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Unraveling the Dynamics of Corporate Dividend Policy: Evidence from the Property-Liability Insurance Industry

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Abstract: What drives corporate dividend policy remains an unsettled issue, largely due to data limitations, as many privately held firms do not need to disclose their financial reports publicly. We examine and compare the dividend policies of firms with three distinct ownership structures—publicly held stock insurers, privately held stock insurers, and mutual insurers—within the U.S. property-liability insurance industry. Our findings indicate that publicly held insurers are more likely to distribute dividends and tend to pay higher dividends compared to privately held insurers, with mutual insurers paying the least in the matched sample. We found that mutual insurers' dividend policies are more sensitive to cash flow, whereas stock insurers' policies are more responsive to profits. We show that private insurers have significantly less smoothness in dividend policies. Our findings highlight the significant role that ownership structure plays in shaping corporate dividend policies.

Keywords: dividend policies; dividend smoothing; property-liability insurance

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1. Introduction

Dividend policy remains an unsettled question in finance. Specifically, what factors affect dividend payout and why do firms pay dividends at all? Numerous theories attempt to explain corporate dividend policy. For example, some researchers (Bernheim & Wantz, 1995; Gomes, 2000) postulate that dividend payout serves as a signal of firm profitability based on asymmetric information theory (Benartzi et al., 1997; Deshmukh, 2003). Other researchers use agency theory to explain dividend payout, suggesting that dividends are used to mitigate value-destroying activities (Jensen, 1986; Dewenter & Warther, 1998). Rozeff (1982) developed an agency cost-transaction cost tradeoff model that suggests firms adopt a dividend policy that minimizes these overall costs. Paying dividends forces the firm into the external markets, and subsequent external scrutiny, to seek replacement capital. Agency theory suggests that the relationship between insiders (i.e., managers) and outside shareholders and corporate governance mechanisms varies widely between private firms and public firms, resulting in different dividend payment policies.

Signaling theory posits that dividend payments convey information about the firm (Leary & Nukala, 2024). Different firms' organizational or ownership structures would therefore result in different informational needs of the stakeholders. La Porta et al. (2000) find that private firms have weaker corporate governance mechanisms relative to public firms, and therefore a greater incentive to pay dividends to distinguish themselves. Other research by Lintner (1956) maintains that managers smooth dividend payouts given the assumption that investors prefer predictability or a stable dividend policy. This desire for

a stable dividend payout should be directly influenced by firms' publicly traded status, since public firms' dividends decisions are publicly observed and trigger investor reactions. Empirical studies confirm the severe consequences of dividend omissions and cuts in public firms (Michaely et al., 1995; Grullon et al., 2005).

These theories all indicate the importance of ownership structure in dividend policy decisions. While dividend policy has been widely studied, most research focuses on firms with dispersed ownership (i.e., public listed firms) or controlling shareholders. However, very few empirical studies systematically compare how dividend policies differ across a range of corporate ownership structures. Understanding these differences is essential, as ownership structure can significantly influence managerial incentives and agency conflicts, which in turn shape dividend decisions. Some research attempts to fill this void by using firm data from foreign countries. For example, Michaely and Roberts (2012) investigate dividend policies in publicly and privately held firms in the U.K., and Berzins et al. (2017) use private Norwegian firm data to examine dividend policies between majority and minority shareholders. The lack of research on the issue is largely due to the lack of data availability for private U.S. firms.

In this paper, we overcome this difficulty by comparing the dividend policies of firms in the U.S. property-liability insurance industry. Both publicly traded insurance firms and private insurance firms are required to file comprehensive financial statement and demographic information with the National Association of Insurance Commissioners (NAIC). This NAIC regulatory compliance creates a rich data set that enables us to parse out dividend policy differences based on whether the firm is organized as a mutual insurer, a privately held stock insurer, or a publicly held insurer.

The three groups vary widely with respect to ownership structure. These differences, such as agency costs and asymmetric information, should impact the factors, which might help explain dividend payout. Mutual insurers are privately held and policyholders are shareholders. Thus, mutual insurers have a significant number of minority shareholders and a dispersed ownership structure. A more dispersed ownership can create more issues related to asymmetric information and agency conflicts. In contrast, privately held stock insurers have concentrated ownership, ranging from a very few shareholders to one shareholder. Concentrated ownership structures should have fewer asymmetric information issues among shareholders but a stronger incentive to monitor managers given their ownership concentration. Publicly held insurers have institutional shareholders, majority shareholders, and minority shareholders. Public firms are subject to more strict corporate governance mechanisms and corporate control, but they have greater access to the capital markets. Such arrangements improve public insurers' information quality and protect outside shareholders.

