Rationality of Insurance Pricing: Do Insurers Herd?

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Abstract: This paper investigates the role of herding behavior in insurance pricing for property-casualty insurance companies in United States. We examine whether insurance price movements are due to rational adjustments for fundamental changes or over-adjustments resulted from irrational herding. Consistent to the herding hypothesis, we find that insurers tend to follow the herd to lower or raise insurance price. We also find that insurers are more responsive to the herd to decrease price than the herd to raise price. Firms of larger size and older age are more likely to follow the herd. Mutual and stock insurers are found to have similar patterns of herding.
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1. Introduction

The term "herding" broadly refers to a tendency of many agents to take similar actions at the same time (Sia, 2004; Jegadeesh, 2010). Academic studies often attribute many market failures such as excess market volatility, bubbles and the emerging market meltdowns to the phenomenon of herding. The property-casualty insurance market is known to alternate between soft markets and hard markets. Premium rates are low in soft markets and much higher in hard markets. Do insurers herd to lower or raise insurance price in soft and hard markets? Are the insurance price movements due to rational adjustments for fundamental changes, or over-adjustments resulted from irrational herding? Such questions are essential to understanding insurer pricing behavior and the underwriting cycle.

Why do agents herd? There has been substantial theoretical and empirical literature that explores the issue and offers many reasons.[1] One reason why agents may herd is because they act based on similar information. Their information may be similar either because they all independently acquired information that happened to be correlated, or they may have rationally learned information from their peers' actions. This information-driven herding, which we refer to as rational adjustment, would not have the destabilizing effect especially when they all react to the same fundamental changes in a timely manner. On the other hand, if herding is driven by a desire to imitate the actions of others, then herding forces may move price away from fundamentals and lead to excess volatility in price. We refer to this imitation-driven herding as irrational herding. In this paper, we investigate the role of herding in insurer pricing for the U.S. property-casualty insurers, which to my knowledge has not been directly addressed in prior research.

The phenomenon of the underwriting cycle in property-casualty insurance market has attracted long-time research interest. There have been various theories proposed to explain the causes of the underwriting cycle.[2] A notable work by Lai et al. (2000) suggests that the market-wide insurance price movements are mainly resulted from the changes of expectations on fundamental factors. This theory posits that the changes of expectation on interest rate, future losses and expenses to much extent affect the insurance pricing. It is suggested that the collective price adjustment by insurance companies is largely a rational reaction to changes of fundamentals.

In contrast, Harrington and Danzon (1994) and Harrington (2004), in their explanation of the fluctuations of insurance price, propose a hypothesis that the herding behavior among insurers results in mispricing and aggravates the underwriting cycle. They suggest that some insurers may have priced below cost because of moral hazard that is resulted from limited liability and risk-insensitive guaranty programs or low loss forecasts relative to optimal forecasts, giving rise to winners' curse effects. Other insurers could cut prices in response to such aberrant firms to preserve market share and avoid loss of quasi-rents from renewal business related to investments in tangible and intangible capital. As a result, aberrant behavior by some firms could aggravate price cutting during soft markets, which contributes to the overpricing in the subsequent hard market.

While Lai et al. (2000) implies insurance price movements are rational adjustment for fundamental changes, Harrington and Danzon (1994) suggests that irrational herding among insurers contribute to the volatility of insurance price. Neither of them, however, empirically examines the role of herding in insurance pricing, which motivate this study.

Drawing from the literature, we test two hypotheses in this paper: (1) The insurance price movements are rational adjustments for

[1] For example, the payoff externalities models (e.g.Brennan, 1990; Froot et al. 1992; and Hirshleifer et al. 1994) show that the payoffs to an agent adopting an action increases in the number of other agents adopting the same action. Principle-agent models (Scharfstein and Stein, 1990; Rajan, 1994; Zwiebel, 1995) show that managers, in order to preserve or gain reputation, may prefer to follow the market consensus. Cascades models (Bikhchandani et al. 1992; Welch, 1992) show that later agents, inferring information from the actions of prior agents, optimally decide to ignore their own information and act alike. For more discussion on the literature regarding herding, refer to Devenow and Welch (1996). See Bikhchandani and Sharma (2001), Hirshleifer and Teoh (2003), and Devenow and Welch (1996) for detailed surveys of the herding literature.

