0.24%;	*t*-statistic = 0.63
Day 0	= −0.43%;	*t*-statistic = −0.97
Day −6 through day +6	= 2.45%;	*t*-statistic = 1.46

Total announcement period raw return = −0.18%; *t*-statistic = −0.41

Table 11

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 26 acquiring companies' non-convertible preferred stocks over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	0.20	13	0.03	0.17	0.17	69.2
−14	−0.09	15	0.07	−0.16	0.01	33.3
−13	−0.11	19	−0.02	−0.09	−0.08	42.1
−12	0.20	18	0.01	0.19	0.11	72.2
−11	−0.13	20	−0.00	−0.13	−0.02	45.0
−10	−0.19	19	0.03	−0.22	−0.23	42.1
−9	0.27	20	0.05	0.22	−0.02	60.0
−8	0.69	19	0.04	0.65	0.63	63.1
−7	0.11	17	−0.01	0.12	0.75	70.5
−6	−0.37	20	−0.05	−0.32	0.43	55.0
−5	0.18	16	0.02	0.16	0.60	62.5
−4	−0.01	16	0.04	−0.05	0.55	62.5
−3	−0.17	19	0.11	−0.28	0.27	36.8
−2	0.14	19	−0.04	0.18	0.45	47.3
−1	0.09	17	0.04	0.05	0.51	70.5
0	0.55	20	−0.04	0.59	1.09	60.0
+1	0.05	17	−0.05	0.10	1.19	47.0
+2	0.01	18	0.02	0.01	1.20	38.8
+3	−0.19	20	0.00	−0.19	1.01	55.0
+4	−0.16	21	0.08	−0.24	0.77	61.9
+5	−0.24	18	0.06	−0.30	0.47	27.7
+6	0.43	22	−0.14	0.57	1.04	50.0
+7	−0.52	22	0.14	−0.65	0.38	40.9
+8	0.52	19	0.07	0.45	0.84	52.6
+9	0.09	20	−0.10	0.19	1.02	55.0
+10	0.11	20	−0.04	0.15	1.17	45.0
+11	−0.05	18	0.05	−0.10	1.07	33.3
+12	0.26	19	0.02	0.24	1.30	63.1

B. Summary Statistics of Daily Returns

Number of securities in the sample = 32
Number of firms in the sample = 26

Cumulative market-adjusted returns:

Day −15 through day −2	= 0.45%;	t-statistic = 0.49
Day −15 through day 0	= 1.09%;	t-statistic = 1.02
Day −6 through day 0	= 0.34%;	t-statistic = 0.45
Day −1 through day 0	= 0.64%;	t-statistic = 1.89
Day −1	= 0.05%;	t-statistic = 0.23
Day 0	= 0.59%;	t-statistic = 1.53
Day −6 through day +6	= 0.29%;	t-statistic = 0.27

Total announcement period raw return = 0.79%; t-statistic = 1.80

Table 12

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 39 acquiring companies' non-convertible bonds over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	−0.37	10	0.02	−0.39	−0.39	40.0
−14	0.05	15	0.02	0.03	−0.36	40.0
−13	−0.47	16	−0.01	−0.47	−0.83	43.7
−12	0.06	18	0.10	−0.04	−0.87	55.5
−11	0.25	19	−0.01	0.26	−0.61	52.6
−10	0.21	17	−0.03	0.24	−0.36	64.7
−9	−0.26	19	−0.15	−0.11	−0.48	52.6
−8	0.67	15	−0.16	0.83	0.35	73.3
−7	−0.45	20	−0.05	−0.40	−0.05	40.0
−6	−0.06	19	−0.11	0.04	−0.01	57.8
−5	−0.07	16	−0.05	−0.02	−0.02	43.7
−4	−0.91	18	−0.18	−0.73	−0.76	44.4
−3	−0.14	19	−0.06	−0.08	−0.84	63.1
−2	−0.06	21	−0.23	0.18	−0.66	42.8
−1	−0.12	17	−0.02	−0.09	−0.76	47.0
0	−0.13	18	−0.05	−0.08	−0.84	44.4
+1	−0.54	20	−0.18	−0.36	−1.20	40.0
+2	0.04	14	−0.01	0.04	−1.15	64.2
+3	0.30	18	−0.12	0.42	−0.74	66.6
+4	0.00	22	−0.04	0.05	−0.69	59.0
+5	−0.06	16	−0.04	−0.02	−0.71	43.7
+6	−0.46	17	0.00	−0.46	−1.18	23.5
+7	0.20	23	−0.07	0.27	−0.90	65.2
+8	−0.08	17	−0.05	−0.03	−0.93	64.7
+9	−0.07	17	−0.09	0.02	−0.92	52.9
+10	0.06	22	0.09	−0.03	−0.95	54.5
+11	−0.15	23	−0.08	−0.07	−1.01	56.5
+12	0.15	16	−0.02	0.17	−0.84	56.2

B. Summary Statistics of Daily Returns

Number of securities in the sample = 67
Number of firms in the sample = 39

Cumulative market-adjusted returns:

Day −15 through day −2	= −0.66%;	t-statistic = −0.48
Day −15 through day −2	= −0.84%;	t-statistic = −0.61
Day −6 through day 0	= −0.78%;	t-statistic = −1.11
Day −1 through day 0	= −0.17%;	t-statistic = −0.89
Day −1	= −0.09%;	t-statistic = −0.72
Day 0	= −0.08%;	t-statistic = −0.33
Day −6 through day +6	= −1.12%;	t-statistic = −1.11

Total announcement period raw return = −0.42%; t-statistic = −1.80

Table 13

Summary of average daily raw returns and average daily market-adjusted returns surrounding merger announcement dates for 22 acquiring companies' non-convertible bonds with ratings BBB or below over the period 1962–1980.

