

## Predictive Modeling and the Underwriting Cycle – Personal Lines

Underwriting Cycle Seminar  
October 5 – 6, 2009



### Predictive Modeling & the Underwriting Cycle – Personal Lines

- Predictive has made an impact on stages of the underwriting cycle
- Underwriting standards are being evaluated more objectively
- Insurers are being more disciplined about overall and risk level pricing
- There will be winners and losers
- Companies are using new and innovative ways to accomplish their goals



## Definition: Underwriting Cycle

- Answer.com
  - Phase 1: Tendency of property and liability insurance premiums, insurers' profits, and availability of coverage to rise and fall with regularity over time. A cycle can be said to begin when insurers tighten their underwriting standards and sharply raise premiums after a period of severe underwriting losses. Stricter standards and higher premiums rates often bring dramatic increases in profits, attracting more capital to the insurance industry and raising underwriting capacity...

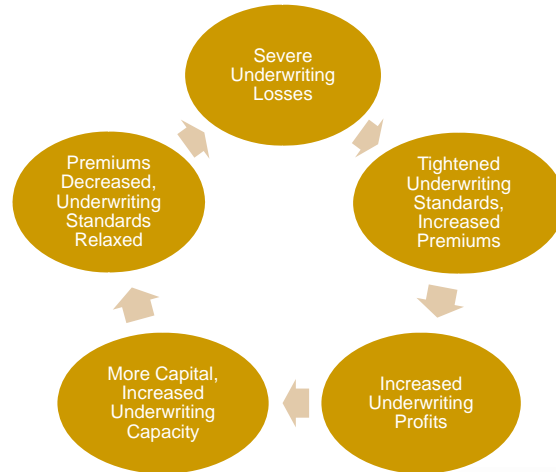


## Definition: Underwriting Cycle (cont'd)

- Answer.com
  - Phase 2: On the other hand, as insurers strive to write more premiums at higher levels of profitability, premiums rates may be driven down and underwriting standards relaxed in the competition for new business. Profits may erode and then turn into losses if more lax underwriting standards generating mounting claims. The stage would then be set for the cycle to begin again



## Underwriting Cycle



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## The Question

- How does predictive modeling impact the stages of the underwriting cycle?
  - Underwriting standards
  - Premium changes
  - Profitability
- Evidence
  - Empirical
  - Anecdotal

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## Underwriting Standards

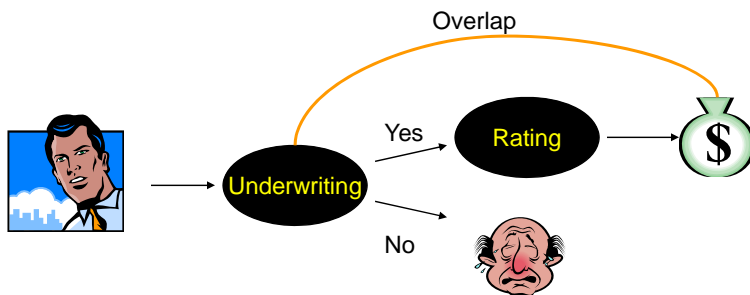


## Underwriting vs. Rating Today

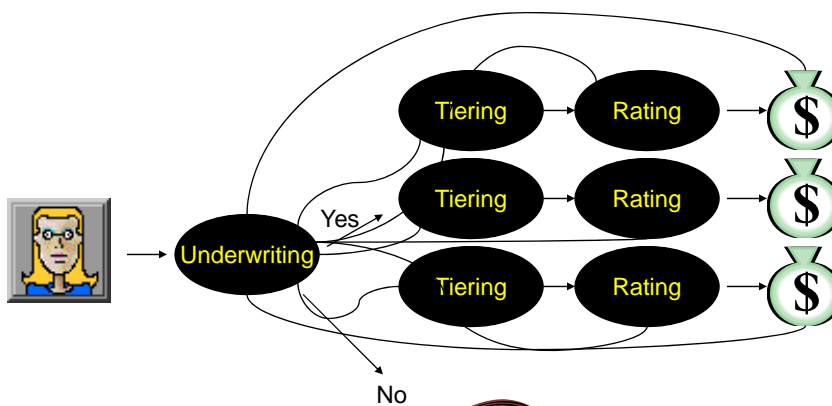
- Historically distinct areas
  - Underwriting determined eligibility
  - Rating determined the price
  - Underwriting was based on more subjective elements
- Today, a more blurred distinction
  - Underwriting determines eligibility
  - Eligibility criteria are more objective
  - Underwriting and actuarial determines rating tier
  - Actuarial determines tier relativities and rates



