Catastrophic Events and Retroactive Liability Insurance: The Case of the MGM Grand Fire

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This study examines the capital market response to the MGM Grand fire and to the announcement of MGM Grand's purchase of $170 million in retroactive liability insurance. The information transfer effect is also examined. Event study research methods support earlier findings that the news of the fire had an adverse effect on MGM's security price. Security prices of industry co-member firms, however, experienced a negative information transfer (positive returns) on the date of the fire, a result consistent with intra-industry shifts in market share. Shifts in systematic risks were not documented for MGM or a portfolio of industry co-members.

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Recent analytical papers have developed the conditions under which an insured's purchase of retroactive liability insurance is economically advantageous. Smith and Witt (1985) argue that tax arbitrage enables the insured to share in the insurer's immediate income tax reductions for loss reserves. Venezian and Fields (1987) identify additional shared economic benefits derived from differential expectations of ultimate loss and the insurer's comparative advantage in dealing with losses. These arguments imply a favorable capital market response to the announcement of a retroactive insurance purchase.

However, it is possible that a retroactive insurance purchase has an additional role in determining firm value. If the capital market is unsure about the probability and amount of loss related to the insured risk, the retroactive insurance agreement may provide a reliable dollar estimate of a significant portion of the loss. Thus, the insurance policy serves to adjust the capital market's initial estimate of probable loss.

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This study examines the capital market response to the MGM Grand fire and to the announcement of MGM Grand's purchase of $170 million in retroactive liability insurance to help cover the costs of potential liability claims resulting from the fire. The notion that information about catastrophic loss results in security price changes for the announcing firm is developed and empirically demonstrated in Sprecher and Pertl (1983, 1988).

Evidence that such losses have industry-wide impact (information transfer) is provided by Bowen, Castanias, and Daley (1983) and Hill and Schneeweis (1982). The information transfer effect is also examined in this study because of its potential to differentiate, at least partially, between 1) the market's interpretation of the economic advantages of retroactive insurance; and 2) the market's use of the insurance announcement to determine the extent of loss. The former is firm-specific while the latter may have industry impact due to competitive shifts within the industry or changes in industry risk. Thus, a finding of information transfer relating to both the fire and the retroactive insurance announcement would be indicative of the market using a retroactive insurance announcement to adjust expectations of probable loss.

The results of this study are consistent with previous research in that the news of the fire had an adverse effect on MGM's security price. The security prices of industry co-member firms were affected in the opposite direction (negative information transfer) on the date of the fire, a result consistent with intra-industry shifts in market share. Also, MGM experienced a statistically significant negative unexpected security return associated with the retroactive insurance purchase. Once again, industry co-members experienced significant unexpected returns in the opposite direction. Shifts in systematic risk were not documented for MGM or the portfolio of industry co-members.

The interpretation of these results is that the securities market used the retroactive insurance announcement to adjust expectations of probable loss. This interpretation is supported by an identical pattern of information transfer around the date of the fire and around the date of the retroactive insurance purchase. This result does not reject the economic advantages hypotheses of Smith and Witt (1985) and Venezian and Fields (1987), and in fact, highlights the role of market expectation of loss on the insured risk in future tests of the hypotheses.

Hypotheses

Economic Effects of a Catastrophic Loss

Sprecher and Pertl (1988) argue that the occurrence of a large loss from a catastrophic event adversely affects the value of the firm because of the inability of the firm's insurance coverage to absorb the full amount of the loss. Additionally, the loss of income from a reduction in productive capacity may occur. They document that firms experiencing a large loss from a catastrophic event sustained an immediate adverse effect on their stock price.

A unique feature of the loss associated with the MGM fire is that the magnitude of the liability, property, and earnings loss was not known on the

date of the fire. Rather, the magnitude of the loss became apparent after the receipt of subsequent information. This suggests the potential for significant MGM stock price reactions to occur not only on the day of the fire but on subsequent announcement days as well.

Although the total loss was not determinable on the day of the fire, it is hypothesized that the announcement of the fire would have an adverse effect on MGM's stock price because of the high probability that MGM would eventually incur a significant loss. Thus, the null hypothesis is tested against the directional alternative of a negative association.

