January Return Seasonality in the U.S. Insurance Industry

Khaled Elkhal,* Roger Shelor, and Mark Cross*****

Abstract: This research employed a two-sample t-test to examine the January effect in the U.S. insurance industry over the period 1980–1999. Results of the two-sample t-test indicate that the mean January returns are significantly higher than non-January returns, and January returns for smaller firms are significantly higher than returns for larger firms. A stochastic dominance approach is used to determine whether the large January returns can be due to omitted risk factors. The results indicate that January returns dominate non-January returns by second-order stochastic dominance. Similarly, January returns for smaller insurers dominate those of larger insurers by second-order stochastic dominance. Omitted risk factors are thus not a likely explanation of the January effect, in the case of the insurance industry. [Key words**:** January effect, stochastic dominance, insurance]

INTRODUCTION

The January effect, first documented by Keim (1983), refers to the abnormally large, positive average stock returns at the beginning of the year. Keim and others suggest that much of the January effect is attributable to the large returns earned by small firms. Researchers have examined the January effect across many different industries, but not specifically the insurance industry.[1]

The continued deregulation in many industries, such as transportation and public utilities, leaves the insurance industry as one of the most heavily regulated. Insurance companies are subject to much more regulation than industrial firms in the areas of legal reserves, surplus requirements,

*Assistant Professor of Finance, The School of Business, The University of Texas at Brownsville.

**Professor of Finance, College of Business, Ohio University.

***Ohio Casualty Professor of Insurance, College of Business, Miami of Ohio University.

Journal of Insurance Issues, 2004, **27**, 2, pp. 123–133.

valuation of assets, audits, solvency testing, investment activities, and pricing policies. Insurance regulation has as one of its primary goals the assurance of solvency, so insurers can pay debts and claims when they come due. A vital part of assuring solvency involves rate regulation or providing insurers a "fair rate of return."

One could argue that a possible consequence of the regulatory system used in the insurance industry, with its emphasis on solvency and providing fair rates of return, is reduced insurance company stock price variance or volatility. This reduced stock volatility could diminish tax-loss selling pressure for insurance company stocks and hence lead to less of a January effect.

The reasons for the January effect are not well understood. Some explanations indicate a failure of efficient markets equilibrium asset pricing models. Consistent with inefficient markets are the tax-loss selling pressure and portfolio rebalancing hypotheses. Ritter (1988) suggests that individual investors, who usually invest in smaller firms, sell losers in December for tax reasons and thereby depress prices. Smaller firms are more likely to be losers because of their greater stock return variance or volatility. Prices then rebound in January when selling pressure subsides and investors repurchase similar smaller firms' stocks.

Haugen and Lakonishok (1988) suggest that portfolio managers often load up on risky, small stocks at the beginning of the year, which creates buying pressure on small stocks in January, thus raising prices. Portfolio managers then sell these small stocks during the year before balance sheets are inspected. Thus, if small stocks have done well, portfolio managers can lock in their superior performance by indexing on the S&P 500 stocks for the remainder of the year. If smaller, riskier stocks have underperformed, managers will sell them to keep them off the year-end balance sheet.

Another group of explanations for the January effect is consistent with the joint framework of efficient markets hypothesis and equilibrium asset pricing models. Chan, Chen, and Hsieh (1985) suggest that stocks exhibit a different return structure during January (risk premiums are higher) because of omitted risk factors. Risk is greater at the turn of the year. Tinic and West (1984) suggest that seasonalities in the risk return trade-off could explain the January effect. Investors require higher returns to take on risk at the turn of the year. Seyhun (1988) suggests an information arrival, insider trading hypothesis, which predicts that informed traders are more likely to trade at the turn of the year, thereby contributing to the January effect. Seyhun (1993) indicates that the presence of stochastic dominance by January returns suggests that the omitted risk factors are not likely to explain the January effect.

Despite extensive research, there is no consensus in the literature as to why the January effect exists, and whether it represents market inefficiency. Many tests of market efficiency are joint tests of efficiency and the model of expected returns. Thus, it is difficult to determine whether a rejection of these joint tests implies market inefficiency or failure of the expected returns model. Alternatively, it is difficult to reject the hypothesis that there is some equilibrium model of expected returns consistent with the January effect.

