Dividend Signaling by Insurance Companies and Price Regulation: A Reexamination

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Abstract: I reexamine Akhigbe, Borde, and Madura's (1993) study of dividend signaling by insurers and provide an alternative interpretation from a price-regulation perspective. Using a more appropriate data classification system, I partition 161 insurance companies into three categories: life, property-liability, and multi-line. All three types of insurers experience significant abnormal returns during the dividend increase events. The property-liability insurers' returns are less volatile during the event window period. This implies that investors of property-liability insurers are more confident in the content of dividend signals, perhaps because the price regulators bear part of investors' monitoring costs. On the other hand, limited information due to price regulation urges investors of property-liability insurers to respond faster than do investors of life insurers. A cross-sectional analysis suggests that property-liability insurers experience large stock price response to dividend signaling. Since price regulation limits information regarding insurers' performance conveyed through insurance premiums, dividend increases potentially convey more asymmetric information in property-liability insurers.

INTRODUCTION

The notion that dividend policies can reflect asymmetric information and can lead to revaluation of share prices has been widely acknowledged in modern finance literature. Akhigbe, Borde, and Madura (1993)—hereafter ABM—extensively study differential impacts of dividend policy for various insurer types. ABM conclude that the magnitude of market price response for life insurers is smaller than that for other types of insurers, and they attribute this difference to life insurers' lower capital levels. ABM allege that "the favorable signal of increased dividends appears to be tempered by a perceived reduction in the contribution to capital." Evidence for their conjecture is the comparison of book value

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mean ratios of capital to assets, from which ABM infer that life insurers have relatively lower capital levels.

If ABM's conjecture is correct, then the capital ratio should have a significantly positive association with their computed cumulative prediction errors (CPEs), since higher capital levels induce less "tempering" effect and hence more favorable signaling effects. Interestingly, in their cross-sectional analysis, ABM found no statistically significant relationship between capital ratios and the CPEs. This finding seems to be inconsistent with their own argument that a relatively low capital level offsets some favorable dividend increase signaling effects.

ABM's inconsistent findings warrant a reexamination of dividend signaling by multiple types of insurance companies. Three issues in ABM's study are worth mentioning.

First, the different capital levels are not necessarily the cause of different stock reactions to dividend changes. ABM find that only a life insurance dummy variable is significant and negative in the cross-sectional regression model. This result only suggests that there is a significant difference in share price response among different types of insurers. However, the different magnitudes of CPEs may not be attributed to different capital levels. Rather, I argue that the difference in price regulation among different lines of insurers induces the dichotomy in market response to dividend signaling. Since the property-liability insurers are subject to price regulations, while life insurers are not, price regulation (rather than the capital level) may be the real culprit behind the different magnitude of signaling effect.

Secondly, the impact of capital level can be either positive (as ABM allege) or negative. For example, a better-capitalized insurer should have less financial risk and hence less return volatility, whereas the relatively low return volatility implies a smaller magnitude of abnormal returns. In fact, the capital ratio variable is found to be negative in my cross-sectional regression of the cumulative abnormal returns.

Finally, ABM partition the insurance sample into three subsamples (life, property-liability, and other insurers) using the COMPUSTAT database classification system. As ABM themselves recognize (in their footnote 2), this sample partition method causes overlap in insurance lines of business, because COMPUSTAT gives only the primary SIC codes but no secondary SIC codes. Thus, their results might have suffered from sampling biases. A more appropriate sampling method is the Compact Disclosure classification system, which provides primary SIC codes and all possible secondary SIC codes for each listed company. This classification system can avoid overlap of the subsamples and thus facilitate a clearer differentiation between property-liability insurers and life insurers.

DIVIDEND SIGNALING AND PRICE REGULATION

Dividend policy changes are perceived by financial markets as important signals of firms' performance. Managers may attempt to convey asymmetric information via dividend changes (Pettit, 1972; Bajaj and Vijh, 1990). In addition, dividend payments can be used to minimize the costs of agency conflicts between managers and shareholders (Jensen and Meckling, 1976; Crutchley and Hansen, 1989).