A. Time Series of Daily Returns

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event day	Average raw return (%)	Number of observations	Average market index return (%)	Average market-adjusted return (%)	Cumulative market-adjusted return (%)	Percentage of returns greater than market index return
−15	−0.42	8	0.11	−0.53	−0.53	37.5
−14	0.18	10	0.12	0.06	−0.47	40.0
−13	−0.64	12	0.02	−0.65	−1.12	33.3
−12	0.11	9	−0.09	0.20	−0.92	66.6
−11	0.34	14	0.01	0.34	−0.58	50.0
−10	0.18	13	0.01	0.17	−0.41	53.8
−9	−0.34	12	−0.08	−0.26	−0.67	33.3
−8	0.87	10	−0.15	1.02	0.35	80.0
−7	−0.86	14	0.06	−0.92	−0.57	28.5
−6	0.02	10	−0.08	0.10	−0.47	70.0
−5	0.19	11	−0.03	0.22	−0.25	63.6
−4	−1.45	11	−0.28	−1.16	−1.41	45.4
−3	−0.01	11	0.06	−0.07	−1.48	63.6
−2	−0.01	16	−0.38	0.37	−1.11	56.2
−1	−0.20	11	0.07	−0.27	−1.38	36.3
0	−0.31	11	−0.07	−0.24	−1.62	45.4
+1	−0.72	14	−0.31	−0.41	−2.03	42.8
+2	0.26	8	0.01	0.25	−1.78	75.0
+3	0.39	13	−0.08	0.47	−1.31	84.6
+4	0.05	13	−0.00	0.05	−1.26	53.8
+5	−0.09	8	−0.08	−0.01	−1.27	50.0
+6	−0.69	11	−0.06	−0.63	−1.90	27.2
+7	−0.06	15	−0.05	−0.01	−1.91	46.6
+8	−0.62	9	−0.16	−0.46	−2.37	55.5
+9	−0.31	9	−0.01	−0.30	−2.66	44.4
+10	0.42	13	−0.08	0.51	−2.16	69.2
+11	−0.20	14	−0.08	−0.12	−2.28	50.0
+12	−0.31	12	−0.00	−0.31	−2.59	58.3

B. Summary Statistics of Daily Returns

Number of securities in the sample = 31
Number of firms in the sample = 22

Cumulative market-adjusted returns:

Day −15 through day −2	= −1.11%;	t-statistic = −0.53
Day −15 through day 0	= −1.62%;	t-statistic = −0.77
Day −6 through day 0	= −1.05%;	t-statistic = −0.85
Day −1 through day 0	= −0.51%;	t-statistic = −1.87
Day −1	= −0.27%;	t-statistic = −1.89
Day 0	= −0.24%;	t-statistic = −0.65
Day −6 through day +6	= −1.33%;	t-statistic = −0.86

Total announcement period raw return = −0.59%; t-statistic = −1.64

These results can be compared with those for non-convertible bonds. For the full sample of non-convertible bonds (in table 12) the day −1, day 0 and two-day announcement period *MAR*'s are −0.09%, −0.08% and −0.17% with corresponding *t*-statistics of −0.72, −0.33 and −0.89. The *CMAR* over the interval $t = -15$ through $t = 0$ is −0.84% ($t = -0.61$); the *CMAR* over the interval $t = -6$ through $t = 0$ is −0.78% ($t = -1.11$); the *CMAR* over the interval $t = -6$ through $t = +6$ is −1.12% ($t = -1.11$); and the total announcement period raw return is −0.42% ($t = -1.80$).

For the sample of non-convertible bonds rated BBB or below (in table 13), the day −1, day 0 and two-day announcement period *MAR*'s are −0.27%, −0.24% and −0.51% with *t*-statistics of −1.89, −0.65 and −1.87. The *CMAR* over the interval $t = -15$ through $t = 0$ is −1.62% ($t = -0.77$); the *CMAR* over the interval $t = -6$ through $t = 0$ is −1.05% ($t = -0.85$); the *CMAR* over the interval $t = -6$ through $t = +6$ is −1.33% ($t = -0.86$); and the total announcement period raw return is −0.59% ($t = -1.64$).

Additionally, unlike the samples of acquiring companies' common stocks, convertible preferred stocks and convertible bonds, none of the samples of non-convertible securities exhibit a predominance of positive returns following the merger announcement date. Thus, for non-convertible preferred stocks, the two-day announcement period *MAR* is marginally significantly positive and for the low-rated non-convertible bond sample the two-day announcement period *MAR* is marginally significantly negative. However, in neither sample is there overwhelming evidence of either positive or negative abnormal returns around the merger announcement date.

One factor that could obscure any effects that may be latent in the data is that acquiring companies tend to be large in comparison with acquired companies. Thus, when a relatively large firm merges with a relatively small one, there may, for example, be some effect upon the larger firm's senior securities, but the effect may be so small that our tests are unable to detect it [see, for example, Asquith, Bruner and Mullins (1983)]. This potential problem is less likely to be present in the sample used for this study because one criterion used for sample selection is that the acquiring firm's securities be included only if the book value of the assets of the acquired firm is greater than $70 million or 5 percent of the book value of the assets of the acquiring firm. Nevertheless, to determine further the validity of this proposition, the statistics were recomputed sequentially for samples which included the securities of acquiring companies only if the book value of the assets of the acquired company was at least 10 percent, then 20 percent of the book value of the assets of the acquiring company. The results were similar to those for the full samples.[11]

[11] For example, when the 'size' requirement is that an acquiring company's stock be included only if the book value of the assets of the acquired company is at least 10 percent of the book value of the assets of the acquiring company, the day −1, day 0 and two-day announcement period

Because of the mildly contradictory patterns that are present in the daily rates of return, a complete summing up of the results for the samples of acquiring companies' securities is difficult. A liberal interpretation of the results is that, on average, common stockholders, convertible preferred stockholders, and non-convertible preferred stockholders gain in merger, convertible bondholders neither gain nor lose in merger, and non-convertible bondholders lose in merger. A conservative interpretation of the results is that, on average, convertible preferred stockholders of acquiring companies gain in merger, while all other classes of securityholders neither gain nor lose in merger.

