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# Success in Implementing Workers Compensation Predictive Models at Zurich Financial Services

Joel Appelbaum  
Zurich Financial Services  
Chief Risk Officer of North America  
Underwriting Transformation  
May 2010

# Agenda

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- What is Predictive Modeling All About
- What will it do for us?
- Lessons Learned
- Examples of How we have Implemented

# Zurich

- Global footprint
  - Five continents
  - 170+ countries
- 3rd largest commercial insurer
- 27 straight quarters of profitability



# FAMILY FEUD

TRIPLE

✓	✓
✓	✓
✓	✓
✓	✓
✓	✓
✓	✓

TRIPLE

196

400

## Predictive Modeling Feud

### Question

# Predictive modeling feud

What are predictors of future workers compensation losses ?

**Prior losses/loss history**

X X X X X X X

**Financial Health**

X X X X X X X

**Safety Program**

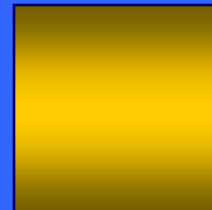
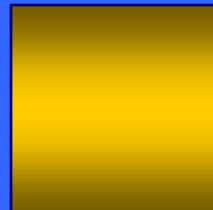
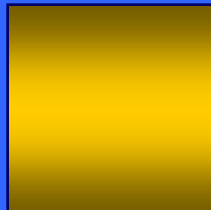
X X X X X X X

**Industry/SIC Code**

X X X X X X X

**Location/Demographics**

X X X X X X X



# What is the Value Proposition related to Predictive Analytics?

## Value Drivers:

**Loss Ratio Improvement**

**Expense Reduction**

**Profitable Growth**

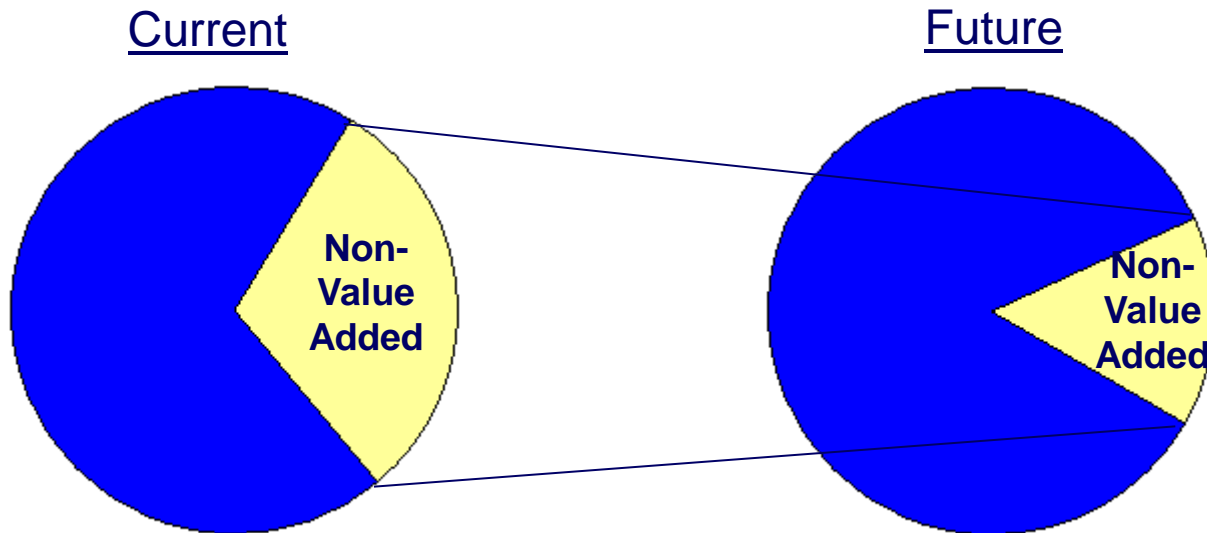
**Customer Centricity**

## Implementation Methods:

- **Design risk based pricing structure**
- **Focus retention effort on profitable risks**
- **Identify potential premium leakage**
  
- **Implement straight through processing**
- **Optimize audit procedures, loss control, service offerings**
- **Enhance our ability to detect fraud**
  
- **Focus sales on profitable niches**
- **Target new business**
- **Identify highly profitable agencies**
  
- **Reduce application information collection**
- **Increase our Cross-selling / Product Density**

# Expense Reduction

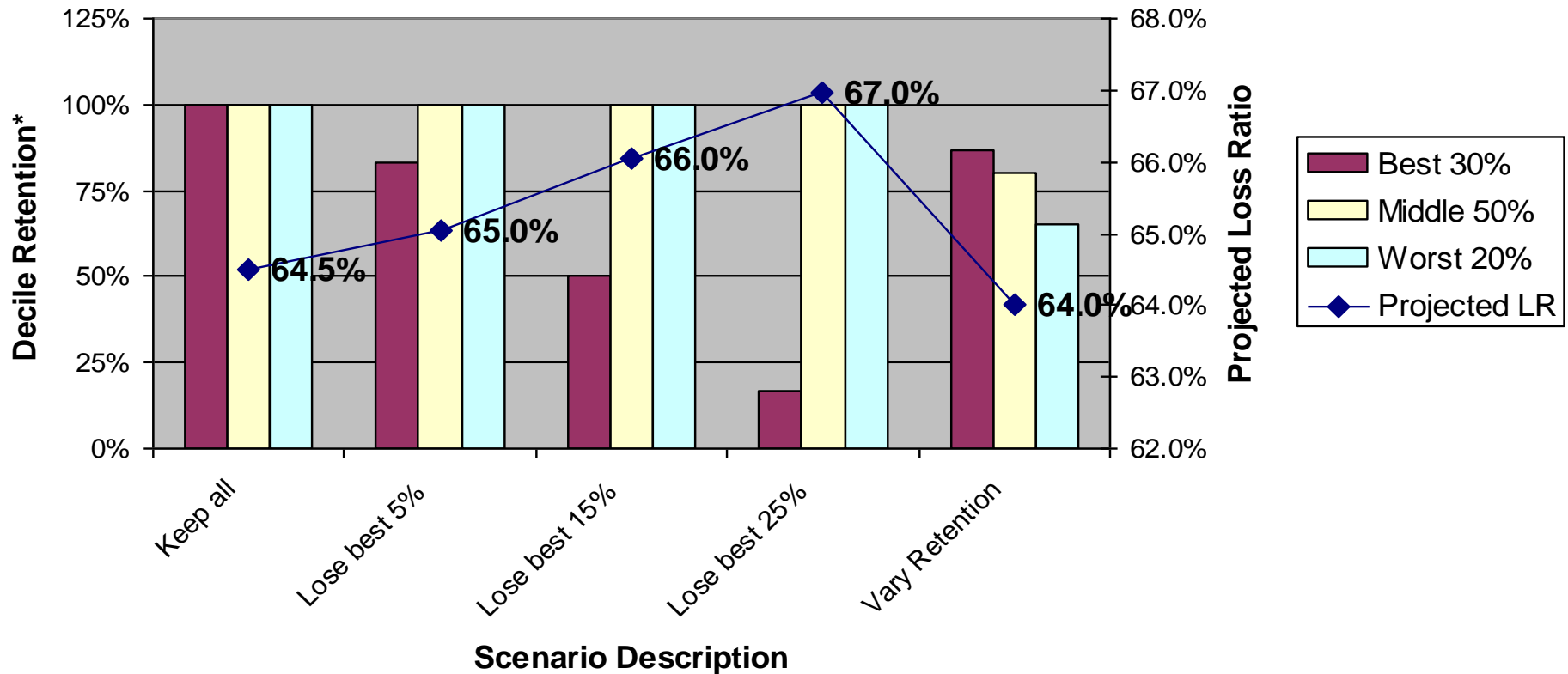
## Putting Predictive Analytics in the Underwriting Process