[2] For example, the capacity constraint theory (Gron, 1994; Winter, 1988, 1991, 1994; Cummins and Danzon, 1997) suggests that the cyclical premium adjustments reflect changes in insurer surplus that affect the industry's capacity for bearing risk. The institutional intervention theory proposed by Cummins and Outreville (1987) posits that the informational lags in data collection, regulation, and policy renewals lead to the cyclical performance. The interest rate theory (e.g. Doherty and Kang, 1988; Doherty and Garven, 1995) relates the underwriting cycles to the fluctuations in interest rates. The under-pricing theory (e.g. Harrington and Danzon, 1994; Harrington, 2004) suggests that the competition-induced excessive price cutting in soft market contributes to the overpricing in the subsequent hard market. Moreover, Lai et al. (2000) develop a multi-factor model to explain the underwriting cycle and emphasizes the role of expectation changes in generating a cycle.

fundamental changes, and (2) The insurance price movements are over-adjustments resulted from herding. We call the former "Rational Adjustment Hypothesis" and the latter "Herding Hypotheses." The two hypotheses are not necessarily competing with each other, as the underwriting cycle is a complicated phenomenon simultaneously caused by multiple factors. Therefore, it is an empirical issue to what extent each factor contributes to the insurance price movements.

To test above hypotheses, we first develop a measure to capture the herding in insurance pricing. The measure, inspired by Lakonishok et al. (1992) and Wermers (1999), is based on the portion of the insurers that increase (decrease) insurance price. To differentiate rational adjustments from irrational herding, we regress the measure on fundamental variables and use the residual values of the regression to capture the degree of irrational herding.

With the measures of herding, we are able to examine whether insurers herd in pricing. The empirical results support the irrational herding hypothesis—fundamental changes cannot fully explain insurance price changes, and insurers follow the herd to lower or raise insurance price. We also find that insurers have higher propensity to follow the herd to decrease price than the herd to increase price. Moreover, firms of large size and older age are more likely to herd.

The rest of the paper is organized as follows. Section 2 describes the sample and data. The mythology of empirical tests and model results are presented and discussed in Section 3. Section 4 concludes.

2. Sample and Data

We investigate the role of herding in insurance pricing for property-casualty insurers in United State. Our primary data source is the database of statuary financial statements of insurance companies provided by SNL Financial. The data are available from 1996 to 2011. Because we need past three-year data to compute two variables in the regression, the final sample covers the period 1998 to 2011 and consists of 15372 observations for 2218 insurance companies. The firms in the sample are affiliated and unaffiliated individual companies. About seventy percent of the insurers are stock companies. The industry-level data, such as combined ratio, investment return and market concentration, are obtained from SNL database of aggregated statistics for insurance markets. The interest rate and GDP data are published by U.S. Department of Treasury and U.S. Bureau of Economic Analysis.

3. Methodology and Empirical Results

A. Measurement of Herding

To test the research hypotheses, we first develop a measure of herding. Prior studies have proposed many herding measures mostly for the stock market and investors.[3] Our measure is essentially similar to that used in Lakonishok et al. (1992) and Wermers (1999).

