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Summary

Dividend payout ratio, dividend yield for non-life insurance industry are studied in detail. A dividend behavior model is developed for the non-life insurance industry. It is found that income measures, ownership and capacity ratio are important factors to be considered in doing the above-mentioned empirical studies.

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The dividend policy of the firm is important for several reasons. An understanding of the factors influencing dividend payments contributes to the theory of corporate savings. Dividends may also influence the price per share of common stock, thus dividend behavior is of interest because it affects the maximization of shareholder wealth. In addition, dividend policy also plays a direct role in the firm's financing and investment decision.

While the factors influencing the dividend policies of industrial firms have been studied in some detail by Lintner [12], Brittain [2], Fama and Babiak [5], Dhrymes and Kurz [4], and others, theories of dividend behavior have not been as extensively developed and explored for financial firms. The purpose of this research is to study the dividend behavior of one type of financial intermediary, the non-life insurance company, to test whether existing dividend behavioral theories are applicable to the non-life insurance firms.

The argument is based upon the fact that the financial management principles of financial institutions are not necessarily identical to those of industrial firms. Specifically, the non-life insurance company deals with (1) different income measures which affect reported earnings and retained earnings, (2) is subject to a unique borrowing-lending rate relationship, and (3) has an asset portfolio comprised primarily of securities of industrial firms. In addition, most insurance stocks are traded over the counter instead of NYSE. If the dividend practices of these firms depart from those anticipated by the theories used to explain the dividend behavior of industrial firms, this is of interest to the understanding of the financial behavior of such firms. On the other hand,

dividend payment patterns which follow the theoretical anticipations will tend to strengthen them.

Brittain said that econometric modeling is an exercise in persuasion [3]. The purpose of this study is not to persuade the reader as to the validity of a particular financial theory involving dividend behavior. Rather, it has the less ambitious but useful objective of ascertaining whether non-life insurance companies follow widely accepted financial models found to be successful in describing dividend behavior.

Certain problems are somewhat unique to the non-life insurance industry. They include the following: (1) There are several income measures that may be used as the basis for the dividend decision; statutory or generally accepted accounting principle earnings; including unrealized capital gains and losses or excluding them, and (2) the capital and surplus position of the non-life insurer, as a measure of financial capacity, may influence the dividend decision; there are also other matters particular to the study of insurance companies which include: (1) some non-life insurers pay dividends to policyholders as well as shareholders, (2) a widespread parent-subsidiary relationship found in the non-life insurance industry, and (3) the total dividend freeze of 1971 and partial freeze of 1972 in the United States. These factors may complicate any study of non-life insurance company dividend behavior.

Two econometric models will be used in this study. First, the model developed by Lintner [12] and Fama and Babiak [5] which defines current dividends as a function of current after-tax profits and the preceding year's dividends will be used to do the empirical study. The rationale underlying this model is that the ability to pay, as measured by corporate

earnings, should have a great influence on dividend payments, and the prior dividend should influence the current dividend to the extent that dividend stability is viewed as desirable. Secondly, the seemingly unrelated regression technique [SUR] developed by Zellner [15] will be used in order to take care of the possible simultaneous relationship over time.

The next section of this paper presents the earnings payout ratios and dividend yields for 61 non-life insurers during 1955-1975; the dividend decision behavior for non-life insurers is also explored. In the second section, the dividend behavior models used in research involving industrial firms are specified and modified in order to describe the dividend behavior of non-life insurance companies. The possible implications arising from the empirical results are justified in accordance with the nature of insurance accounting procedures and financial operations. In the third section, the SUR technique is used in order to investigate the possible simultaneous relationship among the factors presented in the model described in the second section. Aggregate dividend behavior is also examined in this section. The final section of the paper summarizes the implications of the empirical results for financial theory as it relates to the non-life insurance industry.

I. THE DIVIDEND YIELD AND EARNINGS PAYOUT RATIO AND DIVIDEND DECISION BEHAVIOR

Information regarding the dividend yields and the earnings payout ratios for non-life insurers is of interest to both investors and financial managers. Theoretically, the magnitude of the earnings payout ratio for a firm is jointly determined by its investment opportunities and its shareholders' preferences. This decision is complicated in the situation

of a non-life insurer by the payment of policyholder dividends. The nature of policyholder dividends are not necessarily identical to those of equity holder dividends. This is due to the fact policyholders are not necessarily owners of non-life insurance companies.

If a firm has an investment opportunity with a return exceeding its cost of capital, and the internal sources of funds are cheaper than the external sources, then a financial manager will generally reduce his firm's earnings payout ratio.

In relation to external financing, stock non-life insurers are limited to the following alternatives: (1) mergers and acquisitions involving other insurance companies, (2) new stock issues, (3) contributions from a parent insurer or holding company, and/or (4) borrowing of funds for general business purposes (the latter by Section 76, New York Insurance Code, amendment effective September 1, 1969).

In the situation of a merger, one of the insurers loses its identity and the surviving company absorbs all of its assets, liabilities, and legal rights. The shareholders of the merged insurer usually retain a financial interest in the new firm consistent with their interest in the acquired firm. The acquisition may involve either the use of cash or a tax-free exchange of shares.

A stock non-life insurer can also acquire a subsidiary insurer by gaining ownership of more than 50 percent of its voting stock using either cash or an exchange of securities. As a practical matter, Forbes [7] found that non-life insurers usually use exchanges of stock in acquiring subsidiaries because of the attractiveness of this approach from tax and liquidity standpoints. Forbes also found that new stock issues are a

relatively unimportant form of non-life insurance external financing, comprising slightly more than 5 percent of the total financing volume during the 1955-66 period studied [7].

The advantages of external financing involving contributions from a parent insurer or holding company are its simplicity and the lack of substantial transactions costs. The borrowing of funds for general business purposes is a relatively new external financing option in the non-life insurance industry which has not been explored at length in the financial literature except for Nye [13].

Forbes found in another study [8] that new money flowing into the non-life insurance industry played a minor role in the industry's capital and surplus growth during 1956-70. Given this behavior, the conservation of capital and surplus would appear to be a primary non-life insurance company objective in the typical situation. Inasmuch as dividend policy provides one of the important mechanisms for controlling the level of retained earnings, one would expect dividend policies of non-life insurance companies to be geared to the insurer's capital and surplus requirements.[1] Empirical results reported later in this study suggest a direct relationship between dividend policies and capital and surplus adjustments in this industry.

Haugen and Kroncke [10] have argued that policyholder funds also represent a source of external financing to the non-life insurance industry. Other things remaining equal, an increase in the ratio of an insurer's unearned premium and loss and loss adjustment expense reserves to its capital and surplus will affect the risk/return relationships involving its shareholders. However, this interesting problem is not studied in this paper.

