BIG DATA AND THE ROLE OF THE ACTUARY
PRESENTATION TO NAIC CASTF PREDICTIVE ANALYTICS BOOK CLUB

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A.I.

ARTIFICIAL INTELLIGENCE

BIG DATA

WEARABLE TECH

ROAD WARRIOR

FITNESS JUNKY

TECHNO-CHIC

SAVY GRAN

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- Current and Emerging Practices
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  - InsurTech
  - Actuarial Standards of Practice
Current and Emerging Practices
What is Big Data?

- No widely accepted definition
- 5 Vs:
  - Variety
  - Value
  - Veracity
  - Volume
  - Velocity
- Predictive Analytics
- Computational Algorithms
- Data Handling
Applications

- Telematics
- Internet of things
- Machine learning
- Cognitive computing
- Artificial intelligence
The American Academy of Actuaries’ Role

Public Policy

and

Professionalism
Data Analytics Techniques and Methodologies

- Descriptive – What happened?
- Diagnostic – Why did it happen?
- Predictive – What will happen?
- Prescriptive – What should I do?
Application of Predictive Analytics

- Marketing
- Engagement
- Underwriting
- Product Development
- Claims and Reserving
- Decision-Making Analytics
- Behavior Analytics
- Customer Satisfaction and Upselling
- Targeted Marketing
Practice Area Specific Applications

- Life
- Property & Casualty
- Health
- Pensions
Considerations in the Use of Predictive Analytics

- Business Considerations
- Model Development Considerations
Data Sources

- Traditional
- Emerging
- Practice Areas
  - Life
  - Property & Casualty
  - Health
  - Pensions
Regulatory Considerations
Benefits and Challenges

☐ Insurers
☐ Consumers
☐ Regulators
Insurance Industry

- Confidentiality of intellectual property submitted to regulators
- Standards that are barriers to conducting business
- Specific lines of business requirements
Consumers

- Adequate privacy standards
- Data ownership rights
- Notification by insurers of use of consumer data
- Contest and correct data
Regulators

- Satisfactory and appropriate access to insurers’ models
- Prohibited data variables
- Specific levels of correlation/causality for rating variables
- Additional risk segmentation (good or bad?)
- Oversight of data vendors
- Specific standards for certain lines of business
Existing Regulatory Framework

- Consumer Protection
- Anti-Discrimination
Emerging Regulatory Developments

- NAIC Big Data (EX) Working Group/CASTF
- Permitted Uses
- Data Ownership, Transparency, Portability
- Regulatory Sandboxes
- Regulatory Disruptors
Who Owns Your Personal Data?
Regulatory Challenges

- Privacy
- Staffing
- Correlation vs. Causation
Spurious Correlation
Work with your regulators
"Your recent Amazon purchases, Tweet score and location history makes you 23.5% welcome here."
The Web of Professionalism
The Basis of Self-Regulation of the US Actuarial Profession

- The Code of Professional Conduct
- U.S. Qualification Standards (USQS)
- Actuarial standards of practice (ASOPs)
- Counseling and discipline
Actuarial Standards of Practice

- Data Quality
- Risk Classification
- Using Models Outside the Actuary’s Expertise (P&C)
- Credibility Procedures
- Actuarial Communications
- Responding to or Assisting Auditors or Examiners
Role of Professional Judgment

Questions to consider

1) How representative is your data set?
2) Does your model account for biases?
3) How accurate are your predictions based on Big Data?
4) Does your reliance on Big Data raise fairness or ethical concerns?
5) Unfair Discrimination?

Source: Big Data: A Tool for Inclusion or Exclusion, FTC, January 2016
Understanding Some Ethical Guidelines

Questions to consider

1) Does your approach comply with applicable law – both letter of the law and in spirit?
2) Are certain permissions needed?
3) Are you comfortable describing to your stakeholders what you are doing (consumers, insurance companies, providers, regulators, auditors, etc.)?
Professional Judgment

- The Role of Professional Judgment
  - Value of being able to connect the dots
  - Big Data can be misleading
    - Context
    - Overreliance
    - Cherry-picking
  - **Correlation is not causality**
  - Beware of spurious correlations & statistical paradoxes
Role of the Actuary

- Multidisciplinary Team
- Statistician, Computer Expert, Data Scientist, Actuary
- Subject Matter Expert
- Hypothesis Generator
- Turn Big Data into Smart Data
Clear Communications
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