



**INSURANCE
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Price Optimization and Professionalism

Casualty Actuaries of Desert States

December 2, 2016

Download at www.iii.org/presentations

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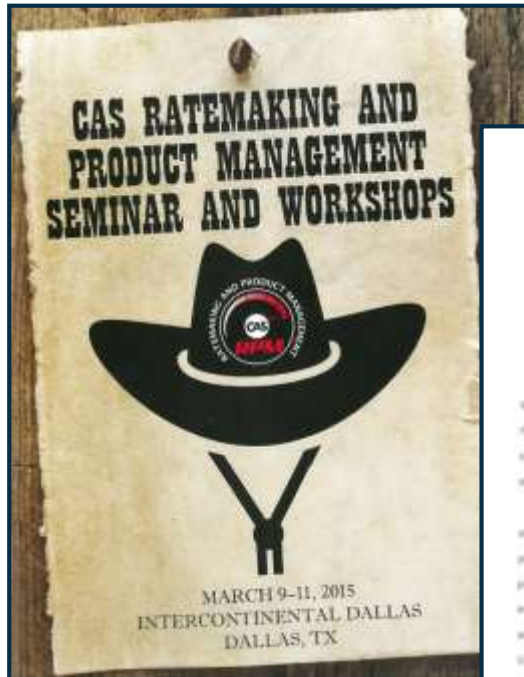
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Before We Start...

Oh, Boy, is This Controversial



How Controversial?



- ▲ Banned/Challenged/ Questioned in 19 States
- ▲ NAIC Studied, Issued White Paper
- ▲ CAS, AAA, ASB All Approach Topic Carefully

“The Views Expressed by Participants Are Their Own, and the CAS Takes No Position on the Views Expressed. It Is Also the Policy of the CAS that Its Members Should Practice Within the Bounds of Local Laws and Regulations”

Disclaimer

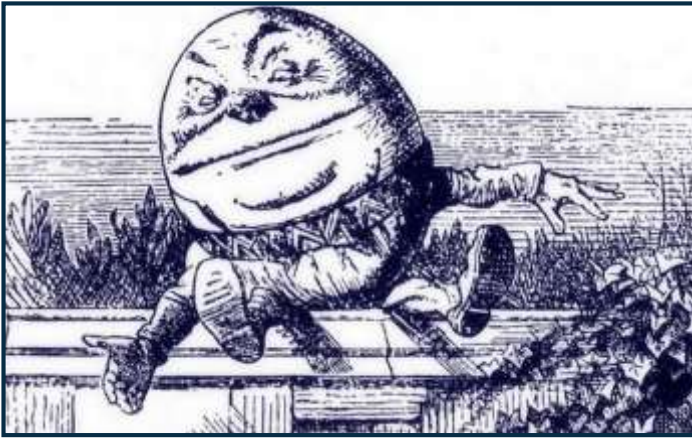
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What is Price Optimization?

Price Optimization Defined



“When I use a word,” Humpty Dumpty said in rather a scornful tone, “it means just what I choose it to mean — neither more nor less.”

“The question is,” said Alice, “whether you can make words mean so many different things.”

“The question is,” said Humpty Dumpty, “which is to be master — that’s all.”

Earnix (P.O. Vendor):

- ▲ “Systematic and statistical method to help an insurer estimate a rating plan factoring in a competitive environment”
- ▲ “Using mathematical algorithms to determine optimal values of rating factors to meet business goals and constraints”

Shopping for Water



Insurers Don't Do This!!!

320% Price Difference! Does It Cost \$18.25 to Unpack the Bottles and Keep Them Cold?

