
Predictive Modeling for Smaller Companies

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Discussion Topics

- Setting the Stage
- Is the glass half empty?
 - Unique challenges for smaller companies
 - Unique opportunities for smaller companies
- Considerations
 - Data
 - Analysis
 - Application
- Extended Applications

Setting the Stage

The Changing World of Insurance

- Increase in the use of tiering
- Increase in the use of new or proprietary factors
 - Insurance score
 - Prior limits
 - Historical non-chargeable losses
- Increase in the difficulty of getting competitor information
 - Filings on copy resistant paper
 - Classifying of certain information as underwriting
- Increase in sophistication of analysis
- Increase in the complexity of rating plans

Smaller Company Options

- Do nothing
- Judgmentally add complexity
- Use credit score vendor to super-impose credit on your rating and underwriting plan
- Copy competitors to the best of your ability
- **Analyze rating and underwriting plan in more detailed manner**

Is the Glass Half-Empty? Or Half-Full?

Unique Challenges of Smaller Companies

- Data
 - Credibility
 - Availability
- Unique focus
 - Staying within themselves
- Smaller margin for error
- Expense considerations

Unique Opportunities for Smaller Companies

- Nimble
 - More opportunity to try new ideas
 - “Flatter” management structure
- Potentially less regulatory scrutiny
- Less competitive scrutiny

Considerations for Smaller Companies— Increasing Confidence in Your Results

Data

Data Topics

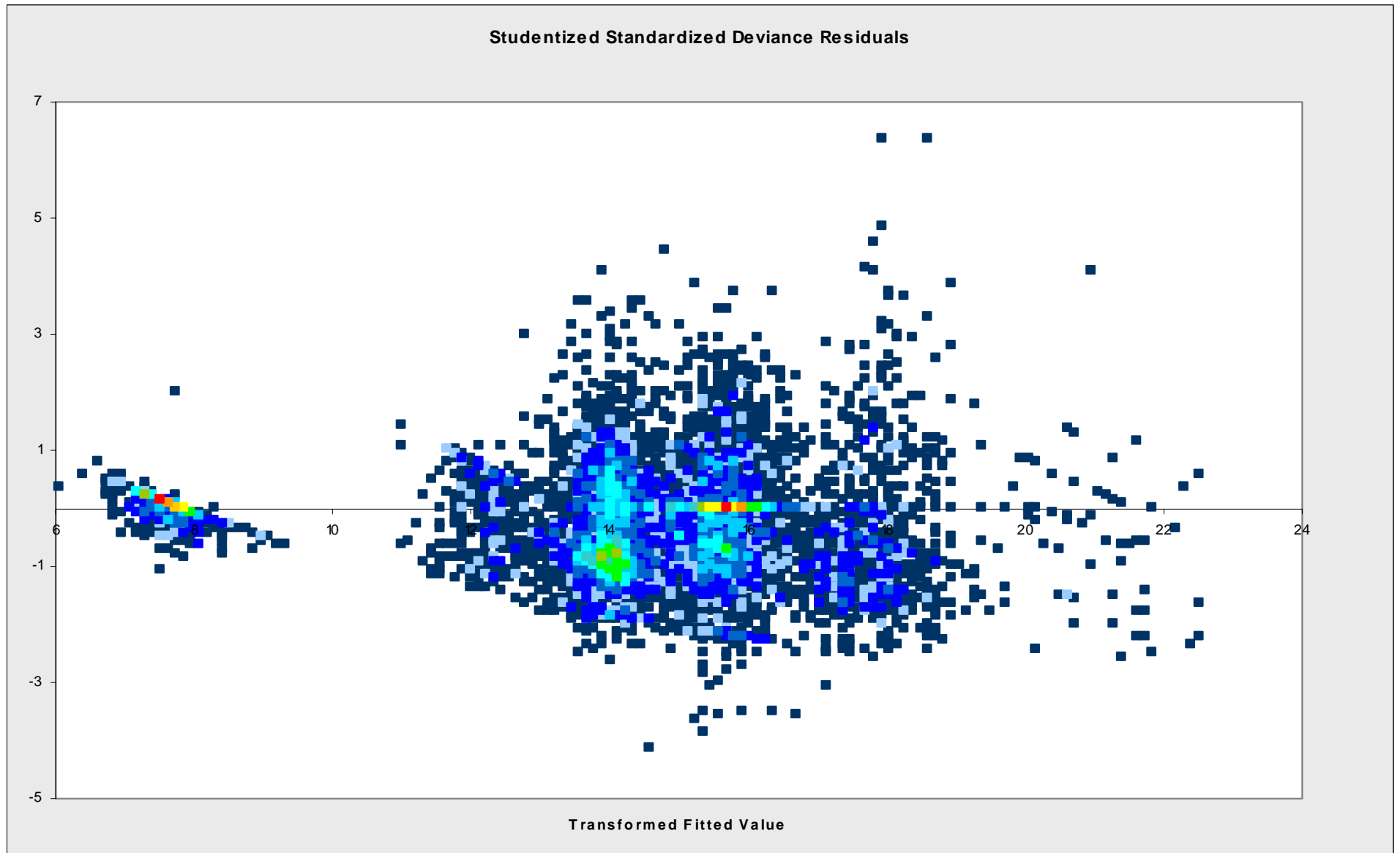
- How much?
- Homogeneity
- External Data



