G1: Actuarial and Business Perspectives on the Insurance Cycle

Monday, November 7, 2011: 10:15 a.m. – 11:45 a.m.

David Bassi, FCAS; CUO, Plymouth Rock Assurance Corporation

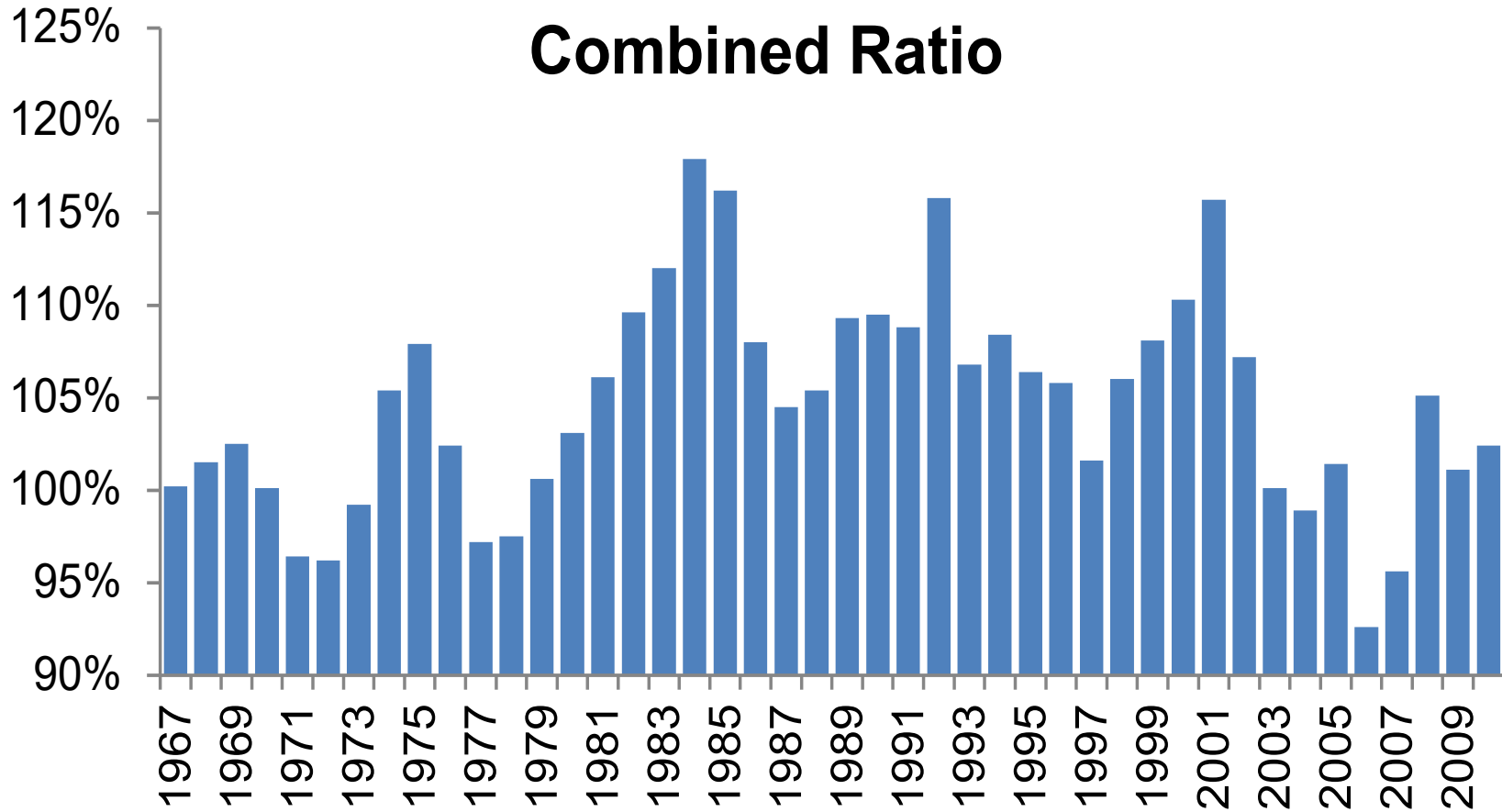**John Beckman, FCAS;** SVP & CUO, CNA Insurance Companies