H_{01}: The announcement of the MGM fire did not have an immediate effect on the unexpected security returns of MGM.

Economic Effects of Retroactive Insurance

It is unlikely that MGM would have purchased the retroactive insurance unless it were cost beneficial to do so. To the extent the market interpreted the insurance purchase as decreasing MGM's eventual loss from litigation, then a positive stock price reaction would be expected on the day of the announcement. Alternatively, it is possible that the purchase of the retroactive insurance may have provided the market a signal that MGM's loss from the litigation was going to be larger (smaller) than originally expected. The actual amount and the timing of any payments to be made with respect to the litigation were unknown. Reports cited liability claims in excess of $1 billion, whereas MGM had only $30 million of liability coverage (Lancaster, 1981).[1] From this perspective, the insurance purchase could be viewed as "bad" ("good") news and would be associated with a negative (positive) stock price reaction. These opposing views of the stock market reaction lead to testing of the following null hypothesis against a non-directional alternative.

H_{02}: The announcement of the purchase of retroactive liability insurance did not have an immediate effect on the unexpected security returns of MGM.

Intra-Industry Information Transfer Effects

Intra-industry information transfer occurs when information releases made by one firm affect the security prices of other, similar firms. The existence of information transfer has been associated with various types of information releases. Of particular interest to this study are the information transfer effects associated with catastrophic events. Previous research (Bowen, Castanias, and Daley, 1983; and Hill and Schneeweis, 1982) has documented

[1] The uncertainty surrounding the total impact of the fire is evident from subsequent *Wall Street Journal* announcements. For instance, in the initial announcement of the fire, MGM officials stated that the hotel-casino would be closed for over seven months; however, the amount of the fire-related income loss covered by the firm's business interruption insurance was unknown. Additionally, no reconstruction estimates were available at this time. Later announcements provided additional information on the extent of the loss and MGM's insurance coverage.

the existence of positive information transfer associated with the nuclear accident at Three Mile Island. A primary motivation for these studies was that the accident increased public concern about the safety of nuclear plants and intensified regulatory activity in the electric utility industry. Positive information transfer was hypothesized because the changes in attitudes resulting from the accident may have lead to increased uncertainty about the level and variability of future cash flows for all firms in the industry. For instance, the accident had the potential to result in extended plant shutdowns and increased costs to meet stricter regulations for all firms in the electric utility industry.

The information transfer associated with the MGM fire has also been examined (see Sprecher and Pertl, 1988). Similar to the Three Mile Island studies, the basis for hypothesizing positive information transfer was the potential decrease in similar firms' expected future cash flows due to the increased costs associated with improving fire safety in the hotel-casino industry. In contrast to the positive transfer documented with the Three Mile Island accident, Sprecher and Pertl find no evidence of information transfer associated with the MGM fire.[2]

Although the evidence from the Three Mile Island accident suggests the potential for positive information transfer associated with catastrophic events, the possibility of differential information transfer among firms also exists. Foster (1981) states that information releases by one firm in an industry can convey positive information for some firms in the industry, negative information for others, and possibly no information transfer for some firms. The prediction of positive information transfer is based on the notion that information releases of one firm are reflective of industry-wide commonalities. Therefore, positive information transfer may be associated with the MGM fire if all firms in the hotel-casino industry were affected similarly by the information releases.

In contrast, negative information transfer is based on the notion that firms in the same industry are involved in a constant sum game. Thus, positive (negative) information releases of one firm may convey information about competitive shifts within an industry and may convey negative (positive) information to other firms in the industry (see Foster, 1981). For instance, the MGM fire resulted in the temporary closing of the damaged Las Vegas hotel-casino and delayed groundbreaking on MGM's planned Atlantic City hotel-casino. If the firms in the hotel-casino industry are involved in a constant sum game, this negative information regarding MGM may provide information on market share shifts in the industry and may be considered "good" news for other firms in the industry. As a result, there exists the

[2]This finding may be partially attributable to the presence of negatively correlated market model residuals in their study. This leads to an upward-biased estimate of the standard deviation of the residuals and results in a bias against rejecting the null hypothesis of no information transfer.

possibility of negative information transfer associated with fire-related announcements made by MGM.