How Much Data Is Needed?

- Rule of thumb – 50,000 exposures
- All else being equal, the more exposures you have, the more reliable the results
- Model validation
- Options
 - Additional years of experience
 - All coverage vs. by coverage/peril analysis

Non-homogeneity



External Data

- Can assist in evaluating new factors
- Can also help validate existing factors
- Potential sources
 - Credit
 - Individual/household level demographics
 - Vehicle/home characteristics
 - Fire station data
 - Etc.

Analysis

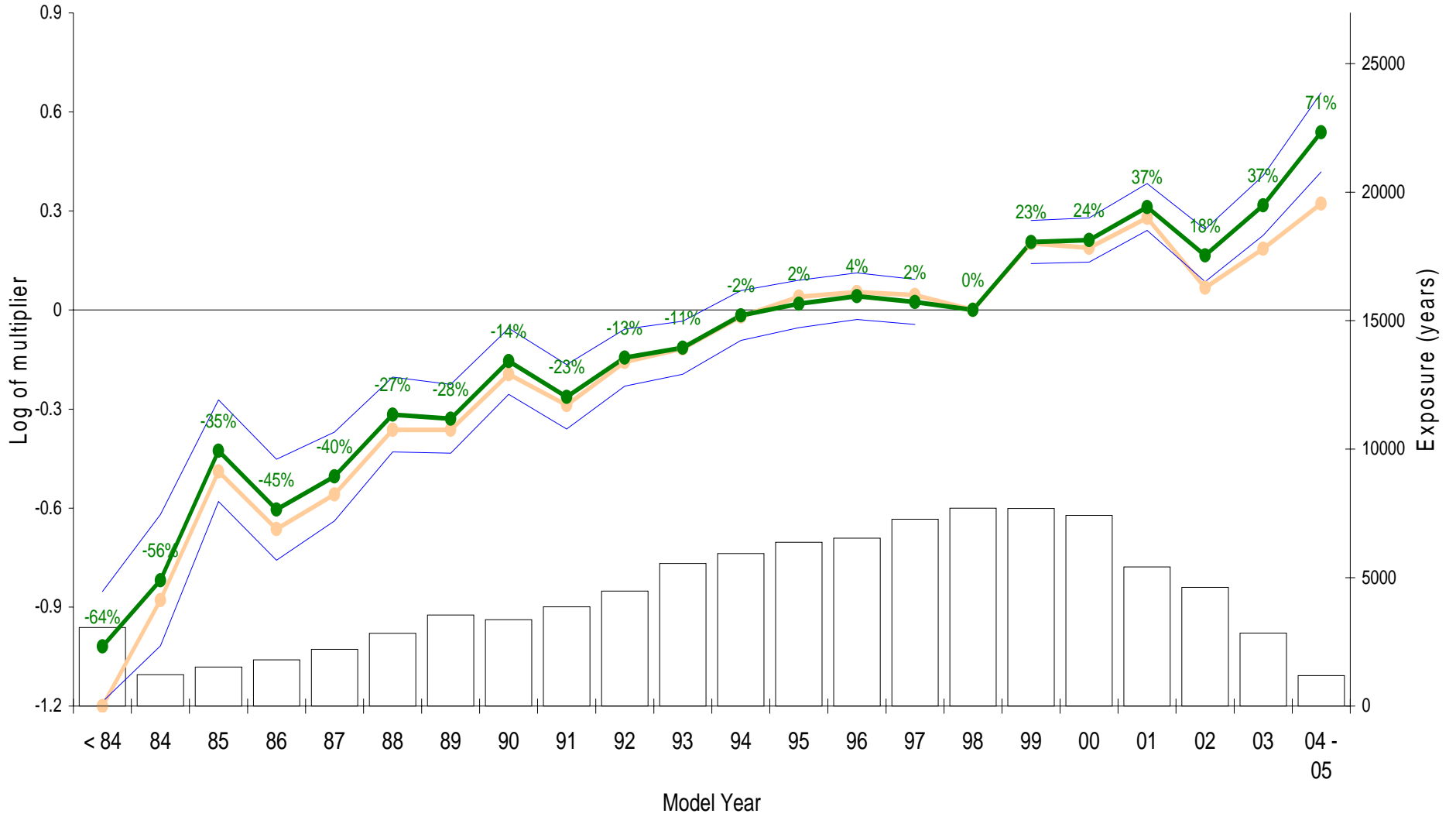