Pricing Water vs. Pricing Insurance

Pricing H₂O

- ▲ It's cold – charge more
- ▲ It's near the front of the store – charge more
- ▲ It's easy to carry – charge more
- ▲ It's Memorial Day – charge less
- ▲ “What the market will bear”

Value Based: *None* of These are Related to Projected Expenses

Pricing Insurance

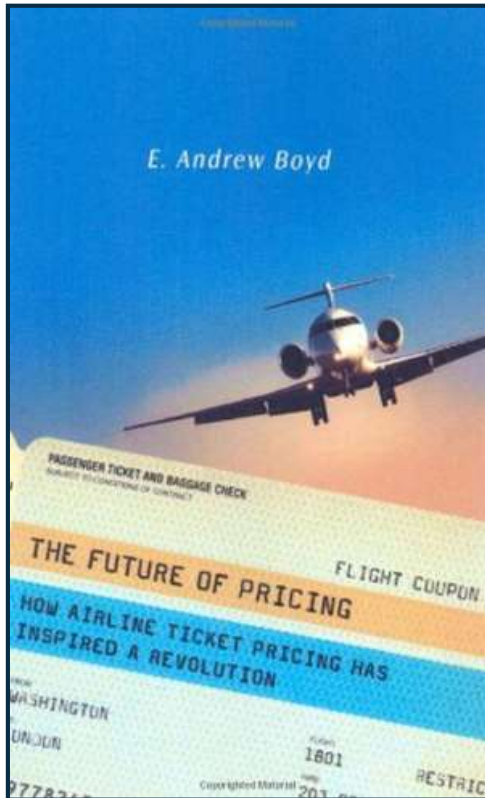
- ▲ Price = Loss + Exp + Profit
- 1. Expected value of future costs*
- 2. Provides for all costs of risk transfer*
- 3. Provides for all costs of individual risk transfer*
- 4. Reasonable rate estimates all future costs of risk transfer*

Cost Based: *All* of These Are Related to Projected Expenses

**For Most Products, Supply and Demand Set Price –
But Not In Insurance**



Not Just Water...



- ▲ Computer-Driven Dynamic Pricing Sets Rates for:
 - ◆ Hotels
 - ◆ Airline Tickets
 - ◆ Uber Rides
- ▲ Prices Change
 - ◆ Weekly
 - ◆ Daily
 - ◆ *Instantaneously*

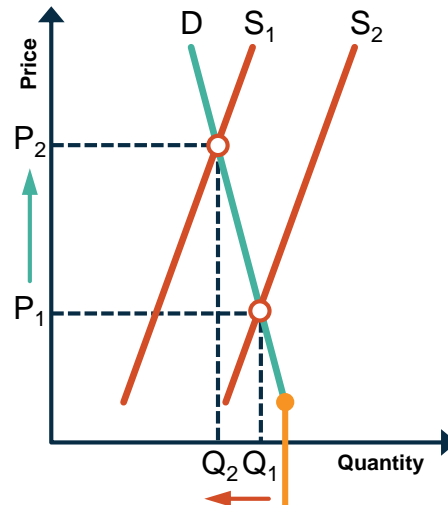
Not Surprised Are You? We Are Used to Seeing Price Optimization in Other Products – but Not Insurance

Predicting Supply and Demand

Elasticity of Demand

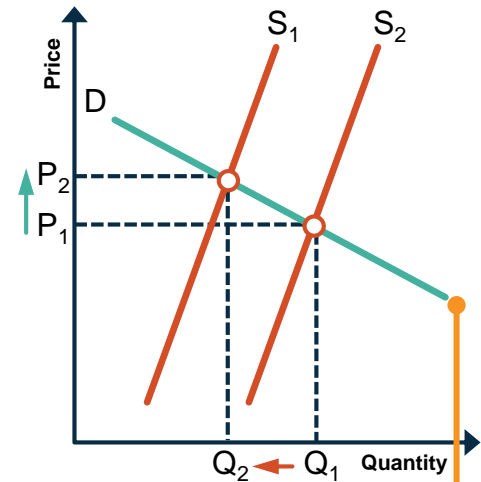
- ▲ Econ 101: How Much Will Sales Fall if Price Rises?
- ▲ Steep Demand Curve → Consumer Doesn't Care Much if Prices Rise
- ▲ Companies That Know the Slope Can Price Smarter
- ▲ This is Normal in Other Industries – But Not Insurance

Inelastic Demand



Example:
Gasoline

Elastic Demand



Example:
Shell Gasoline

Now Computers Can Model Elasticity of Demand

Have Insurers Always Optimized Prices?



