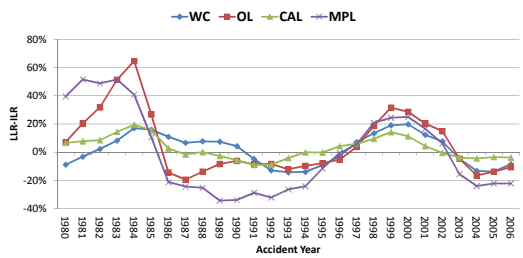
Are Insurance Companies' Reserve Risks The Same?

October 3rd, 2012

P&C Industry Reserving Cycle



Total loss ratio is (Total loss/Net Earned Premium). Total loss is from Schedule P part 2. Initial total loss is reported incurred loss at 12-months. Latest total loss is reported incurred loss at 120-months for accident year(AY) 2002 and prior. For AY 2003 and later, the latest total losses are as of December 31, 2011.

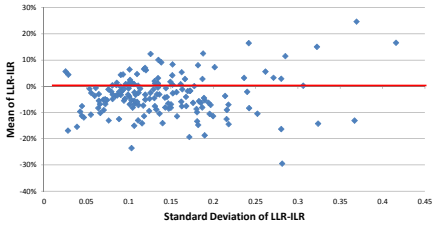
Are Companies' Reserve Risks the Same?

Insurance companies tend to look at other companies to judge the adequacy and accuracy of their reserves.

Workers Compensation Reserve Risk

Accident Years 1980 to 2006, Net of reinsurance

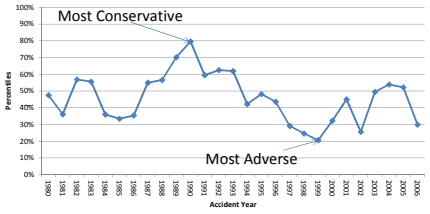
Workers' Compensation



The mean and standard deviation of reserve "error" is shown. Each dot in the graph represents an insurance company group.

Is Company Reserve Risk Consistent through the Cycle?

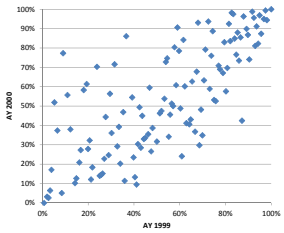
Company A WC LLR-ILR Percentiles



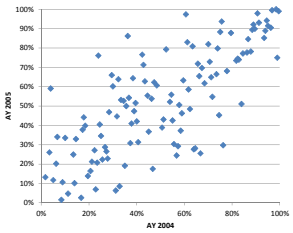
LLR-ILR percentiles are calculated for all companies for each accident year. A higher percentile represents a more conservative reserve position compared to other insurance companies.

Is Company Reserve Risk Consistent through the Cycle?

WC 1999 vs. 2000 LLR-ILR Percentiles

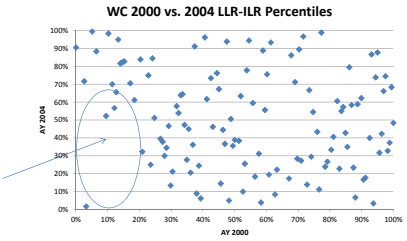


WC 2004 vs. 2005 LLR-ILR Percentiles



The two graphs use the same company list. Each dot in the graph represents an insurance company group. A higher percentile represents a more conservative reserve position compared to other insurance companies.

Is Company Reserve Risk Consistent through the Cycle?



Over a longer time period, the positive correlation no longer exists. In fact, for the companies with worst reserving experience (0%-20%) in AY2000, most of them held a more conservative reserve estimate than average in AY2004.