We attempt to answer three fundamental questions about dividend policies of insurers: (1) Is there any difference among the three groups of insurers with respect to the propensity of paying dividends and dividend levels?; (2) Do these three groups of insurers experience the same level of dividend smoothing?; and (3) Do these three groups of insurers react in a similar manner to profitability and cash flow? We investigate these questions by evaluating the dividend policies among the three groups of insurers and focusing on the different dividend policy responses of insurers that experience a change in profits and cash flows. To date, the only research we have documented that directly compares dividend policies in insurers with different organization forms is Zou et al. (2009). Their paper compares dividend payout ratios between mutual and stock insurers. They did not look at the dividend policy differences between public firms and private firms, which is important because the ownership structure of public insurers is different from that of private insurers. This paper addresses this issue.

Zou et al. (2009) lumps all insurers, both stock insurers and mutual insurers, together and compares dividend payout ratios based on the two organizational forms. To address the issue,

we used a propensity score matching method (Rosenbaum & Ruben, 1983; Heckman et al., 1997). We matched the three distinct groups of insurers on three dimensions—firm size, directed written premiums, and net income—to reduce the potential bias in samples which may cause different dividend policies.

Our first set of results shows that public insurers have a significantly higher propensity for paying dividends than private stock insurers and mutual insurers. Insurers distribute a larger percentage of net income as dividends to shareholders than firms in most other industries. Specifically, we found that public firms distribute an average of 66.9% of net income as dividends, compared to 59.6% of net income distributed as dividends by private stock insurers, and only 19.3% of net income distributed as dividends by mutual insurers. The results are consistent with agency consideration and shareholder power (e.g., La Porta et al., 2000; Michaely & Roberts, 2012). Public shareholders have more power over management (e.g., selling shares to hostile takeovers) to obtain more dividends than other types of insurers. Aligned with agency conflict theory, we found highly profitable insurers pay higher dividends, and the effects are larger in public insurers and mutual insurers. Meanwhile, high free cash flow public insurers and mutual insurers pay higher dividends. We did not observe any evidence of dividend changes predicting future earnings and signal growth, or a signaling role of dividend policy in mutual insurers, where information asymmetry is the greatest among the three groups of insurers.

Our second set of analyses reveals information on dividend smoothing using Lintner's model of dividend policy. We found that the private insurers' coefficient of speed of adjustment is significantly higher than that of public insurers and mutual insurers. Similarly, we found that private insurers are more prone to omit or initiate dividends relative to publicly held insurers and mutual insurers. Private insurers' chance of dividend omission is as high as 26.6%, whereas the chance of dividend omission is only around 11.3% for mutual insurers and public insurers. When we consider all dividend changes, we show that public insurers and mutual insurers follow reasonably consistent dividend policies. Thus, the propensity for changing dividends appears to be unique to private firms. Overall, our results indicate that ownership structure is a major factor in insurers' dividend smoothing behaviors.

The remainder of the paper is organized as follows. Section 2 describes the hypotheses developed from the dividend policy theoretical arguments and the previous empirical literature. Section 3 provides a description of our data, sample selection, and variable constructions. Section 4 explains the empirical methodologies and results. Section 5 concludes the paper.

2. Hypotheses Development

Agency theories point out that dividend payout serves to resolve agency-conflict between insiders (managers) and outside shareholders (Jensen, 1986). Asymmetric information and agency costs suggest that dividend payout could reduce the shareholder–management conflict when ownership is dispersed (d'Udekem, 2021), while concentrated ownership could result in lower agency costs. Firms with concentrated ownership structures are more likely to use dividends to address shareholder conflicts (Berzins et al., 2017). Shareholders of firms with a concentrated ownership structure can obtain access to hard and soft information to minimize asymmetric information. Therefore, the greater agency problems of public insurers where ownership is heavily dispersed may lead to a greater propensity for paying dividends and higher level of dividends than privately held stock insurers for which shareholders have concentrated ownership and minimize agency costs (Jensen & Meckling, 1976).

The rationale that dividends are used to reduce agency problems is based on the power of shareholders. Shareholders in public firms have more general rights in terms of

voting for directors and protesting wealth-destroying activities (Attig et al., 2021). Thus, shareholders in public firms may have greater power afforded to them than shareholders in private dispersed firms (Michaely & Roberts, 2012). Such effects are described as an "outcome model" in La Porta et al. (2000), in which dividends are the result of effective pressure by minority shareholders to force firms to give away cash. Equivalently, mutual insurers may have the most dispersed ownership among the three groups as policyholders are equal to shareholders, yet mutual shareholders have much less power over managers to induce dividend payout. Mutual shareholders' general rights cannot be transferred since insurers usually make insurance policies nontransferable. Meanwhile, mutual insurers are subject to capital constraints due to mutual insurers' disadvantage in raising new capital to remain competitive. All things being equal, mutual insurers are expected to be less likely to pay dividends and, if they do, they pay fewer dividends.