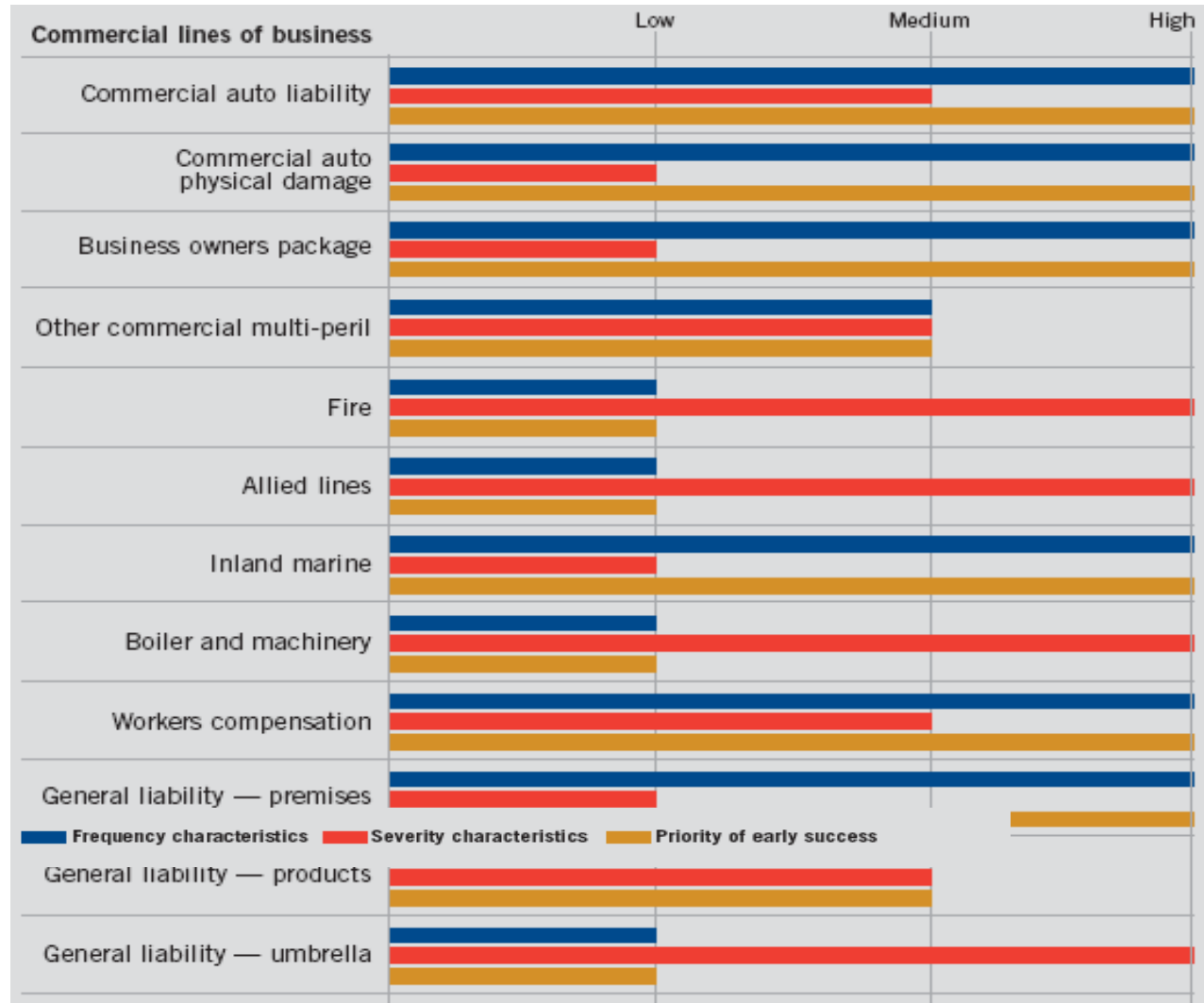
- Review of deductibles
- Collection of Financials
- Calculation of Quick ratios
- Providing the Financial Ranking
- Lowering costs and Increasing Premiums Audited