## Historical Risk Selection & Pricing Flow



## Current Risk Selection and Pricing Flow



## Underwriting Eligibility Criteria

- Auto
  - Prior accidents
  - Violation history
  - Credit score
  - Prior insurance
  - Existing damage
  - Vehicles
  - Vehicle usage
  - Vehicle age
  - Driver license infractions
  - Driving experience
- Homeowners
  - Prior claims
  - Credit score
  - **Property condition\***
  - Amount of insurance
  - Occupancy
  - **Reputation\***
  - Swimming pools/trampolines
  - Age of major elements

## Has Predictive Modeling Impacted Underwriting Standards?

- Many underwriting criteria are being objectively measured
- The overlap between rating factors and underwriting criteria is being eliminated
- With less underwriting standard subjectivity, a part of the cycle is diminished

## Premium Changes & Profitability

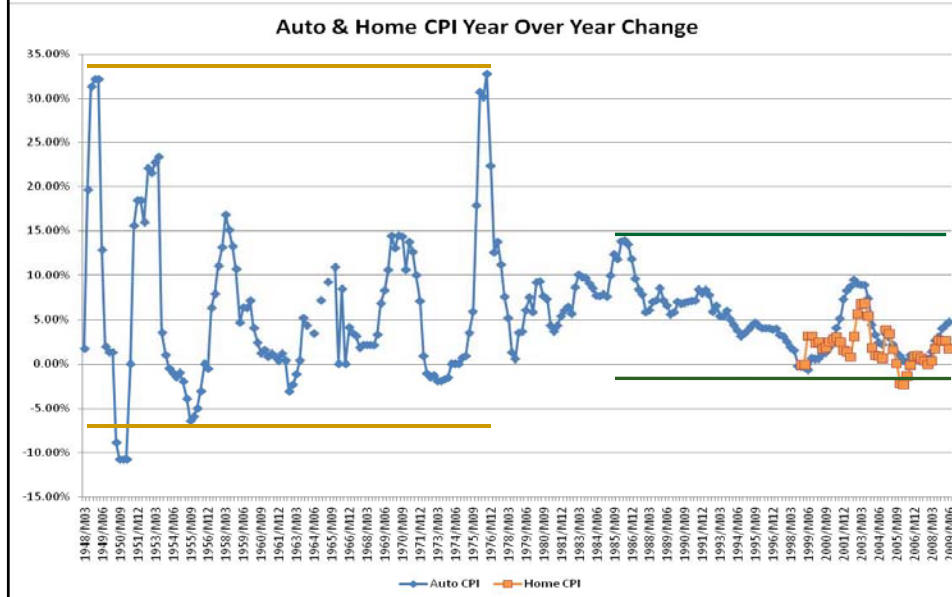


## Premium Changes

- Companies have using base rate changes less to manage competitive position
- Many premium changes have incorporated more complex rating algorithms
- Rate decreases were being targeted for those customers identified by predictive modeling as lower cost risks
- Companies have being careful about “following the leader”
- In the future...



## Auto & Home Insurance CPI Data



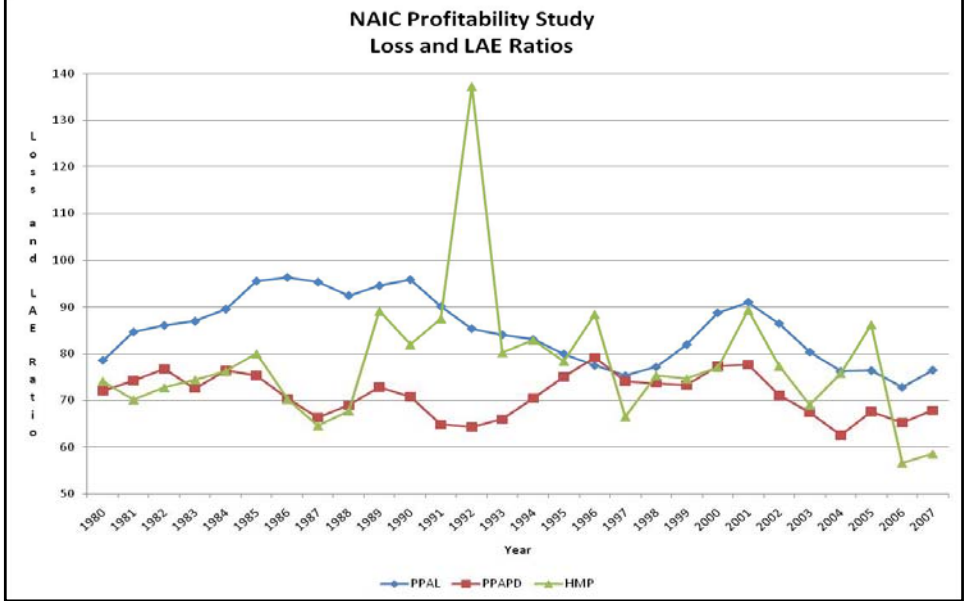
## “State Farm: Behind the Veil” – July 1, 2001