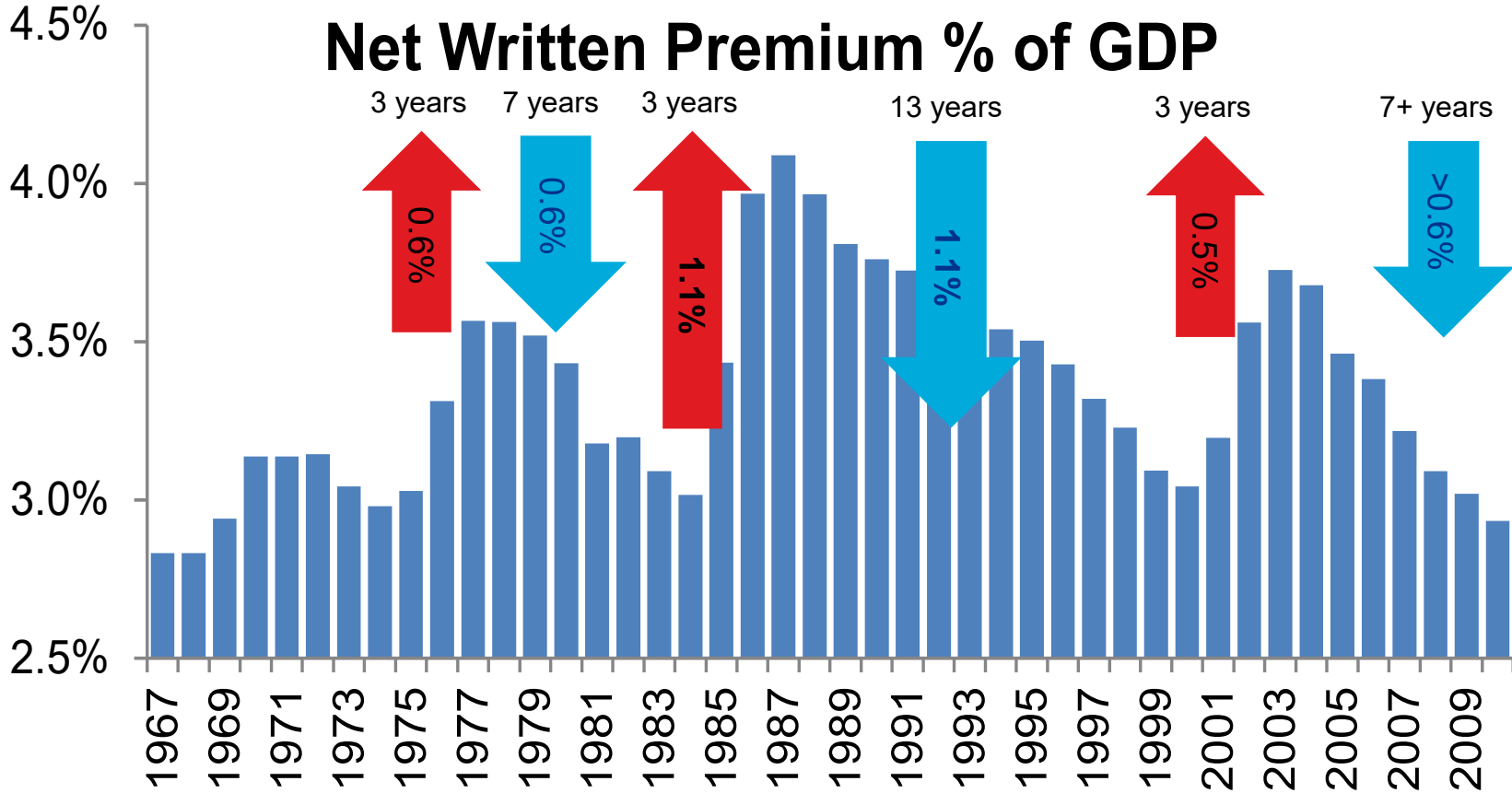**Stephen Mildenhall, FCAS;** CEO Aon Benfield Analytics
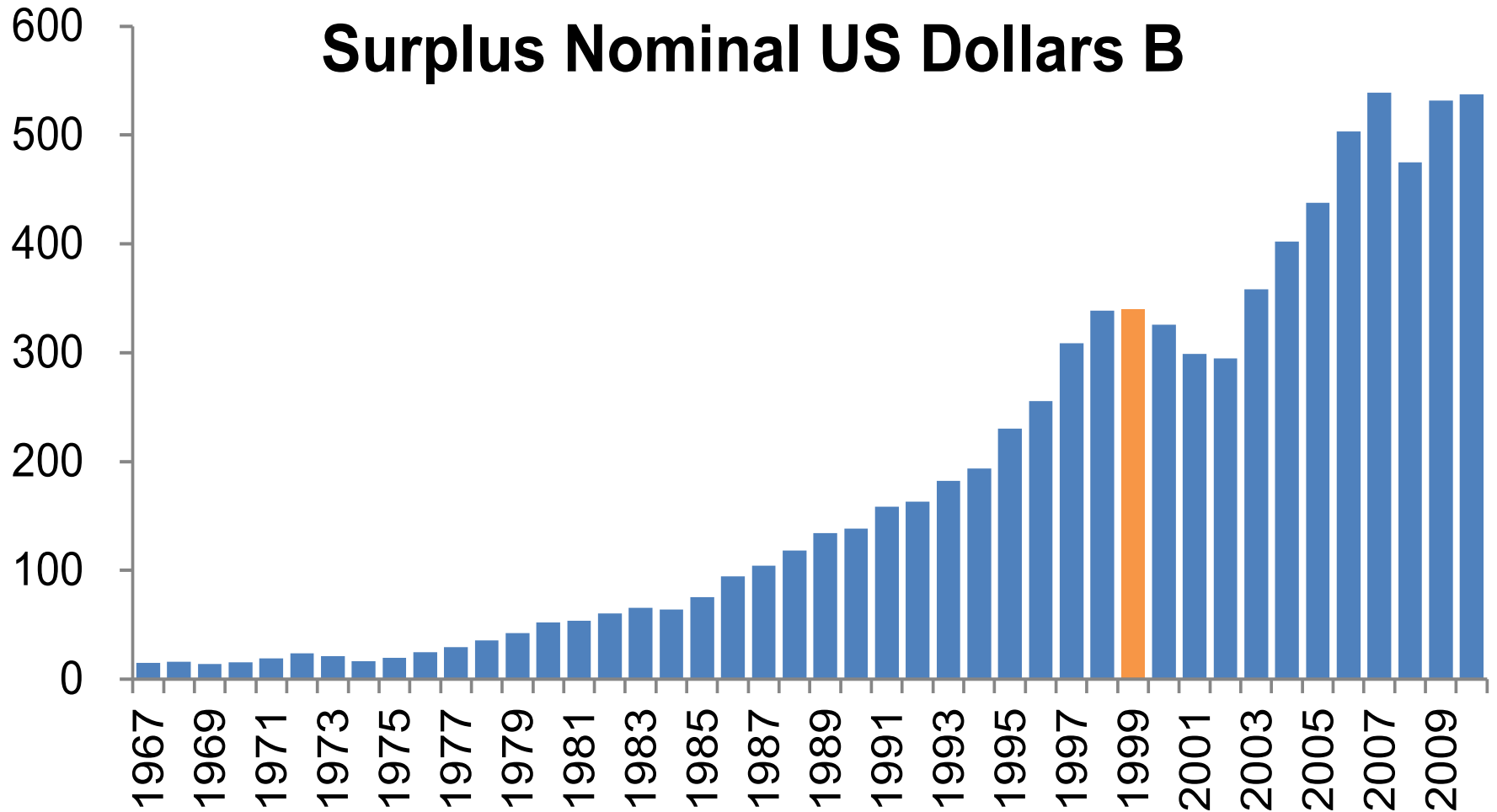
CAS 2011 Annual Meeting

Chicago IL

What is the Cycle? How Do We See It?

