Financial Risk Management Principles – Loss Development

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Liberty Mutual INSURANCE

Questions We Are Often Asked!

- “My loss pick is going from $7.8M last year to $14.6M this year. How can that be?”
- “There are only 3 months left in my current policy year – surely you can forecast the ultimate losses now. My projection is due to Accounting tomorrow.”
- “Why are my claims costs going up when the number of accidents is going down?”
- “I’ve never had an excess loss. Why is the cost going up?”
- “I only have 12 open claims left, from a total of 145 for that policy year. There is no way the reserves can be double what we have already paid!”

How do we
respond to these issues; what are the answers?

Agenda

- Goal of loss forecasting
- Loss development and ultimate loss
  - Underlying assumptions
  - Incurred but not reported (IBNR)
- Components of ultimate loss
  - Paid loss
  - Case reserves
  - Bulk reserves
- “Loss Triangle” – what is it and how is it used?
- Development to ultimate factors
  - What are they?
  - How are they calculated?
- Q & A

Session Objectives

By the end of this session, you should be able to:

- Define key financial risk management terms.
- Explain how and why the value of individual casualty claims change over time.
- Indicate how to measure development of a body of claims over time.
- Construct and interpret loss triangles.
- Identify factors driving loss development at the micro (single claim) and macro (all claims) levels.
- Discuss how bulk reserves are applied to a body of claims.

Financial Components of Casualty Claims

- **Paid Loss**: Amount actually paid on losses that occurred within a specified time period, measured at a specific point in time.
- **Case Reserves**: Best estimate of total future payments expected to be made for an individual claim. It's determined by assessing all the known facts of the case at the time.
- **Incurred Loss**: Amount of loss actually paid for claims that occurred during a specified period, plus an estimate of what is expected to be paid in the future for all claims that will occur in that same period (paid losses + case reserves).
- **IBNR (Incurred But Not Reported)**: (also known as "bulk reserves") Reserve provision for late reported claims, development on known claims, and re-opened claims.

Financial Components of Casualty Claims (Continued)

- **ALAE (Allocated Loss Adjusting Expenses)**: Costs incurred in conjunction with the adjudication and administration of a casualty claim that are specific to that claim and associated with the loss. ALAE can be measured as paid, reserved, and incurred (paid + reserves), similar to the loss portion of a claim.

  Examples of ALAE include legal expenses, medical bill review fees, field investigation services, and so on.

- **Ultimate Loss**: Estimate of the total loss, or loss plus ALAE, that will be paid for all claims that occurred within a specified period when all claims have been fully paid and closed.

Loss Forecasting

Goal: The process of estimating a policy year's ultimate value when all claims are paid and closed. Judgment is imperative!

Underlying Assumptions: Past loss experience can be used to estimate future loss experience if nothing materially changes.