- “In recent years, State Farm’s strategy has led it to maintain low rates in certain states and reduce rates in others, all with an eye toward winning back market share”
- Since 1998 - \$2.7B in rate reductions
- Since 1997 - \$2.6B in dividends
- GEICO – price to produce satisfactory float costs to investors
- Progressive – promise to price product to 4% underwriting profit
- State Farm has reported \$6.4B in underwriting losses and dividends over last two years

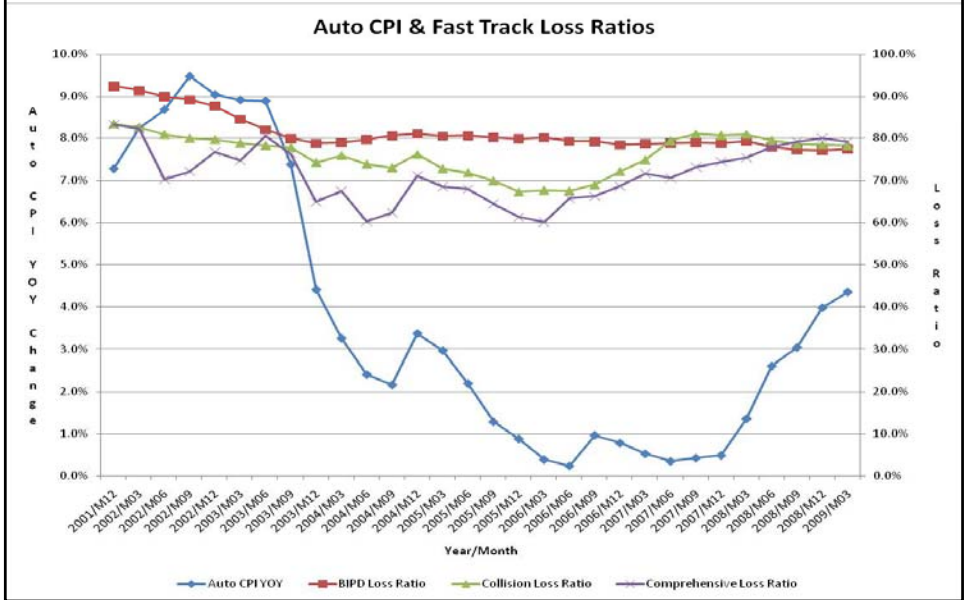
Bowers, Barbara. “State Farm: Behind the Veil.” Best’s Review, July 1, 2001.