Data associated with four different income measures and the dividends for 61 firms (see Appendix A) during 1955-75 are used in order to analyze the earnings payout behavior for the non-life insurance industry. The stratified random sampling technique is used to select the sample insurers. Three strata represent three alternative ownerships (see the discussion in this section and Appendix A). The insurers were selected at random from the population of firms in Best's Property Liability (formerly Best's Fire and Casualty) Insurance Reports having complete series of 1955-1975 financial data. The stock price data were taken from the Bank Quotation Record. The four different methods of calculating the net income of a non-life insurer involve the following:[2]

(A) earnings without the amortization of underwriting expenses and without unrealized capital gains and losses

(B) earnings without the amortization of underwriting expenses and with unrealized capital gains and losses

(C) earnings involving the amortization of underwriting expenses without unrealized capital gains and losses

(D) earnings involving the amortization of underwriting expenses with unrealized capital gains and losses

Under the accounting procedures used to measure (A) and (B), the first year acquisition costs for insurance policies are written off immediately against earnings without proper allocation to the periods in which the associated premiums are earned. This method is required under statutory accounting. It is also the method of accounting used in federal income tax calculations.

In the situation of an insurer with an expanding premium volume, this accounting technique usually understates profits (overstates losses) and understates capital and surplus. This is viewed by regulators as

desirable because the resulting excess valuation in the unearned premium reserve (UPR) may provide additional surplus if the insurer encounters financial difficulty (there will be no excess valuation of course if all of the UPR is required for the payment of losses and loss adjustment expenses). The lack of underwriting expense amortization under statutory accounting also tends to make insurers more cautious in obtaining new business since there are large surplus reductions if premium expansion is too rapid.

Income measures (C) and (D) involve the proper amortization of underwriting expenses. This is accomplished by adding to earnings the after-tax prepaid expense involving the increase in the unearned premium for the period. The increase in the UPR is multiplied by $(1-\tau)E_t$, where τ is the marginal federal income tax rate for the year and E_t equals the ratio of underwriting expenses to net written premiums.

The other adjustment in the paper involves the inclusion of unrealized capital gains and losses in income measures (B) and (D). This "flow-through" approach to measuring earnings eliminates the potential for earnings manipulation through the selective taking of realized capital gains or losses (usually involving the taking of realized capital gains in order to improve poor results). The primary argument against including unrealized capital gains and losses in earnings is the "realization principle". Under this principle, it is argued that only realized income and loss items should be included in the income statement [1].

The American Institute of Certified Public Accountants has not taken a clear position on the treatment of unrealized capital gains and losses in insurance company earnings. Most insurers take such a gain or

loss as a direct credit or charge, respectively, to surplus rather than a "flow-through" to earnings. The "flow-through" approach to earnings measurement does not give an insurer an incentive to take realized capital gains in order to disguise bad performance. Thus, on an a priori basis, one would expect earnings measures (B) and (D) to be more closely associated with dividend decisions than measures (A) and (C), other things remaining equal.

As a negative net income for an individual insurer in a particular year is not unusual, a time aggregate earnings payout ratio is calculated for each firm over the 21 year period. The resulting 61 payout ratios for the 21 years are listed in Table 1.

During 1955-75, the ownership arrangement for these insurers can be classified as (i) majority of common stock never held by a single entity during the period, (ii) majority of common stock acquired by a single entity sometime during the period, and (iii) majority of common stock held by a single entity throughout the period (see Appendix A).[3] One would expect that the earnings payout policies of insurers having widely held common stock under ownership arrangement (i) would most closely follow (or fit) the models found successful in describing dividend behavior in other industries.[4] This is because the shareholders of these insurers have the same objectives as other investors in widely held equities. On the other hand, the dividend policies of wholly owned subsidiaries under ownership arrangement (iii) would be determined by the managerial discretions of the parent insurers or holding companies. Dividends may be declared in these situations in order to reduce perceived excess surpluses in the subsidiaries. Sometimes subsidiaries are

acquired or holding companies are formed for the express purpose of transferring surplus from relatively unprofitable insurance operations to other activities. The dividend policies of the insurers in group (ii) would be expected to vary depending upon the individual circumstances surrounding each acquisition.

The analysis of variance technique is used to test whether significant differences arise among the earnings payout ratios for these three groups. It is found that the average earnings payout ratios are significantly different among the three groups with a 5 percent level of significance if the (A) or the (B) net income definition is used. Furthermore when either the (A) or (B) income definition is used, the average earnings payout ratio is higher than 50 percent. This figure is close to the earnings payout ratio of the electric utility industry as indicated in Lee [11]. Empirical studies related to this issue and the possible implications of a high earnings payout ratio on the cost of equity capital will be done in separate research.

As only a portion of the firms listed in Appendix A had actively traded common stock during 1955-75, the dividend yield results are based upon a subset of these insurers. The annual average shareholder dividend yields calculated for these insurers are listed in Table 2. The analysis of variance technique is used to test whether the dividend yield for the non-life insurance companies changed over the 25 year period studied.

It is found from Table 2 that the shareholder dividend yields among the years are significantly different at a one percent level of significance. The average dividend yield for the 21 years studied is 3.38 percent. This fluctuation is related to business cycles and economic

conditions. The average dividend yields for 1974 and 1975 are 5.57 and 6.03 percent, respectively. These figures are as high as the time deposit interest rates in these respective years. This information suggests that non-life insurance companies' stock dividend yields are similar to those found for low risk investments.

The results of this section give both investors and decision makers some cross-sectional and time series information about the earnings payout ratios and dividend yields of non-life insurers.

