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RISK MARGINS FOR HEALTH INSURANCE

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Structure of presentation

- Why this paper?
- The nature of health insurance
- Our approach
- Benchmarks
- LAT
- Limitations

Why this paper?

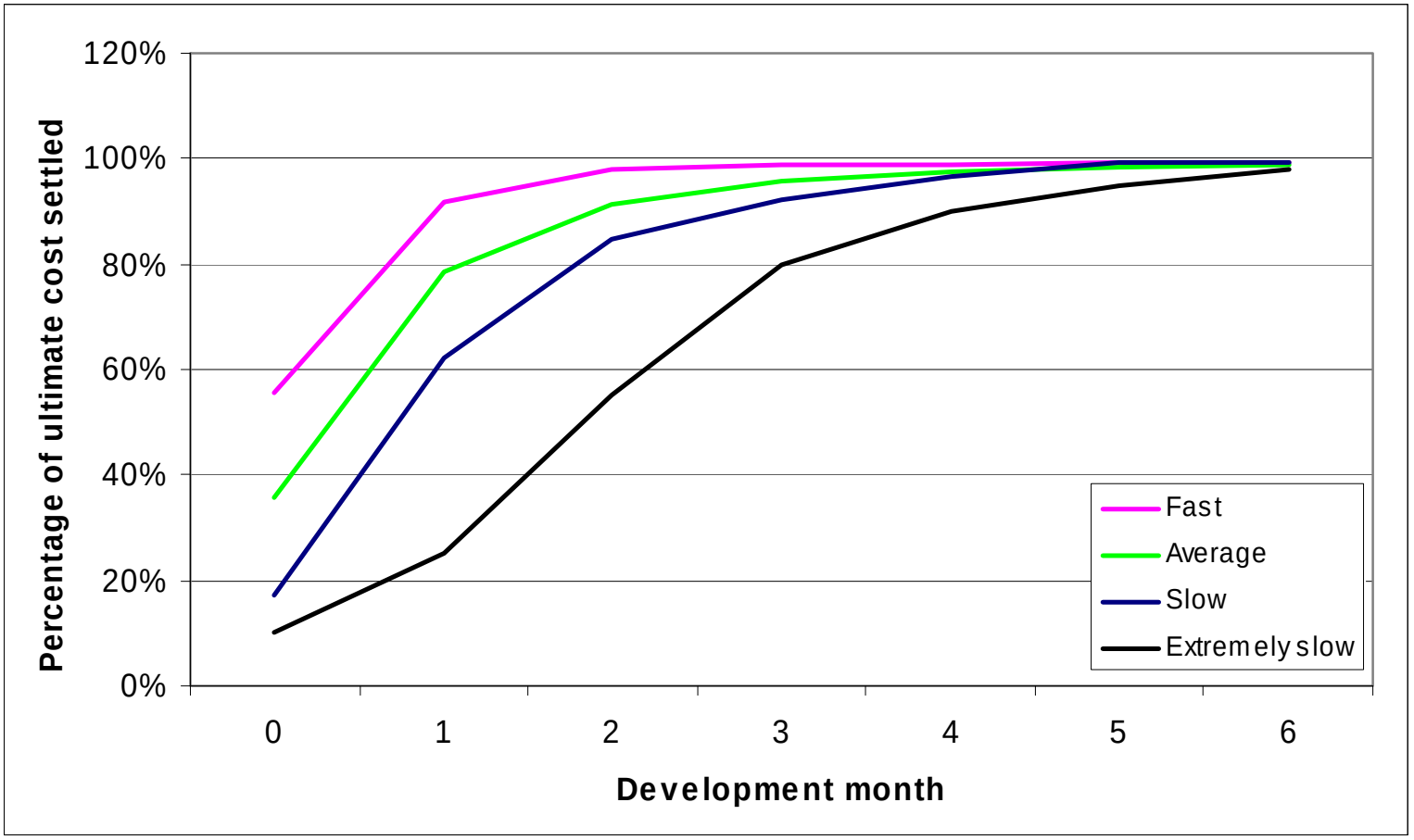
- AASB1023
- Potential future listings of health insurers
- IFRS and Solvency II
- 75% Probability of Adequacy benchmark

Nature of health insurance

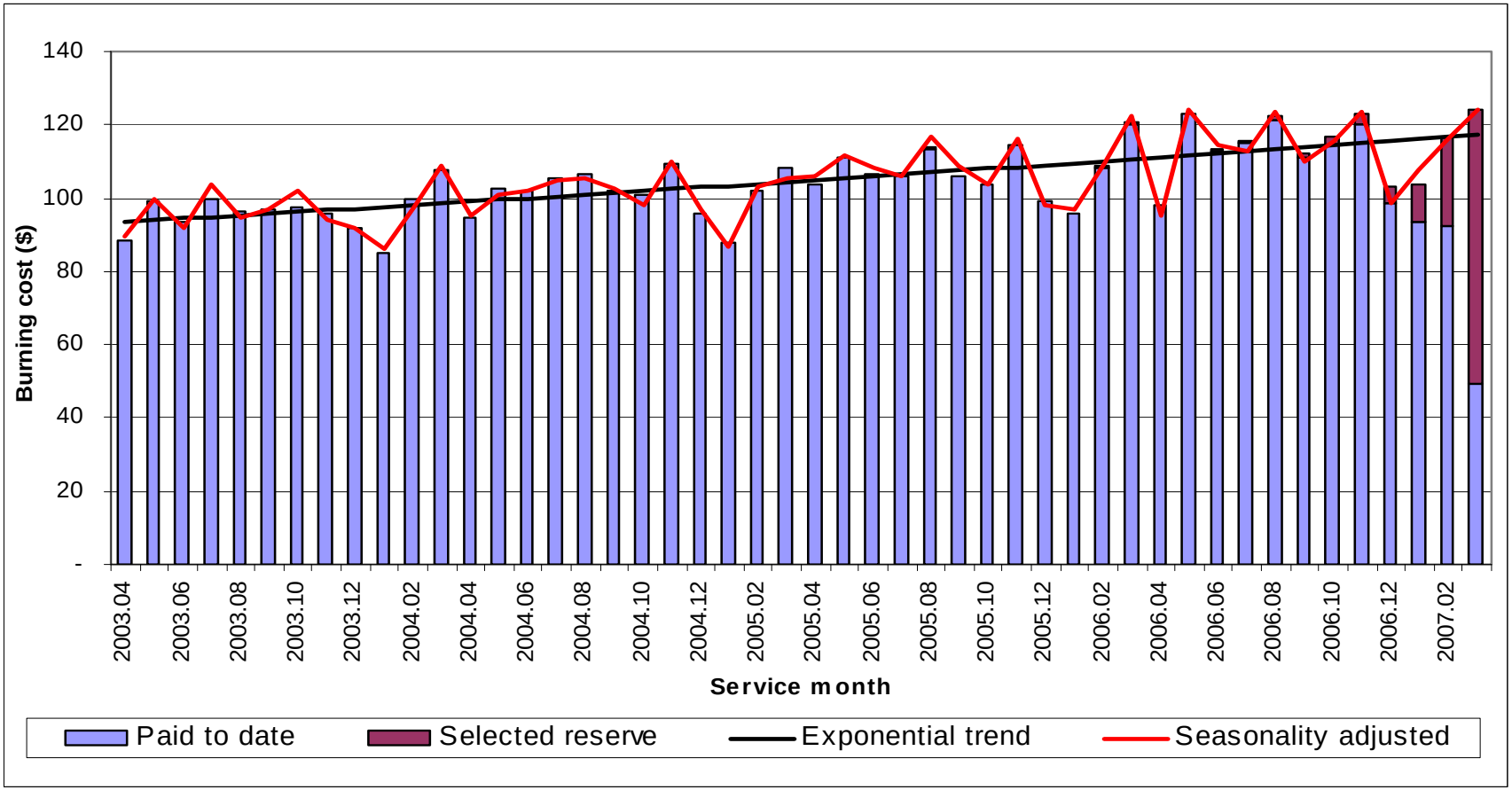
- Very short tail
- No case estimates
- Service / Treatment date rather than Occurrence / Accident date
- Benefit types
- Predictability of ultimate benefits
- Reserving typically based on Paid Chain Ladder with ‘reasonableness adjustment’