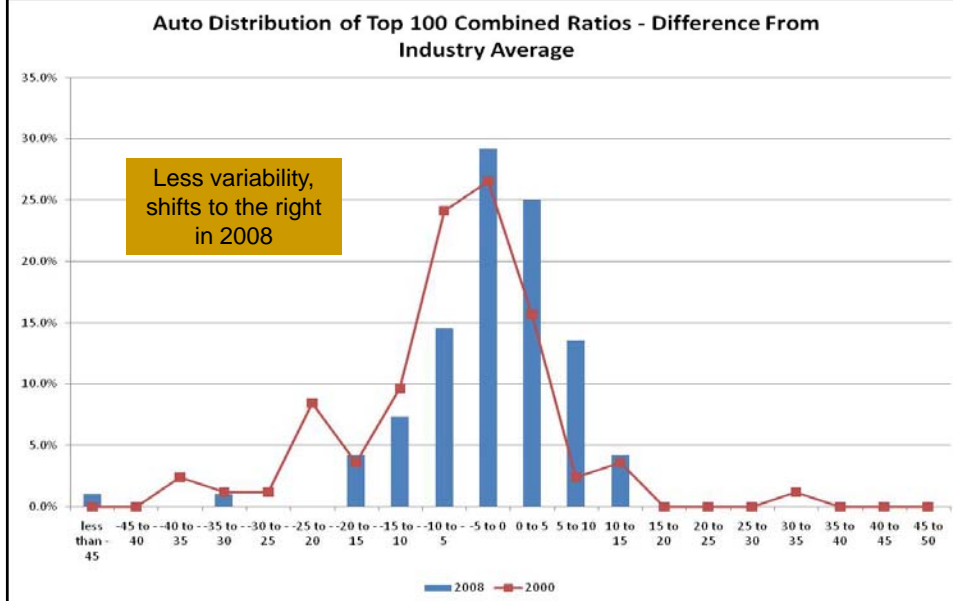
## Personal Lines Profitability



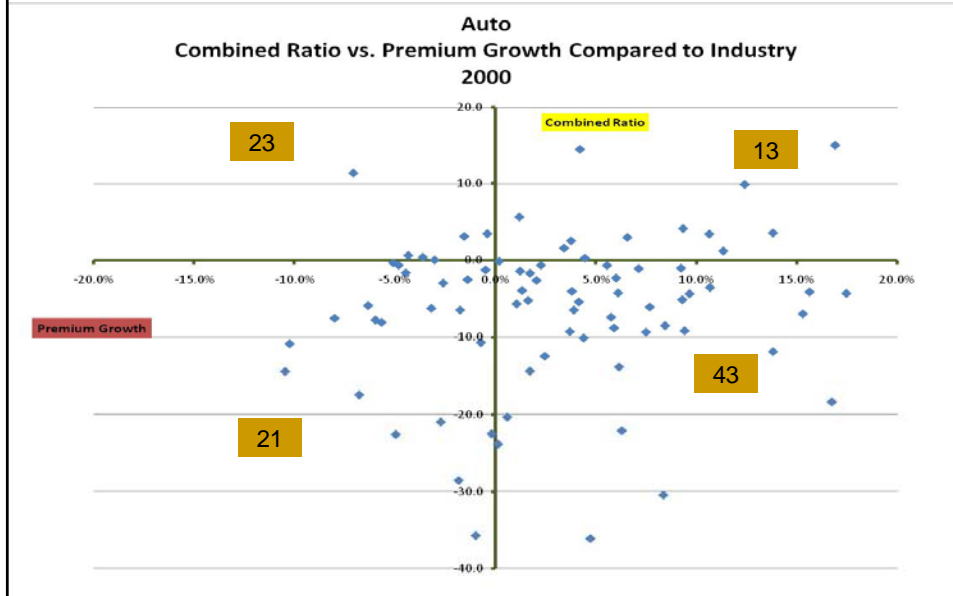
## Premium History and Profitability



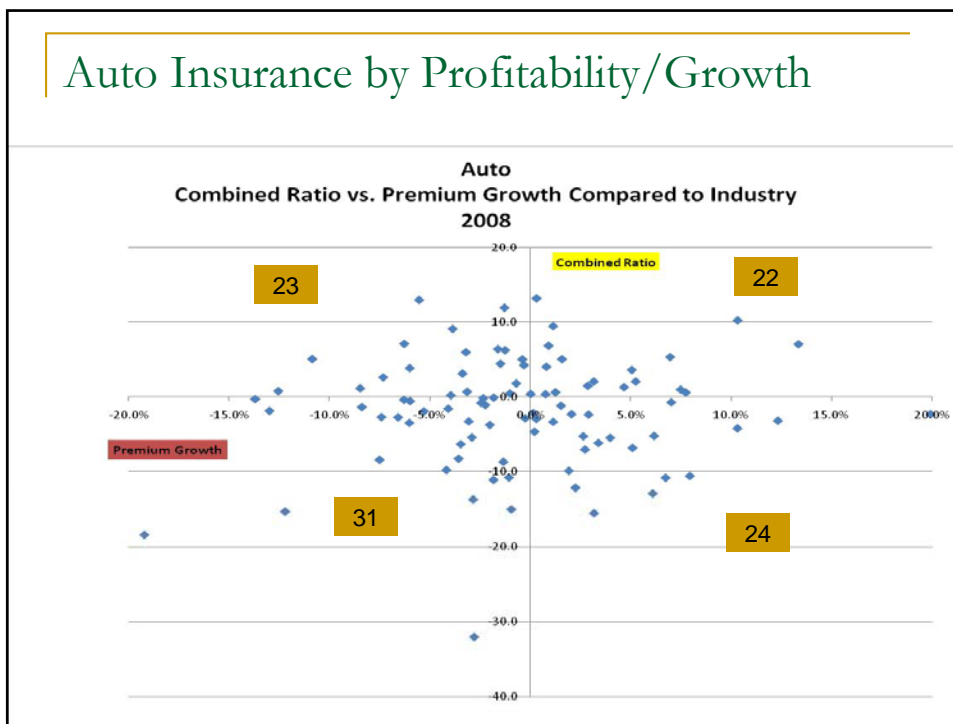
## Auto Distribution of Combined Ratios



## Auto Insurance by Profitability/Growth



## Auto Insurance by Profitability/Growth



## Auto Premium Growth

Rank	Group	Difference From Market											
		2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997
1	00088 State Farm Group	1.9%	-0.6%	-0.2%	-3.1%	-4.3%	-1.7%	1.8%	6.5%	-5.0%	-4.6%	-3.8%	-4.5%
2	00008 Allstate Insurance Group	-3.2%	0.3%	0.4%	5.8%	3.3%	-3.7%	-6.2%	-5.0%	-3.2%	-1.5%	0.3%	-0.4%
3	00811 Berkshire Hathaway Ins Group	7.0%	5.8%	9.5%	12.2%	10.4%	7.9%	2.4%	-1.1%	15.3%	17.4%	14.8%	11.3%
4	00780 Progressive Insurance Group	-0.3%	-2.6%	-0.7%	3.1%	7.9%	18.4%	19.9%	4.0%	-1.7%	15.4%	12.2%	27.0%
5	00032 Farmers Insurance Group	0.0%	2.7%	0.4%	-2.4%	-0.7%	-8.0%	-10.2%	-8.2%	-1.4%	-1.2%	-2.4%	-5.2%
6	05987 Nationwide Group	-0.2%	0.4%	-0.3%	0.3%	-0.2%	-1.7%	-2.7%	1.3%	5.8%	6.4%	0.4%	1.2%
7	00060 Liberty Mutual Insurance Companies	1.1%	1.2%	-2.8%	-3.7%	3.0%	62.1%	2.4%	-1.4%	3.7%	22.5%	0.8%	-1.3%
8	04080 USAA Group	5.1%	0.2%	3.1%	1.0%	-3.0%	0.8%	3.4%	2.9%	7.5%	4.6%	-2.8%	-1.3%