It takes two steps to construct our measures of herd. In the first step, measures are constructed to capture the propensity of herd which is based the portion of firms revising price toward to the prevailing price. To differentiate the direction of herding, we define as the measure of herding to increase insurance price, and as the measure of herding to lower insurance price, which are expressed as

$$IHM_t = (I_t - E[I]) - E(I \quad (1)$$

$$DHM_t = (D_t - E[D]) - E(D_t - \quad (2)$$

where is the proportion of all insurers that increase insurance price, and is the proportion of all insurers that decreases insurance price in year t. and are the average proportion of insurers increasing and decreasing price over the sample period. Then, an adjustment factor, or , is subtracted to account for the trend of the expected proportion of insurers increasing or decreasing insurance price. Insurance price charged by firm i in year t, is measured as the ratio of premiums written net of underwriting expenses and policyholder dividends to the discounted value of incurred losses and loss adjustment expenses. Incurred losses and loss adjustment expenses are net of changes in prior years' reserves, on an accident year (AY) basis, and are discounted using the U.S. Treasury yield curves.[4]

To test the two hypotheses, it is critical to empirically differentiate between co-movements reacting to changes in fundamentals and

[3] For example, Lakonishok, Shleifer, and Vishny (1992) and Wermers (1999) develop a measure of herding in stock market based on changes in the number of buyers and sellers. Nofsinger and Sias (1999) use the proportion of institutional ownership to measure herding. Chang et al. (2000) and Christie and Huang (1995) employ cross-sectional standard deviation of stock returns to detect herd behavior in a market setting. Hwang and Salmon (2004) develop a measure of herding in a market based on the cross-sectional variance of beta.

[4] This price measure is based on the work of Winter (1991), Berger, Cummins, and Tennyson (1992), Cummins and Danzon (1995), and Sommer (1996). See Cummins and Danzon (1995) for a more detailed explanation of the insurance price measure.

correlated behavior due to irrational herding in the market. In the second step, therefore, we regress and on the changes of macro-fundamental factors including the changes of industry combined ratio, investment return rate, concentration ratio, and GDP, and then use the residuals from the regression to capture the degree of insurer irrational herding. In this way, we remove the effect of fundamental adjustments from and . The resulted measures of herding are denoted as HER and HERD. The time-series trends of HER and HERD are displayed in Figure 1. As shown in Figure 1, HER is relatively high for periods 1997- 1999 and 2006-2008, which are known to be soft market periods. HEI is higher during the hard market of 2001-2005.

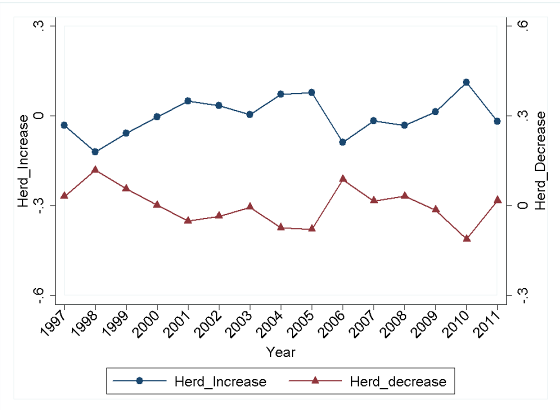

Figure 1 Industry Herding Measures over Time

B. Do Insurers Herd in Pricing?

With the measures of herding, we are able to test the research hypotheses by incorporating the measures of herding into the insurance pricing model. Lai et al. (2000) develop a model of the determination of insurance premium. We include the determination factors in their models in our insurance pricing model.

Dependent Variable$_{it}$ = HERD_INCREASE$_t$ (HERD_DECREASE$_t$) + f (LOSS, VLOSS, EXPENSE, VEXPENSE, INVEST, LEVERAGE, SIZE, REINS, LIQ, STOCK, AFFILLIATE, AGE)$_{it}$ (3)

where

Dependent Variables include three measures of price change: PRICE_CHANGE, INCREASE, and DECREASE. The herding measure of HERD_INCREASE$_t$ and HERD_DECREASE$_t$ are defined in the earlier section. The other variables are defined as follows:

year t and t-1

VEXPENSE is the change of the variance of past-three-year expense ratio between year t and t-1