II. DIVIDEND FORECASTING MODEL FOR THE NON-LIFE INSURANCE INDUSTRY

Lintner [12] has used the partial adjustment assumption in order to derive a dividend forecasting model for an industrial firm. This model takes the following form:

$$\Delta D_t = \gamma(D_t^* - D_{t-1}) \tag{1}$$

where,

$$D_t^* = \beta E_t \tag{2}$$

and,

D_t = actual total cash dividend payment in period t

D_t^* = desired total cash dividend payment in period t

D_{t-1} = actual total dividend payment in period t-1

E_t = total earnings in period t

γ = partial adjustment coefficient

β = target earnings payout ratio

After substituting (2) into (1), we can formulate the following alternative time series regression models in order to describe an individual firm's dividend behavior over time:

$$D_t = A_o + A_1 E_t + A_2 D_{t-1} + \varepsilon_{1t} \quad (3)$$

$$D_t = B_1 E_t + B_2 D_{t-1} + \varepsilon_{2t} \quad (4)$$

where $A_1 = B_1 = \beta\gamma$ and $A_2 = B_2 = 1-\gamma$; A_o is the intercept; and both ε_{1t} and ε_{2t} are disturbance terms for the regressions. To accommodate the two special circumstances we have encountered in this study (full and partial dividend freezes and capital and surplus capacity considerations), equation (3) is modified as

$$D_t = a_o + a_1 X_t + a_2 E_t + a_3 D_{t-1} + a_4 \frac{CS_t}{AA_t} + \varepsilon_t \quad (5)$$

where,

X_t = 0 for 1955-70
= 1 for 1971-75

as dummy variables

and, $\frac{CS_t}{AA_t}$ = capacity ratio[5]

where,

CS_t = capital and surplus at the end of the period = capital stock, plus paid in surplus, plus retained earnings

AA_t = admitted assets at the end of the period

The change in a non-life insurer's capital and surplus is explained by the following:

$$\Delta CS = I \pm U - D \pm F \pm M$$

where,

I = net income or loss after taxes [the sum of the statutory underwriting gain (loss), net realized capital gain (loss), interest, dividends, and rents, reduced by net loss from agents' premium balances charged off, and adjusted for the federal and foreign income tax liability (rebate)]

U = unrealized capital gain (loss)

D = dividends declared to shareholders and/or policyholders

F = external financing

M = miscellaneous adjustments (the sum of the change in the excess of bodily injury liability and compensation statutory and voluntary reserve over the case basis and loss expense reserve, change in nonadmitted assets, change in liability for unauthorized reinsurance, change in foreign exchange adjustment, and net remittances to or from the home office). Nonadmitted assets include furniture and office equipment, unpaid balances over 90 days late, and other items considered to be lacking in liquidity under statutory accounting.

From the above model, it can be seen that an insurer needs to retain capital and surplus in order to absorb (1) net losses from operations (defined by I), (2) unrealized capital losses, and (3) miscellaneous adjustments (defined by M). Generally, items (1) and (2) will cause the greatest surplus fluctuations in a given accounting period. Net losses from operations may be compounded by the upward adjustment of inadequate loss and loss adjustment expense reserves arising from claims incurred in prior years. These adjustments can be especially large during periods of rapid inflation.

The model indicates that the adjustment of dividends is one of the most realistic alternatives in attempting to conserve capital and surplus in the typical situation. This is because the raising of external financing through new equity issues involves a transactions cost,

uncertain proceeds (especially in volatile stock markets), and is time consuming as well as troublesome to management. Empirical data indicate that new equity issues have not been an important form of external financing in the non-life insurance industry [7]. External financing involving mergers and acquisitions is not motivated by the need to conserve surplus as it does not affect the CS_t/AA_t ratio in most situations. Contributions of surplus from parent insurers or holding companies, or the borrowing of funds, have not been common external financing practices. Thus, dividend policy is the only decision variable left.

It is also relevant to note the CS_t/AA_t ratios fluctuate widely from period to period for a given insurer because of the impact of unrealized capital gains and losses involving common stock portfolios and fluctuating underwriting results (see Forbes [8]). Thus a non-life insurer does not have time to consider external financing as a means of stabilizing capital and surplus in the usual situation. The adjustment of dividends is a more direct and immediate method of correcting capital and surplus deficiencies. As an alternative hypothesis, it might be argued that rapidly changing capital and surplus positions would make a non-life insurer more cautious in its earnings payout policies. These issues are explored by including the CS_t/AA_t ratio in equation (5).

In Table 2, we have calculated the average capacity ratios for 78 insurers for each of the years studied. Observation of the Table will indicate that the average capacity ratio for the non-life insurance industry fluctuates over time. This fluctuation may result from changes in the value of insurance company equity portfolios and/or variations in underwriting results. In addition, the coefficients of variation associated

with the average capacity ratios in Table 3a suggest wide variations in capacity ratios among the insurers for each year.

Table 3a presents a frequency distribution of the temporal coefficients of variation for the capacity ratios of the 78 insurers. It should be noted that 73 percent of the coefficients in the Table fall within a range of .1 to .3.

Table 3b shows the percentage distribution of the average 1955-75 capacity ratios for the 78 insurers. Approximately 64 percent of the insurers had average capacity ratios within the range of .3 to .5.

The empirical results based upon this specification for 61 non-life insurers during 1955-75 are reported in Table 4. From the t-values associated with the regression coefficients of the dummy variable (a_1), it is found that 15 out of 61 firms appeared to change their dividend payment behavior because of the dividend freeze. Similarly, from the t-values associated with the regression coefficients of the capacity variable (a_4), only 17 of the 61 firms had an a_4 coefficient significantly different from zero. This implies that most of the insurers' dividend decisions were not affected by a change in the capacity variable. This may be due to the fact that a change in retained earnings is only one of two alternatives for adjusting the capacity ratio. In general, a non-life insurance company can also issue new equity in order to raise its capacity ratio. It should also be noted that four alternative earnings definitions are used to fit equation (5). These empirical results in terms of income measure (A) are reported in Table 4. The overall results are relatively independent of the different income definitions used.

One of the main purposes of equation (5) is to forecast a firm's future dividend payment. The adjusted coefficient of determination ($\bar{R}^2$) provides an indication of a regression equation's statistical fit to historical data. Based upon Table 4, it is found that the $\bar{R}^2$ ranges from .0209 to .9845. The frequency distribution of $\bar{R}^2$ for these 61 firms indicated that more than 90 percent of these firms' dividend behaviors can be described by equation (5). Furthermore, the $\bar{R}^2$ are classified according to the ownership arrangements (i), (ii), and (iii) defined above. From the analysis of variance results indicated in Table 5 it is found that significant differences exist for the $\bar{R}^2$ among these three groups. The implication arising from these results is that the ownership arrangement has an impact upon the dividend payment behavior of a non-life insurer. This follows the expectations discussed earlier in the paper. Other possible explanations for the low $\bar{R}^2$ include the presence of negative earnings in some of the years studied for a particular insurer and policyowner dividends. The percentages of policyowner dividends to total dividends are listed in Table 6.

The estimated partial adjustment coefficient γ and the percentage of optimal dividend related to current earnings are of interest to both investors and financial managers in the non-life insurance industry. Based upon Table 4, the average γ is .53 and average β is .268. These imply that the partial adjustment coefficient is .53 and the average target payout ratio is 26.8 percent. The estimated γ of .53 also implies that it takes non-life insurance firms an average of about 2 years to adjust their dividend payments to desirable levels.