It is also possible that information releases contain no information for some of the firms in the industry. That is, the announcements may have neither provided information on industry-wide commonalities nor provided information on competitive shifts within the industry. This possibility may be partially attributable to the methodology employed to identify similar firms.[3]

The potential for information transfer effects associated with MGM fire-related announcements motivates testing the two null hypotheses against non-directional alternatives for a portfolio of industry co-members in addition to MGM. If the same pattern of information transfer is detected in rejecting H_{01} and H_{02} for the portfolio of nonreleasers, then the information effects of the retroactive insurance announcements are likely to be related to the market's reassessment of probable loss rather than to the firm-specific economic advantages of retroactive liability insurance.

Shifts in Systematic Risk

While it is unlikely that a shift in systematic risk resulted from the firm-specific events associated with the MGM Grand fire, a test of such a shift was included in this study. This permits comparison to the results of other studies on catastrophic events discussed earlier. Also, if such a shift is present for MGM or MGM's industry co-members, formal incorporation of the potential for the shift into the econometric model will provide unbiased tests of the effects of post-fire events (retroactive insurance).

H_{03}: The systematic risk of MGM and industry co-members did not change in the period subsequent to the MGM fire.

Research Methods

Sample of Firms and Event Days

For comparison purposes, the sample of firms chosen in this study was the same as that used by Sprecher and Pertl (1988). The selection criteria employed by Sprecher and Pertl were twofold. First, four-digit SIC code industry classifications were used to identify firms that were in the hotel-casino industry. Second, daily return information for these firms had to

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[3] A common technique used to identify similar firms is on the basis of four-digit SIC codes. However, this may lead to the inclusion of firms with different business risk classes and varying degrees of sales covariability (see Baginski, 1987). For instance, in a study of the information transfer associated with management forecasts, Baginski (1990) found that the existence of information transfer at the four-digit SIC code level was driven by nonreleaser firms with sales that covaried highly with releaser firms' sales. No information transfer was found when the sales relationship was low. Similarly, Foster (1981) detected more significant information transfer for firms with a larger percentage of their revenues in the same line of business as the earnings release firms. Therefore, it appears that the ability to detect information transfer is somewhat dependent upon appropriately identifying similar firms.

be available from the Center for Research on Security Prices daily returns tape. This selection criteria resulted in the identification of 15 similar firms (in addition to MGM Grand). One of these firms, Resorts International, had two classes of common stock which resulted in 16 securities being included in the information transfer analysis. Appendix 1 contains a list of these firms.

The fire event was specified as occuring on two potential dates: (1) November 21, 1980, date of the fire; and (2) November 24, 1980, date of announcement of the fire in the *Wall Street Journal (WSJ)*. The event date for the public revelation of the retroactive liability insurance is more difficult to determine. The *WSJ* report date is February 11, 1981. However, *Business Insurance* also carried the story. Cassidy, Constand, and Corbett (1990) document that significant single day standardized abnormal returns related to formations or expansions of risk management departments occur for sample firms 11 trading days before the publication date of *Business Insurance*. This day corresponds to the publication deadline.

Based on this evidence, two approaches were used to specify the retroactive insurance release date. In one model, January 23, 1981 (publication deadline for February 9, 1981 issue of *Business Insurance*) and February 11, 1981 (*WSJ* report date) were designated as the event dates. In a second model, a 16 trading-day event window was constructed beginning on the Monday of the week of the publication deadline (January 19, 1981) and extending through the *WSJ* report date (February 11, 1981). Although this window covers 18 trading days, two days were removed due to MGM fire-related announcements. There were no MGM announcements reported in the *WSJ* on the remaining 16 days except for the retroactive insurance announcement.

