Let Me See:
a Showcase of Visualization Technologies

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2 WINGS RISK SERVICES

Ideal Actuarial System

An ideal data visualization solution is a
>
> a) transparent to users and b) highly efficient
>
> **storage/retrieval system** for
>
> c) structured data (objects) with
>
> d) an extremely flexible, e) computationally
>
> complete, f) open
>
> **calculation engine** and
>
> g) integrated, h) automated and i) interactive
>
> **report generator**

a

Human perception

Relies heavily on **Short-Term Memory**.

Problems with STM:

- Can hold only **5-7** similar similar items at once

- It's a "**buffer**": new info erases old information

- Even without distractions can hold info only for **30 seconds**

b

Data-Driven Technologies

- Adaptive Reporting
- Visualization
- Alarm Systems

Adaptive Reporting

- Adaptive Reporting
  - Filtering
  - Sorting
  - Outlining
  - Conditional Formatting
  - OLAP-enabled tools

Adaptive Reporting: **Filtering**

- Auto-Filter in Excel
  - Plain-Vanilla Filtering
  - Checking Distinct Values
  - Adaptive Filtering (through VBA)

3

Adaptive Reporting: **Outlining**

- Outlining in Excel
  - Hierarchical view
  - Different level of details
  - Subtotals
- Master-Detail relationship in Access

4

Adaptive Reporting: **Sorting**

- Does not reduce amount of information displayed
- Brings **most important** info on top or up front
- Requires definition of *importance*

5

Adaptive Reporting: **Dynamic Formatting**

- ■ Conditional Formatting in Excel
  - ■ allows users to define
    - ■ font
    - ■ color
    - ■ border
    - ■ background pattern
  - of a cell **as a function** of the values in other cells

6

Adaptive Reporting: **OLAP**

- Pivot Tables and OLAP cubes in Excel
  - Combine
    - Filtering
    - Outlining
    - Sorting
  - Add on-the-fly processing
    - Calculated Field
    - Calculated Item
  - Data Source is not limited by 65,536 rows

7

Visualization: **Maps**

- **Maps in Microsoft MapPoint:**
    - Colors
    - Shapes
    - Glyphs
   - Isosurfaces
  - Links to Office applications
  - VBA

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Alarm Systems: **Algorithms Applicability**

