

# **Contagion Effects In Stock Returns and Analysts' Forecasts: The Case of Mutual Benefit Life Insurance Corporation**

**Samuel H. Szewczyk\***  
*Drexel University*

**Martin R. Thomas**  
*Advanta Corporation*

**George P. Tsetsekos**  
*Drexel University*

*On July 15, 1991 New Jersey regulators seized Mutual Benefit Life Insurance Corporation. Major insurance rating agencies assigned favorable ratings to Mutual Benefit Life until the day of its seizure. This study examines the impact of Mutual Benefit Life's failure on common stock values within the life insurance industry and on analysts' expectations for the industry. The results indicate a negative industry reaction in stock prices and analysts' forecasts following the event that was especially significant for highly rated insurers.*

## **INTRODUCTION**

Rating agencies are third party certifiers of the quality of financial claims. Insurance agents, policyholders, and other investors rely on ratings assigned to life insurers (especially by the three major agencies: A.M. Best, Moody's, and Standard & Poor's) for information about the safety of the savings plans and life insurance policies of rated insurers.<sup>1</sup> To the extent that rating agencies produce timely and accurate information, their

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<sup>1</sup> Recent empirical studies find that quality ratings can provide valuable information to investors. Holthausen and Leftwich (1986), Schweitzer, Szewczyk, and Varma (1991), and Hand, Holthausen, and Leftwich (1992) document significantly negative security price reactions to announcements of rating downgrades by Moody's and Standard & Poor's.

information-gathering and rating activities impose market discipline on insurers; policyholders are directed to safe companies, thereby penalizing risky companies by denying them funds. Moreover, if ratings are perceived to be reliable indicators of an insurer's claims-paying ability, rating agencies may play an instrumental role in preventing policyholder runs at financially troubled insurers from developing into widespread panics that could threaten the solvency of even financially sound life insurers.<sup>2</sup>

Recent events, however, cast doubt on the efficiency of professional insurance raters. On July 15, 1991 New Jersey state regulators seized Mutual Benefit Life Insurance Corporation. This action came as a surprise to insurance raters and policyholders. Seven days prior to the takeover A.M. Best lowered its rating on Mutual Benefit from A+ to a contingent A.<sup>3</sup> On the day of the seizure Moody's Investors Service downgraded its insurance financial strength rating for Mutual Benefit Life from single A-3 to Caa and the rating on its commercial paper from Prime-2 to Not-Prime. Also on that day Standard & Poor's suspended its ratings on Mutual Benefit's senior debt, commercial paper, and claims-paying ability.

Mutual Benefit's problems stemmed from its guaranteed investment contracts (GICs). GICs are fixed interest rate investment vehicles that generally are sold to pension plans. While the contracts have a maturity date, GICs typically allow early withdrawal with little penalty on as short as 30 days notice. Funds from these contracts were invested by Mutual Benefit in commercial real estate and mortgages totaling more than \$5 billion.<sup>4</sup> Large losses in these commercial real estate investments reduced the insurer's capital to less than 4 percent of assets by March 31. The company's problems were exacerbated by runs on GICs and policyholder redemptions. Policyholder redemptions totaling \$1 billion reduced the cash reserves of Mutual Benefit to around \$300 million within weeks. During the same time period approximately \$500 million in GICs were canceled. Regulators were forced to put a hold on further surrenders of policies and loans against policies. New Jersey state insurance commissioner Samuel Fortunato stated that he was taking this action "to protect the interest of policyholders" (*Wall Street Journal*, July 16, 1991).

Three other large life insurers also failed in 1991: Executive Life, First Capital Life, and Monarch Life. The failure of these insurers affected more than a million policyholders through reductions in retirement benefits and loss of access to savings. These failures raised concerns among policyholders, regulators, and legislators about the soundness of the industry and the effect of the failures on other insurers. An insurance analyst at Salomon Brothers noted that "investors are wondering if similar runs could occur at other insurers that have issued GICs" (*Wall Street Journal*, July 23, 1991). Criticism also was directed at insurance raters. Senator Howard M. Metzenbaum observed that "If the rating

<sup>2</sup> Unlike the banking industry where the activities of the Federal Deposit Insurance Corporation guard against panics, no federal guaranty fund exists for life insurance companies. State guaranty funds, which generally are not actuarially funded, vary in coverage and availability.

<sup>3</sup> The rating change was announced on the same day that the *Wall Street Journal* reported that Mutual Benefit was planning to dismiss 30 percent of its headquarters staff.

