Case Study – Allstate's Complementary Group Rating (CGR)

Evolution of Classification Rating for Personal Auto

How to Evaluate a Rating Plan Innovation

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March 28, 2017

Steps for Evaluating CGR

Step #1:

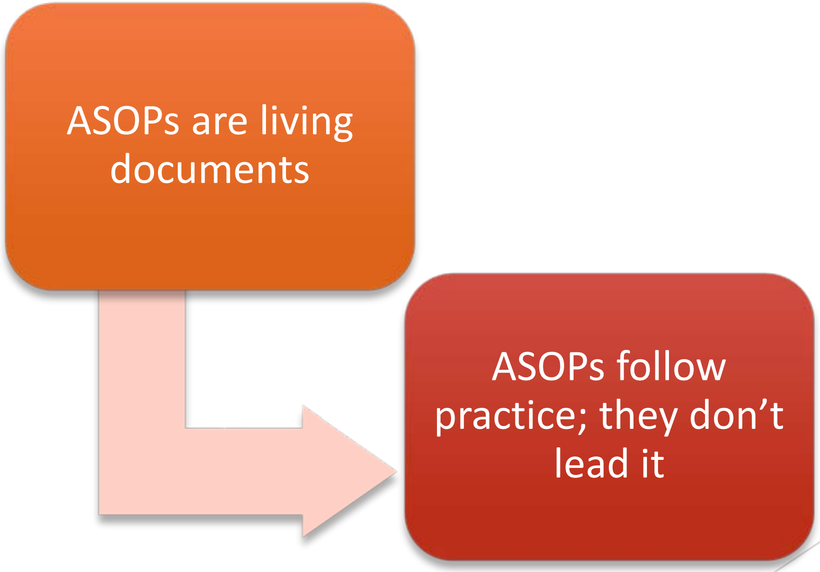
Understand CGR

Step #2:

Apply criteria to reach an opinion

ASOP 1: Introductory ASOP
Section 1: Overview

"While these ASOPs are binding, they are not the only considerations that affect an actuary's work. Other considerations may include legal and regulatory requirements, professional requirements promulgated by employers or actuarial organizations, evolving actuarial practice, and the actuary's own **professional judgment** informed by the nature of the engagement. The ASOPs provide a basic framework that is intended to accommodate these additional considerations."



Steps of the Review Process

Step #1: Understand CGR

Interviewed Allstate Actuaries & Data Engineers

Reviewed

- Internal documentation/presentation
- Data
- Prior public rate filings
- Acceptance testing

What CGR Accomplishes

- Enhancement to Allstate's private passenger auto class ratemaking
- Solves a historical problem associated with capping large changes in rating factors
- Alternative to the judgment actuaries have historically applied
- Not a (new) class system
- Not a change to the rating variables used to calculate policy premium
  - CGR can be introduced with or without changes to the underlying classification ratemaking (loss) model

What CGR Accomplishes

Traditional Rating Plan - Rating Factors Example

Territory	Current Rating Factor	Initial Indicated Rating Factor	Proposed Rating Factor
1	1.00	0.95	0.99
2	1.20	1.30	1.25
3	1.40	1.10	1.35
Claims	**Current Rating Factor**	**Initial Indicated Rating Factor**	**Proposed Rating Factor**
0	1.00	1.00	1.00
1	1.10	1.10	1.10
2+	1.50	1.60	1.51
Vehicle Type	**Current Rating Factor**	**Initial Indicated Rating Factor**	**Proposed Rating Factor**
Car	1.00	1.00	1.00
Truck	1.10	1.30	1.12
Van	1.50	1.60	1.60
Base Rate	**Current**	**Initial Indicated**	**Proposed**
Statewide	$231.48	$223.42	$224.02

In the above example, the proposed factors are capped so each individual rating factor is always within the range that is bounded by the current factor and the initial indicated factor.

What CGR Accomplishes

Issue with traditional rating factor selection

- Capping historically applied independently to each rating variable
- Reversals occur due to factor compounding
- A reversal occurs when a policy premium that should increase (decrease) according to the initial actuarially indicated rating factors, instead decreases (increases)

