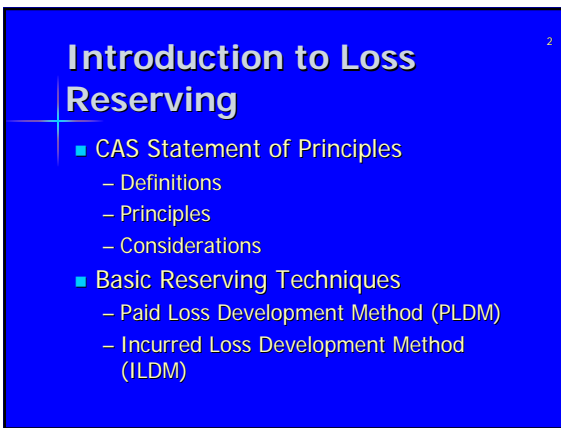




Basic Track I

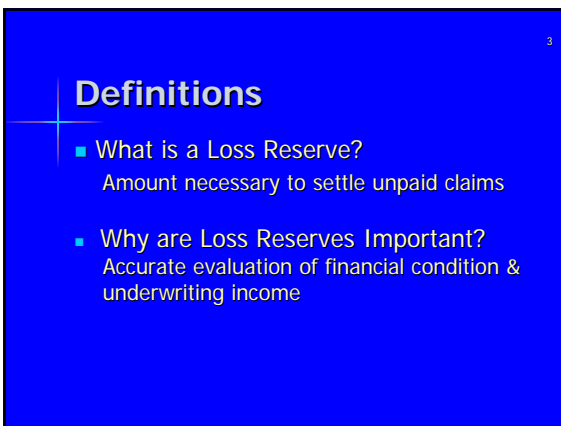
2010 CLRS
September 20-21, 2010
Lake Buena Vista, FL



Introduction to Loss Reserving

- CAS Statement of Principles
 - Definitions
 - Principles
 - Considerations
- Basic Reserving Techniques
 - Paid Loss Development Method (PLDM)
 - Incurred Loss Development Method (ILDM)

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Definitions

- What is a Loss Reserve?
Amount necessary to settle unpaid claims
- Why are Loss Reserves Important?
Accurate evaluation of financial condition & underwriting income

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Definitions

- Accounting Aspects of Loss Reserves

A diagram of a balance sheet represented as a triangle. The top vertex is labeled "Balance Sheet". The left side of the triangle is labeled "Assets". The right side of the triangle is divided into two sections: the top section is labeled "Liabilities" and the bottom section is labeled "Surplus".

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Definitions

- Accounting Aspects of Loss Reserves

A diagram of a balance sheet represented as a triangle. The top vertex is labeled "Balance Sheet". The left side of the triangle is labeled "Assets". The right side of the triangle is divided into two sections: the top section is labeled "Surplus" and the bottom section is labeled "Liabilities".

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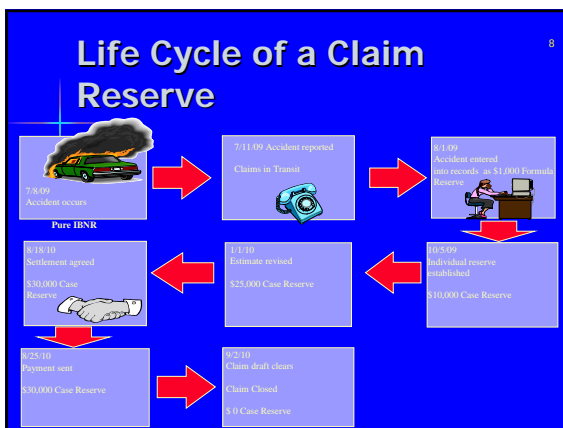
Definitions

- Carried Loss Reserve
The amount shown in a published statement or an internal statement of financial condition.
- Indicated Loss Reserve
The amount that results from the application of a particular loss reserving method.
- Reserve Margin/Deficit
The difference between an indicated loss reserve and a carried loss reserve.