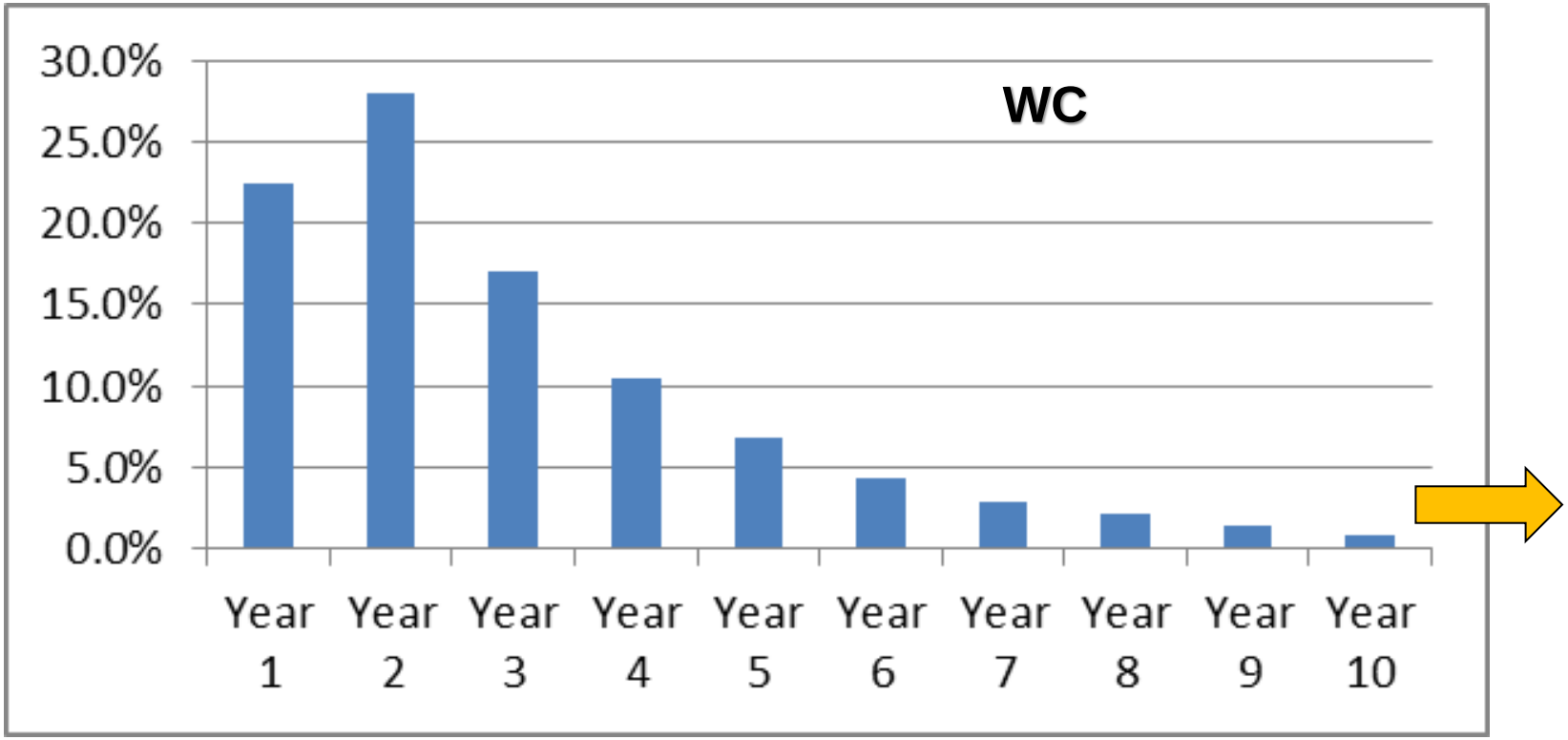
Examples of "material changes":

- Acquisitions and divestitures
- Change in reserve practices
- Safety program changes
- Benefit level changes

"My loss pick is going from $7.8M last year to $14.6M this year. How can that be?"

Casualty Loss Payout Patterns – Workers Compensation (WC)

A Single Year's Losses Are Paid Out Over Several Years



These figures are hypothetical

"There is no way the reserves can be double what we have already paid!"

WC Payout Pattern – High Cost Claims Take Longer to Pay Off

Losses	Approx. years to pay out the ultimate loss
> $100k	7.5
> $250k	15.5
> $500k	20.0
> $1M	26.5

"I've never had an excess loss. Why is the cost going up?"

For every 1 claim in excess of $1,000,000 as of 5 years, there will be 3.6 claims in excess of $1,000,000 as of 15 years.

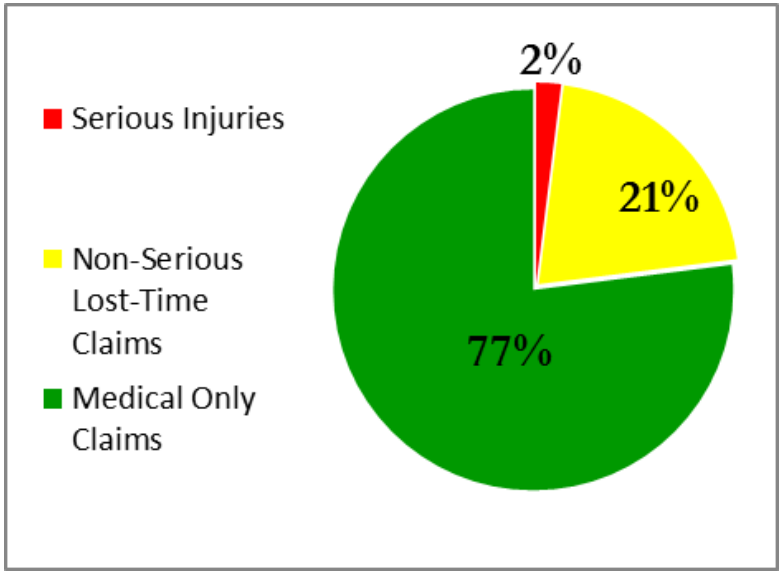
After 5 Years	**After 10 Years**	**After 15 Years**
1.0	**2.6**	**3.6**

