International Actuarial Association
Association Actuarielle Internationale

CELEBRATING 75 YEARS OF INDIAN ACTUARIAL PROFESSION EST. 1944

Institute of Actuaries of India
Statutory body established under an Act of Parliament

Actuaries : Striving for excellence, creating sustainable future

21st Global Conference of Actuaries

17th - 19th February 2020 | Mumbai, India

Adding to Your Actuarial Toolbox – Bridging the Gap Between Actuaries and Non-Actuaries in the Insurance Space

Ron Kozlowski

CAS Ambassador

February 19, 2020

What is The CAS Institute?

- Subsidiary of the Casualty Actuarial Society
- Provides specialist credentials and resources for quantitative professionals in selected areas, such as:

Predictive Analytics / Data Science

Catastrophe Risk Management

Helping folks understand the data, modeling process and output is important.

• What credentials are being offered?

- Certified Specialist in Predictive Analytics (CSPA)
- Catastrophe Risk Management Credentials

  Two Levels:
  - Certified Specialist in Catastrophe Risk (CSCR)
  - Certified Catastrophe Risk Management Professional (CCRMP)

Why Credential through iCAS?

Insurance Related Content

Education is a combination of:

- Self-paced study
- Online courses
- Exams
- Case study projects

Open to All

Membership of Professional Society (iCAS)

- Professional responsibilities
- Continuing education opportunities
- Community

• CSPA Credential Requirements: Overview of Assessments

Exam 1
Property - Casualty Insurance Fundamentals

Exam 2
Data Concepts and Visualization

Exam 3
Predictive Modeling – Methods and Techniques

Case Study Project: P&C Predictive Modeling Application

Online Course on Ethics and Professionalism

What is the Expected Rigor and Time Commitment for CSPA?

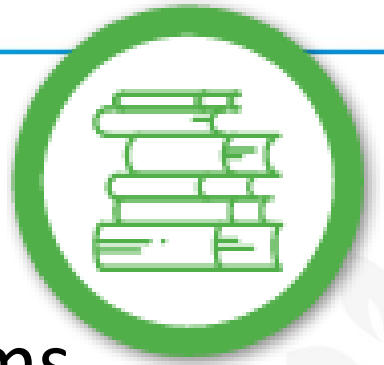
1 – 2 years

- Self-paced
- Less than a Masters or PhD
- Open to all

Study Time Per Exam

- Exam 1 – 200 hours
- Exam 2 – 200 hours
- Exam 3 – 300 hours

Exam 1: Property - Casualty Insurance Fundamentals



- Intro to Risk Management
- Insurance Company Operations:
  Marketing, Underwriting, Auditing, Actuarial and Claims
- Insurance Policy Analysis
- Common Coverages
- Factors Affecting Exposure to Loss
- Regulation of Insurance
- Basic Concepts and Functions of Ratemaking and Reserving

Exam 2: Data Concepts and Visualization

- Data Sources
- Data Access
- Data Usage
- Data Quality
- Insurance Applications
- Regulations
- Data Tools
- Exploration
- Univariate Analysis
- Multivariate Analysis
- Visualization

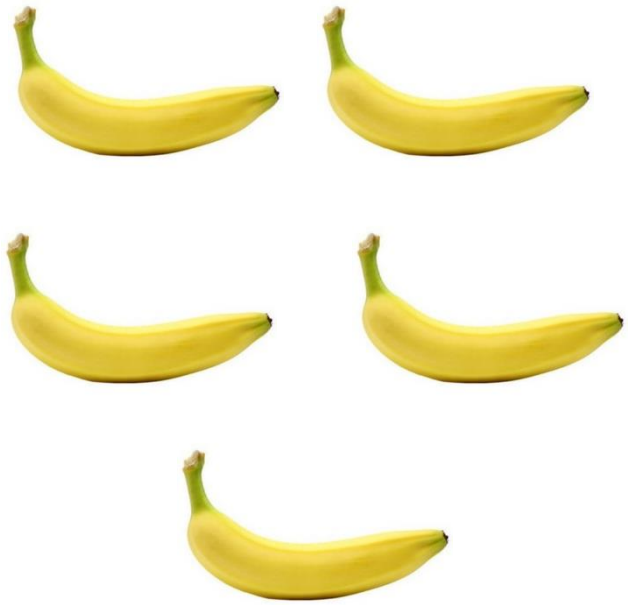
• Exam 3: Predictive Modeling – Methods and Techniques

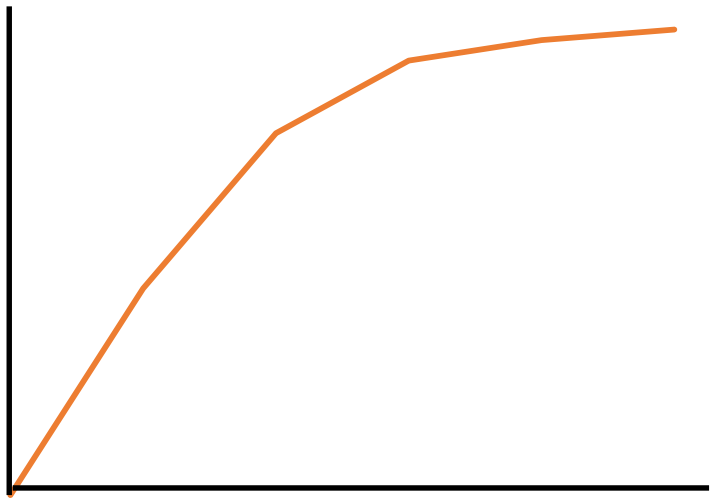
- Identifying the business problem
- Designing the model
- Preparing the data
- Selecting features
- How to choose a model
- Interpreting the output
- Sharing the output