Isolation of Security Price Effects

A dummy variable technique was used in this study to measure unexpected security returns for the specified event days. This technique is econometrically equivalent to the procedure traditionally used in event studies to obtain unexpected security returns (see Karafiath, 1988). The traditional procedure consists of two steps. First, ordinary least squares is used to obtain estimates of the market model parameters for each security. Second, unexpected security returns, or abnormal returns, are computed by subtracting the security's estimated return from the security's actual return. That is,

$$\text{Step 1: } \hat{R}_{it} = \hat{\alpha} + \hat{\beta}_i R_{mt}$$

$$\text{Step 2: } AR_{it} = R_{it} - \hat{R}_{it}$$

where:

$\hat{R}_{it}$ = estimated daily return of security i for day t;

R_{it} = actual daily return of security i for day t;

R_{mt} = actual daily return of equally weighted market portfolio for day t;

α_i, β_i = estimated market model intercept and slope parameters, respectively; and

AR_{it} = abnormal return for security i for day t.

In contrast, the dummy variable approach computes the estimated market model parameters and unexpected security returns in one step. This is accomplished by appending a (0, 1) dummy variable for each event day of interest to the ordinary least squares regression used to estimate the market model parameters. By allowing a dummy variable to equal one on the specified event day, and zero otherwise, the dummy variable coefficient will be exactly equal to the unexpected security return computed by the traditional method.

Two advantages accrue from the use of the dummy variable technique in the context of this study. First the economic significance of MGM's event-specific returns are assessed relative to MGM's normal return-generating process. This occurs because the t-statistics on the dummy variable coefficients are determined using standard errors derived from MGM's time series of returns. Traditional capital market approaches use cross-sectional approximations of mean abnormal returns and standard errors, and hence, characterize the economic significance of a single firm's residual return in terms of sample-wide rather than firm-specific residual return variability.

Second, the portfolio approach used for the nonreleasers avoids the problems of intra-industry, cross-sectional return dependencies, and the resulting problems in interpreting test statistics (see Baginski, 1987; Bernard, 1987). The portfolio approach is equivalent to a properly specified joint generalized least squares estimation of an interdependent system of return-generating equations with a cross-sectional equality constraint on the firm-specific dummy variable coefficients (Schipper and Thompson, 1983).[4]

The following ordinary least squares regressions were estimated for MGM and for the portfolio of industry co-members:

$$RMGM_t = \alpha + \beta_1(R_{mt}) + \beta_2(POST_t * R_{mt}) + \sum_{i=1}^{n} \tau_i(D_{it}) + \epsilon_t \quad (1)$$

$$t = -150, \ldots, 0, \ldots, 150$$

$$RPNR_t = \alpha + \beta_1(R_{mt}) + \beta_2(POST_t * R_{mt}) + \sum_{i=1}^{n} \tau_i(D_{it}) + \epsilon_t \quad (2)$$

$$t = -150, \ldots, 0, \ldots, 150$$

[4] As discussed by Sprecher and Pertl (1988), overcoming the potential problem of cross-sectional correlation is sometimes approached by using Zellner's seemingly unrelated regression (SUR) technique. The advantage of the SUR technique is that more efficient parameter estimates are obtained by incorporating the contemporaneous covariances of the residuals into the estimation process. However, when the explanatory variables are the same for all equations, the parameter estimates and standard errors obtained by applying the SUR technique are identical to those obtained by applying OLS estimation (see Kmenta, 1986, p. 639). As this is the case in this study, the application of the SUR would not alleviate the bias caused by cross-sectional correlation in the residuals. In contrast, the standard deviation of the residuals based on the portfolio returns will be free from bias due to cross-sectional correlation and tests of information transfer will be unbiased (see Bernard, 1987).

where:

$RMGM_t$ = day t return for MGM Grand (day 0 is the date of the fire),

$RPNR_t$ = day t return for an equally-weighted industry co-member portfolio,

α = intercept,

β_1 = slope (systematic risk) parameter,

β_2 = increase in post-announcement slope parameter (shift in systematic risk),

$POST_t$ = dummy variable equal to one (zero) in post- announcement (pre-announcement) period.

τ_i = dummy variable coefficient on event day i

D_{it} = dummy variable for event i (of n events) equal to one on day t corresponding to event i and zero otherwise, and

ϵ_t = error term on day t.