Do Rates Adhere to the Actuarial Model?

Regulators are Generally OK With That.

Disposition

Disposition Date: 03/11/2015
 Effective Date (New): 05/01/2015
 Effective Date (Renewal): 05/01/2015
 Status: **Approved**
 Comment:

Company Name:	Overall % Indicated Change:	Overall % Rate Impact:	Written Premium Change for this Program:	Number of Policy Holders Affected for this Program:	Written Premium for this Program:
REDACTED	5.700%	2.600%	\$169,000	632	\$6,483,000
	17.400%	2.600%	\$898,000	3,649	\$34,492,000
	-3.800%	3.400%	\$1,859,000	15,942	\$54,331,000
	-6.300%	3.200%	\$170,000	1,071	\$5,284,000
	7.500%	2.700%	\$955,000	5,793	\$35,290,000

Overall Rate Information for Multiple Company Filings

Overall Percentage Rate Indicated For This Filing	4.500%
Overall Percentage Rate Impact For This Filing	3.000%
Effect of Rate Filing-Written Premium Change For This Program	\$4,051,000
Effect of Rate Filing - Number of Policyholders Affected	27,087

Companies Temper Increases Based on 'Market Judgment'

Indication (Technical Price) vs. Charged (Street Price)



The Triple-I Players Present

Do Actuaries Make Rates?





Actuary

- ▲ “My Analysis Shows We Need to Raise Rates 5%”



Underwriter

▲ “We Might As Well Close Up Shop Right Now”



Agent

▲ “You’re Killing Me”



Senior Management

- ▲ “I Think Maybe You Should Sharpen Your Pencil”

**Repeat as Needed Until...
The End**

**Moral:
Ratemaking is a Collaboration**



Traditional Adjustments (Optimizations?)

By the Insurer

- ▲ Young Drivers Undercharged – Don't Want to Lose the Parents (Class Plan)
- ▲ Implementation of New Class Plan – Minimize Rate Shock (Individual)
- ▲ Post-Merger Rate Stabilization Factor (Individual)

Insurers Have Been Adjusting Rates for Reasons Unrelated to Loss for Decades. Was That Wrong?



Other Adjustments (Optimizations?)

By Government

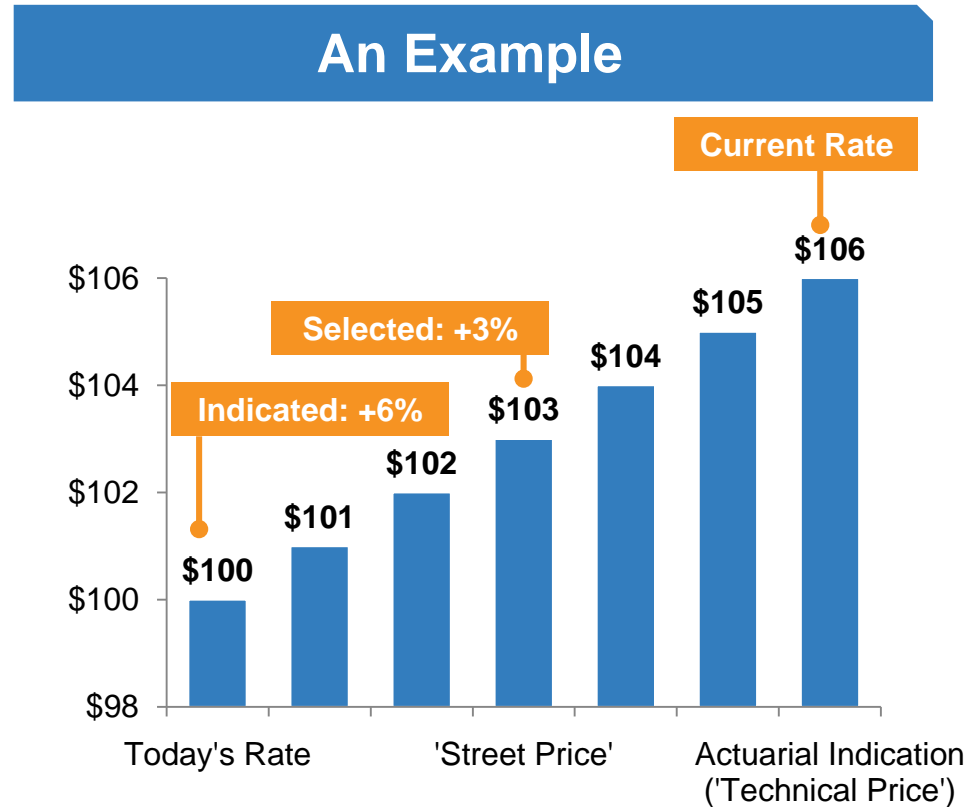
- ▲ Proposition 103 (20% Rate Rollback) – 1988
- ▲ Flood Insurance (18% Cap on Rate Increases) – 2014
- ▲ Limit/Ban on Age/Gender As Rating Variable (~Seven States) – Ongoing