Privately held stock insurers have relatively easier and less expensive ways to raise new capital than mutual insurers. In addition, since privately held stock insurers have much higher concentrated ownerships with no wealth expropriation issues, their dividend level should be free from any monitoring costs. We expect that privately held stock insurers are more likely to pay dividends and pay higher dividends than mutual insurers but less than public insurers, since public insurers have greater access to capital markets and face higher agency problems. Alternatively, La Porta et al. (2000) propose "the substitute model" according to which firms substitute the external corporate governance and legal protection of public firms by using dividend payments. Their study suggests that private firms have a weaker governance structure to support their reputation and conveying quality, which means that dividend payout is even more important for them. Therefore, the ownership structure of private insurers and public insurers and their willingness to pay dividends are empirical questions. We developed the following hypothesis:

Hypothesis 1. *Public insurers and privately held stock insurers are more likely to pay dividends and pay higher dividend levels than mutual insurers.*

Asymmetric information between insiders and outside shareholders may give managers incentives to hoard excess cash and use the cash to invest in worthless projects or waste it on personal benefits at the expense of outside shareholders (Chay & Suh, 2009). Higher free cash flow provides incentive to cause more managerial misbehavior and this issue would be worse with dispersed ownership. According to the survey results of Brav et al. (2005), firms with more cash are committed to paying out more dividends (Javadi et al., 2021). Firms pay dividends to reduce the agency costs of free cash flow and minimize suboptimal managerial behavior (Easterbrook, 1984) and build trust and convey the commitment to act in the best interests of shareholders in order to reduce the owner–management agency costs (e.g., Allen et al., 2000; La Porta et al., 2000). We expect insurers with more free cash flow will pay more dividends and mutual insurers will exhibit the greatest sensitivity to free cash flow among three groups.

Signaling theory indicates that the value of dividend payout as a signal increases with the level of asymmetric information, and higher dividends signal higher earnings (Miller & Rock, 1985). The signaling argument suggests that, all things being equal, firms with higher earnings are predicted to pay higher dividends. Furthermore, insurers with a lower ownership concentration need to maintain the prospect of their firms and are more likely to signal their quality with higher dividends. For private insurers, ownership is concentrated, which leads to little wealth expropriation. We developed two hypotheses about the sensitivity of ownership structures to cash flow and earnings:

Hypothesis 2. *Mutual insurers' dividend policies have the greatest sensitivity to cash flow, followed by public insurers and then privately held stock insurers.*

Hypothesis 3. *Publicly held insurers and privately held stock insurers' dividend policies have greater sensitivity to profits than mutual insurers.*

Dividends are widely believed to be sticky and smoothed. Lintner (1956) finds that managers are reluctant to dramatically change dividends, such as increase (decrease) dividends immediately following an increase (decrease) in earnings. Michaely and Roberts (2012) find that dividend smoothing is greater in public firms than private firms using U.K. data. This occurs because the diverse ownership structure found in public firms increases the value of the signaling and agency reduction roles fulfilled by corporate dividends. Similarly, the potential agency issues and information asymmetries are more pronounced in public insurers. Public insurers may want to maintain a good corporate reputation and attract more minority investment, so they are reluctant to cut or omit dividends.

However, the signaling role of dividends may weaken because public firms have to disclose their financial statements regularly and are subject to scrutiny of the capital markets. Mutual insurers, which also have diverse ownership, may have greater incentive to pay dividends to maintain and gain reputation. The need for firms to signal stable value is lower for private insurers since the consequence of dividend changes is less severe relative to their mutual or public counterparts. Such opinion is also supported by survey evidence (Brav et al., 2005). Thus, we have the following hypothesis and its alternative:

Hypothesis 4. *Publicly held insurers are more likely to smooth dividends than mutual insurers, and private insurers are least likely to smooth dividends.*

Hypothesis 4a. *Mutual insurers are more likely to smooth dividends than publicly held insurers, and private insurers are least likely to smooth dividends.*

3. Data and Variable Construction

3.1. Data and Sample Selection

Our data come from several sources. First, the public insurer samples include all publicly traded insurance companies in the merged CRSP/Compustat database for the years 1989–2012. We identified insurance companies based on the Standard Industrial Classification System (SIC) codes and kept all firms with SIC codes of 6331, 6399, and 6351. We obtained a complete list of publicly traded property-liability firms. We followed Zou et al. (2009) in the initial data screen: we calculated the proportion of firms' sales revenue from insurance operations based on the Compustat Segment database and only included firms with more than 50% of their revenue in insurance. This initial sample consists of 183 unique firms. Second, we obtained annual financial statements from the National Association of Insurance Commissioners (NAIC) for property and liability insurers for 1989–2012. We used group-level and unaffiliated firm data of NAIC. For example, if a holding company is publicly traded, the affiliated insurers or members of the insurance group of this holding company are all considered to be a publicly held firm. We then hand-matched the NAIC data and the public insurers by using information collected from NAIC, A.M. Best, EDGAR database Form 10-K, and various other resources. We deleted public insurers if such insurers had incomplete information in NAIC or had existed less than five years. Applying these screens reduced our sample to 165 public insurers and 1616 firm-years. Lastly, we selected the private insurer samples from the NAIC database by conducting the following three procedures: (1) We excluded the 183 public firms and insurers whose ultra-parents' firms were publicly traded (e.g., some public ultra-parents' firms that are classified as "life-health" may also have property-liability insurance business) from the NAIC database and identified all other groups and unaffiliated firms in NAIC during 1989–2012; (2) We

required that the private firms had at least five years' operation during our sample period and we deleted observations with missing information since we employed lagged terms (for growth and prior dividend payouts) and lead terms (for future earnings); (3) We then divided the private insurers into private stock insurers and mutual insurers based on their filing organization information to NAIC. Finally, we obtained 23,353 firm-year observations for private stock insurers and 8643 firm-year observations for mutual insurers.