Property-liability insurance business is price-regulated to some degree in virtually all states. State laws typically require that rates of property-liability insurers not be inadequate, excessive, or unfairly discriminatory. The rationale for government restrictions on insurance price increases is that consumers' imperfect information and unequal bargaining power with insurers can make consumers vulnerable to abusive marketing and claims practices of insurers and agents. In this view, the objective of price regulation is to enforce a ceiling that will prevent prices from rising above a competitive level and to protect consumers against unfair market practices (Klein, 1995). By contrast, life insurance business is generally not subject to price regulation.

Insurance premiums are determined by the insurers' creditability and financial risk status, and they virtually contain information of the insurers' overall performance. If the insurance premiums are regulated and hence inflexible, they do not convey as much information regarding the insurers' performance. Thus, some of this information has to be conveyed via dividend policies by insurers' managers. To that end, the information content of dividend signaling is more enriched in the case of property-liability insurers. Knowing this fact, investors of property-liability insurers are more concerned about the changes in dividend policies and tend to react to any dividend changes more swiftly and strongly than investors of life insurers. Therefore, the market responses to the dividend signals for property-liability insurers are expected to be earlier in timing and greater in magnitude than those for life insurers.

On the other hand, investors of property-liability insurers are aware that the regulators are supervising the insurers' operations. According to agency theory, when there is a separation of ownership and control in the public companies, shareholders will have to bear monitoring costs (a major type of agency costs) to supervise and motivate managers to work for shareholders' best interests. By applying regulatory price control to property-liability insurance companies, regulators effectively assume a portion of monitoring (agency) costs for shareholders. Consequently, investors are more confident with managers' actions and changes in dividend policy, so that market prices of property-liability insurers are expected to be less volatile than those of life insurers during dividend increase events.

DATA AND METHODOLOGIES

I update ABM's data set and identify all quarterly dividend increases by insurers in the Center for Research in Security Prices (CRSP) data tape from 1976 through 1994. To be consistent with ABM, I eliminate those elements for which there are insufficient CRSP data and for which the dividend announcements occurred concurrently with earnings, stock dividend, or stock split announcements. Multiple dividend increases by a given insurer in any single year are excluded, and insurers that increased their dividends in more than one year are counted multiple times.

In order to assess the differential effects of price regulation on insurers' share prices, I use the Compact Disclosure classification system to partition the sample into three subsamples: life insurers (with primary SIC code 6311 but without secondary SIC code 6331), property-liability insurers (with primary SIC code 6331 but without secondary SIC code 6311), and multi-line insurers (with both SIC codes 6311 and 6331). Obviously, the multi-line insurers are those that deal with both property-liability insurance and life insurance. This classification method enables one to avoid the overlap of types of businesses and clearly differentiate life insurers, property-liability insurers, and multi-line insurers. Using the procedures outlined above, I collect a total of 161 dividend increase announcements—63 announcements by life insurers, 60 by property-liability insurers, and 38 by multi-line insurers.

Following the standard event study methodologies, I estimate the following market model over the 100-day period (event day t = –111, …, –12) prior to the event window period (event day t = –11, …, +10).

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt} (t = -111, \ldots, -12) \quad (1)$$

where R_{jt} is the actual equity return on insurer j for event day t; R_{mt} is the actual return on the value-weighted CRSP index for day t; α_j and β_j are estimated intercept and slope coefficients of the market model, respectively; and ε_{jt} is the error term.

The cumulative abnormal return for insurer j over the interval T_1 to T_2 in the event window period, CAR_j, is computed as the sum of AR_{jt} over this interval:

$$CAR_{jt} = \sum_{t=T_1}^{T_2} AR_{jt} = \sum_{t=T_1}^{T_2} (R_{jt} - \alpha_j - \beta_j R_{mt})(t = -11, \ldots, +10) \quad (2)$$