9	18540 American International Group	-8.4%	-4.4%	0.6%	5.2%	2.5%	0.7%	3.5%	-1.9%	11.3%	42.3%	10.0%	-3.2%
10	00124 American Family Insurance Group	-3.1%	0.8%	-1.9%	-0.6%	1.2%	2.4%	5.8%	0.0%	2.1%	5.3%	7.8%	4.5%
11	18674 Travelers Group	1.5%	1.4%	2.9%	-1.0%	6.7%	-8.0%	-10.2%	-8.2%	-1.4%	-1.2%	-2.4%	-5.2%
12	00048 Hartford Insurance Group	-1.6%	2.0%	3.9%	3.4%	4.0%	-9.7%	-4.3%	1.0%	6.0%	9.9%	10.1%	-1.4%
13	04524 Mercury General Group	-7.4%	-2.4%	1.6%	9.4%	11.8%	12.1%	18.4%	4.7%	-3.6%	2.4%	5.4%	27.6%
14	18515 Auto Club Enterprises Insurance Group	-0.4%	-1.7%	-3.5%	6.2%	-0.8%	17.1%	5.7%	-2.9%	7.7%	6.7%	2.6%	3.7%
15	18552 MetLife Auto & Home Group	-1.3%	0.5%	-1.8%	-2.1%	-3.9%	-6.0%	2.9%	9.1%	8.5%	-0.8%	-1.0%	-0.8%
16	04283 Erie Insurance Group	1.6%	-0.4%	-6.3%	-3.6%	2.3%	5.2%	9.4%	2.3%	1.3%	-3.8%	-0.6%	2.4%
17	18460 California State Auto Group	-5.3%	2.0%	1.4%	2.7%	-0.7%	-2.6%	-2.7%	-4.4%	0.6%	-3.6%	-4.4%	1.8%
18	02966 Commerce Group	-7.3%	-2.9%	-2.8%	0.9%	6.7%	11.9%	10.7%	-2.6%	10.7%	6.8%	-0.1%	0.1%
19	00914 Unitrin P & C Insurance Grp	10.3%	7.0%	-1.7%	-1.3%	24.4%	-8.0%	-10.2%	-8.2%	-1.4%	-1.2%	-2.4%	-5.2%
20	18431 GMAC Insurance Group	-7.5%	-6.8%	-5.5%	2.4%	-0.6%	12.5%	-0.3%	-5.3%	1.2%	-3.0%	-15.7%	-7.8%