Delay to settlement

Volatility in the claims payment pattern



Stability of the ultimate liability



General insurance risk margin methods

- Volatility in the payment pattern results in unadjusted chain ladder giving volatile results
- Mack, Stochastic Chain Ladder and Bootstrap give unreasonably high results
- Need to allow for the underlying predictability of ultimate benefits

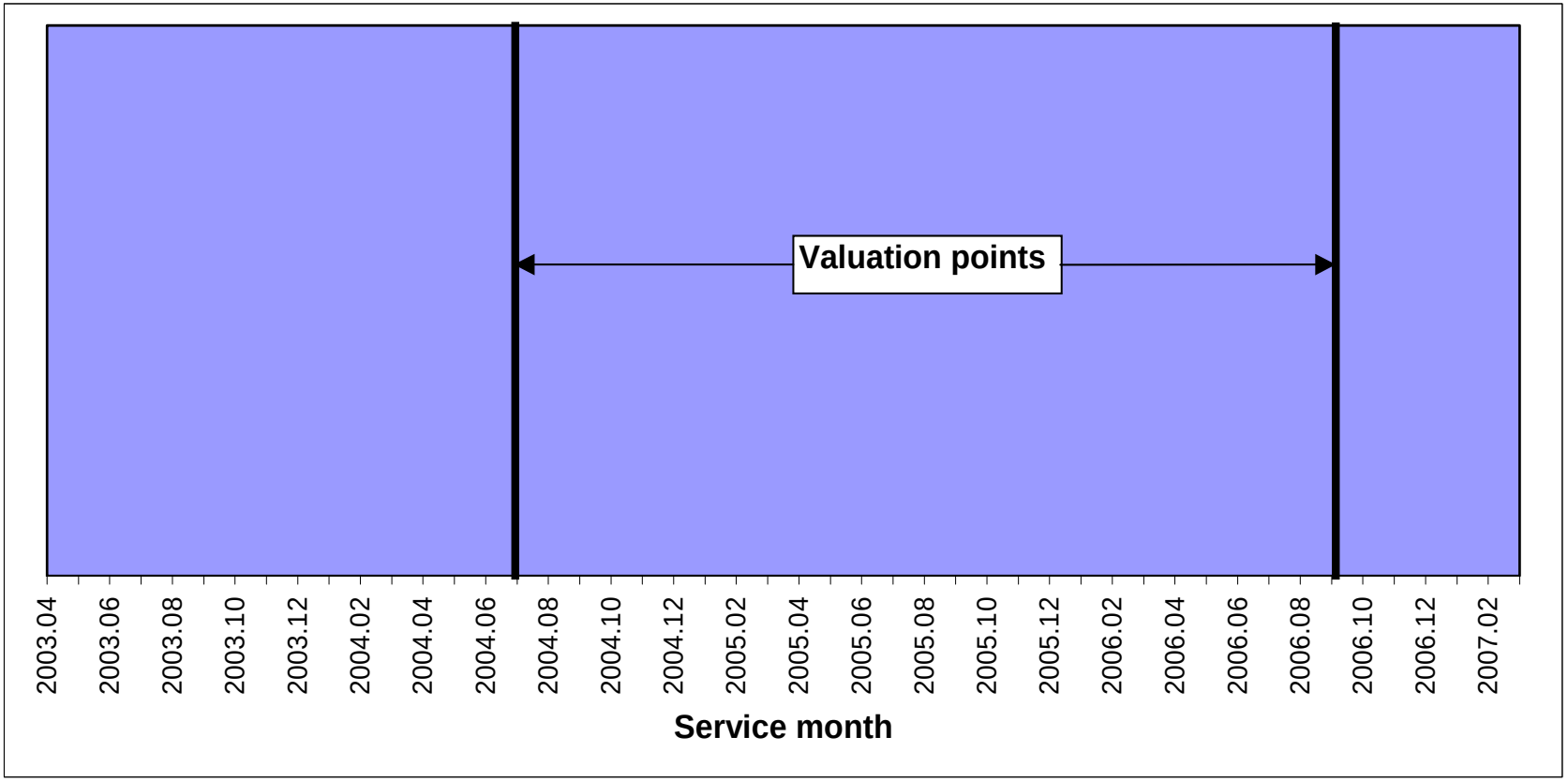
Our approach to assessing risk margins

- Develop a mechanical reserving method
- Assess accuracy against actual payments
- Determine the risk margin using distribution free approach

Data used

- 19 Australian health insurers
- At least 4 years of data for each insurer
- Paid triangles (monthly / monthly)
- Claims data split by hospital / medical / ancillary
- Grouping of claim types for analysis
- Exposure data from PHIAC B
- Thanks to all the insurers who provided data