Fama and Babiak [6] have shown that Lintner's [12] model without the constant term has the greatest forecasting power. Therefore, equation (5) without a_o and a_4 is also calculated for the 61 firms. It is found that the $\bar{R}^2$ associated with Lintner's model without the constant term are generally lower than with the constant term. This is due to the fact that the capacity ratio is important for 17 firms.

III. SUR AND AGGREGATE BEHAVIOR FOR SHAREHOLDER DIVIDENDS

In the final section of the paper, a pooled time series and cross sectional simultaneous equation model will be constructed using the following extensions of equation (3), above:

$$\begin{aligned} D_{t1} &= A_1 + B_1(E_{t1}) + C_1(D_{(t-1)1}) \\ D_{t2} &= A_2 + B_2(E_{t2}) + C_2(D_{(t-1)2}) \\ &\vdots \\ D_{tn} &= A_n + B_n(E_{tn}) + C_n(D_{(t-1)n}) \end{aligned} \qquad (6)$$

where the equations are generated for each year and the subscripts 1...n refer to each of the insurers studied.

Zellner's [15] seemingly unrelated regression method is now used to simultaneously estimate these equation systems. The strength of this method rests in its ability to consider the effects of both time and firm behavior upon dividend policy.

We would anticipate that dividend behavior would vary by the ownership arrangement of the insurer. Based upon the ownership arrangement the OLS residuals associated with the shareholder dividend behavior

equation are used to estimate three variance-covariance matrices and three correlation coefficient matrices. It is found that the relationships among OLS residuals within each group are relatively strong. This implies that Zellner's SUR method can be used to improve the efficiency of the estimated shareholder dividend behavior relationship.

The $\bar{R}^2$ values under the regressions without policyholder dividends are generally lower than the $\bar{R}^2$ values for the total dividends presented in the third section of the paper. This is demonstrated by the following:

	$\bar{R}^2$ for Total Dividends	$\bar{R}^2$ for Shareholder Dividends
Total Insurers	.73	.64
Group i	.92	.89
Group ii	.69	.50
Group iii	.62	.60

These results imply that the earnings payout decision is made on the basis of total policyholder and shareholder dividends rather than considering these dividends separately. It is also found that SUR provides a more accurate estimation of the regression coefficients than the OLS method.

Overall, we found that the prior dividend was the most important variable explaining the level of current shareholder dividends under the SUR technique. This variable was significant at the 5 percent level for 100, 68 and 63 percent of the group i, ii, and iii insurers respectively. Next, the capacity ratio was found to be important in explaining shareholder dividends for 53, 44, and 44 percent of the group i, ii, and iii insurers, respectively. Similar percentages for current earnings were 59, 32, and 50 percent respectively.

The aggregated results for the equation (5) regression without the dummy variable presented differ significantly from the disaggregated results. This may be due to aggregation bias and/or the equal weighting procedure in the individual company case. Also the correlation coefficient between the lagged dividend and the capacity ratio approximated a negative .8.

IV. SUMMARY AND CONCLUDING REMARKS

We have examined the shareholder and policyholder dividend policies of a large sample of non-life insurers over 1955-75 in terms of some widely accepted financial models. These models were applied using four definitions of income and three insurer ownership groups. Adjustments were also made for capacity ratios and the partial and complete dividend freezes in the early 1970's.

We found based upon a count of the significant t-values for the a_2 coefficient in Table 4a for each earnings measure, that unrealized capital gains and losses were viewed as a transitory non-life insurance income component in the earnings payout decision. This probably follows from the widely accepted accounting practice of treating unrealized results as a surplus adjustment rather than an income component. In addition, we found that the total average earnings payout ratio was higher than 50 percent for statutory income definitions. The average shareholder dividend yield for all of insurers for 1955-75 was 3.38 percent. However, this yield fluctuated widely over time. This was the result of non-life insurance common stock prices tending to move in concert with the overall market during this period.

Lintner's dividend forecasting model was modified and applied to the non-life insurance company sample. Regressions were run for both total policyholder and shareholder dividends and the shareholder dividends alone. On an overall basis, the ranking of the explanatory power of the regressors was (1) the prior year's dividend, (2) the current earnings, and (3) the capacity ratio. We also found a significant difference in the $\bar{R}^2$ among the three ownership groups. It was also determined that it takes approximately two years for non-life insurers to adjust their total earnings payouts to desired target levels using Lintner's formulation. The dummy variable for the partial and total dividend freeze was also tested and found not to be important for the great majority of insurers.

The cross-sectional and temporal average capacity ratios and their coefficients of variation were calculated for the sample non-life insurers. Over 50 percent of the insurers had average 1955-75 capacity ratios ranging from .3 to .5. Wide variations in the temporal coefficients of variation in the capacity ratios of the individual insurers were found. This resulted from different compositions of underwriting and investment portfolios and varying premiums written/capital and surplus ratios among the insurers.

The SUR is superior to the OLS regression method if the OLS residuals among the firms within the group are correlated. We found that the SUR technique was superior to the OLS in estimating the dividend determination behavior relationships for each of the three ownership groups. This implies that there was some behavioral similarity in each of these groups. The SUR findings were otherwise consistent with the other findings in the paper.

The capacity ratio dominated the aggregate dividend determination model. This result was at variance with the other results reported in the paper. This may be due to aggregation bias.

The purpose of this research is to show how the finance theory and technique used in the industrial firms can be used to do dividend decision of non-life insurance industry. The complication of dividend decision for the non-life insurance industry relative to that of industrial firms is the interaction relationships among different income measure, ownership and capacity ratio and alternative definition of dividend decision as is dictated in Figure 1. From the theoretical analysis and empirical investigation of this paper it is found that dividend decision rules used in the industrial firms can generally be used to help the dividend decision for non-life financial managers. However, the unique nature of the definitions and interaction relationship of non-life insurance industries (see Figure 1). Some modification of the dividend behavior decision model for industrial firms may well be beneficial from the viewpoints of corporate finance theory and practices.

Footnotes

[1]Other possible mechanisms for controlling the level of retained earnings are: (1) decrease premiums written, and (2) reinsurance for all or portion of the existing portfolio.

[2]Foster [6] has investigated the impacts of these four alternative earnings on the market value of property-liability companies. One of the referees has argued that the use of statutory earnings as a dividend decision factor is unrealistic since management would recognize the need to adjust earnings before such a decision was made. However, alternative earning measures have different implications on the earnings power of a non-life insurance firm. Therefore, different income measures should lead to a difference in valuation approach for non-life insurance companies as discussed by Foster [6].

