Intermediate Track I

Considerations in Evaluating Changing Conditions

2009 CLRS

Chicago, IL

Introduction

- Must go beyond rote application of basic techniques to produce a meaningful reserve estimates.
- Additional considerations and diagnostic tools offer perspective in the effort to understanding risks and uncertainties.
- Communication among operating units is essential.
- Subsequent Intermediate Tracks will provide additional insights and techniques useful in addressing several of these issues.

Considerations

- Aging of Claims
- Loss Adjustment Expenses
- Operations
- Limits and Deductibles
- Interpolation/Extrapolation
- Changing Indications

Considerations

- Aging of Claims
  1. **Average Closed Value** is not the same as **Average Open Value**
  2. **Early Reported Claims** are not the same as **Late Reported Claims**

- Loss adjustment expense
- Operations
- Limits and Deductibles
- Interpolation/Extrapolation
- Changing Indications

Consideration #1

The average value of claims closed is often a poor estimator of the ultimate average settlement value of claims still open.

Consideration #1 (cont.)

Accident Year 2000

Calendar Date	Cumulative Paid on Closed Claims $	Cumulative Paid on Closed Claims % of Ultimate	Number of Closed Claims No.	Number of Closed Claims % of Ultimate	Average Settlement Value $
12-00	$50,000,000	25%	1,000	50%	$50,000
12-01	100,000,000	50%	1,500	75%	66,667
12-02	150,000,000	75%	1,800	90%	83,333
*	*	*	*	*	*
*	*	*	*	*	*
*	*	*	*	*	*
12/08 (Ult)	200,000,000	100%	2,000	100%	100,000

Why might this frequently be true?

Consideration #1 (cont.)

- Claims that close early are smaller
- For example in Workers Compensation:
  - » The cases that close quickly are usually for minor injuries, and may involve just medical-only costs.
  - » The cases open for a long period represent severe injuries and may include:
    - – Major Medical Expenses
    - – Lifetime Pension Benefits

Consideration #2

The average costs for late reported claims may differ materially from those reported earlier.

Consideration #2 (cont.)

Reason: Often, late reported claims have a very different nature than those reported early.

(1) General Liability: Product Liability vs "Slip & Fall"

- » Product Liability cases are often reported later
- » Product cases are often complex, requiring expert testimony and lengthy litigation
- » Product cases reported very late may involve latent injury or cumulative exposure, cases which are difficult to define in terms of date of loss, party at fault, number of occurrences, and type or extent of injuries

Consideration #2 (cont.)

(2) Workers Compensation:

Most Workers Compensation cases are reported within the first 18 months. However, when there are late reported claims they often involve occupational diseases (e.g. carpal tunnel), rather than trauma that is quickly identified and assignable to a single accident date and/or policy.

Considerations

- Aging of Claims
- Loss adjustment expense
    3. The ratio of **Paid Defense & Cost Containment (DCC)** to **Paid Loss** increases over time
    4. **Segregate** into Components
- Operations
- Limits and Deductibles
- Interpolation/extrapolation
- Changing Indications

Consideration #3

For an accident year, the ultimate ratio of DCC to loss may be materially higher than has been true for payments to date.

Consideration #3 (cont.)

Reasons:

1) Cases open for lengthy periods often involve costly litigation.

2) Legal payments are occasionally disbursed later than loss payments.

Consideration #3 (cont.)

Industry Schedule P Data
Other Liability and Products Liability*
Net Payments Through 12/31/02
(millions)

Accident Year	Age (months)	Cumulative Paid Losses (1)	Cumulative Paid DCC (2)	Ratio (3)=(2)/(1)
1998	60	$10,258	$2,272	22.1%
1999	48	9,549	1,979	20.7%
2000	36	7,673	1,612	21.0%
2001	24	5,183	765	14.8%
2002	12	2,600	209	8.0%

* Includes both claims-made and occurrence

Source: The Thomson Corporation, June 2003

Consideration #3 (cont.)

- This pattern by company can be influenced by many factors, such as the mode of payment of legal bills, which may vary by company between:
  - » Interim Case Billing
  - » End of Case Billing
- Other influences can include:
  - » Geographical Differences
  - » Use of Staff Counsel vs. Outside Counsel
  - » Classes of Business
  - » Primary vs. Excess Contracts

Consideration #4

Where DCC costs are volatile, it may be useful to split it into components such as:

- **Attorney Fees (External or Internal)**
- **Other Legal**
- **Expert Witnesses**
- **Medical Audits/Reviews**

Consideration #4 (cont.)