Combined Ratio
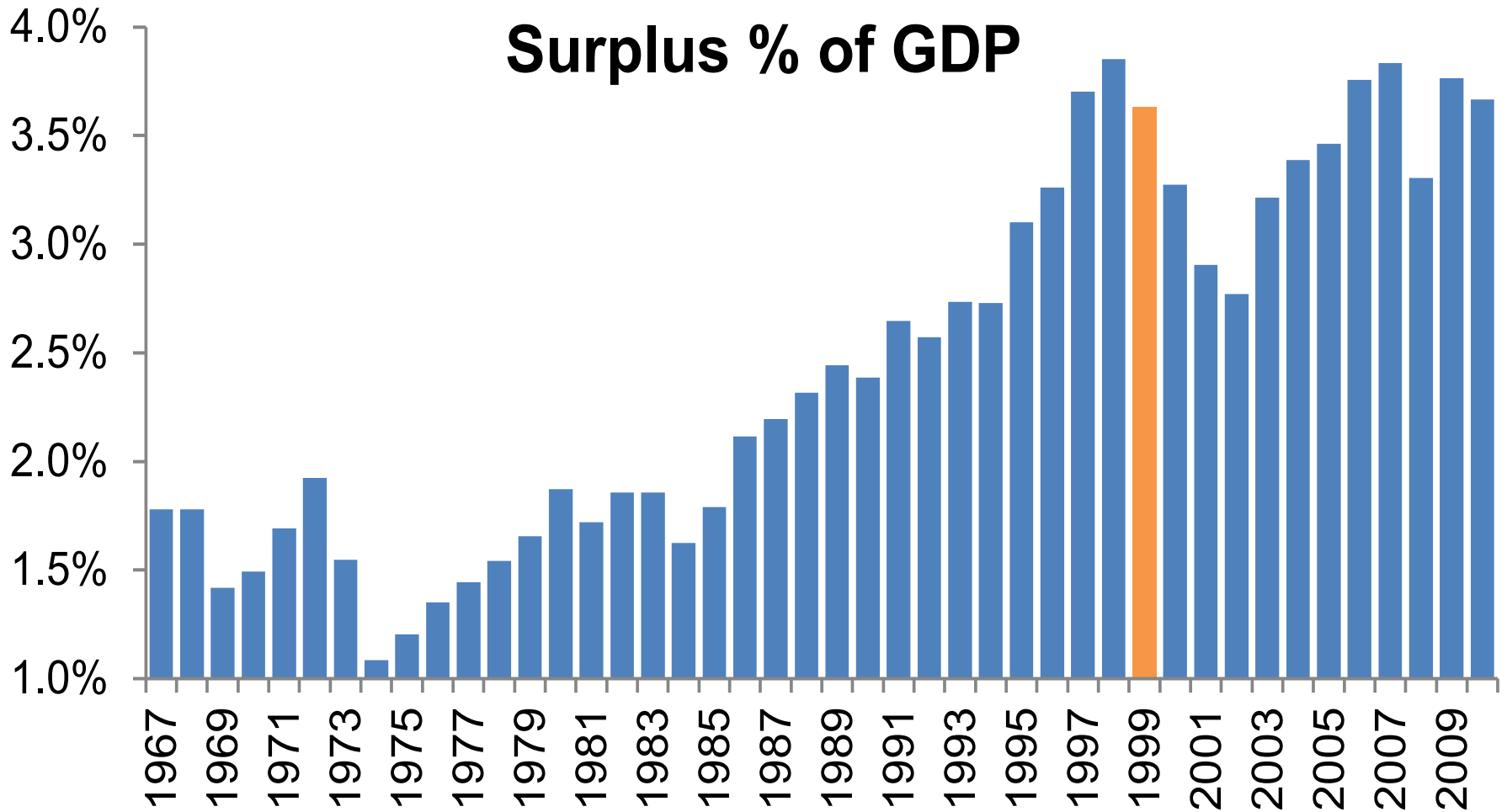
Source: A.M. Best Aggregates and Averages, Calendar Year Statutory Results

What is the Cycle? How Do We See It?

