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ADVERTISING, MARKET CONCENTRATION, AND FIRM PERFORMANCE ON THE DISTRIBUTION SYSTEM

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ABSTRACT

This paper examines the impact of advertising on the firm performance as measured two profit variables and market structure as measured by market concentrations and the relationship is analyzed by two different distribution systems: independent agency writers vs. direct writers. The empirical testing results show that a positive and non-significant relationship between concentration and advertising for both distribution systems, while a negative and significant relation between market share and advertising is found. These results are consistent with the two distribution systems. This paper, however, finds differences between the two distribution systems in the profit model. A negative and significant relationship is found between advertising and profits for independent agency writers, while there exists no significant relationship for direct writers. So, in this highly competitive market, advertising does not boost profit for independent agency writers.

JEL: G14, G22, L11, L16

KEYWORDS: Advertising, Market Structure, Firm Performance, Insurance Distribution System

INTRODUCTION

Insurance is distributed to customers in a number of different ways, and different distribution systems vary according to costs and barriers to entry considerations (see Brozen, 1982, Shepherd, 1986, Regan, 1997, Seog, 1999, and Regan and Tennyson, 2000). Some insurers use independent agents or brokers to distribute insurance, especially in complex lines of insurance such as commercial liability. The alternative is direct writing. Direct writers rely relatively more on factors such as advertising and (computer) automation in distributing insurance. The importance of advertising may differ between direct writers and independent agency writers. Prior studies have documented that cost inefficiencies of these two distribution systems are indeed dissimilar (e.g., Joskow, 1973, Barrese and Nelson, 1992, and Berger, Cummins and Weiss, 1997). Thus, the distribution system may play a significant role in determining prices. For example, direct writers rely relatively more on factors such as advertising and computer automation in distributing insurance**.** However, independent agency writers depend more on the capacity and expertise of agents. So, their commission rates are higher than other distribution systems.

Insurance companies use different marketing channels to attract their customers in this competitive market. The property and liability (P/L) insurance industry spent over $6 billion in advertising, and its ratio of advertising to premium accounts for 2.27% in year 2013 (SNL Financial, 2014). According to data compiled by SNL Financial, the lead advertiser spent $1.18 billion or $6.7 on advertising for every $100 of premium they wrote in year 2013. The general concern about the advertising issue is whether insurers operate efficiently, profitably, and safely, and, whether they expose the industry to excessive risk. The never-ending advertising competition changes the market structure and the performance of the insurers in

the P/L insurance market. Especially, they would like to achieve its brand's long-run competitive position or short-run market share increase.

LITERATURE REVIEW

The structure-conduct-performance (SCP) paradigm suggests that performance of the industry is affected by the conduct of the participants in the market, which is influenced by the companies' market structure (Bain, 1951 and Stigler, 1964). That is, the SCP hypothesis suggests a positive relationship between performance and concentration. Performance is typically measured as price or profit. Weiss (1974) argues that market concentration may cultivate agreement among firms in the market since higher concentration lowers the cost of collusion, determines the profits of the firm. Thusly, the traditional SCP hypothesis and supporting literatures give a contention to antitrust arrangement precluding activities prompting a diminished number of practical contenders. Advertising activities constitute the conduct of the industry and the relationship between advertising intensity and market structure had been a debate for long periods of time (Grossman and Shapiro, 1984, Lee, 2002, Nazari and Tajdini, 2011, Fier and Pooser, 2016, and Chen and Waters, 2017). For example, Grossman and Shapiro (1984) find that advertising does not boost profit in highly competitive market and suggest that product differentiation increases advertising. In contrast, Chen and Waters (2017) argue that more cost efficient firms take advantage of advertising and show that advertising positively affects profitability. Related to this issue, this study is interested in finding short-run and long-run performance effect and market concentration in the U.S. P/L insurance industry between the two distinguished distribution systems. That is, whether advertising generates profit by spending more or they take share from other competitors to grow in the market.