Evaluation of Individual Factors

- Variability of parameter estimates
- Tests of overall model significance
 - Single inclusion
 - Single exclusion
- Stability of parameters from year to year
- Validation holdback
- Re-sampling

Credibility

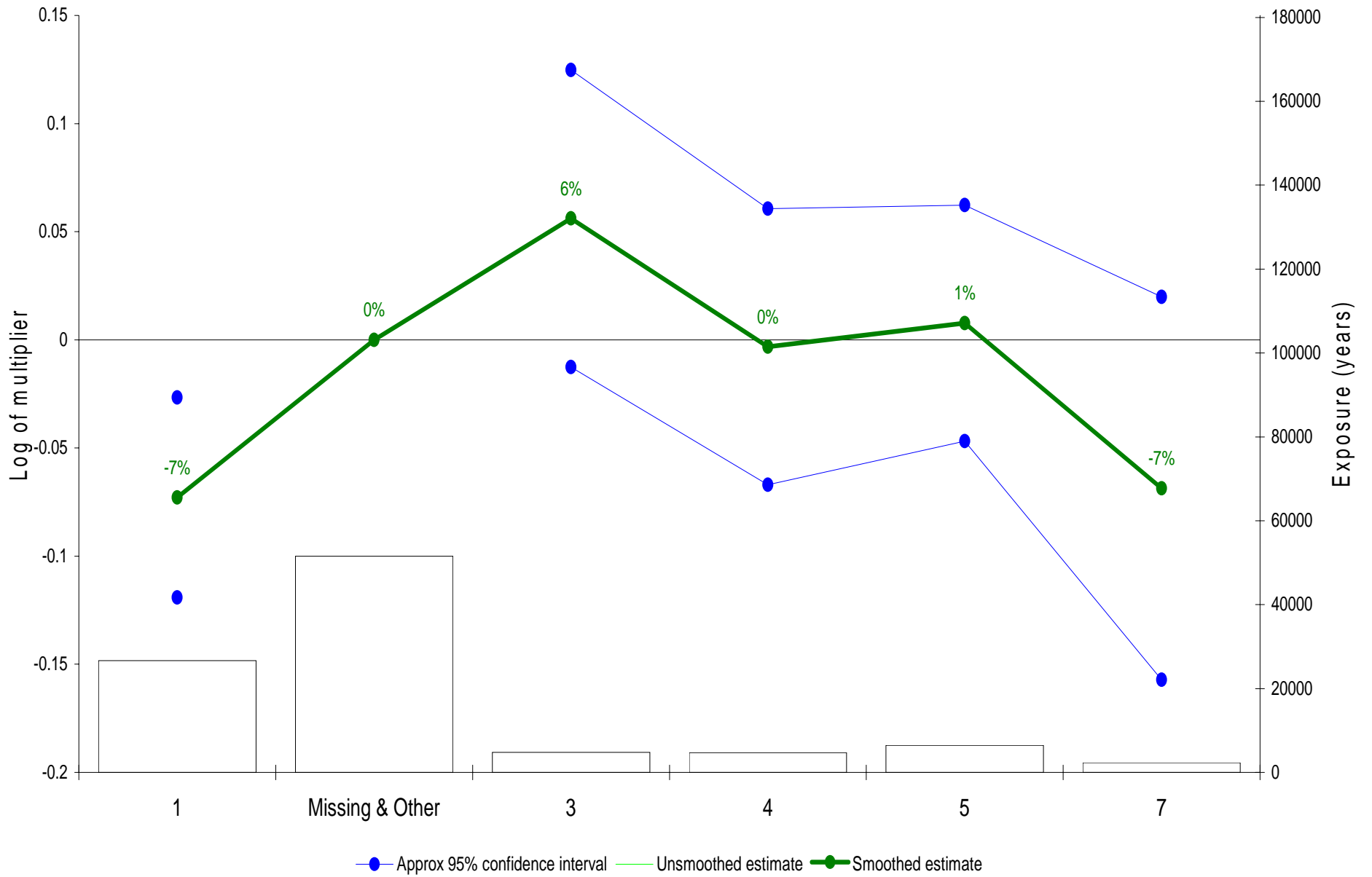
- Traditional credibility: based on number of claims
 - Credibility increases in proportion to number of data points
- True credibility: based on variability of estimate
 - Credibility increases with the **stability** of the parameter estimate
 - Tends to increase with data volume, but not always