INVEST is the change of investment return of the firm between year t and t-1

LEVERAGE is the natural logarithm of liabilities-to-surplus ratio in year t

SIZE is the natural logarithm of total assets of the firm in year t

REINS is net reinsurance ceded divided by direct premiums written in year t

LIQ is cash plus government bonds over admitted assets in year t

STOCK is a dummy variable equal to 1 for stock companies and 0 otherwise

AFFILLIATE is a dummy variable equal to 1 for affiliated single companies and 0otherwise

AGE is firm age calculated as (2011- year in which the firm was established)

If insurers adjust price rationally for fundamental changes, then the coefficients of HERD_INCREASE (HERD_DECREASE)

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
PRICE_CHANGE	15372	-0.302	8.951	-90.957	93.503
INCREASE_DUM	15372	0.465	0.499	0	1
DECREASE_DUM	15372	0.535	0.499	0	1
LOSS	15372	0.087	34.227	-790.667	715.746
VLOSS	15372	-159.541	10160.160	-450354.420	359725.29
EXPENSE	15372	0.815	35.042	-617.436	819.412
VEXPENSE	15372	-73.515	8185.21	-273729.88	350831.07
INVEST	15372	-0.170	1.505	-45.371	45.667
LEVERAGE	15372	4.264	1.048	-5.809	7.869
SIZE	15372	11.270	1.894	5.445	18.499
REINS	15372	0.598	0.931	0	58.233
LIQ	15372	47.842	234.786	-96.169	8897.15
STOCK	15372	0.681	0.466	0	1
AFFILIATE	15372	0.056	0.230	0	1
AGE	15372	50.791	41.912	1	212

Table 1 Descriptive Statistics of Variables

should be insignificant in model (3). On the other hand, a significant HERD_INCREASE (HERD_DECREASE) would suggest evidence supporting the herding hypothesis. We estimate the coefficients using panel data fixed-effect models. While both fixed-effect and random-effect models generate very similar results, we report the results of fixed-effect models because Hausman's test suggests that fixed-effect models are superior to random-effect models. The constant firm specific variables STOCK and AFFFILIATE, however, are not estimable in fixed-effect models. Therefore, the coefficients of these variables are estimated using random-effect models. Moreover, to account for serial correlation in price change, we assume the covariance structure in the fixed-effects models follows a first order autoregressive process AR(1).

Table 1 reports the summary statistics of the variables. Both SIZE and LEVERAGE are highly skewed and are log transformed. The negative means of PRICE_CHANGE and the greater mean of DECREASE than INCREASE suggest that over the sample period there is a higher proportion of insurers decreasing price than the proportion of insurers increasing price. This phenomenon is probably due to the increasing competition in the insurance market.

The estimation results for model (3) are presented in Table 2. Note that by construction HERD_INCREASE and HERD_DECREASE are almost perfectly inversely related, so we include only one of them in a regression. When the dependent variable is INCREASE_DUM,

	Dependent Variables		
	PRICE_CHANGE	INCREASE	DECREASE
INTERCEPT	-0.442*** (0.077)	0.400*** (0.024)	0.599*** (0.027)
HERD_INCREASE	2.935 *** (1.011)	0.909*** (0.072)	
(HERD_DECREASE)	-2.935*** (1.011)		0.909*** (0.072)
LOSS	-0.004 (0.002)	-0.001*** (1.19E-4)	0.001*** (1.19E-4)
VLOSS	2.055E-6 (6.057E-6)	4.562E-7*** (<0.10E-8)	-4.91E-7*** (<0.10E-8)
EXPENSE	-0.013*** (0.002)	-0.001*** (1.22E-4)	0.001*** (1.23E-4)
VEXPENSE	0.620E-4*** (0.086E-4)	2.54E-4*** (<0.10E-8)	-2.54E-4*** (<0.10E-8)
INVEST	-0.055 (0.049)	0.003 (0.003)	0.003 (0.003)
LEVERAGE	0.002*** (0.0004)	0.027*** (0.004)	-0.027*** (0.004)
SIZE	-0.040 (0.028)	-0.005*** (0.002)	0.006*** (0.002)
REINS	0.14E-4 (0.21E-4)	2.51E-6* (1.315E-6)	-2.51E-6* (1.315E-6)
LIQ	0.78E-4 (2.35E-4)	0.65E-4*** (0.16E-4)	-0.65E-4*** (0.16E-4)
AGE	-0.001 (0.001)	0.10E-4 (0.90E-4)	-0.60E-4 (0.90E-4)
STOCK††	-0.042 (0.127)	-0.008 (0.009)	0.008 (0.009)
AFFILIATE††	-0.117 (0.240)	-0.052*** (0.016)	0.052*** (0.016)
$\chi 2$	1210.3	61.94	61.94