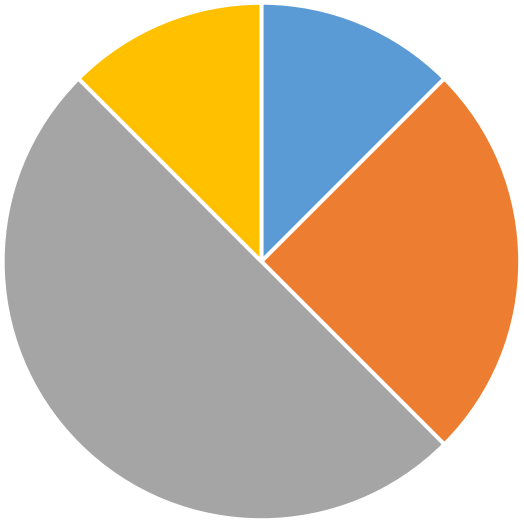
Case Study Project: P&C Predictive Modeling Application

- Claims
- Marketing
- Underwriting
- Risk Management
- Pricing / Ratemaking
- Operational Performance

• Visualization Design Principles

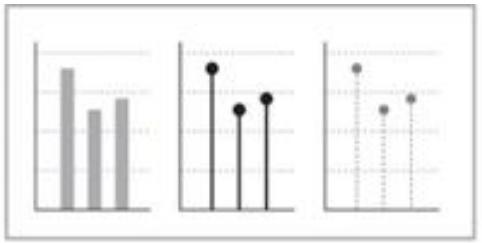






5 bananas

Easiest to Interpret



Position along a common scale

