The Insurance Cycle: Up, Down & Round & Round we Go

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Lead Casualty Specialty Actuary
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U.S. Reserve Cycle

Booked Ultimate Loss

Accident Year


12 months
U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss

- 24 months
- 12 months
U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss


36 months

Guy Carpenter
U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss

48 months
U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss

60 months

U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss

72 months

U.S. Reserve Cycle

Booked Ultimate Loss

Accident Year


1.00 1.05 1.10 1.15 1.20

84 months

1984 months
U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss

96 months
U.S. Reserve Cycle

Accident Year


Booked Ultimate Loss

1.20
1.15
1.10
1.05
1.00
0.95
0.90
0.85
0.80

108 months
U.S. Reserve Cycle

120 months

Booked Ultimate Loss

Accident Year

U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss

U.S. Reserve Cycle – Workers Compensation

Accident Year vs. Booked Ultimate Loss
Reserve Cycle – Company A

Booked Ultimate Loss vs. Accident Year

Beta 1.0
Reserve Cycle – Company C

- Beta 1.5
Reserve Cycle – U.S. Workers Compensation

Booked Ultimate Loss

Accident Year

Reserve Cycle – U.K. Employers Liability
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1. Why do we have a cycle?
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3. What does this mean for reserve risk?
Workers Compensation Cycle & Inflation

Accident Year

Booked Ultimate Loss

Medical
CPI
Incurred Chain ladder Cycle
1. Why do we have a cycle?
2. How does it fool us?
3. What does this mean for reserve risk?
1. Why do we have a cycle?
2. How does it fool us?
3. What does this mean for reserve risk?
Fool me once…fool me twice…

fool me three times
Fool me once…fool me twice…

fool me three times
Reserving Cycle

Accident Year

Booked Ultimate Loss

- 2003
Top stories for CAS actuaries 2003:
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1. Criticism for Poor Performance in Projecting Loss Reserves
   - S&P article 2003: "actuaries are signing off on reserves that turn out to be wildly inaccurate. It's an abysmal track record."
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1. Criticism for Poor Performance in Projecting Loss Reserves
   - S&P article 2003: "actuaries are signing off on reserves that turn out to be wildly inaccurate. It's an abysmal track record."

2. [L]evel of Reserve Deficiency…
   - Despite substantial reserve increases by ...insurers, during 2003 rating agencies estimate that the non-asbestos reserve shortfall ...is between $30 billion and $60 billion.
Top stories for CAS actuaries 2004:
9. Actuarial Organizations Respond to …Criticism of Loss Reserving

[T]he CAS Board is working …to prioritize …action plans relating to loss reserving.
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The profession must continue… its self-review, as these issues will not go away on their own.
Reserving Cycle
Top stories for CAS actuaries 2005:
Top stories for CAS actuaries 2005:

- ?
Top stories for CAS actuaries 2005:

- ? What reserving problem ?
Reserving Cycle

Accident Year

Booked Ultimate Loss

Fool me once…fool me twice…

fool me three times
Fool me once… fool me twice…

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Reserve Cycle – WC using bootstrap model

Booked Ultimate Loss

Accident Year

Reserve Cycle – WC using bootstrap model

One year risk
Ultimate time horizon

Booked Ultimate Loss

Accident Year


Ultimate time horizon
One year risk

Accident Year


Booked Ultimate Loss

1.30
1.20
1.10
1.00
0.90
0.80
0.70
U.S. Reserve Cycle

Booked Ultimate Loss

Accident Year

U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss

Ultimate time horizon

One year risk
Fool me once…fool me twice…
fool me three times
Fool me once…fool me twice…

fool me three times
Company A’s loss portfolio transfer

Accident Year

Booked Ultimate Loss


0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20

Company A
1. Best estimate is not our best estimate
1. Best estimate is not our best estimate
Conundrum

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Conundrum

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Conundrum

1. Best estimate is not our best estimate
1. Best estimate is not our best estimate

2. No incentive to do anything about it
Conundrum

1. Best estimate is not our best estimate

2. No incentive to do anything about it

3. Can’t model it
1. Why do we have a cycle?
2. How does it fool us?
3. What does this mean for reserve models?
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What does this mean for reserve models?

1. Reserve best estimate
2. Reserve risk
What does this mean for reserve models?

1. Reserve best estimate
2. Reserve risk
Incurred Chain ladder Cycle

Ultimate Loss

Accident Year
Paid Chain ladder Cycle

Ultimate Loss vs Accident Year


0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15 1.20 1.25 1.30

Guy Carpenter
What does this mean for reserve models?

1. Reserve best estimate
2. Reserve risk
U.S. Reserve Cycle

Accident Year

Booked Ultimate Loss

Key features of the Reserve Cycle

Reserve Risk: +15% / -10%
Key features of the Reserve Cycle

- AY auto-correlation
- Reserve Risk: +15% / -10%
Key features of the Reserve Cycle

- Reserve Risk: +15% / -10%
- AY autocorrelation
- Years go bad keep going bad
Modeling the key features of the Reserve Cycle

1. Reserve risk

2. Accident year auto-correlation

3. Years go bad keep going bad
Modeling the key features of the Reserve Cycle

1. Reserve risk

2. Accident year auto-correlation

3. Years go bad keep going bad

4. Correlation between LOBs
Modeling the key features of the Reserve Cycle

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3. Years go bad keep going bad

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4. Correlation between LOBs

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4. Correlation between LOBs

Time series model
Modeling the key features of the Reserve Cycle

1. Reserve risk

2. Accident year auto-correlation

3. Years go bad keep going bad

4. Correlation between LOBs

Time series model
Pros:

- Death due to correlation:
  - Years that go bad keep going bad
  - Groups of AY’s go bad together
  - Lines of business go bad together
Cons
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