Table 2 Effect of Herding in Insurance Pricing†

Notes:
* indicates significance at 10% level; ** indicates significance at 5% level; *** indicates significance at 1% level
† Standard errors are heteroscedasticity and autocorrelation consistent. Robust standard errors are reported in the parentheses below coefficient estimates. Company specific intercepts are included in the fixed effects models, but are not reported here.
†† Because in fixed-effect model, the constant firm specific variable STOCK and AFFILIATE cannot be estimated, the coefficients for these two variables are estimated using random-effect models. Fixed-effect and random-effect model generate very similar results for other variables.

we use HERD_INCREASE, and in the DECREASE_DUM regression, we use HERD_DECREASE. The results for the HERD_INCREASE and HERD_DECREASE regressions are very similar with reversed signs.

Consistent to the herding hypothesis, the coefficients of HERD_INCREASE or HERD_DECREASE are significant for all the three dependent variables. When the herding measure HERD_INCREASE (HERD_DECREASE) is higher, insurers tend to increase (decrease) insurance price. The results suggest that fundamental changes in insurance product cannot fully explain the insurance price movements, and insurers tend to irrationally follow their peers to raise or lower insurance price ignoring their own analysis.

C. What Kind of Insurers Tend to Herd?

After establish the fact that insurers irrationally herd to raise or lower insurance price, a natural question follows: what kind of insurers tend to herd? What are the relationships between firm characteristics and decisions to herd? To answer these questions, we first need to capture a firm's propensity to herd.

Let HERD_INCREASE_DUM be denoted for a dummy variable equal to 1 if a firm increases insurance price when the market appears to herd to increase price, i.e. $HERD\_INCREASE_t > E[HERD\_INCREASE_t$. $E[HERD\_$ is the average of HER for the sample period. Similarly, HERD_INCREASE_DUM represents a dummy equal to 1 if a firm decreases insurance price when the market herds to decrease insurance price, i.e. $HERD\_DECREASE_t > E[HERD\_DECREASE_t$. Moreover, let a dummy variable HERD_DUM equal to 1 when a firm follows the herd. These dummy variables can be expressed as

$$HERD\_INCREASE\_DUM_{it} = \begin{cases} 1, & \text{if } PRICE\_CHANGE>0 \text{ when } \\ & HERD\_INCREASE_t > E[HERD\_INCREASE_t] \\ 0, & \text{otherwise} \end{cases}$$

$$HERD\_DECREASE\_DUM_{it} = \begin{cases} 1, & \text{if } PRICE\_CHANGE<0 \text{ when } \\ & HERD\_DECREASE_t > E[HERD\_DECREASE_t] \\ 0, & \text{Otherwise} \end{cases}$$

$$HERD\_DUM_{it} = \begin{cases} 1, & \text{if } HERD\_INCREASE\_DUM=1 \text{ or } \\ & HERD\_DECREASE\_DUM=1 \\ 0, & \text{Otherwise} \end{cases}$$

We then regress the above dummy variables on a series of firm characteristics variables, including LOSS_RATIO, EXPENSE_RATIO, LEVERAGE, LIQ, REINS, INVEST, SIZE, STOCK, AFFILIATE and AGE, and the industry herding measure HERD_INCREASE (HERD_DECREASE).