<sup>4</sup> Like other financial intermediaries, life insurance companies have undergone a fundamental change during the past decade. Deregulation, intensified competition, and disintermediation have induced financial intermediaries to offer more innovative investment products with higher promised returns. To obtain higher returns, many life insurers have invested in high yield risky assets such as commercial real estate and junk bonds.

agencies were getting constant information from insurers, then they have a lot to explain in terms of how they missed the boat on Mutual Benefit. Their credibility has been severely tested” (New York Times, August 4, 1991).

This study investigates the impact of the failure of Mutual Benefit Life on other insurers in the life insurance industry by examining contagion effects in both industry share prices and in analysts' earnings forecasts. Prior studies by DeAngelo, DeAngelo, and Gilson (1994) and Fenn and Cole (1994) document contagion effects in share prices associated with First Executive's announcement that it was writing down its bond portfolio. The failure of First Executive followed a long series of unfavorable reports; consequently, its eventual seizure was anticipated by the market. The seizure of Mutual Benefit Life was unexpected. The failure of professional insurance raters to foresee this insolvency may weaken the credibility of their ratings. If so, we would expect an increase in the uncertainty associated with investments in other life insurers. We document losses in equity values within the life insurance industry following the seizure of Mutual Benefit Life. These losses are statistically significant for highly rated insurers, but not statistically significant for low rated and unrated insurers. We also find concurrent evidence that analysts had lowered their assessment of the earnings of highly rated insurers systematically. Moreover, the share price reaction and earnings forecast revisions for rated firms are related to the riskiness of their investment portfolios.

## DATA AND RESEARCH METHODS

### SAMPLE SELECTION

A preliminary list of 57 firms (excluding Mutual Benefit Life) with a primary Security Industrial Classification (SIC) code of 6311 (life insurance) is obtained from the Dow Jones News Retrieval Data Base. The final sample is restricted to 47 life insurers with continuous trading records for their common stock through December 1991. This ensures that firms will not leave or enter the sample over the analysis period. Twenty-two of the sample firms are listed on either the New York Stock Exchange or American Stock Exchange, and 25 firms are traded in the over-the-counter market. Forty-five firms are rated either by A.M. Best, Moody's, or Standard & Poor's at the time of the state takeover of Mutual Benefit Life; two firms are unrated by the three rating agencies. Eight of the rated firms have low ratings. Low rated firms are assigned speculative grade ratings by Moody's (below Baa) or Standard & Poor's (below BBB) or are rated B or below by A.M. Best.

### ESTIMATING ABNORMAL COMMON STOCK RETURNS

A standard event study methodology is used to evaluate the market response to the failure of Mutual Benefit Life Insurance Corporation. The state takeover of the insurer on July 15, 1991 establishes day 0 (announcement day) in event time. The abnormal return

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<sup>5</sup> Critics contend that rating agencies pay closer attention to insurers' assets than to liabilities. As a result, they fail to assess the likelihood of large withdrawals by investors. The critics also note that because rating agencies sell their services to insurers, the rating agencies may have a conflict of interest. Depending on the insurance industry for revenues, the agencies may be reluctant to cut ratings. The three leading rating agencies dismiss much of the criticism as mere hindsight. A.M. Best has announced that it will factor investor confidence into its ratings. Moody's and Standard & Poor's have said they will give greater weight to that criterion.

(AR) for each security is the deviation of the security's actual return ( $R$ ) from an expected return generated by the market model:

$$(1) AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}).$$

The coefficients  $\hat{\alpha}_i$  and  $\hat{\beta}_i$  are the OLS estimates of security  $i$ 's market model parameters obtained from an estimation period of 150 consecutive trading days ending 135 trading days prior to day 0.<sup>6</sup> The S&P 500 index is used to measure the market return over day  $t$  ( $R_{mt}$ ).

For a sample of  $N$  securities the average abnormal return (AAR) on day  $t$  is calculated as:

$$(2) AAR_t = \frac{1}{n} \sum_{i=1}^N AR_{it}.$$

To control for heteroskedasticity, test statistics are based on standardized abnormal returns. The standardized abnormal return (SAR) for security  $i$  on day  $t$  is:

$$(3) SAR_{it} = \frac{AR_{it}}{S_{it}}$$

where

$$(4) S = \left[ V_i^2 \left( 1 + \frac{1}{ED} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{t=1}^{ED} (R_{mt} - \bar{R}_m)^2} \right) \right]^{1/2}.$$

In the above equation,  $V_i^2$  is the residual variance of security  $i$ 's market model regression,  $ED$  is the total number of days in the regression's estimation period, and  $\bar{R}_m$  is the average market return over the estimation period.