## Auto Combined Ratio

Rank	Group	Difference from Industry										
		2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998
1	00088 State Farm Group	-9.9	-6.0	-7.1	-3.3	-1.4	-3.0	-20.5	-24.2	-22.6	-16.0	-20.4
2	00008 Allstate Insurance Group	6.0	5.9	7.0	3.8	2.1	3.5	-3.2	-2.5	-6.2	-3.7	-6.1
3	00811 Berkshire Hathaway Ins Group	5.3	5.2	6.5	6.0	3.5	3.9	3.1	2.6	-7.0	-7.5	-5.8
4	00780 Progressive Insurance Group	4.2	3.7	6.4	6.9	6.5	9.7	3.3	2.5	-6.5	-3.4	-4.1
5	00032 Farmers Insurance Group	0.4	-2.5	-5.0	-1.6	-5.2	-3.3	95.7	99.3	99.2	94.0	88.0
6	05987 Nationwide Group	-2.9	-5.9	-2.0	-7.4	-3.8	-1.5	-0.5	-7.3	-7.4	-10.1	-13.7
7	00060 Liberty Mutual Insurance Companies	-3.4	-0.1	-1.3	-0.8	-4.7	-3.3	-11.6	-10.8	-9.3	-8.5	-10.5
8	04080 USAA Group	3.6	-3.8	0.1	0.0	3.7	7.9	-1.1	-4.1	-9.3	-18.3	-28.1
9	18540 American International Group	-1.4	-0.1	5.1	-16.1	0.2	6.3	4.0	1.8	1.2	-4.4	0.9
10	00124 American Family Insurance Group	-3.3	-4.7	-8.4	1.9	-3.5	-2.2	-3.0	-2.0	-2.6	-5.5	-8.8
11	18674 Travelers Group	-1.2	2.9	3.0	8.0	0.7	1.4	95.7	99.3	99.2	94.0	88.0
12	00048 Hartford Insurance Group	6.4	-0.9	-0.9	-3.3	-2.2	3.2	-4.8	-6.6	-2.3	-7.7	-9.1
13	04524 Mercury General Group	-2.7	0.7	-2.8	2.7	2.8	4.2	-2.3	-0.3	0.4	-0.3	-0.6
14	18515 Auto Club Enterprises Insurance Group	5.0	0.8	-2.0	3.3	3.5	-0.8	-6.2	-9.2	-6.1	-7.2	-17.8
15	18552 MetLife Auto & Home Group	11.9	7.1	6.6	1.0	-3.8	-5.2	-6.3	-7.6	-8.5	-5.3	-9.8
16	04283 Erie Insurance Group	5.0	5.9	-2.3	-6.7	-7.5	-8.5	-29.3	-14.0	-3.9	-3.4	-10.7
17	18460 California State Auto Group	-1.9	-4.5	-6.9	1.1	-4.1	-3.0	-11.4	-13.8	-20.3	-9.8	-23.5
18	02966 Commerce Group	2.6	3.3	5.2	6.9	7.2	4.4	-3.6	1.5	3.4	-7.4	-11.2
19	00914 Unifrin P & C Insurance Grp	-4.2	-7.3	-6.8	-5.6	-18.5	-5.7	95.7	99.3	99.2	94.0	88.0
20	18431 GMAC Insurance Group	-8.4	-1.7	-8.4	-9.0	-11.1	-8.7	-10.3	-15.0	-1.4	-11.2	-15.5



