Workers’ Compensation
Product Management Applications of Predictive Modeling

2007 WRG PREDICTIVE MODELING IMPLEMENTATION for
WORKERS’ COMPENSATION SEMINAR

Robert J. Walling, FCAS, MAAA
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Presentation Outline

- Current Workers Compensation Environment
- A Hypothetical Case Study
- Predictive Modeling Applications
  - A Basic Solution
  - A Better Solution
  - A Product Management Solution
Current Environment & Trends

- Market Consolidation
- Alternative Markets
- Increased Profitability
- Personal Lines Advances

Increased Competition

- Need for More Accurate “Walk Away” Price
- Pressure for Reserve Accuracy
- Improved Internal/External Data
- Evaluation of ALL Service Providers
## Schedule Credits Can Still Overwhelm Manual Rates

<table>
<thead>
<tr>
<th>Company</th>
<th>Tiering Factor</th>
<th>Schedule Max/Min</th>
<th>Percent of Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>SubStandard I.C.</td>
<td>1.25</td>
<td>+40%</td>
<td>175%</td>
</tr>
<tr>
<td>SubStandard I.C.</td>
<td>1.25</td>
<td>-40%</td>
<td>75%</td>
</tr>
<tr>
<td>Vanilla I.C.</td>
<td>1.00</td>
<td>+40%</td>
<td>140%</td>
</tr>
<tr>
<td>Vanilla I.C.</td>
<td>1.00</td>
<td>-40%</td>
<td>60%</td>
</tr>
<tr>
<td>Preferred I.C.</td>
<td>0.85</td>
<td>+40%</td>
<td>119%</td>
</tr>
<tr>
<td>Preferred I.C.</td>
<td>0.85</td>
<td>-40%</td>
<td>51%</td>
</tr>
<tr>
<td>SuperPreferred I.C.</td>
<td>0.70</td>
<td>+40%</td>
<td>98%</td>
</tr>
<tr>
<td>SuperPreferred I.C.</td>
<td>0.70</td>
<td>-40%</td>
<td>42%</td>
</tr>
</tbody>
</table>

THE HIGHEST NET RATE IS OVER FOUR TIMES THE LOWEST!!
Hypothetical Case Study
The Situation

- You are a product manager⁠¹ at a company providing workers compensation insurance.

- Your boss has asked that you develop a predictive modeling application to assist you in improving the performance of the book of business in your state(s).

¹ – This means regardless of your training (e.g. Actuarial, Accounting, CPCU, Marketing) you are responsible for the performance of a book of business, including all aspects of the book of business.
A Basic Solution
Pricing Predictive Model

- By Peril Model (Indemnity vs. Medical, ALAE?)
- Class Refinement
- Alternate Approaches to NCCI Class Rates
- Territory
- Underwriting/Tiering Scorecard
Basic Predictive Model

- Policy Number
- Claim Number
- Effective Date/Policy Year
- Accident Date
- Class
- State
- Zip Code/County
- New/Renewal Indicator (or Year on Risk)
- Endorsed Program ID
- Other Policies on Account
- Hazard Group
- SIC Code
- Current NCCI Loss Cost?
- Credit Score
- Written Premium
- Incurred Loss
- Claim Count (no CWPs)
- Payroll
Basic Predictive Model - Approach

- Adjust Data to Reflect Non-ratable Classes
  - Experience, Schedule, Premium Discount, etc.
- Model Frequency and Severity Separately
- Model Indemnity and Medical Separately
- Consolidate into a single pure premium model
Basic Pure Premium Model - Class

Log of multiplier

Exposure (years)