To test the hypothesis that the average standardized abnormal return (ASAR) over/on day  $t$  is equal to zero, the following  $Z$ -statistic is computed:

$$(5) Z = \sqrt{N}(ASAR_t)$$

where:

$$(6) ASAR_t = \frac{1}{n} \sum_{i=1}^N SAR_{it}$$

is the ASAR on day  $t$ . The above  $Z$ -statistic is distributed unit normal under the null hypothesis.

To test the hypothesis that the difference in the average standardized abnormal returns of samples 1 and 2 is equal to zero the following  $Z_{diff}$  statistic is computed:

<sup>6</sup> We test the sensitivity of our results to the estimation period with event tests using alternative estimation periods. The results of these event tests do not differ significantly.

$$(7) Z_{\text{diff}} = \frac{\sqrt{N_2}Z_1 - \sqrt{N_1}Z_2}{\sqrt{N_1+N_2}}.$$

The above  $Z_{\text{diff}}$  statistic is distributed unit normal under the null hypothesis.

### ESTIMATING EARNINGS FORECAST REVISIONS

We use the methodology described in Brous (1992) to test the response in analysts' forecasts to the seizure of Mutual Benefit Life. Earnings forecast data are obtained from the Institutional Brokers Estimate System (IBES) tape. IBES reports earnings forecasts made by analysts on a monthly basis for more than 8,000 individual firms. We use the forecast series for the current year earnings per share to examine revisions in analysts' expectations for the firm's near-term earnings. IBES compiles analysts' forecasts on the third Thursday of each month; therefore, a forecast month is defined as the third Thursday in one month to the third Thursday in the following month. July 15, 1991 establishes forecast month 0 in event time (also designated as month *July* in the tables). The forecast for month 0 is the first earnings forecast reported by IBES following the seizure of the insurer.

The monthly forecast revision for the current year earnings per share for firm  $i$  in forecast month  $t$  is calculated as:

$$(8) FR_{i,t} = \frac{(F_{i,t} - F_{i,t-1})}{P_i}$$

where:

- $F_{i,t}$  = The mean of analysts' earning forecast for firm  $i$  at month  $t$ ;
- $F_{i,t-1}$  = The mean of analyst's earnings forecast for firm  $i$  at month  $t - 1$ ; and
- $P_{i,t-1}$  = The market price of firm  $i$ 's common stock at month  $t - 1$  as reported by IBES.<sup>7</sup>

Brous (1992) shows that analysts' earnings forecasts are subject to optimism bias whereby forecasts are overly optimistic at the beginning of the fiscal year and are systematically revised downward. Consequently, expected earnings forecast revisions are not equal to zero. Brous (1992) also demonstrates that because not all analysts update their earnings forecasts on a monthly basis, monthly forecast revisions are serially correlated. This suggests that revisions preceding the announcement month may be useful in estimating expected forecast revisions.

As in Brous (1992), we adjust the earnings forecasts by an estimate of the expected forecast revision that takes into account both optimism bias and serial correlation in the forecast revisions. The expected forecast revision is estimated using a fourth order moving

<sup>7</sup> See Christie (1987) for a discussion of the merits of normalizing earnings per share by price.

average model.<sup>8</sup> The expected forecast revision for firm  $i$  in forecast month  $t$  is estimated as

$$(9) E[FR_{i,t}] = k_i + \frac{1}{n} \sum_{s=1}^{n-1} \epsilon_{i,t-s}.$$

The forecasted component,  $k_i$ , is a measure of the bias for firm  $i$ .  $k_i$  is estimated for each firm as the average forecast revision over an estimation period consisting of all months for which forecasts are available excluding months -6 to 6. The unexpected component,  $\epsilon_{i,t-s}$ , is the difference between  $k_i$  and the actual forecast revision in month  $t$ . Therefore, the expected forecast revision in month  $t$  is equal to the forecastable component,  $k_i$ , plus a weighted average of the four previous month's unexpected component, where the weights equal 0.20.

The abnormal or unexpected forecast revision for firm  $i$  in forecast month  $t$  can be expressed as

$$(10) AFR_{i,t} = FT_{i,t} - E(FR_{i,t}) = \epsilon_{i,t}.$$

For a sample of  $N$  firms the average abnormal forecast revision (AAFR) in forecast month  $t$  is calculated as

$$(11) AAFR_t = \frac{1}{n} \sum_{i=1}^N AFR_{i,t}.$$

We use a standard  $t$ -statistic to test the hypothesis that the average abnormal forecast revision in month  $t$  is equal to zero.

