



2011 CAS Spring Meeting

Systemic Risks for P&C Insurers

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Contents

- Impacts of Systemic Risks
- Benchmarks and Differences
- A Perfect Storm in the Making?


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Defining Systemic Risks

- “Systemic risks” has become center of attention for financial regulators
- Geneva Association April 2011 Report --- *“Considerations for Identifying Systemically Important Financial Institutions in Insurance”*
- We focus on the U.S. P&C insurance, and its players (from large national/global insurers to small to mid-sized regional insurers)


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Identify Systemic Events

- 1983-87 Liability crisis created a multi-year *bust-and-boom* in the casualty insurance sector
- 1992 Hurricane Andrew changed the way companies manage catastrophe accumulation
- 9/11/2001 not only changed airport security check, but accelerated the hardening of the P&C insurance market cycle
- AIG and Bond Insurers were at the center of 2008-2009 crisis, but the P&C industry was not hugely impacted (*thanks to the Fed*)

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U.S. Property-Casualty: Underwriting Cycle Modeling and Risk Benchmarks

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John A. Major, ASA
Charles H. Pan
Jessica W.K. Leong, FCAS, FIAA

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Data Analysis of Systemic Risks

- In 2010, Risk Lighthouse and Guy Carpenter undertook a joint research project
- Thousands of hours (5 months, 7+ persons)
- Compiled and cleaned extensive insurance company data filings
- Cleaned data serve as basis for studying systemic risks and benchmark parameters

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Data Cleaning

- Data Sources: SNL, NAIC, and A.M. Best
- Unit: insurance company group & sub-groups
- AY 1980 to 2009 Gross and Net Premiums; Paid, Case Incurred and INBR loss triangles
- Diagnosis of Inconsistencies:
 - 1) Restatement of historical data
 - 2) Mergers and Acquisitions
 - 3) Inter-company reinsurance

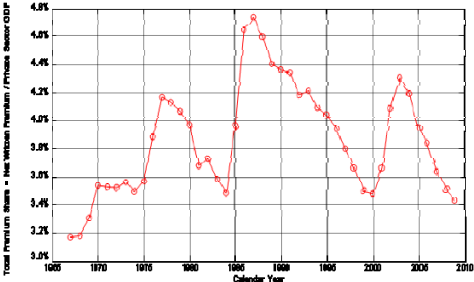
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Segments of Company Groups

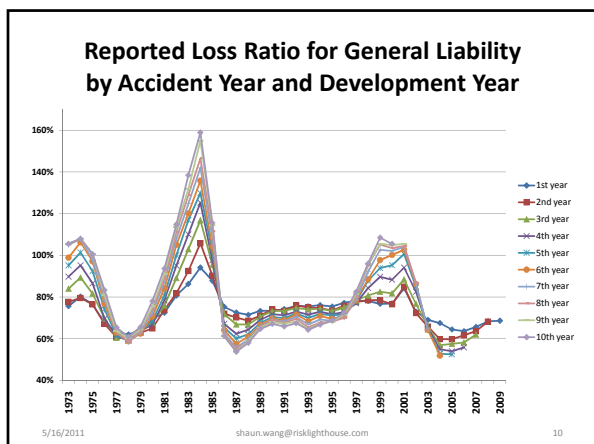
Segment	Number of Company Groups
Large National	23
Super Regional	30
Small Regional	474
Specialty Writer	55
Reinsurer	19
Other	113
Homeowner	16

