RPM Workshop 1: Basic Ratemaking

Development of an Overall Indication

May 15th, 2010
The Fairmont Chicago
Chicago, IL

Scott Donoho, FCAS, MAAA
Allstate Insurance Company
Scott.Donoho@Allstate.com

Antitrust Notice

- The Casualty Actuarial Society is committed to adhering strictly to the letter and spirit of the antitrust laws. Seminars conducted under the auspices of the CAS are designed solely to provide a forum for the expression of various points of view on topics described in the programs or agendas for such meetings.
- Under no circumstances shall CAS seminars be used as a means for competing companies or firms to reach any understanding – expressed or implied – that restricts competition or in any way impairs the ability of members to exercise independent business judgment regarding matters affecting competition.
- It is the responsibility of all seminar participants to be aware of antitrust regulations, to prevent any written or verbal discussions that appear to violate these laws, and to adhere in every respect to the CAS antitrust compliance policy.

Basic Ratemaking Equation and Its Considerations:

- How is data organized?
- What are the two main methods of ratemaking and what are their equations?
- Rate Level Indication Example
  - What adjustments need to be made to losses?
  - How do we incorporate expenses and profit?
  - What adjustments need to be made to premium?

HOW IS DATA ORGANIZED?

I. CALENDAR YEAR DATA
(standard accounting year)

II. POLICY YEAR DATA

III. ACCIDENT YEAR DATA

4

HOW IS DATA ORGANIZED?

I. CALENDAR YEAR DATA

Premium and Loss transactions that occur during the year.

Premiums:

- Written Premium—Total Premium for policies written during the calendar year.
- Earned Premium—Total Premium earned during the calendar year.

Incurred Loss = Payments + ***change*** in reserves *during year*

5

HOW IS DATA ORGANIZED?

I. CALENDAR YEAR DATA

Advantages:

- Matches financial statements
- Data available quickly
- Never changes after it is calculated at the end of a year.

Disadvantages:

- Premium and Loss transactions ***DO NOT*** match
- Reserve changes from prior years can distort the reliability of the data for ratemaking and management purposes.

6

HOW IS DATA ORGANIZED?

I. CALENDAR YEAR DATA

A 12 month policy is written on 7/1/09 for $1000

2009 Written Premium = $1000

2009 Earned Premium = $500

7

HOW IS DATA ORGANIZED?

I. CALENDAR YEAR DATA

The insured has an accident on 12/15/09. A reserve is set up for $5000.

2009 Incurred Losses = 2009 Payments + 2009 Change in reserves.

Payments = $0

Change in reserves = $5000 (since previously there were no reserves).

2009 Incurred Losses = $0 + $5000 = $5000

8

HOW IS DATA ORGANIZED?

I. CALENDAR YEAR DATA

The insured has an accident on 12/15/09. A reserve is set up for $5000.

On 2/15/10, the claimant is paid $3000 and the claim is closed. Assume this insured has no more claims the rest of the policy period. What are the new 2009 Incurred Losses?

Remember, one advantage of Calendar Year data is that it never changes once it is calculated.

So, 2009 Incurred Losses are still $5000.

9

HOW IS DATA ORGANIZED?

I. CALENDAR YEAR DATA

The insured has an accident on 12/15/09. A reserve is set up for $5000.

On 2/15/10, the claimant is paid $3000 and the claim is closed. Assume this insured has no more claims the rest of the policy period. What are the 2010 Incurred Losses?

2010 Incurred Losses = 2010 Payments + 2010 Change in Reserves

2010 Payments = $3000

Change in Reserves = Reserves at end of 2010 – Reserves at beginning of 2010

Change in Reserves = $0 - $5000 = -$5000

2010 Incurred Losses = $3000 + -$5000 = $-2000

10

HOW IS DATA ORGANIZED?

II. POLICY YEAR DATA

Premium and Loss transactions ***on policies with effective dates (new or renewal)*** during the year.

Incurred Loss = Payments on these policies + Reserves on these policies

11

HOW IS DATA ORGANIZED?