A Measure of Cycle Reserving Management

Background

- To measure companies' loss reserve development and how that development compares with the industry and with the companies' peer groups

Formula

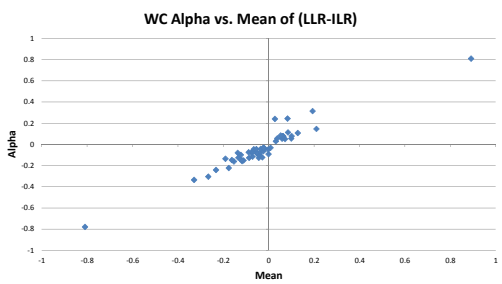
- [LLR-ILR(Company)] = Alpha + Beta*[LLR-ILR(Industry)] + error

Interpretation

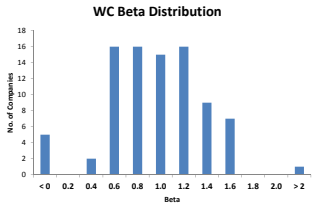
- Alpha represents a general directional trend above or below the industry
- Beta represents how closely company loss reserve development follows year to year changes in industry loss reserve development in direction and magnitude.

What is Alpha?

- Alpha and mean stand for the same thing.

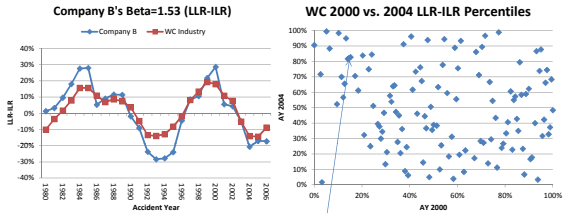


How is Beta distributed across companies?



Only the significant betas are presented in the graph (90% confidence level). Half of the companies have significant betas.

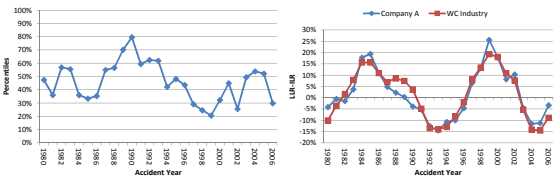
A Company with High Beta



Company B

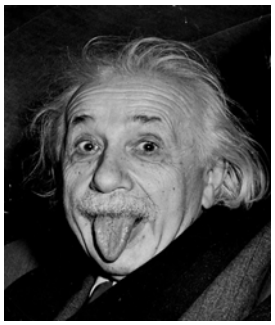
Company B is a company that had more adverse reserve development than the industry when industry reserves were weak, but had an over-conservative reserve when industry reserves were strong.

A Company with Beta=1



From AY 1991 to 1998, company A's reserve development experience followed the industry closely, but its relative reserve position (LLR-ILR percentile) still deteriorated during this time period.

Albert Einstein Said…



"The significant problems we have can not be solved at the same level of thinking we were at when we created them."

– Albert Einstein

Risk Lighthouse Internal Research

1. Link Between Reserving Cycle and Pricing Cycle
2. Reserving Risk varies across Segments
3. Tail Factors
4. Misused Reserving Risk Indicators

Internal Research 1: Where Are We in the Reserve Cycle?

Cycle Position

- It is important to know where we are in the cycle to judge and project a company's reserve position.

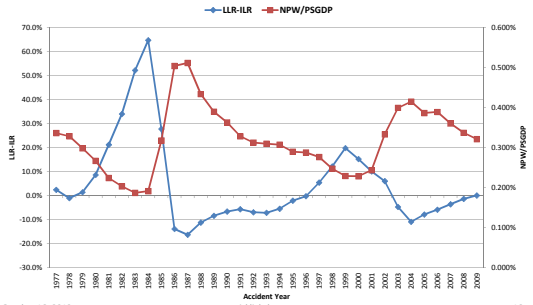
Reserving Cycle

- The reserving cycle is an observation of hindsight. Usually it takes 3 to 5 years for us to know.

How to project the current position in the cycle?

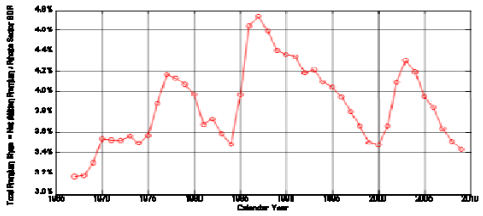
Pricing Cycle vs. Reserving Cycle

General Liability (Other Liability + Product Liability): LLR-ILR vs. Premium Rate Proxy



How to measure the Pricing Cycle?