Example Output

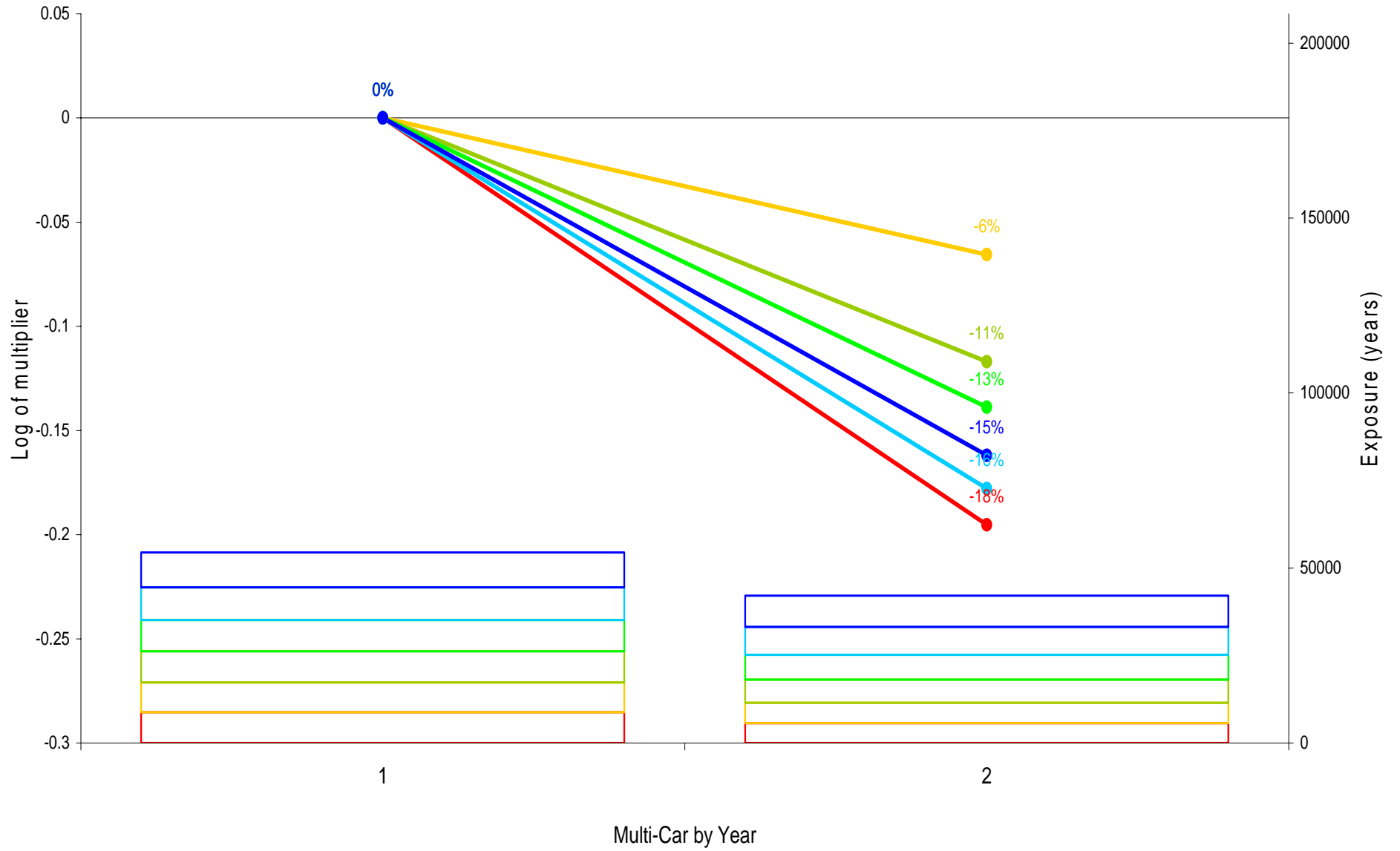


—●— Oneway relativities
 — Approx 95% confidence interval
 —●— Unsmoothed estimate
 —●— Smoothed estimate