II. POLICY YEAR DATA

Advantages:

- Premium and Loss transactions ***DO*** match
- Transactions from policies effective in prior years do not distort the data for ratemaking

Disadvantages:

- Data with the greatest time lag (not available until one term after end of the year.)
- Exact ultimate losses cannot be finalized until all losses settled.

12

HOW IS DATA ORGANIZED?

I. POLICY YEAR DATA

A 12 month policy is written on 7/1/09 for $1000

2009 Written Premium = $1000

2009 Earned Premium = $1000

13

HOW IS DATA ORGANIZED?

I. POLICY YEAR DATA

The insured has an accident on 12/15/09. A reserve is set up for $5000.

2009 Incurred Losses = Payments on policies effective in 2009 + Reserves on policies effective in 2009

Payments = $0

Reserves = $5000

2009 Incurred Losses = $0 + $5000 = $5000

14

HOW IS DATA ORGANIZED?

I. POLICY YEAR DATA

The insured has an accident on 12/15/09. A reserve is set up for $5000.

On 2/15/10, the claimant is paid $3000 and the claim is closed. Assume this insured has no more claims the rest of the policy period. What are the new 2009 Incurred Losses?

Since 2009 Incurred Losses are for all losses paid and reserved on policies effective in 2009, the 2009 incurred losses are revised from their prior estimate.

2009 Incurred Losses = Payments on policies effective in 2009 + Reserves on policies effective in 2009

So, 2009 Incurred Losses are now $3000.

15

HOW IS DATA ORGANIZED?

I. POLICY YEAR DATA

The insured has an accident on 12/15/09. A reserve is set up for $5000.

On 2/15/10, the claimant is paid $3000 and the claim is closed. Assume this insured has no more claims the rest of the policy period. What are the new 2010 Incurred Losses?

There are no 2010 Incurred Losses for this policy since it was effective in 2009.

In fact, there will never be any 2010 Incurred Losses for this policy.

16

HOW IS DATA ORGANIZED?

III. ACCIDENT YEAR DATA

Loss transactions ***for accidents occurring*** during the year. Premium transaction during the same 12 months. The premiums will be exactly the same as those calculated under the Calendar Year Method.

Incurred Loss = Payments on accidents occurring in that year + Reserves for accidents occurring in that year.

17

HOW IS DATA ORGANIZED?

III. ACCIDENT YEAR DATA

Advantages:

- Represents a better match of premium and losses than Calendar Year aggregation
- Transactions from accidents occurring in prior years do not distort the data for ratemaking

Disadvantages:

- Data with slight time lag
- Exact ultimate losses cannot be finalized until all losses settled.

18

HOW IS DATA ORGANIZED?

I. *ACCIDENT YEAR DATA*

A 12 month policy is written on 7/1/09 for $1000

2009 Written Premium = $1000

2009 Earned Premium = $500

19

HOW IS DATA ORGANIZED?

I. *ACCIDENT YEAR DATA*

The insured has an accident on 12/15/09. A reserve is set up for $5000.

2009 Incurred Losses = Payments on Accidents occurring in 2009 + Reserves on Accidents occurring in 2009

Payments = $0

Reserves = $5000

2009 Incurred Losses = $0 + $5000 = $5000

20

HOW IS DATA ORGANIZED?

I. *ACCIDENT YEAR DATA*

On 2/15/10, the claimant is paid $3000 and the claim is closed. Assume this insured has no more claims the rest of the policy period. What are the new 2009 Incurred Losses?

Since 2009 Incurred Losses are for all losses paid and reserved on accidents occuring in 2009, the 2009 incurred losses are revised from their prior estimate.

So, 2009 Incurred Losses are now $3000.

21

HOW IS DATA ORGANIZED?

I. ACCIDENT YEAR DATA

On 2/15/10, the claimant is paid $3000 and the claim is closed. Assume this insured has no more claims the rest of the policy period. What are the 2010 Incurred Losses?

There are no 2010 Incurred Losses for this policy since it has no accidents in 2010.

22

HOW IS DATA ORGANIZED?

In summary, as of 12/31/2010 we have the following…..