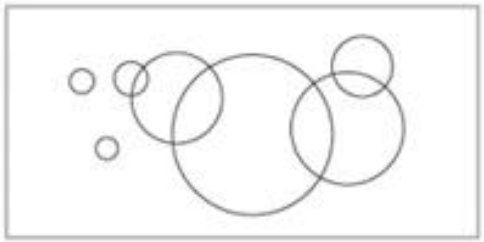
Position along nonaligned scales

Length

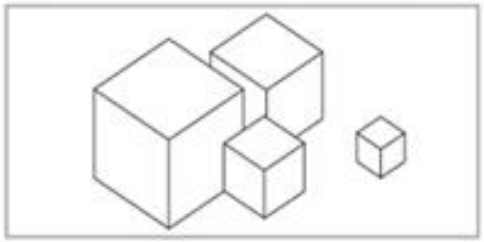
Direction

Angle

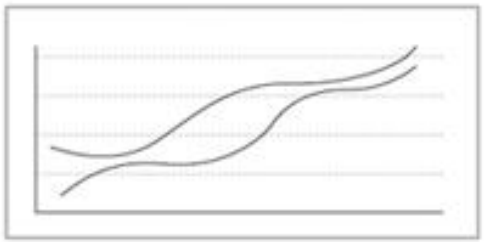
Hardest to Interpret



Area



Volume

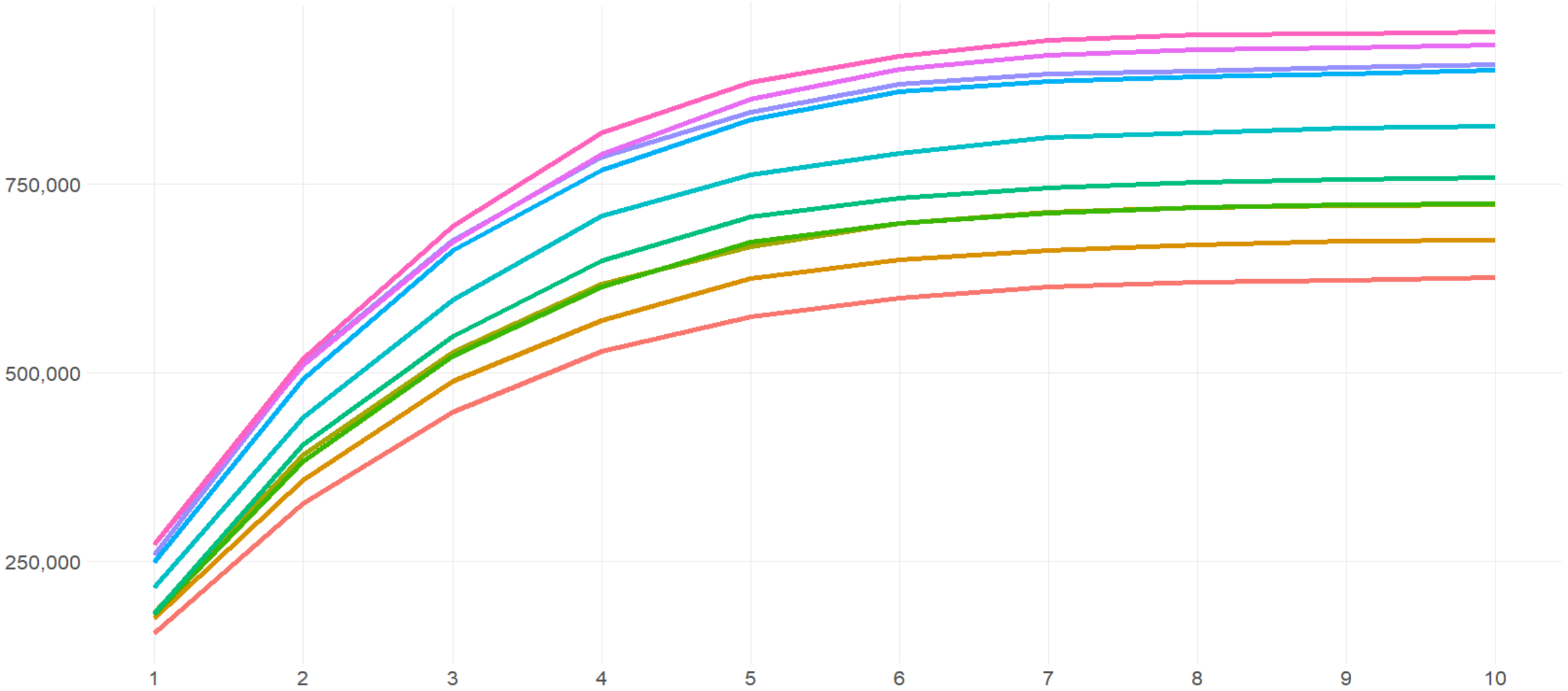


Curvature

Shading

Color saturation

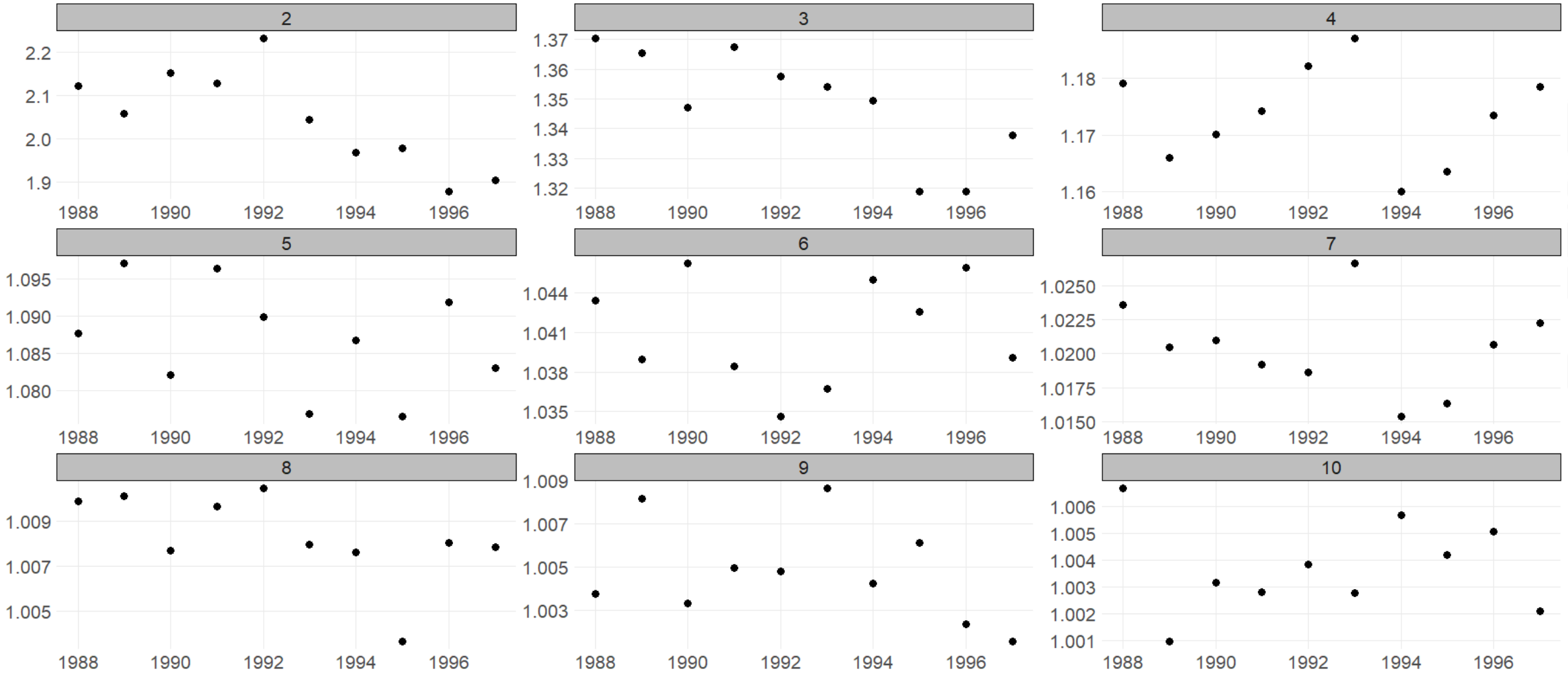
• Cumulative Paid Loss by Development Lag