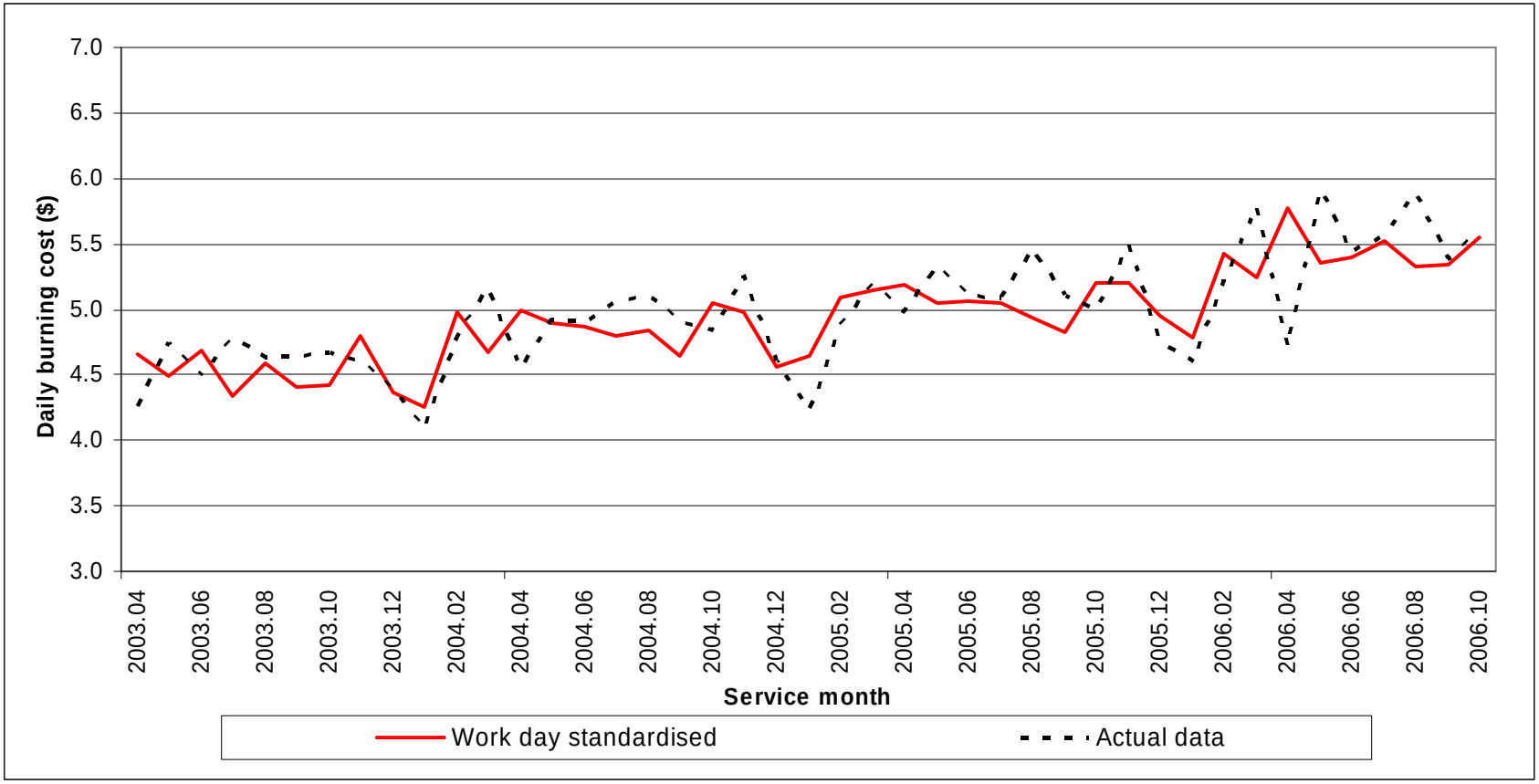
Available valuation points



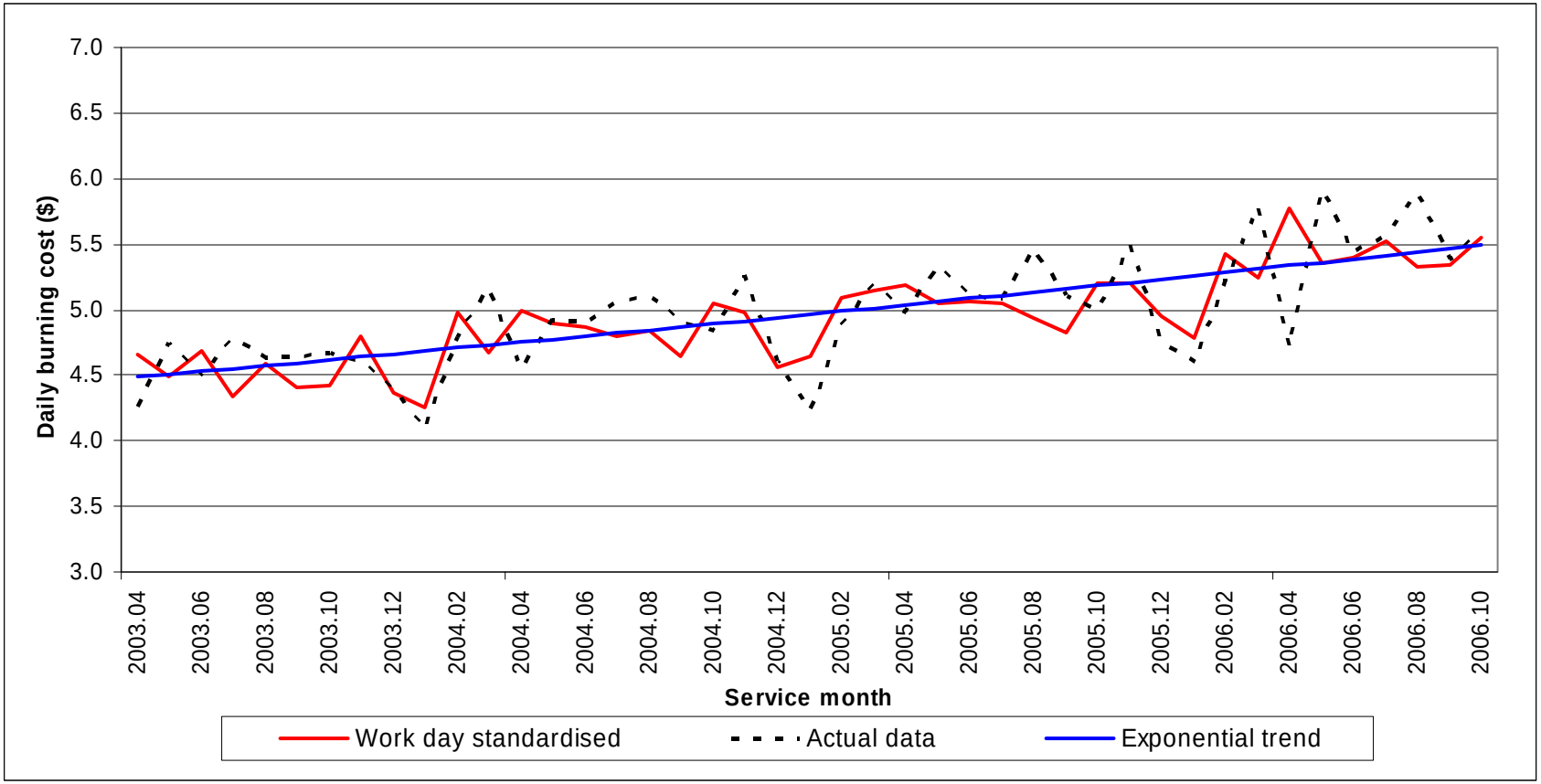
Our approach

1. Example fund
2. For an individual insurer, project ultimate burning costs using paid chain ladder
   - Monthly by monthly payments triangle
   - Burning cost = $\frac{\text{ultimate claims cost}}{\text{exposure}}$
   - Development factors calculated from the insurer's own data with no smoothing