We performed two steps for the matches. Since the number of mutual insurers was much less than private stock insurers, we first used propensity score matching to match public firm-year observations to mutual insurer firm-year observations. Then we took the public observations from the first match and matched them to private stock insurer firm-year observations. Specifically, in each step, we estimated a logit model using the dependent variable as an indicator variable which equals one for publicly-held status and three independent variables—firm size, total premium written, and net income. We then calculated the propensity score for every firm-year observation with non-missing values in the sample and matched each public insurer observation to a unique mutual insurer and private stock insurer by minimizing the absolute difference in their propensity scores. We had 1434 matched public insurers, mutual insurers, and private stock insurers, respectively. The logit results pre-and post-match are presented in Tables 1 and 2. Table 1 reports the coefficient estimates from two logit regressions using an indicator variable equal to one if the firm is publicly held. The results suggest that three matching variables are significantly different between public insurers and mutual insurers, and between public insurers and private stock insurers before matching. The public insurers are larger in size and business and more profitable. After matching, the differences are not statistically significant.

Table 1. Propensity score matching for public insurers and private stock insurers.

Variables	Pre-Match	Post-Match
Size	0.365 ***	−0.002
	(0.023)	(0.036)
Direct Premiums	0.265 ***	0.056
	(0.024)	(0.037)
Profitability	−1.264 ***	0.093
	(0.319)	(0.548)
Constant	−14.585 ***	−1.099 ***
	(0.286)	(0.408)
Public Insurer Obs	1616	1434
Private Stock Insurer Obs	23353	1434
Total Obs	24969	2868

Robust standard errors in parentheses. *** $p < 0.01$.

Table 2. Propensity score matching for public insurers and private mutual insurers.

Variables	Pre-Match	Post-Match
Size	0.540 ***	0.156 ***
	(0.038)	(0.021)
Direct Premiums	0.195 ***	0.042
	(0.039)	(0.150)
Profitability	2.912 ***	1.429
	(0.849)	(0.910)
Constant	−15.674 ***	−3.413 ***
	(0.369)	(0.482)
Public Insurer Obs	1616	1434
Mutual Insurer Obs	8643	1434
Total Obs	10,259	2868

Robust standard errors in parentheses. *** $p < 0.01$.

3.2. Variable Constructions and Discussions

Our measure of dividend payout ratio is total dividends paid scaled by the net earnings after taxes but before dividends. Policyholders in mutual insurers are also stockholders of the firms, so dividends paid to policyholders are considered dividends paid to stockholders. Lee and Forbes (1982) find insurers in property liability insurance industry make dividend payout decisions considering both stockholders and policyholders. We used dividends paid to stockholders and policyholders in insurers in the analysis (e.g., Formisano, 1978; Lee & Forbes, 1982).[1] We describe the proxy variables and their hypothesized relationship with dividend policy decisions as follows.

3.2.1. Profitability and Earning Volatility

Dividends can be used to convey firm profitability or differentiate the firm's quality from peers'. We measured *Profitability* as net earnings before interest and taxes scaled by total assets and expected that the more profitable firms will pay more dividends. We calculated *Future Earnings* as the expected percentage change in net income over the next year. We measured *Earnings Volatility* as the standard deviation of the annual earnings.

3.2.2. Free Cash Flow, Growth Opportunity, and Past Dividend

An insurer with a large free cash flow has greater agency costs between managers and shareholders. Paying dividends may be taken as evidence of an attempt to reduce agency costs and mitigate asymmetry information. We measured *Cash Flow* as the sum of investment cash flow, underwriting cash flow, and miscellaneous business cash flow before dividends and scaled by total assets. We measured *Growth* by the percentage increase in direct writing premiums and predicted a negative relationship with dividends.

Firms with opaque information are reluctant to increase (decrease) dividends following an increase (decrease) in earnings and appear to be reluctant to inform the public about corporate affairs. We assumed that previous dividends are important determinants of the current dividend payouts. We used *Previous Dividend* as the dividend paid in the last year to control dividend smoothing of insurers.

3.2.3. Tax

In a perfect market where there are no taxes and transaction costs, dividend policy is irrelevant. However, in the real world, dividends are taxed and are a substantial portion of investor earnings (Allen et al., 2000). High corporate tax rates would make the external finance more costly than internal finance. We assumed that tax is an important determinant in insurers' inclination to pay dividends. We measured the tax incentive using an indicator variable, *Tax*, following other researchers (e.g., Petroni, 1992; Penalva, 1998; Nelson, 2000). The proxy was based on the "NOL carryforward" tax paying status of the firm (Scholes et al., 1990). "NOL carryforward" is defined by the insurer as not currently paying any taxes or receiving a refund of prior-year taxes. The insurers are considered to have a low tax rate if they have a "NOL carryforward" status. The tax indicator takes the value of one if the insurer has a high tax rate, and zero otherwise.