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Definitions

- Elements of a Loss Reserve
 - Formula Reserve/Case Reserve
 - Development on Known Claims
 - Reopened Claims Reserve
 - Incurred But Not Reported (IBNR)
 - Claims in Transit



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Definitions

- Case Reserves
 - Claim reported but not yet paid
 - Assigned a value by a claims adjuster or by formula
- Bulk + IBNR reserves include:
 - Reserves for claims not yet reported (pure IBNR)
 - Claims in transit
 - Development on known claims
 - Reserves for reopened claims

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Definitions

- Loss Adjustment Expenses (LAE) are sum of:
 - Defense & Cost Containment (DCC) Expense
 - Adjusting and Other (AO)

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Definitions

- Loss Adjustment Expenses (LAE) are sum of:
 - Defense & Cost Containment (DCC) Expense
 - Allocated Loss Adjustment Expense (ALAE)
 - Includes all defense, litigation, and medical cost containment related expenses, whether internal or external to a company.
 - In general, includes costs associated with controlling the severity of cases.

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Definitions

- Loss Adjustment Expenses (LAE) are sum of:
 - Adjusting & Other (AO) Expense
 - Unallocated Loss Adjustment Expense (ULAE)
 - Includes all claims adjusting expenses, whether internal or external to a company.
 - In general, includes costs associated with recording and adjusting cases.

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Definitions

- Reserves = Outstanding
 - = Liabilities = Unpaid
 - = Case Reserves + IBNR
- Incurred losses may have various meanings!
 - ▲ Ultimate Losses (incl. IBNR)
 - ▲ Reported Losses (excl. IBNR)

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Principles




- Actuarially sound reserves
 - based on *estimates*
 - derived from reasonable *assumptions*
 - using appropriate *methods*
- Inherent Uncertainty
 - a range can be actuarially sound
 - true value known only after all claims settled

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Principles

- Most appropriate reserve depends on:
 - relative likelihood of estimates in range
 - financial reporting context

**Considerations:
Data Organization** 16

- **Accident Date**
– The date on which the loss occurred. 
- **Report Date** 
– The date on which the loss is first reported to the insurer.
- **Recorded Date**
– The date on which the loss is first entered into the statistical records of the insurer. 

**Considerations:
Data Organization** 17

- **Accounting Date**
– Defines a group of claims for which liability may exist.
– All claims incurred on or before the accounting date. 
- **Valuation Date**
– Defines the time period for which transactions are included when evaluating the existing liability.

**Considerations:
Homogeneity** 18

Accuracy is often improved by subdividing experience into groups exhibiting similar characteristics.

Automobile

```
graph TD
    A[Automobile] --> B[Liability]
    A --> C[Physical Damage]
    B --> B1[Bodily Injury]
    B --> B2[Property Damage]
    B --> B3[PIP]
    B --> B4[Med Pay]
    B --> B5[UM-BI]
    B --> B6[UM-PD]
    C --> C1[Collision]
    C --> C2[Other Than Collision]
```

**Considerations:
Credibility** 19

- A measure of the predictive value that is attached to a body of data.
- A group of claims should be large enough to be statistically reliable.
 - May be a point at which partitioning will divide the data into groups too small to provide credible development patterns.
- Use of supplementary data sources
 - Examples include industry data, countrywide data.

**Basic Reserving
Techniques: Definitions** 20

- Loss Development
The financial activity on claims from the time they occur to the time they are eventually settled and paid.
- Triangles
Compiled to measure the changes in cumulative claim activity over time in order to estimate patterns of future activity.
- Loss Development Factor
The ratio of losses at successive evaluations for a defined group of claims (e.g. accident year).

