




Professionalism in the Evolving World of UBI

CAS Ratemaking and Product Management (RPM) Seminar
March 31st – April 1st, 2014

Verbind Insurance en Geduldens | ISO AIP Voor de Bto | Nieuwste




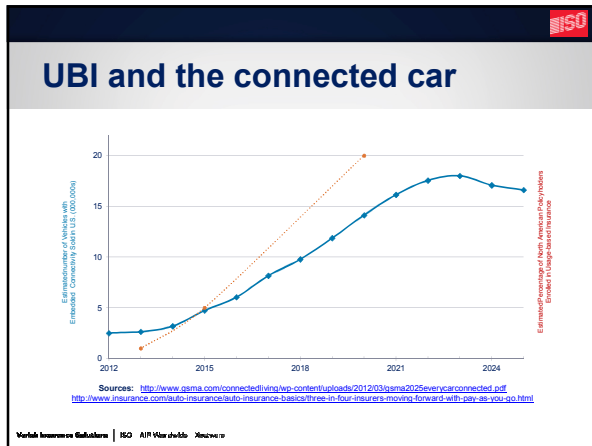
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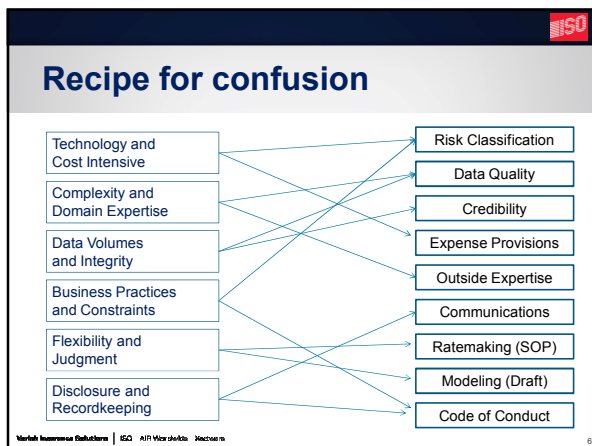
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Background





- ### Potential applications in pricing
- Mileage authentication
 - Behavioral scoring
 - Forgiveness
 - Location-based discounts



“End-to-end” case study

- Technology platform
- Model build or buy
- Initial pricing
- Rating plan
- Implementation
- Disclosures
- Monitor operating results

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Technology selection

ISO

Driving behavior data

3.27 Gal / fuel
256.6°F
4200 RPM
72.852 Miles
Dr. Seatbelt: Y

2013/08/18
22:47:53.07 UTC
34° 59' 20" N'
106° 36' 52" W'

101°F
25 Mi / Hr
(Wind: 2mph NW)
Sunny

Interstate 40 (Freeway)
Speed Limit 65 MPH
Albuquerque, New Mexico

Avg. Traffic Flow 82 mph

6.23 m / s²

86 mph

0.8 m / s²

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Data selection

1. appropriateness for intended purpose...;
2. reasonableness and comprehensiveness...;
3. ... known, material limitations...;
4. the cost and feasibility of obtaining alternative data...;
5. the benefit... balanced against its availability and the time and cost to collect and compile...;
6. sampling methods...

Source: ASOP 23 (Data Quality), Section 3.2.b

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Discussion

<u>Dongle</u>	<u>Smartphone</u>
• Dedicated technology	• Repurposed
• One size fits most	• Support multiple OS
• Powered by vehicle	• Charger needed
• Send data	• Send/receive
• Installation and logistics	• Simple download

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Initial pricing

ISO

ISO

Types of expenses

- 2.3 General administrative
- 2.5 Other acquisition
- 2.7 Premium-related
- 3.3 “Start-up costs” (may be amortized)

Source: ASOP 29 (Expense Provisions in P&C Insurance Ratemaking), Sections 2 and 3

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ISO

Debating discount-only UBI

Approach	Tier	Pure Premium	Annualized Technology	Total Contribution
Approach A	Non-UBI Tier	500	0	500
	UBI Tier (Base)	550	100	650
	UBI Tier (Discount)	450	150	600
Approach B	Non-UBI	500	0	500
	UBI No Discount	500	0	500
	UBI Discount	450	10	460

All pure premiums and cost assumptions above are hypothetical.

