



**CASUALTY ACTUARIAL SOCIETY**  
Ratemaking, Product, and Modeling Seminar



**Banking & Insurance Group**  
MORE INFORMATION. BETTER DECISIONS.

2018 RATEMAKING, PRODUCT AND MODELING SEMINAR  
**PRODUCT MANAGEMENT WORKSHOP**

# Part 8: Data Gathering

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# CASUALTY ACTUARIAL SOCIETY

## Antitrust Notice

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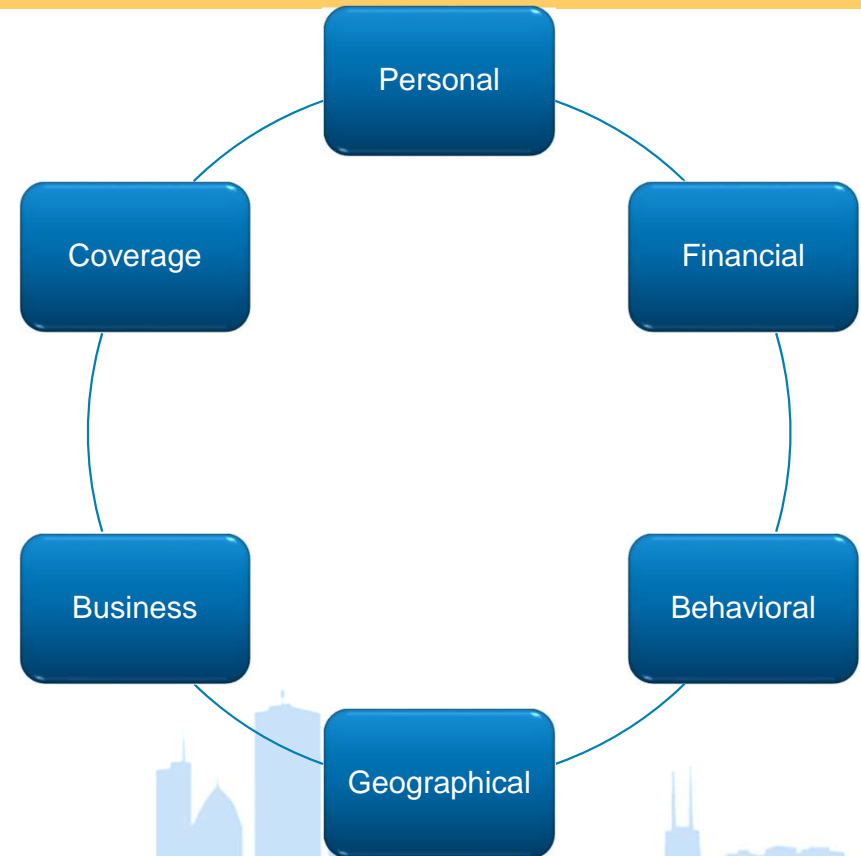
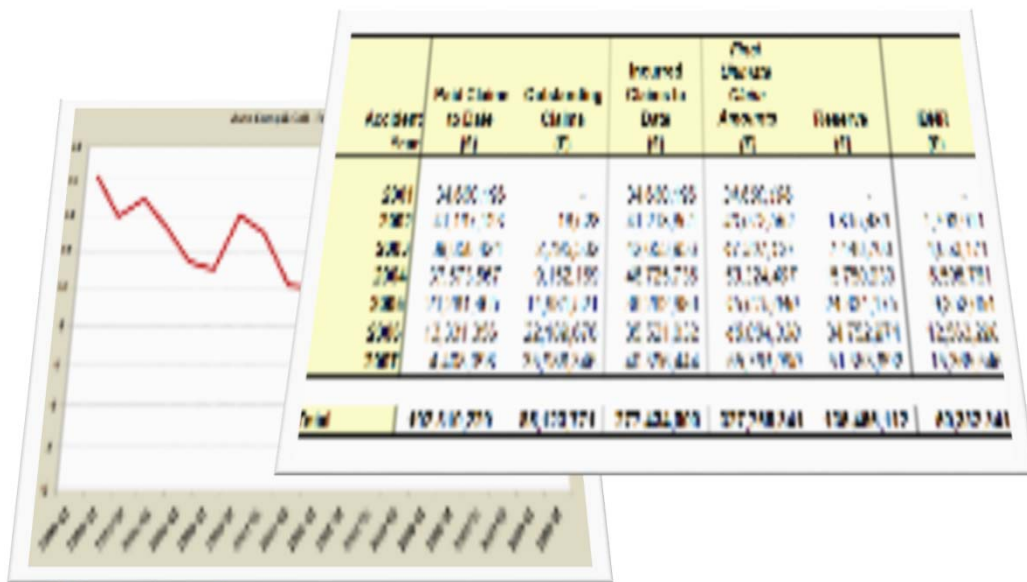
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# Table of Contents

- What are the actual risk drivers?
- What are some personal and commercial lines external data sources?  
How do they overlap?
- What do these sources offer?
- What are some implementation and other considerations?