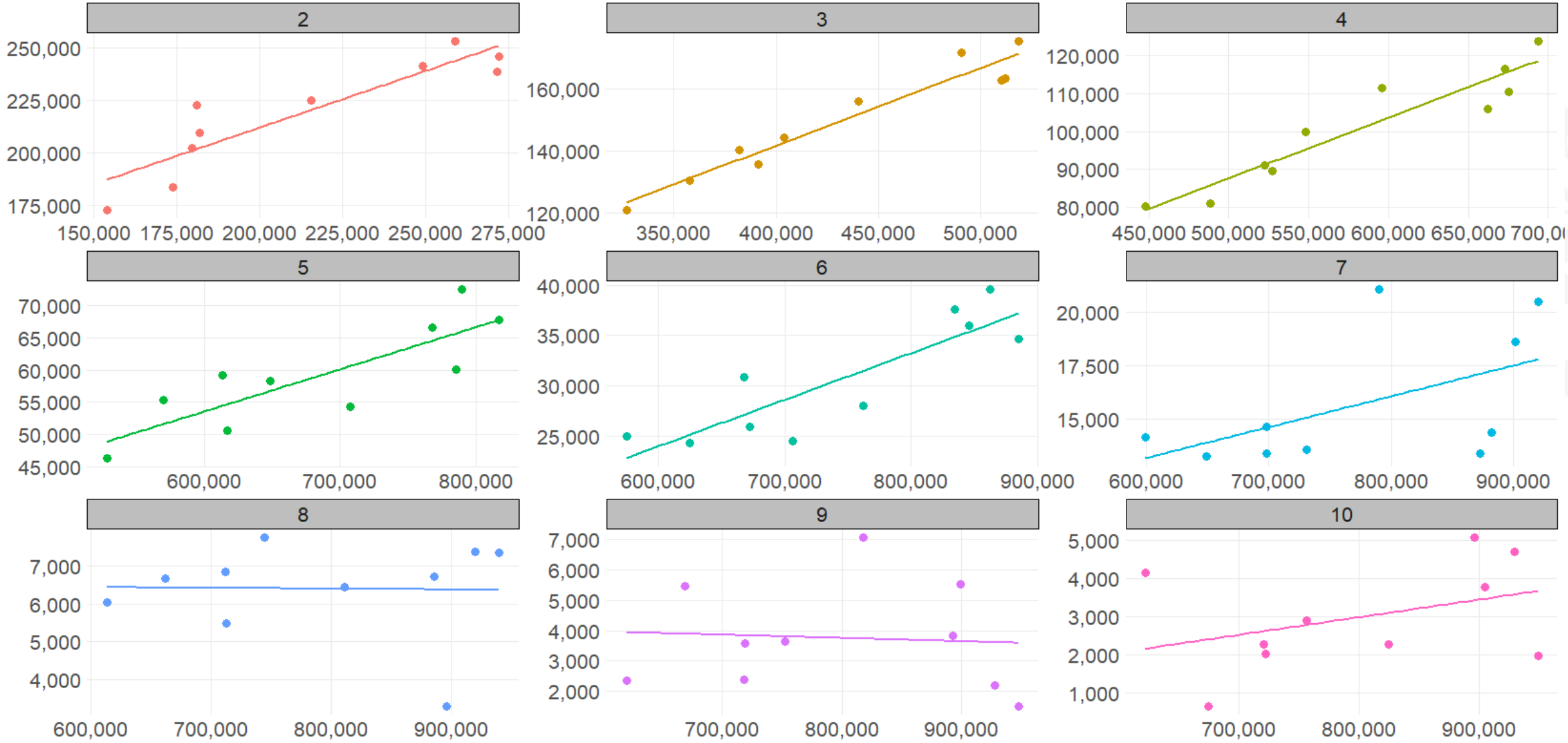
"A sure sign of a puzzle is that the graphic must be interpreted through a verbal, rather than a visual process"

- Edward Tufte

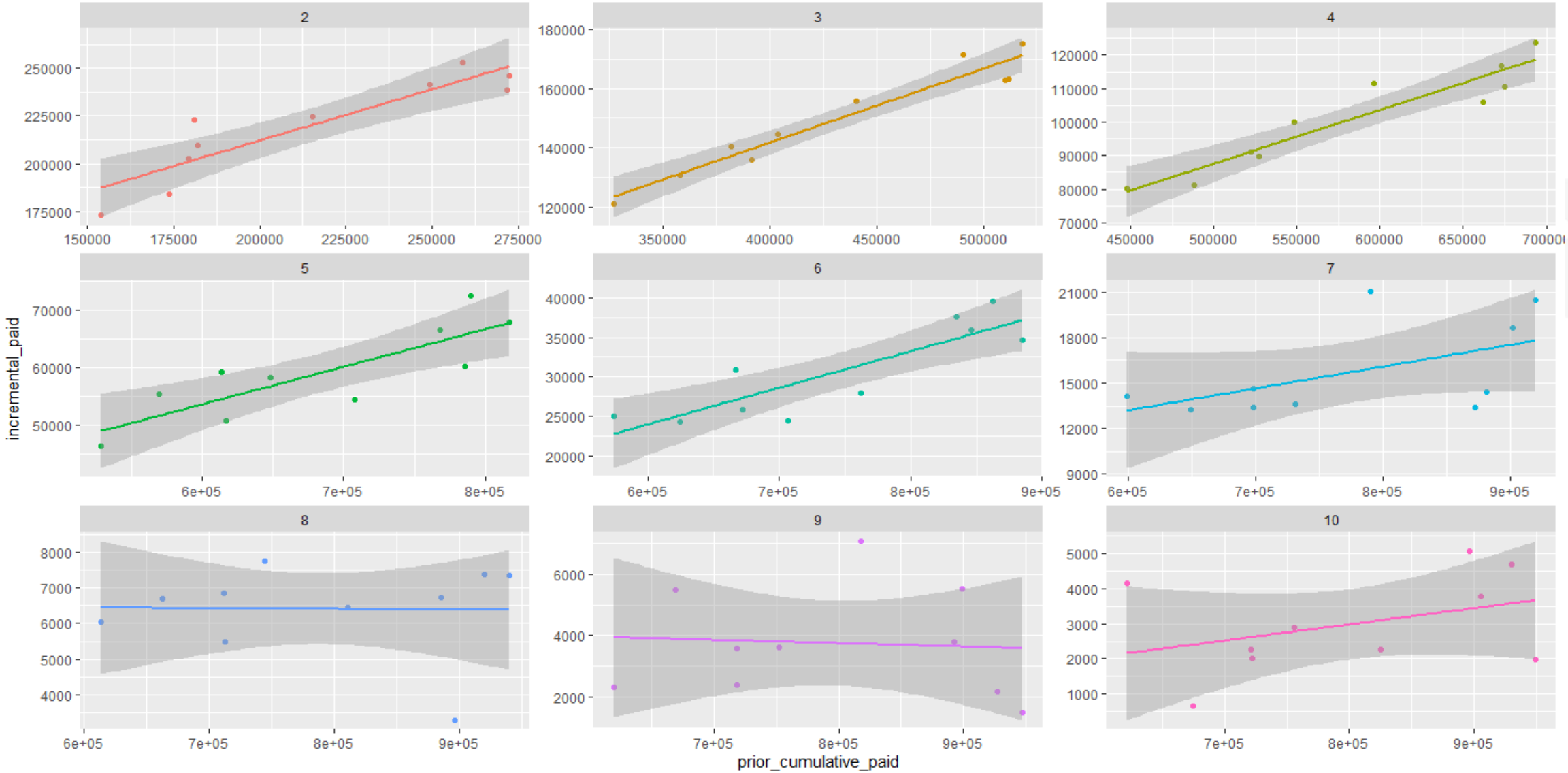
• Incremental Paid Loss Development by Lag