## EMPIRICAL RESULTS

### CONTAGION EFFECT IN STOCK RETURNS AND ANALYSTS' FORECASTS

Table 1 presents average abnormal returns (AAR) for 21 trading days surrounding the July 15, 1991 seizure of Mutual Benefit Life. Abnormal stock price performance is presented for the total sample of life insurers and for samples consisting of highly rated and low rated or unrated firms. Table 1 shows a significant stock price reaction of -0.994 percent in the total sample of insurers over the July 15 announcement day, with 68.1 percent of the sample firms individually reporting negative abnormal returns. The associated  $Z$ -statistic of -2.47 indicates that the announcement day AAR is significantly different from zero at the 0.05 level. A significantly negative reaction is recorded on July 8, the trading day prior to the report in the *Wall Street Journal* of Mutual Benefit Life's decision to dismiss 30 percent of its employees at its headquarters. Significant stock price reactions also are observed surrounding an unfavorable report on the insurance industry in the "Heard on the Street" column of the *Wall Street Journal* on July 24. The report was precipitated by the collapse and seizure of Mutual Benefit Life.

<sup>8</sup> Because approximately 20 percent of analysts in our sample revise their forecasts of current year earnings each month, there will be a four month period between individual analyst's updates. Consequently, these forecast revisions will be correlated with forecast revisions in the previous four months.

**Table 1—Percentage Average Abnormal Returns (AAR) Around the Seizure of Mutual Benefit Life Insurance Company for an Industry Portfolio of Life Insurers**

| Calendar Day      | Event Day | Total Sample<br>(N = 47) |             |            | Highly Rated Firms<br>(N = 37) |             |            | Low Rated and Unrated Firms<br>(N = 10) |             |            |
|-------------------|-----------|--------------------------|-------------|------------|--------------------------------|-------------|------------|-----------------------------------------|-------------|------------|
|                   |           | AAR                      | Z-Statistic | % Negative | AAR                            | Z-Statistic | % Negative | AAR                                     | Z-Statistic | % Negative |
| 6/28              | -10       | -0.172                   | -0.10       | 51.1       | -0.147                         | -0.32       | 54.1       | -0.261                                  | 0.39        | 40.0       |
| 7/01              | -9        | -0.200                   | -0.45       | 53.2       | 0.086                          | -0.23       | 51.4       | -1.256                                  | -0.95       | 60.0       |
| 7/02              | -8        | -0.328                   | -0.78       | 61.7       | -0.489                         | -1.67       | 56.8       | 0.269                                   | 0.01        | 80.0       |
| 7/03              | -7        | -0.130                   | 0.33        | 44.7       | 0.256                          | 0.83        | 43.2       | -1.560                                  | -0.88       | 50.0       |
| 7/05              | -6        | -0.887                   | -1.98       | 66.0       | -1.114                         | -2.28       | 70.3       | -0.046                                  | 0.09        | 60.0       |
| 7/08*             | -5        | 0.062                    | 1.14        | 55.3       | 0.384                          | 0.66        | 54.1       | 1.513                                   | 1.21        | 60.0       |
| 7/09              | -4        | -0.139                   | -0.71       | 57.4       | -0.199                         | -0.85       | 56.8       | 0.082                                   | 0.09        | 60.0       |
| 7/10              | -3        | -0.262                   | -0.31       | 55.3       | -0.345                         | -0.60       | 56.8       | 0.699                                   | 0.85        | 40.0       |
| 7/11              | -2        | 0.736                    | 1.12        | 51.0       | 0.505                          | 0.66        | 54.1       | 1.591                                   | 0.91        | 40.0       |
| 7/12              | -1        | -0.635                   | -1.21       | 61.7       | 0.066                          | -0.37       | 56.8       | -3.230                                  | -1.92       | 80.0       |
| 7/15 <sup>b</sup> | 0         | -0.994                   | -2.47       | 68.1       | -1.148                         | -2.72       | 67.6       | -0.423                                  | -0.12       | 70.0       |
| 7/16              | 1         | -0.354                   | -0.94       | 63.8       | -0.362                         | -0.44       | 62.2       | -0.324                                  | -1.20       | 70.0       |
| 7/17              | 2         | 0.265                    | -0.24       | 59.6       | 0.182                          | -0.45       | 62.2       | 1.088                                   | 0.51        | 50.0       |
| 7/18              | 3         | 0.037                    | 0.10        | 57.4       | -0.182                         | -0.23       | 62.2       | 0.849                                   | 0.56        | 40.0       |
| 7/19              | 4         | -0.565                   | -1.24       | 51.1       | -0.089                         | -0.90       | 48.6       | -2.325                                  | -0.96       | 60.0       |
| 7/22              | 5         | -0.332                   | -0.72       | 51.1       | -0.498                         | -0.84       | 51.4       | 0.284                                   | 0.69        | 50.0       |
| 7/23              | 6         | -1.138                   | -2.84       | 61.7       | -0.892                         | -2.17       | 62.2       | -2.047                                  | -2.00       | 60.0       |
| 7/24 <sup>c</sup> | 7         | 0.038                    | -1.06       | 57.4       | -0.684                         | -2.28       | 64.9       | 2.709                                   | 2.09        | 30.0       |
| 7/25              | 8         | -0.429                   | -1.43       | 48.9       | -0.226                         | -0.38       | 48.6       | -1.182                                  | -1.06       | 50.0       |
| 7/26              | 9         | -0.289                   | -1.30       | 66.0       | -0.294                         | -1.18       | 64.9       | -0.272                                  | -0.55       | 70.0       |
| 7/29              | 10        | 0.238                    | 1.45        | 48.9       | 0.652                          | -1.90       | 37.8       | -1.295                                  | -0.58       | 60.0       |