- Statistical assumptions testing
  - Mack
  - Murphy
  - Zehnwirth

Alarm Systems: **Digital Dashboard**

- Portal to the most important info
  - Corporate
  - Professional
  - Personal
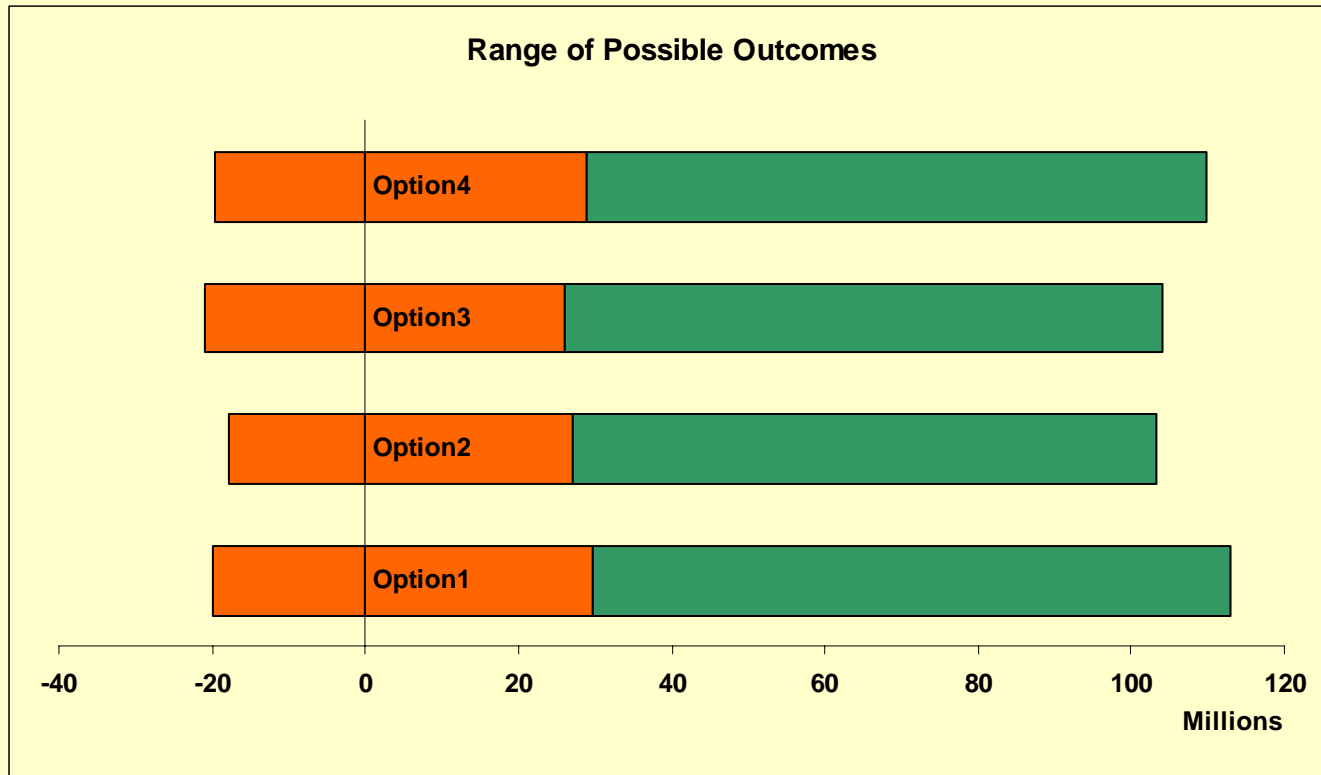- Dashboard's space limitations re-emphasize the **necessity** of space-conscious reporting techniques!
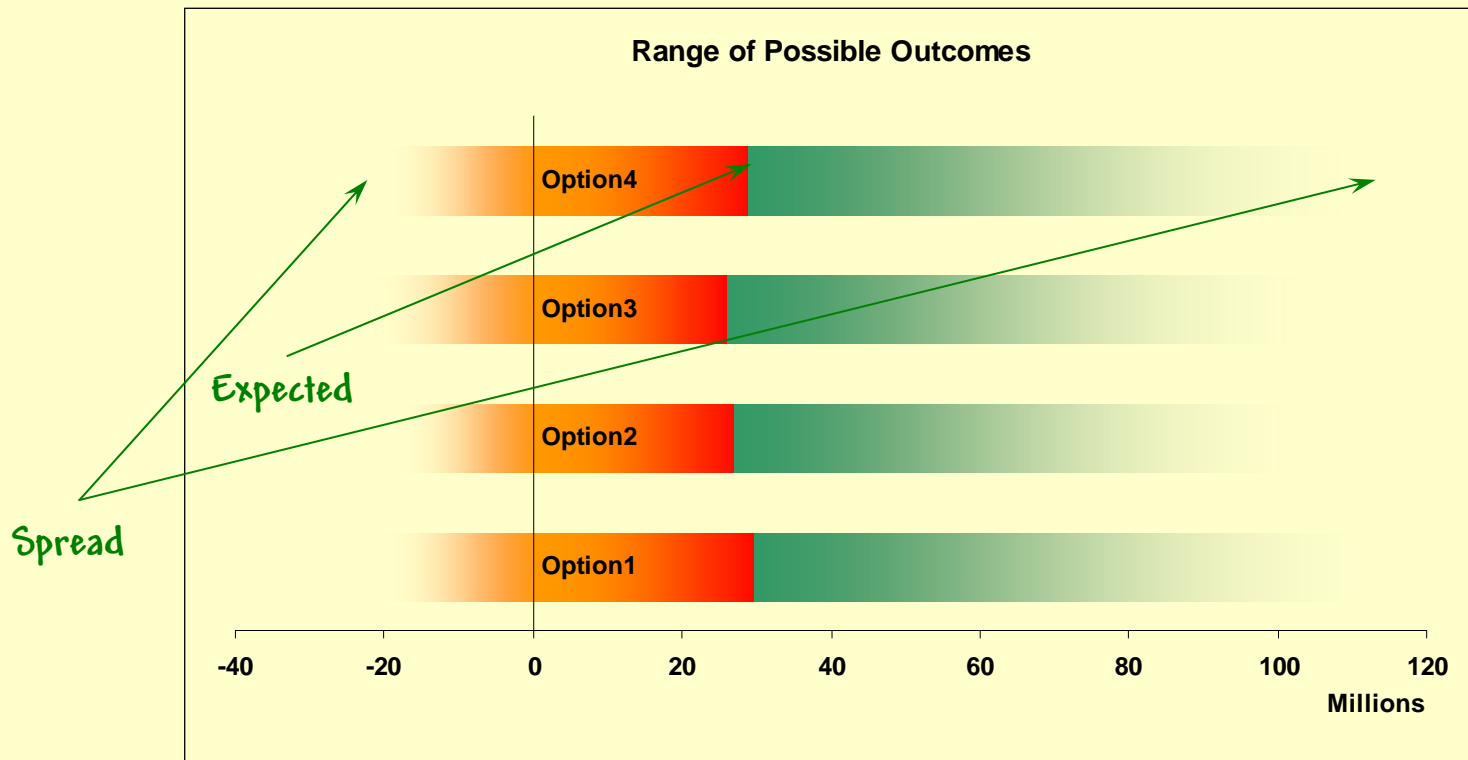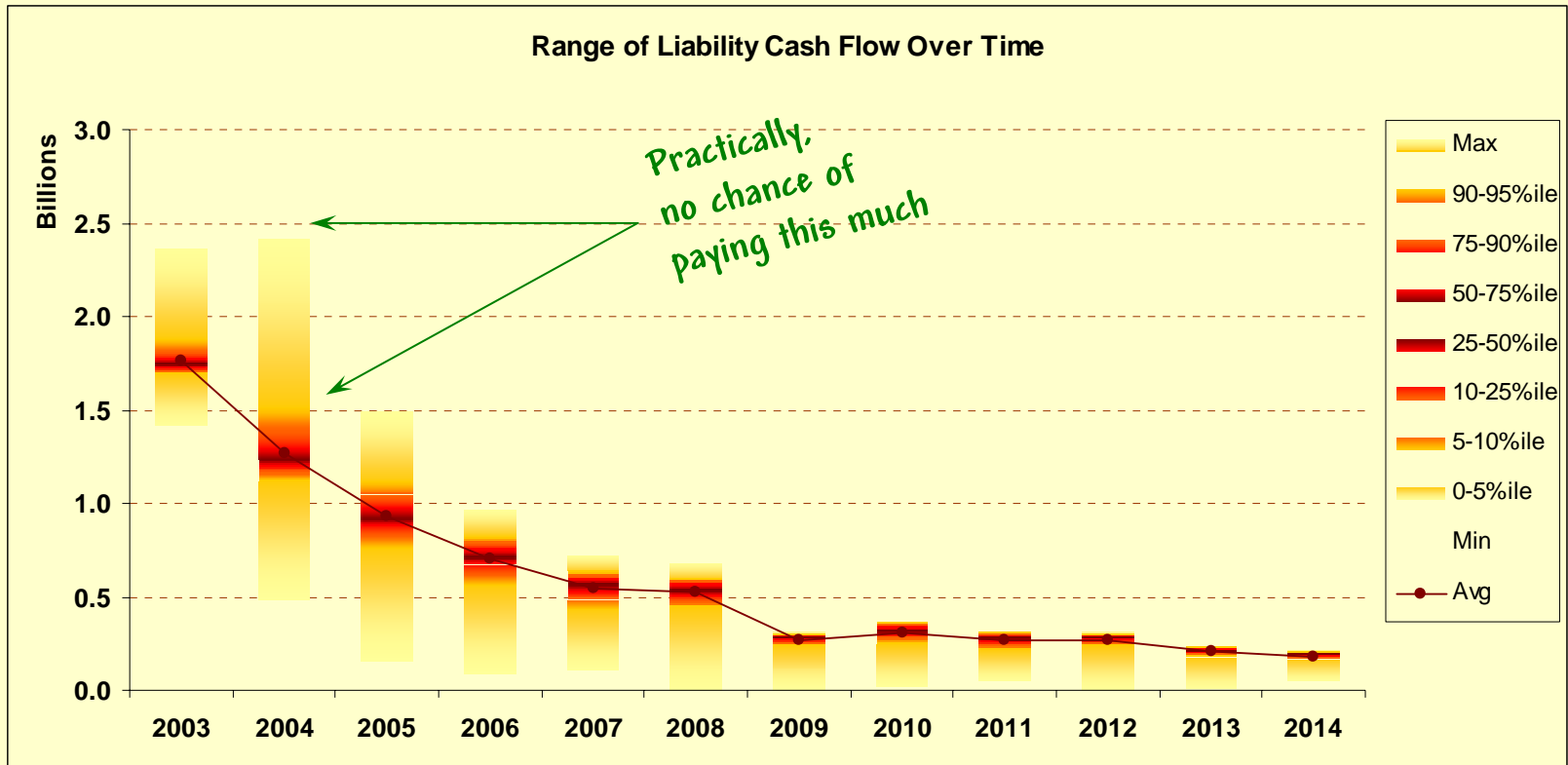
11