Reasons:

(1) Legal expense are typically the fastest growing component of DCC, with a growth rate exceeding trends in loss costs.

(2) Many companies have attempted cost savings steps such as:

- » Use of staff counsel, rather than independent attorneys, in some situations
- » Use of companies which audit legal bills
- » More vigorous defense (which may slow payment patterns on loss side)
- » Initiating contact with the claimant sooner

Considerations

- Aging of Claims
- Loss adjustment expense
- Operations
  5. **Rate adequacy** can impact reserving
  6. **Positive Development** does not mean a **Claim Department problem**
  7. **Operational changes** affect reserving
- Limits and Deductibles
- Interpolation/Extrapolation
- Changing Indications

Consideration #5

Expected Loss Ratios based on prior years' experience, used in reserving, must be adjusted for any material changes in rate adequacy.

Consideration #5 (cont.)

If adjustments are not made, severe distortions can result:

Accident Year (1)	Earned Premium (2)	Paid Losses (3)	2005 Loss Ratio (4)	Reserves Using 2005 Loss Ratio (5)=(2)x(4)-(3)	Ratio of Actual Rates to Adequate Rates (6)	Actual Loss Ratio (7)=(4) / (6)	Reserves Using Actual Loss Ratio (8)=(2)x(7)-(3)
2006	10,000	5,000	50%	0	1.0	50%	0
2007	9,000	2,700	50%	1,800	0.9	56%	2,300
2008	8,000	800	50%	3,200	0.8	63%	4,200
Total		8,500		**5,000**			**6,500**
						Error = $1,500	

Consideration #5 (cont.)

Think about it!

From another angle...

Accident Year (1)	Earned Premium (2)	Paid Losses (3)	2005 Loss Ratio (4)	Ultimates Using 2005 Loss Ratio (5)=(2)x(4)	Ratio of Actual Rates to Adequate Rates (6)	Adjusted Loss Ratio (7)=(4) / (6)	Ultimates Using Actual Loss Ratio (8)=(2)x(7)-(3)
2006	10,000	5,000	50%	5,000	1.0	50%	5,000
2007	9,000	2,700	50%	4,500	0.9	56%	5,000
2008	8,000	800	50%	4,000	0.8	63%	5,000
Total		8,500		**13,500**			**15,000**

If rates are changing,

but exposure is not …,

What do you expect to happen with ultimate losses?

Consideration #5 (cont.)

- Premium can be affected by increased competition and efforts to retain market share
  - » filed rate decreases
  - » increased use of flexible discounts
  - » accounts moved to “preferred” status
- Need to talk to your colleagues to understand what is happening in the marketplace
  - » underwriters
  - » marketing
  - » field office staff
  - » pricing actuaries

Consideration #6

Upward case development does not necessarily demonstrate something "needs fixing" in the Claims Department.

Consideration #6 (cont.)

Resulting Development (Illustration):

ESTIMATE AT 12 MONTHS			STATUS 3 YEARS LATER	
Claims	Average $	Total	Average $	Total
1-97	$10,000	$970,000	$10,000	$970,000
98-100	10,000	30,000	500,000	1,500,000
TOTAL		$1,000,000		$2,470,000

LDF = 2.47

The Point: Loss development can arise from the natural emergence of facts within the context of a company's reserving philosophy

Consideration #7

Internal company changes can dramatically affect patterns in reserving data, and distort the result of basic reserving methodologies.

Consideration #7 (cont.)

For example, suppose the company changed TPA's 12 months ago, and now has the following triangles:

Paid Losses

Acc Yr.	12 Mos.	24 Mos.	36 Mos.	48 Mos.	60 Mos.
2004	100	150	180	198	208
2005	100	150	180	198	
2006	100	150	180		
2007	100	150			
2008	100				

Reported Losses

Acc Yr.	12 Mos.	24 Mos.	36 Mos.	48 Mos.	60 Mos.
2004	125	167	189	202	208
2005	125	167	189	206	
2006	125	167	194		
2007	125	177			
2008	133				

Consideration #7 (cont.)