Issue with Traditional Rating Factor Selection

Illustrative Summary of Current, Indicated & Proposed Policy Premiums

Risk #	Terr.	Claim History	Type	Current Premium	Indicated Premium	Proposed Premium	Indicated Change	Proposed Change
1	1	0	Car	$231.48	$212.24	$221.78	-8.3%	-4.2%
2	1	0	Truck	$254.63	$275.92	$248.39	8.4%	-2.5%
3	1	0	Van	$347.22	$339.59	$354.84	-2.2%	2.2%
4	1	1	Car	$254.63	$233.47	$243.95	-8.3%	-4.2%
5	1	1	Truck	$280.09	$303.51	$273.23	8.4%	-2.4%
6	1	1	Van	$381.94	$373.55	$390.33	-2.2%	2.2%
7	1	2+	Car	$347.22	$339.59	$334.88	-2.2%	-3.6%
8	1	2+	Truck	$381.94	$441.47	$375.07	15.6%	-1.8%
9	1	2+	Van	$520.83	$543.35	$535.81	4.3%	2.9%
10	2	0	Car	$277.78	$290.44	$280.02	4.6%	0.8%
11	2	0	Truck	$305.56	$377.57	$313.62	23.6%	2.6%
12	2	0	Van	$416.67	$464.70	$448.03	11.5%	7.5%
13	2	1	Car	$305.56	$319.48	$308.02	4.6%	0.8%
14	2	1	Truck	$336.11	$415.33	$344.98	23.6%	2.6%
15	2	1	Van	$458.33	$511.17	$492.84	11.5%	7.5%
16	2	2+	Car	$416.67	$464.70	$422.83	11.5%	1.5%
17	2	2+	Truck	$458.33	$604.11	$473.57	31.8%	3.3%
18	2	2+	Van	$625.00	$743.53	$676.53	19.0%	8.2%
19	3	0	Car	$324.07	$245.76	$302.42	-24.2%	-6.7%
20	3	0	Truck	$356.48	$319.48	$338.71	-10.4%	-5.0%
21	3	0	Van	$486.11	$393.11	$483.87	-19.1%	-0.5%
22	3	1	Car	$356.48	$270.33	$332.66	-24.2%	-6.7%
23	3	1	Truck	$392.13	$351.43	$372.58	-10.4%	-5.0%
24	3	1	Van	$534.72	$432.53	$532.26	-19.1%	-0.5%
25	3	2+	Car	$486.11	$393.21	$456.66	-19.1%	-6.1%
26	3	2+	Truck	$534.72	$511.17	$511.46	-4.4%	-4.3%
27	3	2+	Van	$729.17	$629.14	$730.65	-13.7%	0.2%
			Average =	$400.00	$400.00	$400.00	0.0%	0.0%

Indicated and proposed premiums reflect off-balance correction. Shaded figures indicate reversals

What CGR Accomplishes

Illustrative Summary of Current, Indicated & Proposed Policy Premiums

Risk #	Terr.	Claim History	Type	Current Premium	Indicated Premium	Proposed Premium	Indicated Change	Proposed Change	CGR Factor	Proposed Change After-CGR
1	1	0	Car	$231.48	$212.24	$221.78	-8.3%	-4.2%	1.01	-3.2%
2	1	0	Truck	$254.63	$275.92	$248.39	8.4%	-2.5%	1.04	1.5%
3	1	0	Van	$347.22	$339.59	$354.84	-2.2%	2.2%	0.97	-0.9%
4	1	1	Car	$254.63	$233.47	$243.95	-8.3%	-4.2%	1.03	-1.3%
5	1	1	Truck	$280.09	$303.51	$273.23	8.4%	-2.4%	1.04	1.5%
6	1	1	Van	$381.94	$373.55	$390.33	-2.2%	2.2%	0.97	-0.9%
7	1	2+	Car	$347.22	$339.59	$334.88	-2.2%	-3.6%	1.02	-1.6%
8	1	2+	Truck	$381.94	$441.47	$375.07	15.6%	-1.8%	1.03	1.1%
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27	3	2+	Van	$729.17	$629.14	$730.65	-13.7%	0.2%	0.98	-1.8%
		Average =		$400.00	$400.00	$400.00	0.0%	0.0%	-	0.0%

Indicated and proposed premiums reflect off-balance correction. Shaded figures indicate reversals

What CGR Accomplishes

- The CGR process uses iterative analysis to:
  - Cap large changes in policy premiums
  - Phase-in changes over time
  - Prevent policy premium reversals
  - Allow continual re-estimation
- There is no unique solution - policy premium changes can be capped many different ways
- CGR process only considers actuarially sound solutions that also meet business constraints
  - The solution chosen from within that subset is the one with the highest probability of renewal for Allstate's book of business as a whole
- Retention of Allstate's book of business is not the primary driver of the CGR process--it is simply the "tie breaker" to select from among multiple solutions
- In short, CGR is an improved, systematic approach for doing what actuaries--with approval from regulators--have been doing for decades based solely on judgment

How CGR Affects Policy Premium

Two important goals of ratemaking:

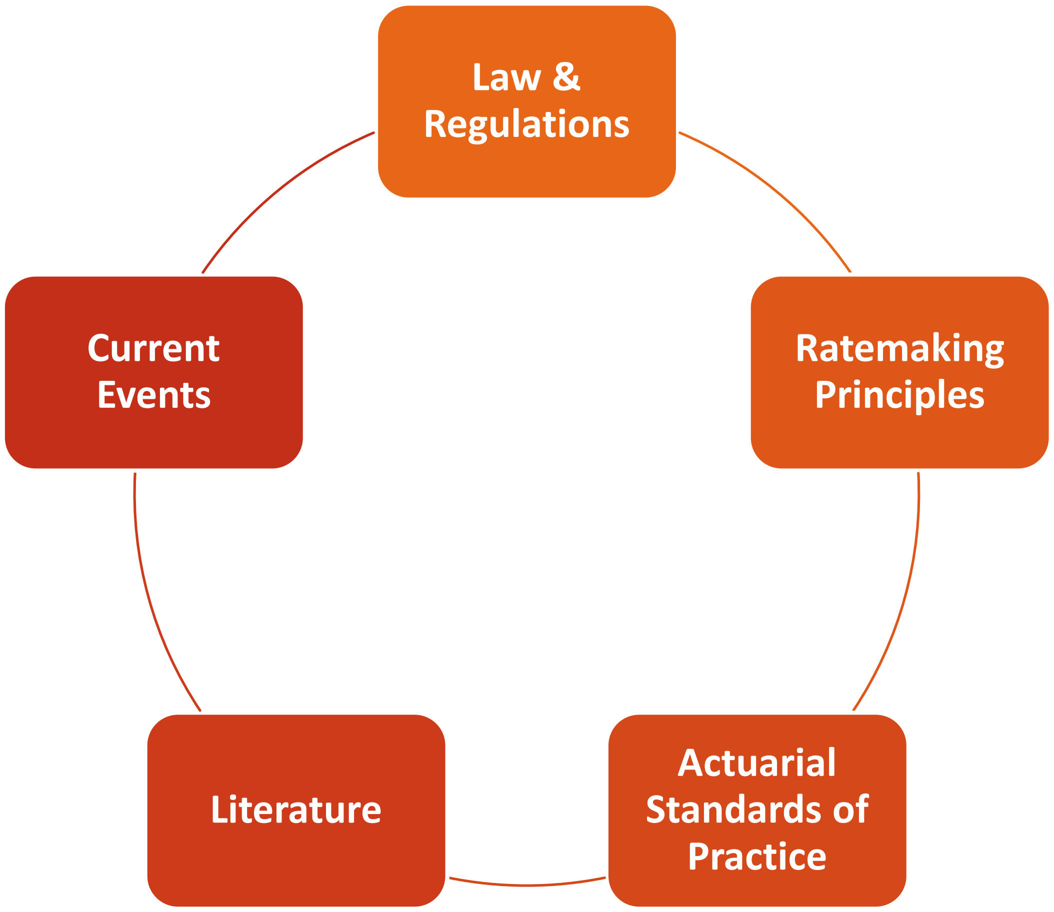
1) Responsiveness and
2) Stability

CGR reduces the size of large changes

CGR ensures all changes are in the direction of the actuarially indicated premium

CGR is neutral to the filed rate level

Step #2: Apply Criteria to Reach an Opinion



Law

- Not excessive, inadequate or unfairly discriminatory
- Disallowed rating variables
- Disallowed expenses
- Prescribed techniques
- Proscribed techniques

CGR and Ratemaking Principles

- Principle 1: A rate is an estimate of the expected value of future costs
- Principle 2: A rate provides for all costs associated with the transfer of risks
- Principle 3: A rate provides for the costs associated with an individual risk transfer*
- Principle 4: A rate is reasonable and not excessive, inadequate or unfairly discriminatory if it is an actuarially sound estimate of the expected value of all future costs associated with an individual risk transfer

* In other words, the goal of ratemaking is to find that premium which most closely reflects the expected costs of the individual insured. Hence, there is nothing intrinsically wrong or inappropriate about making adjustments to premiums at the "granular" level

CGR and ASOP 12: Risk Classification

Section 3.2.1	Related to expected outcomes
Section 3.2.1	Interdependence of risk characteristics
Section 3.2.3	Objective
Section 3.2.4	Practical
Section 3.2.5	Limitations of the law
Section 3.3.3	Comply with applicable law
Section 3.2.6	Industry practices
Section 3.3.2 (a)	Adverse selection / homogeneity
Section 3.3.2(b)	Credibility
Section 3.3.4	Reasonableness of results
Section 3.4.3	Testing
Section 3.6	ASOP 41 – Communications and documentation

Literature

- Peer reviewed literature (*Variance, Proceedings*)
- Other CAS Publications
- CAS meeting/seminar presentations
- Other scholarly papers
- NAIC reports
- Business publications – current events

CGR and Price Optimization

CGR advances current practices and does not possess key characteristics often associated with price optimization

- CGR is cost based
- CGR does not identify the highest possible premium a policyholder will accept
- CGR continues the historical process of capping large premium changes, but does it in a more systematic and objective manner
- CGR does not seek to maximize profits
- CGR is revenue neutral

Summary Opinion of CGR

- Is cost based and consistent with the Ratemaking Principles
- Complies with relevant portions of the Actuarial Standards of Practice (“ASOP”), in particular ASOP 12
- Meets regulatory requirements -- not excessive, not inadequate, and not unfairly discriminatory
- Does not possess characteristics often associated with price optimization

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