In addition to the variables listed above, we calculated the log of total assets as *Firm Size*, total liabilities divided by total assets as *Leverage*, the net premiums written to policyholder surplus ratio as *Capacity*, and the proportion of ceded premiums written to the total premiums written as *Reinsurance* to further control firm characteristics influencing dividend decisions. Appendix A Table A1 lists the description of all variables. Table 3 reports average characteristics of mutual insurers, private stock insurers, and publicly held insurers for matched samples.

Table 3. Summary statistics across different ownership structures in insurers.

Variable	Mutual Insurer			Private Stock Insurer			Public Insurer		
	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD
Log Asset	20.924	20.836	1.787	21.137	21.151	2.065	21.392	21.329	1.951
Capacity	1.004	1.081	0.577	0.955	1.056	0.689	1.017	1.106	0.639
Leverage	0.617	0.605	0.137	0.665	0.632	0.160	0.668	0.652	0.108
Growth	0.039	0.066	0.204	0.044	0.097	0.316	0.057	0.125	0.344
Profitability	0.027	0.028	0.027	0.033	0.033	0.042	0.034	0.033	0.040
Profit Volatility	0.020	0.022	0.015	0.016	0.025	0.045	0.025	0.038	0.061
Previous dividend	0.000	0.190	0.517	0.069	0.357	1.020	0.222	0.381	1.145
Future Earnings	0.005	0.600	4.545	0.052	0.378	3.207	0.012	0.170	3.361
Cash Flow	0.005	0.008	0.040	0.016	0.021	0.071	0.020	0.022	0.062
Reinsurance Ratio	0.261	0.449	0.786	0.479	0.718	0.873	0.432	0.696	1.044
Tax	0.000	0.040	0.195	0.000	0.036	0.185	0.000	0.015	0.123

4. Empirical Analysis

4.1. Dividend Payments Across Ownership Structures

We present our analysis of hypotheses 1 through 3 in Table 4, which provides a detailed comparison of public, mutual, and private insurers' propensity to pay dividends.[2]

$$\begin{aligned} Dividend_{it} = {} & \alpha_i + \beta_1 \times \text{Publiclyheld}_{\text{it}} + \beta_2 \times \text{FirmSize}_{\text{it}} + \beta_3 \times \text{Capacity}_{\text{it}} + \beta_4 \times \text{Leverage}_{\text{it}} + \beta_5 \times \text{Growth}_{\text{it}} \\ & + \beta_6 \times \text{Profitability}_{\text{it}} + \beta_7 \times \text{EarnignVolality}_{\text{it}} + \beta_8 \times \text{Dividend}_{\text{it}-1} + \beta_9 \times \text{FutureEarnings}_{\text{it}} \\ & + \beta_{10} \times \text{Cashflow}_{\text{it}} + \beta_{11} \times \text{ReinsRatio}_{\text{it}} + e_{it} \end{aligned} \quad (1)$$

Table 4. Propensity to pay dividends.

Variables	Public vs. Private Stock	Public vs. Mutual	Mutual Insures	Private Stock Insurers	Public Insurers
Publicly held	0.557 ***	1.007 ***			
	(0.168)	(0.243)			
Firm Size	0.510 ***	0.641 ***	0.783 ***	0.440 ***	0.650 ***
	(0.050)	(0.063)	(0.095)	(0.058)	(0.084)
Capacity	0.011	−0.366 **	−0.767 ***	−0.148	0.245
	(0.143)	(0.180)	(0.263)	(0.170)	(0.260)
Leverage	0.946	2.816 **	4.737 ***	1.752 **	−0.997
	(0.664)	(1.134)	(1.506)	(0.702)	(1.703)
Growth	−0.587 ***	−0.239	0.042	−0.726 ***	−0.420 *
	(0.148)	(0.186)	(0.311)	(0.209)	(0.227)
Profitability	20.933 ***	16.558 ***	9.436 ***	19.741 ***	21.354 ***
	(2.954)	(2.723)	(3.023)	(2.593)	(5.723)
Earning Volatility	−8.622 *	−11.668 *	−9.884	−6.091 ***	−12.222
	(4.581)	(6.511)	(9.118)	(1.571)	(10.591)
Previous dividend	0.213 ***	0.042	−0.531 **	0.204 ***	0.219 ***
	(0.051)	(0.066)	(0.265)	(0.077)	(0.073)
Future Earnings	0.028 *	−0.005	−0.024 *	0.026	0.018
	(0.014)	(0.010)	(0.014)	(0.019)	(0.024)
Cash Flow	3.449 ***	5.428 ***	6.886 ***	3.401 ***	3.835 ***
	(0.808)	(1.056)	(1.712)	(1.016)	(1.391)
Reinsurance Ratio	−0.065	−0.164	0.156	−0.031	−0.321 ***
	(0.043)	(0.121)	(0.153)	(0.044)	(0.108)
Tax	−0.531	−0.537	−0.114	−0.024	−2.079 **
	(0.341)	(0.416)	(0.509)	(0.403)	(1.017)
Constant	−10.516 ***	−14.154 ***	−17.840 ***	−9.478 ***	−11.492 ***
	(0.972)	(1.341)	(2.083)	(1.150)	(1.739)
Pseudo R^2	0.266	0.277	0.331	0.222	0.338
Observations	2868	2868	1434	1434	1434