All Adjustments Unrelated to Expected Loss (but Mandated)



Are Rates Unfair?

- ▲ Traditional practice
 - ◆ Used 'seat-of-the-pants' judgment to discount off indication
- ▲ What's new
 - ◆ Software informs the judgment
- ▲ Always within actuarial indications

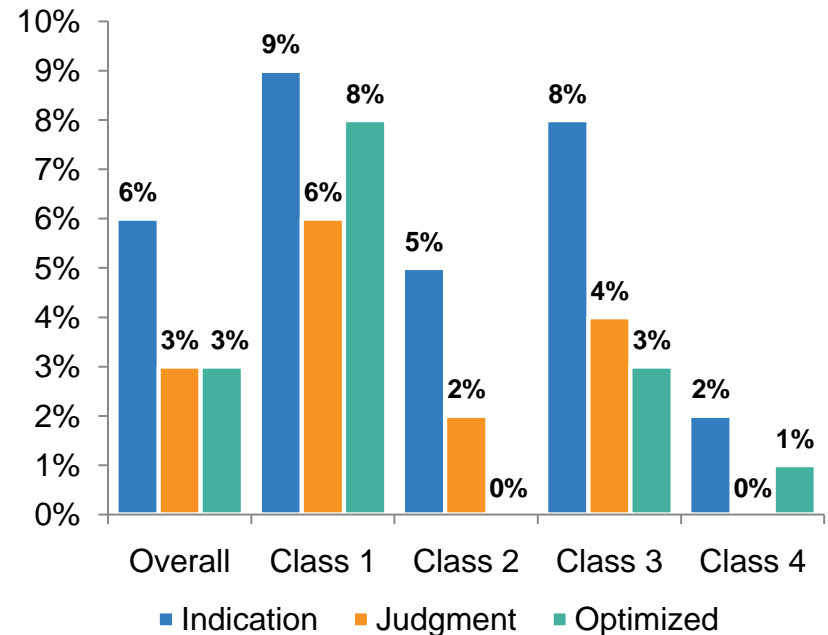


If Today's Rate is Fair, and The Indication is Fair, Can Anything in Between Be Unfair?

At the Class Plan Level

- ▲ As practiced in U.S.
 - ◆ Remains true to cost-based price.
 - ◆ Applied to classes, not individuals.
- ▲ Innovations are usually encouraged, with appropriate restraint.

Example (cont'd): There Are Many Reasonable Ways to Achieve Reasonable Rates.



Avoiding The Reversal (1)

- ▲ 3 Territories
- ▲ 3 Vehicle Types
- ▲ 3 Claim Bands
- ▲ 1 Vehicle in Each Territory/Vehicle/Claim

Illustrative Example			
<u>Territory</u>	<u>Current</u>	<u>Indicated</u>	<u>Proposed</u>
1	1.00	0.95	0.99
2	1.20	1.30	1.25
3	1.40	1.10	1.35
<u>Claims</u>	<u>Current</u>	<u>Indicated</u>	<u>Proposed</u>
0	1.00	1.00	1.00
1	1.10	1.10	1.10
2+	1.50	1.60	1.51
<u>Vehicle Type</u>	<u>Current</u>	<u>Indicated</u>	<u>Proposed</u>
Car	1.00	1.00	1.00
Truck	1.10	1.30	1.12
Van	1.50	1.60	1.60
<u>Base Rate</u>	<u>Current</u>	<u>Indicated</u>	<u>Proposed</u>
State	231.48	223.42	224.02
Overall Rate Change:		0%	

All Proposed Factors Between Current & Indicated

It Is. You'll See.