[3]It would be interesting to see the effect, if any, upon dividend policy of a change in the common stock ownership of the firm. This will be a subject for future research.

[4]The "follow" or "fit" implies that the power of forecasting the dividends payment over time. The specific formulation and test of these arguments are the adjusted coefficient of determination as defined in the following section.

[5]The measurement of the capacity ratio used in this paper does not take into account the portfolio characteristics of the sample firm's assets and liabilities. See Stone [15] for detail. The authors are grateful to one of the referees for supplying these helpful comments.

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TABLE 1

AGGREGATE EARNINGS PAYOUT RATIOS

Insurer Group (i)[a]					Insurer Group (ii)					Insurer Group (iii)				
CO.	E1[b]	E2[c]	E3[d]	E4[e]	CO.	E1	E2	E3	E4	CO.	E1	E2	E3	E4
11	.83	.96	.72	.81	01	.89	.97	.85	.92	02	.55	.65	.51	.60
14	.67	.63	.64	.60	03	.53	.56	.47	.49	05	.14	.08	.11	.07
17	.82	.91	.79	.88	04	.74	.76	.68	.70	06	.83	.72	.78	.68
24	.75	1.61	.63	1.13	07	.62	.63	.57	.58	08	.83	1.14	.80	1.10
30	.21	.28	.16	.19	09	.58	.40	.51	.37	13	.67	.74	.64	.69
33	.71	.84	.58	.66	10	.53	.75	.53	.74	15	.66	.55	.49	.43
36	.99	1.22	.83	.99	12	.93	1.17	.78	.95	16	.36	.33	.35	.31
38	.73	.79	.57	.61	18	.96	1.05	.83	.89	19	.23	.35	.23	.33
40	-.00	-.00	-.00	-.00	23	1.13	1.15	1.12	1.14	20	.64	.55	.60	.51
44	.59	.85	.53	.72	25	.86	.80	.69	.65	21	.67	.88	.70	.93
45	.15	.15	.13	.13	31	.33	.35	.31	.33	22	.06	.06	.04	.04
46	.45	.28	.47	.29	34	.61	.66	.60	.65	26	.58	.62	.55	.58
48	.52	.42	.49	.40	37	.86	.82	.82	.79	27	.84	.66	.72	.59
56	.73	.65	.50	.46	39	.21	.20	.20	.19	28	-1.21	-.92	-2.14	-1.37
58	.37	.37	.31	.30	41	.32	.34	.27	.28	29	.55	.38	.47	.34
60	.77	.67	.68	.60	42	.97	1.26	.96	1.24	32	.11	.12	.10	.10
61	.49	.29	.44	.28	43	.87	.76	.80	.71	35	.77	.71	.71	.66
					50	.50	.42	.45	.38	47	.33	.32	.27	.26
					52	.80	.86	.80	.86	49	.35	.32	.30	.28
					53	.92	.80	.85	.75	51	.33	.30	.30	.28
					54	.65	.76	.62	.71					
					55	.55	.50	.45	.42					
					57	.30	.30	.27	.27					
					59	.24	.30	.22	.26					
Average	.61	.68	.53	.57		.66	.69	.61	.64		.41	.43	.33	.37

a = ownership groups (i), (ii), and (iii) are defined in the text.
b = total 1955-75 dividends ÷ total 1955-75 earnings as measured by definition (A) in text.
c = total 1955-75 dividends ÷ total 1955-75 earnings as measured by definition (B) in text.
d = total 1955-75 dividends ÷ total 1955-75 earnings as measured by definition (C) in text.
e = total 1955-75 dividends ÷ total 1955-75 earnings as measured by definition (D) in text.

TABLE 2

NON-LIFE INSURER DIVIDEND YIELDS AND CAPACITY RATIOS

Year	Annual Average Dividend Yield (%)	Capacity Ratio		Sample Size
		Mean	C.V.	
1955	2.90%	.4249	.4552	22
1956	3.37	.4040	.3988	23
1957	3.63	.3760	.4282	25
1958	3.38	.3960	.3874	26
1959	3.04	.4192	.6171	28
1960	3.58	.3903	.3941	28
1961	2.79	.4202	.3796	29
1962	2.70	.4010	.3850	28
1963	2.36	.4064	.3889	29
1964	2.48	.4093	.3997	30
1965	3.14	.4007	.3894	30
1966	3.14	.3742	.3979	28
1967	3.43	.3844	.3858	28
1968	3.30	.3872	.3597	26
1969	4.40	.3595	.4412	19
1970	4.27	.3571	.4439	18
1971	2.90	.3766	.4033	19
1972	2.72	.3960	.4006	21
1973	3.68	.3472	.4502	20
1974	5.57	.2794	.5845	21
1975	6.03	.2799	.5858	20
Overall Average	3.38%			

F-test results for average dividend yields among years 1955-75,
F = 5.3006 (significant at 1 percent level).

Table 3a

Frequency Distribution of 1955 - 1975 Coefficient Variation for Average Capacity Ratio

AT LEAST	AND LESS THAN	Number of Firms	Percentage
0	- 0.1	8	10.25
0.1	- 0.2	25	32.05
0.2	- 0.3	32	41.03
0.3	- 0.4	9	11.54
0.4	- 0.5	3	3.85
		.	
		.	
		.	
1.4	- 1.5	1	1.28
		78	100%

Table 3b

Frequency Distribution of Average 1955 ~ 1975 Capacity Ratio

AT LEAST		AND LESS THAN	Number of Firms	Percentage
0.1	~	0.2	2	2.56%
0.2	~	0.3	15	19.23%
0.3	~	0.4	36	46.15%
0.4	~	0.5	14	17.95%
0.5	-	0.6	4	5.13%
0.6	~	0.7	4	5.13%
0.7	-	0.8	2	2.57%
0.8	-	0.9	1	1.28%
			78	100%

TABLE 4

EMPIRICAL RESULTS FOR EQUATION (7)--
INCOME MEASUREMENT (A)