# Commercial insurance - Avoiding Adverse Selection

Potential for Adverse Development



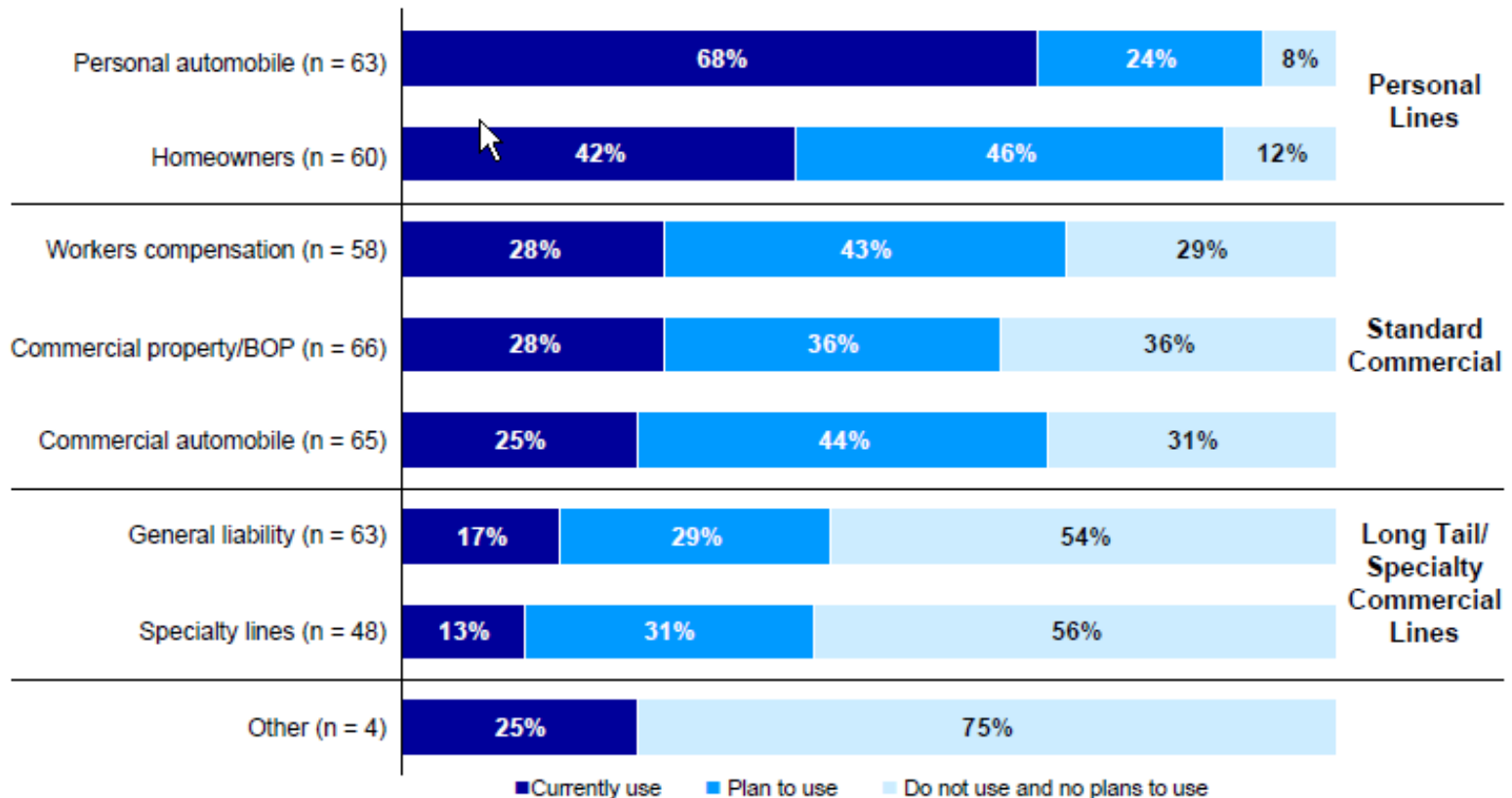
# Commercial insurance – Frequency vs. Severity



# Predictive Modeling—Why Now?

- Predictive Modeling is becoming widespread in commercial lines. Failure to act will result in adverse selection!

Do you currently use or plan to use predictive modeling in rating or underwriting for the following lines of business? (Q.4)



# Top 10 Lessons Learned

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## Analytical Transformation

1. Use Innovation and entrepreneurial principles
2. Be thought leaders
3. Reuse insight where you can

## Business Fundamentals

4. Apply project management competencies
5. Control scope – successful bite size chunks
6. Sprint the last mile – implementation is the only thing that counts
7. Measure outcomes against key performance indicators

## Communicate

8. Establish a communication plan upfront
9. Apply change management competencies to overcome adoption challenges
10. Share success