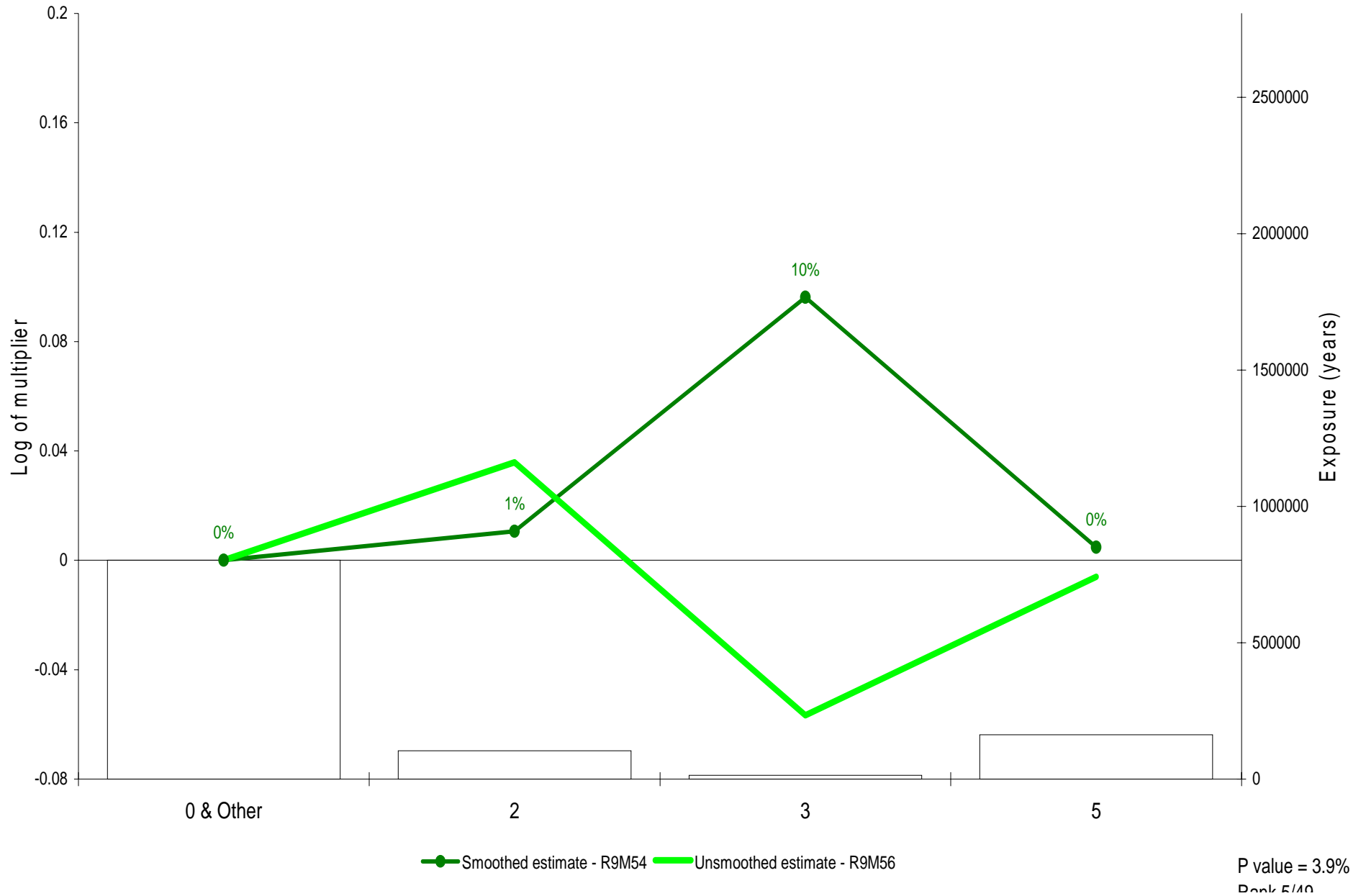
Example Output



Example Output



Example Output



Application