Co. No.[a]	a_o	a_1	a_2	a_3	a_4	$\bar{R}^2$	S.E.[b]
(01)	28856	48347	1.0732	-.1909	-1477.9	.8705	22487
	(1.03)[c]	(2.73)	(7.99)	(-1.64)	(-2.32)		
(02)	-2088.7	5311.6	.0615	1.0043	-88.1867	.9572	2179.9
	(-.41)	(1.48)	(.84)	(9.13)	(-.63)		
(03)	-33600	-22349	.444	.4477	1615.8	.4771	18474
	(-.87)	(-1.79)	(2.02)	(1.55)	(1.41)		
(04)	41880	10161	.377	-.3301	-913.30	.8093	4100.4
	(3.51)	(1.99)	(3.68)	(-1.12)	(-3.18)		
(05)	111.92	21.052	-.0146	.5626	1.9058	.6159	103.67
	(.36)	(.26)	(-.97)	(3.37)	(.19)		
(06)	2224.4	89.114	-.012	.6742	-42.8317	.7374	499.14
	(2.07)	(.17)	(-.11)	(2.83)	(-1.28)		
(07)	4606.9	-2050.4	.1777	-.1215	-26.82	.9107	474.73
	(4.69)	(-5.05)	(4.04)	(-.83)	(-1.51)		
(08)	-7201.8	957.27	-1.2438	.2049	224.87	.4194	2474.7
	(-2.23)	(.57)	(-2.26)	(.97)	(2.56)		
(09)	3209.8	1464.7	.1395	.9153	-144.21	.7183	1406.4
	(.48)	(.66)	(1.32)	(2.29)	(-.79)		
(10)	-271.55	116.32	.0601	.2545	14.329	.5125	135.36
	(-.79)	(1.58)	(1.57)	(1.48)	(1.33)		
(11)	3651.3	-149.76	.1194	.7052	-103.72	.9865	632.16
	(1.31)	(-.22)	(13.95)	(5.71)	(-1.39)		
(12)	483.36	-342.8	-.0194	.4561	6.182	.5171	232.98
	(.73)	(-2.53)	(-.47)	(1.61)	(.31)		
(13)	371.99	-360.08	.1098	.7322	2.5613	.8936	294.38
	(.48)	(-1.23)	(1.97)	(3.98)	(.13)		
(14)	-1146	-464.32	-.0279	.706	93.125	.9771	190.12
	(-1.28)	(-2.1)	(-.4)	(8.87)	(2.66)		
(15)	2595.05	-1705.75	-.1866	-.2681	-1.2436	.3308	1137.2
	(1.29)	(-2.61)	(-1.09)	(-.62)	(-.02)		
(16)	266.56	-11.34	.0031	.3117	.1542	.5612	29.8
	(3.76)	(-.56)	(.42)	(4.10)	(.10)		
(17)	-6628	3664.6	.0089	1.1095	54.7184	.9825	1572.4
	(-3.22)	(2.28)	(.35)	(16.55)	(1.89)		
(18)	25089	7552.2	.4611	.1089	-633.14	.4185	9842.5
	(2.22)	(.92)	(2.27)	(.5)	(-1.88)		
(19)	-234.61	511.6	.0602	.3044	-.0705	.1690	737.46
	(-.09)	(.97)	(.27)	(1.25)	(-.00)		
(20)	632.62	278.37	.0731	.5974	-21.454	.8193	204.76
	(2)	(2.31)	(2.1)	(4.42)	(-2.75)		
(21)	-474.03	-83.623	-.0611	-.2239	21.8	.3824	336.77
	(-1.28)	(-.44)	(-.45)	(-.85)	(2.64)		
(22)	-158.59	820.79	.0563	-.1037	-13.14	.75	294.31
	(-.18)	(1.68)	(3.29)	(-.52)	(-.59)		

TABLE 4 (con't.)

Co. No.	a_o	a_1	a_2	a_3	a_4	$\bar{R}^2$	S.E.
(23)	236.36	-132.37	.2276	.6218	-.5987	.7821	174.42
	(.94)	(-1.04)	(3.19)	(4.45)	(-.04)		
(24)	76.332	-30.198	.0146	.7806	14.1488	.7048	386.83
	(.12)	(-.12)	(.64)	(4.84)	(.75)		
(25)	133.92	12.326	.0223	.3131	-1.3485	.75	12.874
	(5.27)	(1.09)	(2.98)	(3.00)	(-2.73)		
(26)	1011.7	12.994	.0561	.1079	-21.728	.3014	101.96
	(2.98)	(.21)	(.76)	(.57)	(-2.05)		
(27)	5649.4	946.63	.4176	.0973	-148.02	.7476	1004.5
	(2.9)	(.90)	(2.68)	(.33)	(-2.7)		
(28)	8211.5	-3162.3	.2192	1.1228	-119.34	.8404	2004.8
	(4.58)	(-2.72)	(3.29)	(5.77)	(-3.03)		
(29)	-1563.5	-290.22	.2386	-.2357	54.328	.3096	219.41
	(-2.36)	(-1.41)	(.78)	(-1.11)	(2.41)		
(30)	22.086	-5.1426	.0515	.8264	-.0806	.9866	42.299
	(.37)	(-.10)	(1.54)	(5.42)	(-.03)		
(31)	-12.87	-32.086	.13279	.3581	3.5981	.6896	141.45
	(-.04)	(-.19)	(1.86)	(1.83)	(.42)		
(32)	178.68	-113.31	.0212	.7986	-1.1135	.9422	92.144
	(1.01)	(-.89)	(.93)	(5.38)	(-.73)		
(33)	129.26	-16.705	.0661	.5398	-1.6399	.9359	18.196
	(1.66)	(-.98)	(3.73)	(2.66)	(-1.11)		
(34)	135.03	-193.11	.1684	.5969	6.5116	.9463	189.98
	(.45)	(-.92)	(1.16)	(1.78)	(.56)		
(35)	2240.8	3069.2	.8689	.2253	-161.74	.3504	6055.8
	(.15)	(.48)	(1.30)	(.80)	(-.6)		
(36)	59.841	5.7237	.0182	.7153	-.3979	.8378	14.71
	(1.26)	(.48)	(1.44)	(3.44)	(-1.04)		
(37)	-20111	8985.1	1.1034	.4233	182.74	.6978	7045.5
	(-1.3)	(1.59)	(4.08)	(2.32)	(.57)		
(38)	-7459.8	1379.9	-.0318	1.6049	195.75	.881	715.82
	(-1.93)	(1.69)	(-.67)	(4.49)	(1.75)		
(39)	799.85	-739.81	.0031	.0157	19.998	.9635	194.45
	(6.78)	(-6.59)	(.81)	(.32)	(19.84)		
(40)	7.3184	-42.759	0	.8356	1.7461	.7457	44.817
	(.12)	(-1.72)	(-.61)	(5.36)	(.92)		
(41)	1016.4	-908.3	.3012	-.5897	-2.7769	.8896	268.97
	(1.48)	(-1.62)	(3.08)	(-1.18)	(-.43)		
(42)	317045	122943	.3593	-.4354	-5716	.4084	109098
	(2.16)	(1.10)	(.68)	(-1.61)	(-2.00)		
(43)	-989.77	351.41	2.1274	.174	-91.979	.8914	2095.4
	(-.18)	(.21)	(9.03)	(1.35)	(-1.1)		
(44)	4.7857	2.1733	.0333	.8963	-.0282	.9353	4.3958
	(.48)	(.33)	(1.69)	(10.1)	(-.15)		
(45)	823.23	-125.00	.0017	.7098	-8.739	.9362	76.1949
	(2.02)	(-1.57)	(.54)	(4.98)	(-1.25)		
(46)	27.2701	6.0099	.07781	.8345	-.3367	.9463	11.9968
	(.32)	(.65)	(2.33)	(8.11)	(-.3)		

TABLE 4 (con't.)