Net Written Premium % of GDP

Source: A.M. Best Aggregates and Averages, Calendar Year Statutory NWP; BEA GDP

Nominal Surplus Dollars: Local Peak in 1999, Q2 2011 at $560B

Surplus Nominal US Dollars B

Source: A.M. Best Aggregates and Averages, Calendar Year Statutory NWP

Surplus to GDP Ratio: Peaks in 1998 at 3.85%

Surplus % of GDP

CY Incurred Loss % GDP

$y = 0.0005x - 0.915$
$R^2 = 0.8869$

Andrew

Crisis

$y = -0.0004x + 0.7941$
$R^2 = 0.727$
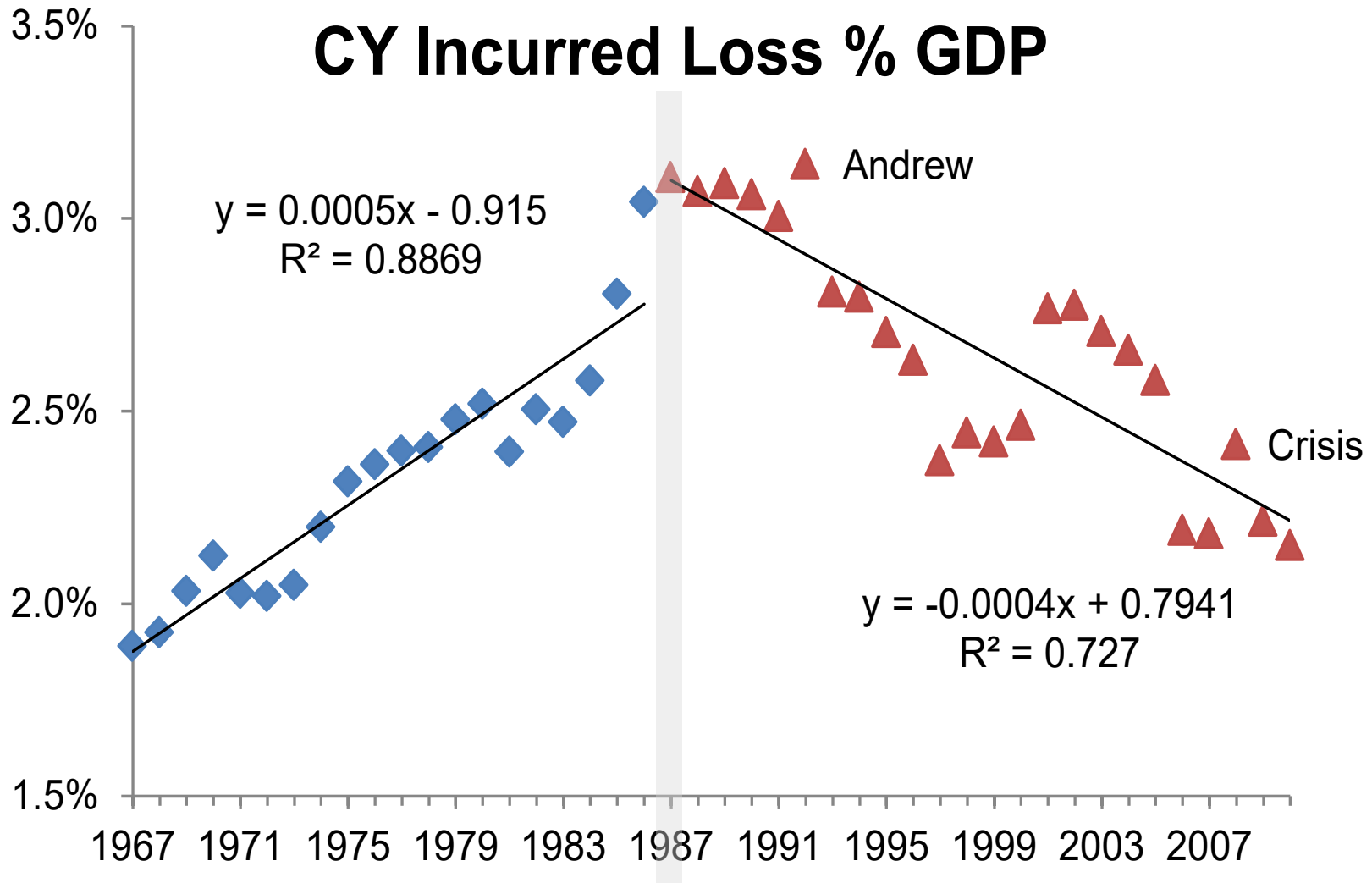
Cycle Dynamics Are Loss Driven With Systemic Noise

Model vs. Actual Premium/GDP Ratio

Legend: ■ Actual ◆ Model
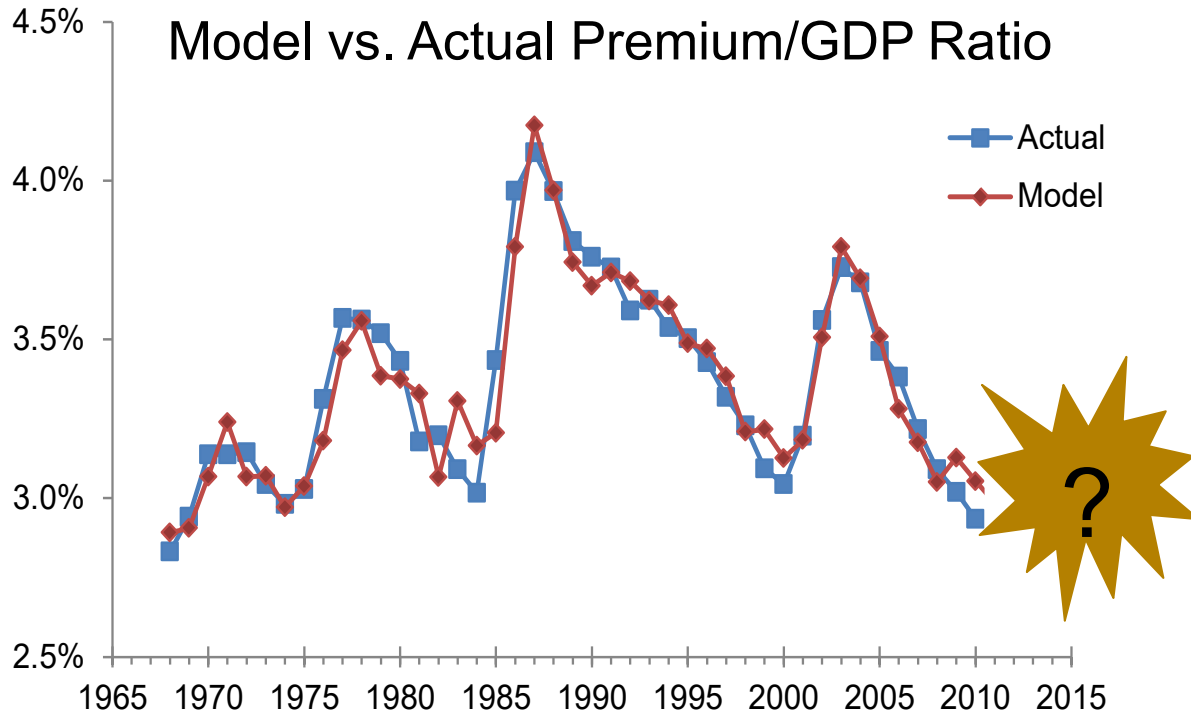
Cycle Model Statistics

|	Parameter	Std. Error	p Value
Constant	0.010	0.0017	7.9E-07
Prior Loss/GDP	0.426	0.0798	4.4E-06
Prior Premium/GDP	1.053	0.1149	1.2E-08
Second Prior Premium/GDP	-0.673	0.0936	2.8E-11
Regression R²	90.9%		