	Incurred Loss		2009 Written Premium	2009 Earned Premium
	2009	2010		
Calendar Year	$5000	-$2000	$1000	$500
Policy Year	$3000	$0	$1000	$1000
Accident Year	$3000	$0	$1000	$500

23

Basic Ratemaking Equation:

Future Premiums =

Future Losses +

Future Expenses +

Underwriting Profit and Contingency Provision

24

BASIC RATEMAKING METHODS

- **Loss Ratio Method**
  - Develops an indicated rate change (A)
  - A = (Experience Loss Ratio / Target Loss Ratio) – 1
- **Pure Premium Method**
  - Pure Premium (PP) = Dollars of Loss / # of Exposure Units
  - Develops indicated premium (R) per unit of exposure
  - R = (PP + FE) / (1 –VER – Profit Ratio)

Note: The two methods produce identical results when identical data and assumptions are used.

25

BASIC PURE PREMIUM FORMULA

Indicated Premium (R) = Future Pure Premium (PP)
+ Future Fixed Expense (FE)
+ Future Variable Expense (VE)
+ Future Profit (π)

Since VE and Profit vary with premium, this equation becomes….

26

BASIC PURE PREMIUM FORMULA

$R = PP + FE + VER*R + \pi*R$

$R - VER*R - \pi*R = PP + FE$

$R (1 - VER - \pi) = PP + FE$

$R = (PP + FE) / (1 - VER - \pi)$

Example:
R = ($120 + $20) / (1 - 25% - 5%) = $200

27

BASIC PURE PREMIUM FORMULA

In order to determine an indicated rate change, we must compare this indicated premium to the premium we would expect to get over the future policy period if we did nothing.

For example, our indicated premium is $200. If our expected future premium if we did nothing was $100, our indicated rate change is 100%.

Indicated Rate Level Change
= (R / E[Future Premium]) - 1

28

PURE PREMIUM METHODOLOGY

- Loss Adjustments
  - Loss Development
  - Loss Adjustment Expense
  - Loss Trend
  - Catastrophe Adjustments
- Premium Adjustments
  - Adjust to Current Rate Level
  - Premium Trend

29

RATE INDICATION WORKSHEET
Pure Premium Methodology

A. INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10) . . . . . .

(1) Accident Year 2009 Ultimate Losses & ALAE . . . . . .
(2) Unallocated Loss Adjustment Expense (ULAE) Factor. . . . . .
(3) Annual Loss Trend ___% Trend Period:
(4) Exponential Trend Factor [1.0 + (3)] ^ Trend Period . . . . . .
(5) Trended Ultimate Losses and LAE = (1) * (2) * (4) . . . . . .
(6) Expected Catastrophe Loss & LAE for Projection Period . . . . . .

(7) Fixed Expense Ratio . . . . . .
(8) Fixed Expense Dollars = (7) * (11) . . . . . .

(9) Variable Expense Ratio . . . . . .
(10) Underwriting Profit Provision . . . . . .

B. EXPECTED FUTURE PREMIUM. . . . . .

(11) 2009 Earned Premium . . . . . .
(12) Current Rate Level Factor . . . . . .
(13) Premium Trend Factor . . . . . .
(14) Trended Premium @ Current Rate Level = (11)*(12)*(13) . . .

C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0. . . . . .

30

Sample Rate Level Indication

Assumptions

- Annual Policies. Rates to be revised as of JANUARY 1, 2011
- Pure Premium Methodology
- EXPERIENCE PERIOD: ACCIDENT YEAR 2009
  - 2009 Earned Premium $7,380,000
  - Reported Incurred Losses as of 12/31/09: $3,800,000

31

PURE PREMIUM METHODOLOGY

Adjustments to Losses

- Loss Development
- Loss Adjustment Expenses
  - Allocated Loss Adjustment Expense (ALAE)
    - Generally included with loss
  - Unallocated Loss Adjustment Expense (ULAE)
    - Generally loaded to Loss & ALAE
- Loss Trend
- Catastrophe Adjustments

32

PURE PREMIUM METHODOLOGY

Adjustments to Losses

- Loss Development
  - Adjust historical losses to an expected ***ULTIMATE*** value
  - Reflects revisions to claim values as claims are settled
  - Used with policy and accident year data
  - Reflects IBNR reporting.
  - Reflects development on reported claims.