Co. No.	a_o	a_1	a_2	a_4	a_4	$\bar{R}^2$	S.E.
(47)	637.75	-397.18	.0201	-.4872	-5.936	.3842	205.65
	(2.4)	(-2.09)	(.21)	(-1.20)	(-1.00)		
(48)	-171.78	198.29	.0038	1.1509	-1.8817	.984	126.47
	(-.54)	(1.37)	(.22)	(15.86)	(-.27)		
(49)	4.7876	3.1862	.0242	.9569	.0307	.9821	17.961
	(.12)	(.16)	(3.99)	(12.85)	(.04)		
(50)	-53.344	-37.445	.0229	.6896	4.4049	.542	150.27
	(-.22)	(-.26)	(.66)	(2.21)	(.68)		
(51)	-32.542	5.29	.0198	1.0743	.6195	.9766	25.401
	(-.57)	(.15)	(2.02)	(10.62)	(.72)		
(52)	3676	-1260.8	.5737	.089	-71.872	.8266	1026.1
	(2.67)	(-1.47)	(3.41)	(.48)	(-1.34)		
(53)	50783	-14548	-.4155	-.3623	-543.13	.5344	9389.4
	(4.34)	(-1.88)	(-1.51)	(-1.77)	(-2.66)		
(54)	-744.65	-757.48	-.0171	-.0399	56.1391	.0209	2652.4
	(-.2)	(-.31)	(-.07)	(-.16)	(.53)		
(55)	855.25	-146.2	.1232	.6583	-13.2631	.9582	265.47
	(1.3)	(-.45)	(5.00)	(4.74)	(-1.24)		
(56)	300.33	-40.63	.0843	1.0597	-7.668	.9382	67.948
	(1.72)	(-.47)	(1.62)	(5.97)	(-2.09)		
(57)	-126.11	-153.88	-.0592	.7387	17.3201	.5249	192.4
	(-.26)	(-.92)	(-1.83)	(3.34)	(1.44)		
(58)	6.1672	-37.944	.0402	.8567	1.3717	.8506	40.326
	(.07)	(-.8)	(.81)	(4.55)	(.67)		
(59)	93.2801	8.5132	.024	.8533	-1.0067	.912	61.563
	(.73)	(.15)	(.66)	(4.69)	(-.54)		
(60)	-9381.5	9615.2	.093	1.1848	-42.876	.988	2029.8
	(-2.74)	(3.77)	(1.87)	(17.65)	(-.45)		
(61)	-356.07	-202.36	-.0227	1.1427	16.443	.9845	119.6
	(-.75)	(-1.37)	(-1.13)	(17.95)	(1.37)		

[a]See Appendix A for company names.

[b]Standard error of the estimate.

[c]All values in parentheses are t-values.

TABLE 5

F-TEST FOR SIGNIFICANT DIFFERENCE IN $\bar{R}^2$
AMONG OWNERSHIP GROUPS

Ownership Group	Average $\bar{R}^2$	F Value
(i)[a]	.917705	
(ii)	.690487	9.0361[b]
(iii)	.623534	
Overall Average	.731858	

[a]See text for the definition.

[b]Significant at .038% level.