We use a two-sample t-test to determine whether the January effect applies in the insurance industry. We also take a stochastic dominance approach to examine the hypothesis that there is some equilibrium model of expected returns that can explain the January effect (rather than that the January effect represents market inefficiency). The stochastic dominance approach is implemented by looking at the distribution of stock returns. If the distribution of January returns for all insurers and smaller insurers dominates non-January returns and January returns of larger insurers, then omitted risk factors cannot explain the January effect. Thus, stochastic dominance provides a good test of market efficiency.[2]

The primary advantage of the stochastic dominance method is that no assumptions are made about the model of expected stock returns, and only minimal assumptions are made about investors' utility functions. In return for the weak assumptions as to investor preferences, stochastic dominance has very stringent requirements on realized returns as a basis for establishing preference ordering of risky asset choices.

The main disadvantage of the stochastic dominance approach is that realized sample stock returns are used to make inferences about the unobservable distribution of returns. If realized returns do not provide a good indication of the population distribution of the stock returns, then the stochastic dominance approach will misstate the dominance results. The research hypotheses are:

H_1: In the U.S. insurance industry, all firms tend to have higher returns in January than in non-January months.

H_2: Smaller insurance firms have higher returns in January than larger firms.

H_3: The distribution of January stock returns for all insurers dominates that of non-January returns.

H_4: The distribution of January stock returns for smaller insurers dominates that of larger insurers.

METHODOLOGY

We use two techniques to examine the January effect in the insurance industry—namely, a two-sample t-test and a stochastic dominance test. The first technique, which examines the difference between the means of two independent populations with unequal variances, is suggested by Gultekin and Gultekin (1983). The high volatility of stock returns makes the unequal variance assumption necessary.

In the presence of unequal population variances, the pooled variances t-test becomes inappropriate. To address this issue, we use an approximation developed by Cochran (see Snedecor and Cochran, 1980) where separate estimates of the variance are included in the test statistic while the critical value of t is determined by weighing the critical value of each sample by its variance of the mean $\left(\frac{s^2}{n}\right)$. The test statistic used is:

$$t' = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \tag{1}$$

The monthly stock returns for all insurers for the years 1980–1999 are used to form two populations. One population consists of January returns R_j and the other includes returns for the other months, February through December (R_o).

We test whether all insurance firms tend to do better in January than in any other month. The null and alternative hypotheses are:

$$H_0{:}R_j \le R_o \quad \text{versus} \quad H_1{:}R_j > R_o$$

Then we examine the argument that much of the January effect is due to the large returns generated by small firms. We divide the population of January returns for all insurers into two samples based on firm size. The first sample consists of the 40 smallest firms, R_{js}, whereas the second is composed of the 40 largest firms, R_{jl}. The null and alternative hypotheses are:

$$H_0{:}R_{js} \le R_{jl} \quad \text{versus} \quad H_2{:}R_{js} > R_{jl}$$

Rejection of the two null hypotheses would be sufficient to establish the existence of the January effect: that January returns for all firms are higher than non-January returns, and smaller firms earn higher January returns than larger firms. If this is the case, then stock returns become more predictable, disproving the efficient markets hypothesis.

The the second technique applied, a stochastic dominance approach, provides a method of choice among risky assets. Risky alternatives can be ordered without having to specify individuals' utility functions or the return distributions of the risky assets. An asset or portfolio is stochastically dominant over another if an individual receives greater wealth (W) from it in every state of nature. This is referred to as first-order stochastic dominance. Asset x, with cumulative probability distribution $F_x(W)$, stochastically dominates asset y, with cumulative probability distribution $G_y(W)$, for the set of all nondecreasing utility functions if:

$$F_x(W) \leq G_y(W) \text{ for all } W, \tag{2}$$

$$F_x(W_i) < G_y(W_i) \text{ for some } W_i.$$

The cumulative probability distribution for asset y always lies to the left of the cumulative distribution for asset x. Thus, x is said to dominate y for all increasing utility functions, and individuals would prefer asset x to asset y.

Second-order stochastic dominance assumes utility functions are nondecreasing and strictly concave. Thus, individuals are assumed to be risk-averse. Asset x will be second-order stochastically dominant over asset y for all risk-averse investors if:

$$\int_{-\infty}^{W_i} [G_y(W) - F_x(W)]dW \geq 0 \text{ for all } W, \tag{3}$$

$$G_y(W_i) \neq F_x(W_i) \quad \text{for some } W_i.$$

This means that for asset x to dominate asset y, the accumulated area under the cumulative probability distribution of y must be greater than the accumulated area for x, below any given wealth level. Unlike first-order stochastic dominance, the cumulative density functions can cross.