The mean cumulative abnormal return for all N insurers, $MCAR_t$, is calculated as follows:

$$MCAR_t = \frac{1}{N}\sum_{j=1}^{N} CAR_{jt} \quad (3)$$

Following Henderson (1990), I compute the standardized abnormal returns for each firm j and for each event day t (t = –11, …, +10)

$$SAR_{jt} = \frac{AR_{jt}}{s_j\left[1 + \frac{1}{100} + \frac{(R_{mt} - MR_m)^2}{\sum_{\tau=-111}^{-12}(R_{m\tau} - MR_m)^2}\right]^{\frac{1}{2}}} \quad (4)$$

where MR_m is the mean return on the market index over the 100-day estimation interval and s_j is insurer j's estimated standard deviation of abnormal returns over the same interval of calendar time.[1] The standardized two-day cumulative abnormal return, $SCAR_t$, for insurer j is computed:

$$SCAR_t = \frac{SAR_{jt-1} + SAR_{jt}}{\sqrt{2}} \quad (5)$$

The cross-sectional test statistic for event day t for a sample of N insurers is defined as:

$$Z = \frac{\sum_{j=1}^{N} SCAR_t}{\sqrt{N}} \sim N(0, 1) \quad (6)$$

EMPIRICAL RESULTS

Table 1 displays the results from the event study methodology. Figure 1 plots the two-day cumulative abnormal returns for each of the three types of insurers. In contrast to ABM's finding that life insurers, experience insignificant CPEs, I find that all three types of insurers, including life insurers, have significant cumulative abnormal returns. On average, the share prices of property-liability insurers respond to dividend increase six days prior to the announcement day (mean CAR = 0.85%, Z = 2.03**) and readjust to the announcement three days later (mean CAR = 0.75%, Z = 2.50**). By contrast, the share prices of life insurers and multi-line insurers respond to the dividend announcement only one day ahead of and on the announcement day. These results indicate that investors of property-liability insurers are more alert to dividend signaling than are investors of the other two types of insurers and proactively anticipate the dividend policy changes. This finding is consistent with my earlier notion that more potential asymmetric information resulting from the price regulation may trigger investors of property-liability insurers to react more swiftly.

Another message from Figure 1 is also worth mentioning: the share price responses to dividend policy changes exhibit more volatility for life insurers and multi-line insurers than for property-liability insurers. This implies that investors of property-liability insurers are more confident with the content of the information conveyed by dividend increases. As I conjecture in the previous section, since the insurance premiums of property-liability insurers are subject to regulatory approval, regulators need to monitor the actions of managers of property-liability insurers hence effectively reduce the monitoring costs borne by shareholders. Consequently, the potential agency conflicts between managers and investors are mitigated, and the dividend signaling of property-liability insurers, are more trustworthy to shareholders. This increased investors' confidence in the dividend signaling is manifested in the lesser volatility of abnormal returns during the event window periods.

These empirical results are invariant, even controlling for possible time-varying variance of the stock return data.[2] In order to check for the specification of the market model, I conduct various diagnostic tests for parameter instability (Farley-Hinich test and Chow test), autocorrelation (Bruesch-Godfrey test of first and second order of autocorrelation), heteroscedasticity (Lagrange Multiplier test and White test), autoregressive conditional heteroscedasticity (ARCH(1) test), and omission of variables (Ramsey Reset test). The means and the percentages of significant cases of these diagnostic tests over the full sample of 161 firms are reported in Table 2. None of the means of the diagnostic test statistics is significant even at

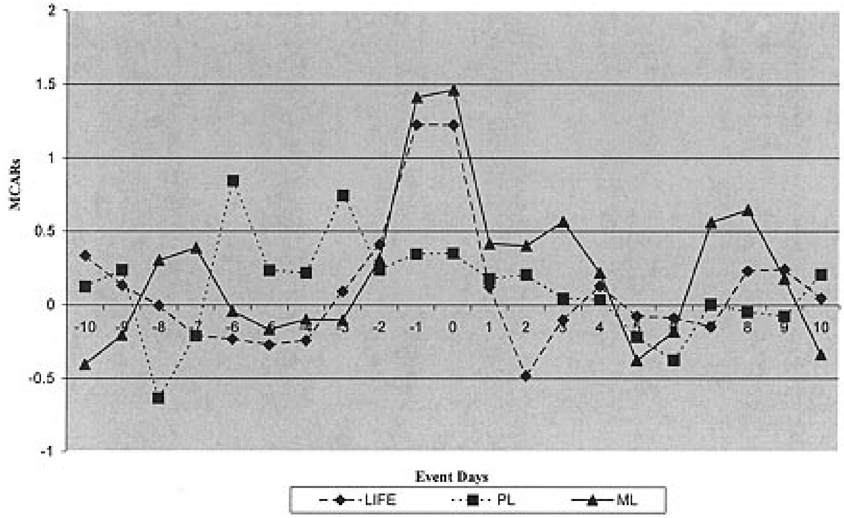
Table 1. Share Price Response to Dividend Increase by Insurers (1976–1994)