(Claims greater than $1,000,000)

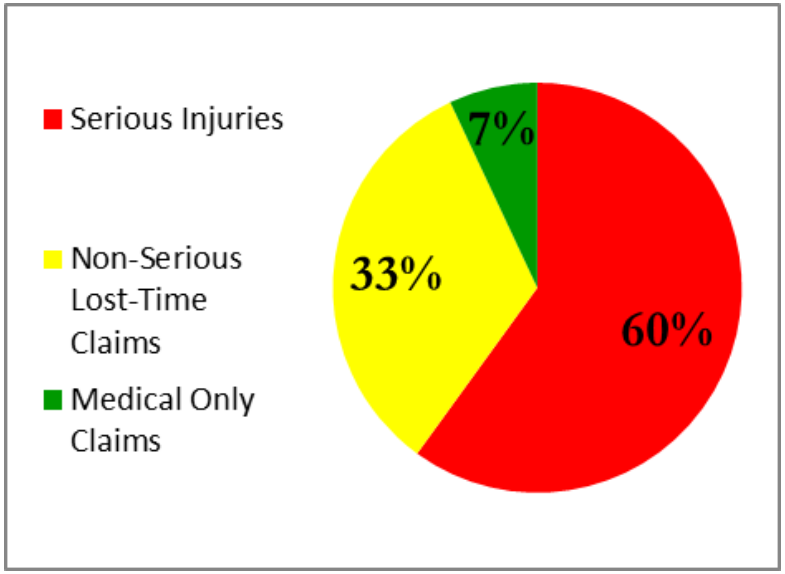
These figures show Liberty data, on a weighted average

Serious WC Claims Drive the Overall Loss Dollars

Percentage of Claims



Percentage of Loss $



These charts show Liberty data, on a weighted average.

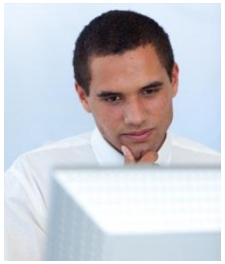
2% of claims account for 60% of loss dollars

Serious claims are defined as fatalities, permanent total disabilities, and major permanent partial disabilities.

Life Cycle of a WC Claim

Accident occurs

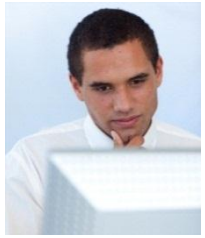
Claim reported



Investigation conducted

Case owner posts initial case reserves

New information emerges about seriousness of the injury



Case owner revises reserves for medical, indemnity, and expenses

Medical bills and payments made for lost wages

Case owner adjusts indemnity reserves based on estimated recovery period

Injured worker returns to work

Final payments made

Case closed

What Causes Losses to Develop?

Upward Loss Development

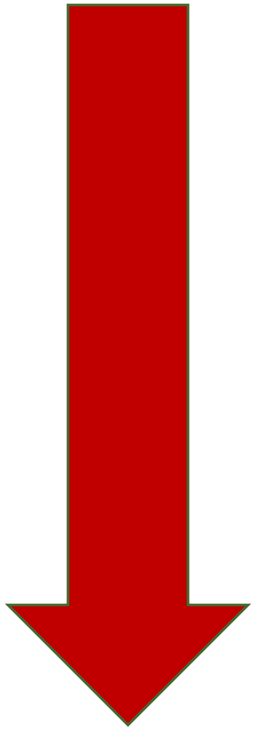
- Facts about a case emerge over time.
- Unforeseen medical developments or complications arise.
- Claims may re-open.
- Inflation may be higher than estimated.
- Some WC claims may not develop until years later.

"Why are my claims costs going up when the number of accidents is going down?"

What Causes Losses to Develop?

Downward Loss Development

- Facts about a case emerge over time.
- Inflation may be lower than estimated.
- Initial case reserve was incorrect.
- Favorable settlements occur.
- Recourse made to State Second Injury Funds.
- Recovery of some loss through subrogation.