Unsmoothed estimate
Smoothed estimate

PINNACLE ACTUARIAL RESOURCES, INC.
The Firm of Choice
## WC Class Analysis

<table>
<thead>
<tr>
<th>NCCI Class Code</th>
<th>Class Description</th>
<th>Revised Company Exposure ($00)</th>
<th>2004 NCCI Loss Cost</th>
<th>Proposed Loss Cost</th>
<th>Change from Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>7228</td>
<td>Trucking: Local Hauling Only</td>
<td>66,891</td>
<td>9.81</td>
<td>6.68</td>
<td>-32%</td>
</tr>
<tr>
<td>7380</td>
<td>Commercial Drivers</td>
<td>95,217</td>
<td>5.48</td>
<td>7.39</td>
<td>35%</td>
</tr>
<tr>
<td>7382</td>
<td>Bus Company</td>
<td>12,658</td>
<td>5.41</td>
<td>6.04</td>
<td>12%</td>
</tr>
<tr>
<td>8006</td>
<td>Gasoline Station</td>
<td>52,068</td>
<td>3.78</td>
<td>5.39</td>
<td>42%</td>
</tr>
<tr>
<td>8385</td>
<td>Bus Company</td>
<td>10,496</td>
<td>3.47</td>
<td>4.32</td>
<td>25%</td>
</tr>
<tr>
<td>8387</td>
<td>Service Stations</td>
<td>32,628</td>
<td>3.20</td>
<td>1.83</td>
<td>-43%</td>
</tr>
<tr>
<td>8391</td>
<td>Automobile Body Repair Shop</td>
<td>118,611</td>
<td>4.01</td>
<td>2.64</td>
<td>-34%</td>
</tr>
<tr>
<td>8393</td>
<td>Automobile Body Repair</td>
<td>33,165</td>
<td>2.99</td>
<td>0.98</td>
<td>-67%</td>
</tr>
<tr>
<td>8748</td>
<td>Automobile Salespersons</td>
<td>96,971</td>
<td>1.75</td>
<td>2.36</td>
<td>35%</td>
</tr>
<tr>
<td>42</td>
<td>Landscape Gardening &amp; Drivers</td>
<td>70,943</td>
<td>8.45</td>
<td>4.46</td>
<td>-47%</td>
</tr>
<tr>
<td>5190</td>
<td>Electrical Wiring - Within Buildings</td>
<td>206,541</td>
<td>3.60</td>
<td>2.51</td>
<td>-30%</td>
</tr>
<tr>
<td>5437</td>
<td>Carpentry - Interior</td>
<td>111,300</td>
<td>6.87</td>
<td>4.83</td>
<td>-30%</td>
</tr>
<tr>
<td>5474</td>
<td>Painting Or Paperhanging</td>
<td>113,721</td>
<td>6.65</td>
<td>4.36</td>
<td>-34%</td>
</tr>
<tr>
<td>5606</td>
<td>Contractor - Executive Supervisor</td>
<td>113,489</td>
<td>2.09</td>
<td>14.49</td>
<td>593%</td>
</tr>
<tr>
<td>9052</td>
<td>Hotel: All Other Employees</td>
<td>863,123</td>
<td>3.22</td>
<td>2.53</td>
<td>-21%</td>
</tr>
<tr>
<td>9058</td>
<td>Hotel: Restaurant Employees</td>
<td>167,039</td>
<td>2.15</td>
<td>2.34</td>
<td>9%</td>
</tr>
<tr>
<td>9082</td>
<td>Restaurant NOC</td>
<td>709,574</td>
<td>2.61</td>
<td>1.83</td>
<td>-30%</td>
</tr>
<tr>
<td>9083</td>
<td>Restaurant: Fast Food</td>
<td>139,396</td>
<td>2.45</td>
<td>3.36</td>
<td>37%</td>
</tr>
<tr>
<td>8017</td>
<td>Store: Retail NOC</td>
<td>280,356</td>
<td>2.40</td>
<td>2.74</td>
<td>14%</td>
</tr>
<tr>
<td>8033</td>
<td>Store: Meat, Grocery &amp; Provision Stores</td>
<td>458,603</td>
<td>2.85</td>
<td>2.14</td>
<td>-25%</td>
</tr>
<tr>
<td>8601</td>
<td>Architect Or Engineer - Consulting</td>
<td>135,932</td>
<td>0.99</td>
<td>1.25</td>
<td>26%</td>
</tr>
<tr>
<td>8742</td>
<td>Salespersons, Collectors or Messengers</td>
<td>672,184</td>
<td>0.95</td>
<td>1.20</td>
<td>26%</td>
</tr>
<tr>
<td>8810</td>
<td>Clerical Office Employees NOC</td>
<td>2,628,543</td>
<td>0.55</td>
<td>0.74</td>
<td>34%</td>
</tr>
<tr>
<td>8820</td>
<td>Attorney - All Employees &amp; Clerical</td>
<td>148,121</td>
<td>0.44</td>
<td>1.48</td>
<td>237%</td>
</tr>
<tr>
<td>8832</td>
<td>Physician &amp; Clerical</td>
<td>342,051</td>
<td>0.63</td>
<td>0.39</td>
<td>-38%</td>
</tr>
</tbody>
</table>
Complement of Credibility Ideas