Economic theory suggests that profit margins are higher in concentrated market (Ramaswamy et al., 1994, Berger, 1995, and Lipczynski and Wilson, 2001). Insurers can increase their market share in two principal ways: by achieving superior efficiency and providing broader and higher quality services (efficient market structure), or by lowering prices below competitive levels, even at their own loss in order to attract new customers. Under the former strategy, consumers are likely to benefit from a wider set of products and more favorable prices. Under the latter approach, however, aggressive insurers would exercise price undercutting and would take unwarranted risks, in order to drive out their competitors. In this scenario, regulators must take steps to limit the insolvency risk faced by those insurers and to maintain a level playing field. Hence, it would be useful to determine which of these two strategies is the dominant mode of operation in the U.S. P/L insurance industry and how the relative efficiency of those insurers enters the picture. A study shows that advertising intensity do affect firm efficiency (Choi and Weiss, 2005). To this end, the current study aims to investigate and compare the advertising impact on the profitability and market structure for the two groups: independent agency writers and direct writers. The results of this paper are of interest to insurers, regulators, consumers, investors in insurance stocks, and academicians. Since there have been no prior studies on the impact of advertising of P/L insurers on the distribution system in the U.S. market structure, the findings here can shed new light on the relative performance and risk of these firms caused by advertising.

DATA AND METHODOLOGY

Performance data are from the National Association of Insurance Commissioners (NAIC). Annual Statements from NAIC are used to calculate the changes in the market shares of the P/L U.S. insurers. The sample for these data starts from 1998 and ends in 2014. From this potential sample, insurers with negative values of surplus, assets, premiums, inputs, or outputs are deleted to conduct a meaningful empirical test. A total of 22,644 firm-year observations was analyzed for the tests. The following model is designed to examine the association between advertising intensity and market concentration and profitability, including insurer characteristics and three dummy variables:

$$Concentration_{it}/Profits_{it} = \alpha_0 + \beta_1 Advertising\ Intensity_{it} + \beta_2 Assets_{it} + \beta_3 Investment_{it} + \beta_5 Leverage_{it} + \beta_5 Reinsurance\ Utilization_{it} + \beta_6 Personal\ Lines_{it} + \beta_7 Diversifications_{it} + \beta_8 Group\ Dummy_{it} + \beta_9 Stock\ Dummy_{it} + \beta_{10} Market\ Cycle\ Dummy + \varepsilon_{it} \quad (1)$$

Consistent with many industrial organization studies, the Herfindahl index is used to measure market concentration in the P/L insurance industry. For example, Stigler (1964) argues that the Herfindahl index is superior to the concentration ratio (e.g., four-firm concentration ratio) for measuring concentration to assess the likelihood of effective collusion. Herfindahl index is defined as the sum of the squared market share of each insurer in the US market. Market share is defined as the proportion of total premiums accounted for by insurer *i* in total market at time *t*, and is computed based on direct premiums written. Two more concentration variables are also used; (1) market concentration ratio by the top three insurers (Concentration Top 3) and top five insurers (Concentration Top 5). To obtain an insurer's profitability, a form of the underwriting profit margin is used in addition to the conventional accounting profit, rate of return on equity (ROE).

In this model, the key independent variable is *Advertising Intensity*. It is measured as a ratio of advertising expenses over premiums written, subscript *i* represents the i^{th} insurance company, *t* is a time index, and ε_{it} is a random error term with zero mean and a constant variance. Two key independent variables are *Concentration* and *Profits*. The control variables follow the existing literature. They include asset size (Assets), Investment Ratio, Leverage, Reinsurance Utilization, Personal Lines, Diversifications, and dummies for membership in an insurance group (Group Dummy), stock vs. mutual organization (Stock Dummy), and hard market vs. soft market (Market Cycle Dummy).

Financial conditions of the firm are influenced by, among other factors, the size of the firm. Hence, total assets in logarithm form are used as a control variable in the model. Prior studies find that as size gets bigger scale economies decline (Berger, Cummins, and Weiss, 1997). The model controls for the investment activities. Since investment is one of the core business activities of insurers, it is essential to P/L insurers' overall financial performance. The firms' asset portfolio and their capacity in investment could affect the performance (Choi and Weiss, 2005). It is expected to have a positive relationship between this variable and firm performance if the market views increased investment as a signal of improving firm value. Else, we expect a negative relationship if the market sees the forceful investments as a dangerous factor.

