Predictive Modeling, Big Data and Regulatory Concerns: A Healthy Tension?

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PREDICTIVE MODELING, BIG DATA AND REGULATORY CONCERNS: A HEALTHY TENSION?
A Practical Perspective: Historical Context

Statutory Review Standard

(officially and generally)

Rates neither:
- Excessive
- Inadequate
- Or unfairly discriminatory
A Practical Perspective: Historical Context

Review standard *(unofficially)*

Don’t Screw Up!
A Practical Perspective: Efficient Solution

An Often Workable Solution:

- Competition in competitive markets can often regulate markets to the statutory standard.
A Practical Perspective: Efficient Solution

- Why?
- How?
The likely cornerstone of any company’s business plan is profitable growth. The Personal Auto Book continues to be at the core of this strategy. Companies generally know that they must:

- **Identify and keep the better risks**
- **Attract more of these risks**
- **Refine pricing and selection among all risks**
- **Avoid adverse selection**
A Practical Perspective: Personal Auto

- **Personal Auto**
  - Like bonds in a diversified portfolio
  - Generally lower volatility
  - High volume
  - Very predictable
    - Modest limits
    - Other statutory factors
  - Must guard against loss ratio erosion
    - *Adverse selection!*
A Practical Perspective: Key Observation

- Adverse Selection ...

- **Anti-selection**, or **negative selection**, is a term used in **economics**, **insurance**, **risk management**, and **statistics**. It refers to a market process in which undesired results occur when buyers and sellers have **asymmetric information**.
Intuitively, we all know the key factors:
- How many miles are driven
- Where are they driven
- When are they driven
- How are they driven
- And the insured’s proclivity to use the insurance product
A Practical Perspective: Personal Auto

Past Practice:

- Ask the insured for annual mileage
- Ask the insured where the vehicle is garaged
- Work, pleasure or both?
- Past violations and accidents?
- Past claims?
A Practical Perspective: Personal Auto

Recent Practices

- Credit scores
- Big data
- Predictive models
  - Location
  - Education
  - Income
  - Other factors....
A Practical Perspective: Personal Auto

On the Horizon *(Now?)*

- Brave new world is here
  - Fitness devices
  - Smartphones
  - Auto manufacturers
- Accelerometers & apps everywhere!
- Everybody is monitoring
- Who “owns” the data?
- More importantly: Who knows how to leverage the data?
A Practical Perspective: Personal Auto

Key Points

- Companies, like species, must compete. They either adapt or go extinct!
- Beyond the science, the devil is in the details
A Practical Perspective: Personal Auto

Survival

- Strength in data and analytics
- Outliers, those that lag behind, become prey
A Practical Perspective: Conclusion

- Competition works, but there can be . . .
- Tension with consumer interests
A Practical Perspective: Structural Considerations

- Mandatory coverage
- Public acceptability
- Consumerism
Many players are now using this information and employ these techniques.

They are advantaging themselves at their competitors' expense.

This is anathema to profitable growth for the less prepared and refined.
A Practical Perspective: Managing the Tension

Analytic framework to manage the tension and to guide regulatory response

- Risk Classification Statement of Principles
A Practical Perspective: Managing the Tension

Purpose

To achieve and maintain viable insurance systems, the process of risk classification should serve three primary purposes:

- Protect the insurance system’s financial soundness
- Be fair
- Permit economic incentives to operate and thus encourage widespread availability of coverage
A Practical Perspective: Managing the Tension

A Regulatory Solution

- Rely on market place competition (economic incentive)
- Balance with an eye to assure fairness for all parties
A Practical Perspective: Key Takeaways

- For economic survival, companies must compete and keep up with the pack
- Best practice is to exploit available technologies
- Technologies are moving closer to measuring real risk factors
- Regulators have a daunting task to balance the tension between fairness and competition
The Perspective in Practice: We Have a Filing, Now What?

- What is your state’s law?
  - Statutes
  - Regulations
  - Bulletins

- What is the commissioner’s position?

- How do Actuarial Principals and Standards of Practice apply?
The Perspective in Practice: State Law

- Rate standards – rates shall not be:
  - Inadequate
  - Excessive
  - Unfairly discriminatory

- Unfair and deceptive practices
  - Discrimination in the amount of premium between individuals of essentially the same risk and hazard
The Perspective in Practice: Rate Standards

- Rate standards – rates shall not be:
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  - Excessive
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- Unfair and deceptive practices
  - Unfair discrimination in the amount of premium between individuals of essentially the same risk and hazard

- CAS Statement of Principals Regarding P&C Ratemaking
  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.

- ASOP 12 – Risk Classification
  Rates ... would be equitable (i.e., fair) if differences in rates reflect differences in expected cost for risk characteristics.
The Perspective in Practice: Unfair Discrimination

- Prohibited characteristics
  - Race
  - Creed
  - Color
  - National origin
  - Ethnic background
  - Sexual orientation

- Other characteristics for some states
  - Gender
  - Age
The Perspective in Practice: Reviewing the Model – Key Questions

- How is it used?
  - Supplementary factor
  - Element of the classification system
  - Entire classification system

- What does the commissioner approve?
  - Rates – most common answer
  - Methods – in some states

- What precedents have been set?
  - Other insurers’ use of models
The Perspective in Practice: Prohibited Characteristics

- Demonstrate that the prohibited characteristics are not used
  - List of variables actually used
  - Attestation from the actuary or a company officer?
  - Known data source

- Issues
  - Confidentiality of proprietary models
  - Do any variables act as surrogates?
The Perspective in Practice: Reviewing the Model

- How much detail is feasible?
- What resources are available?
- What are the time limits governing reviews?
- How can regulatory needs be met?
The Perspective in Practice: Reviewing the Model

- How will having the formula help:
  - In determining fair discrimination?
  - In prohibiting unfair discrimination?

- Do you have an expert in:
  - GLMs?
  - Modeling?

- Would you recreate the model from scratch?
  - Need source database
  - Need assumptions and decisions at key points of development

- Is this practical?
The Perspective in Practice: Reviewing the Model

- What is needed
  - To determine fair discrimination?
  - To detect unfair discrimination?

- Results
  - Matching rates to level of risk
  - Based on risk classification standards

- Measurement
  - Loss ratio relativities
  - Goodness of fit
  - Stability in results over time
The Perspective in Practice: Reviewing the Model

- How was the model developed?

  Data
  - How many states?
  - How many years?
  - How many data records?

  Process
  - Modeling protocols
    - Documentation
    - Who signs off, when?
  - Set aside data for validation
  - Calibration
  - How often is the model updated?
The Perspective in Practice: Reviewing the Model

- Does the model do what the insurer says?
- Do the results make sense?
- Are the statistical methods and the tests applied to the model appropriate?
- How long will it be accurate; when will it be updated?
The Perspective in Practice: Other Concerns

- Market Conditions
  - Availability of coverage
  - Affordability of coverage
  - Consistent treatment of consumers

- Financial Solvency
  - Adverse selection of companies without models
  - Alignment of price and risk

- Precedent
  - Consistent treatment of insurers
Questions
For More Information

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