Run 5 Model 1 - Risk Premium - Smoothed standard risk premium model (single claim type)
Complement of Credibility Ideas (cont.)

Predicted Relativities

% of Exposures

Industry

Agriculture | Auto | Construction | Heath | Hotel | Manufacturing | Misc. | Office | School | Service | Trucking | unknown

% of Exposures

0% | 20% | 40% | 60% | 80% | 100% | 120% | 140% | 160%
Company Deviation Factors

Run 5 Model 1 - Risk Premium - Smoothed standard risk premium model (single claim type)

Company

Log of multiplier

Unsmoothed estimate

Smoothed estimate

Exposure (years)
## Revised Tiering Relativities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>34,156,359</td>
<td>1.758</td>
<td>19,429,101</td>
<td>1.00</td>
<td>1.00</td>
<td>1.08</td>
<td>1.897</td>
<td>8%</td>
</tr>
<tr>
<td>7</td>
<td>8,004,943</td>
<td>1.656</td>
<td>4,833,903</td>
<td>0.67</td>
<td>0.94</td>
<td>0.72</td>
<td>1.266</td>
<td>-24%</td>
</tr>
<tr>
<td>8</td>
<td>3,506,269</td>
<td>1.529</td>
<td>2,293,178</td>
<td>0.63</td>
<td>0.87</td>
<td>0.67</td>
<td>1.186</td>
<td>-22%</td>
</tr>
<tr>
<td>10</td>
<td>127,593</td>
<td>1.427</td>
<td>89,413</td>
<td>0.53</td>
<td>0.81</td>
<td>0.57</td>
<td>1.011</td>
<td>-29%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45,795,164</strong></td>
<td><strong>1.719</strong></td>
<td><strong>26,645,595</strong></td>
<td><strong>0.91</strong></td>
<td><strong>0.98</strong></td>
<td><strong>0.98</strong></td>
<td><strong>1.719</strong></td>
<td><strong>0%</strong></td>
</tr>
</tbody>
</table>

**Note:** there are two ways to implement these findings
1) Change the relativities
2) Identify characteristics that better match the current tier factors and retier the book.
Additional Geographic Data

Sample Territory Analysis

Final run

Log of multiplier

Exposure (years)

Population as proxy for traffic density

- One-way relativities
- Approx 95% confidence interval
- Unsmoothed estimate
- Smoothed estimate
Territory Differences
# Multi-Policy Discounts

<table>
<thead>
<tr>
<th>Categories</th>
<th>Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Automobile Policies (excluding Garage Liability and Dealers Blanket)</td>
<td>7%</td>
</tr>
<tr>
<td>Commercial Umbrella Policies</td>
<td>4%</td>
</tr>
<tr>
<td>Commercial, Econ-O-Pak and Habitational Umbrella policies</td>
<td></td>
</tr>
<tr>
<td>Life, Health or Annuity Policies</td>
<td>2%</td>
</tr>
<tr>
<td>- The following policies written on an owner, partner or corporate officer of the business:</td>
<td></td>
</tr>
<tr>
<td>- Life policy (nongroup) with a face amount of $100,000 or more or</td>
<td></td>
</tr>
<tr>
<td>Simplified Issue Life policy with a face value of $50,000 or more; or</td>
<td></td>
</tr>
<tr>
<td>- Annuity policy with a combined cash value exceeding $10,000 or more, or</td>
<td></td>
</tr>
<tr>
<td>- Disability Income policy with a monthly benefit of $1,000 or more; or</td>
<td></td>
</tr>
<tr>
<td>- Long Term Care Policy</td>
<td></td>
</tr>
</tbody>
</table>
Endorsed Program Results