Application Topics

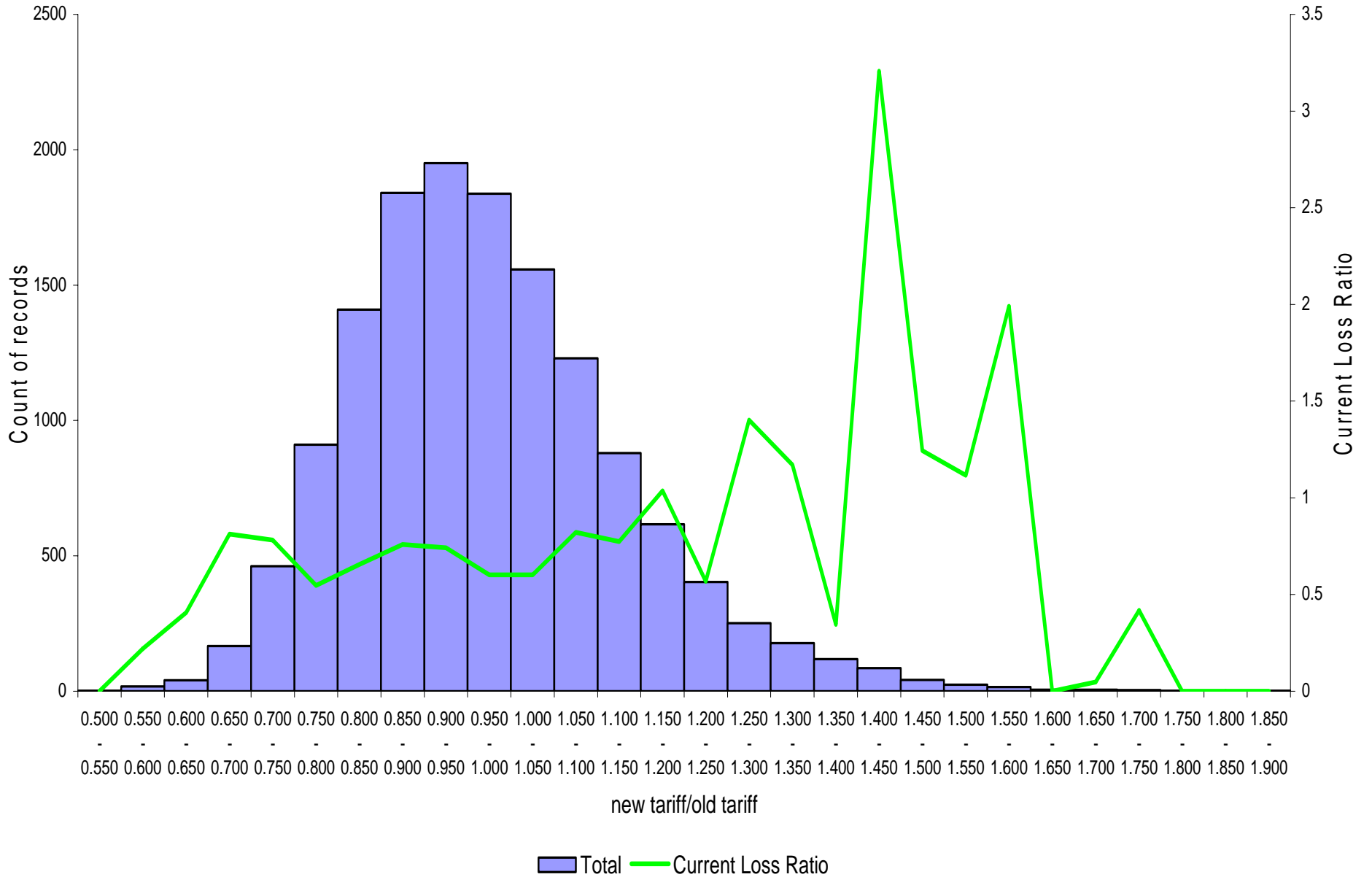
- Systems restrictions
- Impacts
- Competition
- Evaluation