Signal

Noise

Source: Aon Benfield Analytics

Pro-cyclical Dynamic Model: Animal Spirits or Actuarial Inadequacies?
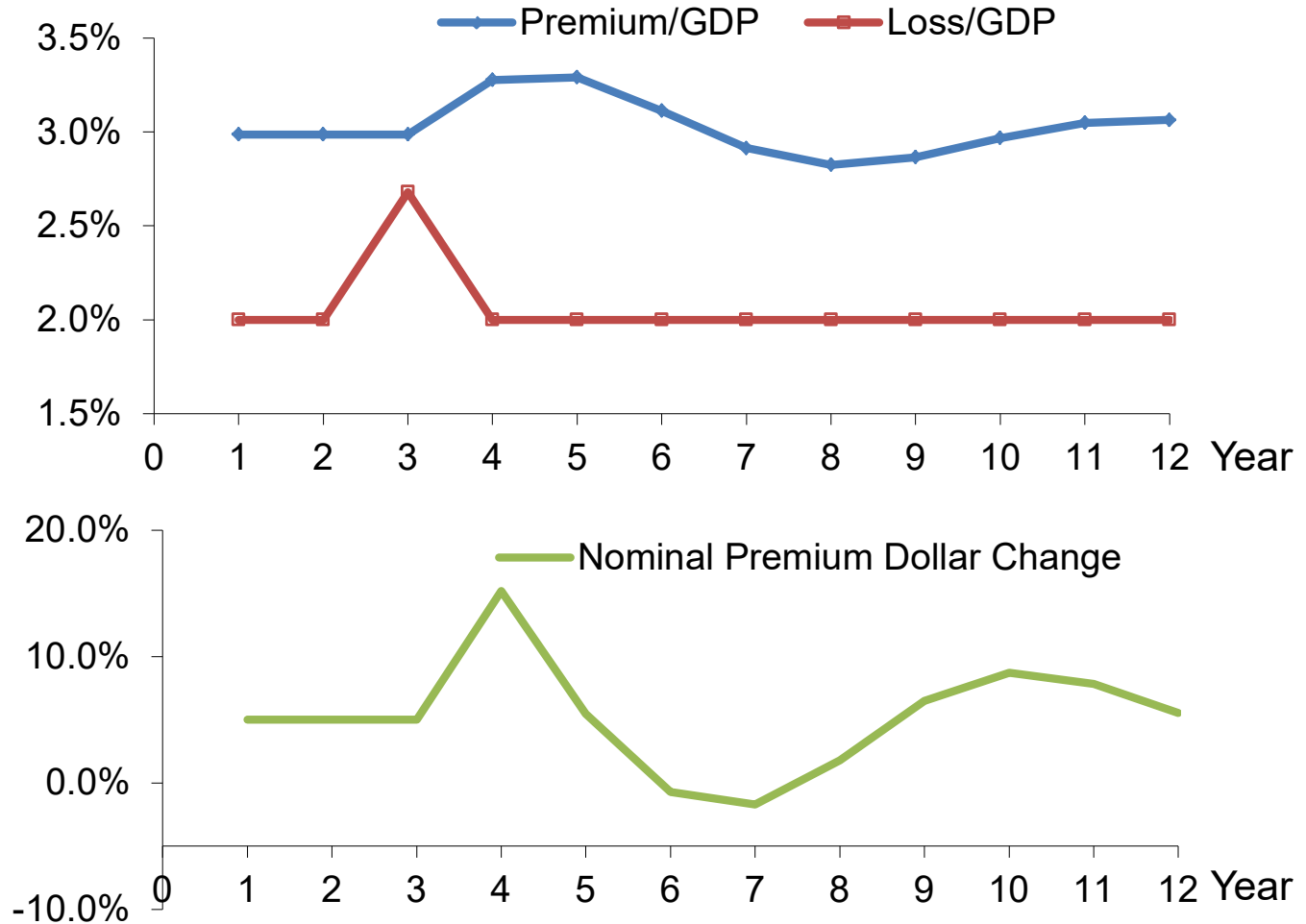
- Impact of $100B loss shock on cycle model shows pro-cyclical nature
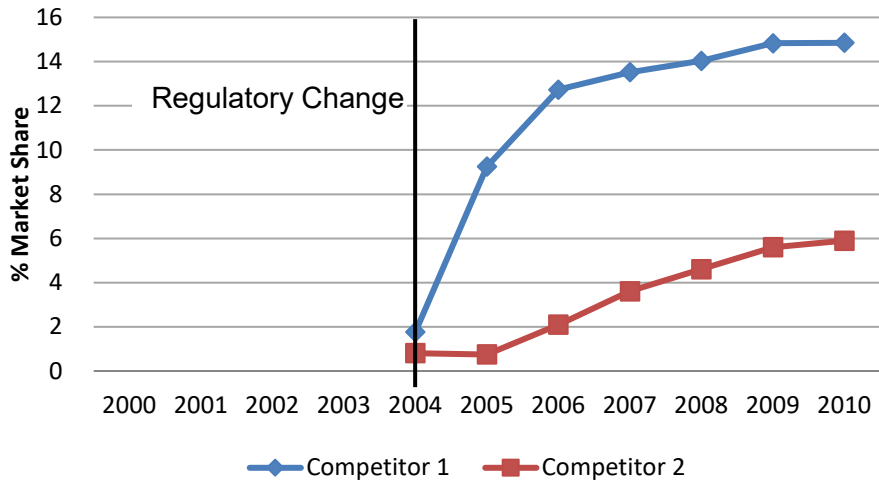- Assumes 3% real GDP growth and 2% inflation
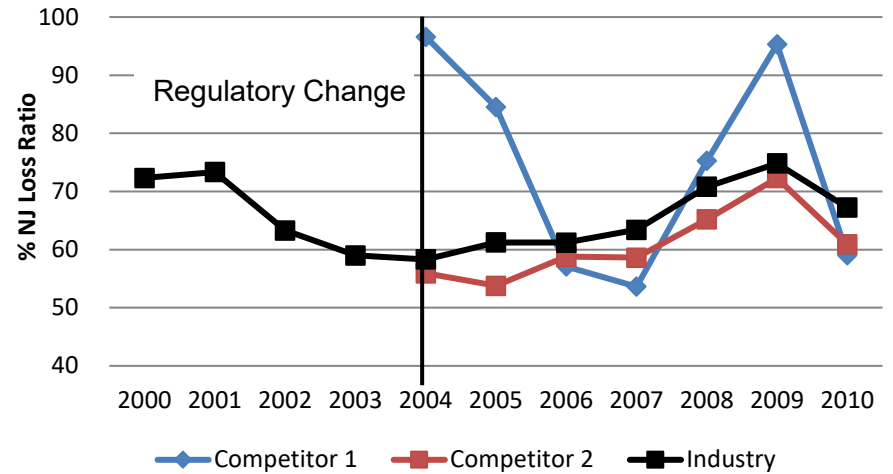
Competition: Industry Surplus