# Data

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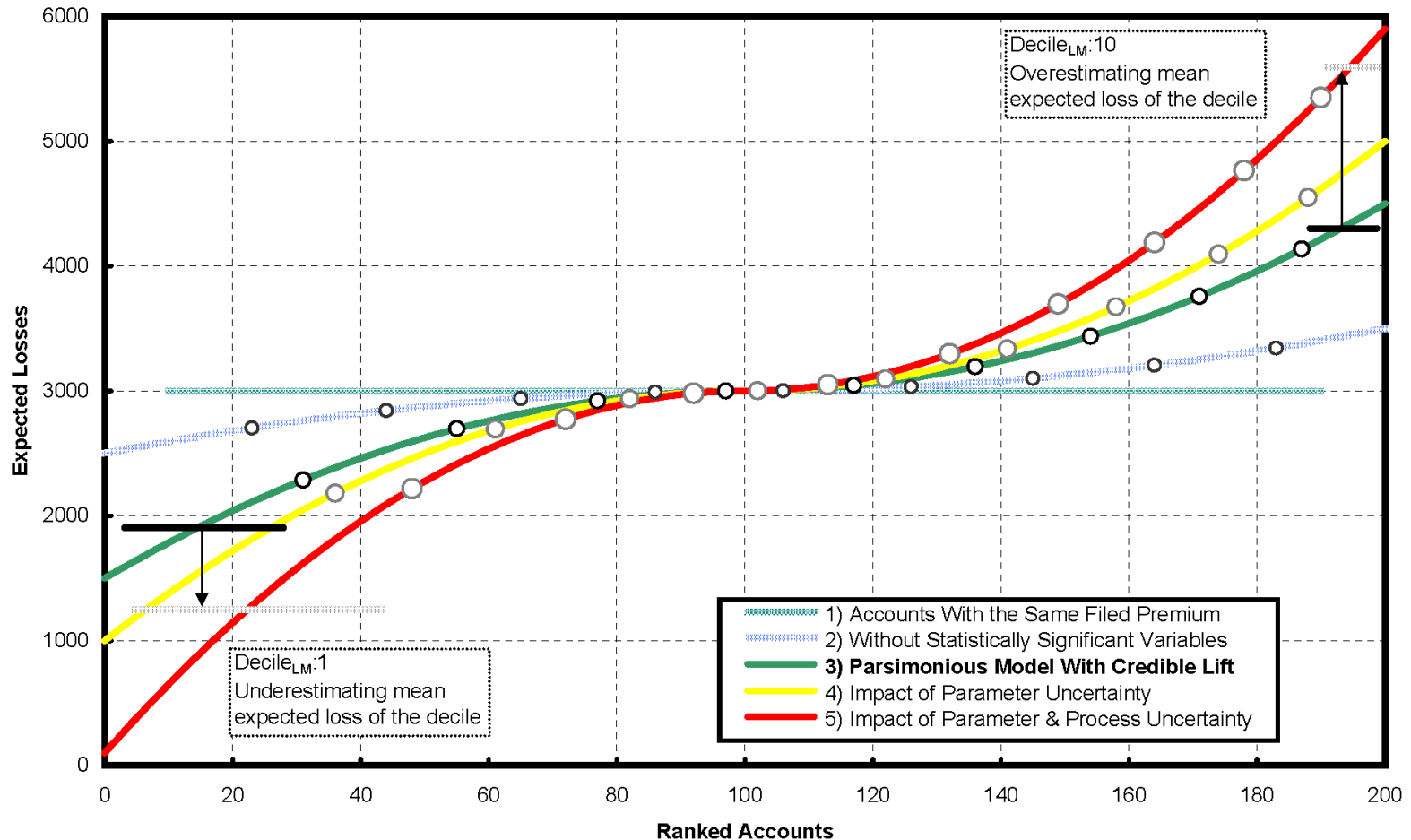
# Data

- Cleansing / reconciling bad data elements is time consuming
- Multiple data sources required
- Commercial lines
  - Regulation
  - Legacy systems
- Data Stewardship – savvy leadership on what the data *means*



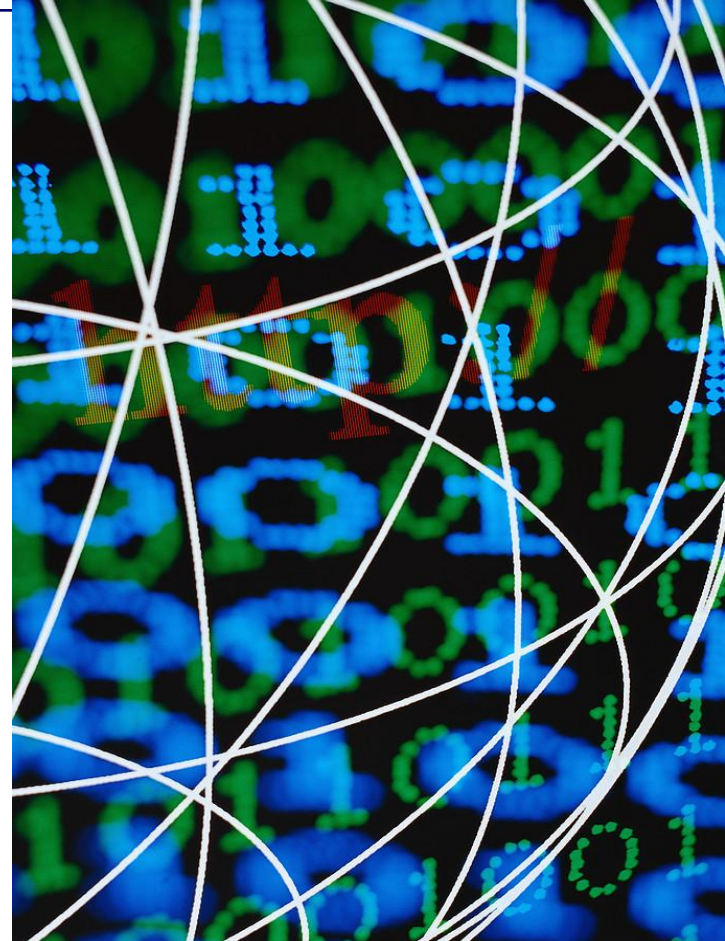
# Keep it Simple! Reducing the “Noise”

Loss Model (LM)  
Influence of Noise on Quality of the Fitted Model



# IT Impact

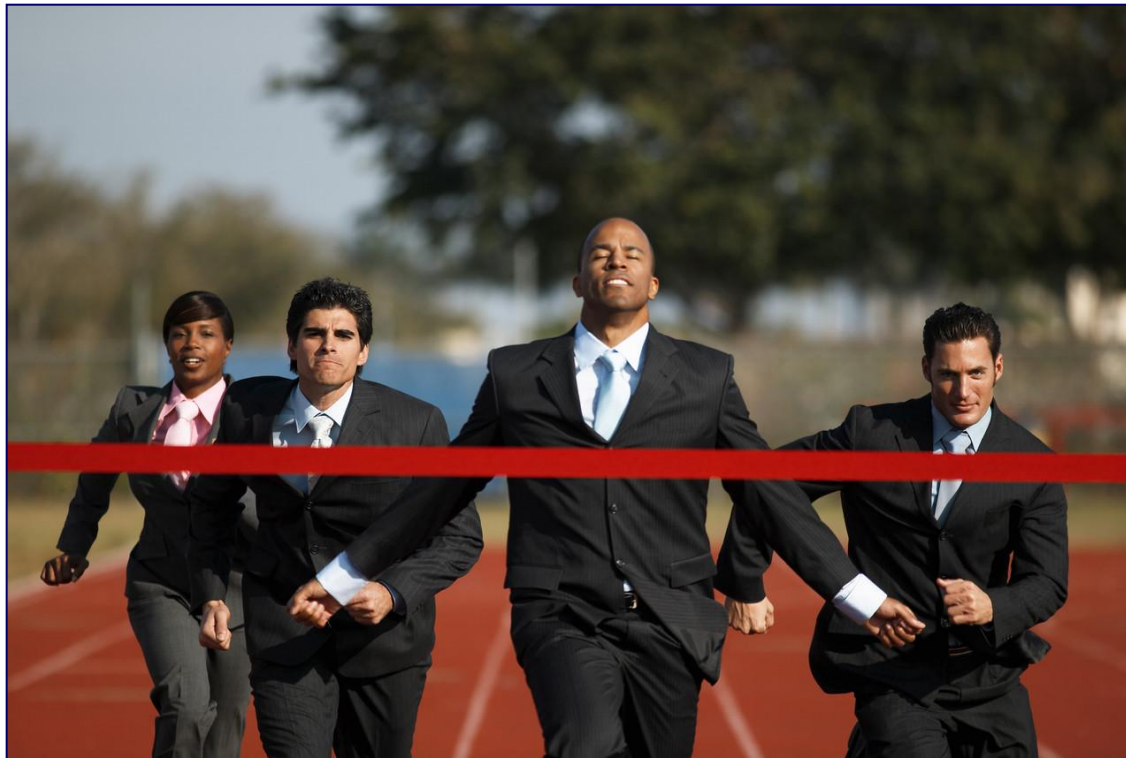
Predictive tools often bump into legacy systems which can be costly