3. Standardise for working days



4. Fit an exponential trend line

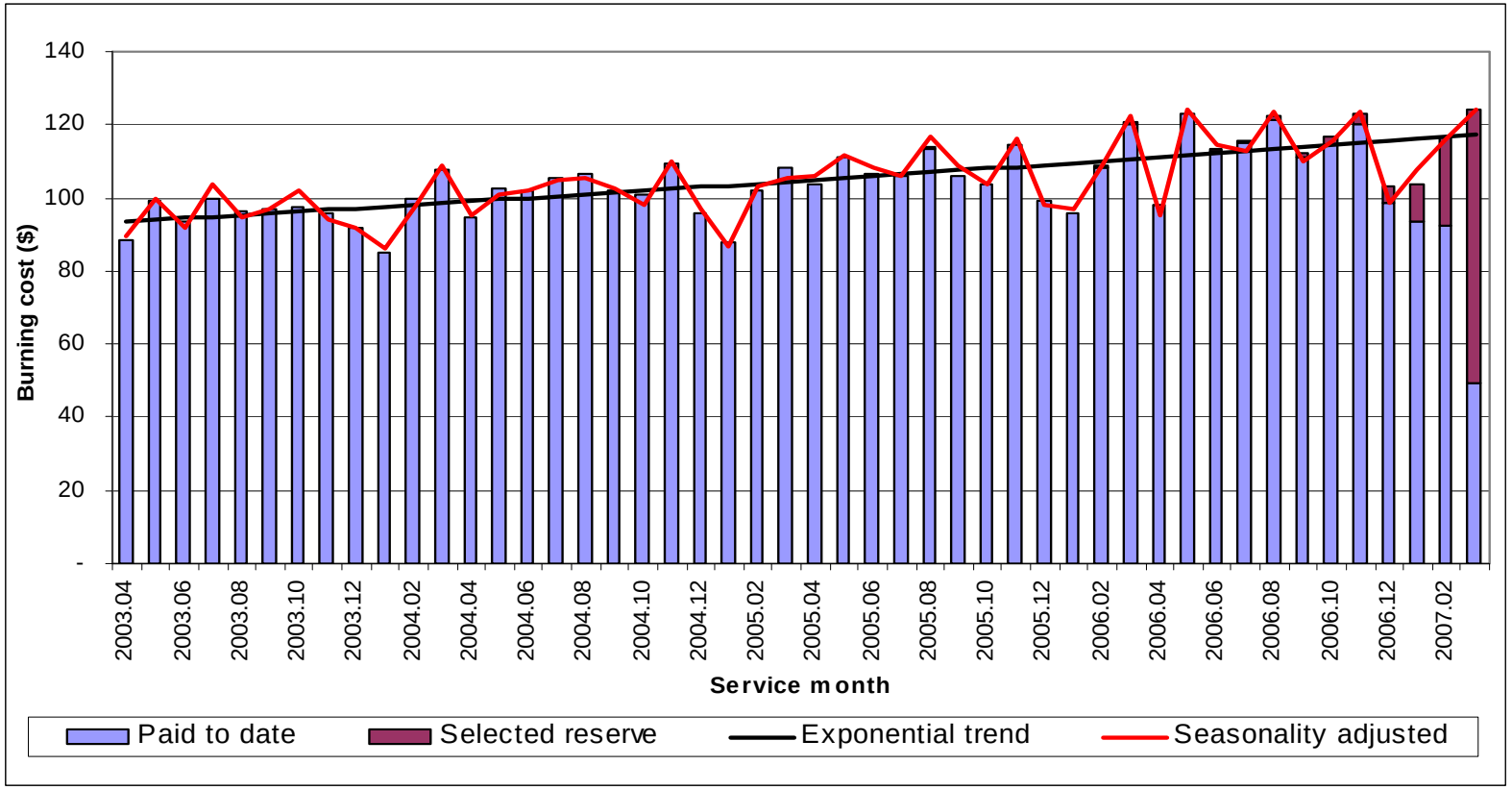


5. Assess remaining seasonality

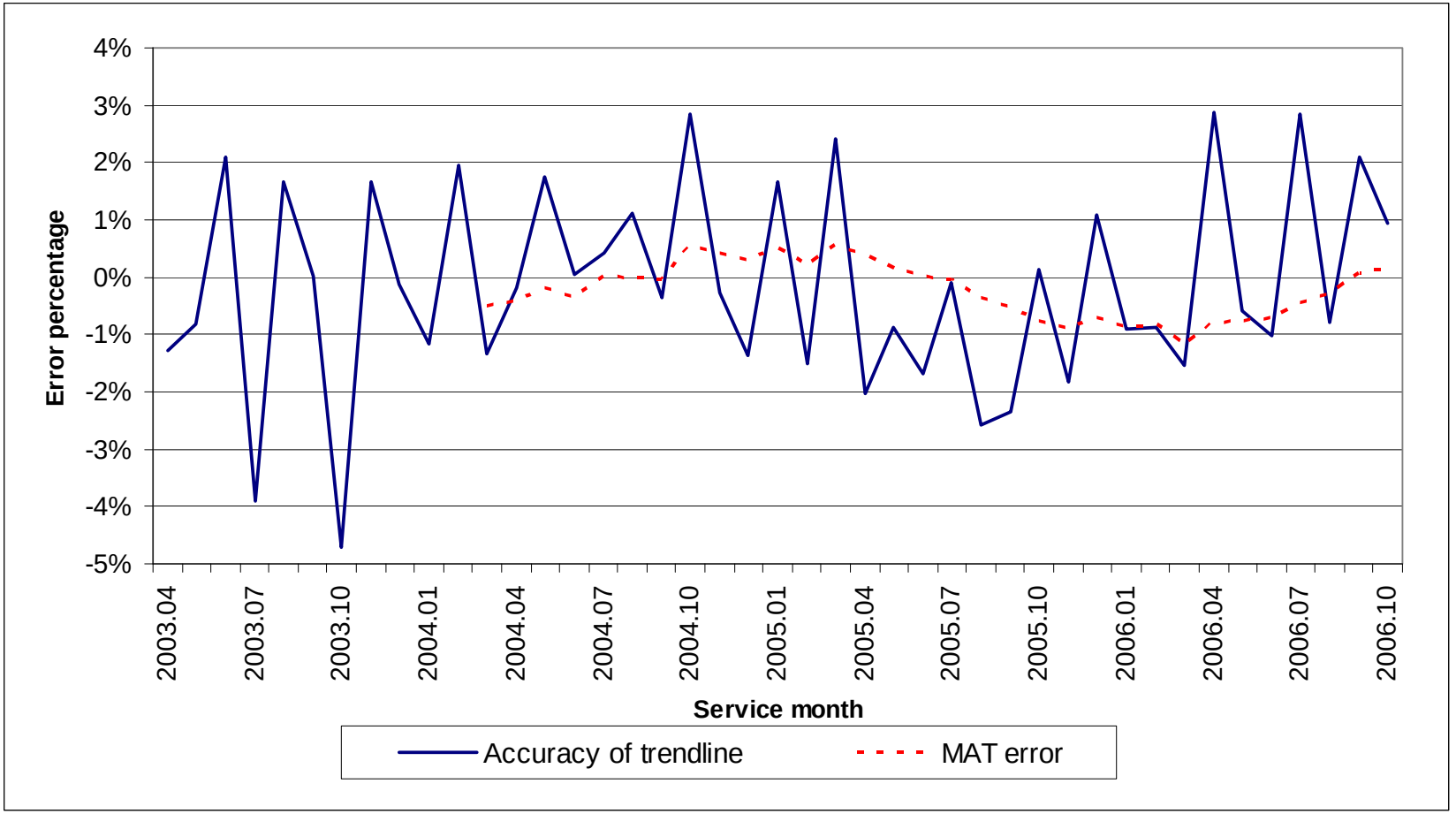
- Calculate average deviations for each calendar month
- Standardise these to ensure bias is not introduced