Visualizing DRM notions
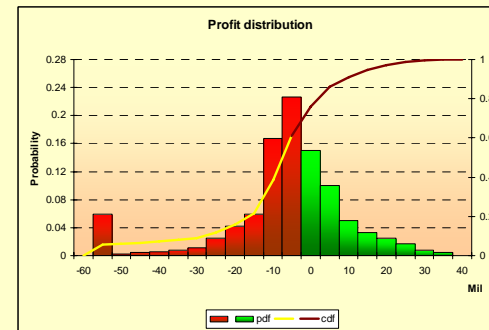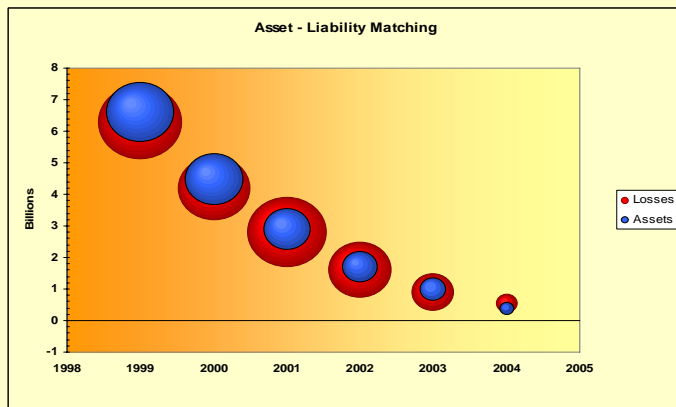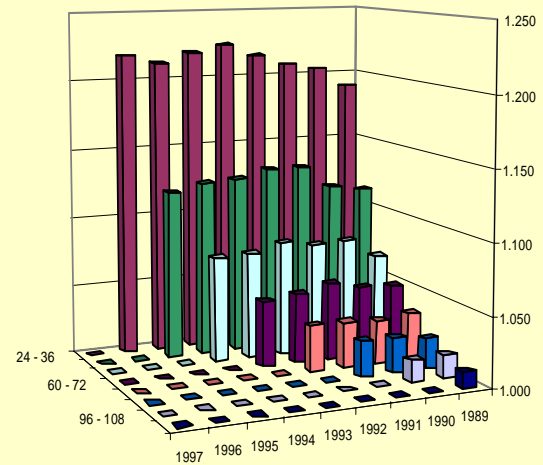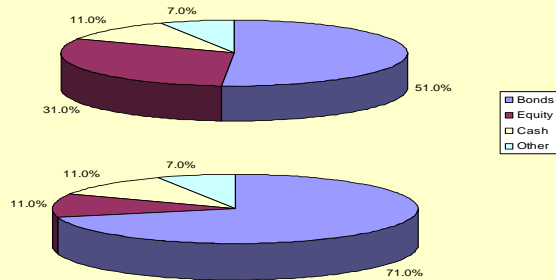
Uncertainty