33

Accident Year Loss Development Analysis

INCURRED METHOD - Recognizes *SYSTEMATIC* inaccuracy of case reserves

INCURRED LOSSES & ALAE
Adjusted for Cats, (000's)

ACCIDENT YEAR	Reported as of: 12 mos	24 mos	36 mos	48 mos
2004	2,400	2,976	3,096	3,096
2005	2,600	3,510	3,686	3,686
2006	2,800	3,416	3,382	3,382
2007	3,000	3,600	3,672	
2008	3,200	3,936		
2009	3,800			

Age to Age Development Factor =
Incurred Loss @ Later Report Period divided by Loss @ Prior Report Period

AY 2007 12 mos TO 24 mos Factor = **$3,600 / $3,000 = 1.20**

34

Accident Year Loss Development Analysis

INCURRED AGE-TO-AGE FACTORS

ACCIDENT YEAR	12-24 mos	24-36 mos	36-48 mos
2004	1.24	1.04	1.00
2005	1.35	1.05	1.00
2006	1.22	0.99	1.00
2007	**1.20**	1.02	
2008	1.23		
Average	**1.248**	**1.025**	**1.000**
Selected	**1.248**	**1.025**	**1.000**
Cumulative Age-to-Age Factors	**1.279**	**1.025**	**1.000**

x x

35

LOSS DEVELOPMENT ANALYSIS

Accident Year	(1) Incurred Loss & ALAE @ 12/09	(2) Cumulative Age to Ultimate Factor	(3) Estimated Ultimate Loss (1) * (2)
2006	**3,382**	**1.000**	**3,382**
2007	**3,672**	**1.000**	**3,672**
2008	**3,936**	**1.025**	**4,034**
2009	**3,800**	**1.279**	**4,860**

36

RATE INDICATION WORKSHEET
Pure Premium Methodology

A. INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10) . . . . . .

(1) Accident Year 2009 Ultimate Losses & ALAE $4,860
(2) Unallocated Loss Adjustment Expense (ULAE) Factor. . . . . .
(3) Annual Loss Trend ___% Trend Period:
(4) Exponential Trend Factor [1.0 + (3)] ^ Trend Period . . . . . .
(5) Trended Ultimate Losses and LAE = (1) * (2) * (4) . . . . . .
(6) Expected Catastrophe Loss & LAE for Projection Period . . . . . .
(7) Fixed Expense Ratio . . . . . .
(8) Fixed Expense Dollars = (7) * (11) . . . . . .
(9) Variable Expense Ratio . . . . . .
(10) Underwriting Profit Provision . . . . . .

B. EXPECTED FUTURE PREMIUM. . . . . .

(11) 2009 Earned Premium . . . . . .
(12) Current Rate Level Factor . . . . . .
(13) Premium Trend Factor . . . . . .
(14) Trended Premium @ Current Rate Level = (11)*(12)*(13) . . .

C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0. . . . . .

EXPENSE ANALYSIS

Unallocated Loss Adjustment Expense

Countrywide Figures
(in $ millions)

Year	Incurred Losses & ALAE	Unallocated Loss Adjustment Expenses	ULAE to Losses & ALAE Ratio
2007	$61,200	$6,500	10.6%
2008	79,000	7,800	9.9%
2009	82,300	8,300	10.1%

Estimated Future ULAE Percentage
as a percentage of Incurred Losses & ALAE **10.0%**

RATE INDICATION WORKSHEET
Pure Premium Methodology

A. INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10) . . . . . .

(1) Accident Year 2009 Ultimate Losses & ALAE $4,860
(2) Unallocated Loss Adjustment Expense (ULAE) Factor. 1.10
(3) Annual Loss Trend ___% Trend Period:
(4) Exponential Trend Factor [1.0 + (3)] ^ Trend Period . . . . . .
(5) Trended Ultimate Losses and LAE = (1) * (2) * (4) . . . . . .
(6) Expected Catastrophe Loss & LAE for Projection Period . . . . . .
(7) Fixed Expense Ratio . . . . . .
(8) Fixed Expense Dollars = (7) * (11) . . . . . .
(9) Variable Expense Ratio . . . . . .
(10) Underwriting Profit Provision . . . . . .