Event day	Life Insurers Two-day MCAR	Life Insurers Z-statistics	Property-liability insurers Two-day MCAR	Property-liability insurers Z-statistics	Multi-line insurers Two-day MCAR	Multi-line insurers Z-statistics
–10	0.33	1.24	0.12	–0.46	–0.40	–0.75
–9	0.13	0.52	0.24	0.18	–0.20	–0.55
–8	0.00	0.26	–0.63	–1.61	0.30	0.63
–7	–0.21	–0.76	–0.21	–0.32	0.39	0.92
–6	–0.23	–1.02	0.85	2.03**	–0.04	–0.15
–5	–0.27	–1.26	0.23	0.03	–0.17	–0.43
–4	–0.24	–1.25	0.22	0.38	–0.10	–0.14
–3	0.09	0.47	0.75	2.50**	–0.10	–0.17
–2	0.41	1.64	0.24	1.14	0.31	1.12
–1	1.23	3.72**	0.35	0.89	1.41	4.70**
0	1.23	3.80**	0.35	0.99	1.46	4.61**
+1	0.12	0.01	0.18	0.90	0.42	1.17
+2	–0.48	–2.24**	0.20	0.78	0.40	1.09
+3	–0.10	–0.68	0.05	0.05	0.57	1.92*
+4	0.13	0.33	0.04	0.01	0.22	1.05
+5	–0.07	–0.06	–0.22	–0.31	–0.37	–0.31
+6	–0.09	0.16	–0.37	–0.71	–0.18	–0.66
+7	–0.15	–0.48	0.00	–0.14	0.56	0.62
+8	0.23	0.57	–0.05	–0.53	0.65	1.09
+9	0.24	0.37	–0.07	–0.33	0.18	–0.12
+10	0.05	–0.05	0.21	0.73	–0.34	–1.26

Notes: The two-day MCAR is the mean cumulative abnormal return with two-day interval as defined in equations (2) and (3). * indicates that p-value < 0.10, while ** indicates p-value < 0.05.

the 10% level. The number of significant cases for each diagnostic test is no more than 22% of the total 161 cases. These findings indicate that the market model estimated by OLS regression is generally well specified.

To gain further insight into the dividend signaling effect, I perform a cross-sectional regression analysis. The cumulative abnormal returns for each company over the day –6 through day +3 event window is the dependent variable, and the measurable firm-specific attributes are the independent variables. These independent variables include three firm-specific characteristics—[return on equity (ROE), capital-to-asset ratio



Notes: LIFE, PL, and ML represent the plots of mean cumulative abnormal returns for life, property-liability, and multi-line insurers, respectively, during the dividend increase event windows (event days –10 to +10).

Fig. 1. Plots of two-day mean cumulative abnormal returns (MCARs).

(CR), and dividend yield (DY)][3]—and three dummy variables representing life insurers (L_DUM), property-liability insurers (PL_DUM), and multi-line (ML_DUM) insurers.[4] Since three dummy variables are used in the cross-section regression, the intercept term is excluded to avoid singularity problems. These three dummy variables serve as proxies for the differential effects of price regulation. In addition, interaction product terms of the three dummy variables and the three firm-characteristic variables are included to take into account the interaction effects of price regulation. The resulting regression includes a total of 12 regressors in the cross-sectional model.

I first estimate this 12-regressor model (results are not reported but are available upon request). Then I follow Hendry's (1979) "general-to-specific" approach, which generates a parsimonious cross-section model with 7 independent variables in the regression.[5] The regression results are displayed in Table 3.[6] The Ramsey Reset test [$F(2,127) = 0.75$, p-value = 0.39] indicates that this parsimonious model does not suffer "omission-of-variable" bias. All regressors are at least marginally significant in the parsimonious regression.