Reinsurance options

Reinsurance options

Liability cash flow

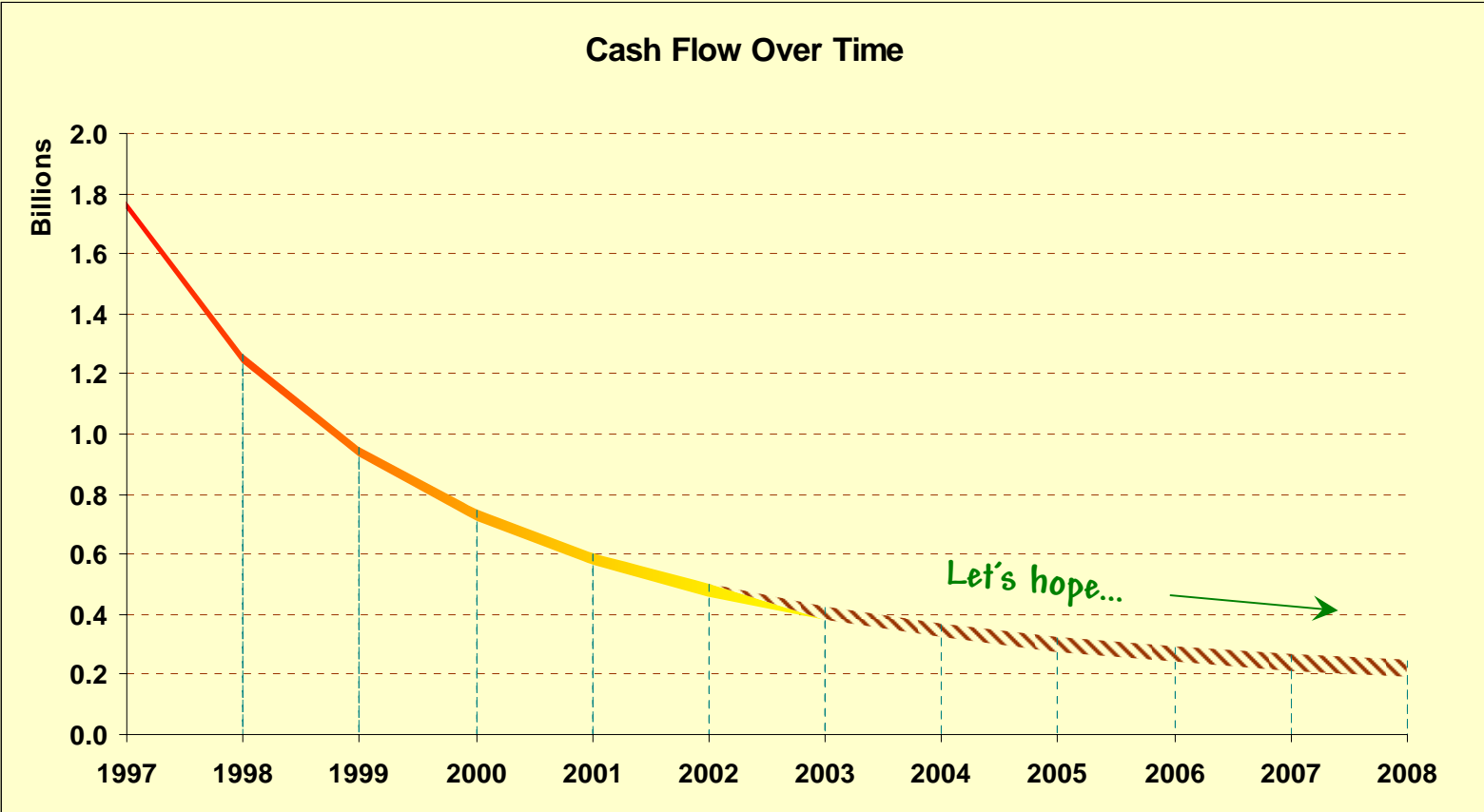Range of Liability Cash Flow Over Time

Development & Trends

Asset – Liability Matching

Asset - Liability Matching

Losses
Assets
Poly. (Assets)
Poly. (Losses)