System Restrictions

- Addition of new variables
- Expansion of current variables
- Examples
 - Homeowners rating by peril
 - Tier rating
- Handling of policyholder impacts

Leads to larger expenses for smaller companies

Example Impact Graph



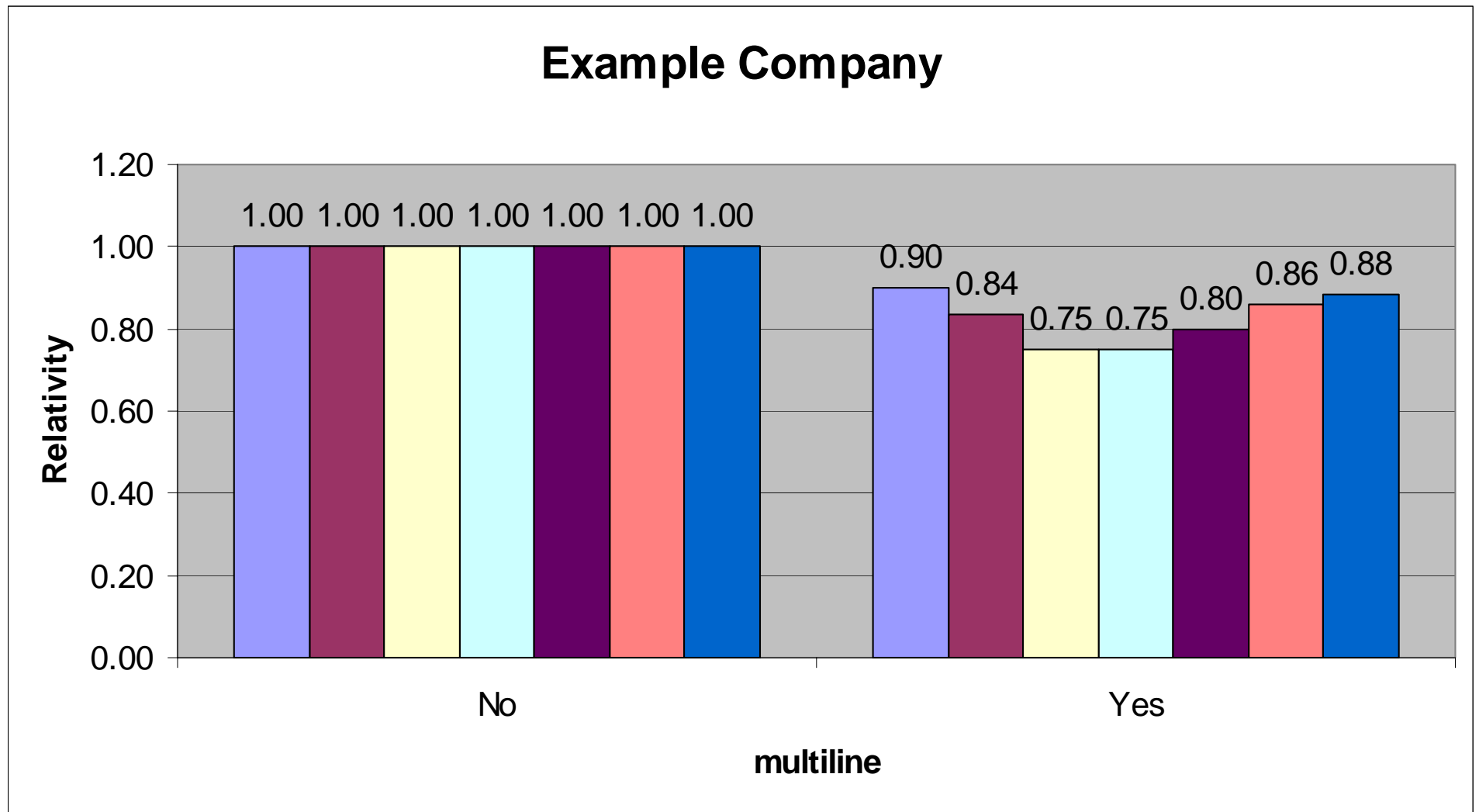
Handling of Policyholder Impacts

- New company or program
 - May not be an option for smaller companies
- Applying new program to new business and renewals
 - Impacts may be painful
- Capping of rate changes
 - Systems nightmare
- Dampening of relativities
 - May not be an option if a company is already behind the curve