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



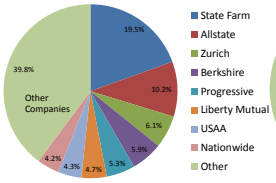
Division of LOBs for Reserve Cycle

1. Personal Lines
   - Private Passenger Auto Liability
   - Auto Physical Damage
   - Homeowners
2. Commercial Liability Lines
   - Commercial Auto Liability
   - Medical Professional Liability
   - Other Liability
   - Product Liability
   - Workers' Compensation
3. Commercial Property Lines
   - The remaining P&C lines excluding Accident and Health.

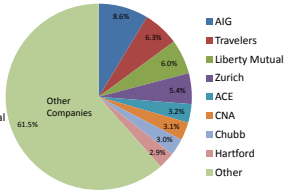
Division of LOBs for Reserve Cycle

Reason 1: Different Players

2010 Personal Line Market Share

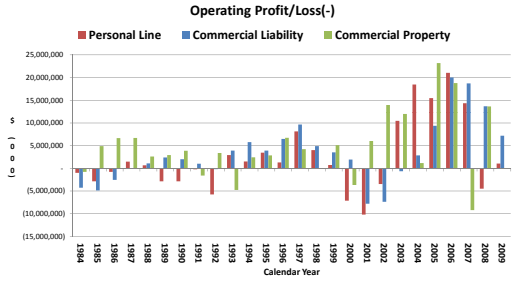


2010 Commercial Line Market Share



Division of LOBs for Reserve Cycle

Reason 2: Different Operating Profit/Loss Cycles



Division of LOBs for Reserve Cycle

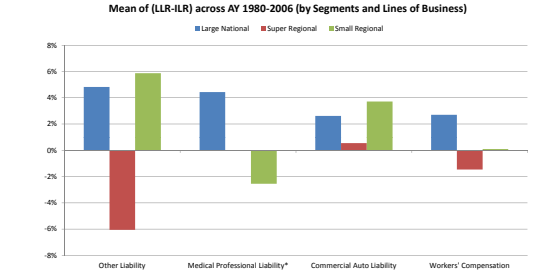
- The evidence supports the subdivision of the P&C industry.
- The subdivision of the P&C industry will have new timing, magnitude, and position of the reserve cycle for each line of business.
- A more accurate estimation of where we are in the cycle will help to determine companies' reserve position.

Internal Research 2: Subdivisions of Insurance Companies

- To better analyze company reserving risk, we divided all insurance companies into seven segments.

Segment	Number of Company Groups
Large National	25
Super Regional	29
Small Regional	247
Specialty Writers	92
Reinsurance	25
Other	71
Florida Homeowner	13

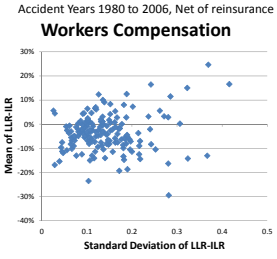
Subdivisions of Insurance Companies



*For Medical Professional Liability, we didn't calculate for Super Regional group since the premium and loss volume is too small.

Subdivisions of Insurance Companies

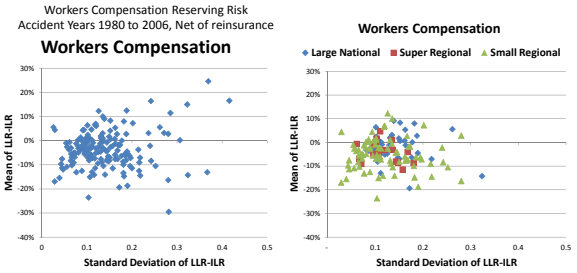
Workers Compensation Reserving Risk
Accident Years 1980 to 2006, Net of reinsurance



Slide 22

EL3 Evan, 9/27/2012

Subdivisions of Insurance Companies

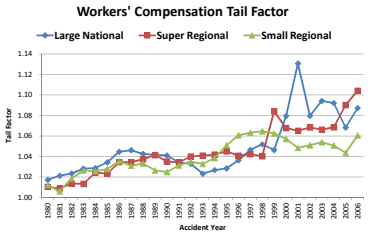


Internal Research 3: Tail Factors of Long Tail Liability Lines of Business

Our internal research indicates that tail factor estimation is very important for reserve estimation of the long tail liability lines, such as Workers' Compensation, Other Liability, and Medical Professional Liability.