Robust standard errors in parentheses. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Specifically, we estimated logit regressions for the matched samples where the dependent variable in each regression equals one if an insurer pays dividends in year t and 0 otherwise. Columns 1 and 2 of Table 4 focus on whether public insurers are more likely to pay dividends than private insurers and mutual insurers for the matched samples, respectively. We then ran the logit regressions for the three groups of insurers, separately, to further examine the influence of earnings and cash flow on dividend decisions. We found that the proportion of dividend payers in public insurers is higher than that in private insurers and mutual insurers. The likelihood of paying dividends is positively related to profitability and cash flow. The likelihood of paying dividends is negatively related to growth and earnings volatility. However, the effects of future earnings on the likelihood of dividends payers are not homogenous. The results imply that future earnings may be more reflective of possible growth opportunities than expected profitability.

Tables 5 and 6 present the results of whether the level of dividends and the relation between dividends and cash flow and earnings vary across the three groups of insurers, using the same specification as Equation (1), but with the dependent variable defined as the dividend level. Focusing first on the level of dividends across different ownerships, Table 5 reports dividend levels in the matched sample of insurers: the ratio of dividends to earnings before tax and dividends and the ratio of dividends to total assets. The matched sample stock insurers distribute a high percentage of their earnings as dividends. For example, public insurers distribute more than 66% of earnings and 2% of total assets as dividends. In contrast, the matched sample mutual insurers pay relatively low dividends: only 19% of earnings and 0.6% of the total assets are distributed as dividends. Consistent with Hypothesis 1, on average, we found that public insurers pay more dividends than private insurers. Mutual insurers tend to pay the least amount of dividends, which suggests the possibility of ineffective pressure of minority shareholders and capital constraints in mutual insurers. We obtained robustness of the results by employing the ratio of dividends to the total asset.

Table 5. Dividend levels for different ownership structure of insurers.

Dividend/Net Income	**Mutual Insurer (1)**	**Private Stock Insurer (2)**	**Public Insurer (3)**	**T-Test (3) vs. (1)**	**T-Test (3) vs. (2)**	**T-Test (2) vs. (1)**
Mean	0.193	0.596	0.669	0.437 ***	0.073 **	0.403 ***
STD	0.453	1.034	1.073	[0.027]	[0.039]	[0.030]
Median	0.023	0.283	0.360			
Dividend/Asset	**Mutual Insurer (1)**	**Private Stock Insurer (2)**	**Public Insurer (3)**	**T-Test (3) vs. (1)**	**T-Test (3) vs. (2)**	**T-Test (2) vs. (1)**
Mean	0.006	0.020	0.020	0.013 ***	0.000	0.014 ***
STD	0.014	0.328	0.024	[0.001]	[0.001]	[0.001]
Median	0.001	0.009	0.012			

Robust standard errors in parentheses. *** $p < 0.01$; ** $p < 0.05$.

Table 6 estimates regressions of dividend levels on determinants that are a proxy for earnings and cash flow and other control variables for two combined matched samples and three groups of insurers as well. For the most part, the coefficient signs of variables are similar to those in Table 4. Consistent with the results in Table 5, columns 1 and 2 of Table 6 show that public insurers pay higher dividends than other groups of insurers. And consistent with hypotheses 2, the estimated coefficient of cash flow is largest in mutual insurers, indicating that mutual insurers exhibit the highest sensitivity to magnitude, followed by public insurers, and then privately held stock insurers to the level of dividend payments and cash flow. We found the coefficients of profitability of publicly held insurers and privately held stock insurers are larger than mutual insurers, which confirms Hypothesis 3

that stock insurers have greater sensitivity to profits than mutual insurers. These findings suggest that private dispersed firms are more sensitive to cash flow but less sensitive to profits.

Table 6. Dividend level regressions.