6. Calculate seasonality-adjusted trend line

- Apply loadings for working days and seasonality to the exponential trend line



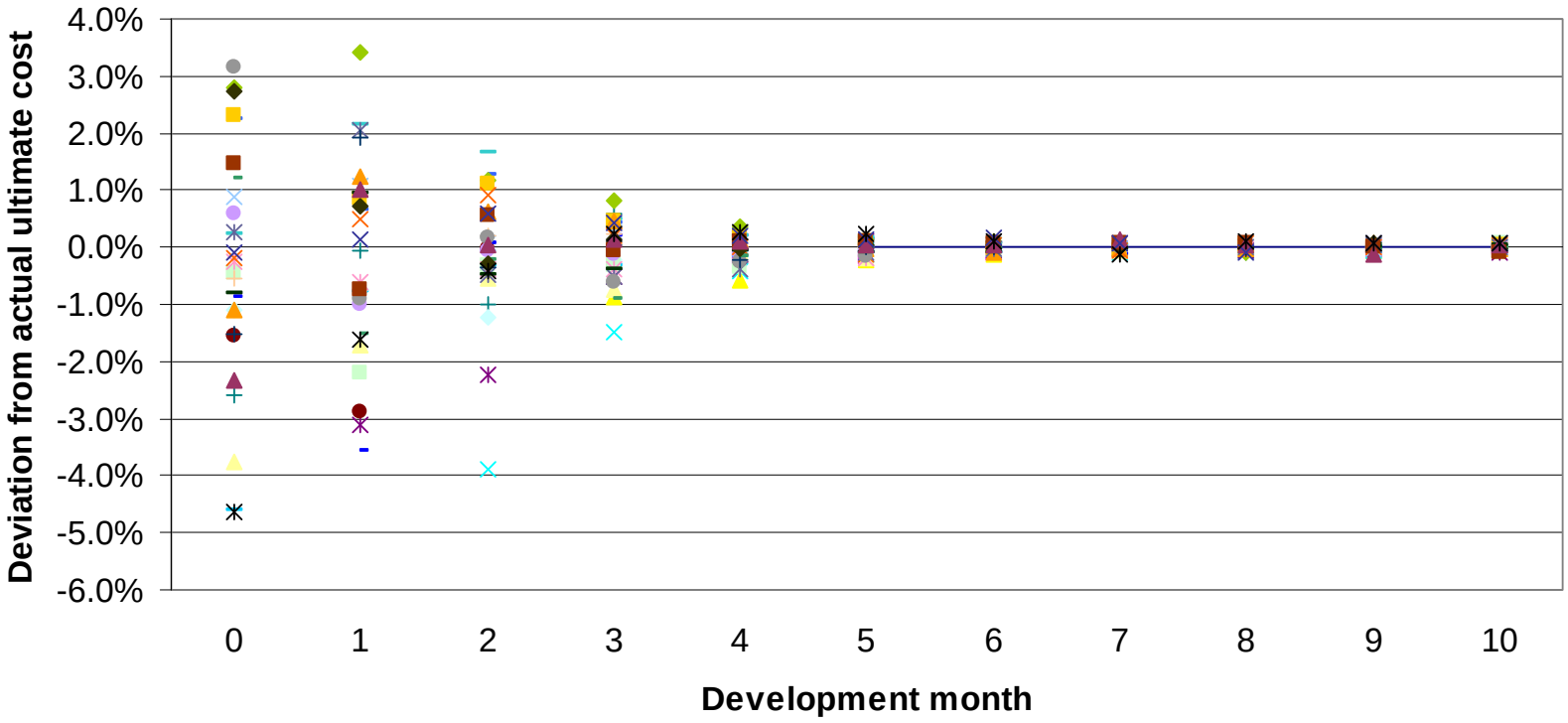
6. Accuracy of the seasonality-adjusted trend line



Our approach (cont.)

7. Repeat all above steps at historic valuation dates
8. Determine best weighting between PCL and trend line
   - Minimise least squares of difference between ultimate projection and actual result for each month
   - Separately for each development month across all valuation periods
9. Assess goodness of fit
   - Serial correlation
   - Distribution of residuals
   - Count of +ve / -ve strings
   - Total +ve / -ve residuals