B. EXPECTED FUTURE PREMIUM. . . . . .

(11) 2009 Earned Premium . . . . . .
(12) Current Rate Level Factor . . . . . .
(13) Premium Trend Factor . . . . . .
(14) Trended Premium @ Current Rate Level = (11)*(12)*(13) . . .

C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0. . . . . .

PURE PREMIUM METHODOLOGY

Adjustments to Losses

- Loss Trend
  - **Project** to the loss level predicted to exist during pricing period
  - **Data Issues**
    - Separate Claim frequency and Severity Trends?
    - Internal Vs. External Data ?
    - Paid, Incurred, Reported data ?
    - Calendar Vs. Accident year ?
    - Length of Historical period ?
    - Credibility ?
    - Extrapolations of Historical Data? (Least Squares Regression, Time Series, Econometric Models)

40

LOSS TREND ANALYSIS

Calendar Year	Paid Losses ($ 000's)	Earned Exposures (000's)	Pure Premium
2002	2,424	26.0	$ 93.23
2003	2,712	26.4	$102.73
2004	2,992	26.6	$112.48
2005	3,452	26.8	$128.81
2006	3,460	27.2	$127.21
2007	3,678	27.4	$134.23
2008	3,968	27.6	$143.77
2009	4,216	28.0	$150.57

Annual Trend based on Least Squares (exponential)	6.6%
Most Recent Annual Change (150.57 / 143.77)	4.7%

Other Possible Trend Sources

C.P.I. Medical Care Index	3 - 4%
C.P.I. Auto Body Work Index	4 - 5%
C.P.I. Home Maintenance & Repair Index	3 - 4%

41

RATE INDICATION WORKSHEET
Pure Premium Methodology

A.	INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10)	
	(1) Accident Year 2009 Ultimate Losses & ALAE	$4,860
	(2) Unallocated Loss Adjustment Expense (ULAE) Factor.	1.10
	(3) Annual Loss Trend 5.0% Trend Period: 2.5	
	(4) Exponential Trend Factor [1.0 + (3)] ^ Trend Period	
	(5) Trended Ultimate Losses and LAE = (1) * (2) * (4)	
	(6) Expected Catastrophe Loss & LAE for Projection Period	
	(7) Fixed Expense Ratio	
	(8) Fixed Expense Dollars = (7) * (11)	
	(9) Variable Expense Ratio	
	(10) Underwriting Profit Provision	
B.	EXPECTED FUTURE PREMIUM.	
	(11) 2009 Earned Premium	
	(12) Current Rate Level Factor	
	(13) Premium Trend Factor	
	(14) Trended Premium @ Current Rate Level = (11)*(12)*(13)	
C.	INDICATED RATE LEVEL CHANGE = (A / B) - 1.0.	

42

PURE PREMIUM METHODOLOGY

- Determination of Loss Trend Period
  - Annual Policies. Rates to be revised as of JANUARY 1, 2011
  - EXPERIENCE PERIOD: ACCIDENT YEAR 2009

Midpoint of Experience Period is 7/1/09

Midpoint of Exposure Period is 1/1/2012

TREND PERIOD is 2.50 Years

43

RATE INDICATION WORKSHEET
Pure Premium Methodology

A. INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10) . . . . . .

(1)	Accident Year 2009 Ultimate Losses & ALAE	$4,860
(2)	Unallocated Loss Adjustment Expense (ULAE) Factor.	1.10
(3)	Annual Loss Trend **5.0** % Trend Period: 2.5	
(4)	Exponential Trend Factor [1.0 + (3)] ^ Trend Period	1.13
(5)	Trended Ultimate Losses and LAE = (1) * (2) * (4)	$6,041
(6)	Expected Catastrophe Loss & LAE for Projection Period	
(7)	Fixed Expense Ratio	
(8)	Fixed Expense Dollars = (7) * (11)	
(9)	Variable Expense Ratio	
(10)	Underwriting Profit Provision	

B. EXPECTED FUTURE PREMIUM. . . . . .

(11)	2009 Earned Premium	
(12)	Current Rate Level Factor	
(13)	Premium Trend Factor	
(14)	Trended Premium @ Current Rate Level = (11)*(12)*(13) . . .	