**Basic Reserving Techniques:
Compilation of Paid Loss Triangle** 21

- The losses are sorted by the year in which the accident occurred.
- The payments from inception are summed at the end of each year.
- Losses paid to date are shown on the most recent diagonal.
- The data is organized in this way to highlight historical patterns.

Basic Reserving Techniques:
Compilation of Paid Loss Triangle
 Accounting Configuration
 Goal: Calculate the total paid-to-date

Accident Year	Cumulative Paid Losses (\$000 Omitted)					
	2004	2005	2006	2007	2008	2009
2004	3,780	6,671	8,156	9,205	9,990	10,508
2005		4,212	7,541	9,351	10,639	11,536
2006			4,901	8,864	10,987	12,458
2007				5,708	10,268	12,699
2008					6,093	11,172
2009						6,962

Basic Reserving Techniques:
Compilation of Paid Loss Triangle
 Actuarial Configuration
 Goal: Estimate the total ultimately paid

Accident Year	Cumulative Paid Losses (\$000 Omitted)						Final Total Cost
	Development Stage in Months						
	12	24	36	48	60	72	
2004	3,780	6,671	8,156	9,205	9,990	10,508	???
2005	4,212	7,541	9,351	10,639	11,536		???
2006	4,901	8,864	10,987	12,458			???
2007	5,708	10,268	12,699				???
2008	6,093	11,172					???
2009	6,962						???

Basic Reserving Techniques:
Paid Loss Development Factors

Accident Year	Evaluation Interval in Months					72 to Ultimate
	12-24	24-36	36-48	48-60	60-72	
2004	1.765	1.223	1.129	1.085	1.052	???
2005	1.790	1.240	1.138	1.084		
2006	1.809	1.240	1.134			
2007	1.795	1.237				
2008	1.834					
2009						

Sample Calculation for Accident Year 2005:
 12-to-24 Months: $1.790 = 7,541 / 4,212$

From the end of the accident year (at 12 months) to the end of the following year (at 24 months), paid losses for 2005 grew 79%. During the next year (from 24 to 36 months), paid losses experienced an additional 24% growth (or development) and so forth.

Basic Reserving Techniques:
Compilation of Paid Loss Triangle

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Accident Year	Cumulative Paid Losses (\$000 Omitted)		
	Development Stage in Months		
	12	24	36
2004	3,780	6,671	8,156
2005	4,212	7,541	

Accident Year	Cumulative Paid Losses (\$000 Omitted)	
	Evaluation Interval in Months	
	12-24	24-36
2004	+6,671 / 3,780	+8,156 / 6,671
2005	+7,541 / 4,212	

Basic Reserving Techniques:
Compilation of Paid Loss Triangle

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Accident Year	Cumulative Paid Losses (\$000 Omitted)	
	Evaluation Interval in Months	
	12-24	24-36
2004	+6,671 / 3,780	+8,156 / 6,671
2005	+7,541 / 4,212	

Accident Year	Evaluation Interval in Months	
	12-24	24-36
2004	1.765	1.223
2005	1.790	

Basic Reserving Techniques:
Paid Loss Development Factors

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Loss Development Factors (LDFs) are also known as:

- Age-to-Age factors
- Link Ratios

Basic Reserving Techniques: Issues to Consider for Paid LDM

Issues to Consider	Examples
Have there been any changes which might make the older years irrelevant?	There are more motorcycle losses in the oldest year: Typical P&C no longer insures motorcycles.
Are the more recent years better predictors of the future?	Typical P&C has begun writing more business in state X.
Are there outlier points that need to be ignored or adjusted?	In one year, there were bad ice storms at the end of December. Late reporting caused unusually high development in the next year.