The Financial Aspects of Casualty Claims – Case-Specific Influences

- Changes in medical status
- Non-related (co-morbid) medical conditions
- Unintended consequences of treatment
- Failed treatment program
- Injury creep
- Prolonged recovery period
- Permanent work restrictions
- Plant closings

The Financial Aspects of Casualty Claims – Global Influences

- Medical and Wage Inflation
- Statutory Rate and Benefit Level Changes
- Political Climate
- Changes in Medical Technology and Treatment Protocols
- Aging Workforce
- Medicare Set Aside Agreements
- New Exposures to Illness and Injury
  - Asbestos
  - Toxic Mold
  - Computer Workstations
  - Cumulative Trauma Disorders (CTDs)

Loss Development Process: Facts

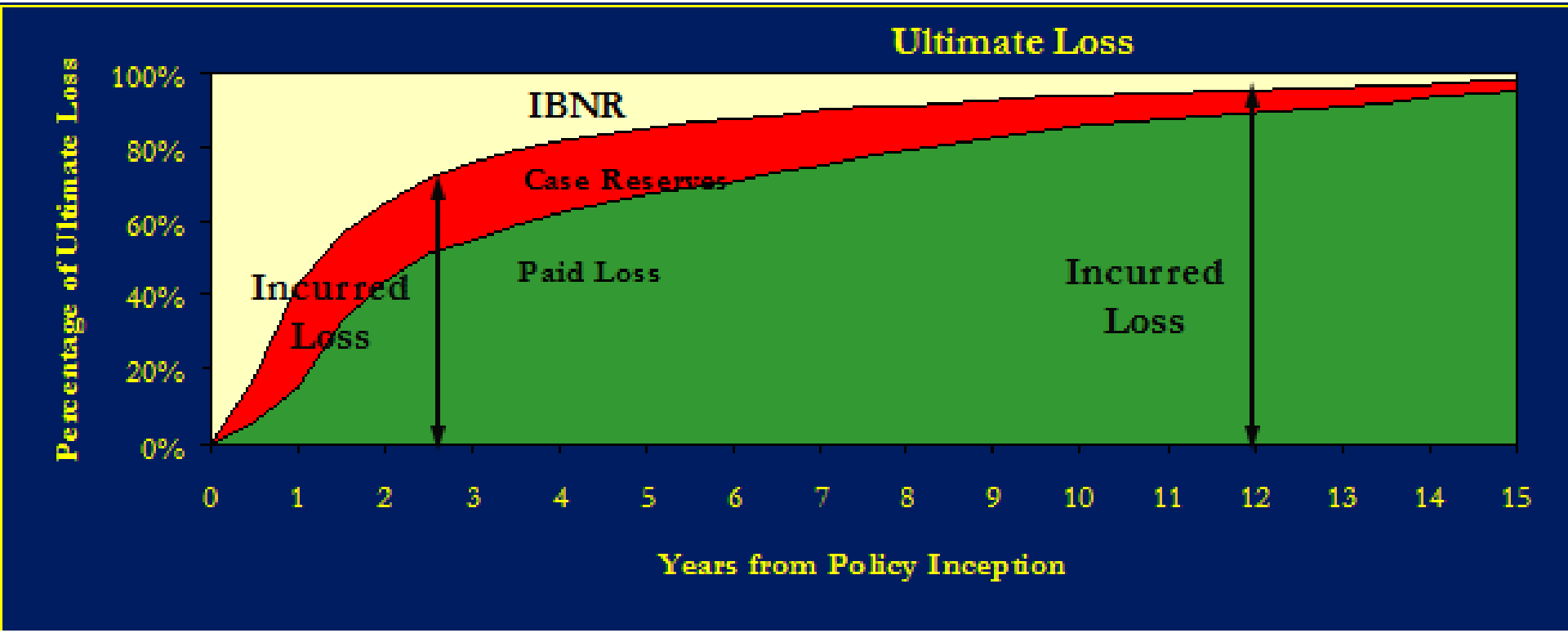
- The incurred loss (paid loss + case reserve) represents the case owner's best estimate of the final cost of the claim, based on the known facts at that specific point in time.

- Incurred loss estimates change (up or down) as claim facts change over time.

- Until all of a claim is paid and the claim is closed, both the actual (paid) and estimated (incurred) cost of the claim may change.

- This change in paid and incurred loss costs over time is known as Loss Development.

The Components of Ultimate Loss



These figures are hypothetical

What is IBNR?