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ISO

“Actuarially sound”

- I. Estimate of the expected value of future costs
- II. Provides for all costs associated with the transfer of risk
- III. Provides for the costs associated with an individual risk transfer

Source: Ratemaking Statement of Principles, Section IV.E

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“Actuarially sound” (cont’d)

Such rates comply with four criteria commonly used by actuaries:

1. Reasonable
2. Not excessive
3. Not inadequate
4. Not unfairly discriminatory

Source: Ratemaking Statement of Principles, Section IV.E

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Discussion

Hypothetical scenarios:


- Spread device costs over all policyholders
- Enrollment discount (before telematics observation)
- Eligibility limited to specific market segment

Source: Ratemaking Statement of Principles, Section IV.E

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Model selection


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UBI predictive models

- Fleet
- Judgmental
- Behavior only
- "Insurance TSP"
- Full pricing

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External models

For specialized knowledge outside actuary's own area of expertise:

- Determine appropriate reliance on experts
- Obtain basic understanding of model
- Evaluate whether appropriate for intended application
- Determine appropriate validation has occurred
- Determine appropriate use

Source: ASOP 38 (Using Models Outside the Actuary's Area of Expertise), Section 3.1

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Model development

Fitness for intended purpose:

- Capability
- Granularity of inputs
- Causal relationships recognized
- Ability to perform stochastic/stress testing
- Ability to identify volatility around predictions

Source: ASOP on Modeling (Exposure Draft), Section 3.2.1

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Discussion

<u>Proprietary</u>	<u>Vendor</u>
<ul style="list-style-type: none">• New data stream• Control assumptions• Low data volumes• Industry/company specific	<ul style="list-style-type: none">• Domain expertise• "Black box"• Data across clients• Possibly developed for fleets

Verbal Assessment of Risk Factors | ISO AIR View 2013 | NextView

Selections


ISO

Common issues

Unique or exacerbated in UBI setting:

- Small data sample
- Highly correlated dependent variables
- Low statistical significance
- Control variables present problems
- Severe sample bias
- Device disharmony

Verbal Assessment of Risk Factors | ISO AIR View 2013 | NextView



Actuarial judgment

One way to estimate a price is to rely exclusively on wisdom, insight, and good judgment ... This usually is not the best method...


Informed actuarial judgments can be used effectively in ratemaking... and should be documented and available for disclosure.

If the actuary judges that the use of the data... may cause the results to be highly uncertain or contain a material bias, the actuary may choose to complete the assignment, but should disclose ...

Sources: SoP Regarding P&C Insurance Ratemaking, Section III; SoP Regarding Risk Classification, Section III.A; ASOP No. 23 (Data Quality)

Market Insurance of Oklahoma | ISO All Other States | New York

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Discussion


Hypothetical scenarios:

- Use “near accidents” as proxy for claims
- Assume driving independent of traditional variables
- Accept low p-value estimates
- PCA to reduce number of input variables
- Scale accelerometer readings by device

Market Insurance of Oklahoma | ISO All Other States | New York

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Classification



Discussion

Hypothetical risk characteristics considered:

- Maximum speed over six month period
- Standard deviation of speed
- Trips on Sundays between 8AM and 12PM
- Miles in areas with lower accident rate than garage
- Braking in icy conditions

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Program design

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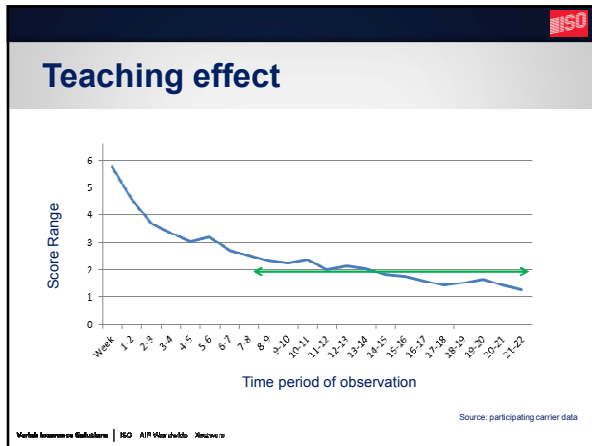
Credibility

Credibility -- A measure of the predictive value in a given application that the actuary attaches to a particular set of data

Full Credibility -- The level at which the subject experience is assigned full predictive value based on a selected confidence interval.