The cumulative abnormal returns appear positively correlated with the return on equity, indicating that an insurer with higher return on

Table 2. Diagnostic Tests of the OLS Market Models

	Distribution and Critical Values	Mean of the Test Statistics	Percentage of Significant Cases
I. Parameter stability tests			
Farley-Hinich	F(2,96) = 3.09	1.28	8.1%
Chow	F(2,96) = 3.09	1.30	13.0%
II. Autocorrelation tests			
Bruesch-Godfrey (1)	$\chi^2(1) = 3.84$	2.23	19.9%
Bruesch-Godfrey (2)	$\chi^2(2) = 5.99$	3.54	21.7%
III. Heteroscedasticity tests			
Lagrange Multiplier	$\chi^2(1) = 3.84$	1.89	11.2%
White	$\chi^2(2) = 5.99$	3.01	13.0%
IV. Autoregressive conditional heteroscedasticity test			
ARCH(1)	$\chi^2(1) = 3.84$	1.95	17.4%
V. Omission-of-variable test			
Ramsey Reset	F(2,96) = 3.09	1.80	18.6%

shareholders' equity tends to encounter larger market response during the dividend-increase announcement. This implies that dividend increases of insurers with better earning performance emit stronger positive signals to the market. Interestingly, the capital-to-asset ratio has a significantly negative impact on the market response. Contrary to ABM's argument of the "tempering" effect of capital level, this finding suggests that an insurer with higher (lower) capital-level experiences smaller (greater) market reaction. Since insurers with lower financial leverages (high capital levels) generally have less financial risks, their share prices are less volatile and hence the price response to dividend signaling is of less magnitude. The "tempering" effect, however, is limited to life insurance companies, since the interaction term of capital ratio and the life insurer dummy variable is significantly positive. Thus, only life insurers are consistent with ABM's argument that the favorable signal of increased dividends is tempered by a perceived reduction in the contribution to capital. The interaction term of dividend yield and the life insurer dummy appears marginally significant (at the 11% level), indicating that a life insurer with relatively high dividend yields gives marginally stronger signals.

Finally, all three types of dummy variables appear significant at least at the 10% level. Both the property-liability insurer dummy and multi-line

Table 3. Cross-Sectional Regression of the Cumulative Abnormal Returns (CARs)

Independent Variables	Estimated Coefficients	t-statistics
ROE	0.033	3.21**
CR	–0.221	–3.41**
CR*L_DUM	0.401	2.78**
DY*L_DUM	2.367	1.62[a]
PL_DUM	0.061	3.09**
L_DUM	–0.117	–1.85*
ML_DUM	0.055	4.64**

Notes: ROE is the return on equity; CR is the capital-to-asset ratio; DY is the dividend yield; PL_DUM, L_DUM, and ML_DUM are three dummy variables representing property-liability, life, and multi-line insurers, respectively (see also endnote 3). Adjusted $R^2 = 0.14$; F-value = 4.54**. The t-statistics have been adjusted for heteroscedasticity using White's (1980) procedure. ** indicates $p < 0.05$, ** indicates $p < 0.10$, and [a] indicates $p < 0.11$.

insurer dummy are significantly positive, but the life insurer dummy is significantly negative. This result suggests that property-liability and multi-line insurers have a larger magnitude of market response over the event day –6 to day +3 than do life insurers. Price regulation of the property-liability insurance business (including the property-liability part of multi-line insurers' business) compresses the information of insurers' performance. Therefore, dividend increases by property-liability insurers tend to convey more asymmetric information to the stock market.

DISCUSSION AND CONCLUSIONS

In a recent contribution, Akhigbe, Borde, and Madura (ABM, 1993) analyze the dividend signaling by insurance companies and conclude that the magnitude of the response for life insurers is smaller than that of property-liability and other types of insurers. ABM attribute this finding to relatively low capital levels of life insurers. However, there seems to be some inconsistency between ABM's findings and argument, since the capital ratio is not found to be significant in ABM's paper. Furthermore, ABM's COMPUSTAT-classification methods of insurer types is questionable.