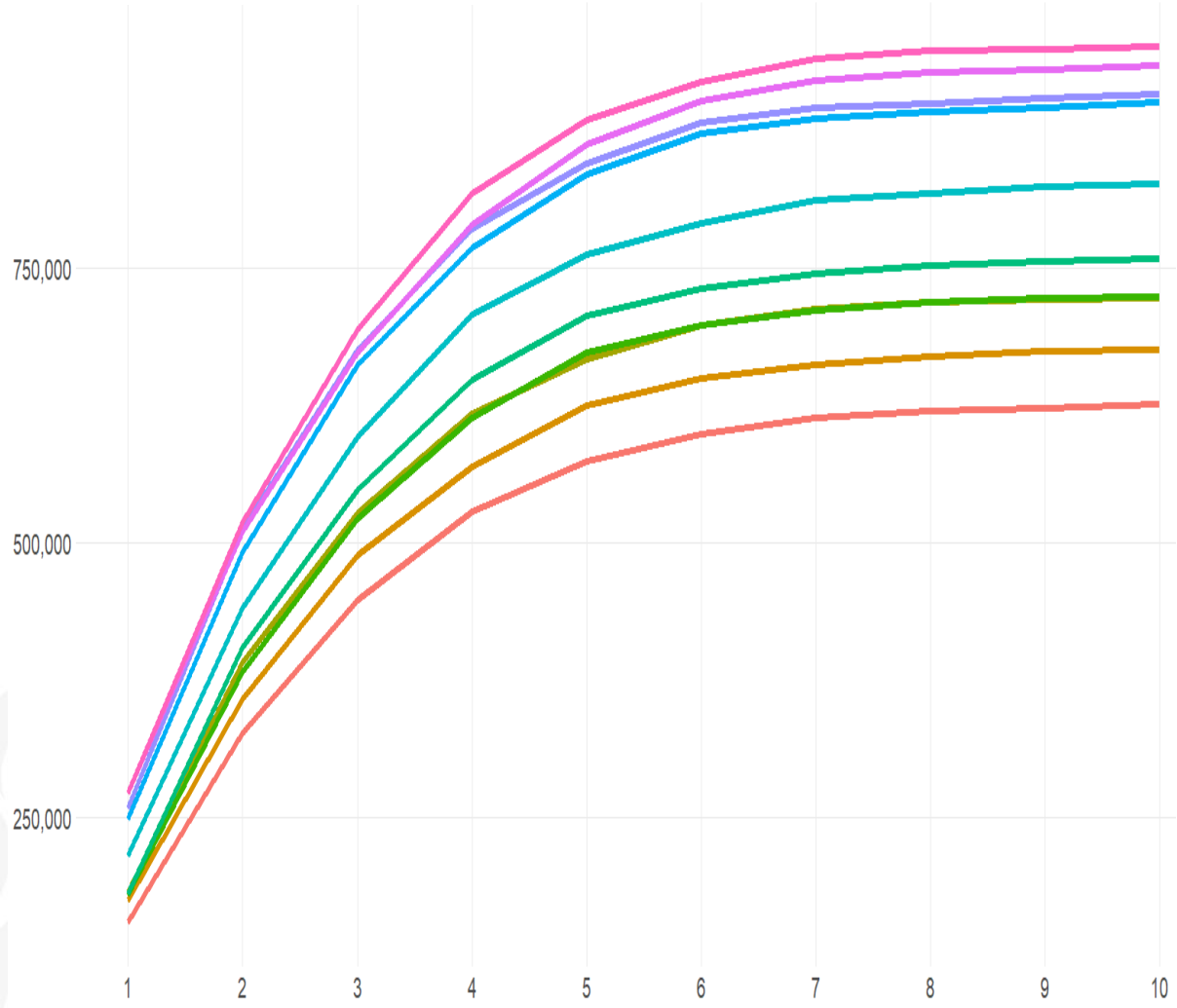
• Incremental Development Against Prior Cumulative Development