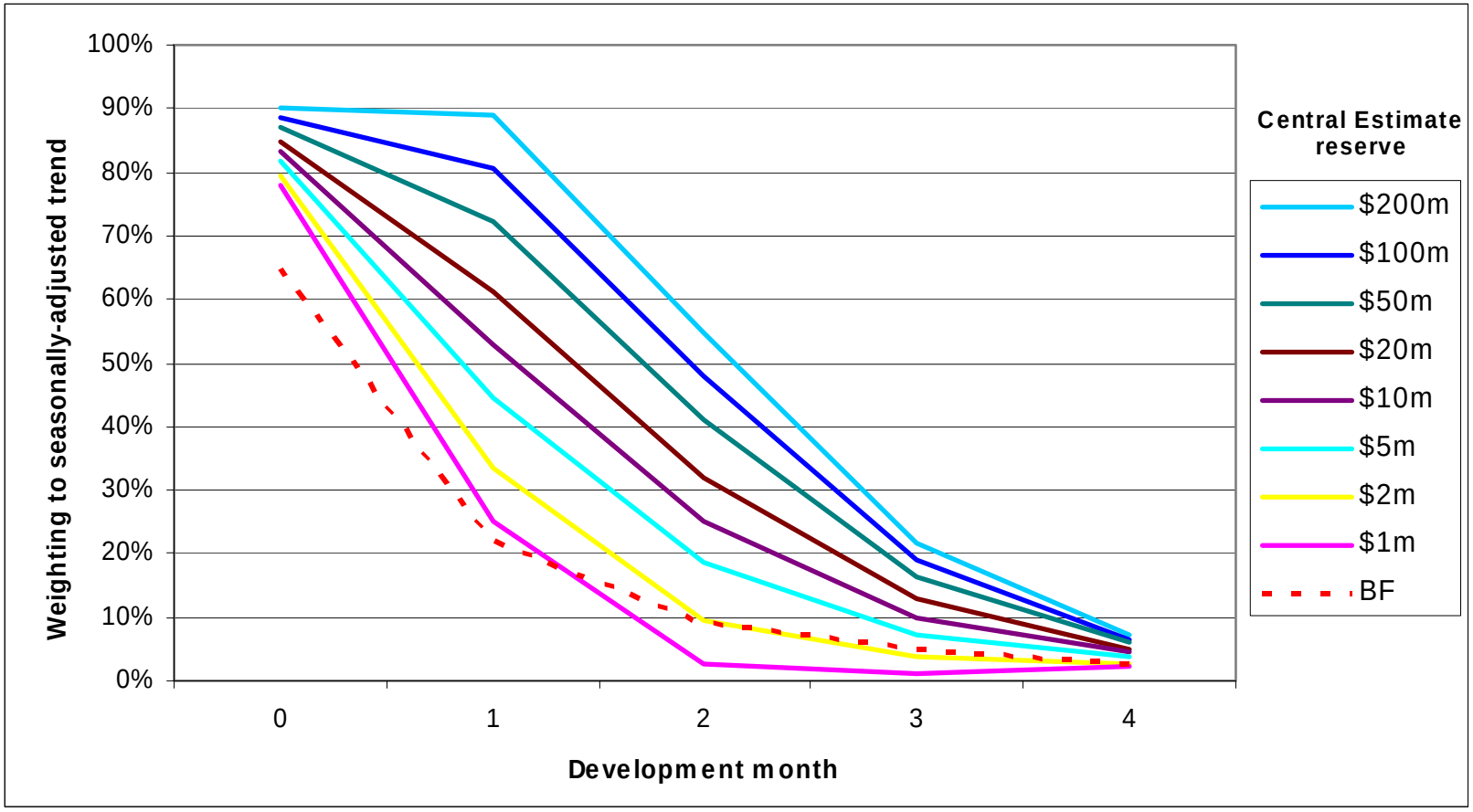
9. Goodness of fit



Our approach (cont.)

10. Repeat all above steps for each insurer
    - 19 insurers * 30 valuations
11. Assess the best weightings across all insurers
    - Weighting between:
      - PCL projection
      - Seasonally-adjusted trend line
    - Varies by size of central estimate reserve
    - Logarithmic curve fit for each development month

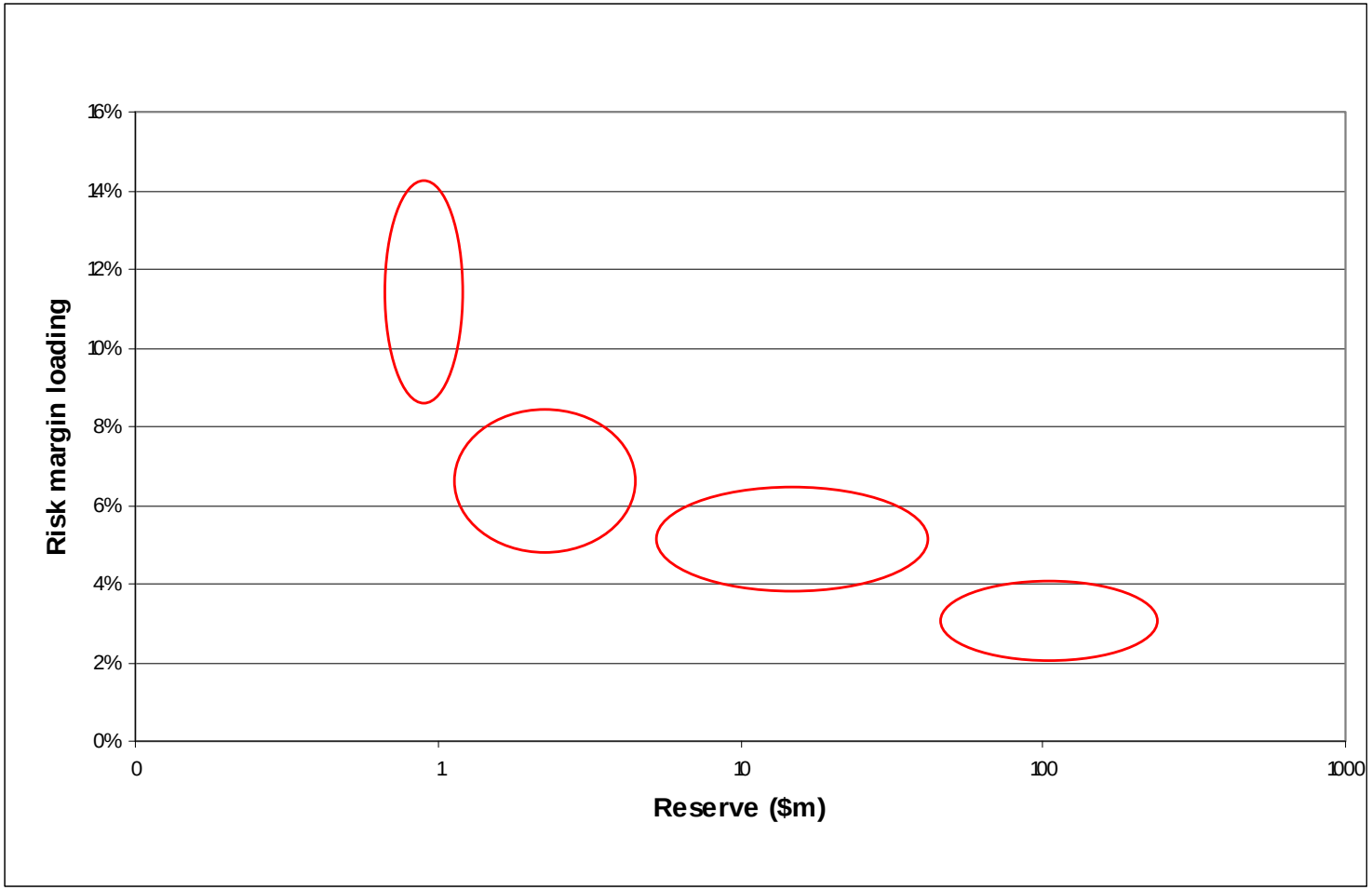
11. Overall weightings adopted between PCL and trend line



Our approach (cont.)