# What Drives Risk?



# Internal Data Sources

- Billing / payment plan data
- Premium audit / loss control data
- Underwriting application data/non-financial risk information {free form text fields}
- Quote system data
- Telematics data
- Data from other lines of insurance
  - Personal auto data for an insured can enhance homeowners modeling
  - Workers comp data for an insured can enhance CMP modeling
  - Policy tenure, payment history, claim history, deductibles and limits of those other products
  - Total number of policies

... and many more

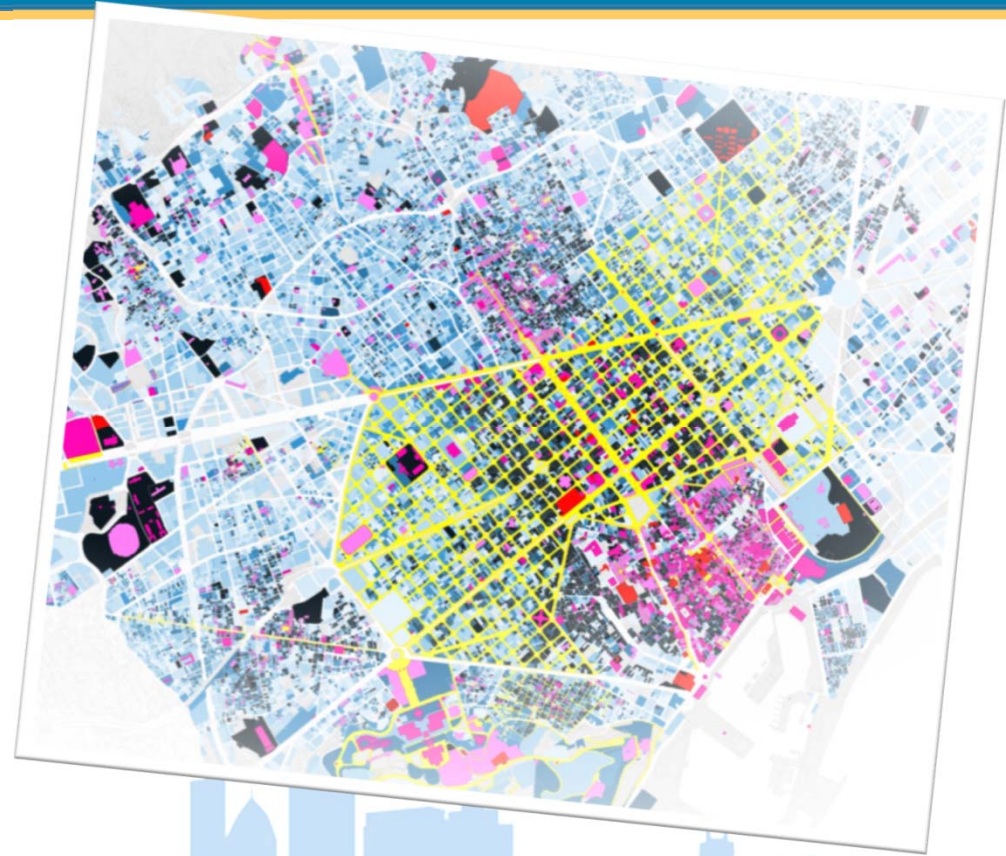
# External Data Sources

- U.S. Census
- National Highway Traffic Safety Administration
- Experian Mosaic®
- Applied Geographic Solutions
- CARFAX
- Highway Loss Data Institute
- Safety and Fitness Electronic Records
- GPS tracking
- FireSafe
- Structure Characteristics (PerilVision)
- Personal credit
- Commercial credit
- Occupational Safety & Health Administration
- NCCI/ISO
- MarketStance