## Homeowners Premium Growth

Rank	Group	Difference From Market											
		2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997
1	00088 State Farm Group	-1.6%	0.1%	-1.5%	-0.8%	-0.1%	-0.4%	2.0%	2.4%	-5.4%	-0.5%	-1.6%	-1.9%
2	00008 Allstate Insurance Group	-4.3%	-4.9%	-3.7%	6.7%	4.3%	-3.7%	1.8%	-1.4%	0.0%	-0.1%	1.9%	-3.6%
3	00032 Farmers Insurance Group	2.5%	1.2%	-0.4%	-2.0%	-4.0%	-14.6%	-14.4%	-8.2%	-6.6%	-4.8%	-6.6%	-6.4%
4	00060 Liberty Mutual Insurance Companies	5.2%	5.0%	-2.2%	-2.8%	-2.7%	80.5%	-0.7%	-2.0%	-1.1%	47.1%	4.7%	5.9%
5	18674 Travelers Group	1.8%	2.8%	2.7%	6.0%	13.1%	-14.6%	-14.4%	-8.2%	-6.6%	-4.8%	-6.6%	-6.4%
6	05987 Nationwide Group	-2.0%	-2.3%	-1.8%	1.3%	0.2%	1.5%	1.3%	1.3%	1.3%	4.1%	1.2%	4.3%
7	04080 USAA Group	-0.8%	2.8%	2.7%	3.1%	5.4%	3.3%	-2.0%	2.3%	2.0%	4.0%	0.7%	0.1%
8	00012 Chubb Group of Insurance Companies	-1.0%	1.8%	1.0%	1.8%	-1.0%	1.1%	8.6%	7.4%	5.9%	4.9%	2.9%	3.1%
9	00124 American Family Insurance Group	-2.1%	-3.6%	-7.6%	-6.4%	5.6%	9.7%	5.7%	5.3%	4.1%	9.5%	7.6%	5.5%
10	00048 Hartford Insurance Group	-2.4%	3.1%	3.7%	2.4%	1.8%	-1.3%	-2.6%	-1.3%	2.5%	2.9%	-0.7%	-0.9%
11	11712 Citizens Property Insurance Corporation	-32.3%	12.4%	146.5%	-7.5%	5.3%	-14.6%	-14.4%	-8.2%	-6.6%	-4.8%	-6.6%	-6.4%
12	18552 MetLife Auto & Home Group	-2.8%	-0.3%	-2.8%	-0.5%	-5.6%	-6.8%	8.5%	24.7%	0.3%	-5.5%	-7.8%	-11.8%
13	04354 Auto-Owners Group	-1.1%	-4.3%	-7.8%	-0.7%	2.4%	10.8%	13.1%	9.5%	6.5%	5.4%	7.5%	8.3%
14	04283 Erie Insurance Group	0.2%	-2.2%	-8.8%	-6.2%	9.3%	9.9%	7.7%	6.2%	3.8%	6.8%	7.8%	7.1%
15	18540 American International Group	8.7%	14.6%	8.6%	-2.3%	-2.1%	30.6%	14.5%	8.1%	7.9%	19.8%	-7.3%	24.2%
16	18429 Allianz of America	-0.1%	6.8%	4.4%	1.6%	-5.3%	-10.0%	-10.5%	2.3%	-0.2%	-0.6%	1.2%	1.4%
17	00302 COUNTRY Financial	3.7%	5.5%	-1.8%	5.3%	10.7%	30.8%	2.0%	3.0%	-1.6%	9.6%	-1.6%	0.5%
18	18460 California State Auto Group	-1.3%	4.0%	4.4%	9.9%	5.2%	11.9%	-4.2%	2.6%	7.6%	10.7%	2.0%	-1.4%
19	18753 Universal Insurance Holdings Group	1.1%	29.6%	328.5%	95.3%	28.4%	-14.6%	-14.4%	-8.2%	-6.6%	-4.8%	-6.6%	-6.4%
20	04861 Allmerica Financial P & C Cos	-1.5%	0.7%	-3.4%	-9.0%	-6.3%	-5.0%	-1.3%	1.6%	2.9%	-1.5%	-7.2%	0.1%
21	18515 Auto Club Enterprises Insurance Group	4.2%	2.2%	5.4%	4.2%	5.5%	36.7%	10.3%	7.9%	7.0%	15.9%	18.1%	15.2%
35	18488 Homesite Group	20.1%	6.4%	9.5%	65.9%	56.8%	75.4%	142.2%	1772.2%	2136.2%	-4.8%	-6.6%	-6.4%