# The Last Mile

“...the most important activity for the leadership team is to keep analytical initiatives on track and to monitor outcomes to ensure that anticipated benefits are achieved.”

*Competing on Analytics, Thomas Davenport, Harvard School of Business, 2007.*



# Opportunities and Value of Predictive Modeling

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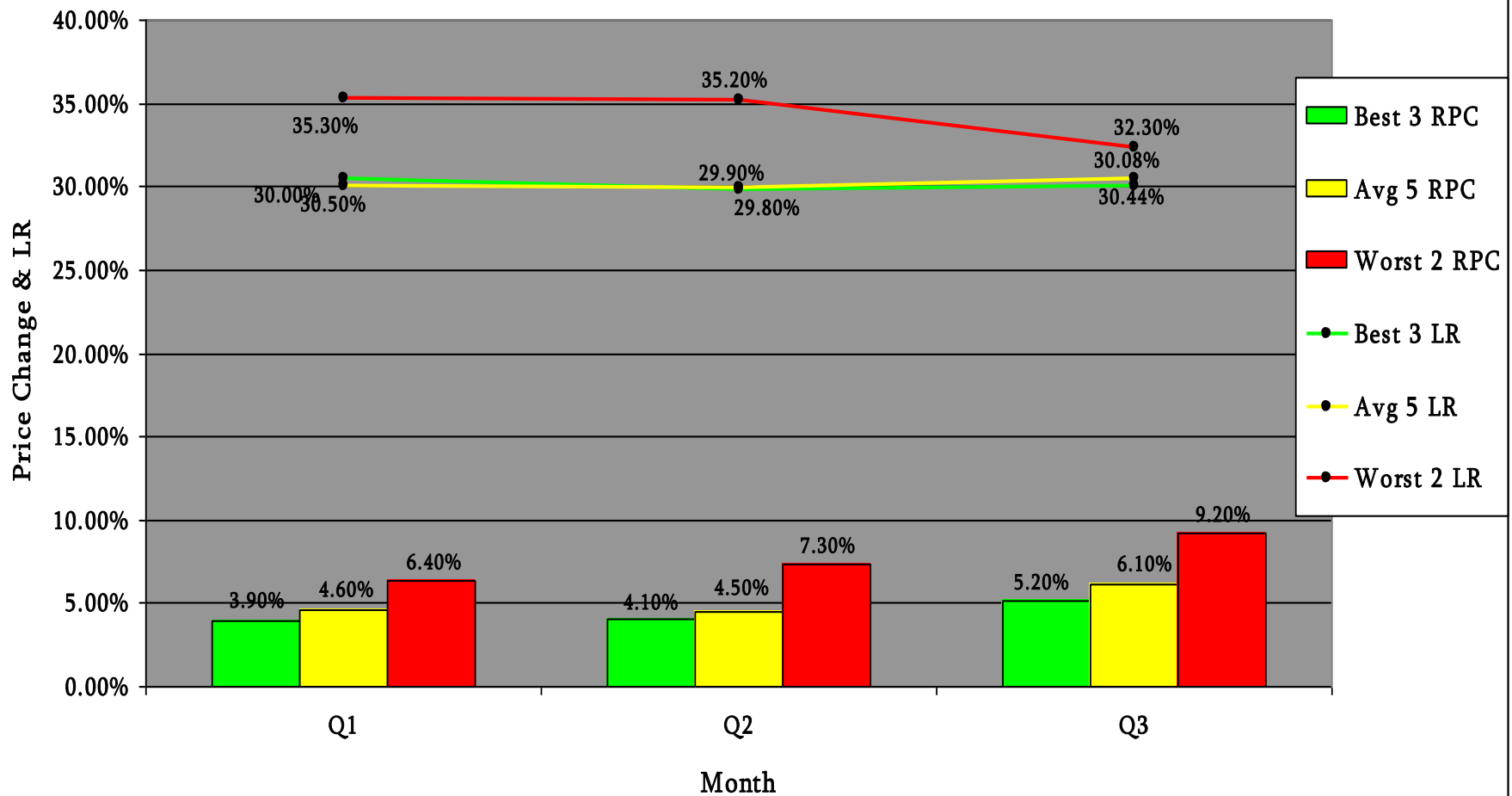
- Supports a risk-based pricing structure
- Focuses retention efforts on profitable risks
- Identify potential premium leakage
- Increases profitability and decreases loss ratio by avoiding adverse selection
- Does not eliminate the need for underwriter judgment and accountability but creates a more analytically based framework in which judgments can be applied or evaluated
- The model results will be used in conjunction with your own underwriting insights and consistent with filed rating plans