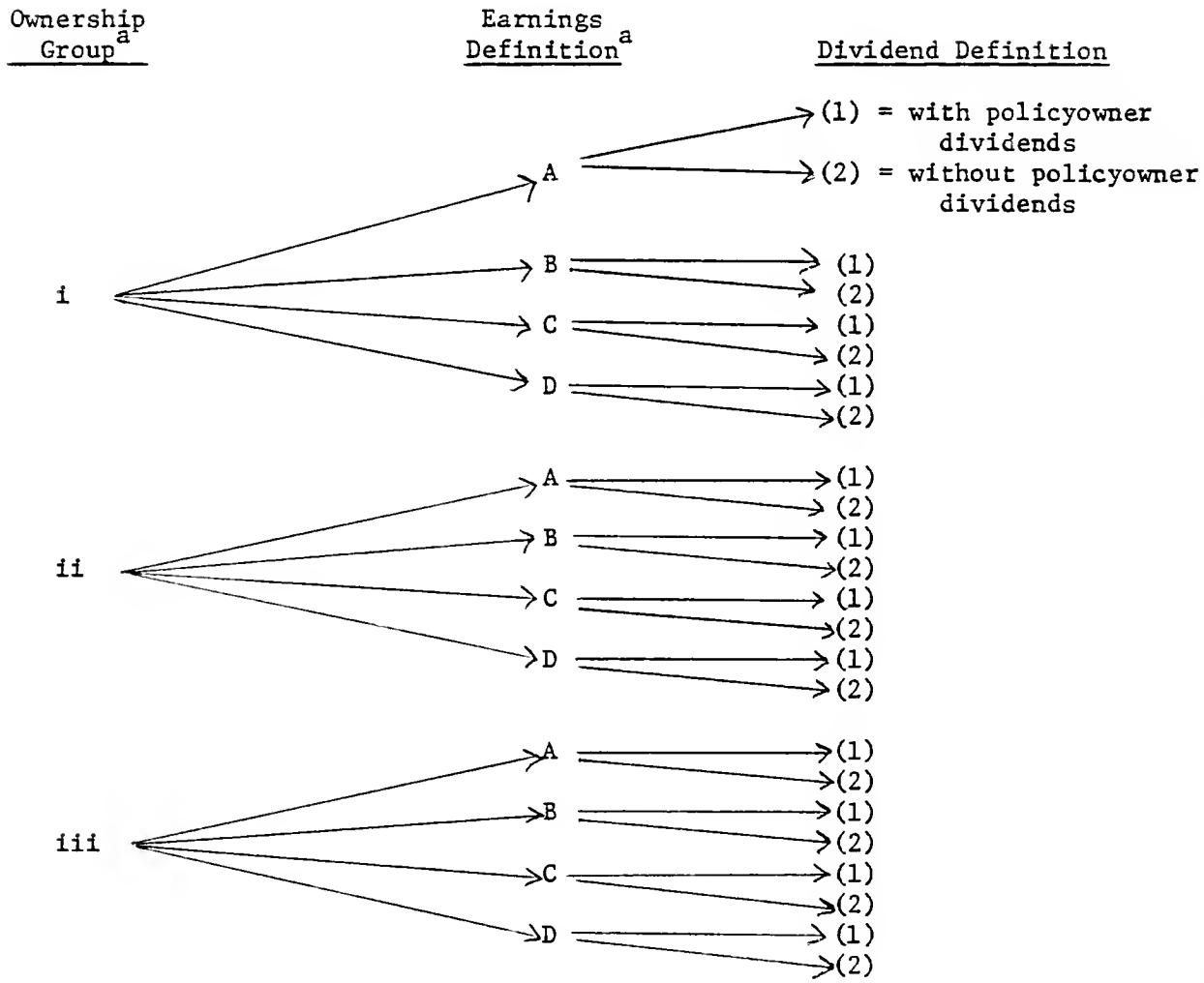
TABLE 6

AVERAGE 1955-75 RATIOS OF POLICYOWNER DIVIDENDS TO TOTAL DIVIDENDS

	Mean	σ
INA	.0170	.0237
HARTFORD ACCIDENT AND INDEMNITY	.0979	.0986
AETNA CASUALTY AND SURETY	.3133	.4016
FEDERAL	.0409	.0288
AMERICAN STATES	.0033	.0102
ROYAL INDEMNITY	.1010	.1070
WESTCHESTER FIRE	.0824	.0991
PROVIDENCE WASHINGTON	.1106	.2899
GOVERNMENT EMPLOYEES	.2366	.0808
PEERLESS	.1461	.2194
EMPLOYERS FIRE	.1544	.2227
EMPLOYERS CASUALTY	.7680	.0341
UNITED PACIFIC	.1237	.2962
AMERICAN GENERAL	.0379	.0255
RELIANCE	.0259	.0445
AFFILIATED FM	1.000	0
CONNECTICUT INDEMNITY	.1981	.3853
STATE FARM FIRE AND CASUALTY	1.000	0
CALIFORNIA COMPENSATION AND FIRE	.9440	.0360
HANOVER	.0418	.0627
AMERICAN POLICYHOLDERS	.7301	.0799
GLOBE INDEMNITY	.0912	.0956
PACIFIC	.0879	.2163
TRI STATE	.2190	.3574
CIVIL SERVICE EMPLOYEES	.1139	.1858
WEST AMERICAN	1.000	0
AMERICAN AUTOMOBILE	.7339	.4040
AMERICAN DRUGGISTS	.0694	.0813
THE AMERICAN INSURANCE COMPANY	.3692	.4306
BITUMINOUS CASUALTY CORPORATION	.2413	.1379
THE CINCINNATI INSURANCE COMPANY	.0096	.0207
THE CONTINENTAL INSURANCE COMPANY	.0183	.0334
HARBOR INSURANCE COMPANY	.6176	.4633
PACIFIC EMPLOYERS	.6764	.1208
PHOENIX INSURANCE COMPANY	.1001	.1313
REPUBLIC INSURANCE COMPANY	.0041	.0107
SOUTH CAROLINA INSURANCE COMPANY	.0025	.0086
TRINITY UNIVERSAL	.0301	.4426
UNITED FIRE AND CASUALTY	.1718	.2490
UNITED STATES FIDELITY & GUARANTY	.0356	.0428
WESTERN CASUALTY AND SURETY	.0712	.0878

FIGURE 1

OWNERSHIP ARRANGEMENTS, EARNINGS MEASURES, AND DIVIDEND DEFINITIONS AVAILABLE FOR ANALYSIS



[a]See text for definitions.

Figure 1 summarizes the combinations of potential ownership arrangements, earnings definitions, and dividend definitions that could be tested in this study.

APPENDIX A

Co. No.	Company List
01	INA (ii)[a]
02	Hartford Accident & Indemnity (iii)
03	AETNA Casualty & Surety (ii)
04	Federal (ii)
05	American States (iii)
06	Royal Indemnity (iii)
07	Westchester Fire (ii)
08	Calvert Fire (ii)
09	Ohio Casualty (ii)
10	Providence Washington (ii)
11	Government Employees (i)
12	Peerless (ii)
13	Employers Fire (iii)
14	Employers Casualty (i)
15	United Pacific (iii)
16	National Casualty (iii)
17	American General (i)
18	Reliance (ii)
19	American Credit Indemnity (iii)
20	Affiliated FM (iii)
21	Connecticut Indemnity (iii)
22	State Farm Fire & Casualty (iii)
23	California Compensation & Fire (ii)
24	Hanover (i)
25	Utah Home Fire (ii)
26	American Policyholders (iii)
27	Globe Indemnity Co. (iii)
28	Pacific (Earlier Guarantee) (iii)
29	Tri State (iii)
30	American Bankers (i)
31	Civil Service Employees (ii)
32	West American (iii)
33	Excelsior Insurance Company of New York (i)
34	Republic Indemnity (ii)
35	American Automobile (iii)
36	American Druggists Insurance Co. (i)
37	The American Insurance Co. (ii)
38	American Reinsurance (i)
39	Bituminous Casualty Corp. (ii)
40	Carolina Casualty (i)
41	The Cincinnati Insurance Co. (ii)
42	The Continental Insurance Co. (ii)
43	Fidelity and Deposit Co. of Maryland (ii)
44	Firemens Insurance Company of Washington D.C. (i)
45	General Reinsurance Corp. (i)
46	Germantown Insurance Co. (i)
47	Harbor Insurance Co. (iii)
48	The Hartford Steam Boiler Inspection and Insurance Co. (i)
49	Hawkeye-Security Insurance Co. (iii)
50	Interstate Fire & Casualty Co. (ii)
51	Northeastern Insurance Co. of Hartford (iii)
52	Pacific Employers (ii)
53	Phoenix Insurance Co. (ii)
54	Reinsurance Corporation of New York (ii)
55	Republic Insurance Co. (ii)
56	South Carolina Insurance Co. (i)
57	Trinity Universal Insurance Co. (ii)
58	United Fire & Casualty Co. (i)
59	United Fire Insurance Co. (ii)
60	United States Fidelity and Guaranty Co. (i)
61	Western Casualty and Surety Co. (i)

[a]Ownership arrangements are in the parentheses following the company names. These (i), (ii), and (iii) ownership arrangements are defined in the text.