Variables	Public Insurers vs. Private Stock Insurers	Public Insurers vs. Mutual Insurers	Mutual Insures	Private Stock Insurers	Public Insurers
Publicly held	0.081 **	0.375 ***			
	(0.041)	(0.037)			
Firm Size	0.050 ***	0.035 ***	0.048 ***	0.041 **	0.058 ***
	(0.012)	(0.011)	(0.018)	(0.017)	(0.020)
Capacity	−0.003	−0.082 **	−0.016	−0.010	−0.001
	(0.038)	(0.033)	(0.048)	(0.053)	(0.055)
Leverage	−0.328	0.346 **	−0.323	−0.235	−0.439
	(0.217)	(0.146)	(0.346)	(0.269)	(0.396)
Growth	−0.080	0.028	0.010	−0.239 ***	0.067
	(0.072)	(0.069)	(0.090)	(0.078)	(0.112)
Profitability	0.073 ***	0.021 **	0.050 ***	0.070 ***	0.074 ***
	(0.017)	(0.008)	(0.017)	(0.022)	(0.026)
Earning Volatility	−0.568 **	−1.139 ***	−0.832 **	−0.026	−0.867 **
	(0.253)	(0.410)	(0.354)	(0.470)	(0.411)
Previous dividend	0.118 ***	0.077 ***	0.095 ***	0.154 ***	0.086 ***
	(0.023)	(0.022)	(0.027)	(0.040)	(0.026)
Future Earnings	−2.488 ***	−2.632 ***	−3.211 ***	−1.870 **	−3.508 ***
	(0.558)	(0.568)	(0.875)	(0.749)	(0.931)
Cash Flow	2.755 ***	3.054 ***	3.268 ***	2.561 ***	2.973 ***
	(0.425)	(0.382)	(0.585)	(0.605)	(0.592)
Reinsurance Ratio	−0.007	−0.050 ***	−0.040	−0.001	−0.042
	(0.012)	(0.017)	(0.029)	(0.014)	(0.028)
Tax	−0.185	−0.110	−0.452 ***	−0.084	−0.451 ***
	(0.126)	(0.078)	(0.141)	(0.163)	(0.146)
Constant	−0.252	−0.556 **	−0.108	−0.159	−0.222
	(0.254)	(0.231)	(0.358)	(0.347)	(0.425)
R^2	0.120	0.171	0.135	0.122	0.127
Observations	2868	2868	1434	1434	1434

Robust standard errors in parentheses. *** $p < 0.01$; ** $p < 0.05$.

4.2. Dividend Smoothing Across Ownership Structures

We first used Lintner's model, which tests whether the dividend policies of insurers are stable. Table 7 reports the results of testing Hypothesis 4 by estimating a partial adjustment model of dividends by Lintner (1956), which reflects the response of dividend policies to earning shocks. The equation for estimating a partial adjustment model of dividends is

$$Dividend_{it} = \alpha_i + \beta_i \times Earning_{it} + \gamma_i \times Dividend_{it-1}$$

where $\Delta Dividend_{it}$ is the change of dividend, $Earning_{it}$ is earning before tax and dividends for firm i and year t, and $Dividend_{it-1}$ is the dividend for firm i and year $t-1$. The $1-\gamma_i$ measures the response of insurers' dividend policies to earning shocks as the speed of adjustment, while the $\beta_i/(1-\gamma_i)$ is referred to as the target payout ratio. The model has been widely used by many scholars to examine dividend smoothing (e.g., Aivazian et al., 2003; Michaely & Roberts, 2012; Leary & Michaely, 2009). The higher value of the speed of adjustment indicates the firm adjusts dividends more rapidly to reach the target ratio and therefore has lower dividend stability.

Table 7. Lintner model of dividends.

Parameters	Firm Obs	Target Payout Ratio			Speed of Adjustment		
		Mean	STD	Median	Mean	STD	Median
Mutual Insures	122	0.347	0.769	0.229	0.554	0.973	0.641
Private Stock Insurer	79	0.514	1.086	0.140	0.573	0.489	0.594
Public Insurer	107	0.503	0.907	0.241	0.504	0.910	0.625
T-test for γ (Speed of Adjustment)							
Mutual Insurers vs. Public Insurers				0.050 [0.088]			
Private Stock Insurers vs. Public Insurers				0.068 *** [0.113]			
Mutual Insurers vs. Private Stock Insurers				0.019 *** [0.118]			

*** $p < 0.01$.

Table 7 shows the coefficient estimates for each of the three groups of insurers for the speed of adjustment and target payout ratio. We found target payout ratios are high for stock insurers. We found decreases in the speed of adjustment (both mean and median values) from private stock insurers (0.574) to mutual insurers (0.504) to public insurers (0.504). The t-test showed the difference between groups are statistically significant. The results confirmed the hypothesis that the dividend policies of private insurers exhibit more sensitivity to earnings shocks than public insurers, although the magnitude of the difference in sensitivity is relatively small.

We further examined insurers' decisions to make dividend changes, i.e., dividend omissions, dividend decrease, dividend initiation, and dividend increase, to show the following insights on dividend smoothing. Table 8 presents a detailed summary analysis of dividend changes for public and private stock insurers and mutual insurers. The last two columns present t-statistics for pairwise comparisons of the difference in mean values for the groups of matched samples. The first row shows estimates of the propensity for omitting a dividend, where a dividend omission is defined as a firm-year observation in which the insurers pay dividends in the previous year but no dividends in the current year. We found that private stock insurers omit nearly 4.0% of the time. Public insurers are strongly averse to omitting dividends, and only around 3.0% of our sample has dividend omission. There is no statistically significant difference of dividend omission between public insurers and mutual insurers. The results suggest that dividend omission is uncommon in all three groups of insurers. The second row shows whether a dividend change in the current year is negative. We found no significant difference among the three groups of insurers.