Relative Association Value

% of Exposures

Pure Premium Relativity

Exposures
Relativity

PINNACLE
ACTUARIAL RESOURCES, INC.
The Firm of Choice
A Better Solution
Traditional Underwriting vs. Rating

- Historically Distinct (*and often conflicting*)
  - Underwriting Determined Eligibility
  - Rating Determined Manual Premium
  - Underwriting then Applied IRPM/Schedule Rating
Historical Risk Selection & Pricing Flow

Underwriting

Rating

IRPM/Schedule

Overlaps

Yes

No

$
Underwriting vs. Rating Today

- Lines are blurred…
  - Underwriting determines eligibility, often using modeled actuarial data
  - Underwriting determines rating tier, often with actuarially determined tiers
  - Actuarial determines tier relativities and rates
Current Risk Selection and Pricing Flow
Additional Internal Information

- Percent Occupied
- Years in Business
- Years of Same Mgt.
- Hours of Operation
- Deliveries?
- Franchise?
- Safety Program
- # of Employees/Leasing
- Part Time/Full Time Mix
- On-Site Owner
- Loss Control Survey Score

Not to mention – Billing history, account experience
### Core Section

<table>
<thead>
<tr>
<th>Core Section</th>
<th>Questions</th>
<th>Points</th>
<th># of N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Frequency and Severity Trends</td>
<td>3</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>2. Loss Prevention Direction</td>
<td>13</td>
<td>41</td>
<td>1</td>
</tr>
<tr>
<td>3. Substance Abuse</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4. Accident Investigation</td>
<td>2</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>5. Claims Management</td>
<td>3</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>6. Emergency Response</td>
<td>5</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>7. Regulatory Compliance</td>
<td>14</td>
<td>21</td>
<td>6</td>
</tr>
<tr>
<td>8. Liability</td>
<td>4</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>9. Motor Vehicle</td>
<td>4</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>10. Ergonomics</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTALS** 53 128 12

### Supplemental Section

<table>
<thead>
<tr>
<th>Supplemental Section</th>
<th>Applicable Sections</th>
<th>Questions</th>
<th>Points</th>
<th># of N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Construction</td>
<td>☒</td>
<td>20</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>B. Distribution</td>
<td>☐</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Health Care</td>
<td>☐</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Quarries</td>
<td>☐</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Service Companies</td>
<td>☐</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Transportation</td>
<td>☐</td>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTALS** 20 50 5

\[
\frac{73 - 17}{224} \times 4 = 79 \%
\]

Total Questions (Core & Supplemental) 73

# of N/A 17

Maximum Points 224

Final Score 79%
It’s not “What” but “Who”

“Who” Issues - Organizational

- Credit
- Ownership Type
- Yrs. In Business
- Changes
  - Sales
  - Acquisitions
  - Downsizings
- Owner Involvement
  - Company
  - Owner
- Absence Management
- Quality of Benefits (Cost Shifting Implications)
- Billing Method
- Audit Premium
- Hours of Operations
- Physician Direction
- Franchisee?
It’s not “What” but “Who”

- Safety
  - OSHA Violations
  - Return to Work Program
  - Equipment Maintenance
  - Loss Control Survey Scores
  - Loss Committee

- Employees
  - Shifts/Hours
  - Full Time/Part Time/Outsourcing
  - Training
  - Turnover
  - Drug Testing
  - Driving Records
  - Screening
Additional External Information