Increased leverage, measured by the Kenney ratio (the ratio of net premiums written to policyholders' surplus) is associated with reduced insurer ability to cover unexpected losses and, thus, higher funding cost and lower efficiency. Reinsurance utilization (the ratio of reinsurance ceded to the sum of reinsurance assumed and direct premiums written) may affect the overall riskiness and efficiency of the insurer because it effectively expands the capacity of the firm to offer insurance services, stabilizes loss experience, and protects the firm from catastrophe. Effective use of reinsurance transaction can affect the revenues and costs due to better management and/or scale economies. Personal Lines is defined as the proportion of personal lines to total insurance business written. This measure shows whether the insurer's focus is on a more standardized set of personal lines of products (less complexity), or in commercial line products (high complexity). This variable reflects the effect of specialization in complex lines of business on advertising intensity. It also controls for the differences in claims settlement period and the differences in payment pattern and risk taking behavior between personal lines and commercial lines.

Insurers with greater diversification in product mixes or geographic mixes are expected to have a more diversified revenue flow and thus a greater stability in capital inflow from premiums. We have two business diversification variables as control variables. First, the lines of business an insurer writes can affect the overall risk and performance of the firm. *Business Diversification* is measured using a Herfindahl index which is defined as

$$\sum_{i=1}^{34}\left(\frac{PW_i}{TPW}\right)^2 \quad (2)$$

where PW_i is the value of premiums written in each line of business in the insurer's annual statement and TPW represents the insurer's total premiums written. The data in the NAIC annual statement, Underwriting and Investment Exhibit, Part 1B-Premiums Written, were used to obtain these variables. A higher value of the Herfindahl index indicates a more specialized (less diversified) company. The highest level of diversification (i.e., lower value) would indicate that the insurer's operation is well spread over various lines of business, while the lowest level of diversification (i.e., higher score) indicates the insurer's operation is fully devoted to single line of business. Insurers that specialize in a few lines may gain greater expertise in administering these lines leading to a positive relationship between diversification and price. On the other hand, it may be more difficult to achieve economies of scope or cross-sell business so that price might be reduced for such an insurer. We used data on the lines of business in which the insurers were active to develop a measure of their product line concentration (Choi, Park and Ho, 2013). Another control variable related to the insurers' diversification strategy is the Herfindahl index of geographical operations (*Geographic Diversification*). This variable is calculated as follows:

$$\sum_{i=1}^{58}\left(\frac{PW_i}{TPW}\right)^2 \quad (3)$$

where PW_i is the value of premiums written in each state and TPW represents the insurer's total premiums written. As in the line of business diversification, the higher value indicates that firms operate in one state or small number of states, while the lower value indicates higher diversification in terms of geographical operations. Binary variables for group membership and organizational form, control for the effect of affiliation with an insurance group and mutual vs stock ownership on efficiency. They take the unit value if a company is a member of an insurance group, or is a stock organization. Controlling for group membership allows for the differential efficiencies between group members and non-group members in insurance operations and marketing strategy. Each organizational form is effective in solving specific incentive conflicts among the contractual parties (Mayers and Smith, 1994). In mutual organizations the conflicts between policyholders and owners are eliminated while the conflict between owners and managers is greater, since, among other things, managers of a mutual firm are monitored less than those of stock firms (Baranoff and Sager, 2003). Controlling for organizational form allows for the possibility of differing levels of advertising impact among stock and mutual firms.

Lastly, to reflect the business cyclical economic fluctuation, a cyclical variable is included in the testing model. The model controls for the underwriting cycle which exists in the property and liability insurance industry. The property-liability insurance industry is notorious for its underwriting cycles. An underwriting cycle is associated with several periods of increasing profitability followed by declines in profitability (e.g., Cummins and Danzon, 1997 and Weiss and Chung, 2004). It is expected to be negatively related to the dependent variable since insurance is relatively less available during the hard market period. It is additionally expected that this variable controls the riskiness of the firm at various focuses in the business cycle (see Bassett and Brady, 2002). Years 2000 ~ 2003 are assigned to a hard market and all other years are deemed to be a soft market.