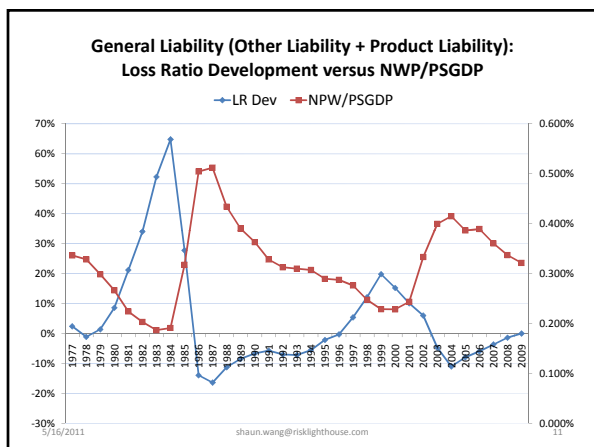
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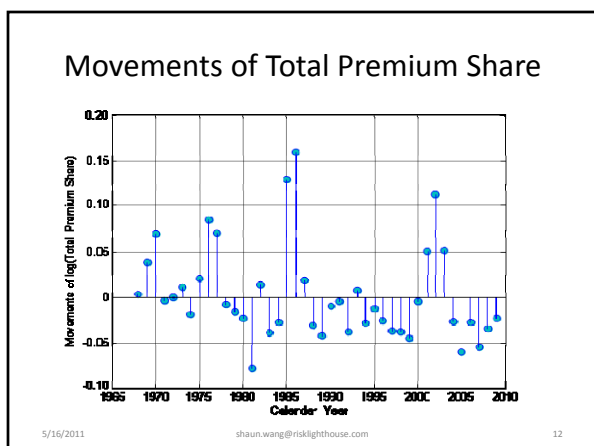
Total Written Premium to Private Sector GDP Ratio (1967-2009)



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Regime-shifting model for the Total Premium Share

- **Up-regime**

$$Y_{t+1} - Y_t = -0.4891 - 0.1597 \cdot Y_t + \varepsilon_{UP,t}$$

$$\varepsilon_{UP,t} \sim N(0, 0.0032)$$

- **Down-regime**

$$Y_{t+1} - Y_t = -2.4358 - 0.7266 \cdot \min(Y_t, -3.3129) + \varepsilon_{DOWN,t}$$

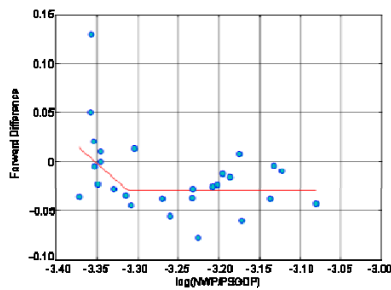
$$\varepsilon_{DOWN,t} \sim N(0, 0.0012)$$

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Down-regime modeled as Hockey-stick



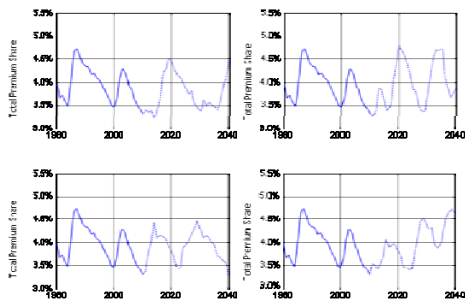
$$Y_{t+1} - Y_t = -2.4358 - 0.7266 \cdot \min(Y_t, -3.3129) + \varepsilon_{DOWN,t}$$

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Example Simulation Paths of Total Premium Share



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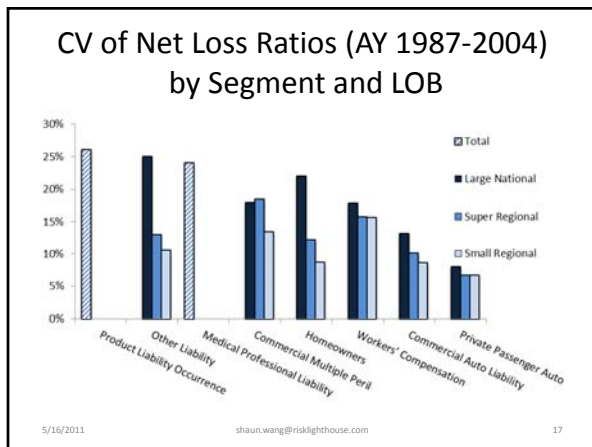
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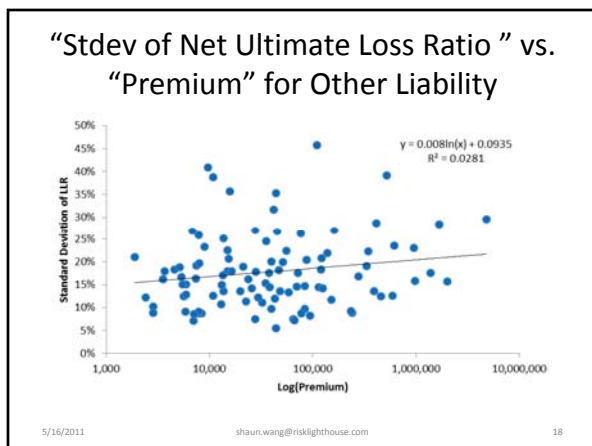
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 **Findings of Our Data Analyses**