# How can you benefit from the Work Comp Model?

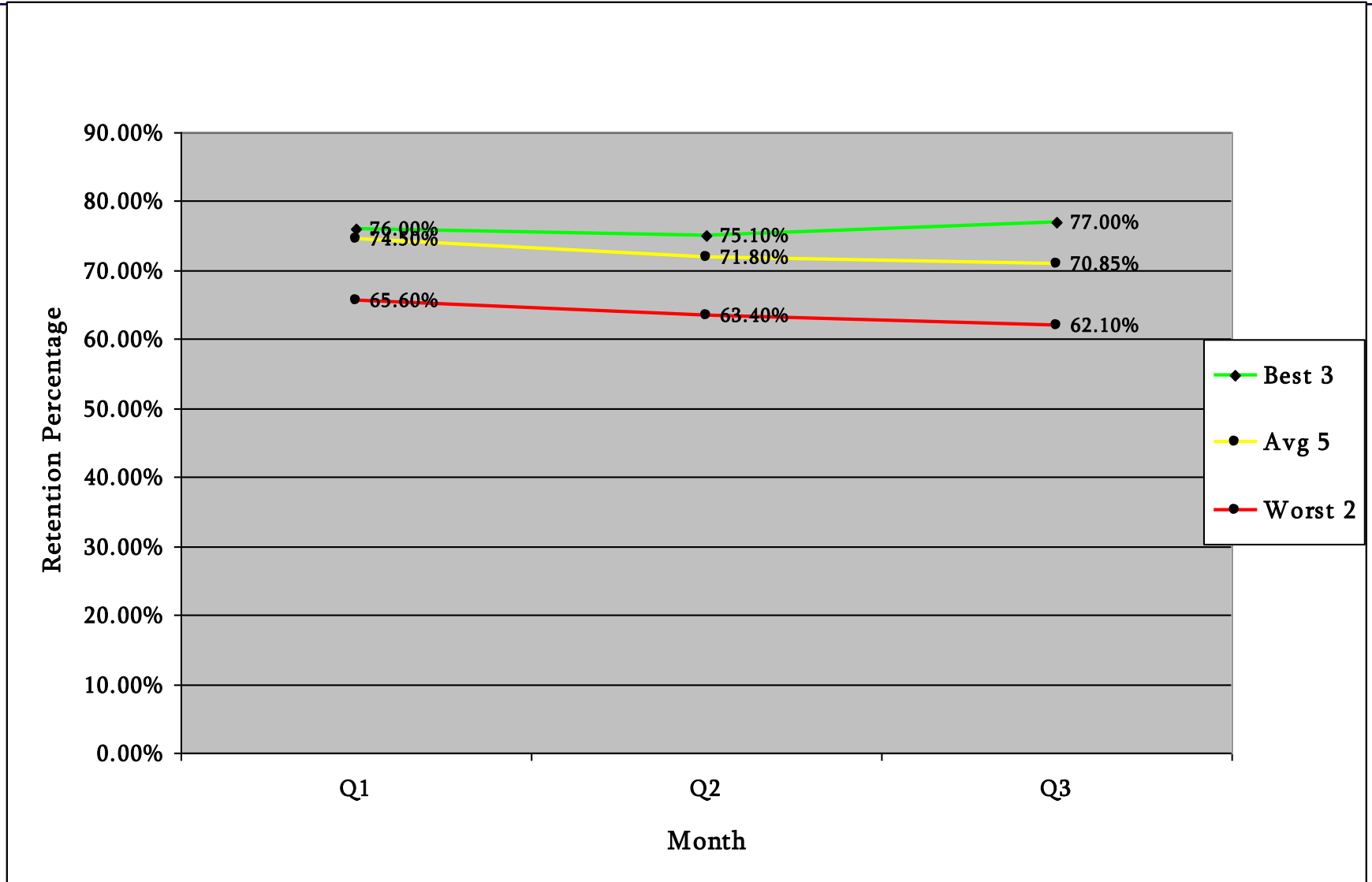
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- The additional segmentation provided by the model scores:
  - Shows you the range of scores for all renewals in the month
  - Helps you target rate changes for your renewal policies
  - Provides additional facts and insight for more accurate risk selection
- The policy Reason Codes provide additional insight and may direct you to risk factors you may want to investigate

# Line of Business Countrywide—Pricing, Loss ratio by Decile Bands



# Line of Business Countrywide— Retention Results by Decile Bands



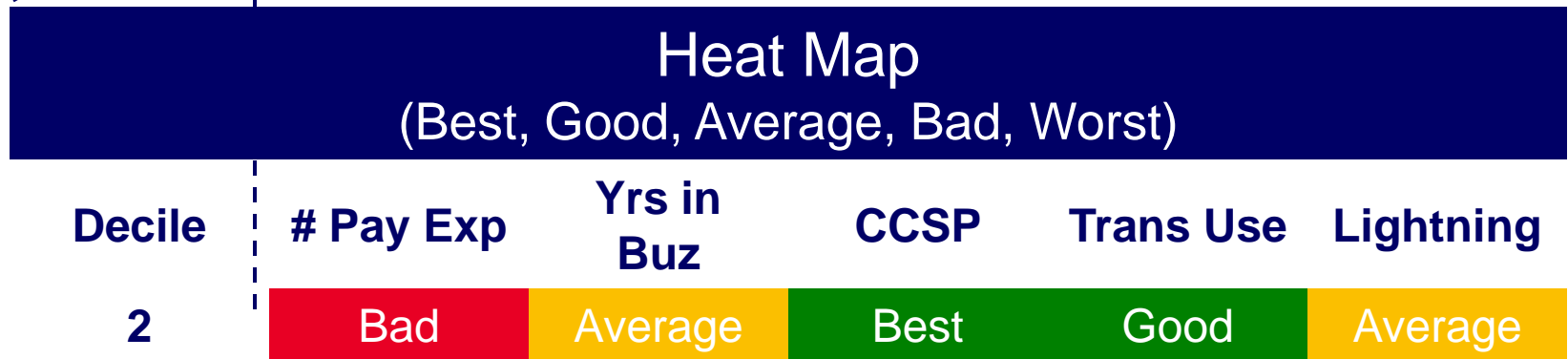
# Predictive modeling as UW assistance on the account level

Heat map concept:

- Information is presented on an account-level basis
- The decile indicates to the UW the accounts predicted loss ratio relativity
- Five variables will be presented using **red**, **yellow**, and **green** to provide a quick view of the contributors to the overall model score