12. Calculate central estimate reserve:
    - At all historic valuations
    - For all insurers
    - Using the standard weightings
13. Calculate the percentage errors
    - Between projected reserve at each valuation for each insurer, and
    - Eventual outcome of the actual reserve required
14. Assess the loadings required to give a 75% confidence level

14. Calculated OSC risk margins at 75% PoA



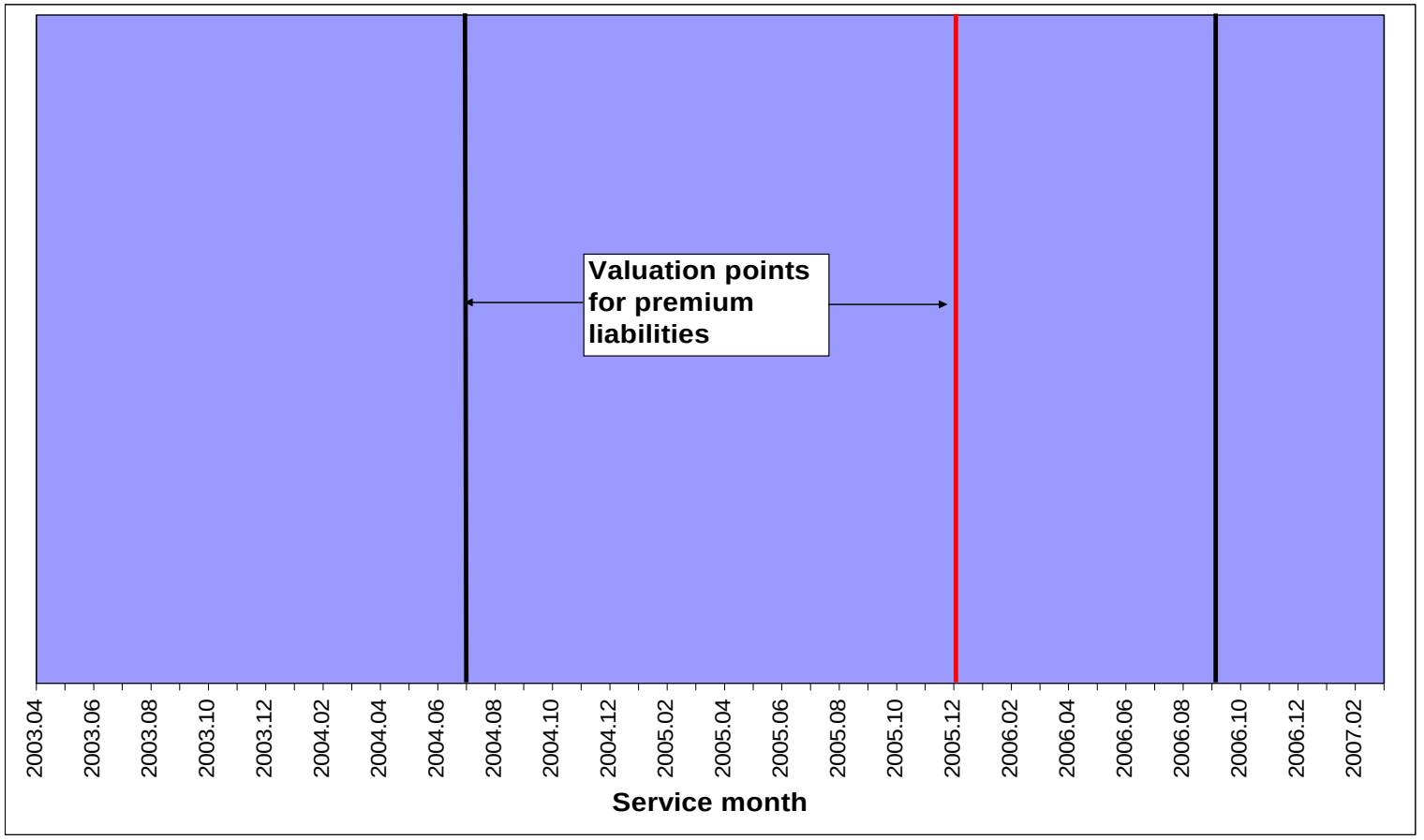
Benchmark OSC risk margins at 75% PoA

Outstanding claims central estimate	Benchmark risk margin	Tillinghast paper - short tail
< $1.5m	8% - 14%	20% - 30%
$1.5m - $5m	5% - 8%	20% - 30%
$5m - $50m	4% - 5.5%	8.0% - 18.5%
> $50m	2% - 3.5%	5.5% -13.2%