As indicated earlier, models (1) and (2) were estimated for a single-day analysis and again for an event-window analysis. For both types of analyses, event 1 (yielding estimate τ_1) was the day of the MGM fire and event 2 (yielding estimate τ_2) was the day of the *WSJ* announcement of the fire. For the single-day analysis, event 3 (τ_3) was defined as the publication deadline for the issue of *Business Insurance* announcing the retroactive insurance (trading day -11) and event 4 (τ_4) was defined as the day of the *WSJ* announcement of the retroactive insurance.[5] For the event window analysis, event 3 (τ_{3EW}) was defined as the period of time surrounding the public revelation of retroactive insurance. The window began on the Monday of the week of the publication deadline of *Business Insurance* and ran through the date of the *WSJ* announcement. The relation of the hypotheses to the model coefficients is presented in Table 1.

Results

Effects of Events on MGM Grand

Table 2, Panel A presents the single-day analysis of the effect of the fire and subsequent retroactive insurance announcement on the returns of MGM Grand. On the date of the fire (Friday, 7:00 a.m. EST), MGM experienced a significant negative unexpected return of 22.28 percent (τ_1 = -.2228, t = -8.688, p = .0006). Therefore, H_{01} is rejected in the expected direction for MGM.

[5] D_{1t} takes on the value of one on event day t for event 1 and zero otherwise. D_{2t} takes on the value of one on event day t for event 2 and so on.

Table 1

Relation of Hypotheses to Model Coefficients

Models for Single Day Analysis

Dependent Variable =
$$\alpha + \beta_1(R_{mt}) + \beta_2(POST_t * R_{mt}) + \tau_1 D_{1t} + \tau_2 D_{2t} + \tau_3 D_{3t} + \tau_4 D_{4t} + \epsilon_t$$

Hypothesis	Event	Dependent Variable	Null Hypotheses for Model Coefficients
H_{01}	Date of fire-unexpected return	$RMGM_t$	$\tau_1 = 0$
	Information transfer effect	$RPNR_t$	$\tau_1 = 0$
	WSJ Fire Announcement - unexpected return	$RMGM_t$	$\tau_2 = 0$
	Information transfer effect	$RPNR_t$	$\tau_2 = 0$
H_{02}	Publication deadline for *BI* issue containing retroactive insurance accouncement	$RMGM_t$	$\tau_3 = 0$
	Information transfer effect	$RPNR_t$	$\tau_3 = 0$
	WSJ retroactive insurance announcement	$RMGM_t$	$\tau_4 = 0$
	Information transfer effect	$RPNR_t$	$\tau_4 = 0$
H_{03}	MGM beta shift subsequent to fire	$RMGM_t$	$\beta_2 = 0$
	Industry beta shift subsequent to fire	$RPNR_t$	$\beta_2 = 0$

Models for Event Window Analysis

Dependent Variable =
$$\alpha + \beta_1 (R_{mt}) + \beta_2(POST_t * R_{mt}) + \tau_1 D_{1t} + \tau_2 D_{2t} + \tau_{3EW} D_{EWt} + \epsilon_t$$

All same as above except:

Hypothesis	Event	Dependent Variable	Null Hypotheses for Model Coefficients
H_{02}	Public revelation of retroactive insurance	$RMGM_t$	$\tau_{3EW} = 0$
	Information transfer effect	$RPNR_t$	$\tau_{3EW} = 0$

$RMGM_t$ = day t return for MGM Grand

$RPNR_t$ = day t return for an equally-weighted portfolio of MGM Grand industry co-members

R_{mt} = equally-weighted market return on day t

$POST_t$ = dummy variable equal to zero for days -150 to -1 and equal to one for post-fire period (days 0 to 150)

D_t = dummy variable equal to one on event day and zero otherwise

Table 2

Effect of Fire and Subsequent Announcement of Retroactive Liability Insurance on the Risk and Returns of MGM Grand

Model: $RMGM_t = \alpha + \beta_1(R_{mt}) + \beta_2 (POST_t * R_{mt}) + \sum_{i=1}^{n} \tau_i (D_{it}) + \epsilon_t$