RESULTS

Table 1 presents summary statistics for our sample of insurers used for the regression model along with T-test results between direct writers and independent agency writers. Table 2 contains the information to test the hypothesis as in Equation (1) for the entire sample period with market structure variables for the direct writers group, while Table 3 highlights the same model for the independent agency writers group. To

capture the effects of different market structure variables, further testing models are estimated with Herfindahl Index, Concentration Top 3, Concentration Top 5, and Market Share. Results with the performance variables are reported in Table 4 and Table 5, for the direct writers and independent agency writers respectively. No evidence of multicollinearity among variables is found. However, testing for heteroscedasticity shows that it exists in this sample, and so heteroscedastic-consistent estimators following the method of White (1980) are used. Table 1 shows that U.S. property and liability insurance industry is highly competitive market with the Herfindahl index of 0.0087 on average during the sample period for the both groups. In addition, the three largest insurers own 12 percent of the market and the five largest firms control about 14.7 percent of the market, on average. We don't see any difference between the two groups for those concentration variables. So, overall, U.S. P/L insurance industry represents a relatively unconcentrated and fairly competitive market.

Table 1: Summary Statistics for Variables (Direct Writers vs. Independent Agency Writers)

	Direct Writers		**Independent Agency Writers**		
	Mean	**Stan. Dev.**	**Mean**	**Stan. Dev.**	**t-test**
Advertising Intensity	0.0125	0.0415	0.0084	0.0436	***
Herfindahl	0.0087	0.0008	0.0087	0.0008	
Concentration Top3[1]	0.1200	0.0096	0.1199	0.0098	
Concentration Top5[2]	0.1469	0.0106	0.1468	0.0107	
Market Share	0.0009	0.0043	0.0004	0.0011	***
ROE	0.0460	0.1905	0.0344	0.1744	***
Profit Margin	0.2932	0.2673	0.3024	0.2503	**
Asset (log)	18.5897	2.2022	18.3870	1.8640	***
Investment Ratio	0.0356	0.0331	0.0358	0.0560	
Leverage	0.9720	0.8973	1.0595	0.8627	***
Reinsurance Utilization	0.3256	0.2691	0.4314	0.3025	***
Proportion of Personal Lines	0.3864	0.4169	0.3863	0.3641	
Business Diversification	0.5852	0.3040	0.4445	0.2934	***
Geographic Diversification	0.6089	0.3971	0.5448	0.3820	***
Group Dummy	0.6324	0.4822	0.7268	0.4456	***
Stock Dummy	0.5531	0.4972	0.7461	0.4353	***
Observations	4,986		17,658		

*This table shows mean difference analysis. The last column reports the results of the Mean T-test for differences in means. ***, ** and * indicate significance at the 1, 5 and 10 percent levels respectively. [1]Market concentration ratio by the top three insurers. [2]Market concentration ratio by the top five insurers.*

Table 1 indicates that there are significant differences between direct writers and independent agency writers in many variables including advertising intensity. On average, direct writers use 1.25 percent of their premiums income while independent agency writers utilize only 0.84 percent on advertising. That is, direct writers, compared to independent agency writers, are more likely to spend on advertising, which is consistent with previous studies (e.g., Marvel, 1982, Grossman and Hart, 1986, and Sass and Gisser, 1989, and Regan, 1997). On average, the sample direct writers return 4.6 percent on equity (ROE), while the mean of the profit margin (0.2932) shows that every $1 of premium sample insurers spend $0.7068 on losses and loss adjustment expenses. On average, direct writers transfer their risks to reinsurers 32.56 percent of their total premiums written and they are not diversified geographically or by products compared to their counterpart. Table 1 also presents that independent agency writers are smaller, less affiliated with a group (73% vs 63%), and more in stock form of ownership (75% vs. 55%), which are generally consistent with previous studies. The results in Tables 2 indicates that the coefficients on three concentration variables are positive but not significant. Thus, these results do not support the long-debated economic theory on the relationship between conduct and performance (see Lee, 2002, Nazari and Tajdini, 2011, and Chen and Waters, 2017 for more discussion). However, we find the negative and significant relation between the market share variable and advertising in Table 2.