4.4. *Changes in the dollar values of acquired companies' securities*

Both Malatesta (1983) and Roll (1984) have argued that the appropriate metric for determining the impact of corporate merger on securityholder wealth is the change in the dollar value of securities due to the merger. To gain some further insight into the effect of merger on the wealth of securityholders, we estimated the dollar change in the market value of each security in our sample around the merger announcement date. For each issue of securities in our sample, the changes in the raw dollar value and the market-adjusted dollar value are estimated. The change in the raw dollar value is estimated as

$$\Delta V_{ij} = \left(P_{ij}^{a} - P_{ij}^{b} \right) \cdot NS_{ij}, \tag{8}$$

where P_{ij}^{a} is the dollar price of security i issued by firm j measured a days after the merger announcement; P_{ij}^{b} is the dollar price of security i issued by firm j measured b days prior to the merger announcement date; and NS_{ij} is the number of securities (i.e., the number of stocks or bonds) outstanding. For common stocks $a = b = 20$. For senior securities, P^{a} is the last price after the merger, but no later than day $+12$, and P^{b} is the first price prior to the merger, but no earlier than day -15.

For each firm for which data are available for the common stock and at least one senior security, the change in the total market value of the firm is estimated as the sum of the change in the dollar values of the individual

MAR's for acquiring companies common stock are -0.19%, -0.45% and -0.64% with t-statistics of -0.60, -1.75 and -1.63. The *CMAR* over the interval $t = -19$ through $t = 0$ is 1.14% ($t = 0.81$), and the *CMAR* over the interval $t = -6$ through $t = 0$ is 1.16% ($t = 1.08$). The sample size is 68. When the size requirement is raised to a 20 percent cutoff, the day -1, day 0 and two-day announcement period *MAR*'s are -0.36%, -0.11% and -0.47% with t-statistics of -0.89, -0.37 and -0.88. The *CMAR*'s over the intervals $t = -19$ through $t = 0$ and $t = -6$ through $t = 0$ are 1.84% ($t = 1.05$) and 1.76% ($t = 1.39$), respectively.

security issues. The change in the total dollar value of the firm is estimated as

$$\Delta V_j = \sum_{i=1}^{I} \Delta V_{ij}, \tag{9}$$

where I is the number of different security issues issued by firm j. In some cases, the firms in our sample have outstanding a senior security that does not enter the sample because the security did not trade over the time interval surrounding the merger announcement. Thus, our estimate of the total dollar change in value is correct only if it is assumed that the values of the firms' remaining senior securities are unaffected by the merger announcement.

The market-adjusted change in the dollar value of each issue of securities is estimated as

$$\Delta MAV_{ij} = \left(P_{ij}^{b} \cdot \prod_{t=b}^{a} (1 + MAR_{ijt}) - P_{ij}^{b} \right) \cdot NS_{ij}, \tag{10}$$

and the market-adjusted change in the total dollar value of firm j is estimated as

$$\Delta MAV_j = \sum_{i=1}^{I} \Delta MAV_{ij}, \tag{11}$$

where all terms are as defined previously. The change in the dollar value of the entire firm is calculated only if data are available for the firm's common stock and at least one senior security.

Cross-sectional averages are computed for the change in the total dollar value of the firm and for the various classes of securities in the sample and a simple t-statistic is computed to test the null hypothesis that the average dollar value change is equal to zero. The results are presented in table 14. In addition to the cross-sectional average change in dollar value and the t-statistic, the table reports the median dollar value change, the maximum dollar value change, the minimum dollar value change, the number of dollar value changes that are positive, and the sample size for each sample of securities.

For acquired companies, the average change in the aggregate raw dollar value of the firm is 30.1 million dollars with a t-statistic of 4.79, and the average market-adjusted change in the aggregate dollar value of the firm is 33.5 million dollars with a t-statistic of 4.37. Thus, for both measures the null hypothesis of no effect can be rejected at the 0.01 level of significance. Similar results are reported for acquired companies' common stocks. The average change in the raw dollar value of common stock is 28.5 million dollars ($t = 4.81$), and the average market-adjusted change in dollar value is 31.8

Table 14

Summary of changes in the dollar values of various classes of acquired and acquiring companies' securities over a 40-day time interval surrounding merger announcement dates, 1962–1980 (in thousands of dollars).

	Acquired companies		Acquiring companies	
	Change in raw dollar value	Change in market-adjusted dollar value	Change in raw dollar value	Change in market-adjusted dollar value
A. *Change in Aggregate Dollar Value of Securities Outstanding per Firm (i.e., Change in Total Value of the Firm)*				
Average	30092.8	33508.6	40179.7	58611.3
t-statistic	4.79	4.37	2.59	1.75
Median	17467.2	15462.0	8757.5	2476.6
Maximum	308637.1	486299.4	1041677.4	2684887.0
Minimum	−53949.4	−26533.2	−240621.0	−318008.8
No. positive	61	65	63	54
Sample size	76	76	90	90
B. Change in Dollar Value of Common Stock				
Average	28460.5	31842.9	34036.9	52398.8
t-statistic	4.81	4.36	2.30	1.58
Median	16935.6	15710.8	8300.5	1475.7
Maximum	303527.4	481965.3	1042237.9	2685791.9
Minimum	−53949.4	−26516.5	−240996.0	−318310.5
No. positive	62	64	62	51
Sample size	76	76	90	90
C. Change in Dollar Value of Convertible Preferred Stock				
Average	4615.5	4813.3	9689.3	6327.8
t-statistic	1.65	1.50	2.21	2.24
Median	660.0	649.9	1391.3	1002.0
Maximum	58635.0	66528.1	88770.0	72374.8
Minimum	−4424.0	−4310.3	−88651.8	−18556.2
No. positive	15	15	28	29
Sample size	21	21	41	41
D. Change in Dollar Value of Convertible Bonds				
Average	350.6	326.9	44.2	34.4
t-statistic	2.21	2.23	1.17	1.01
Median	87.5	110.7	0.7	1.3
Maximum	5469.8	4562.9	718.8	672.1
Minimum	−134.9	−1024.0	−323.4	−200.9
No. positive	27	25	16	13
Sample size	35	35	28	28
E. Change in Dollar Value of Non-convertible Preferred Stock				
Average	773.2	717.3	6453.3	12497.2
t-statistic	2.16	1.93	1.04	1.12
Median	518.9	544.8	45.0	18.2
Maximum	3927.1	3958.7	151861.9	275298.1
Minimum	−3030.0	−3626.6	−5517.5	−1539.2
No. positive	14	15	14	14
Sample size	18	18	24	24
F. Change in Dollar Value of Non-convertible Bonds				
Average	43.0	10.6	−26.1	−39.7
t-statistic	0.94	0.48	−0.48	−0.91
Median	2.0	15.8	4.3	−1.6
Maximum	843.2	287.1	1600.0	746.9
Minimum	−360.0	−228.8	−560.4	−913.4
No. positive	13	14	14	19
Sample size	22	22	38	38