To implement the stochastic dominance approach, we examine the distribution of stock returns for insurance companies. If January returns exhibit stochastic dominance over non-January returns, and January returns for smaller firms dominate larger firms' returns, it would be difficult to conclude that seasonal differences in past stock returns can be explained by some equilibrium model of expected returns. January return dominance suggests that omitted risk factors cannot explain the January effect and provides evidence of market inefficiency.

DATA

Information to compute monthly stock returns for the 133 U.S. insurance companies in the sample is gathered from the Compustat database for the period 1980–1999. A complete list is in the appendix. Forty of the companies are classified as life-health insurers, 27 as multi-line, and 66 as property-casualty. Monthly stock returns are calculated as the difference between end-of-month and beginning-of-month closing price as a percentage of beginning-of-month closing price.

The January effect received considerable airing in the financial press during the 1980s. If enough investors tried to exploit the January effect, the pricing anomaly should have dissipated over the years and should ultimately disappear. It is for this reason that we examine the period 1980–1999 to determine whether the January effect continues, despite much publicity.

Total assets on December 31, 1999, also obtained from Compustat, are used as a proxy for firm size. The 40 smallest companies, with total assets of under $500 million per company, constitute the small-firm sample. The 40 largest insurers, with total assets of over $9 billion, constitute the large-firm sample. The large firms on average have approximately 18 times the total assets of the smaller firms.

RESULTS

The results in Table 1 indicate that mean January stock returns for all insurers (2.12%) are significantly greater than the non-January returns (1.33%). The table also indicates that mean January returns for smaller insurers (4.05%) are significantly higher than returns for larger insurers (1.13%). The results indicate a strong January effect for U.S. insurance companies.

Figure 1 shows the cumulative density function (CDF) of all the insurers' realized returns in January and non-January months from 1980 through 1999. To construct the CDF for January returns, the realized mean January returns are ranked in increasing order. Since each of the 20 observations for the years 1980–1999 has an equal probability of occurrence, each realized return is assigned a probability of 1/20. Thus, the lowest realized January return has a cumulative probability of 1/20 and the second-lowest January

Table 1. Monthly Returns in the Insurance Industry

Monthly Returns (%)	Mean	Std. Deviation
January returns for all insurers	2.12*	12.93
Non-January returns for all insurers	1.33	14.95
January returns for smaller insurers	4.05*	17.87
January returns for larger insurers	1.13	9.35

* Indicates significant difference in means at the 5 percent level.

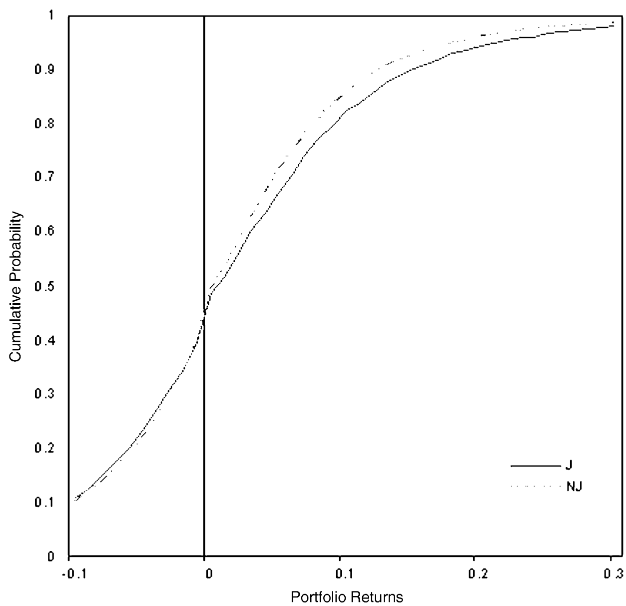

Fig. 1. Cumulative density function of January and non-January returns for all insurers (J denotes January returns, while NJ denotes non-January returns).

return a cumulative probability of 2/20. The highest realized January return has a cumulative probability of 1.0. A plot of these 20 points produces the CDF. A similar procedure produces the CDF for non-January returns.