Avoiding The Reversal (2)

Example: Territory 1, 1 Claim, Truck				
		Current	Indicated	Proposed
Base Rate		\$231.48	\$223.42	\$224.02
Territory	X	1.00	0.95	0.99
1 Claim	X	1.10	1.10	1.10
Truck	X	1.10	1.30	1.12
Premium	=	\$280.09	\$303.51	\$273.23

Illustrative Summary of Current, Indicated, and Proposed Policy Premiums							
Territory	Claims	Vehicle	Base Rate	Policies in Force	Current	Indicated	Proposed
1	0	Car	State	1	231.48	212.24	221.78
1	0	Truck	State	1	254.63	275.92	248.39
1	0	Van	State	1	347.22	339.59	354.84
1	1	Car	State	1	254.63	233.47	243.95
1	1	Truck	State	1	280.09	303.51	273.23
1	1	Van	State	1	381.94	373.55	390.33
1	2+	Car	State	1	347.22	339.59	334.88
1	2+	Truck	State	1	381.94	441.47	375.07
1	2+	Van	State	1	520.83	543.35	535.81
2	0	Car	State	1	277.78	290.44	280.02
2	0	Truck	State	1	305.56	377.57	313.62
2	0	Van	State	1	416.67	464.70	448.03
2	1	Car	State	1	305.56	319.48	308.02
2	1	Truck	State	1	336.11	415.33	344.98
2	1	Van	State	1	458.33	511.17	492.84
2	2+	Car	State	1	416.67	464.70	422.83
2	2+	Truck	State	1	458.33	604.11	473.57
2	2+	Van	State	1	625.00	743.53	676.53
3	0	Car	State	1	324.07	245.76	302.42
3	0	Truck	State	1	356.48	319.48	338.71
3	0	Van	State	1	486.11	393.21	483.87
3	1	Car	State	1	356.48	270.33	332.66
3	1	Truck	State	1	392.13	351.43	372.58
3	1	Van	State	1	534.72	432.53	532.26
3	2+	Car	State	1	486.11	393.21	456.66
3	2+	Truck	State	1	534.72	511.17	511.46
3	2+	Van	State	1	729.17	629.14	730.65
Total/Average:				27	400.00	400.00	400.00

See? No Overall Rate Change



Avoiding The Reversal (3)