million dollars ($t = 4.36$). A comparison of the average change in the total dollar value of the firm and the average change in the dollar value of common stock indicates that most of the increases in the value of the firm is due to the increase in the dollar value of common stock. Nevertheless, the average change in the dollar value of convertible preferred stock, convertible bonds and non-convertible preferred stock is not trivial. For convertible preferred stock, convertible bonds and non-convertible preferred stock, the average changes in the raw dollar values of the securities are 4.6 million dollars ($t = 1.65$), 350.6 thousand dollars ($t = 2.21$) and 773.2 thousand dollars ($t = 2.16$), respectively. The average market-adjusted changes in the dollar values of the three classes of securities are 4.8 million dollars ($t = 1.50$), 326.9 thousand dollars ($t = 2.23$) and 717.3 thousand dollars ($t = 1.93$). Consistent with the time series analysis of returns, for non-convertible bonds the average change in the raw dollar value and the market-adjusted change in the dollar value are both positive, but they are the relatively trivial amounts of 43.0 thousand dollars ($t = 0.94$) and 10.6 thousand dollars ($t = 0.48$). Neither of these estimates is significantly different from zero at any reasonable level of significance.

Because the distributions of dollar changes in security values appear to be skewed, a binomial sign test is also conducted. Under the null hypothesis of no merger announcement effect, the fraction of positive market-adjusted changes in the dollar values of securities is assumed to be 0.50. A z-statistic is calculated as

$$z = (Q - N(0.5))/(N(0.5)(0.5))^{1/2}, \tag{12}$$

where Q is the number of positive market-adjusted changes in the dollar value of securities in the sample and N is the sample size. The z-statistic for the various samples of securities are as follows: (1) total value of the firm: $z = 6.19$; (2) common stock: $z = 5.96$; (3) convertible preferred stock: $z = 1.96$; (4) convertible bonds: $z = 2.53$; (5) non-convertible preferred stock: $z = 2.67$; and (6) non-convertible bonds: $z = 1.28$. For acquired companies the results of the binomial sign test are generally consistent with those of the analysis of daily rates of return and of the t-statistics computed for changes in the dollar values of securities. For each class of securities, except non-convertible bonds, it is possible to reject the null hypothesis of no effect at traditionally acceptable levels of significance.

4.5. Changes in the dollar values of acquiring companies' securities

For acquiring companies, the average change in the aggregate raw dollar value of the firm is 40.2 million dollars with a t-statistic of 2.59, and the average market-adjusted change in the aggregate dollar value of the firm is 58.6

million dollars with a t-statistic of 1.75. Thus, the null hypothesis of no effect can be rejected at the 0.01 level of significance on the basis of the raw dollar value change, and the null hypothesis can be rejected at the 0.08 level of significance on the basis of the market-adjusted change in the aggregate dollar value of the firm.

As with the samples of acquired companies' securities, for acquiring companies, the results of the analysis of the changes in the raw and market-adjusted dollar values of the various classes of securities are consistent with the analysis of the time series of daily rates of return. The average market-adjusted changes in the dollar values of the samples of common stocks, convertible preferred stocks, convertible bonds and non-convertible preferred stocks are 52.4 million dollars ($t = 1.58$), 6.3 million dollars ($t = 2.24$), 34.4 thousand dollars ($t = 1.01$), and 12.5 million dollars ($t = 1.12$). Thus, all are positive, but only the dollar value change for convertible preferred stocks is statistically significantly different from zero. Additionally, as with the analysis of the time series of daily returns, the average market-adjusted change in the dollar value of non-convertible bonds is negative (-39.7 thousand dollars), but not statistically different from zero at a traditionally acceptable level of significance ($t = -0.91$).

The results of the binomial sign test are consistent with those of the t-test. For the various classes of securities the z-statistics are as follows: (1) total value of the firm: $z = 1.90$; (2) common stock: $z = 1.27$; (3) convertible preferred stock: $z = 2.65$; (4) convertible bonds: $z = -0.37$; (5) non-convertible preferred stock: $z = 0.82$; and (6) non-convertible bonds: $z = 0.00$. Thus, on the basis of the binomial sign test it is possible to reject the null hypothesis at the 0.06 level of significance for the total value of the firm and at the 0.01 level for the value of convertible preferred stocks. It is not possible to reject the null hypothesis for any of the other classes of securities at even the 0.10 level of significance.

4.6. Changes in the dollar values of combined acquired and acquiring firms

We also estimated the change in the total dollar value of the combined acquired and acquiring firms. Construction of this sample begins with the acquired and acquiring firms previously analyzed. The merger partner for each of these firms was identified. If the merger partner was not already in the sample, the partner was added to the sample if its common stock was available in the Standard and Poor's *Daily Stock Price Record* during the 40-day interval surrounding the merger announcement date. Thus, for each merger in this sample it was possible to estimate the effect of the merger on the value of both firms in the transaction. For 46 of the mergers in the sample, both the acquired and acquiring company had outstanding an actively traded senior security around the initial merger announcement date. Thus, both of these firms were already in the sample. An additional 62 merger partners were added to the

Table 15

Summary of changes in dollar values of combined securities of acquired and acquiring companies over a 40-day time interval surrounding merger announcement dates, 1962–1980 (in thousands of dollars).