Competition

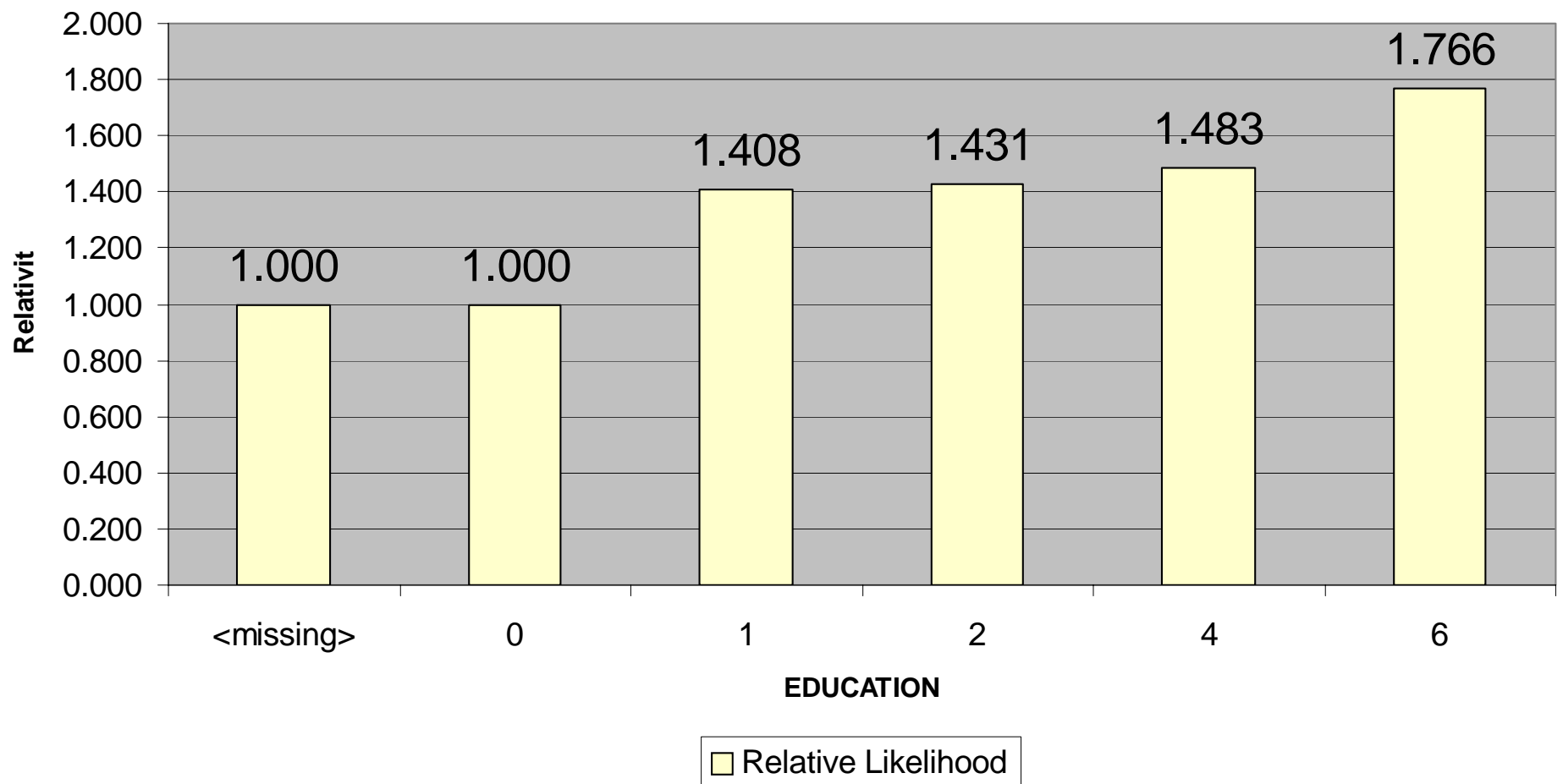
- Effective competitor relativities
- Retention and conversion analysis

Effective Competitor Relativities



Conversion Analysis Example

Example



Evaluation

- Traditional results measures take time to develop
- Need to evaluate leading indicators
 - Characteristics of risks being quoted/written
 - New business hit ratios
 - Actual vs. expected claim frequency
 - Expected risk profitability

Conclusion

- You can do it!
- Your data is more credible than you think
- Constant re-evaluation is key