## Homeowners Combined Ratio

Rank	Group	Difference from Industry										
		2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998
1	00088 State Farm Group	-12.8	-5.3	-4.9	-3.6	-0.1	-4.2	-22.4	-28.4	-26.9	-19.8	-23.7
2	00008 Allstate Insurance Group	-0.4	4.0	8.7	-24.2	0.0	10.8	-0.3	-0.5	-3.2	-5.8	-6.1
3	00032 Farmers Insurance Group	-26.8	-13.7	-6.7	18.0	18.2	3.1	-17.5	-24.9	-21.8	-28.0	-18.1
4	00060 Liberty Mutual Insurance Companies	-0.1	1.8	-4.7	10.3	10.8	2.1	-7.2	-10.5	-17.0	-14.4	-18.2
5	18674 Travelers Group	14.1	4.0	10.2	6.5	31.0	9.7	1.0	-4.7	-8.6	-4.7	-16.1
6	05987 Nationwide Group	-6.2	-5.2	0.1	7.2	-2.3	-8.8	-6.7	-6.6	-14.9	-21.9	-28.9
7	04080 USAA Group	7.4	7.2	11.5	5.4	3.9	-0.7	-1.5	7.2	-4.5	-25.6	-15.7
8	00012 Chubb Group of Insurance Companies	30.2	11.1	10.0	28.7	10.3	-3.5	-5.7	-3.7	-2.2	-6.2	2.7
9	00124 American Family Insurance Group	-20.7	-33.6	-50.3	24.5	19.1	3.3	-9.9	-66.1	-39.4	-28.0	-71.1
10	00048 Hartford Insurance Group	18.4	10.7	5.9	3.3	-27.2	11.3	3.0	11.4	2.0	-2.3	-3.5
11	11712 Citizens Property Insurance Corporation	108.7	85.3	82.2	110.4	102.5	96.3	94.9	105.8	92.2	90.4	87.2
12	18552 MetLife Auto & Home Group	13.9	4.0	-4.3	-7.8	11.4	10.2	6.7	-7.1	-26.4	-4.9	-17.6
13	04354 Auto-Owners Group	-25.8	-20.5	-14.2	20.4	-26.5	-6.7	-19.2	-29.8	-25.9	-24.4	-37.7
14	04283 Erie Insurance Group	9.2	-3.7	-9.7	32.6	22.0	-11.9	-34.9	1.9	-10.9	-14.7	-13.1
15	18540 American International Group	3.6	-24.5	4.7	-53.9	1.1	15.4	1.0	26.8	16.7	40.3	-4.4
16	18429 Allianz of America	23.9	-2.5	-5.1	4.8	8.1	0.8	-9.9	-16.2	-11.6	-9.9	2.5
17	00302 COUNTRY Financial	-14.2	-20.2	-23.7	11.1	-14.5	-8.7	-12.6	-3.6	-18.3	-9.9	-19.8
18	18460 California State Auto Group	19.5	3.6	12.2	37.6	38.1	25.2	-8.9	5.5	-6.9	-23.8	-32.0
19	18752 Universal Insurance Holdings Group	52.0	85.3	82.2	-48.2	-423.6	32.4	0.1	36.9	20.0	31.6	-1.6
20	04861 Allmerica Financial P & C Cos	9.6	1.3	-1.2	5.4	9.2	3.9	1.9	0.1	-21.0	-18.7	-24.2
35	18488 Homesite Group	16.7	-5.9	-3.5	7.7	6.2	-2.5	-1.7	-34.8	-312.5	-909.5	87.2



## How Else Have Companies Distinguished Themselves?

- Marketing
- Service
- Ease of doing business
- Product differentiation



## Premium Changes and Profitability

- Overall variability of rate changes appears to be decreasing
- Results are showing more stability on profitability
- There are differences in rate of growth and profitability among insurers
  - There are some companies that are not taking full advantage of predictive modeling
- Insurers are not using price as the sole way to attract new business



## Predictive Modeling & the Underwriting Cycle – Personal Lines

- Predictive has made an impact on stages of the underwriting cycle
- Underwriting standards are being evaluated more objectively
- Insurers are being more disciplined about overall and risk level pricing
- There will be winners and losers
- Companies are using new and innovative ways to accomplish their goals

