

Predictive Modeling for Workers Compensation



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Agenda

- Unique Features of Workers Compensation Insurance
- Predictive Modeling for Workers Compensation:
Overview of Current Status
- Predictive Modeling Challenges Specific to Workers
Compensation
- Key Considerations for Workers Compensation
Predictive Modeling
- Examples of PM for WC Pricing/UW
- Conclusions

Uniqueness of WC Insurance

- ❑ Benefit or insurance?
 - Workers Compensation = Liability + Healthcare + Disability/Life
- ❑ Only know half of the true exposure information
- ❑ Highly regulated line of business
- ❑ Highly publicized line of business
- ❑ Sensitive to external economic development
- ❑ Risky and cyclical business
- ❑ Prone to fraud
- ❑ Long tailed
- ❑ Unique, independent, and uniform rating structure
- ❑ Less interaction with other lines of business

Uniqueness of WC Insurance

- Highly diverse business
 - Many different industries, classes, and types of risks
 - Wide range of policy size
- Fragmented industry
 - No dominant players in the industry
 - National players, regional players, multi-line players, mono-line players
 - State funds are also competitive
- Uniqueness of the product:
 - Highly uniform
 - Rating bureau driven, no independent rating plans
 - Limited flexibility in coverage
 - Limited product and coverage options for competitive strategy (retro, large deductibles, dividends)
 - No territorial rating

Current Status of Workers Compensation Predictive Modeling

- Across-the-board interest for WC predictive modeling:
 - National carriers, regional carriers, multi-line carriers, mono-line carriers, State Funds.
 - Even excess writers and re-insurers are paying interest in predictive modeling for WC as well
 - Multi-line carriers are interested in growing WC for their accounts

Current Status of Workers Compensation Predictive Modeling

- PM applications for WC include:
 - *Pricing and underwriting*
 - A significant portion of small business WC is using PM for pricing or underwriting
 - Interest starts to spread to middle market segment
 - PM may replace past/current competitive tools, such as, large dividends plans, retro products, large deductible products, etc
 - Retention
 - Classical PM application
 - Claim management/fraud
 - Return to work program, case management, soft and hard fraud detection, adjuster assignment, bill review, etc
 - Premium audit/premium leakage
 - Natural application of using PM for premium audit

Challenges for Workers Compensation Predictive Modeling

□ Data challenges:

- Data quality
 - Generally low data quality for commercial line insurance
- Experience of IT support for WC predictive modeling data (also for commercial lines in general)
- Limited exposure, business, and risk characteristics available for prediction
- Lack of “account view” for multi-line carriers
- For some multi-line carriers, WC is a “secondary” or “add-on” business for a commercial account.

Challenges for Workers Compensation Predictive Modeling

- Model design challenges:
 - Exposure/pure premium modeling approach challenges:
 - Hundreds of industry class rates by state
 - Limited amount of data for modeling
 - Modeling “severity” is challenging
 - Policy level/loss ratio modeling approach challenges:
 - “Mixed” distribution for loss ratio - Tweedie distribution?
 - Wide range of policy sizes
 - Actual premium vs. on-leveled premium
 - Long tailed loss development
 - Lack of predictive variables for modeling
 - Implementation challenges

Challenges for Workers Compensation Predictive Modeling

- ❑ Implementation challenges
 - Pricing implementation challenges:
 - ❑ Can have independent class plan and class rates?
 - ❑ Other pricing options?
 - Underwriting implementation challenges:
 - ❑ How to interpret the models results?
 - ❑ How to implement the models through underwriting actions?
 - Credit/debits vs. Company Placement vs. Cancellation?
 - System implementation challenges:
 - ❑ Challenges if models include “non-traditional” variables
 - Business implementation challenges: operation, new business writing, renewal cycle, agency management, etc.

Key Considerations for Workers Compensation Predictive Modeling

- Carefully design the models:
 - Clearly define the goal:
 - class plan optimization, pricing, or UW? Consider business and implementation factors
- Enrich the list of predictive variables:
 - External data sources such as business, crime, demographic, etc
 - Account variables (non WC variables)
 - Non-traditional variables
 - “Creative” variables

Key Considerations for Workers Compensation Predictive Modeling

- It is not just a statistical or technical exercise
 - Need to understand the business issue and the data issue
 - “prediction” patterns may be different between regional vs. national, multi-line vs. mono-line, private carriers vs. state fund etc.
 - In-depth reasonability check
 - Is the result “reasonable”?
 - Avoid “ivory tower” modeling approach
 - In-depth diagnostic check

What will You Do with Territorial Finding?

- ❑ File rating territories to insurance departments
- ❑ Ask rating bureaus to create rating territories
- ❑ Use it in underwriting, such as company placement or credit/debit
- ❑ Ask marketing department and product managers to write more in the good territories
- ❑ Do nothing

Conclusions

- ❑ WC is a fairly unique line of business and is difficult to model compared to other lines
- ❑ However, with careful model design, Workers Compensation models can be as powerful as other insurance models (such as credit score model) and can bring significant values to the industry
- ❑ Longer term impact of predictive modeling on the Workers Compensation industry may include:
 - More in-depth understanding of exposures and risks
 - More pressure on less sophisticated carriers
 - Underwriting cycle may be minimized - winners vs. losers
 - More independence from Rating Bureaus
 - More pressure on Rating Bureaus for additional services for their members
 - Enhanced data collection and continuing search for powerful variables
 - Traditional pricing and UW will be challenged
- ❑ Be creative, be careful, and avoid “ivory tower” modeling