Illustrative Summary of Indicated and Proposed Policyholder Impacts

Territory	Claims	Vehicle	Base Rate	Policies in Force	Current	Indicated	Proposed	Indicated	Proposed
1	0	Car	State	1	231.48	212.24	221.78	-8.3%	-4.2%
1	0	Truck	State	1	254.63	275.92	248.39	8.4%	-2.5%
1	0	Van	State	1	347.22	339.59	354.84	-2.2%	2.2%
1	1	Car	State	1	254.63	233.47	243.95	-8.3%	-4.2%
1	1	Truck	State	1	280.09	303.51	273.23	8.4%	-2.5%
1	1	Van	State	1	381.94	373.55	390.33	-2.2%	2.2%
1	2+	Car	State	1	347.22	339.59	334.88	-2.2%	-3.6%
1	2+	Truck	State	1	381.94	441.47	375.07	15.6%	-1.8%
1	2+	Van	State	1	520.83	543.35	535.81	4.3%	2.9%
2	0	Car	State	1	277.78	290.44	280.02	4.6%	0.8%
2	0	Truck	State	1	305.56	377.57	313.62	23.6%	2.6%
2	0	Van	State	1	416.67	464.70	448.03	11.5%	7.5%
2	1	Car	State	1	305.56	319.48	308.02	4.6%	0.8%
2	1	Truck	State	1	336.11	415.33	344.98	23.6%	2.6%
2	1	Van	State	1	458.33	511.17	492.84	11.5%	7.5%
2	2+	Car	State	1	416.67	464.70	422.83	11.5%	1.5%
2	2+	Truck	State	1	458.33	604.11	473.57	31.8%	3.3%
2	2+	Van	State	1	625.00	743.53	676.53	19.0%	8.2%
3	0	Car	State	1	324.07	245.76	302.42	-24.2%	-6.7%
3	0	Truck	State	1	356.48	319.48	338.71	-10.4%	-5.0%
3	0	Van	State	1	486.11	393.21	483.87	-19.1%	-0.5%
3	1	Car	State	1	356.48	270.33	332.66	-24.2%	-6.7%
3	1	Truck	State	1	392.13	351.43	372.58	-10.4%	-5.0%
3	1	Van	State	1	534.72	432.53	532.26	-19.1%	-0.5%
3	2+	Car	State	1	486.11	393.21	456.66	-19.1%	-6.1%
3	2+	Truck	State	1	534.72	511.17	511.46	-4.4%	-4.4%
3	2+	Van	State	1	729.17	629.14	730.65	-13.7%	0.2%
Total/Average:				27	400.00	400.00	400.00	0.0%	0.0%

Reversals

Another Reversal

Note that while all proposed factors moved toward indicated or were left constant, not all policies move toward indicated.

Reversal: Rating Factors are Reasonable, but Individual Premiums Do Not Appear to Be



How is P.O. Different From the Past?

Proponents

- ▲ It's Not, Except Software Replaces Subjective Process
- ▲ Allowed Under Current Actuarial Standards of Practice [Statement of Principles?]
- ▲ It Isn't Price Optimization – Not Maximizing Profits

Opponents

- ▲ Gouges Customers, Particularly Those Who Shop Less
 - ◆ Renewals and the Poor
- ▲ Conflicts With State Rating Laws
 - ◆ 'Not to Be Excessive, Inadequate, Unfairly Discriminatory'

Each Side Has Counterarguments, of Course



What is the Issue?

- ▲ The practice of charging something other than the technical price?
- ▲ The software that insurers can use to move from technical price to street price?
- ▲ The variables that insurers use to move from technical price to street price?



Debate
is Here



Debate Should
Be Here

Professionalism Break

Does Statement of Principles Allow Price Optimization?

- ▲ The principles in this Statement are *limited to that portion of the ratemaking process involving the estimation of costs* associated with the transfer of risk

What I'm
Looking At.
(You Might
Disagree)

- ▲ “Ratemaking should provide for the costs of an individual risk transfer *so that equity among insureds is maintained.*” (Reasonable, not excessive, not inadequate, not unfairly discriminatory)
- ▲ Justification Via Considerations?
 - ◆ Mix of Business – “...distributional changes in deductibles, coverage limitations or type of risks *that may affect the frequency or severity of claims*”



Professionalism Break

▲ Justification Via Considerations?

- ◆ Operational Changes – “Changes in the *underwriting process*, claim handling, case reserving and marketing practices that affect the *continuity of the experience*”
- ◆ Other Influences – “The impact of external influences *on the expected future experience* should be considered... (seems to focus on residual markets, etc.)
- ◆ Actuarial Judgment – “...may be applied throughout the ratemaking process...”



Professionalism Break

▲ § IV. Conclusion

- ◆ “The actuary, by applying the ratemaking principles in the Statement, will derive an estimation of the future costs associated with the transfer of risk. **Other business considerations are also a part of ratemaking.**” [U/W, Marketing, Law, Claims, etc.]

Foreshadowing
Alert

Reality Alert:
It's a Static
Model

Of Course, These Are the *Old* Principles...

Professionalism Break

- ▲ Statement of Ratemaking Principles Is Changing
 - ◆ Distinguish Between Principles (Worldwide) and Practices (Country-specific)
 - ◆ Separate Estimation of Rate From Setting of Rate
- ▲ ASB Developing U.S. Standard of Practice



CAS
(Constitution)
vs. ASB
(Local Law)

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Source: Notes from "The Standards and Principles: 'They are a Changin,'" 2015 Ratemaking and Product Management Seminar.