*Account Executives & Program Administrators*

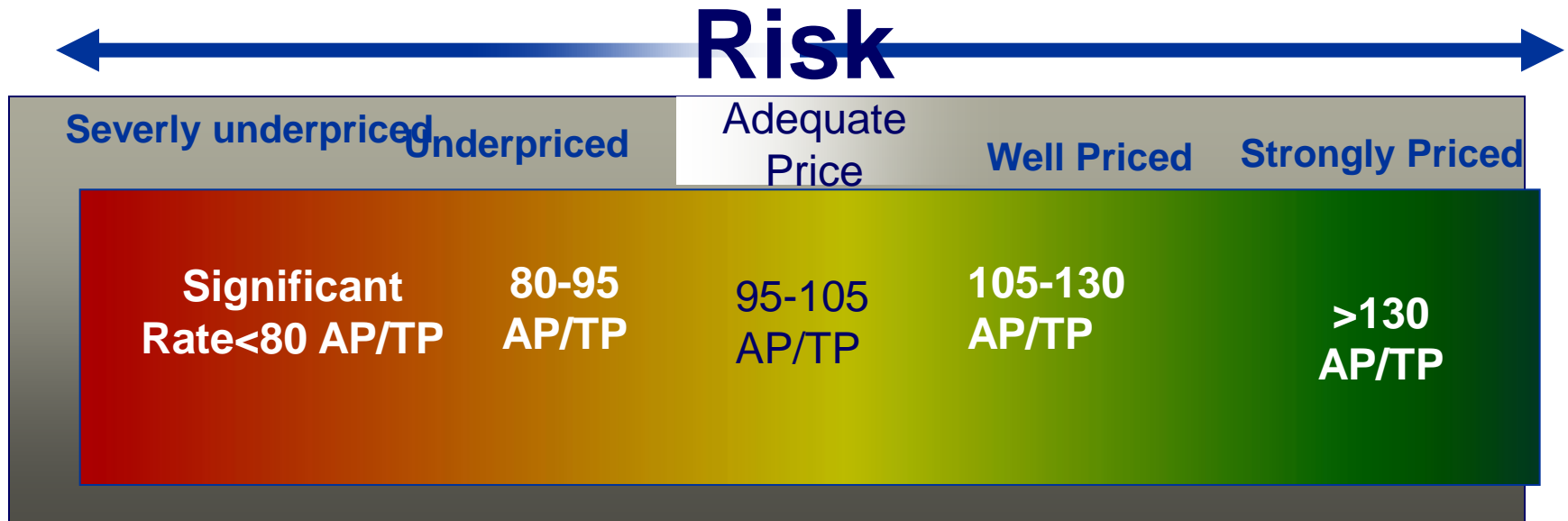
*Underwriters*



# Underwriting Actions viewed just as colors and not using words



# Underwriting Actions viewed just as colors and not using words



# Start off Simple...

Displays policy and modeling results for selected renewal policy

- Primary tool for Underwriters
- Displays detailed data
- Drop downs for policy search
- Basic policy data
- Premium and loss data
- D&B data
- Company, Exp and Schedule mod
- PM Indication
- Reason Code Indications
- Notes field for UW comments

DO NOT PRINT - PROPRIETARY AND CONFIDENTIAL	
<b>Predictive Model A</b> Joe's Sandwich Shop	<b>Program Administrator:</b> Arrowhead
<small>Complete the yellow background areas.</small>	
<b>Account Info:</b>	<b>Company Selection:</b>
Policy ID: 3107580	Renewal Company Placement: Assurance
Account Legal Name: CAMPION WALKER GARDEN DESIGN, INC.	Expiring Company Placement: Assurance
Effective Date: 1/29/2009	Renewal Company Tier: Standard
Expiration Date: 1/29/2010	Renewal Co. Deviation Factor: 1.00
Written Premium: \$29,862	Renewal Experience Mod: 1.11
State: CA	Expiring Experience Mod: 1.11
State Category: Fair	Expiring Schedule Rating Fac: 0.84
Governing Class Code: 0042	<b>PM Indication: 0.79</b>
SIC: 78200	
Yrs with Zurich: 1	
<b>PA Authority:</b>	<b>Loss Info:</b>
Schedule Rating: +/-20%	Expiring Term Losses: \$17,193.35
Experience Mod: .65 to 1.30	1 Year Loss Ratio: 60.50%
Premium Size: <\$125,000	3 Year Loss Ratio: 60.50%
3 Year L/R: <= 60%	Prior Year Incurred Losses: \$0
	Prior 2 yr Incurred Losses: \$0
<b>Model Output:</b>	<b>D&amp;B Data:</b>
Overall Indication: Good	Yr Started: 1998
Financial Health: Bad	Financial Stress Score: 1
Demographic Data: Best	Commercial Credit Score: 2
Historical Data: Good	\$ of Lawsuits: 0
Claim Frequency: Bad	FSSP: 79
Risk Complexity: Good	CCSP: 88
3 Year L/R: Average	Slow Pay: 2
Policy Tenure: Best	
	Save Notes
	Submit Issue

# Company Selection Worksheet



**ZURICH**

## Zurich North America - Tier Assignment Worksheet

Program Administrator: **All American**  
 Agent: **John Doe**  
 Policyholder: **Big Gas**  
 State: **OK**  
 Policy Number: **9990123**  
 Policy Effective Date: **01/01/2010**

Press to Clear Inputs    Press to Save data

**Driver History**

Number of Drivers that do not meet our Driver Record Criteria*:	<input type="text" value="0"/>	* Drivers that do not meet our Driver Record Criteria are defined as: Any drug or alcohol violation in connection with the operation of a motor vehicle Any violation for hit and run, manslaughter, or use of a motor vehicle for felonious purposes Any reckless driving violation More than 3 moving violations during the previous 36 months or more than 2 moving violations in the previous 24 months More than 1 at fault accident during the previous 36 months Any violation for operating a motor vehicle while under suspension
Number of Drivers with no moving violations or accidents:	<input type="text" value="1"/>	
Number of Drivers not already listed above:	<input type="text" value="1"/>	
Total number of Drivers:	2	
Number of Drivers between Ages 25 - 64:	<input type="text" value="2"/>	

Type of Account: **Trucking-Petroleum & Environmental-Long H**

Frequency Information (provide info only for completed policy years	Expiring Pol Yr	Prior Pol Yr	2nd Prior Pol Yr
Number of Power Units with Liability Coverage:	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
Number of Liability Claims (exclude Claims Closed without Payment)	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Financial Condition / D&B Credit Score (leave blank if unavailable):

**Other Information**

Number of Years in Business:

Any Bankruptcy in the past 7 Years?