Basic Reserving Techniques: Incurred Loss Triangle

Accident Year	Case Reserves (\$000 Omitted)					
	Development Stage in Months					
	12	24	36	48	60	72
2004	5,557	4,176	2,936	1,987	1,245	742
2005	6,328	4,664	3,200	2,051	1,189	
2006	6,974	4,968	3,251	1,955		
2007	7,835	5,274	3,367			
2008	8,376	5,604				
2009	9,599					

Add → Add ↓

Accident Year	Cumulative Paid Losses (\$000 Omitted)					
	Development Stage in Months					
	12	24	36	48	60	72
2004	3,780	6,671	8,156	9,205	9,990	10,508
2005	4,212	7,541	9,351	10,639	11,536	
2006	4,901	8,864	10,907	12,458		
2007	5,708	10,288	12,699			
2008	6,093	11,172				
2009	6,962					

Basic Reserving Techniques: Incurred Loss Triangle

Accident Year	Cumulative Case Reported Losses (\$000 Omitted)						Final Total Cost
	Development Stage in Months						
	12	24	36	48	60	72	
2004	9,337	10,847	11,082	11,192	11,235	11,250	???
2005	10,540	12,205	12,551	12,690	12,725		???
2006	11,875	13,832	14,238	14,413			???
2007	13,343	15,542	16,066				???
2008	14,469	16,776					???
2009	16,561						???

Comparison of Loss Development Methods 37

Underlying Assumptions

- **PLDM: No changes in the payment pattern**
- **ILDM: No changes in case reserve adequacy**

Pro	Con
PLDM: "Hard" data; no estimates involved	PLDM: May generate large, volatile loss development factors & take longer to develop to ultimate
ILDM: Uses all available information	ILDM: Uses case reserves, which are estimates, to develop estimates of ultimate losses

Key Assumptions & Potential Problems 38

Assumptions	Potential Problems
Claims settlement patterns unchanging	Increasing delays in claim closing rates
Case reserving practices & philosophies unchanging	Conscious effort to improve case reserve adequacy: Introduction of new case reserving procedures
No claim processing changes	Change in data processing; Revised claim payment recording procedures
Policy limits have no impact on loss development	Increasing frequency of full policy limits claims; Changing policy limits

Key Assumptions & Potential Problems 39

Assumptions	Potential Problems
Loss development unaffected by changing loss cost trends	Surges in inflation; Increased litigation; Diminished policy defenses
No change in mix of business	Changes in reinsurance coverages; Increased long-tail exposures; Introduction of new or revised coverages
No cyclical loss development	Underwriting cycles impact claims settlement or reserving practices

Key Assumptions & Potential Problems

Assumptions	Potential Problems
No data anomalies	Catastrophic or unusual losses reflected in loss experience; Unusual claim settlement/reporting delays

Comparison of Estimated Reserves

Accident Year	Estimated Loss Reserves Based on:		
	Paid LDM	Incurred LDM	Average = Selected
	Paid Method	Incurred Method	Average
2004	736	742	739
2005	1,449	1,202	1,326
2006	2,757	2,013	2,385
2007	4,889	3,609	4,249
2008	7,937	6,367	7,152
2009	14,473	13,157	13,815
Total	32,241	27,090	29,666

Comparison of Estimated Reserves

Components of Selected Reserve at 12/31/09

Accident Year	Case	IBNR	Total
2004	736	0	736
2005	1,449	0	1,449
2006	2,757	0	2,757
2007	4,889	0	4,889
2008	7,937	0	7,937
2009	13,815	6,000	19,815

Comparison of Estimated Reserves ⁴³

- Which estimate is right?
- Which estimate is best?
- How will you know?
- When will you know?

Session I Review ⁴⁴

- CAS Statement of Principles
 - Definitions
 - Principles
 - Considerations
- Basic Reserving Techniques
 - Paid Loss Development Method (PLDM)
 - Incurred Loss Development Method (ILDLM)

Looking Ahead ⁴⁵

- Evaluating for Reasonability
- Factors influencing Sensitivity of Estimates
- More Basic Reserving Techniques
- Loss Adjustment Expenses
- Schedule P
- Examples - You set the reserve!

Basic Track I

September 2009

Chicago, IL