... and many more

# Geo-demographic Data: US Census Bureau

- Publicly available
- Manipulation required
- **BE CAREFUL:** Contains data that may pose regulatory problems
- Potential predictors:
  - Median income
  - Education level
  - Average age
  - Occupation
  - Work-from-home
  - Home Ownership



# Geo-demographic Data: NHTSA

## Fatality Analysis Reporting System (FARS)

- Fatal accidents nationwide
- County level

## Potential predictors:

- Hit & run frequency
- Drug and alcohol-related accident frequency





# Geo-demographic: Other sources

## Experian Mosaic

- Zip code level data
- Compiled from several sources

## EASI Analytics

- ZIP, County, Census Block levels
- Compiled from several sources

## Potential Predictors

- population,
- household,
- income,
- labor force
- metro area characteristics

## Applied Geographic Solutions

- Models results from publicly available data
- Data and map point files available
- Create custom indexes for weather events

## Potential predictors

- Average temperature
- Precipitation
- Air quality
- Expected damage relativities
- Indexes for weather events

# Vehicles: CARFAX

- 16 billion records from over 100,000 sources
- VIN level

## Potential predictors:

- Severe problem indicator
- Potential damage indicator
- Number of owners
- Average annual mileage
- Odometer readings



# Vehicles: IIHS Highway Loss Data Institute

- Relative average loss payments derived from historical data compiled from sponsoring companies
- Make and model level
- Potential predictors:
  - Injury frequency and severity
  - Collision frequency and severity
  - Theft score
  - Crash protection ratings
  - Safety engineering analysis



# Vehicles

## Safety and Fitness Electronic Records System (SAFER)

- Safety performance of motor carriers
- Based on data collected from state and federal systems

### Potential predictors:

- Federal safety ratings
- Carrier crashes
- Inspection summaries
- Safety/Compliance reviews



## Telematics systems

- Fleet tracking services
- Validate radius of operation
- Ensure driver safety
- Monitor driving style

# Personal Dwellings

## Explore FireSafe

- Refined fire peril scoring
- Fire protection and weather related information
- General characteristics reflected:
- Drive distance between home and fire station
- Proximity to water source
- Fire Station type

## Structure Characteristics

- Construction score by peril
- Enhances peril rating
- Addresses damageability and reparability

## Home Telematics



# Credit

## Personal credit

- Industry standard
- Business owner



## Commercial credit

- Business credit risk and profiling
- Additional data elements as predictive if not more than the score itself

## Potential predictors:

- Number and amount of lines of credit
- Bankruptcies
- Years in business
- Trade lines with debt beyond terms

# Industry

## **NCCI**

- Workers Compensation

## **ISO**

- Personal & Commercial

## **Supplier Relations**

- Manufacturing sub-sector

- Closed claims history for physicians

## **SIC and/or NAICS**

- Refinement of commercial classes

## **MarketStance**



# Individual



- US News
  - Educational institute ranking
- Professional organizations
- Licensing and certification history
- Social Media



# Business

## OSHA

- Occurrence of workplace injuries
- Compliance and enforcement information available nationwide
- Inspection detail
- Violation history

## Oxford Life Cycle

- Reflects status of business growth

## Better Business Bureau

- Complaints
- Rating

## Experian/D&B/Bloomberg

- Non-financial risk specific information
- Financial Risk

# Considerations when Gathering Data

- Relevance
- Regulations
- Social Acceptance
- Overlap of various sources
- Level of detail
- Applicable lines
- Frequency of updates
- Historic data
- Timing
- Assembly of data
- Matching
- Geographic coverage
- Cost

... and many more



# Implementation Considerations



- Extent of intelligence willing to disclose in public filings
- Level of underwriting sophistication
  - Scorecard
  - Selection of accounts for manual review
- Prioritizing marketing

# Summary

- Various non traditional insurance data sources available
- Value of sources dependent on current state of competitive advantage/disadvantage
- Predictive characteristics usually implemented through a combination of pricing, underwriting, claims and marketing



# Group Activity #1

## SELECT A PRODUCT IDEA

- Brainstorm in your team to come up with a product idea based on the concepts discussed in the Niche Identification module.
- Be creative!

## DETERMINE POTENTIAL DATA SOURCES

Discuss potential data sources you would research to help with the development of your product based on the concepts discussed in the Data Gathering module.

- What data might be useful to help flesh out or validate the product idea?
- What data sources should the group consider as part of the product design, for instance to support underwriting or pricing?