Paid to Reported Ratios

Acc Yr.	12 Mos.	24 Mos.	36 Mos.	48 Mos.	60 Mos.
2004	0.80	0.90	0.95	0.98	1.00
2005	0.80	0.90	0.95	.096	
2006	0.80	0.90	.093		
2007	0.80	.085			
2008	.075				

Paid to Reported Ratios are an example of a diagnostic tool which can be used to check for:

- Case reserve strengthening (this example)
- Case reserve weakening
- Change in rate of payment

Later sessions will discuss methods, such as the Berquist & Sherman approach, to correct for these kinds of changes.

Considerations

- Aging of Claims
- Loss adjustment expense
- Operations

- Limits and Deductibles
    8. **Higher limits** mean more future development
    9. **Higher deductibles** (attachment points) mean more future development

- Interpolation/Extrapolation
- Changing Indications

Consideration #8

When reinsurance retentions and/or policy limits are higher, the portion of ultimate losses that are reported at each given maturity tends to be lower.

Consideration #8 (cont.)

ILLUSTRATION:

One Claim	Dollars Reported as of: 12 Months	24 Months	36 Months (Ult.)
Loss Limited to $100,000	$50,000	$100,000	$100,000
Loss Limited to $500,000	50,000	300,000	500,000
Unlimited Loss	50,000	300,000	1,000,000

	% of Ultimate Losses Reported as of: 12 Months	24 Months	36 Months (Ult.)
Loss Limited to $100,000	50%	100%	100%
Loss Limited to $500,000	10%	60%	100%
Unlimited Loss	5%	30%	100%

Consideration #9

When attachment points are higher for reinsurance, excess, umbrella or self-insured coverages, then the percentage of ultimate dollars that is reported at each given maturity tends to be lower.

Consideration #9 (cont.)

ILLUSTRATION:

One Claim	Dollars Reported as of: 12 Months	24 Months	36 Months (Ult.)
1st Dollar Coverage	$50,000	$300,000	$1,000,000
Losses in excess of $100,000	0	200,000	900,000
Losses in excess of $500,000	0	0	500,000

	% of Ultimate Losses Reported as of: 12 Months	24 Months	36 Months (Ult.)
1st Dollar Coverage	5%	30%	100%
Losses in excess of $100,000	0%	22%	100%
Losses in excess of $500,000	0%	0%	100%

Considerations

- Aging of Claims
- Loss adjustment expense
- Operations
- Limits and Deductibles

- Interpolation/Extrapolation
  - **10. Incomplete accident years** can be deceiving
  - **11. Tail development** is important

- Changing Indications

Consideration #10

Estimating ultimate losses for an incomplete accident year requires special adjustments.

Consideration #10 (cont.)

Reported losses through Q3 2009

Accident Year	9 mos.	21 mos.	33 mos.	45 mos.	57 mos. (ult.)
2005	100,000	250,000	300,000	315,000	315,000
2006	100,000	250,000	300,000	315,000	
2007	120,000	300,000	360,000		
2008	110,000	275,000			
2009	130,000				

Age to Age Factors

Accident Year	9-21	21-33	33-45	45-57
2005	2.50	1.20	1.05	1.00
2006	2.50	1.20	1.05	
2007	2.50	1.20		
2008	2.50			
Cumulative Factor to Ultimate	3.15	1.26	1.05	1.00

Consideration #10 (cont.)

Required IBNR as of Q3 2009

Accident Year	(1) Reported as of Q3 2009	(2) Factor to Ultimate	(3)=(1)*(2) Estimated Ultimate Losses	(4)=(3)-(1) Required IBNR as of Q3 2009
2005	315,000	1.00	315,000	0
2006	315,000	1.00	315,000	0
2007	360,000	1.05	378,000	18,000
2008	275,000	1.26	346,500	71,500
2009	130,000	3.15	409,500	279,500

IS THIS CORRECT?

Consideration #10 (cont.)

Estimating ultimate losses for an incomplete accident year requires special adjustments.

The latest year needs to be reduced by .75 for the incomplete policy period. Future claims for the final quarter need to be excluded.

Consideration #11

“Tail Development” can have a dramatic effect on reserve needs.

Consideration #11 (cont.)

Some examples of when development occurs beyond 10 years

Products	• Complex issues (Who's liable? How to prove injury was caused by product? Date of loss?)
Workers Compensation	• Occupational Disease • Life pension cases, with escalation clauses in some states' benefit structures • Medical costs on life pension cases
Medical Malpractice	• Child injured at delivery reaches legal age • Delayed manifestation, with subsequent complex issues

Consideration #11 (cont.)