Not enough
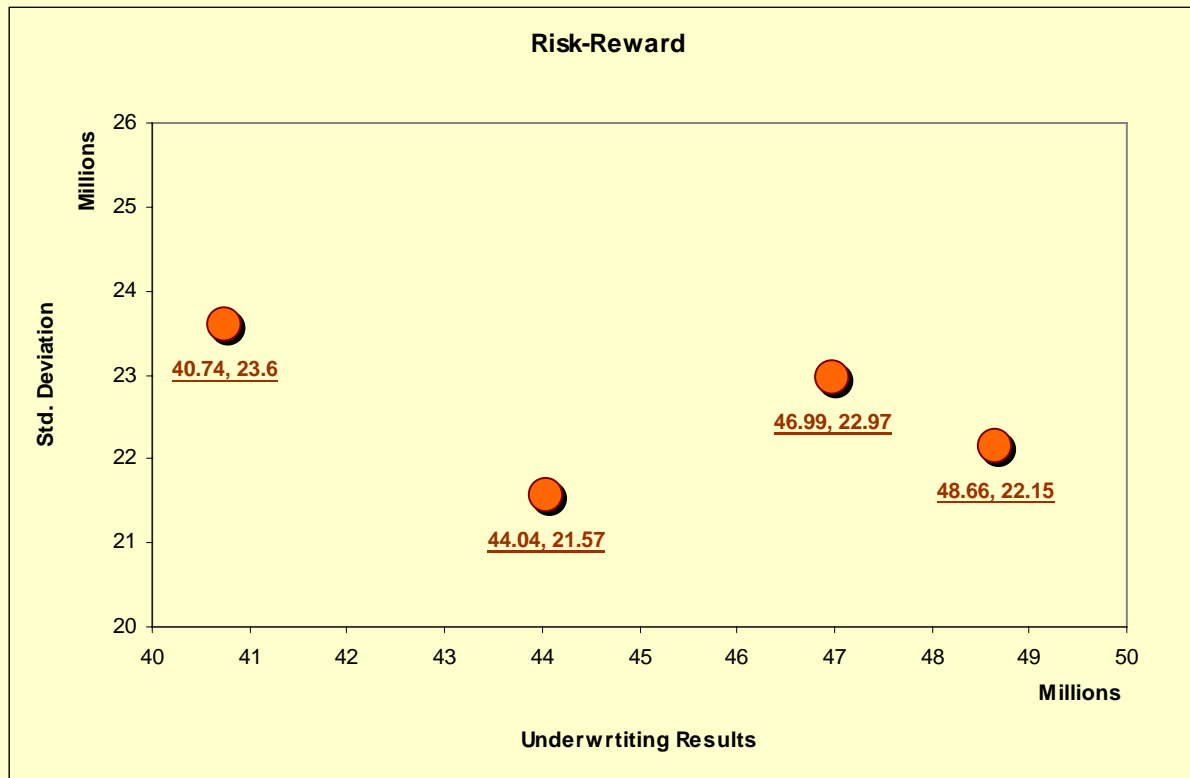and getting worse