Table 3 reports the results of the probit model. Model 1 and Model 4 are for HERD_INCREASE_DUM. Model 2 and Model 5 are for HERD_DECREASE_DUM.

Model 3 and Model 6 are for HERD_DUM. In Model 1 and Model 2, the coefficient of HERD_DECREASE_DUM is greater than the coefficient of HERD_INCREASE_DUM with a higher significance. It suggests that firms are more responsive to the herd of decreasing price than to the herd of increasing price.

The coefficients of AGE and SIZE are generally significantly positive, suggesting that firms of larger size and older age are more likely to follow the herd, especially the herd to raise price. Affiliated firms are more likely to herd to decrease price, while unaffiliated firms are more likely to herd to raise price. In addition, firms with higher leverage and more liquid assets are more likely to herd to raise price; firms with a lower level of loss ratio, expense ratio and liquid assets are more likely to herd to lower price.

Table 4 Means of Herding Dummies for Mutual and Stock Insurers

	Mutual	Stock
HERD_INCREASE_DUM	0.531	0.551
HERD_DECREASE_DUM	0.651	0.625
HERD_DUM	0.580	0.581

While we expect that mutual insurers may behave differently from stock insurers, the coefficient of STOCK is insignificant. Table 4 confirms this result by showing the tendency of herding for mutual and stock insurers. We can see that mutual and stock insurers share the similar pattern of pricing change.

4. Conclusion

Herding is believed to be a crucial element of behavior in financial markets and contribute to a number of economic phenomena such as bubbles, momentum and business cycles. In the insurance market, herding may lead to systematic erroneous pricing. To our knowledge, this paper is the first study to explore the role of herding in insurance pricing.

Using a sample of property-casualty insurers in United States, we investigate the role of herding in insurance pricing. We first establish the fact that fundamental changes cannot fully explain insurance price movements, and insurers tend to irrationally herd to raise or low insurance price. We also find that insurers are more responsive to the herd to lower price than to the herd to raise price. We then investigate the features of insurers that are more likely to herd than others. We identify that larger and older firms are more likely to herd, especially herd to decrease price. This result is consistent to the prediction of Harrington (2004) that some inexperienced small insurers may have priced below cost because of moral hazard that is resulted from limited liability or low loss forecasts, giving rise to winners' curse effects. Other insurers may follow such aberrant firms to cut price in order to preserve market share and avoid loss of quasi-rents from renewal business. We also find that mutual insurers have the similar herding pattern as stock insurers.

The results of this paper enrich the understanding of insurer pricing behavior and the underwriting cycle. Herding not only contributes to the systemic mispricing but prolongs the length of the underwriting cycle. The issue of herding in insurance price has important implications for insurance regulation and deserves future research.

Reference

[1] Bikhchandani, Sushil, David Hirshleifer, and Ivo Welch, 1992, A Theory of Fades, Fashion, Custom, and Cultural Change as Informational Cascades, Journal of Political Economy, 100, 992–1026

[2] Christie, W. G., and R. D. Huang, 1995, Following the Pied Piper: Do Individual Returns Herd Around the Market? Financial Analysts Journal (July-August), 31-37

[3] Cummins, David J. and Patricia Danzon, 1997. "Price, Financial Quality, and Capital Flows in Insurance Markets," Journal of Financial Intermediation 6: 3-38

[4] Cummins, David J. and Francois J. Outreville, 1987. "An International Analysis of Underwriting Cycles in Property-Liability Insurance," Journal of Risk and Insurance 54: 246-262.

[5] Devernow Andrea and Ivo Welch, 1996, Rational Herding in Financial Economics, European Economic Review, 40, 603-615

[6] Doherty, Neil A. and James Garven, 1995. "Insurance Cycles: Interest Rates and the Capacity Constraint Model," Journal of Business, 68: 383-404.