Using the Compact-Disclosure-classification method, I reexamine the dividend signaling issues of insurance companies and provide an alternative explanation for the dichotomy in market price responses between property-liability insurers and life insurers. Specifically, different regulatory regimes in these two lines of insurers contribute to the difference in market responses during the dividend increase events. I find that all three types of insurers (life, property-liability, and multi-line) can expect significant abnormal returns during the event window from day –6 to day +3. The property-liability insurers' returns appear less volatile than those of the other two types of insurers during the dividend increase events. This suggests that investors of property-liability insurers are more confident with the content of dividend signals, perhaps because price regulators bear some monitoring (agency) costs for investors. On the other hand, investors of property-liability insurance companies also respond five days earlier than the other two types of insurance companies. These early responses indicate that investors of property-liability insurers are more alert to the dividend increases, and they are able to rationally foresee the events and adjust the share prices even prior to the announcement dates.

In the cross-sectional regression analysis, I find that capital ratio exerts significantly negative (rather than positive) impact on the cumulative abnormal returns, suggesting that insurers with lower financial leverage (high capital level) tend to experience lower share response during dividend increase events. ABM's interpretation of the "tempering effect" of capital level exists only in life insurance companies. The return on equity is positively associated with the market response. The property-liability insurers and multi-line insurers tend to have larger magnitude of response than life insurers. This may be due to the rate regulation on property-liability insurers, which limits the information of insurers' performance conveyed through the insurance premiums. More information has to be conveyed through the dividend policies channel in the property-liability insurance lines.

Given that price regulation contributes to the dichotomy in market price responses in the insurance business, one may naturally raise a question: is price regulation good or bad for investors in insurance companies? The answer can be twofold: either good or bad.

First, regulators need to monitor the managers' behavior and share some agency costs that are originally borne by shareholders. Thus, share prices appear to be less volatile during events. In this regard, shareholders of price-regulated insurers are exposed to less price-fluctuation risks.

On the other hand, the regulated insurance premiums are usually binding price ceilings. From a competitive market standpoint, price control may distort the marketplace and hurt competition. For instance, price control may erode the service quality as insurers reduce the speed of reimbursement and increase the scrutiny with which they examine claims

(Zycher, 1992). The compulsory price ceilings and reduced service quality eventually reduce the earnings of insurers and in turn hurt the benefits of shareholders. More critical, as Berrington (1997) argues, price controls may make insurance pricing a political action. When a regulatory system has the power to control prices, this power will be exercised for political purposes. If this indeed happens, investors of the regulated insurance companies will very likely bear significant loss, both in earnings and in ownership control.

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NOTES

[1] Note that the way I calculate the Z-statistic is different from ABM's in that my computation of the Z-statistic adjusts for the number of observations in the estimation interval and for changes in event-induced security return variances (see Henderson, 1990; Boehmer, Musumeci, and Poulsen, 1991; McNomara et al., 1997, for elaboration of the importance of this adjustment). Given this methodological improvement, it is not surprising to find different results than ABM's.

[2] In light of Giaccoto and Ali (1982), Bera, Bubnys, and Park (1988), and Corhay and Tourani Rad (1996), I also employ a conditional-heteroscedasticity-adjusted market model that accounts for possible GARCH effects. These results (available upon request) are very similar to those reported in Table 1.

[3] These firm-characteristic measures are typical in event studies and also are suggested by ABM (1993).

[4] The firm-specific characteristic data are obtained from the COMPUSTAT database. Each dummy variable takes the value 1 for one type of insurers and 0 for the other two types of insurers.

[5] The Hendry (1979) "general-to-specific" approach (also called "top-down" approach) starts with a general model with all possible regressors in the regression model. Then the regressors with t-statistics less than 1.0 are dropped from the regression. The resultant parsimonious model provides more accurate statistical inferences. Hendry (1979) recommends that this approach be used in econometric modeling.

[6] The cross-sectional model appears to have heteroscedasticity problems, suggested by the White (1980) test (χ^2 (35) = 42.91 with p-value 0.04). Therefore, I use White's (1980) procedure to compute heteroscedasticity-consistent t-statistics.

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