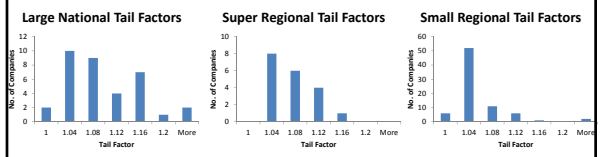
Tail factors vary significantly across accident years and across the different segments.

WC Tail Factors for Different Segments



The tail factors are calculated as (120-month Net Total Loss/120-month Net Case Incurred Loss). For accident year after 2002, we develop the latest reported Net Total Loss and Net Case Incurred Loss to 120-month.

WC Tail Factors for Different Segments



The tail factors in the above charts are AY 2000-2002 loss weighted average of tail factors.

Internal Research 4: Misused Reserving Indicators

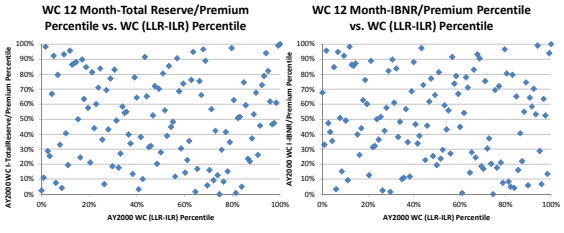
Many insurance companies use ratios to compare their reserve adequacy with their peer group.

For example, Total Reserve/Premium, IBNR/Premium, Case Reserve/IBNR, or Paid Loss/Total Reserve.

Before relying on those ratios, it is important to know whether those ratios work.

A back test is applied to check the relationship of those ratios with the reserving risk LLR-ILR.

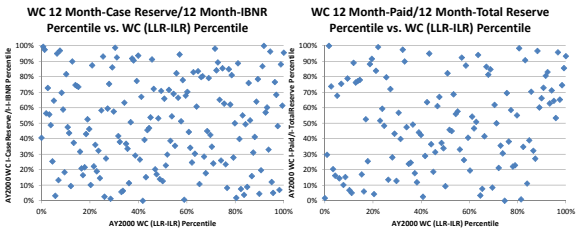
Misused Reserving Indicators-Back Test Results



For the ratios of Total Reserve/Premium and IBNR/Premium, insurance companies usually think the higher those two ratios are, the more adequate the reserve is.

In our back test, we give a higher percentile for a higher ratio. A higher percentile represents a more conservative reserving position comparing with other insurance companies.

Misused Reserving Indicators-Back Test Results



For the ratios of Case Reserve/IBNR and Paid Loss/Total Reserve, insurance companies usually think the lower those two ratios are, the more adequate the reserve is.

In our back test, we give a higher percentile for a lower ratio.

Conclusion

- Reserve risk varies significantly from company to company.
  - An individual company's reserve risk varies over time.
- The projection of the reserve cycle is important for estimation of individual company's reserve risk.
  - We need better predictive variables/drivers.
- Reserve risk varies by line of business and by market segment.
  - Reserve cycle timing varies by line of business.
  - Tail factors are important for reserve projection and they vary across the segments.
- Popular indicators of reserve adequacy fail backtesting.
- Next steps:
  - Better prediction of the reserve cycle
  - Better indicators of reserve adequacy

Thank you!

Contact

Han Chen
One Atlanta Plaza, Suite 2160
950 E. Paces Ferry Road NE
Atlanta, GA 30326-1384
Phone: 678-732-9112
han.chen@risklighthouse.com
www.risklighthouse.com