\*Mutual Benefit Life announces it will dismiss 30 percent of its employees at its headquarters. A.M. Best lowers its rating on Mutual Benefit Life from A-plus (superior) to A (excellent)

<sup>b</sup>New Jersey takes over Mutual Benefit Life Insurance Corporation. Standard & Poor's Corp. suspends its ratings on Mutual Benefit Life. Moody's Investors Service downgrades Mutual Benefit Life from A-3 to Caa

<sup>c</sup>Heard on the Street: Investors Are Warned to be Wary of Insurance Stocks for a While," *Wall Street Journal*, July 24, 1991

Results for the total sample of insurers indicate that investors inferred unfavorable new information regarding conditions within the insurance industry from the seizure of Mutual Benefit Life. The magnitude of the reaction, however, may vary across firms with different quality ratings. If rating agencies provide reliable information about the financial strength and claims-paying ability of insurers, information inferred from the event could be especially unfavorable for low rated and unrated firms; therefore, their stock price reactions would be more negative than the reactions for highly rated firms. Mutual Benefit Life was a highly rated firm, however, and its unexpected seizure may have caused investors to doubt the reliability of high ratings assigned to insurers. In this case, more negative stock price reactions would be observed for highly rated firms. On the other hand, if the event cast doubt on the reliability of all ratings assigned to insurers, similar stock price reactions would be observed for all firms regardless of rating.

In Table 1 highly rated firms report a statistically significant AAR of -1.148 percent ( $Z$ -statistic = -2.72) over July 15; low rated or unrated firms report a smaller negative AAR of -0.423 percent which is statistically insignificant ( $Z$ -statistic = -0.12). The difference in announcement period AARs for highly rated and low rated or unrated firms is not statistically significant ( $Z_{\text{diff}}$ -statistic = -1.15). This evidence is consistent with the conjecture that the seizure of Mutual Benefit Life hurt the credibility of the ratings assigned to life insurers.

A large negative reaction of -3.230 percent is recorded by the low rated or unrated sample of firms on July 12, the trading day before the seizure of Mutual Benefit Life. This AAR could be attributed to news about the impending seizure leaking into the market prior to the event. If so, the total market response to the seizure would be captured by cumulating the AARs across July 12 and July 15 (days -1 and 0 in event time). Across this two day announcement period highly rated firms record a statistically significant AAR of -1.082 percent ( $Z$ -statistic = -2.183). Low rated or unrated firms record a negative but statistically AAR of -3.652 ( $Z$ -statistic = -1.438). The difference in AARs between highly rated and low rated or unrated firms is statistically insignificant ( $Z_{\text{diff}}$ -statistic = -0.05).

Table 2 reports AARs around the seizure dates for the three insurance failures that occurred earlier in 1991: First Executive Life (April 12, 1991), First Capital Life (May 15, 1991), and Monarch Life (May 31, 1991). We find no significant announcement day abnormal returns for any of the three insurers. Other events unfavorable to these firms and leading to their seizures were reported by the financial press. Consequently, the seizures of First Executive Life, First Capital Life, and Monarch Life were anticipated by the market, and we observe no significant market response. The seizure of Mutual Benefit Life, however, was unanticipated.