Table 2: Market Structure Regressions: Direct Writers

	Herfindahl		Concentration Top3		Concentration Top5		Market Share	
Independent Variable	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err.**
Intercept	0.00897	0.00011***	0.12371	0.00134***	0.15052	0.00148***	-0.01262	0.00067***
Advertising Intensity	0.00030	0.00022	0.00374	0.00266	0.00266	0.00293	-0.00303	0.00133**
Asset (log)	-0.00004	0.00001***	-0.00046	0.00007***	-0.00048	0.00007***	0.00077	0.00003***
Investment Ratio	0.00361	0.00028***	0.04575	0.00337***	0.04889	0.00371***	-0.00341	0.00169**
Leverage	0.00001	0.00001	0.00027	0.00013**	0.00029	0.00014**	-0.00016	0.00006**
Reinsurance Utilization	-0.00009	0.00004**	-0.00108	0.00044**	-0.00101	0.00049**	-0.00038	0.00022*
% of Personal Lines	0.00000	0.00003	0.00002	0.00034	0.00002	0.00038	0.00188	0.00017***
Business Diversification	-0.00005	0.00004	-0.00058	0.00043	-0.00059	0.00048	0.00067	0.00022***
Geographic Diversification	0.00000	0.00003	-0.00002	0.00031	-0.00005	0.00034	-0.00109	0.00015***
Group Dummy	0.00007	0.00002***	0.00087	0.00030***	0.00091	0.00033***	-0.00086	0.00015***
Stock Dummy	-0.00002	0.00002	-0.00017	0.00024	-0.00016	0.00026	-0.00066	0.00012***
Hard Market Dummy	0.00085	0.00002***	0.01207	0.00025***	0.01321	0.00028***	0.00035	0.00013***
Observations	4,986		4,986		4,986		4,986	
R^2	0.309		0.371		0.365		0.203	
Adjusted R^2	0.307		0.369		0.364		0.201	

This table shows the regression estimates of the equation: $Concentration_{it} = \alpha_0 + \beta_1 Advertising\ Intensity_{it} + \beta_2 Assets_{it} + \beta_3 Investment_{it} + \beta_5 Leverage_{it} + \beta_5 Reinsurance\ Utilization_{it} + \beta_6 Personal\ Lines_{it} + \beta_7 Diversifications_{it} + \beta_8 Group\ Dummy_{it} + \beta_9 Stock\ Dummy_{it} + \beta_{10} Market\ Cycle\ Dummy + \varepsilon_{it}$ *. The first figure in each cell is the regression coefficient. The second figure in each cell is the standard error. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively. Standard Errors are heteroscedastic-consistent estimators following the method of White (1980).*

The results from Table 3 show a similar outcome on three concentration variables. The relation between advertising intensity and market structure is positive but it is not significant. Table 3 also presents that the coefficients on the Market Share variable are negatively related to advertising intensity. That is, insurers with higher market share tend to spend relatively less on advertising, while insurers with smaller market share spend relatively more on advertising to attract their customers. Table 4 and Table 5 show different results in the performance models. The coefficients on Profit Margin and ROE are all significantly and negatively related to advertising intensity for the independent agency writers' group, as shown in Table 5, while they are not significantly related to advertising intensity for the direct writers in Table 4. In consistent with Grossman and Shapiro (1984), these results indicate that insurers spending more on advertising do not gain additional advantages when they use agents for their marketing system. Those insurers spending more on advertising are negatively affected by the additional expenses on their financial statements. This could be related to the fact that independent agency writers do their own advertising, are more flexible and are more likely having the power to do what they want to serve their clients to grow their business.

U.S. P/L insurers are not achieving benefits from advertising in terms of underwriting profits during the sample period. Advertising may impact on the barriers to entry, but it was not statistically significant. Insurers in the U.S. market could not take an advantage of advertising related to profits in this highly competitive market. Similar results are found on other control variables in Tables 4 and 5. Assets size is positively and significantly related to the accounting profit variable, but negatively related to profit margin. So, larger insurers tend to make more return on asset, but they tend to spend more on losses and expenses. We also find the same direction on the investment variable. Thus, the market can view increased investment

as enhancing profitability. Leverage is negatively related to the performance variables for the two groups, indicating that insurers faced with higher risks more likely to make less profits.