Professionalism Break

CURRENT: *Ratemaking is the process of establishing **rates used** in insurance or other risk transfer mechanisms*

PROPOSED: *Ratemaking is the process of establishing **future costs associated with the transfer of risk** in insurance or other risk transfer mechanisms.*

Distinguishes Between
Technical Price, “Street Price”

Current Principles

- ▲ 4 Sections – Definitions, Principles, Considerations, Conclusion

Proposed Principles

- ▲ 3 Sections (Considerations Moved to Standards of Practice)

Professionalism Break

CURRENT/PROPOSED: *The actuary, by applying **informed actuarial judgment and** the ratemaking principles in this Statement, will derive an estimation of the future costs associated with the transfer of risk. Other business considerations are also a part of ~~ratemaking~~ **insurance pricing**.*

Replaces 'Ratemaking'
with 'Insurance Pricing'

Some are dismayed

"...dismantling the cost-based standard as the bedrock of the actuarial profession ...

"It is shocking to me as a Fellow of the CAS that the Society would propose a set of principles that [implies actuaries] not only have no impact on the prices that policyholders will pay, but acts to remove the actuary from the central role she has in ratemaking today."

– J. Robert Hunter, Consumer Federation of America

But For Reserving Actuaries, the Distinction May Sound Familiar



New Reserving Standard



Statement of Principles Regarding Property
and Casualty *Unpaid Claims Estimates*
Born May 6, 2015

The Triple-I Players Present

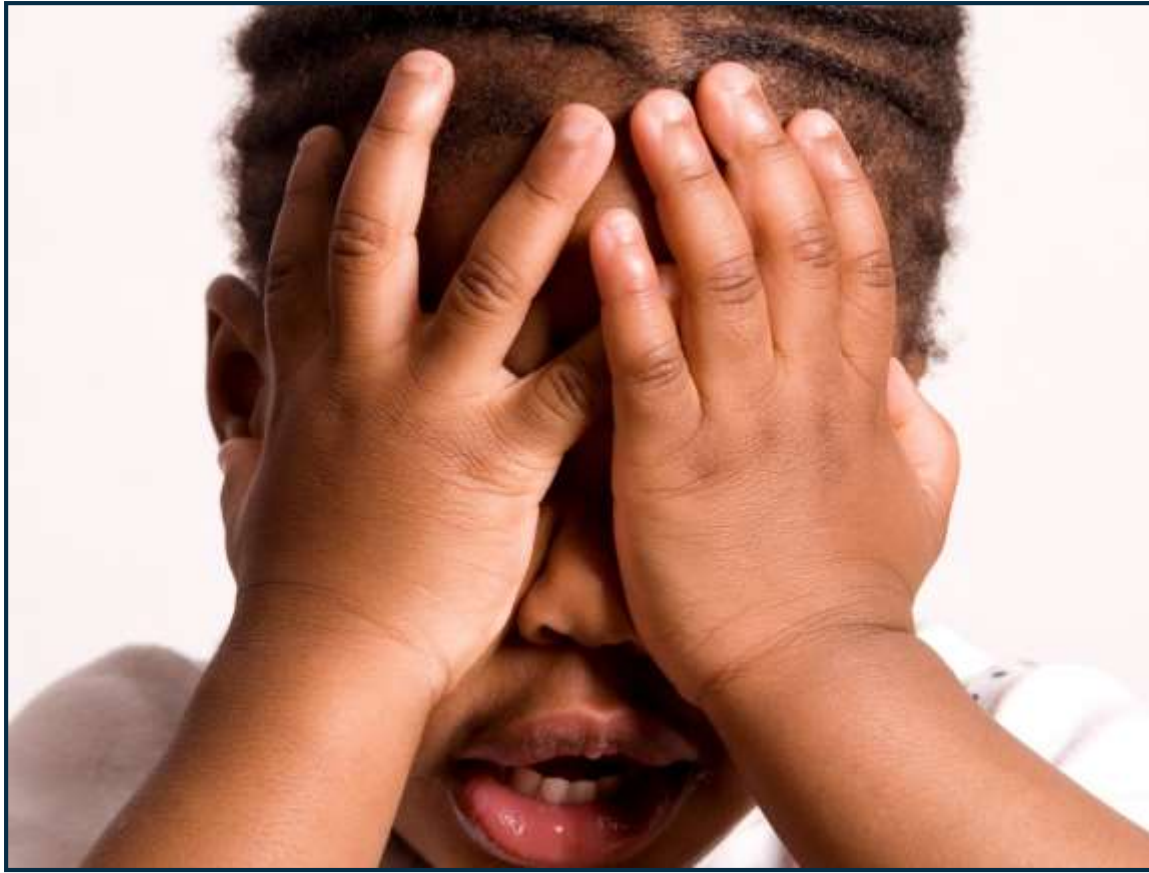
Do Actuaries Set Reserves?