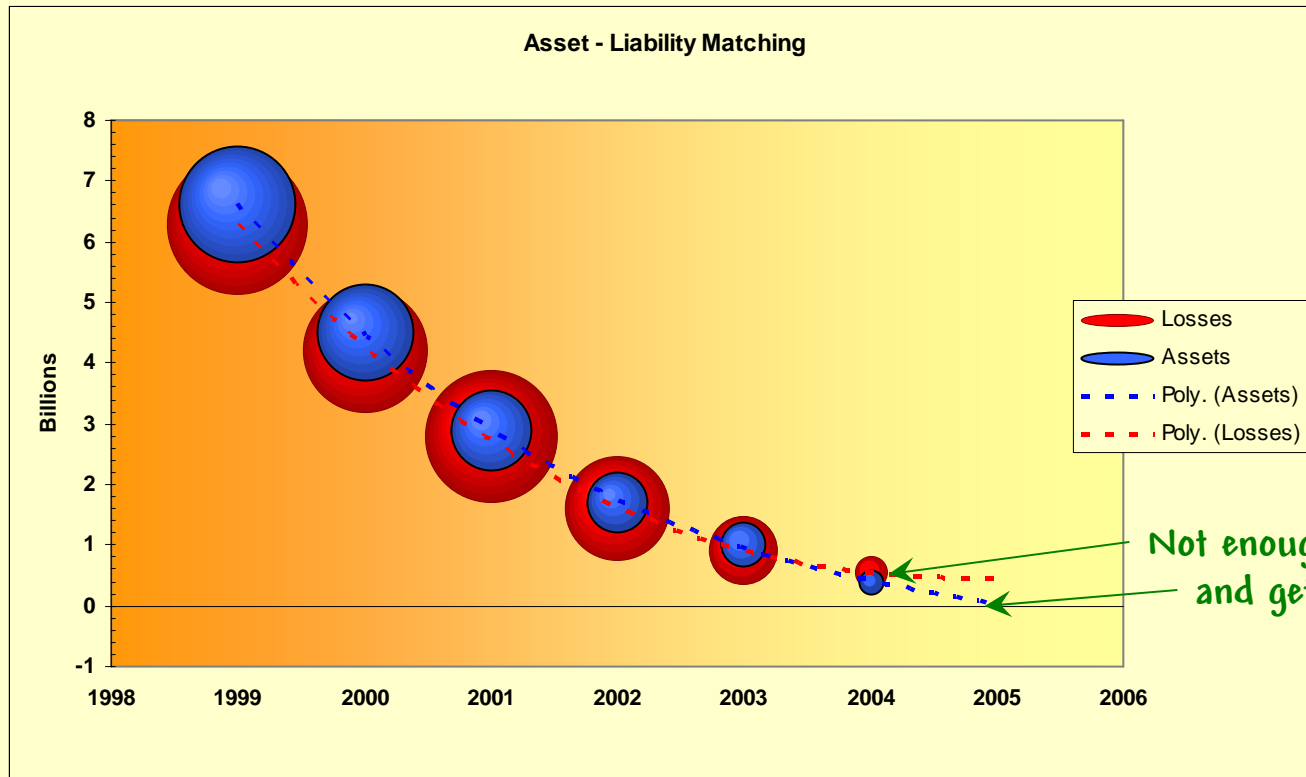
Cash Flow Forecast
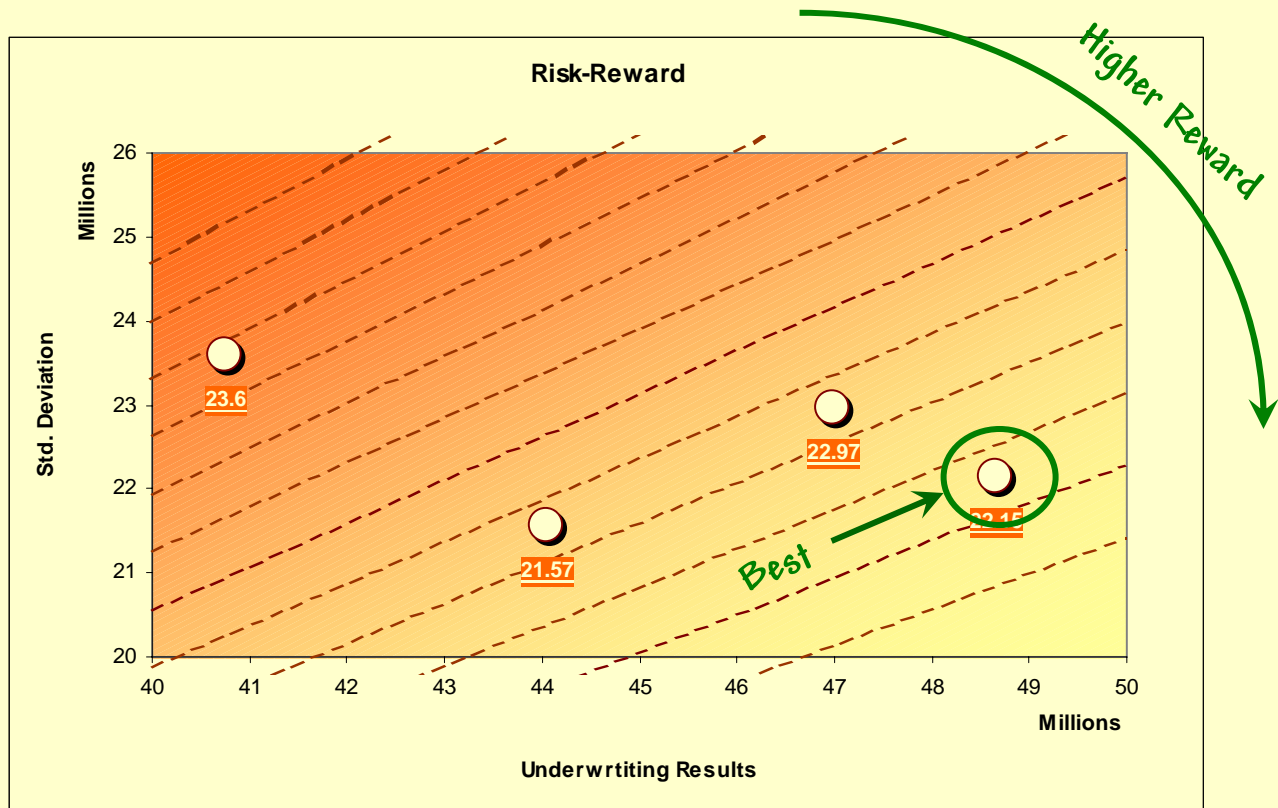