	Combined acquiring and acquired companies	
	Changes in raw dollar value	Changes in market-adjusted dollar value
A. Change in Aggregate Dollar Value of Securities Outstanding for Combined Acquired and Acquiring Companies (i.e., Change in Total Value of Combined Firms)		
Average	64847.5	76724.7
t-statistic	4.32	2.66
Median	35185.8	21941.3
Maximum	1045316.9	2668188.8
Minimum	−221064.8	−302109.8
No. positive	79	78
Sample size	108	108
B. Change in Dollar Value of Combined Firms' Common Stock		
Average	59343.6	70791.5
t-statistic	4.19	2.51
Median	34639.5	16578.3
Maximum	1045864.9	2669297.7
Minimum	−228272.0	−311918.0
No. positive	78	73
Sample size	108	108

sample. For these firms only the common stock is included in the analysis. The final sample contains 108 mergers.

The change in the aggregate raw dollar value and the aggregate market-adjusted dollar value of the combined acquired and acquiring firms is estimated for each merger as the sum of the change in the aggregate raw dollar value and the aggregate market-adjusted dollar value of the two merging companies. In a similar fashion, the change in the raw dollar value and the market-adjusted dollar value of the common stocks of the two merging firms is also estimated.

As reported in table 15, the average change in the total raw dollar value of the combined firms is 64.8 million dollars with a *t*-statistic of 4.32, and the average market-adjusted change in the total value of the combined firms is 76.7 million dollars with a *t*-statistic of 2.66. Thus, based on either measure, it is possible to reject the null hypothesis of no effect on the combined firms' market value at the 0.01 level of significance. The same is true for the combined value of common stock. The average change in the raw dollar value of combined common stock is 59.3 million dollars with a *t*-statistic of 4.19, and the average market-adjusted change in the combined value of common stock is

70.8 million dollars with a t-statistic of 2.51. In all cases the results of the binomial sign test support the results of the t-test.

It is interesting to compare our results with those of Malatesta (1983).[12] Like Malatesta's results, our results indicate that merger announcements, on average, have a significant positive effect on the market value of acquired companies' common stock. Unlike Malatesta, however, we find that the average effect on acquiring companies' common stock is positive, although statistically different from zero at only the 0.115 level of significance. Furthermore, our results indicate that merger announcements are associated with a positive effect on the total market value of both the acquired and the acquiring firm. Additionally we find that merger announcements have a positive effect on the total market value of the combined acquired and acquiring firms. Finally, as do Malatesta's results, our results indicate that merger announcements are associated with a positive change in the combined value of the acquired and acquiring firms' common stocks. However, unlike Malatesta our result is not driven primarily by the return to acquired companies' shareholders. In our sample, the gains are more equally divided between acquired and acquiring firms' stockholders.

5. Alternative explanations of returns to merging firms' senior securities

Two alternative hypotheses have been offered to explain returns to merging firms' senior securities. The first is the co-insurance hypothesis. This hypothesis has its origins in papers by Higgins and Schall (1975), Galai and Masulis (1976) and Kim and McConnell (1977). According to the co-insurance hypothesis, combining two levered firms will lead to a reduction in the default risk of the combined firms' senior securities with a concomitant increase in their aggregate market values. The analysis of the co-insurance effect typically assumes that the merger is non-synergistic so that the total value of the combined firms is unchanged by the merger. In that circumstance, the increase in the value of senior securities comes at the expense of an equal decrease in the aggregate market value of the merging firms' common stock. For non-synergistic mergers, the empirical prediction of the co-insurance hypothesis is that common stockholders will earn negative excess returns and senior securityholders will earn positive excess returns. However, a co-insurance effect can also exist in synergistic mergers. The difference is that both common stockholders and senior securityholders may gain due to the value created by the synergy, so that examination of the time series of excess returns may not itself indicate whether a co-insurance effect is present in the reaction of merging firms' securities to merger announcements.

[12] Because Malatesta examined returns around the board approval month our results are not strictly comparable with his. However, in many instances, the month of merger announcement encompasses the month of board approval and vice versa.

Galai and Masulis (1976) note a second empirical prediction of the coinsurance hypothesis. They show that the excess returns to merging firms' senior securities will be negatively correlated with the correlation coefficient between the merging firms' operating income streams. That is, the lower the correlation between the merging firms' operating income streams, the greater the coinsurance provided to senior securities. Furthermore, this empirical prediction of the co-insurance hypothesis applies to both synergistic and non-synergistic mergers.

The second explanation of the returns to merging firms' senior securities can be labelled the 'redistribution' hypothesis. This hypothesis has its origins in papers by Galai and Masulis (1976), Jensen and Meckling (1976) and Myers (1977). Each of these authors shows that there exists an incentive for shareholders of a levered firm to undertake projects that increase the firm's risk so as to redistribute wealth away from the firm's senior securityholders to themselves. Furthermore, this incentive exists whether or not the project increases the firm's overall market value. When applied to non-synergistic mergers, the empirical prediction of the redistribution hypothesis is that common stockholders will earn positive excess returns and senior securityholders will earn negative excess returns. This hypothesis also predicts that excess returns to common stock will be negatively correlated with excess returns to senior securities.

In synergistic mergers it is possible for both common stockholders and senior securityholders to earn positive excess returns due to the value created by the synergy. However, if there is a redistribution effect, the excess returns to common stock will still be negatively correlated with the excess returns to senior securities – the larger the redistribution of wealth to common stock, the smaller the excess returns to senior securities.

A final point should be noted about the redistribution hypothesis. A redistribution effect cannot apply to both firms in a merger. Given that the acquired firm is typically perceived as being the 'passive' partner in the initiation of a merger, it is perhaps more likely that the redistribution hypothesis will be applicable to acquiring than to acquired firms.