We also find a contagion effect in analyst forecasts associated with the seizure of Mutual Benefit Life. Table 3 reports average abnormal forecast revisions (AAFR) for 12 months surrounding July 15, 1991. AAFRs are measured for the total sample of life insurers and for subsamples of highly rated firms and low rated or unrated firms. Table 3 shows that a negative AAFR is recorded by the total sample of insurers during the July announcement month, with 83 percent of the forecasts revised downward. The associated  $t$ -statistic of -2.50 indicates the announcement month AAFR is significantly different from zero at the 0.05 level.

**Table 2—Percentage Average Abnormal Returns (AAR) Around the Seizures of First Executive Life (April 12, 1991), First Capital Life (May 15, 1991), and Monarch Life (May 31, 1991) for an Industry Portfolio of Life Insurers**

| Event Day | Executive Life |             |            | First Capital Life |             |            | Monarch Life |             |            |
|-----------|----------------|-------------|------------|--------------------|-------------|------------|--------------|-------------|------------|
|           | AAR            | Z-Statistic | % Negative | AAR                | Z-Statistic | % Negative | AAR          | Z-Statistic | % Negative |
| -10       | 1.022          | 1.45        | 46.8       | -0.308             | -0.35       | 59.6       | 0.526        | 0.52        | 53.2       |
| -9        | -0.253         | -1.00       | 53.2       | 0.369              | 0.05        | 51.1       | -0.501       | -0.87       | 59.6       |
| -8        | -0.413         | -0.01       | 57.4       | 0.186              | -0.10       | 55.3       | -0.548       | -0.55       | 51.1       |
| -7        | 0.081          | 0.13        | 51.1       | -0.709             | -1.03       | 42.6       | 0.498        | 0.65        | 59.6       |
| -6        | 0.672          | 2.38        | 44.7       | 0.987              | 2.04        | 38.3       | 0.753        | 1.65        | 55.3       |
| -5        | -0.143         | 1.38        | 48.9       | 0.736              | 0.12        | 66.0       | 0.203        | 0.44        | 53.2       |
| -4        | -0.286         | 0.34        | 57.4       | 0.358              | 0.76        | 48.9       | 0.120        | 1.16        | 57.4       |
| -3        | -0.151         | -0.81       | 53.2       | 0.237              | 0.00        | 53.2       | -0.248       | -0.23       | 61.7       |
| -2        | -0.624         | -1.30       | 57.4       | -0.487             | -1.43       | 59.6       | 0.246        | -0.41       | 61.7       |
| -1        | 0.277          | -1.06       | 66.0       | -0.826             | -1.38       | 55.3       | -0.360       | -0.03       | 53.2       |
| 0         | 0.133          | -0.04       | 55.3       | 0.370              | 1.31        | 46.8       | -0.047       | -1.16       | 63.8       |
| 1         | -0.320         | -0.01       | 48.9       | 0.542              | 0.52        | 51.1       | -0.761       | -1.36       | 68.1       |
| 2         | -0.729         | -0.37       | 59.6       | -0.486             | -0.84       | 51.1       | 0.454        | 1.28        | 44.7       |
| 3         | 0.755          | 0.72        | 55.3       | -0.533             | -0.61       | 48.9       | 0.042        | -0.32       | 68.1       |
| 4         | -0.224         | -0.48       | 59.6       | 0.513              | 0.70        | 57.4       | -0.339       | -0.63       | 57.4       |
| 5         | 0.622          | 1.34        | 44.7       | 0.768              | 1.41        | 51.1       | 0.117        | 0.10        | 59.6       |
| 6         | -0.584         | -0.34       | 44.7       | 0.218              | 0.39        | 44.7       | 0.077        | 0.13        | 46.8       |
| 7         | 0.916          | 1.08        | 51.1       | 0.135              | 1.14        | 55.3       | -0.303       | -1.56       | 66.0       |
| 8         | -0.166         | -0.55       | 48.9       | -0.232             | -0.24       | 59.6       | 0.570        | 0.86        | 40.4       |
| 9         | 0.936          | 2.10        | 42.6       | 0.261              | -0.35       | 57.4       | 0.681        | 1.36        | 46.8       |
| 10        | -0.738         | -1.52       | 57.4       | -0.344             | -0.02       | 53.2       | -0.029       | -0.47       | 66.0       |