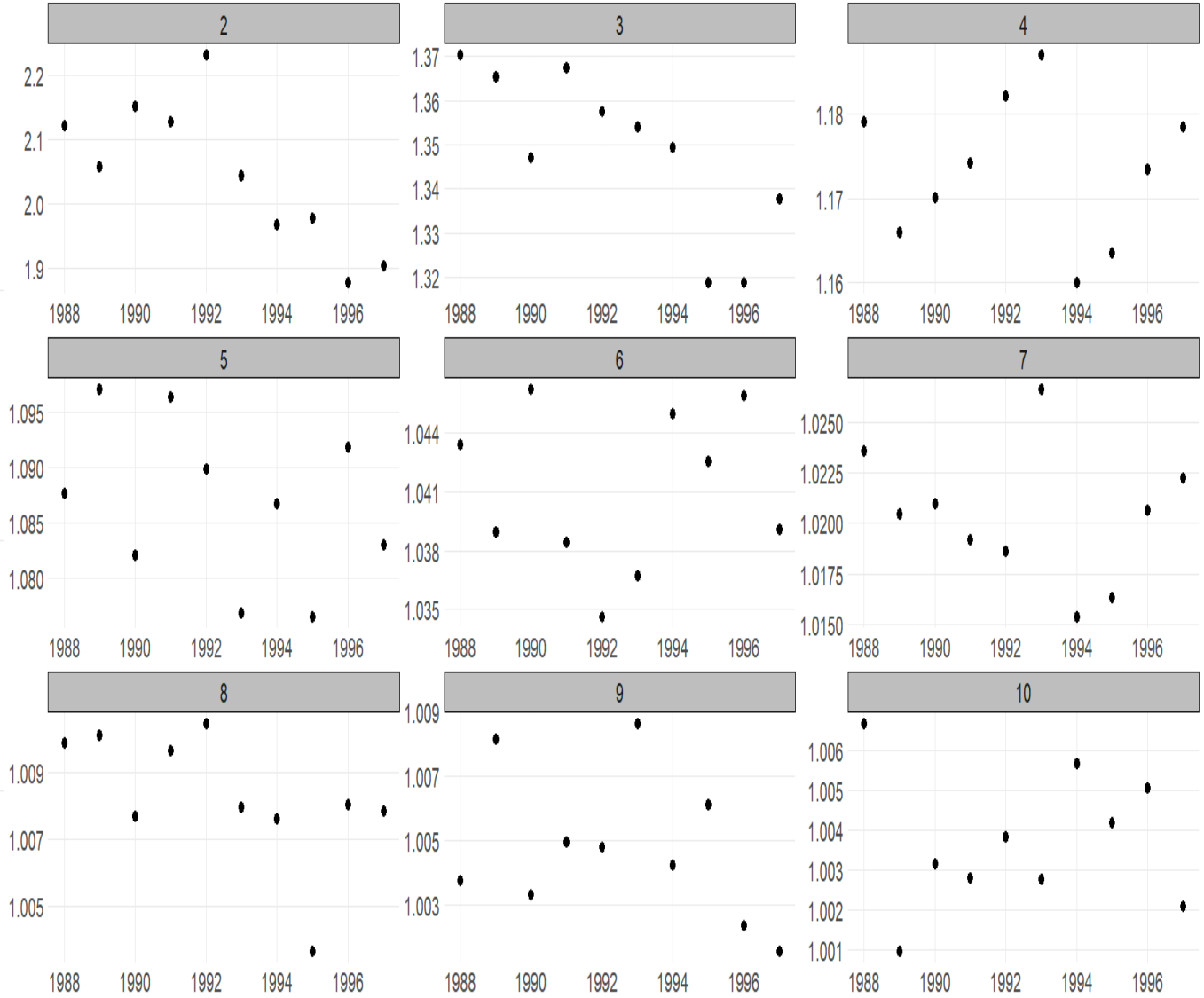


• Incremental Development Against Prior Cumulative Development – with a Range



- # Which visualization works best?