As the foregoing discussion indicates, the effect of merger on security returns is likely to depend upon whether the merger is synergistic or non-synergistic. For our sample of firms, mergers, on average, appear to be synergistic. If mergers are value creating, it seems reasonable to presume that each of the various classes of merging firms' securityholders will share in those gains. This presumption is buttressed by the observation of Smith and Warner (1979) that many bond indenture agreements contain provisions which give bondholders the right to veto any merger or acquisition by the firm that issued the bond. The same types of provisions are also often contained in preferred stock indenture agreements. To the extent that such provisions are binding, and given that common stockholders must approve most corporate mergers, a reasonable presumption is that mergers will be undertaken only if each class of

securityholders gains (or at a minimum does not lose) in the process. This logic leads to another set of empirical predictions which we shall label the 'value-sharing hypothesis' of merger.

The value-sharing hypothesis predicts that the excess returns to each class of merging firms' securities will be positive (or at least not negative.). This hypothesis also predicts that the increases in wealth received by the common stockholders and senior securityholders of merging firms will be positively correlated – in those mergers in which total gains are relatively large, both common stockholders and senior securityholders will do relatively well; when the gains are relatively small, the gains to both common stockholders and senior securityholders will be relatively small.[13]

The results of the analysis of the time series of daily security returns and of the changes in the dollar market values of securities are generally consistent with the value-sharing hypothesis of mergers, but they are also generally consistent with the co-insurance hypothesis for synergistic mergers. Furthermore, the marginally negative excess returns to acquiring companies' non-convertible bonds provide some weak support for the redistribution hypothesis for acquiring firms.[14]

To provide some further tests of the alternative hypotheses, ordinary least squares (OLS) regression was used to estimate the following cross-sectional regression equation for various samples of acquired and acquiring companies' securities:

$$R_{ss,j} = a_0 + B_1 R_{cs,j} + B_2 C_j + e_j, \tag{13}$$

where $R_{ss,j}$ is the average total announcement period raw return for the senior securities of firm j; $R_{cs,j}$ is the total announcement period raw return for the common stock of firm j;[15] C_j is the correlation coefficient between the returns on the common stocks of the two merging firms; and e_j is the error term,

[13] Shastri (1983) presents a model and conducts simulations to illustrate this effect and other wealth transfer effects of corporate mergers.

[14] Hite and Owers (1983) and Schipper and Smith (1983) examine returns to common stocks and senior securities around the announcement dates of corporate spin-offs. Both studies view spin-offs as the mirror image of corporate mergers. Both studies conclude that, on average, common stockholders gain around the announcement dates of spin-offs, but the gains do not come wholly at the expense of senior securityholders.

[15] Returns other than the total announcement period raw return could be used in the cross-sectional regression analyses. For example, we could have used the two-day or six-day raw or market-adjusted returns. However, because the total announcement period raw return can be calculated for each security, the use of this measure of 'abnormal performance' maximizes the number of observations in the various regression analyses. Furthermore, in most samples, the sign and magnitude of the initial total announcement period raw return is consistent with the sign and magnitude of the various alternative measures of abnormal performance so that results produced with the total announcement period raw return are likely to be similar to those produced with the alternative measures of abnormal performance.

assumed to be independently identically distributed. C_j was estimated with daily returns over the period $t = -100$ through $t = -20$ relative to the merger announcement date. Because of this data requirement, a firm enters the sample only if common stock returns are available for both the acquiring and the acquired company. Thus, all firms in the acquired and acquiring firm samples are not included in the regression analysis. If a company has more than one class of senior securities outstanding, the firm's total announcement period raw return is computed as the average of the total announcement period raw returns across the firm's various classes of senior securities. Thus, an individual company may enter each regression only once.

The value-sharing hypothesis predicts that the announcement period returns to senior securities will be positively correlated with the announcement period returns to common stock, whereas the redistribution hypothesis predicts a negative relationship. Thus, according to the value-sharing hypothesis $B_1 > 0$ and according to the redistribution hypothesis $B_1 < 0$. Furthermore, the co-insurance hypothesis predicts that the announcement period returns to senior securities will be negatively correlated with the correlation between the merging firms' operating earnings streams. In this regard, C_j is used as a proxy (albeit an imprecise one) for the correlation between the merging firms' operating earnings streams, so that the co-insurance hypothesis predicts $B_2 < 0$.[16] The results of the OLS estimation are reported in panel A of table 16 for the various samples of acquired companies' securities and in panel B for the various samples of acquiring companies' securities.

For the full sample of acquired companies' securities, B_1 is positive and statistically different from zero at the 0.01 level of significance ($t = 4.58$), and B_2 is negative, but statistically different from zero at only the 0.15 level of significance ($t = -1.52$). For the sample which includes only convertible senior securities B_1 is positive and statistically different from zero at the 0.01 level of significance ($t = 5.01$), and B_2 is negative and statistically different from zero at the 0.01 level of significance ($t = -2.69$). For the sample which includes only non-convertible senior securities both B_1 and B_2 are positive, but, with t-statistics of 0.71 and 0.015, neither is statistically different from zero at any reasonable level of significance.

Thus, the results for the full sample of acquired firms' securities are consistent with the value-sharing hypothesis and indicate that in those instances in which common stockholders earn relatively large (or small) returns, so do senior securityholders. However, when the sample is divided into

[16]Asquith and Kim (1982) also tested the redistribution hypothesis and the co-insurance hypothesis. As a test of the redistribution hypothesis they estimated the rank–order correlation between excess returns to common stock and non-convertible bonds. As a test of the co-insurance hypothesis, they estimated the rank–order correlation between excess returns to non-convertible bonds and the correlation coefficient between the common stock returns of the two merging companies. In no case was the rank–order correlation coefficient statistically different from zero.

Table 16

Estimated coefficients of the cross-sectional regression $R_{ss,j} = a_0 + B_1 R_{cs,j} + B_2 C_j + e_j$.