$t = -150, \ldots, 0, \ldots, 150$

Panel A: Single day analysis

Model F = 24.457 probability = .0001 R^2 = .3329 Adjusted R^2 = .3193

Independent Variable	Coefficient	Estimate	t-statistic	Two-tailed probability
Intercept	α	-.0002	-.145	.8850
Market Return	β_1	1.0858	3.861	.0001
Beta-shift	β_2	.3905	.993	.3214
Date of fire	τ_1	-.2228	-8.688	.0001
Date of *WSJ* fire announcement	τ_2	-.0890	-3.466	.0006
Publication deadline for issue of *Business Insurance* announcing retroactive insurance	τ_3	-.0307	-1.203	.2301
WSJ announcement of retroactive insurance	τ_4	-.0564	-2.205	.0282

Panel B: Event window analysis

Model F = 29.297 probability = .0001 R^2 = .3318 Adjusted R^2 = .3205

Independent Variable	Coefficient	Estimate	t-statistic	Two-tailed probability
Intercept	α	-.0002	-.147	.8831
Market Return	β_1	1.0860	3.865	.0001
Beta-shift	β_2	.3967	1.010	.3133
Date of fire	τ_1	-.2227	-8.694	.0001
Date of *WSJ* fire announcement	τ_2	-.0889	-3.467	.0006
Event window beginning four days before publication deadline for *Business Insurance* through date of *WSJ* announcement of retroactive insurance (excluding dates of other events)	τ_{3EW}	-.0436	-2.408	.0167

$RMGM_t$ = day t return for MGM Grand

R_{mt} = equally-weighted market return on day t

$POST_t$ = dummy variable equal to zero for days -150 to -1 and equal to one for post-fire period (days 0 to 150)

D_t = dummy variable equal to one on event day and zero otherwise

With respect to the retroactive insurance hypothesis (H_{02}), coefficient τ_3 is negative (-.0307) but insignificantly different from zero (t = -1.203, p = .2301). Coefficient τ_4, however, is negative and significantly different from zero (τ_4 = -.0564, t = -2.205, p = .0282). Thus H_{02} is rejected because the *WSJ* retroactive insurance announcement was related to nonzero unexpected returns.

While a single-day analysis increases the power of an event study by avoiding the averaging of significant and nonsignificant unexpected returns, two problems are introduced. First, the date of public revelation may be unspecified, introducing a bias in favor of the null. Second, analyzing multiple events as a series of tests of the same hypothesis overstates the significance level of each individual test.

Therefore, Panel B of Table 2 presents an event-window analysis.[6] Coefficient τ_{3EW} is equivalent to a cumulative unexpected return for the 16-day event window beginning on the Monday preceding the Friday *Business Insurance* publication date through the *WSJ* announcement.[7] Consistent with the Table 2, Panel A results, τ_{3EW} is negative (-.0436) and significantly different from zero (t = -2.408, p = .0167). The interpretation of the negative retroactive insurance effect on MGM's returns will be discussed in conjunction with the information transfer results.

With respect to H_{03}, it does not appear the MGM experienced a significant increase in systematic risk in the post-announcement period. Coefficient β_2 is positive (.3905) but not significantly different from zero at a conventional level (t = .993, p = .3214 in Panel A). This result is consistent with Sprecher and Pertl (1988).

Effects of Events on Industry Co-members

Table 3 replicates the Table 2 tests for an equally-weighted portfolio of industry co-members. The portfolio approach has the advantages of avoiding cross-sectional residual correlation problems and mitigating the effects of firm-specific contemporaneous announcements. However, the coefficients of the estimated model must be interpreted as average effects. Since positive, negative, or no information transfer may exist simultaneously for the different firms in the portfolio, a bias in favor of the null is introduced. In Panel A, coefficients τ_1, τ_3 and τ_4 are positive and have t-statistics greater than one. However, only the fire date coefficient τ_1 has a t-statistic (1.733) that is significant at a conventional level (p = .0841).

In Panel B, the event window analysis provides stronger conclusions about the information transfer effects of the retroactive insurance announcement. Coefficient τ_{3EW} is positive (.0146) and significant (t = 1.913, p = .0567). Thus, even in the presence of a bias toward the null introduced by the port-

[6] In the absence of multicollinearity, coefficients α, β_1, β_2, τ_1 and τ_2 remain essentially unchanged from Panel A to Panel B. Therefore, only a discussion of τ_{3EW} is presented.