- Unlike large & complex global (re)insurers, small- to mid-sized regional insurers do not pose much systemic risk to the insurance industry, neither to the financial system
 - ✓ They deserve favorable treatment by regulators and rating agencies
 - ✓ All insurers (large and small) can be impacted by systemic events (increased catastrophes and economic crisis)

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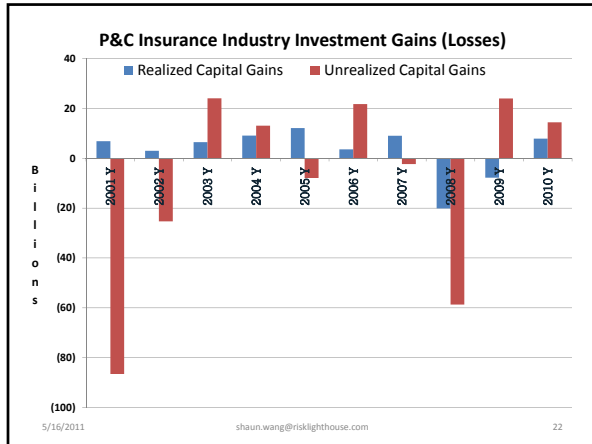
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 **The 2001-2003 Perfect Storm**

- ✓ After a prolonged soft market (1987-2000), industry didn't have cushion for major loss shocks
- ✓ Catastrophe event (9/11/2001)
- ✓ 2001-2003 bear stock market caused investment losses
- ✓ Waves of reserve increases prompted S&P report 19-Nov-2003 *Insurance Actuaries – A Crisis of Credibility: "Actuaries are signing off on reserves that turn out to be wildly inaccurate"*

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Katrina didn't turn the P&C market

- The 2004 and 2005 major catastrophes did not turn the P&C market cycle
- The industry enjoyed strong hard market during 2003-2005 and had redundant reserves
- Investment income/gain on the rise


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How stubborn can a soft market be?

- The recent market softening slide has lasted five years (2005-2010)
- The 2008-2009 Financial Crisis brought heavy investment losses for P&C insurers, but it did not turn the market. Or should it have?
- The 3/11/2011 Japan earthquake has not turned the market yet
- So what will?
- A perfect storm seems to gather clouds

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A Perfect Storm in the Making?

- A mega earthquake in the U.S. may trigger economic collapse and market meltdown
- Unlike the 2008-2009 crisis, this time federal bailout is no longer available
- Insurers may suffer asset losses due to defaults of municipal bond and corporate bonds


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Muni Bond Exposures As of 9/30/2010

SNL top-tier entity	Total municipal bonds* (\$M)	Surplus (\$M)	Invested assets (\$M)	Total municipal bonds/ surplus (%)	Total municipal bonds/ invested assets (%)
American International Group	45,520	28,876	84,219	157.6	54.0
Travelers Cos (TRV)	40,253	20,347	63,521	197.8	63.4
Auto Club Exchange Group	3,293	3,997	5,896	82.4	55.8
Mercury General Corp. (MCY)	2,474	1,559	3,277	158.7	75.5
COUNTRY Financial	1,893	1,807	3,446	104.8	54.9
Texas Farm Bureau	809	731	1,079	110.6	74.9
P&C Industry	363,291	547,042	1,303,796	66.4	27.9

Source: SNL Financial

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Other Economic Factors

- Rising oil prices may cause a double dip recession; on the other hand, an economic downturn may crash oil prices (Gail Tverberg)
- QE2 will end by end of June 2011
- Volatility in exchange rates will impact inflation in some areas and deflation in other areas
- Housing Price volatility (divergence of replacement cost and housing market value)

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