Table 3: Market Structure Regressions: Independent Agency Writers

Independent Variable	Herfindahl		Concentration Top3		Concentration Top5		Market Share	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Intercept	0.00923	0.00007***	0.12676	0.00085***	0.15368	0.00093***	-0.00591	0.00010***
Advertising Intensity	0.00010	0.00011	0.00072	0.00138	0.00114	0.00151	-0.00052	0.00016***
Asset (log)	-0.00005	0.00000***	-0.00057	0.00004***	-0.00059	0.00005***	0.00034	0.00000***
Investment Ratio	0.00122	0.00009***	0.01543	0.00107***	0.01657	0.00118***	0.00002	0.00012
Leverage	0.00004	0.00001***	0.00050	0.00007***	0.00049	0.00008***	0.00005	0.00001***
Reinsurance Utilization	-0.00005	0.00002***	-0.00060	0.00022***	-0.00052	0.00024**	0.00060	0.00002***
% of Personal Lines	-0.00003	0.00001**	-0.00042	0.00018**	-0.00042	0.00020**	0.00005	0.00002**
Business Diversification	-0.00013	0.00002***	-0.00168	0.00023***	-0.00167	0.00025***	-0.00014	0.00003***
Geographic Diversification	-0.00003	0.00002*	-0.00030	0.00020	-0.00036	0.00022*	0.00002	0.00002
Group Dummy	0.00007	0.00001***	0.00085	0.00017***	0.00079	0.00019***	-0.00029	0.00002***
Stock Dummy	0.00001	0.00001	0.00011	0.00015	0.00012	0.00017	-0.00011	0.00002***
Hard Market Dummy	0.00087	0.00001***	0.01233	0.00014***	0.01350	0.00015***	0.00007	0.00002***
Observations	17,658		17,658		17,658		17,658	
R^2	0.284		0.347		0.344		0.320	
Adjusted R^2	0.283		0.346		0.344		0.319	

This table shows the regression estimates of the equation: $Concentration_{it} = \alpha_0 + \beta_1 Advertising\ Intensity_{it} + \beta_2 Assets_{it} + \beta_3 Investment_{it} + \beta_5 Leverage_{it} + \beta_5 Reinsurance\ Utilization_{it} + \beta_6 Personal\ Lines_{it} + \beta_7 Diversifications_{it} + \beta_8 Group\ Dummy_{it} + \beta_9 Stock\ Dummy_{it} + \beta_{10} Market\ Cycle\ Dummy + \varepsilon_{it}$ *. The first figure in each cell is the regression coefficient. The second figure in each cell is the standard error. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively. Standard Errors are heteroscedastic-consistent estimators following the method of White (1980).*

The coefficients on reinsurance utilization are negative and significant for models. That is, insurers who transfer more of their risks to reinsurers tend to make higher profits. Those P/L independent agency writers who write more on personal lines, as opposed to commercial lines, of business are more likely to earn higher return. But, we don't find the same results for the direct writers. Diversification variables present a mixed result. There exists a significant relationship between business diversification and both profit measures for the direct writers. However, the results from the empirical tests indicate that geographic diversification variable is negatively and significantly correlated with profit margin. That is, more geographically diversified insurers tend to make less profits. In other word, it is more likely that insurers who focus on a smaller number of state markets utilize advertising more efficiently reaching out to potential and current customers. On the other hand, the coefficient on the geographic diversification is positive and significant for independent agency writers in Table 5.

Table 4: Performance Regressions: Direct Writers

	ROE		Profit Margin	
Independent Variable	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**
Intercept	-0.1560	0.0323***	0.9395	0.0448***
Advertising Intensity	-0.0350	0.0640	-0.0110	0.0888
Asset (log)	0.0094	0.0016***	-0.0279	0.0022***
Investment Ratio	0.8450	0.0812***	-0.5191	0.1126***
Leverage	-0.0223	0.0031***	-0.0221	0.0043***
Reinsurance Utilization	-0.0276	0.0107***	-0.1607	0.0148***
Proportion of Personal Lines	-0.0033	0.0082	-0.0242	0.0114**
Business Diversification	0.0450	0.0104***	0.0291	0.0144**
Geographic Diversification	-0.0069	0.0074	-0.0721	0.0103***
Group Dummy	-0.0049	0.0073	0.0182	0.0101*
Stock Dummy	0.0283	0.0058***	0.0155	0.0080*
Hard Market Dummy	-0.0223	0.0061***	-0.0724	0.0084***
Observations	4,986		4,986	
R^2	0.0617		0.0839	
Adjusted R^2	0.0596		0.0819	