Techniques To Derive Tail Factors

1. Examine broader data sources

   e.g. ISO, NCCI, RAA, AM Best

   (Caution: Learn the limitations of such data)

2. Curve Fitting

3. Generalized Bondy Method

Consideration #11 (cont.) - Broader Data Sources

How Much Tail Can There Be?

Development in Reinsured Layers
Selected Cumulative Age to Ultimate Factors
Source: RAA data

Line of Business	15 Years to Ultimate	25 Years to Ultimate
WC Treaty	1.582	1.149
GL Treaty	1.234	1.030
AL Treaty	1.021	1.000

Considerations

- Aging of Claims
- Loss adjustment expense
- Operations
- Limits and Deductibles
- Interpolation/Extrapolation

- Changing Indications

  12. Indications can change for a variety of reasons - ask why!

Consideration #12

Why do indications change?

- **Actual losses emergence differs from expected.**
- **Assumptions and/or methods change.**

Consideration #12 (cont.)

Last Year's Review
Reported Losses at 12/2007

AY	12 Mos.	24 Mos.	36 Mos.	48 Mos.
2004	125	167	189	202
2005	125	167	189	
2006	125	167		
2007	125			

Age to Age Factors

AY	12-24	24-36	36-48	
2004	1.34	1.13	1.07	
2005	1.34	1.13		
2006	1.34			
				Tail
Selected	1.34	1.13	1.07	1.00
Factor to Ultimate	1.62	1.21	1.07	1.00

Consideration #12 (cont.)

AY	Reported Losses at 12/2007	Factor to Ultimate	Estimated Ultimate
2004	202	1.00	202
2005	189	1.07	202
2006	167	1.21	202
2007	125	1.62	202

Easy … right!

Consideration #12 (cont.)

12 months later the actuary returns:

"Bad news, boss...

We have to take a big hit to cover deterioration in the prior years."

Will this be a pleasant discussion?

What happened????

Consideration #12 (cont.)

AY	Reported Losses at 12/2008	Factor to Ultimate	Estimated Ultimate	Estimate Last Year	Impact
2004	208	1.00	208	202	6
2005	206	1.03	212	202	10
2006	194	1.11	216	202	14
2007	177	1.28	226	202	24

Total Prior Year impact:	54
Increase in 4-year ultimate	6.7%

Consideration #12 (cont.)

This Year's Review

Reported Losses at 12/2008

AY	12 Mos.	24 Mos.	36 Mos.	48 Mos.	60 Mos.
2004	125	167	189	202	208
2005	125	167	189	206	
2006	125	167	194		
2007	125	177			
2008	133				

Age to Age Factors

AY	12-24	24-36	36-48	48-60
2004	1.34	1.13	1.07	1.03
2005	1.34	1.13	1.09	
2006	1.34	1.16		
2007	1.42			

					Tail
Prior selected	1.34	1.13	1.07	1.00	1.00
Selected	1.40	1.15	1.08	1.03	1.00
Factor to Ultimate	1.79	1.28	1.11	1.03	1.00

Consideration #12 (cont.)

Did the actuary miss the boat last year?

Did the actuary overreact this year?

What if factors (development assumptions) remained unchanged?

Consideration #12 (cont.)

If assumptions remained unchanged?

AY	Reported Losses at 12/2008	Retain Prior Factor	Estimated Ultimate	Estimate Last Year	Impact
2004	208	1.00	208	202	6
2005	206	1.00	206	202	4
2006	194	1.07	207	202	5
2007	177	1.21	214	202	12

Total Prior Year impact: 27

Increase in 4-year ultimate 3.4%

Consideration #12 (cont.)

- Part of the impact is due to actual losses emerging different from what was expected.
- Should development assumptions change?
  - » If so, that accounts for the remaining impact.

Conclusions

It is seldom sufficient to simply manipulate the numbers. The actuary must actively seek a thorough understanding of...

- **...the loss and claims process**
- **...the business and the exposures involved**
  - **underwriting**
  - **pricing**
  - **reinsurance**
- **…techniques and models to deal with the available data**

Conclusions

If professional colleagues are to rely on actuarial advice, they will expect meaningful interpretation of the indications, and the risks and uncertainties in changing estimates.

Looking Ahead

Session II **Investigating and Detecting Change**

Session III **Case Studies**