IBNR = Incurred But Not Reported

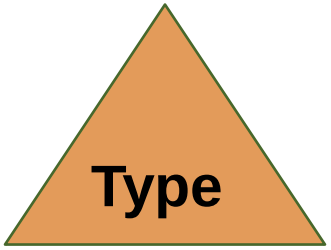
1. Case Development
2. Late Reported Claims
3. Reopened Claims

Which is the Largest Component of IBNR?

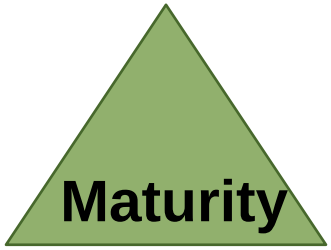
How Do We Measure Loss Development?

Loss Triangles

They represent the historical valuation of aggregate losses from a series of consecutive loss periods, at consistent intervals of time.



They are typically derived from the net of incurred losses, paid losses, and claim counts.



Their value derives from assessing historical loss development and using the data to project future loss development.

Loss Triangle Format and Interpretation

($ in 000)

Accident Period	6 Months	18 Months	30 Months	42 Months	54 Months
2009	$4,823	$13,570	$16,722	$18,822	***$19,795***
2010	$5,138	$17,715	$22,478	***$24,906***	
2011	$5,561	$16,788	***$21,113***		
2012	$6,037	***$18,272***			
2013	***$6,593***				

Loss Development

Total Current Incurred Losses = **$90,679,000**

These figures are hypothetical

Factors That Drive Loss Development

Accident Years' Drivers
- Inflation
- Business levels
- Benefit levels
- Legislative changes

Period to Period Drivers
- IBNR
- Litigation
- Subrogation & recoveries

(In $000,s)

Accident Period	6 Months	18 Months	30 Months	42 Months	54 Months
2009	$4,823	$13,570	$16,722	$18,822	$19,795
2010	$5,138	$17,715	$22,478	$24,906	
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2012	$6,037	$18,272			
2013	$6,593				

Calendar Year Drivers
- Reserving practices
- Payment patterns (existing claims)

These figures are hypothetical

Steps in the Loss Forecasting Process

1. **Calculate** period-to-period development factors – a.k.a. “link ratios,” and expected Age-to-Age (ATA) factors.

2. **Estimate and apply** a “tail” factor where the triangle ends.

3. **Accumulate** the factors backward to get Age-to-Ultimate (ATU) factors.

4. **Apply** the ATU factor to current reported losses to estimate ultimate losses.

The Loss Forecasting Process

A Process of Identifying Historical Patterns to Use for Projecting the Future

($ in 000)

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2013	***$6,593***				

Accident Period	6 to 18 Months	18 to 30 Months	31 to 42 Months	43 to 54 Months
2009	2.8136	1.2323	1.1256	1.0517
2010	3.4478	1.2689	1.1080	
2011	**3.0189**	1.2576		
2012	3.0267			
ATA Factors:	**3.0767**	**1.2529**	**1.1168**	**1.0517**

A *Link Ratio* is the change in value of losses from one valuation to the next.

These figures are hypothetical

Age-to-Age (ATA) Factor Selection

- Consider (average) past link ratios:
  - Longer term for stability
  - Shorter term for responsiveness

- Consider internal and external factors:
  - Changes in inflation/trend
  - Changes in case reserve strength
  - Changes in payment patterns
  - Legal climate

How to Not Apply a Tail Factor

Since this factor adds development to all accident years in the triangle, it must be selected wisely.

Calculating Ultimate Loss

($ in 000)

Accident Period	6 Months	18 Months	30 Months	42 Months	54 Months
2009	$4,823	$13,570	$16,722	$18,822	***$19,795***
2010	$5,138	$17,715	$22,478	***$24,906***	
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2011	**3.0189**	1.2576		
2012	3.0267			

ATA Factors:	3.0767	1.2529	1.1168	1.0517	Tail Factor
ATU Factors:	4.8900	1.5893	1.2685	1.1358	1.0800
Ultimate Losses:	***$32,240***	$29,040	$26,782	$28,289	$21,379

These figures are hypothetical

Applying Loss Development

($ in 000s)

Accident Period	Current Reported Loss	Age in Months	Age to Ultimate Factor	Projected Ultimate Loss
2009	$19,795	54	1.0800	$21,379
2010	$24,906	42	1.1358	$28,289
2011	$21,113	30	1.2685	$26,782
2012	$18,272	18	1.5893	$29,040
2013	$6,593	6	4.8900	***Too "Green"***

"There are only 3 months left in my current policy year – surely you can forecast the ultimate losses now. My projection is due to Accounting tomorrow."