[7] Recall that the 16-day period is an 18 trading-day period with two trading days removed due to MGM fire-related announcements. The average return on those two days is negative.

Table 3

Effect of Fire and Subsequent Announcement of Retroactive Liability Insurance on the Risk and Return of an Equally-Weighted Portfolio of Industry Co-members

Model: $RMGM_t = \alpha + \beta_1(R_{mt}) + \beta_2(POST_t * R_{mt}) + \sum_{i=1}^{n} \tau_i(D_{it}) + \epsilon_t$
$t = -150, \ldots, 0, \ldots, 150$

Panel A: Single day analysis

Model F = 42.875 probability = .0001 R^2 = .4667 Adjusted R^2 = .4558

Independent Variable	Coefficient	Estimate	t-statistic	Two-tailed probability
Intercept	α	-.0008	-1.357	.1758
Market Return	β_1	1.3980	11.773	.0001
Beta-shift	β_2	-.0952	-.574	.5665
Date of fire	τ_1	.0187	1.733	.0841
Date of *WSJ* fire announcement	τ_2	-.0054	-.498	.6191
Publication deadline for issue of *Business Insurance* announcing retroactive insurance	τ_3	.0166	1.537	.1255
WSJ announcement of retroactive insurance	τ_4	.0126	1.168	.2436

Panel B: Event window analysis

Model F = 51.599 probability = .0001 R^2 = .4665 Adjusted R^2 = .4575

Independent Variable	Coefficient	Estimate	t-statistic	Two-tailed probability
Intercept	α	-.0008	-1.360	.1748
Market Return	β_1	1.3982	11.792	.0001
Beta-shift	β_2	-.0943	-.569	.5697
Date of fire	τ_1	.0187	1.736	.0835
Date of *WSJ* fire announcement	τ_2	-.0053	-.498	.6190
Event window beginning four days before publication deadline for *Business Insurance* through date of *WSJ* announcement of retroactive insurance (excluding dates of other events)	τ_{3EW}	.0146	1.913	.0567

$RPNR_t$ = day t return for an equally-weighted portfolio of MGM Grand industry co-members

R_{mt} = equally-weighted market return on day t

$POST_t$ = dummy variable equal to zero for days -150 to -1 and equal to one for post-fire period (days 0 to 150)

D_t = dummy variable equal to one on event day and zero otherwise

folio design, H_{01} and H_{02} are rejected for the industry co-members in Table 3. Consistent with the results in Table 2 for MGM, the risk shift hypothesis is not rejected for industry co-members ($\beta_2 = -.0952$, $t = -.574$, $p = .5665$ in Panel A, Table 3).

Interpretation of Results and Limitations

If the "economic advantages of retroactive insurance" hypothesis is valid and retroactive insurance announcements do not adjust market expectations of probable loss, then positive unexpected returns for MGM are expected. Industry co-member reactions would not be expected given the firm-specific nature of retroactive insurance. Negative unexpected returns would imply: (1) that the economic advantages hypothesis was not valid; or (2) that the retroactive insurance premium provided an upward adjustment of estimated loss.

The negative returns for MGM Grand and the pattern of negative information transfer (positive returns) occurring at both the date of the fire and during the period surrounding the announcement of retroactive insurance jointly suggest that the securities market used both events as a means of upwards adjustment of (1) expected loss for MGM; and (2) competitive advantage for industry co-members. This further suggests that the potential for retroactive insurance to signal probable loss on an insured risk confounds testing of the economic advantages hypothesis.

As with any capital markets study, these conclusions may be contingent upon the return-generating model used and assumptions about the rapidity of stock price adjustment. Potential limitations specific to this study are the grouping of like firms and the specification of the insurance announcement event date.

Appendix 1

Firms Included in the Sample

American Motor Inns
Caesar's World
Elsinore Corporation
Golden Nugget
Hilton Hotels Corporation
Holiday Inns Incorporated
La Quinta Motor Inn
Marriott Corporation
Prime Motors Inns
Ramada Inns
Resorts International "A"
Resorts International "B"
Show Boat, Inc.
United Inns Incorporated
Webb (Del E.) Corporation
Wrather Corporation

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