- Credit Score
  - Commercial
  - Owner
- Lots of Operational Info
  - Niche Specific, too
    - Professional Credentials/Memberships
  - OSHA Violations
- Driving Records
- Geographic Data
- Economic Data
# Underwriting Scorecard Example

## Credit Score

<table>
<thead>
<tr>
<th>Credit Score</th>
<th>Exposure</th>
<th>Indicated Relativity</th>
<th>On Balance Indicated</th>
<th>Score Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>359,376</td>
<td>1.000</td>
<td>0.988</td>
<td>32</td>
</tr>
<tr>
<td>M</td>
<td>153,873</td>
<td>1.081</td>
<td>1.068</td>
<td>9</td>
</tr>
<tr>
<td>NS</td>
<td>90,760</td>
<td>1.045</td>
<td>1.032</td>
<td>19</td>
</tr>
<tr>
<td>S</td>
<td>106,681</td>
<td>0.902</td>
<td>0.891</td>
<td>62</td>
</tr>
<tr>
<td>U</td>
<td>26,131</td>
<td>1.114</td>
<td>1.101</td>
<td>0</td>
</tr>
</tbody>
</table>
## Underwriting Scorecard Example

<table>
<thead>
<tr>
<th>Years of Control</th>
<th>Current Score Control</th>
<th>Score Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10</td>
<td></td>
<td>150</td>
</tr>
<tr>
<td>6-10</td>
<td></td>
<td>75</td>
</tr>
<tr>
<td>0-5</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Time/ Full Time</th>
<th>Score Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;33%</td>
<td>50</td>
</tr>
<tr>
<td>33% - 67%</td>
<td>25</td>
</tr>
<tr>
<td>&gt;67%</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Three Year Employee Retention</th>
<th>Score Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95%</td>
<td>100</td>
</tr>
<tr>
<td>65-95%</td>
<td>50</td>
</tr>
<tr>
<td>&lt;65%</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety Program</th>
<th>Score Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal</td>
<td>50</td>
</tr>
<tr>
<td>Informal</td>
<td>25</td>
</tr>
<tr>
<td>None</td>
<td>0</td>
</tr>
</tbody>
</table>

- Drug Screening: 25 Pts
- Incident Review Cmtee: 25 Pts
- Return to Work Program: 25 Pts
- No Delivery: 5 pts
- Owner on Premises: 15 Pts
- Franchise: 10 Pts
- Closed by 9 pm: 10 Pts
## Underwriting Scorecard Example

<table>
<thead>
<tr>
<th>Cumulative Point Range</th>
<th>Tiering Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 99</td>
<td>1.00</td>
</tr>
<tr>
<td>100 - 199</td>
<td>0.92</td>
</tr>
<tr>
<td>200 - 299</td>
<td>0.84</td>
</tr>
<tr>
<td>300 - 399</td>
<td>0.76</td>
</tr>
<tr>
<td>400 - 499</td>
<td>0.68</td>
</tr>
<tr>
<td>500 - 599</td>
<td>0.60</td>
</tr>
<tr>
<td>600 - 700</td>
<td>0.52</td>
</tr>
</tbody>
</table>
CA Scorecard Example

Company Rates applicable to Sentinel Insurance Company, LTD only:

Based on the following risk characteristics:

1. MVR Information
2. Average Driver Age
3. Youthful Composition
4. Length of Credit History
5. Total Number of Trades
6. Percentage of Balance Overdue of All Trades
7. Total Balance of Regular Trades
8. Number of Public Records / Collections
9. Amount of Judgment
10. Average Number of Days Balance Overdue in the Past 3 Months
11. Number of Inquiries in the Past 9 Months
12. Years in Business (when financial information is not available)
13. Industry Classification
14. Percentage of TTT Power Units
15. Prior 3-Year Loss Frequency by Size of Risks
16. Other risk-specific characteristics that are not contemplated above

use the applicable tier factor as a final step prior to rounding to determine the final rates.
**CA Scorecard Example**