		Coefficient[a]		Adjusted
	a_0	B_1	B_2	R^2
A. Acquired Companies				
Full sample ($N = 56$)	0.0293	0.4161 (4.58)	−0.0889 (−1.52)	0.27
Sample of convertible senior securities ($N = 32$)	0.0257	0.5844 (5.01)	−0.2607 (−2.69)	0.44
Sample of non-convertible senior securities ($N = 33$)	0.0103	0.0591 (0.71)	0.0062 (0.015)	−0.05
Full sample excluding bonds rated AAA, AA, A ($N = 47$)	0.0238	0.4339 (3.95)	−0.1002 (−1.21)	0.23
Sample of convertible senior securities excluding bonds rated AAA, AA, A ($N = 29$)	0.0361	0.5446 (4.19)	−0.2435 (−2.15)	0.36
Sample of non-convertible senior securities excluding bonds rated AAA, AA, A ($N = 25$)	0.0154	0.0205 (0.19)	0.0574 (0.91)	−0.05
Sample of convertible and non-convertible bonds ($N = 39$)	0.0124	0.2185 (3.73)	−0.0238 (−0.62)	0.25
Sample of non-convertible bonds ($N = 23$)	0.0021	0.1012 (1.62)	−0.0049 (−0.16)	0.06
B. Acquiring Companies				
Full sample ($N = 73$)	0.0046	0.6460 (3.26)	0.0568 (1.17)	0.14
Sample of convertible senior securities ($N = 55$)	0.0059	0.7999 (6.37)	0.0405 (1.10)	0.44
Sample of non-convertible senior securities ($N = 43$)	0.0029	—[b]	0.0547 (0.86)	−0.01
Full sample excluding bonds rated AAA, AA, A ($N = 57$)	0.0019	0.7016 (2.86)	0.0826 (1.30)	0.15
Sample of convertible senior securities excluding bonds rated AAA, AA, A ($N = 45$)	0.0044	0.8771 (6.04)	0.0483 (1.04)	0.48
Sample of non-convertible senior securities excluding bonds rated AAA, AA, A ($N = 29$)	−0.0011	−0.1102 (−0.29)	0.0980 (0.99)	−0.04
Sample of convertible and non-convertible bonds ($N = 47$)	−0.0027	0.4569 (1.58)	0.0505 (0.81)	0.03
Sample of non-convertible bonds ($N = 30$)	0.0015	—[b]	0.0681 (0.85)	−0.01

[a] t-statistics are in parentheses.
[b] Not calculated by the stepwise regression routine.

convertible and non-convertible senior securities, the results indicate that it is the convertible securities that are primarily responsible for the statistical significance of B_1. A similar pattern appears in the estimates of B_2. For the full sample of securities, B_2 is negative and marginally significantly different from zero and is thus weakly consistent with the co-insurance hypothesis. However, this result appears to be due almost exclusively to the convertible senior securities. Apparently, convertible senior securities gain in merger due to the overall increase in the value of the acquired firm and they gain further due to a co-insurance effect when the earnings streams of the merging firms are not highly correlated. Given the results for the convertible securities, it is perhaps surprising that the co-insurance effect does not show up in the non-convertible senior security sample.

The cross-sectional regression was estimated for various other subsamples of acquired firms' securities. The results of these exercises are also presented in table 16. In each instance the interpretation of the results is consistent with those discussed above. Additionally, in no instance is the estimated value of B_1 negative, as predicted by the redistribution hypothesis. Thus, the regression analyses provide no evidence that the predominant motive for corporate merger by acquired companies is to shift wealth away from senior securityholders to common stockholders.

For the full sample of acquiring companies' securities B_1 is positive and statistically different from zero at the 0.01 level of significance ($t = 3.26$). As with acquired companies, when the full sample of acquiring companies' securities is separated into convertible and non-convertible securities, the results indicate that the significance of B_1 is due almost exclusively to the convertible senior securities.

Additionally, for the full sample of securities and for each of the various subsamples of securities, B_2 is positive, but not statistically different from zero at any reasonable level of significance. For this coefficient the t-statistics range from 0.81 to 1.30.

Finally, in only one of the regressions is B_1 negative, but with a t-statistic of -0.29, it is not different from zero at any reasonable level of significance.

In sum, given the earlier evidence that the mergers in our sample are, on average, synergistic, the results of the cross-sectional regression analysis of returns provide reasonably strong support for the value-sharing hypothesis. Additionally, there is some very mild support for the co-insurance hypothesis for acquired firms' convertible senior securities, but there is no support for the redistribution hypothesis for either acquired or acquiring firms. This latter result suggests that if there does exist an incentive for firms to use mergers as a way to redistribute wealth away from senior securityholders to common stockholders, existing indenture agreements are sufficiently strong to inhibit the realization of those incentives.

6. Summary and conclusion

This paper examines the returns to various classes of securities of both acquired and acquiring companies around the announcement dates of a sample of 132 mergers which took place over the period 1962 through 1980. The results indicate that, on average, acquired companies' common stockholders, convertible and non-convertible preferred stockholders, and convertible bondholders receive statistically significant gains in mergers as do acquiring companies' convertible preferred stockholders. The results also indicate that, on average, acquired companies' non-convertible bondholders and acquiring companies' convertible bondholders, non-convertible preferred stockholders, and non-convertible bondholders neither gain nor lose by a statistically significant amount in mergers. Finally, for acquiring companies' common stocks, the results are sensitive to the time period used to measure returns. However, on average, there is no evidence that acquiring companies' stockholders lose, and there is some statistically significant evidence that they gain in mergers. When the dollar value of the entire firm is considered (i.e., when the aggregate value of the various classes of securities is considered) the evidence indicates that, on average, the total value of both the acquired and acquiring firm increases by a statistically significant amount around the date of merger announcements. The evidence also indicates that, on average, the combined dollar value of the acquired and acquiring firms increases by a statistically significant amount.