Actuary

- ▲ “My Analysis Shows We Need to Raise Reserves 5%”



CFO

▲ “There Goes My Bonus”



Underwriter

▲ “There Goes My Bonus – And I’ll Be Fired”



Senior Management

- ▲ “No One Wants to Lose Their Bonus or Their Job”

**Repeat as Needed Until...
The End**

**Moral:
Loss Reserving is a Collaboration**



Professionalism Break

Old Principles

- ▲ 4 Sections – Definitions, Principles, Considerations, Conclusion

New Principles

- ▲ 3 Sections (Considerations Moved to Standards of Practice)

OLD: *A loss reserve is a provision for its related liability*

NEW: *Unpaid Claims Estimate: An **actuary's estimate** of the unpaid amount required to make the future loss and/or loss adjustment expense payments related to a defined group of claims*

Implicit Is the Difference Between Estimate and Booked

Professionalism Break

CAS on Unpaid Claims Estimates

- ▲ “The principal objective of revising the original Principles was to update them and to revise them where necessary to contain **principles only, not standards of practice**.”
- ▲ “This newly adopted Statement is not intended to provide prescriptive practice guidance to actuaries. Such practice guidance for actuaries has been developed in the U.S., for example, by the Actuarial Standards Board (U.S.) in the form of Actuarial Standards of Practice.”

The Same Sort of Reasoning Applies to Ratemaking



Homework

▲ Ratemaking Principles (On Hold, Awaiting ASB)

- ◆ Current <http://casact.org/professionalism/standards/princip/sppcrate.pdf>
- ◆ Proposed http://www.casact.org/professionalism/SoP-Ratemaking-Discussion-Draft_October2014.pdf

▲ Ratemaking Standards (2nd Exposure Draft)

<http://www.actuarialstandardsboard.org/asops/propertycasualty-ratemaking-2/>

▲ Reserve Principles

- ◆ Old <http://casact.org/professionalism/standards/princip/sppcloss.pdf>
- ◆ New http://www.casact.org/professionalism/standards/princip/SOP-Regarding-Property-and-Casualty-Unpaid-Claims-Estimates_Final%204-22-2015.pdf



Homework

▲ Carrier Management Articles

- ◆ By James Lynch: About Those Rates: Why Allstate's Rating Program May Not Be What It Seems
 - [Part 1](#)
 - [Part 2](#)
 - [Part 3](#)
- ◆ By Robert Hunter: [CFA's Hunter Reacts in Actuarial Battle: Allstate's Plan Is Price Optimization](#)



Summary

- ▲ Price Optimization Is A Controversial Activity
 - ◆ Much Depends on How Term Is Defined
- ▲ Ratemaking Principles Are Changing. Reserving Principles Changed
 - ◆ Removing Nation-Specific Guidance
 - ◆ Bedrock CAS **Principles** Apply Everywhere
 - ◆ **Practice** Guidelines Tend to Be Nation-Specific (ASB in US)
- ▲ Don't Break the Law

Even if the CAS Principle Changes, the Old Principle is Still the Law in Many (Most?) States



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and Your Attention!*

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