<table>
<thead>
<tr>
<th>Tier</th>
<th>Factor</th>
<th>Tier</th>
<th>Factor</th>
<th>Tier</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
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**NOTICE THE LIFT!**
Scorecard Advantages

- Regulatory
  - Underwriting Guidelines
- Preserve Competitive Advantage
  - To File or Not to File?
- Many Small Factors
- Ability for Underwriter/Agent Feedback
- Response to Counter-Intuitive Results
- Similarity to Credit Scoring (Intuitive)
A Product Management Solution
Predictive Modeling Applications – Other Applications

- Agency Management
- Utilization Review
- Audit Controls
- Expert Claims/Formula Case Reserving
- Experience and Schedule Rating
Agency Management Application

- Historical Problem: Calendar Year Loss Ratios often don’t tell us the whole story about the value added by an agency.

- Additional Data Needed/Desired
  - Agency Number
  - Licensing Status
  - Rank/Premium in Agency
  - Profit Sharing Contract Type
  - Distance to Insured

- Modeling Approach: Loss Ratios with Tweedie Dist.
Profiles by Agency Focus

Predicted Values

Agent Focus

Personal
Balanced
Comm/Specialty
Missing
Utilization Review

Utilization reviews look at the behavior of any provider of services to the underwriting and/or claims processes:

- Underwriting Support
  - Property Inspectors
  - Loss Control Representatives
  - Program Endorsement

- Treatment Providers
  - Doctors & Hospitals
  - Vocational Rehabilitation Centers
  - Auto Repair Shop
  - Auto Glass Companies
  - Special Investigation Units
  - Lawyers

- Court/Resolution Systems
Impact of Attorney Involvement on Claim Severity
Historical Question: Given the available information about a WC insured, how likely is a material audit premium?

Additional Data Needed/Desired
- Audit Premium separate from initial premium

Threshold may be dollar amount, % of premium or a combination of the two

Modeling Approach: Logistic regression model
Audit Premium Model

- Material Audit Premiums Vary by:
  - Size of Risk
  - Industry
  - Policy Size
  - Year on Risk
  - Historical Payroll Changes

- Benefits
  - Significant cost savings from unfruitful audits
  - Significant income potential from new audits
Expert Claims/Formula Case Reserving

- Historical Problem: Can I use historical claims data to more accurately set case reserves.

- Additional Data Needed/Desired
  - More claims detail (severity of injury, ICD-9 code)
  - Claims Lags (Reporting, Settlement)
  - Attorney Involvement
  - In/Out of Network

- Use existing severity models
- Can also do modeling of large loss likelihood
Claim Severities by Settlement Lag

Predicted Values

Settlement_Lag
Experience and Schedule Rating Issues

Historical Questions:
- “Does the Experience Rating Plan reduce loss ratio variability?”
- “How well do the Experience Rating Plan and the Schedule Rating Plan work together to reduce loss ratio variability?”

Additional Data: Policy Experience and Schedule Mods

This may vary significantly by
- Industry Group
- Policy Size
- Credits vs. Debits
Experience/Schedule Rating Interactions

![Graph showing Experience Mod vs Loss Ratio for different categories: Contractors, Manufacturers, and Retail/Wholesale. The graph illustrates the relationship between experience/schedule mod and loss ratio across various percentage ranges.]
Benefits of Using Predictive Modeling

- Improves Rate Accuracy
- Increases Underwriting Effectiveness
- Increased Use of “Who” Characteristics
- Creates Adverse Selection for Competitors
- Reflects Interactions
- Fast, cost-effective tool for U/W Decisions
  - Demonstrated by Success in Personal Lines
- Expand Your Markets
- Smarter Soft Market Reaction
- Smarter Underwriting
Parting Thoughts

When asked to divulge the secret of his playing strategy, ice hockey great Wayne Gretzky used to say,

"I skate where the puck is going to be, not where it's been."

The data’s ready,
The technology’s ready,
**The industry’s ready**

ARE YOU READY???