Figure 1 shows that the CDFs of January and non-January returns cross around portfolio return zero. This violates the first-order stochastic dominance (FSD) requirement. However, we can still say that there is a second-order stochastic dominance (SSD). Seyhun (1993) states that in the SSD, the CDFs can cross "by small amounts" provided that the area under the CDF

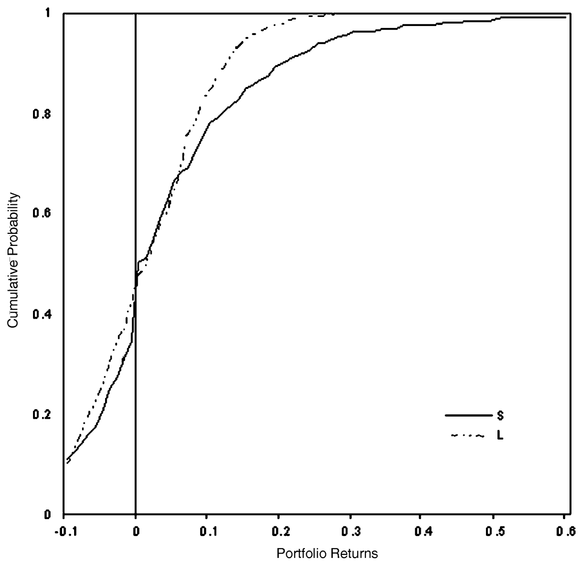

Fig. 2. Cumulative density function (CDF) of smaller versus larger insurers for January returns (S denotes smaller-firm returns, while L denotes larger-firm returns).

of the dominant asset is always smaller than the area under the CDF of the dominated asset. This is clearly visible from Figure 1 where the area under the CDF of January returns is less than that of non-January returns. Also, it is important to note that the FSD implies the SSD. The opposite, however, is not true. That is, the existence of the SSD alone negates the existence of the FSD.

Similarly, Figure 2 provides visual evidence of the dominance of smaller insurers' returns in January over returns of larger insurers. The January returns in small firms dominate returns in larger firms by second-order stochastic dominance. The area under the CDF of smaller firms is less than that of larger firms

CONCLUSIONS

This research examines the January effect for insurance companies using a two-sample t-test approach. Whatever the potential for regulation to diminish insurer stock volatility, the January effect for insurance companies appears to be strong. January returns are significantly higher than non-January returns over the period 1980–1999. Despite publicity given to the January effect, it apparently has not disappeared. Smaller insurers' returns for January also are significantly higher than larger firms' returns. Much of the strong January effect in the insurance industry can be attributed to returns on small firms. This is consistent with earlier findings on the January effect.

The stochastic dominance results, moreover, indicate that previous explanations of the January effect, such as omitted risk factors or changes in investors' risk attitudes, are less probable, since such results are not dependent on typical asset pricing model risk/return trade-offs. The findings suggest that potential explanations of the January effect are more likely associated with various forms of the price pressure hypothesis, such as tax-loss selling, which are inconsistent with market efficiency. Omitted risk factors are not a likely explanation of the January effect in the insurance industry.

NOTES

[1] For an excellent summary of the evidence on the January effect, see Haugen and Lakonishok (1988).

[2] For a discussion of the stochastic dominance approach, see Levy (1985).

REFERENCES

Chan, K. C., N. Chen, and D. A. Hsieh (1985) "An Exploratory Investigation of the Firm Size Effect," *Journal of Financial Economics*, 14, 452–471.

Gultekin, M. N., and N. B. Gultekin (1983) "Stock Market Seasonality: International Evidence," *Journal of Financial Economics*, 12, 469–481.

Haugen, R. A., and J. Lakonishok (1988) *The Incredible January Effect: The Stock Market's Unsolved Mystery*. Homewood, IL: Dow Jones-Irwin.

Keim, D. (1983) "Size Related Anomalies and Stock Return Seasonality: Empirical Evidence," *Journal of Financial Economics*, 12, 13–32.

Levy, H. (1985) "Upper and Lower Bounds of Put and Call Option Value: Stochastic Dominance Approach," *Journal of Finance*, 40, 1197–1217.

Ritter, J. R. (1988) "The Buying and Selling Behavior of Individual Investors at the Turn of the Year," *Journal of Finance*, 43, 701–717.

Seyhun, H. N. (1988) "The January Effect and Aggregate Insider Trading," *Journal of Finance*, 43, 129–141.

______ (1993) "Can Omitted Risk Factors Explain the January Effect? A Stochastic Dominance Approach," *Journal of Finance and Quantitative Analysis*, 28, 195–212.