Cash Flow Over Time

Ranking
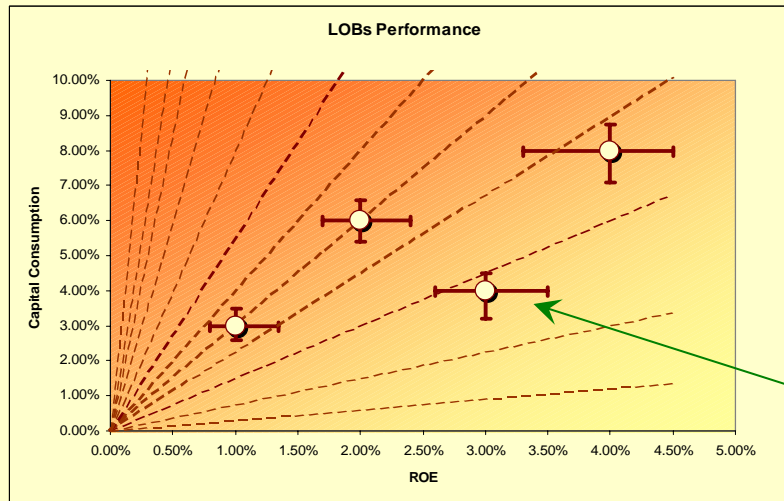
Dare to compare
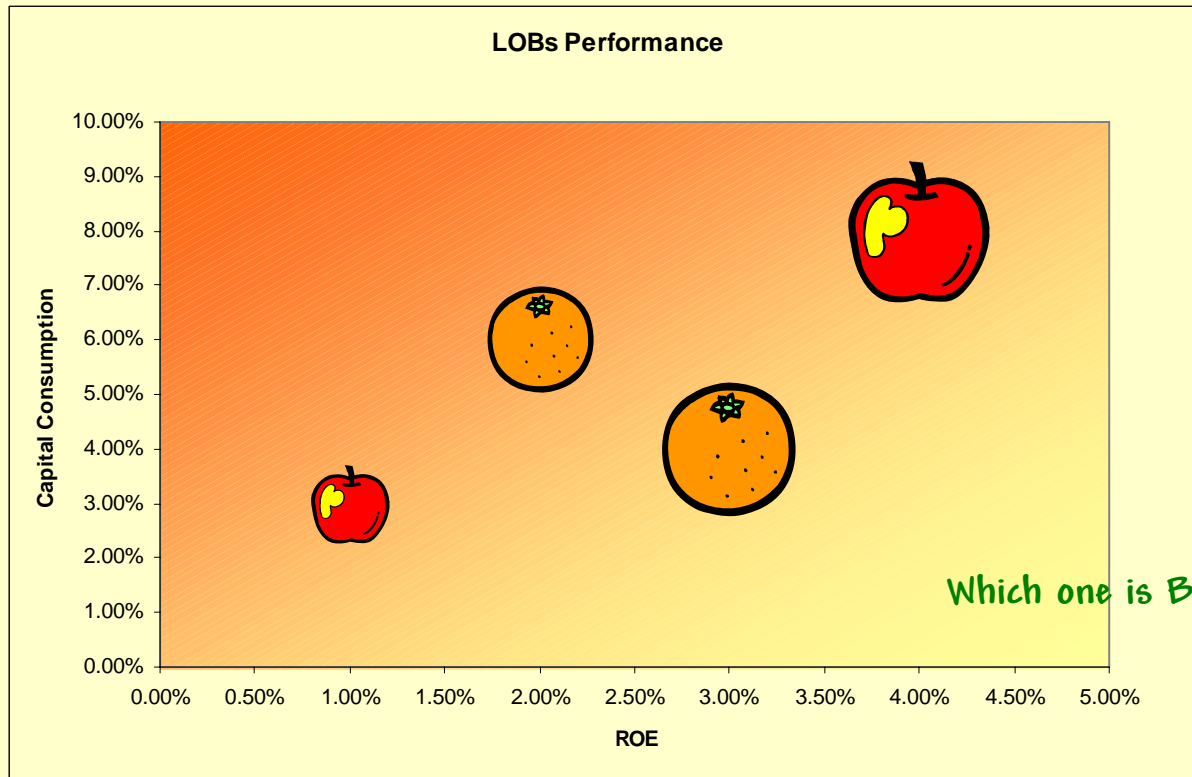
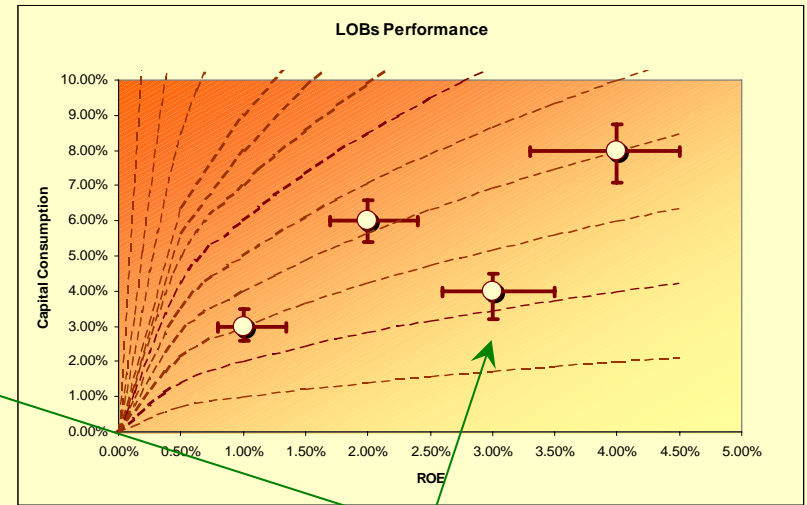# Reinsurance options

Reinsurance options

Different criteria

Max ROE per Capital

Max ROE per (Capital) 2

Still the best

Actuarial IQ Recap

- EDA and ways to present information are two of the sections of the paper

- The paper is an introduction to Data Quality and Data Management written by the CAS Data Management Educational Materials Working Party

- It should be published in Winter 2008 Forum

- What every actuary should know about data quality and data management

- Plus some hands-on techniques

Session Conclusion

- Horror stories and motivation to improve data quality

- Described data quality and data management

- Introduced upcoming paper: "Actuarial IQ"

- Hands-on techniques for data cleansing and better presentations

Getting More from Your Data

Questions?