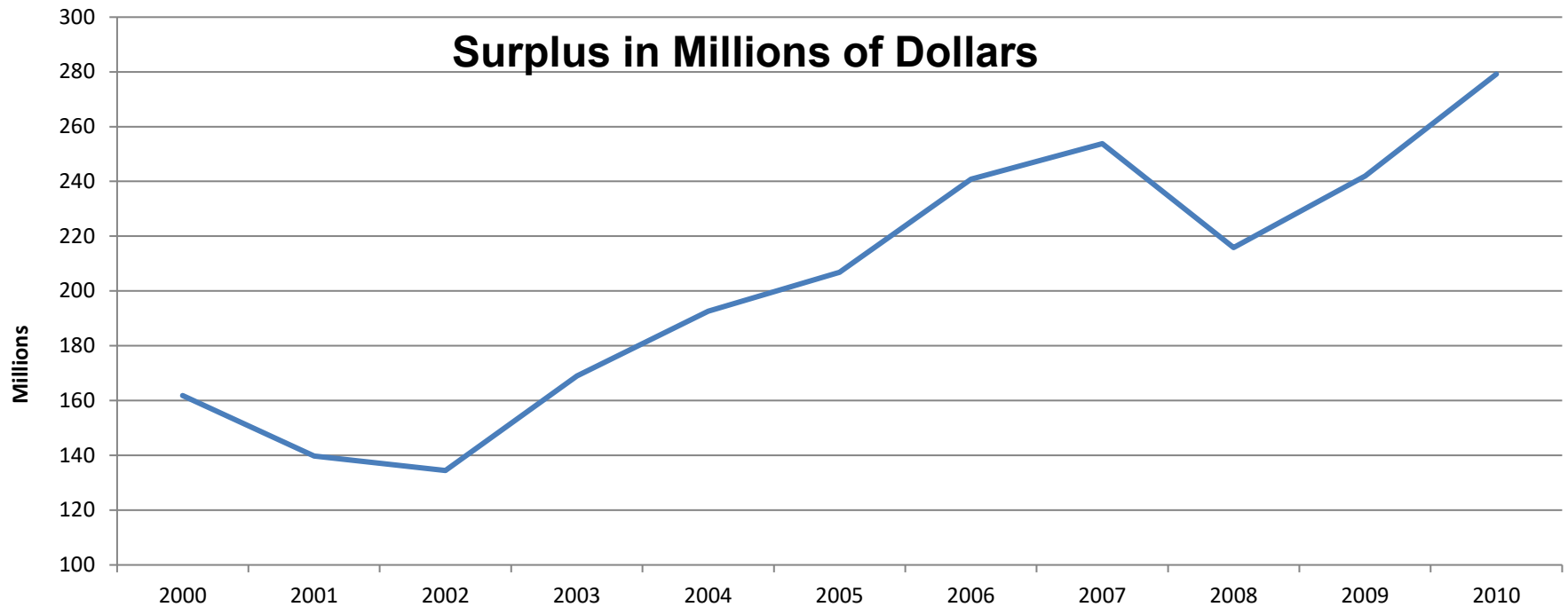
Data Source: A.M. Best's Global Insurance Database. Top 15 private passenger auto insurance companies. Representing 75% of the US market

Competition: NJ Market

NJ Market Share

NJ Loss Ratio

Data Source: Best's Market Share Reports - Eleven-Year, AMB Financial Groups and Unaffiliated Single Companies, All Private Passenger Auto