**Table 3—Average Abnormal Forecast Revisions (AAFR) Around the Seizure of Mutual Benefit Life Insurance Company for an Industry Portfolio of Life Insurers**

| Calendar Month     | Event Month | Total Sample<br>(N = 47) |             |            | Highly Rated Firms<br>(N = 37) |             |            | Low Rated and Unrated Firms<br>(N = 10) |             |            |
|--------------------|-------------|--------------------------|-------------|------------|--------------------------------|-------------|------------|-----------------------------------------|-------------|------------|
|                    |             | AAFR                     | Z-Statistic | % Negative | AAFR                           | Z-Statistic | % Negative | AAFR                                    | Z-Statistic | % Negative |
| January            | -6          | -0.0115                  | -1.62       | 51.1       | -0.0128                        | -1.44       | 54.1       | -0.0068                                 | -1.00       | 40.0       |
| February           | -5          | 0.0050                   | 0.93        | 25.5       | 0.0083                         | 1.57        | 27.0       | -0.0074                                 | -0.46       | 20.0       |
| March              | -4          | 0.0218                   | 2.36        | 42.6       | 0.0181                         | 1.75        | 48.6       | 0.0354                                  | 1.77        | 20.0       |
| April <sup>a</sup> | -3          | 0.0177                   | 1.25        | 68.1       | 0.0208                         | 1.17        | 73.0       | 0.0063                                  | 0.77        | 50.0       |
| May <sup>b</sup>   | -2          | -0.0034                  | -1.85       | 72.3       | -0.0023                        | -1.59       | 75.7       | -0.0076                                 | -1.08       | 60.0       |
| June               | -1          | -0.0057                  | -1.15       | 63.8       | -0.0015                        | -0.81       | 70.3       | -0.0213                                 | -0.95       | 60.0       |
| July <sup>c</sup>  | 0           | -0.0078                  | -2.50       | 83.0       | -0.0074                        | -2.04       | 83.8       | -0.0092                                 | -1.48       | 80.0       |
| August             | 1           | -0.0013                  | -0.14       | 72.3       | -0.0072                        | -1.96       | 73.0       | 0.0007                                  | 0.23        | 80.0       |
| September          | 2           | -0.0125                  | -1.21       | 59.6       | -0.0055                        | -1.62       | 62.2       | 0.0012                                  | 0.33        | 80.0       |
| October            | 3           | 0.0022                   | 1.48        | 55.3       | -0.0001                        | -0.14       | 54.1       | -0.0001                                 | -0.05       | 80.0       |
| November           | 4           | -0.0001                  | -0.02       | 44.7       | -0.0013                        | -1.38       | 48.6       | 0.0005                                  | 0.21        | 60.0       |
| December           | 5           | 0.0016                   | 1.47        | 36.2       | -0.0000                        | -0.03       | 37.8       | -0.0010                                 | -0.41       | 60.0       |

<sup>a</sup>Regulators take control of First Executive's California and New York units

<sup>b</sup>First Capital Life and Monarch Life seized by regulators

<sup>c</sup>New Jersey takes over Mutual Benefit Life Insurance Corporation. Standard & Poor's Corp. suspends its ratings on Mutual Benefit Life. Moody's Investors Service downgrades Mutual Benefit Life from A-3 to Caa

The negative abnormal forecast revisions are consistent with the negative abnormal stock price performance reported in the event tests. The results indicate that the seizure of Mutual Benefit Life led analysts as well as investors to revise their assessments of conditions within the insurance industry. Our results for the subsamples of highly rated and low rated or unrated insurers are also consistent with the prior analysis. Table 3 reports a statistically insignificant announcement AAFR for low rated or unrated insurers (t-statistic = -1.48). On the other hand, highly rated insurers report a negative AAFR that is significant at the 0.05 level (t-statistic = -2.04).

### ***CROSS-SECTIONAL REGRESSIONS OF THE CONTAGION EFFECTS***

To further investigate potential determinants of the industry reaction to the seizure of Mutual Benefit Life, the following regression models are estimated for the sample of rated insurers:<sup>9</sup>

$$(1) AR_i = B_0 + B_1 RATING_i + B_2 NONINV_i + B_3 ROA_i + B_4 SIZE_i$$

$$(2) AFR_i = B_0 + B_1 RATING_i + B_2 NONINV_i + B_3 ROA_i + B_4 SIZE_i$$

In regression model (1)  $AR_i$  is the abnormal return over July 15 for insurer  $i$ . In regression model (2)  $AFR_i$  is insurer  $i$ 's abnormal forecast revision for the month of July 1991. The independent variables for the regressions are defined below.

**RATING** is an index variable equal to 1 if the insurer is assigned a high rating by the rating agencies and 0 otherwise. Information inferred from the seizure of Mutual Benefit Life may be unfavorable for financially weak insurers. To the extent that ratings provide credible information about an insurer's financial condition, a positive coefficient is predicted for **RATING**. On the other hand, if the seizure of Mutual Benefit Life called into question high ratings assigned to insurers, a negative coefficient is predicted.