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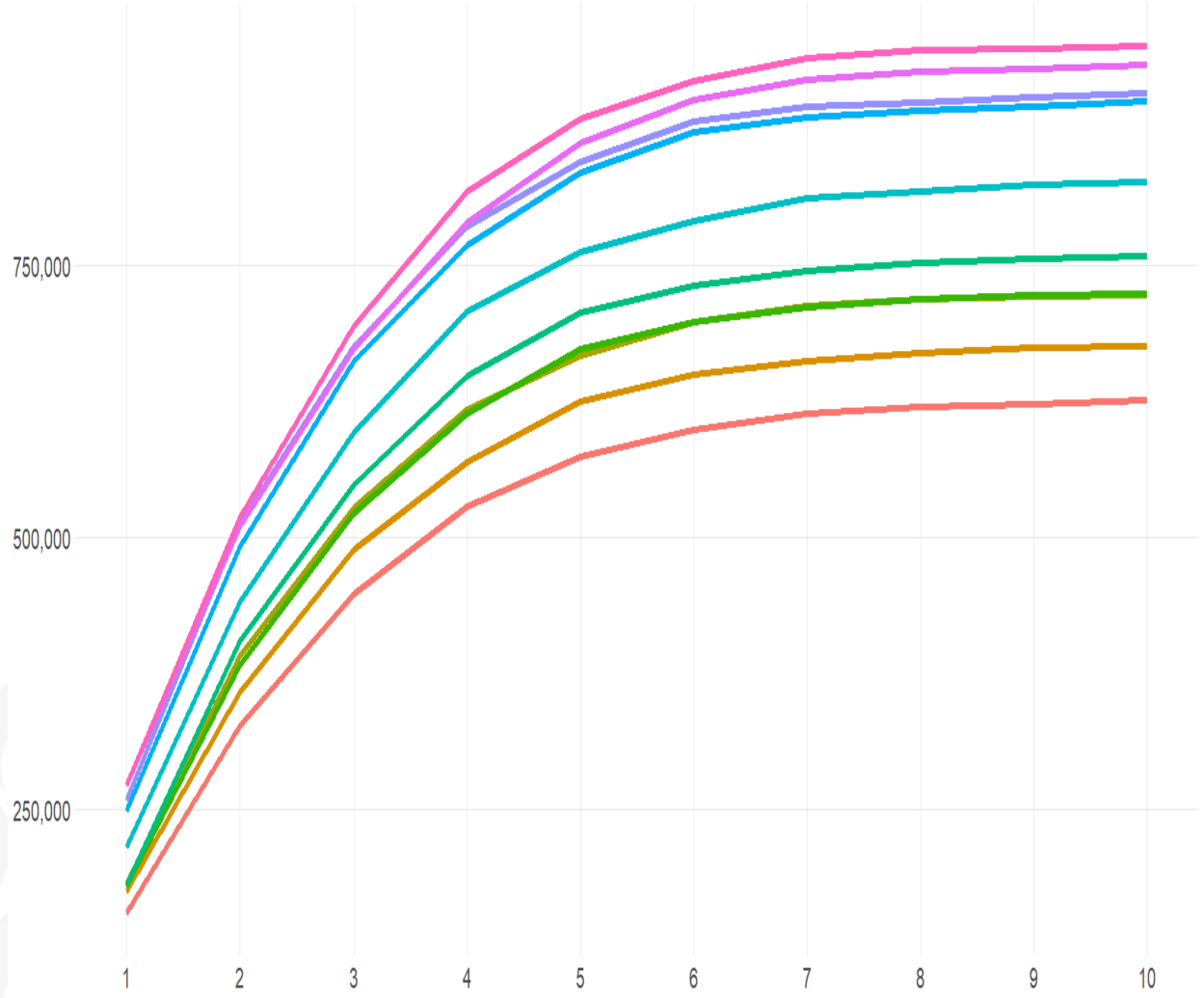
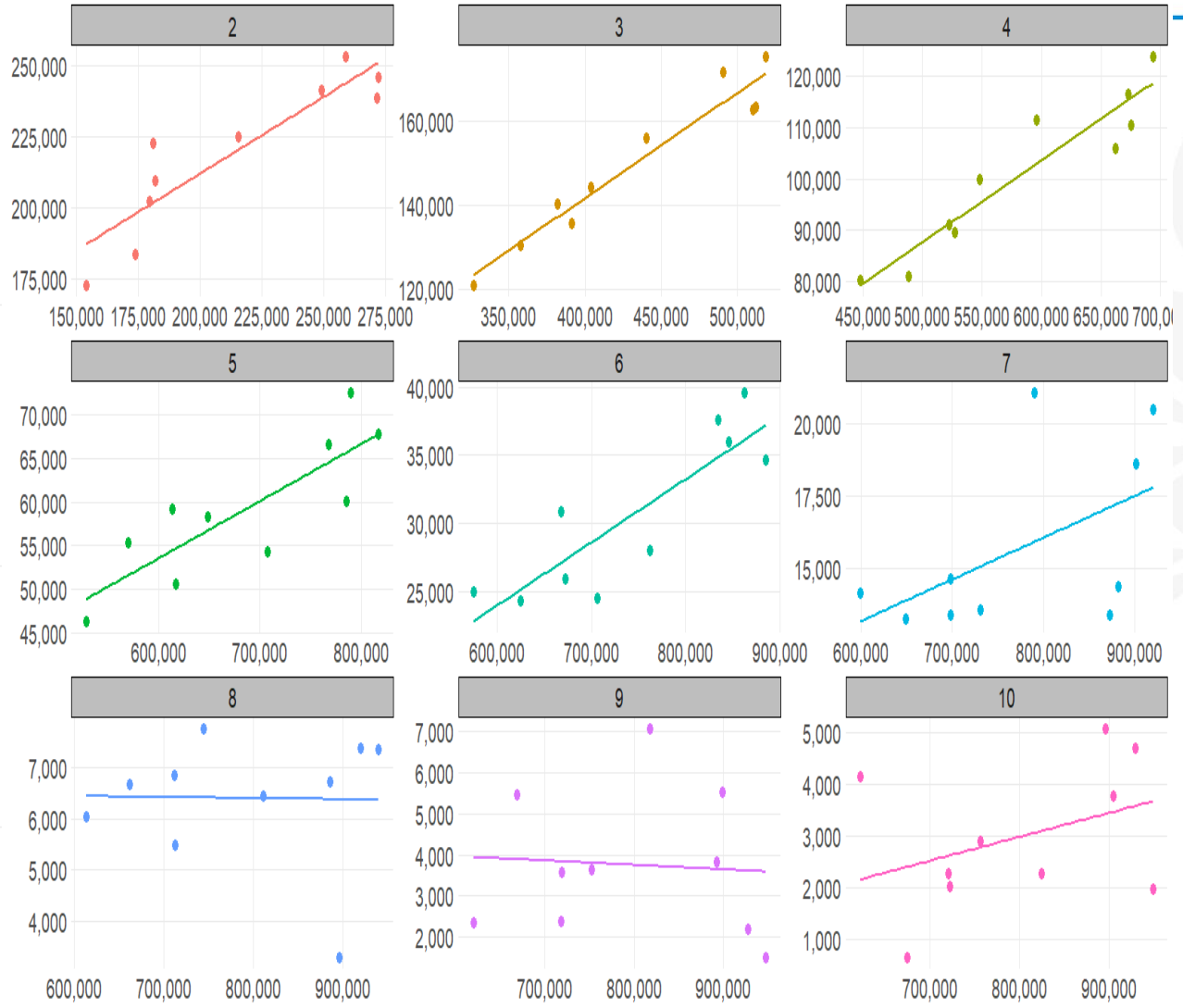




Catastrophe Risk Management Credentials

Tier 1 – Working Knowledge

Certified Specialist in Catastrophe Risk (CSCR)

Tier 2 – Advanced

Certified Catastrophe Risk Management Professional (CCRMP) – *for senior catastrophe risk managers*