C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0. . . . . .

44

PURE PREMIUM METHODOLOGY

Adjustments to Losses

- Catastrophe Adjustment
  - Catastrophes should be eliminated from the underlying data
  - Can be incorporated using various methods: long-term average, catastrophe simulation modeling, etc
  - Should also give consideration to other non-catastrophe large losses

For our example, let us assume we simulated 100,000 years of loss events and the model estimates and average annual catastrophe loss (including LAE) of $842,000 for our projection period

45

RATE INDICATION WORKSHEET
Pure Premium Methodology

A. INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10) . . . . . .

(1)	Accident Year 2009 Ultimate Losses & ALAE	$4,860
(2)	Unallocated Loss Adjustment Expense (ULAE) Factor.	1.10
(3)	Annual Loss Trend **5.0**% Trend Period: **2.5**	
(4)	Exponential Trend Factor [1.0 + (3)] ^ Trend Period	1.13
(5)	Trended Ultimate Losses and LAE = (1) * (2) * (4)	$6,041
(6)	Expected Catastrophe Loss & LAE for Projection Period	$842
(7)	Fixed Expense Ratio	
(8)	Fixed Expense Dollars = (7) * (11)	
(9)	Variable Expense Ratio	
(10)	Underwriting Profit Provision	

B. EXPECTED FUTURE PREMIUM. . . . . .

(11)	2009 Earned Premium	
(12)	Current Rate Level Factor	
(13)	Premium Trend Factor	
(14)	Trended Premium @ Current Rate Level = (11)*(12)*(13) . . .	

C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0. . . . . .

46

UNDERWRITING EXPENSE ANALYSIS
Direct Expenses Other Than Loss Adjustment

Countrywide Figures (In $ Millions)

	2007		2008		2009		Selected
	$	%	$	%	$	%	%
Written Premium	107,400	100	121,600	100	142,400	100	
Commissions	16,647	15.5	18,850	15.5	22,100	15.5	15.5
Other Acquisition	6,703	6.2	7,250	6.0	8,235	5.8	5.8
General	7,332	6.8	7,977	6.6	9,101	6.4	6.4
Taxes, Licenses & Fees	3,652	3.4	4,100	3.4	4,900	3.4	3.4

- Commissions and Premium Taxes vary directly with premiums
- Other Acquisition and General Expenses are "fixed" expenses
  - Not really fixed - vary with inflation

47

PURE PREMIUM METHODOLOGY

Underwriting Profit Provision

- Can be as basic as a simple selection. ex: 5%
- Or more complex with calculations including the consideration of *investment income*

Total Profit = Underwriting Profit + Investment Income

For example: The targeted total rate of return required by the company is 15% and the projected investment income is 6%. The targeted underwriting profit provision would be 9%.

48

PURE PREMIUM METHODOLOGY

Summary of Fixed and Variable Expenses

	Total	Variable	Fixed
Commissions	**15.5%**	**15.5%**	0.0%
Other Acquisition	**3.8**	0.0	**3.8**
General	**5.4**	0.0	**5.4**
Taxes, Licenses & Fees	**3.4**	**3.4**	0.0
Other Costs *	**0.5**	**0.5**	0.0
Contingency	2.0	2.0	2.0
TOTAL	**30.6%**	**21.4%**	**9.2%**
Profit	**5.0**	**5.0**	0.0

* Policyholder Dividends, Involuntary Market Costs, Guaranty Fund Assessments, Etc. (if allowable)