$Profits_{it} = \alpha_0 + \beta_1 Advertising\ Intensity_{it} + \beta_2 Assets_{it} + \beta_3 Investment_{it} + \beta_5 Leverage_{it} + \beta_5 Reinsurance\ Utilization_{it} + \beta_6 Personal\ Lines_{it} + \beta_7 Diversifications_{it} + \beta_8 Group\ Dummy_{it} + \beta_9 Stock\ Dummy_{it} + \beta_{10} Market\ Cycle\ Dummy + \varepsilon_{it}$. *The first figure in each cell is the regression coefficient. The second figure in each cell is the standard error. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively. Standard Errors are heteroscedastic-consistent estimators following the method of White (1980).*

Table 5: Performance Regressions: Independent Agency Writers

	ROE		Profit Margin	
Independent Variable	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**
Intercept	-0.2399	0.0174***	0.6855	0.0254***
Advertising Intensity	-0.1371	0.0308***	-0.1833	0.0450***
Asset (log)	0.0167	0.0008***	-0.0128	0.0012***
Investment Ratio	0.2794	0.0225***	-0.2704	0.0329***
Leverage	-0.0370	0.0015***	-0.0194	0.0022***
Reinsurance Utilization	-0.0333	0.0044***	-0.1714	0.0065***
Proportion of Personal Lines	0.0143	0.0037***	-0.0173	0.0054***
Business Diversification	-0.0017	0.0046	0.0080	0.0067
Geographic Diversification	0.0161	0.0040***	-0.0319	0.0059***
Group Dummy	0.0060	0.0034*	-0.0333	0.0050***
Stock Dummy	0.0038	0.0031	0.0274	0.0046***
Hard Market Dummy	-0.0299	0.0028***	-0.0733	0.0041***
Observations	17,658		17,658	
R^2	0.0796		0.0747	
Adjusted R^2	0.0790		0.0742	

This table shows the regression estimates of the equation: $Profits_{it} = \alpha_0 + \beta_1 Advertising\ Intensity_{it} + \beta_2 Assets_{it} + \beta_3 Investment_{it} + \beta_5 Leverage_{it} + \beta_5 Reinsurance\ Utilization_{it} + \beta_6 Personal\ Lines_{it} + \beta_7 Diversifications_{it} + \beta_8 Group\ Dummy_{it} + \beta_9 Stock\ Dummy_{it} + \beta_{10} Market\ Cycle\ Dummy + \varepsilon_{it}$ *. The first figure in each cell is the regression coefficient. The second figure in each cell is the standard error. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively. Standard Errors are heteroscedastic-consistent estimators following the method of White (1980).*

Stock companies relatively make more profits during the sample period. To check time varying effect and underwriting cycle impact, we include hard market dummy. The results show that this variable is negatively correlated to the performance variables. So, insurers tend make less profits during the hard market period, as expected. Further analyses were conducted by dividing the entire sample into four groups based on the level of the advertising ratio (the first quartile represents 25% of insurers with the least advertising expense ratio, while the fourth quartile include insurers with the most advertising ratio. These results are not presented in this paper due to space limitations). The quartile analyses show mixed results. In sum, the analysis from the fourth quartile confirms the overall results, while the first, second and third quartile results

are not consistent with the entire sample. So, there needs to be caution when analyzing advertising impact for those insurers spending relatively less advertising.

CONCLUDING COMMENTS

The purpose of this paper is to examine the impact of advertising intensity on the profitability as measured by two profit variables and market structure as measured by four market concentrations and those relationships are analyzed for the two different distribution systems: independent agency writers vs. direct writers. The results show a positive and non-significant relationship between concentration and advertising for both distribution systems. However, we find a negative and significant relation between market share and advertising, indicating that advertising does not provide an additional gain in market share for insurers in this highly competitive market. These results are consistent with the two distribution systems.

This paper finds differences between the two distribution systems in the profit model. A negative and significant relationship is found between advertising intensity and profits for independent agency writers, while there exists no significant relationship for direct writers. So, independent agency writers do not increase profits when they spend more on advertising in this highly competitive market. This is mainly reflecting the fact that insurance agents under this system spend their own advertising to create more value to their companies since they spend their own money to increase their customer base. Further quartile analyses based on the percentage of advertising show that results from the group of insurers with higher advertising expenses confirm the findings of this study. However, we find different results from the first, second, and third quartile analyses. So, the interpretation of results in this paper should be carefully applied.

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