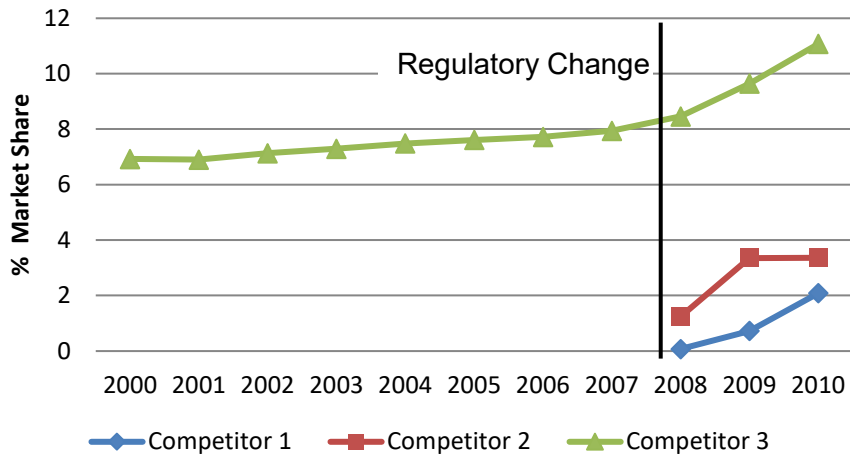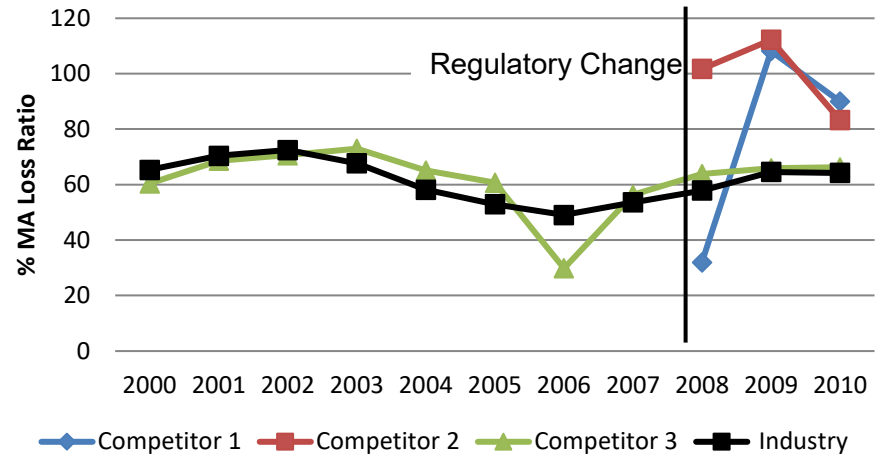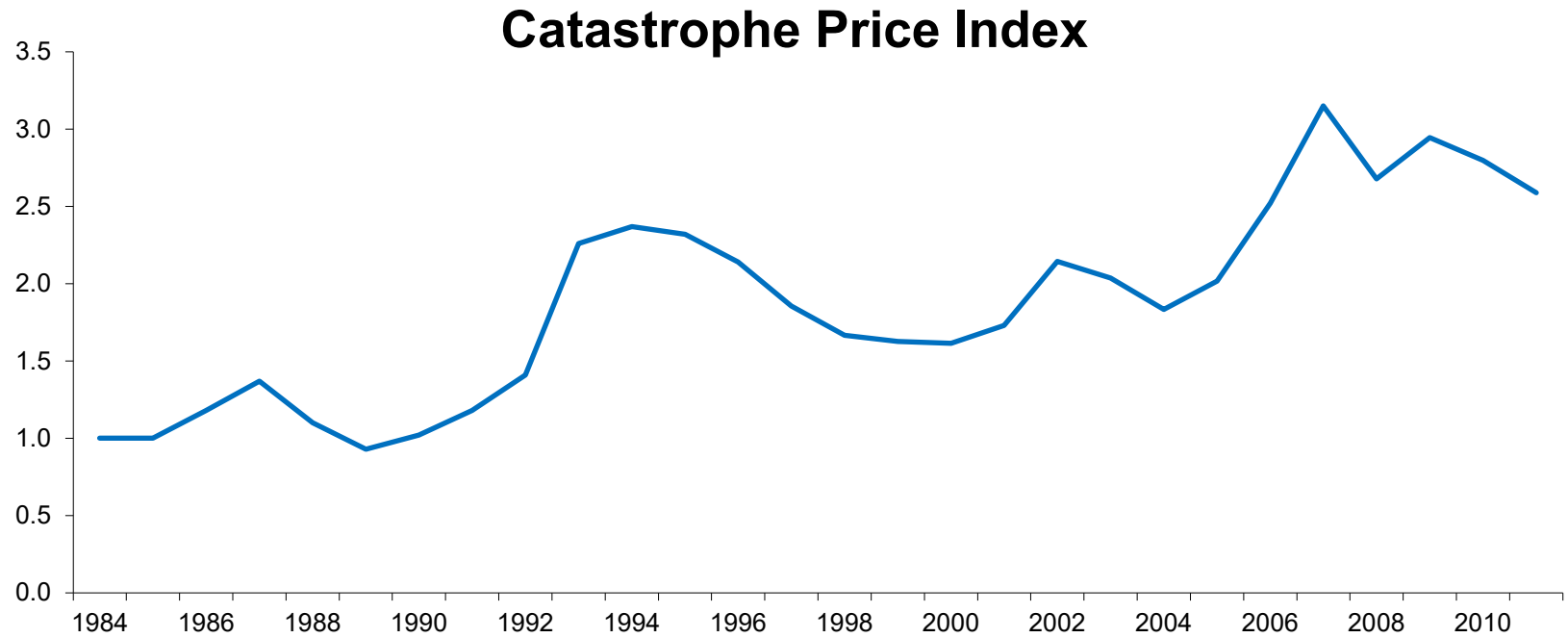# Competition: MA Market

MA Market Share

MA Loss Ratio

Data Source: Best's Market Share Reports - Eleven-Year, AMB Financial Groups and Unaffiliated Single Companies, All Private Passenger Auto

Cost of Reinsurance

Catastrophe Price Index

Source: Aon Benfield

Changed Competitive Landscape

- Number of competitors different today
  - Fewer through consolidation
  - More specialized, especially in reinsurance
  - More transparent, especially in reinsurance

- Capital management tools more flexible
  - 1990s "use it or lose it," with uses being organic growth, acquisition or, underwriting loss
  - Today: dividends and stock buybacks are no longer dirty words

- Underwriting tools have improved
  - Improved tools allow more consistency to be implemented across an organization
  - Use of tools allows better monitoring of KPIs

Q & A – Predictive Modeling

Does Predictive Modeling Dampen or Exacerbate Underwriting Cycles?