49

RATE INDICATION WORKSHEET

Pure Premium Methodology

A. INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10)	**$10,274**
(1) Accident Year 2009 Ultimate Losses & ALAE	$4,860
(2) Unallocated Loss Adjustment Expense (ULAE) Factor	1.10
(3) Annual Loss Trend **5.0**% Trend Period: **2.5**	
(4) Exponential Trend Factor [1.0 + (3)] ^ Trend Period	1.13
(5) Trended Ultimate Losses and LAE = (1) * (2) * (4)	$6,041
(6) Expected Catastrophe Loss & LAE for Projection Period	$842
(7) Fixed Expense Ratio	9.2%
(8) Fixed Expense Dollars = (7) * (11)	$679
(9) Variable Expense Ratio	21.4%
(10) Underwriting Profit Provision	5.0%
B. EXPECTED FUTURE PREMIUM	
(11) 2009 Earned Premium	$7,380
(12) Current Rate Level Factor	
(13) Premium Trend Factor	
(14) Trended Premium @ Current Rate Level = (11)*(12)*(13)	
C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0	

50

PURE PREMIUM METHODOLOGY

Adjustments to Premium

- Current Rate Level
  - Remember, the Pure Premium Method compares the indicated future premium to the expected future premium, not the premium that has already been collected
  - Reflects rate changes NOT already included in historical recorded premium.
  - Also, known as "On-Leveling"

Common Techniques

1. Extension of Exposures
   - Re-rate each exposure (policy)
   - Requires extensive detail and mechanization
   - Most accurate method
2. Parallelogram Method
   - Easier method
   - Specific policy information not required
   - Assumes that premium is written evenly throughout the year

51

CURRENT RATE LEVEL ADJUSTMENT

Extension of Exposures Method

2009 Earned Exposures

	Class 1	Class 2
Territory 1	1,500	2,260
Territory 2	1,995	3,010
Territory 3	2,700	2,500

Current Rates

	Class 1	Class 2
Territory 1	$400	$600
Territory 2	$420	$700
Territory 3	$440	$880

Premium @ Current Rates

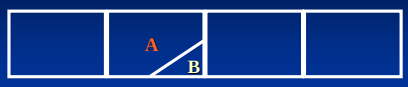
	Class 1	Class 2
Territory 1	$600,000	$1,356,000
Territory 2	$837,900	$2,107,000
Territory 3	$1,188,000	$2,200,000

Statewide total **$8,288,900**

52

CURRENT RATE LEVEL ADJUSTMENT

Parallelogram Method



1/08 **1/09** **1/10** **1/11** **1/12**

Rate Change History

Date	Change	Rate Index	
From 1/1/08 to 6/30/09	None	1.000	A
7/1/09	+ 16%	1.16 (1 * 1.16)	B

--Assume policies are in effect for one year.

53

CURRENT RATE LEVEL ADJUSTMENT

Calculation of Current Rate Level Factor - Parallelogram Method

I. Rate Index for 2009:

Area	Percent of 2009	Rate Index
A	87.5	1.000
B	12.5	1.160
TOTAL	100.0	**1.020**

Average Rate Index

II. On-Level Factor for 2009:

(1) Current Index	**1.160**
(2) 2009 Average Rate Index	**1.020**
(3) Current Rate Level (On-Level) Factor **(1) / (2)**	**1.137**
(4) 2009 Earned Premium	$7,380,000
(5) 2009 Earned Premium @ Current Rate Level	$8,391,060

54

RATE INDICATION WORKSHEET
Pure Premium Methodology

A. INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10)	**$10,274**
(1) Accident Year 2009 Ultimate Losses & ALAE	$4,860
(2) Unallocated Loss Adjustment Expense (ULAE) Factor	1.10
(3) Annual Loss Trend **5.0**% Trend Period: **2.5**	
(4) Exponential Trend Factor [1.0 + (3)] ^ Trend Period	1.13
(5) Trended Ultimate Losses and LAE = (1) * (2) * (4)	$6,041
(6) Expected Catastrophe Loss & LAE for Projection Period	$842
(7) Fixed Expense Ratio	9.2%
(8) Fixed Expense Dollars = (7) * (11)	$679
(9) Variable Expense Ratio	21.4%
(10) Underwriting Profit Provision	5.0%
B. EXPECTED FUTURE PREMIUM	
(11) 2009 Earned Premium	$7,380
(12) Current Rate Level Factor	1.137
(13) Premium Trend Factor	
(14) Trended Premium @ Current Rate Level = (11)*(12)*(13)	
C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0	