[7] Doherty, Neil A. and Han-Bing Kang, 1988. "Interest Rates and Insurance Price Cycles," Journal of Banking and Finance, 12: 189-214.

[8] Froot, Kenneth A., David S. Scharfstein, and Jeremy C. Stein, 1992, Herd on the street: Informational inefficiencies in a market with short-term speculation, Journal of Finance 47, 1461–1484

[9] Gron, Anne, 1994. "Capacity Constraints and Cycles in Property-Casualty Insurance Markets," Rand Journal of Economics 25: 110-127.

[10] Harrington, Scott E., 2004, Tort Liability, Insurance Rates, and the Insurance Cycle, Brookings-Wharton Papers on Financial Services, 97-138

[11] Harrington, Scott E. and Patricia M. Danzon, 1994, Price Cutting in Liability Insurance Markets, Journal of Business, 67, 511-538

[12] Hirshleifer, David, Avanidhar Subrahmanyam, and Sheridan Titman, 1994, Security analysis and trading patterns when some investors receive information before others, Journal of Finance 49, 1665–1698

[13] Hirshleifer, David, and Siew Hong Teoh, 2003, Herd Behaviour and Cascading in Capital Markets: a Review and Synthesis, European Financial Management, 9, 25-66

[14] Hwang, S. and M. Salmon, 2003, Herding and Market Stress, the Journal of Empirical Finance, 11, 585-616

[15] Lai, Gene C. and Robert. C. Witt, Hung-Gay Fung, Richard D. MacMinn and Patrick L. Brockett, 2000, Great (And Not so Great) Expectations: An Endogenous Economic Explication of Insurance Cycles and Liability Crises, the Journal of Risk and Insurance 67, 617-652.

[16] Jegadeesh Narasimhan, and Woojin Kim, 2010, Do Analysts Herd? An Analysis of Recommendations and Market Reactions, Review of Financial Studies, 23, 901-937.

[17] Lakonishok, J., Andrei. Shleifer and Robert.W. Vishny, 1992, The Impact of Institutional Trading on Stock Prices, the Journal of Financial Economics 32, 23-43

[18] Nofsinger John R and Richard W. Sias, 1999, Herding and feedback trading by institutional and individual investors, the Journal of Finance, 54, 2263-2295

[19] Park, S., 1991, Bank Failure Contagion in Historical Perspective, Journal of Monetary Economics 28, 271-286

[20] Rajan, Raghuram G., 1994, Why credit policies fluctuate: A theory and some evidence, The Quarterly Journal of Economics 436, 399-442

[21] Scharfstein, David S., and Jeremy C. Stein, 1990, Herd behavior and investment, American Economic Review 80, 465–479

[22] Sommer W. David, 1996, The Impact of Firm Risk on Property-Liability Insurance Prices, the Journal of Risk and Insurance, 63, 501-514

[23] Welch, Ivo, 2000, Herding among Security Analysts, Journal of Financial Economics 58, 369-396

[24] Wermers, Russ, 1998, Herding, Trade Reversals, and Cascading by Institutional Investors, working paper

[25] Wermers, Russ, 1999, Momentum investment strategies of mutual funds, performance persistence, and survivorship bias, working paper

[26] Winter, Ralph A., 1988. "The Liability Crisis and the Dynamics of Competitive Insurance Markets," Yale Journal on Regulation 5: 455-499.

[27] Winter, Ralph A., 1991. "The Liability Insurance Market," Journal of Economic Perspectives 5: 115-136.

[28] Winter, Ralph A, 1994. "The Dynamics of Competitive Insurance Markets," Journal of

[29] Financial Intermediation 3: 379-415.

Zwiebel, Jeffrey, 1995, Corporate Conservatism and Relative Compensation, Journal of Political Economy, 103, 1-25.