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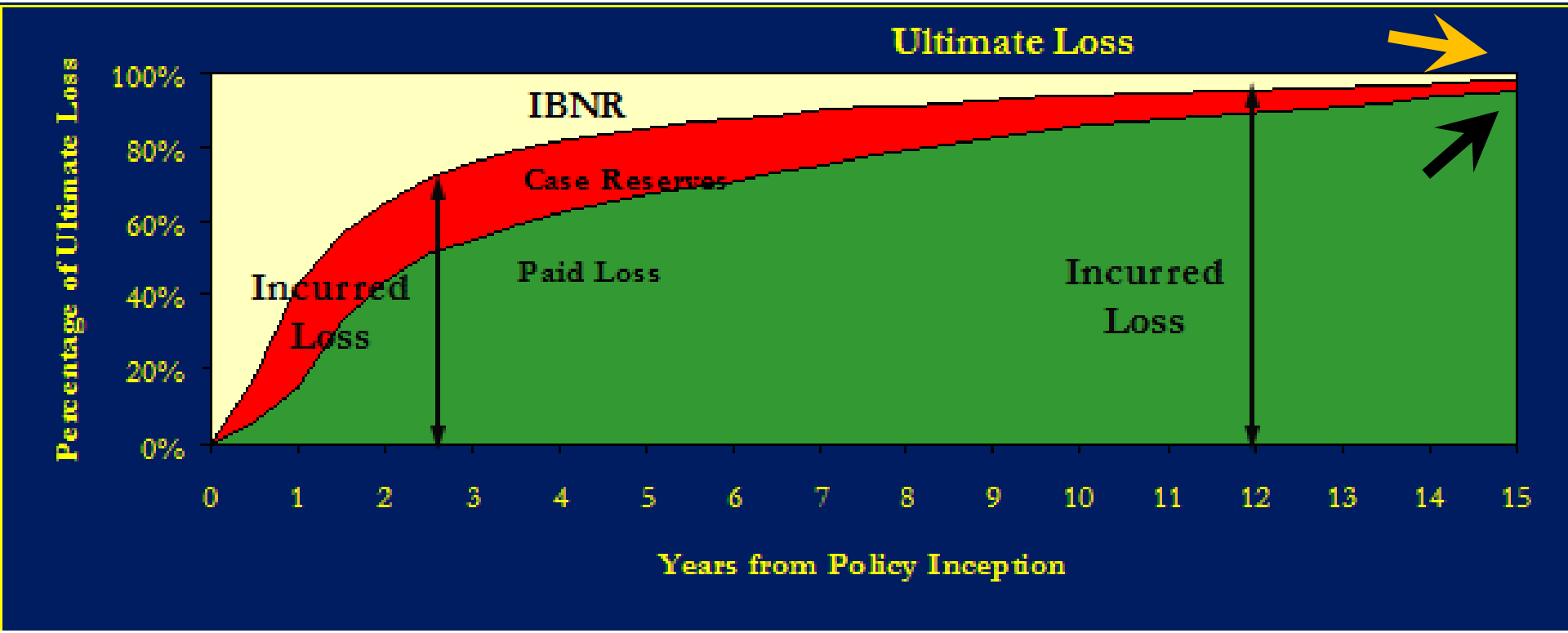
In Theory: Ultimate Incurred = Ultimate Paid



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Selecting the Ultimate Loss

	2009	2010	2011	2012
Incurred Loss	$19,795	$24,906	$21,113	$18,272
ATU Factor	1.0800	1.1358	1.2685	1.5893
Incurred Ultimate Loss	$21,379	$28,289	$26,782	$29,040
Paid Loss	$18,371	$21,683	$16,556	$11,723
ATU Factor	1.1854	1.3315	1.6695	2.5727
Paid Ultimate Loss	$21,777	$28,871	$27,641	$30,160
Incurred Loss Weighting	40%	40%	40%	40%
Paid Loss Weighting	60%	60%	60%	60%
Selected Ultimate Loss	**$21,618**	**$28,638**	**$27,297**	**$29,712**

These figures are hypothetical

Review

We covered:

- What drives the cost of claims over time?
- Loss development (drivers of upward and downward development).
- Estimating the ultimate loss value of a body of claims.

Remember!

Until the last dollar of a claim is paid, the ultimate loss value remains an estimate.

Questions?