Any unreported drivers in the past 3 years?

**Final Company Selection:**

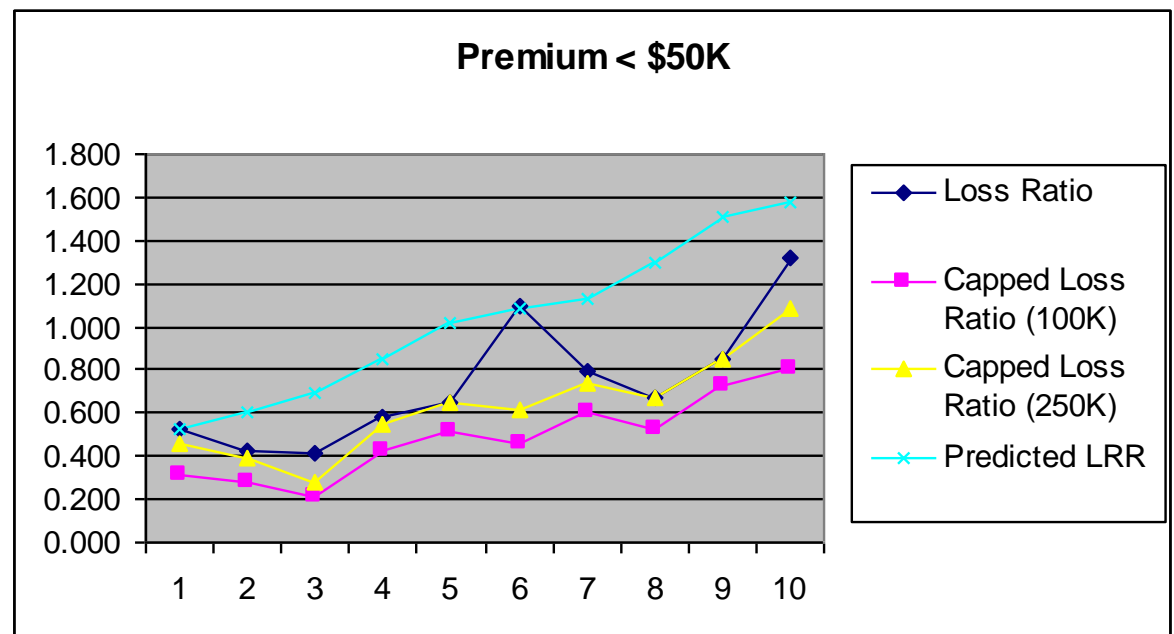
<b>Standard</b>	<b>ZAIC</b>
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**State Filing Information**

Surcharge Company Availability: YES

# Other Avenues of Value in Implementing a WC Predictive Model

- Automatic and Consistent Company Selection guidance
- Presentation and Reuse of D&B Data for multiple purposes throughout process steps (reduced double hits to D&B database)
- Combining External data sources (D&B info, experience mods, sic codes) and proactively enhancing data and scoring potential accounts
- Scoring of Prospective Books of Business





**ZURICH**

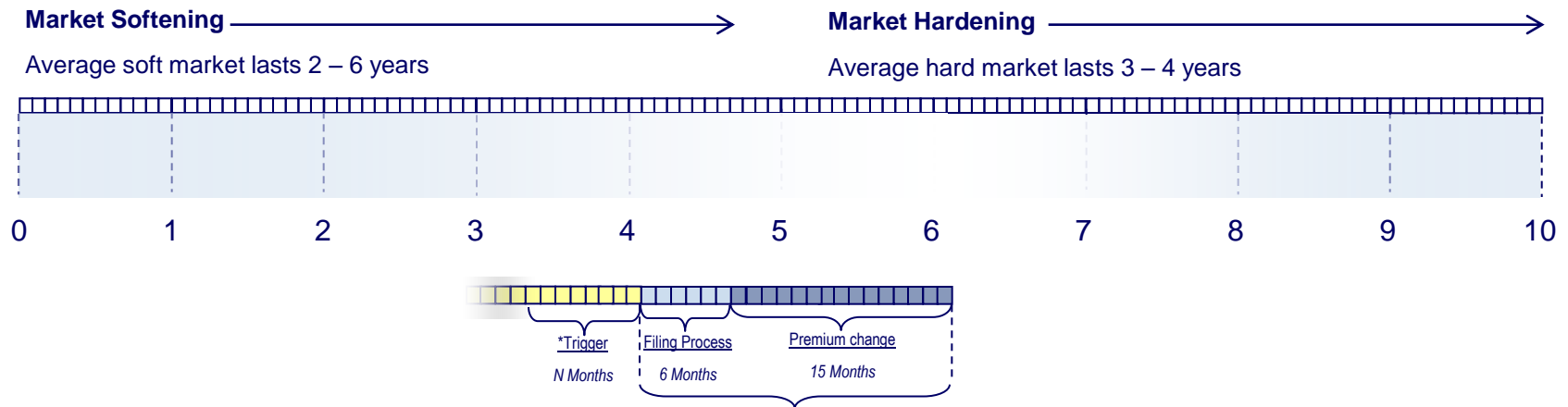
# Industry Specific Considerations - Commercial insurance

- **Market Cycles**
  - Right price for the risk vs. what the market will bear
  - Competition
  - Marketing insight
- **Underwriting Actions**
  - Directional
  - Continuum of actions
  - Renewal strategies
- **Frequency vs. Severity**
  - Frequency based = more stable; more credible
  - Severity based = less stable; less credible
- **Market Forces**
  - Expense reduction
  - Customer expectations
  - Loss inflation trend



# Commercial insurance Market Cycles

Average Complete Market Cycle lasts 5-10 Years



## \* Rate Response Triggers

1) ISO Rate changes and/or 2) Annual pricing projections