The third and fourth row of Table 8 show the propensity of dividend initiation and increase. A dividend initiation is defined as a dividend being distributed in the current year but there being no dividend in the previous year, while dividend increase is defined as a positive change in the dividends for the current year. All pair wise differences are statistically significant across the three groups of matched samples—22.8% of private stock insurers initiate dividend, followed by 11.5% of public insurers, and 8.5% of mutual insurers. Private insurers have no publicly traded stocks with a visible price to show the value of the firms. Therefore, they have more concern over the current signaling role of dividends. On average, 13.9% of the public insurers pay more dividends than they paid the previous year while 11.7 of the private stock insurers pay more dividends. We found public insurers are more likely to increase dividends than private stock insurers. The results imply that private stock insurers appear to follow a residual dividend policy and pay more dividends when better opportunities to use the cash do not exist.

Table 8. Dividend changes for three ownership structures of insurers.

Variable	Statistics	Sample			T-Test		
		Mutual	Private Stock Insurer	Public Insurers	Private Stock vs. Public	Private Stock vs. Mutual	Public vs. Mutual
Pr(Omit)	Mean	0.031	0.040	0.030	0.010 [0.009]	0.009 [0.009]	−0.001 [0.007]
	STD	0.318	0.196	0.171			
	OBS	1297	575	1223			
Pr(Decreased)	Mean	0.084	0.094	0.094	−0.000 [0.015]	0.010 [0.014]	0.010 [0.011]
	STD	0.277	0.292	0.292			
	OBS	1297	575	1223			
Pr(Initiation)	Mean	0.085	0.228	0.115	0.113 *** [0.018]	0.143 *** [0.017]	0.030 *** [0.012]
	STD	0.325	0.420	0.319			
	OBS	1297	575	1223			
Pr(Increase)	Mean	0.132	0.117	0.139	−0.023 * [0.017]	−0.015 [0.017]	0.007 [0.014]
	STD	0.338	0.321	0.346			
	OBS	1297	575	1223			

*** $p < 0.01$; * $p < 0.1$.

5. Conclusions

We overcame the data limitations that private firms do not need to disclose financial reports publicly by using data from the U.S. property-liability insurance industry. We compared corporate dividend policies among three different ownership structures: publicly held insurers, privately held insurers, and mutual insurers. We developed four empirical hypotheses based on signaling motives, the agency problem, and Lintner's dividend smoothing model. The public insurers have more corporate governance mechanisms and face a more restrictive regulatory environment, but have more need to signal the value of the firm, while private concentrated insurers have less agency problems and less need to smooth dividends. We found that publicly held insurers pay more dividends than other groups of insurers. Mutual insurers have the least sensitivity to profits and greatest sensitivity to cash flows. Our final examination of Lintner's smoothing hypothesis confirmed that private insurers have the least sensitive response to shocks in earnings and are more likely to omit dividends. Overall, our findings are broadly consistent with information and agency cost theories. However, we cannot rule out that alternative theories may also explain the insurers' dividend decisions without further tests.

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Appendix A

Table A1. Definition of variables used in the analysis.

Variables	Definitions
	Dependent variables
Dividend Payer	Firms paying dividend in the year (0 = 'No', 1 = 'Yes')
Dividend Payout	Total dividends paid to shareholders as a percent of net earnings after taxes
	***Independent variables* (*first stage*)**
Firm Size	Logarithms of total asset
Capacity	Net premium written dividend by policyholder surplus
Leverage	Total liability divided by total asset
Growth	(Current direct premium written—previous direct premium written)/previous direct premium written
Profitability	Earnings before interest and taxes divided by total asset
Profit Volatility	Volatility of earnings
Previous dividend	Dividend ratio in the previous year
Future Earnings	The percentage change in net income over the next year
Cash Flow	Cash flow divided by total assets
Reinsurance Ratio	Total ceded written premium divided by total written premium
Tax	A dummy variable equals 1 if the insurer has not currently paying any taxes or receiving a refund of prior-year taxes, and zero otherwise.
Mutual	An indicator variable equals 1 if the firm has a mutual organizational structure, 0 otherwise
Geo Herfindahl	The geographical Herfindahl index
Product Herfindahl	The line of business Herfindahl index
%Regulation	Percentage of total premiums written subject to prior approve regulations
High Rating	An indicator variable equals 1 if the firm is rated by A and above, 0 otherwise
Mid Rating	An indicator variable equals 1 if the firm is rated A−, 0 otherwise
Low Rating	An indicator variable equals 1 if the firm is rated A− and below, 0 otherwise

Notes

[1] In the robustness check, we used dividends to stockholders to calculate dividend payout ratio and find out whether our results were robust.

[2] We focused our results on the dividends ratio to net earnings after taxes but before dividends, but the results are robust if we use dividends to total asset as the payout ratio.

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