• CSCR Credential Requirements: Overview of Assessments

Exam 1
Property Insurance
Fundamentals

Exam 2
Catastrophe
Risk Fundamentals

Exam 3
Catastrophe Modeling
Methodology

Exam 4
Introduction to
Catastrophe
Risk Management

Online Course on
Ethics and
Professionalism

1. Property Insurance Fundamentals

- Includes the Usage of Catastrophe Modeling in the Re/Insurance Industry

2. Catastrophe Risk in the Insurance Industry

- History / Use of Catastrophe Modeling in the Re/Insurance Industry
- Major Global Historical Catastrophe Events and the impact on Industry
- Standards of Practice

3. Introduction to Catastrophe Modeling Methodology

- Hazard
  - Earthquake Hazard
  - Hurricane / Tropical Cyclone Hazard
- Vulnerability
  - Building / Structure Vulnerability

4. The Cat Modeling Process

- Data Overview
- Model Settings
- Model Results and Analysis
- Application to Business Needs

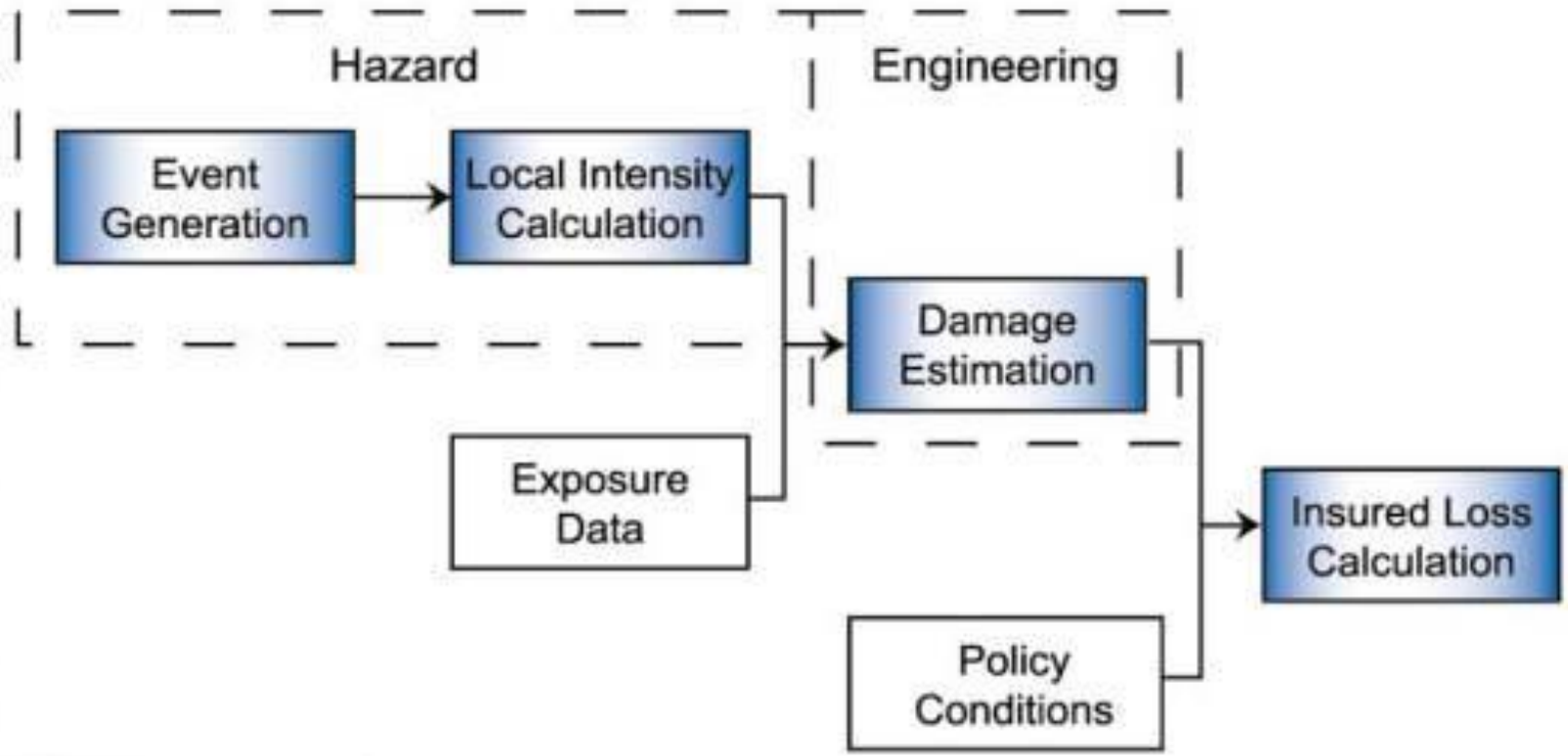
• Certified Catastrophe Risk Management Professional (CCRMP)

Goal: Demonstrate advanced applications of Cat risk management

1. Advanced Concepts
   - Statistics
   - Financial Modeling
   - Capacity Allocation

2. Advanced Applications
   - Customizing Model Results
   - Construction of Cat Models
   - Use of Models in Risk Management

Catastrophe Model Components



Catastrophe Model Components

- Event generation – determines the frequency, wind speed, magnitude, and other characteristics of potential hurricane and earthquake events and assigns appropriate probabilities to each event.
- Local intensity calculation – determines the level of shaking and wind speed that would be felt at each location.
- Damage estimation – calculates the losses each location would incur.
- Insured loss calculation – calculates the losses the insurance company may face based on the policy characteristics (i.e. limits, coverages, deductibles).

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Thank You