Do Management and Underwriters Have "Rational Expectations" About the Effectiveness, Scope and Applicability of Predictive Modeling?

# Does Predictive Modeling Work As Well For Commercial Lines As For Personal Lines?

Q & A – Catastrophe Modeling

A. M. Best Insurance Impairment Study

Cause (1969-2010)	Pct Total
Deficient loss reserves, rapid growth (inadequate pricing)	53.8%
Miscellaneous	8.6%
Alleged fraud	7.8%
Affiliate problems	7.8%
Investment problems (overstated assets)	7.3%
Catastrophe losses	7.1%
Significant change in business	4.0%
Reinsurance failure	3.6%

Source: A.M. Best Co.

1066 impairments* over 42 year period 1969-2010

Primary Causes of P/C Impairments (1969 - 2010)

Significant change in business, 4.0%
Reinsurance failure, 3.6%
Catastrophe losses, 7.1%
Investment problems (overstated assets), 7.3%
Affiliate problems, 7.8%
Alleged fraud, 7.8%
Miscellaneous, 8.6%
Deficient loss reserves, rapid growth (inadequate pricing), 53.8%
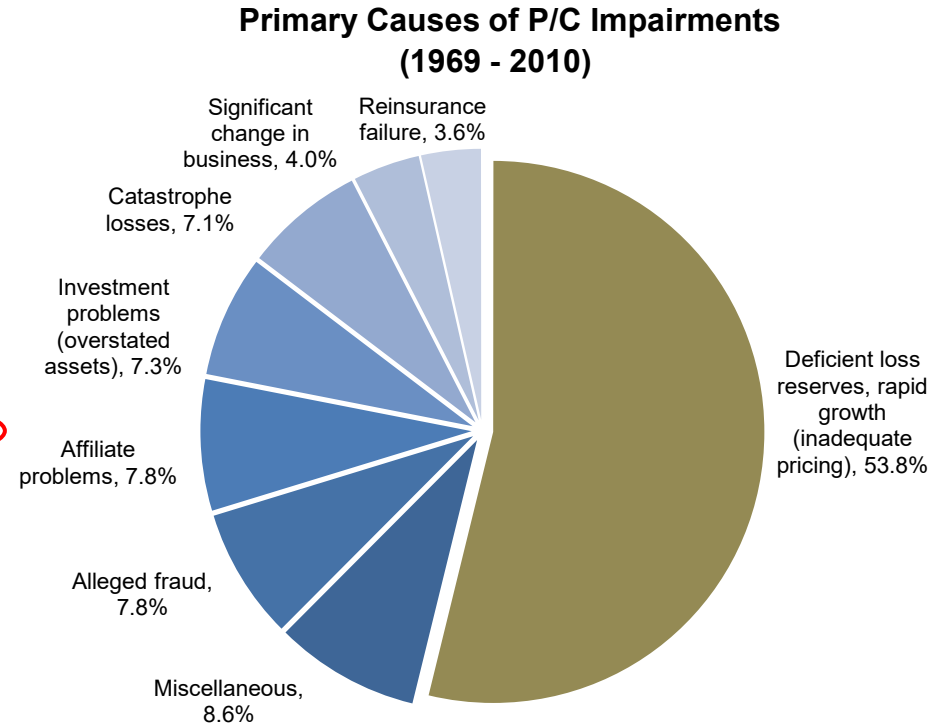
Insurance underwriting risk is the main driver of US P&C impairments based on 40 year track record

Largest U.S. P&C Industry Events (USD Billions)

- A&E estimated ultimate losses larger than any historical event

- AY 1998 to 2001: $63.9B of cumulative adverse development, surpassing the largest catastrophe event by $22.8B

- Impact spread out over time, minimizing the headline effect

Event	Nominal Loss
Asbestos & Environmental	117.0
Hurricane Katrina	41.1
AY 2000 Development*	22.0
AY 1999 Development*	19.3
September 11th	18.8
Hurricane Andrew	15.5
Northridge Earthquake	12.5
Hurricane Ike	12.5
AY 1998 Development*	12.1
AY 2001 Development*	10.5

Source: Aon Benfield Insurance Risk Study, 6th Edition, 2011
* 10 years of development from Schedule P.

The Modeled Risk or the Risk in the Model: Which is Worse?

Do Catastrophe Models Dampen or Exacerbate Underwriting Cycles?

Is Catastrophe Model Output Well Understood in the Underwriting Community?

Is its Message Effectively Communicated?

Q & A – Economic Capital Modeling

Do Economic Capital Models Tell Underwriters And Management Anything Useful?

Do Economic Capital Models Tell Rating Agencies And Regulators Anything Useful?

Is the Solvency II Approach to Internal Capital Models Good or Bad?

Will it Come to the US?

Q & A – Asset Modeling

Insurance Models vs. Finance Models: Are There Fundamental Differences?

Q & A – General

Payback or Changed Perception of Risk: Why Does The Market React To Loss?

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Does The Reaction Differ Between The Insurance and Reinsurance Markets?

One Cycle or Many Cycles: Are There Different Sub-markets With Different Dynamics?

Emerging Risks And Risk Identification: What Are Our Models Missing Today?

Is Unanticipated Risk a More Material Cycle Driver?

With All These Models Available Why Do We Still Have Cycles?

Closing Thoughts?