ASOP No. 25 (Credibility Procedures), Section 2

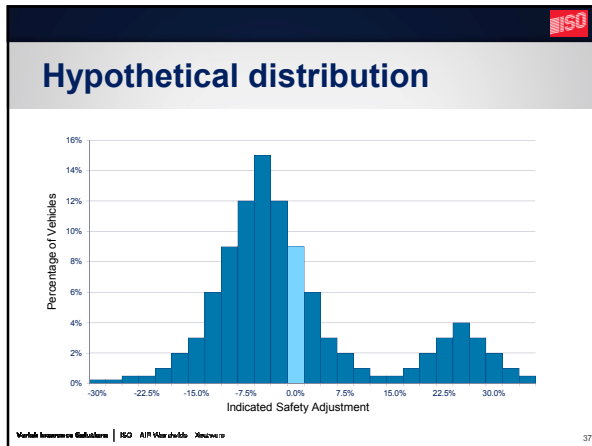
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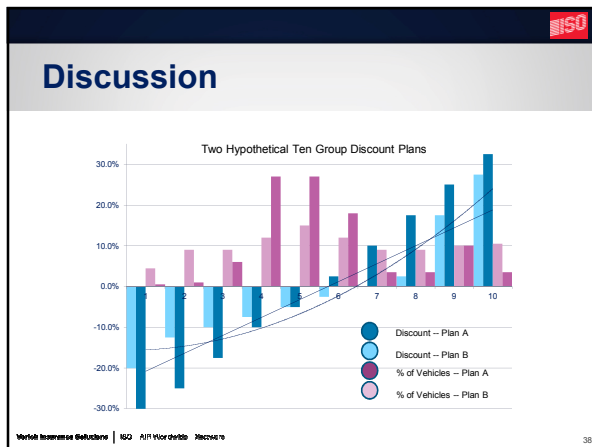


- ### Operational considerations
1. Expense
 2. Constancy
 3. Availability of coverage
 4. Avoidance of extreme discontinuities
 5. Absence of ambiguity
 6. Manipulation
 7. Measurability
- Source: Risk Classification Statement of Principles, Section IV.E

Possible implementations

Discount Period	Five Years			A	
	Three Years	B	C		
	One Year	D			E
		90 Days	Six Months	One Year	Continuous
		Observation Period			





Communications

Stakeholder examples

- Clients
- Employers
- Regulators
- Policyholders
- Plan participants
- Investors
- General public

Source: ASOP 41 (Actuarial Communications), Appendix

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Features of UBI consent

To policyholders:

- Pricing methodology (overview)
- Data collected
- Use cases
- Sharing
- Retention

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Actuarial disclosures

1. Uncertainty or risk
2. Conflict of interest
3. Reliance on other sources for data or other information
4. Responsibility for assumptions and methods
5. Information date
6. Subsequent events

Source: ASOP 41 (Actuarial Communications), Section 3.4

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Report recipients

- Intended User – any person who the actuary identifies as able to rely on the actuarial findings.
- Other User – any recipient of an actuarial communication who is not an intended user.

The actuary should recognize the risks of misquotation, misinterpretation, or other misuse of such a document and should take reasonable steps to ensure that the actuarial document is clear and presented fairly.

Source: ASOP 41 (Actuarial Communications), Section 2 and 3.5.1

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Discussion

Hypothetical scenarios:

- Regulator requests model formula
- Policyholder requests rationale for discount
- Regulator requests variable be removed from model
- Actuary participates in marketing strategy
- Actuary presents modeling approach at conference

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Questions and comments

Contact jweiss@iso.com or 201.469.2216.

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