Several implications and conclusions follow from this study. First, the results indicate that mergers, on average, are value-creating activities for combined firms and for both the acquired and acquiring companies individually. Thus, the results are consistent with the 'synergy' hypothesis of mergers. Second, a number of previous studies have documented that the common stockholders of acquiring companies receive negligible gains in merger. A reasonable question is: Why do stockholders of acquiring firms approve mergers and why do managers pursue them if there is no gain? A possible answer is that some class of securityholders other than common stockholders reaps the gain and that is sufficient motivation to pursue the merger. Like a number of earlier studies, our investigation indicates that, on average, common stockholders of acquiring companies receive positive, but typically not statistically significant gains in merger. However, our results also indicate that, on average, convertible preferred stockholders receive positive and statistically significant gains in merger and that, on average, convertible bondholders and non-convertible preferred stockholders receive positive, but not statistically significant gains. The net result is that the total value of the firm does increase by a statistically significant amount in merger. This set of results raises the possibility that in some mergers common stockholders gain and in other mergers one or more classes of senior securityholders gains so that no single class of securityholders

always gains, but as a group, the securityholders of acquiring firms do gain in merger. Third, and related to point number two, several previous studies of mergers have examined only common stock returns to test hypotheses concerning the total value of the merging companies. In principle, such studies should have examined returns to all classes of the merging firms' securities. The results of this study suggest that the failure to consider the effect of merger on the other various classes of merging firms' securities will likely lead to a downward biased estimate of the total value created by the merger.

Finally, perhaps the primary contribution of this paper is that it provides a detailed and (we believe) reasonably comprehensive documentation of the effect of merger on the market value of the participating firms' senior securities. It is our hope that these results will be a useful complement to the various studies that have presented detailed and comprehensive analyses of the effect of merger on the market value of acquired and acquiring firms' common stocks.

References

American Stock Exchange Daily Stock Price Record, 1962–1980 (Standard and Poor's Corporation, New York).

Announcements of Mergers and Acquisitions, 1965–1980 (The Conference Board, New York).

Asquith, P., 1983, Merger bids, uncertainty, and stockholder returns, Journal of Financial Economics 11, 51–83.

Asquith, P., R.F. Bruner and D.W. Mullins, 1983, The gains to bidding firms from merger, Journal of Financial Economics 11, 121–139.

Asquith, P. and E.H. Kim, 1982, The impact of merger bids on the participating firms' securityholders, Journal of Finance 37, 1209–1228.

Bradley, M., 1980, Interfirm tender offers and the market for corporate control, Journal of Business 53, 345–376.

Bradley, M., A. Desai and E.H. Kim, 1983, The rationale behind interfirm tender offers: Information or synergy, Journal of Financial Economics 11, 183–206.

Bradley, M., A. Desai and E.H. Kim, 1984, Determinants of the wealth effects of corporate acquisitions, Unpublished manuscript (University of Michigan, Ann Arbor, MI, and Iowa State University, Ames, IA).

Brown, S.J. and J.B. Warner, 1985, Using daily stock returns: The case of event studies, Journal of Financial Economics 14, 3–31.

Commercial and Financial Chronicle, 1962–1980 (National News Service, Inc., New York).

Dodd, P., 1980, Merger proposals, management discretion and stockholder wealth, Journal of Financial Economics 8, 105–138.

Dodd, P. and R. Ruback, 1977, Tender offers and stockholder returns: An empirical analysis, Journal of Financial Economics 5, 351–374.

Eckbo, B.E., 1983, Horizontal mergers, collusion and stockholder wealth, Journal of Financial Economics 11, 241–274.

Eger, C., 1983, An empirical test of the redistribution effect in pure exchange mergers, Journal of Financial and Quantitative Analysis 18, 547–572.

Galai, D. and R. Masulis, 1976, The option pricing model and the risk factor of stock, Journal of Financial Economics 3, 53–81.

Higgins, R.C. and L.D. Schall, 1975, Corporate bankruptcy and conglomerate merger, Journal of Finance 30, 93–113.

Hite, G.L. and J. Owers, 1984, Security price reactions around corporate spinoff announcements, Journal of Financial Economics 12, 409–436.

Jensen, M. and W.H. Meckling, 1976, Theory of the firm: Managerial behavior agency costs and ownership structure, Journal of Financial Economics 3, 305–360.
Jensen, M.C. and R. Ruback, 1983, The market for corporate control: The scientific evidence, Journal of Financial Economics 11, 5–50.
Kim, E.H. and J.J. McConnell, 1977, Corporate merger and the co-insurance of corporate debt, Journal of Finance 32, 349–363.
Langetieg, T., 1978, An application of a three-factor performance index to measure stockholder gains from merger, Journal of Financial Economics 6, 365–383.
Malatesta, P.H., 1983, The wealth effect of merger activity and the objective functions of merging firms, Journal of Financial Economics 11, 155–181.
Mandelker, G., 1974, Risk and return: The case of merging firms, Journal of Financial Economics 1, 303–335.
Masulis, R., 1980, The effects of capital structure change on security prices: A study of exchange offers, Journal of Financial Economics 8, 139–177.
Merton, R.C., 1973, An intertemporal capital asset pricing model, Econometrica 41, 867–888.
Myers, S.C., 1977, Determinants of corporate borrowing, Journal of Financial Economics 5, 147–176.
New York Stock Exchange Daily Stock Price Record, 1962–1980 (Standard and Poor's Corporation, New York).
OTC Daily Stock Price Record, 1962–1980 (Standard and Poor's Corporation, New York).
Roll, R., 1984, The hubris hypothesis of corporate takeovers, Unpublished manuscript (University of California, Los Angeles, CA).
Schipper, K. and A. Smith, 1983, Effects of recontracting on shareholder wealth: The case of voluntary spinoffs, Journal of Financial Economics 12, 437–467.
Schipper, K. and R. Thompson, 1983, Evidence on the capitalized value of merger activity for acquiring firms, Journal of Financial Economics 11, 85–119.
Security Owner's Bond Guide, 1962–1980 (Standard and Poor's Corporation, New York).
Security Owner's Stock Guide, 1962–1980 (Standard and Poor's Corporation, New York).
Shastri, K., 1983, The differential effects of merger on corporate security values, Unpublished manuscript (University of Pittsburgh, Pittsburgh, PA).
Smith, C. and J. Warner, 1979, On financial contracting: An analysis of bond covenants, Journal of Financial Economics 7, 117–161.
Statistical Report on Mergers and Acquisitions, 1974 (Federal Trade Commission, Washington, DC).
Wall Street Journal, 1962–1980 (Dow Jones, Inc., New York).
Wall Street Journal Index, 1962–1980 (Dow Jones, Inc., New York).