Snedecor, G. W., and W. G. Cochran (1980) *Statistical Methods*, Seventh Edition. Ames, Iowa: Iowa State University Press.

Tinic, S. (1984) "Upper and Lower Bounds of Put and Call Option Value: Stochastic Dominance Approach," *Journal of Finance*, 40, 1197–1217.

Tinic, S. M., and R. R. West (1984) "Risk and Return: January versus the Rest of the Year," *Journal of Financial Economics*, 13, 561–574.

APPENDIX

Type of Insurance	Companies	
Life and health insurance	Ageon Nv	Kansas City Life Ins Co
	A Life Insur Co	Liberty Corp
	American General Corp	Liberty Financial Cos Inc
	Amerus Life Hldgs Inc	Lincoln National Corp
	Annuity And Life Re Hldgs	Manulife Financial Corp
	Arm Financial Group Inc	Merrill Lynch Life Insur Co
	Citizens Financial Corp	Metlife Inc
	Citizens Inc	Mony Group Inc
	Conseco Inc	Nationwide Financial Services
	Consumers Financial Corp	National Western Life Ins Co
	Cotton States Life Insurance	Presidential Life Corp
	Delphi Financial Grp	Protective Life Corp
	Erie Family Life Ins Co	Prudential Plc
	Financial Industry Corp	Reliastar Financial Corp
	First Alliance	Scottish Annuity & Life Hldg
	Great Northern Insured Annuity	Security National Financial Cp
	Hartford Life Insurance Co	Southern Sec Life Ins
	Intercontinental Life Corp	Standard Management Corp
	Investors Insurance Group	United Tr Group Inc
	John Hancock Mutual Life	Universal American Finl Cp
Multi-line insurance	Accel Intl Corp	Hartford Finl Svcs Grp Inc
	Aetna Inc	Horace Mann Educators Corp
	Alfa Corp	ING Groep Nv
	Allstate Corp	Leucadia National Corp
	American Financial Corp	Loews Corp
	American Finl Group Inc	Midland Co
	American International Group	National Security Group Inc
	American National Insurance	Pico Holdings Inc
	AXA	Safeco Corp
	Berkshire Hathaway	SCOR
	Cincinnati Financial Corp	Unico American Corp
	CNA Financial Corp	United Fire & Casualty Co
	FBL Finl Group Inc	Unitrin Inc
	Fortune Financial Inc	

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Appendix (*continued*)

Type of Insurance	Companies	
Property-casualty insurance	Acceptance Insurance Cos Inc	Meadowbrook Insurance Group Inc
	Ace Limited	Meemic Hldgs Inc
	Allcity Insurance Co	Merchants Group Inc
	Allegany Corp	Mercury General Corp
	Allmerica Financial Corp	Meridian Insurance Group Inc
	Amer Country Holdings Inc	Motor Club Of America
	American Natl Finl Inc	Mutual Risk Management
	American Safety Ins Grp	Navigators Group Inc
	Arch Capital Group	Nobel Insurance
	Argonaut Group Inc	Nymagic Inc
	Baldwin & Lyons	Ohio Casualty Corp
	Bancinsurance Corp	Old Guard Group Inc
	Berkley (W R) Corp	Old Republic Intl Corp
	Chandler Insurance	Paula Financial
	Chubb Corp	Penn-America Group Inc
	Commerce Group Inc	Philadelphia Cons Hldg Corp
	Cumberland Technologies Inc	PMA Capital Corp
	Danielson Holding Corp	Progressive Corp
	Donegal Group Inc	Pxre Group Ltd
	Emc Insurance Group Inc	Reliance Group Holdings
	Farm Family Holdings Inc	RLI Corp
	Fremont General Corp	RTW Inc
	Frontier Insurance Grp Inc	Selective Insurance Group Inc
	Gainsco Inc	St Paul Cos
	Goran Capital Inc	State Auto Financial Corp
	Hallmark Financial Services Inc	Symons International Grp Inc
	Harleysville Group Inc	Tokio Marine &Fire Insurance
	HCC Insurance Hldgs Inc	Transatlantic Holdings Inc
	Highlands Insurance Grp Inc	21st Century Insurance Group
	HSB Group Inc	Unistar Financial Svc Corp
	IPC Holdings	Universal Heights Inc
	Markel Corp	Vesta Insurance Group Inc
	MCM Corp	Zenith National Insurance Corp