55

PURE PREMIUM METHODOLOGY

Adjustments to Premium

- Premium Trend
  - To ***project*** the premium level which will exist during the period being priced. The premium trend accounts for distributional shifts of business that will also impact the losses.
  - Must adjust for items such as:
    - Average car model year or Symbol
    - Average home value
    - Territorial distribution shift
    - Any item that would impact future premium or both premium and losses in the future ***except policy count or rate changes.***

Assuming an average annual trend of **2%** for this example, the premium trend would be: **(1.02) ^ 2.5 = 1.051**

56

RATE INDICATION WORKSHEET
Pure Premium Methodology

A. INDICATED PREMIUM = (5 + 6 + 8) / (1 - 9 - 10)	**$10,274**
(1) Accident Year 2009 Ultimate Losses & ALAE	$4,860
(2) Unallocated Loss Adjustment Expense (ULAE) Factor	1.10
(3) Annual Loss Trend **5.0**% Trend Period: **2.5**	
(4) Exponential Trend Factor [1.0 + (3)] ^ Trend Period	1.13
(5) Trended Ultimate Losses and LAE = (1) * (2) * (4)	$6,041
(6) Expected Catastrophe Loss & LAE for Projection Period	$842
(7) Fixed Expense Ratio	9.2%
(8) Fixed Expense Dollars = (7) * (11)	$679
(9) Variable Expense Ratio	21.4%
(10) Underwriting Profit Provision	5.0%
B. EXPECTED FUTURE PREMIUM	**$8,819**
(11) 2009 Earned Premium	$7,380
(12) Current Rate Level Factor	1.137
(13) Premium Trend Factor	1.051
(14) Trended Premium @ Current Rate Level = (11)*(12)*(13)	$8,819
C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0	**16.5%**

57

LOSS RATIO METHODOLOGY

Indicated Rate Level Change =

$$\frac{\text{Projected Experience Loss Ratio + Fixed Expense Ratio}}{\text{Expected (Target) Loss Ratio + Fixed Expense Ratio*}} - 1$$

For example: 90.3% ÷ 76.6% - 1 = 17.9%

Same adjustments needed as Pure Premium Methodology!

- Loss Adjustments: Loss Development, Loss Adjustment Expense, Loss Trend, Catastrophe Adjustments
- Premium Adjustments: Current Rate Level, Premium Trend

**Expected (Target) Loss Ratio + Fixed Expense Ratio = 1 – Variable Expense Ratio – Profit Provision*

58

RATE INDICATION WORKSHEET
Loss Ratio Methodology

A. EXPERIENCE LOSS & FIXED EXPENSE RATIO = (5 + 6 + 8) / (12) . . . . .

(1) Accident Year 2009 Ultimate Losses & ALAE . . . . . .
(2) Unallocated Loss Adjustment Expense (ULAE) Factor. . . . . .
(3) Annual Loss Trend ___% Trend Period:
(4) Exponential Trend Factor [1.0 + (3)] ^ Trend Period . . . . . .
(5) Trended Ultimate Losses and LAE = (1) * (2) * (4) . . . . . .
(6) Expected Catastrophe Loss & LAE for Projection Period . . . . . .

(7) Fixed Expense Ratio . . . . . .
(8) Fixed Expense Dollars = (7) * (9) . . . . . .

(9) 2009 Earned Premium . . . . . .
(10) Current Rate Level Factor . . . . . .
(11) Premium Trend Factor . . . . . .
(12) Trended Premium @ Current Rate Level = (9)*(10)*(11) . . . . . .

B. EXPECTED (TARGET) LOSS & FIXED EXPENSE RATIO . . . . . .

C. INDICATED RATE LEVEL CHANGE = (A / B) - 1.0. . . . . .

59

RPM Workshop 1: Basic Ratemaking

Development of an Overall Indication

Questions?

Scott Donoho, FCAS, MAAA
Allstate Insurance Company
Scott.Donoho@Allstate.com