**NONINV** is the dollar value of investment in noninvestment grade bonds divided by the insurer's total assets. **NONINV** proxies for the quality of the insurer's investment portfolio. Given the uncertainties and the uneasiness among policyholders following Mutual Benefit Life's collapse, insurers with a high proportion of speculative investments may be perceived as being vulnerable to runs. A negative coefficient is predicted for **NONINV**.

**ROA** is return on assets calculated as net income divided by total assets. **ROA** tests whether less profitable insurers are associated with more negative abnormal returns. A negative coefficient is predicted, therefore, for **ROA**. **SIZE** is the size of the firm measured by the logarithm of total assets.

**SIZE** is a control variable that proxies for the information asymmetry about the firm (Barry and Brown, 1984). More information is generally available for larger firms, and they may experience more subdued abnormal returns. Consequently, a positive coefficient is predicted for **SIZE**.

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<sup>9</sup> Data required to calculate the values of the explanatory variables are collected from Moody's and A.M. Best. Sufficient data are not available for unrated firms.

**Table 4—Regression Results for Sample of 45 Life Insurers (Regression (1) relates abnormal returns for the July 15, 1991 seizure of Mutual Benefit Life Insurance Company to various explanatory variables. Regression (2) relates abnormal forecast revisions for the July 1991 seizure of Mutual Benefit Life Insurance Company to the explanatory variables. t-statistics are in parentheses.)**

|     | Intercept       | RATING            | Independent Variables* |                   | SIZE            | R <sup>2</sup> |
|-----|-----------------|-------------------|------------------------|-------------------|-----------------|----------------|
|     |                 |                   | NONINV                 | ROA               |                 |                |
| (1) | 1.521<br>(0.42) | -3.701<br>(-1.71) | -0.131<br>(-2.20)      | 0.355<br>(1.63)   | 0.039<br>(0.11) | 0.26           |
| (2) | 0.013<br>(0.74) | -0.010<br>(-0.95) | -0.002<br>(-5.48)      | -0.002<br>(-1.75) | 0.000<br>(0.07) | 0.49           |

\*Independent variables are defined as follows:

- RATING = Index variable set to 1 if insurer is assigned high rating and 0 otherwise
- NONINV = Dollar value of investment in noninvestment grade bonds divided by total assets
- ROA = Return on assets calculated as net income divided by total assets
- SIZE = Logarithm of total assets

Table 4 presents results for the regressions. The coefficients for RATING are negative in regressions (1) and (2) but not statistically significant. The coefficients for the variable proxying for asset quality, NONINV, are negative as predicted and statistically significant at the 0.05 level in regression (1) and significant at the 0.01 level in regression (2). This result suggests a failure on the part of rating agencies and other financial analysts in accurately predicting asset risk. The coefficients for ROA and SIZE are not statistically significant.

## SUMMARY AND CONCLUSIONS

The rating of life insurers by rating agencies such as A.M. Best, Moody's, and Standard & Poor's perform several valuable functions:

- Ratings supply policyholders and other investors with information regarding the quality of the financial claims of rated insurers;
- The rating of insurers contributes to market discipline within the industry
- Credible ratings guard against panics and widespread runs on insurers by policyholders.

The collapse of Mutual Benefit Life, an insurer with favorable ratings until its seizure by New Jersey insurance regulators, demonstrates the failure of insurance raters to foresee insolvencies and accurately predict asset risks.

We measure the impact of Mutual Benefit Life's failure on the share prices of other life insurers and find a significantly negative industry effect. We find no evidence that the share price reaction for highly rated insurers was less unfavorable than that reported for low rated and unrated insurers. We also find identical results for industry effects measured by analysts' forecast revisions—industry forecasts were systematically revised downward during the month of Mutual Benefit Life's failure. Forecast revisions were especially significant for highly rated insurers. We find the share price reaction and analyst forecast revisions for rated insurers to be positively related to their investment in noninvestment

grade bonds. Our results indicate that the seizure of Mutual Benefit Life revised perceptions regarding conditions within the life insurance industry and that the activities of rating agencies did not reduce the information of the event for rated insurers. The strong reactions for highly rated insurers demonstrates that ratings at the time of Mutual Benefit Life's seizure did not capture appropriate information about asset quality and cash flow potential. Our evidence suggests that the failure of rating agencies to accurately assess the difficulties of Mutual Benefit Life lowered the credibility of their ratings among investors and analysts.

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