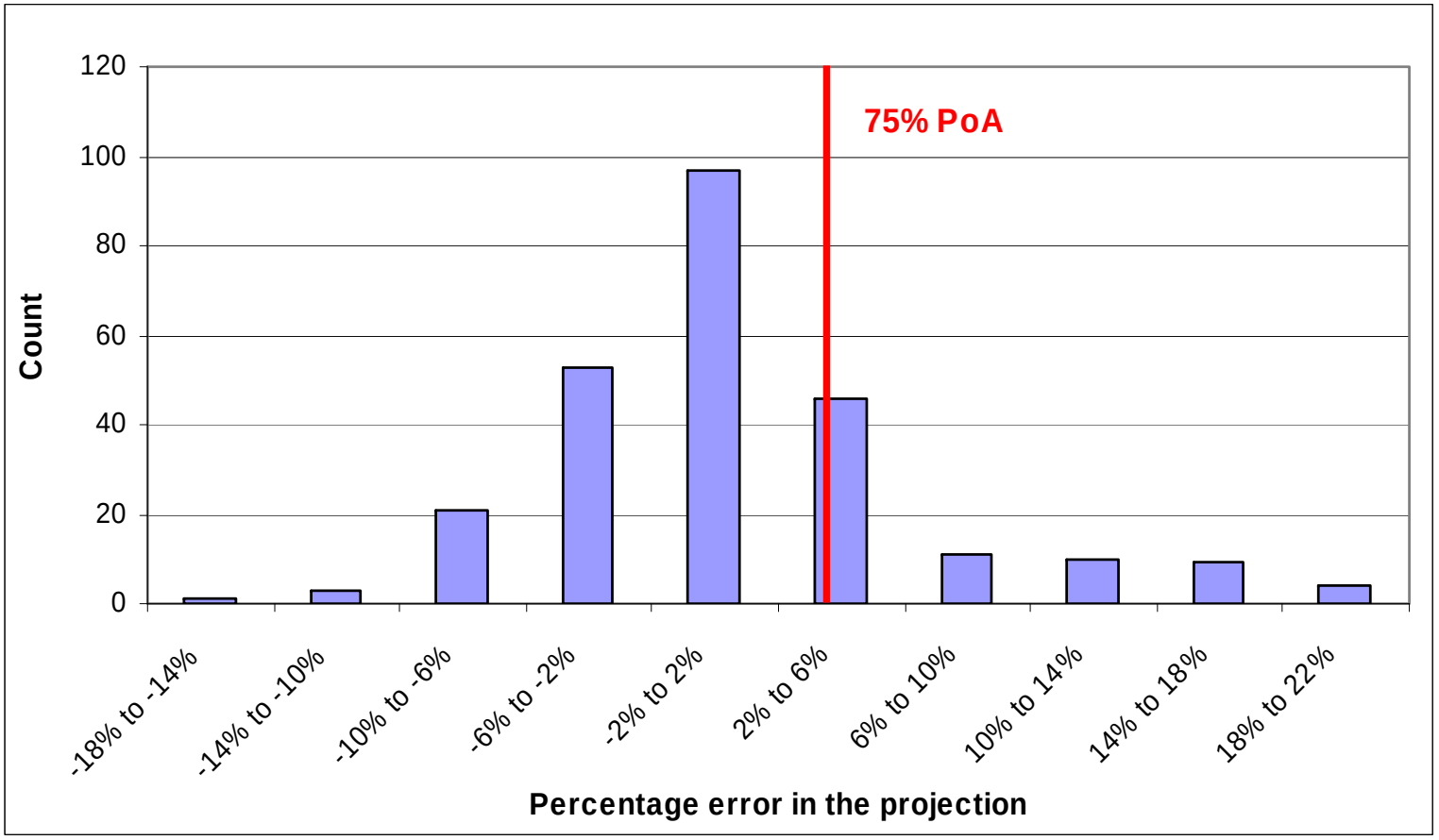
Liability Adequacy Test

- AASB1023
- Industry interpretation
- Have only assessed for June balance dates
- Same data used as for OSC (minus 1 fund)
- Fewer valuation dates
- No benchmarks by size

Data available for premium liabilities risk margin assessment



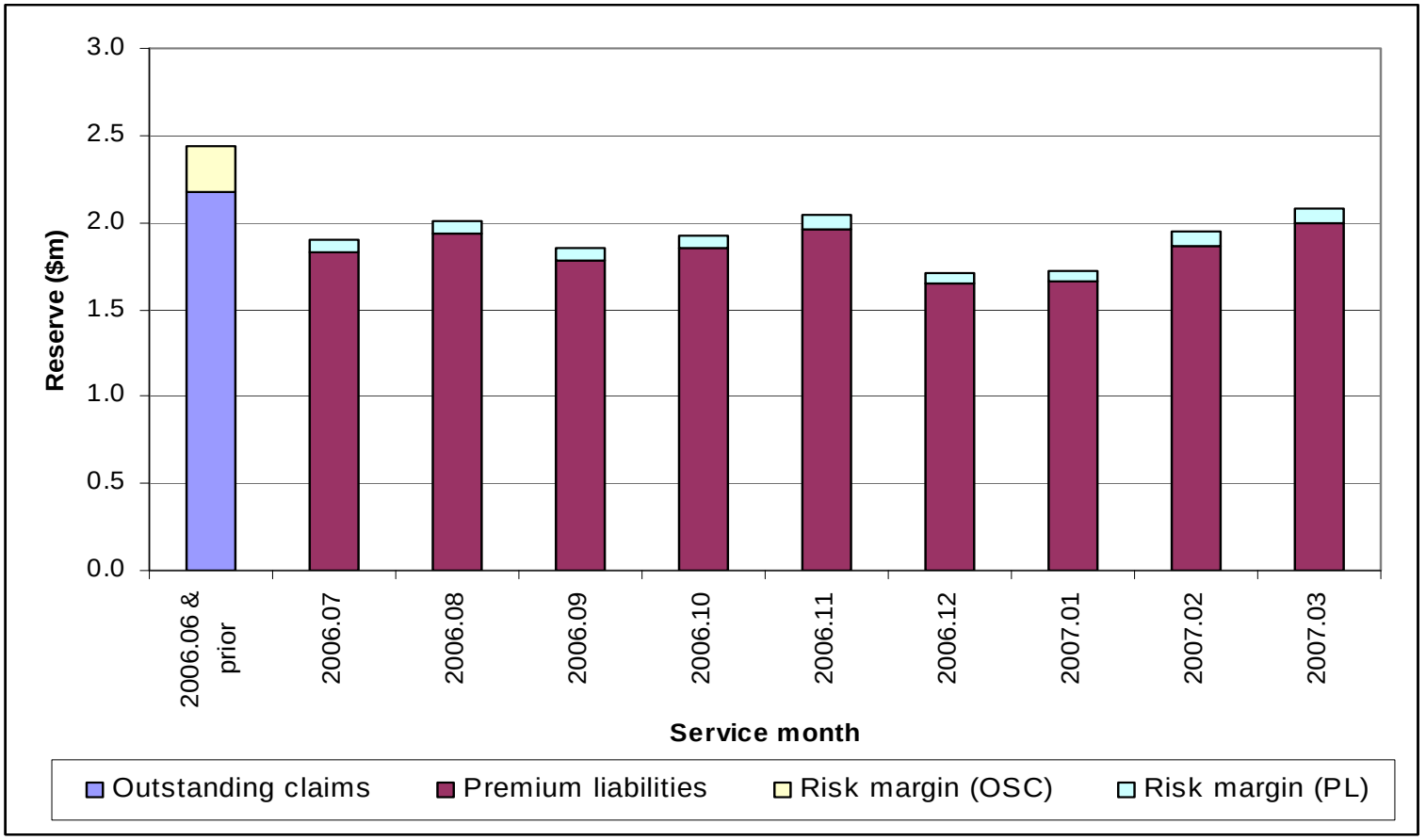
Percentage errors in the 9-month future projections for premium liabilities



75% PoA for LAT

- Calculated across all funds of 2.8%
- This would vary significantly by size of central estimate (and other factors)
- Likely to be lower than the risk margin percentage for OSC
  - Volatility due to size
  - Trend accurate as %age of ultimate liability, but less accurate as a %age of the OSC component only

Indication of reserve proportions (for a 2006.06 valuation date)



Limitations

- Probability of sufficiency
- Data limitations
- Not assessed by type of claim
- Confidentiality restrictions
- Using the benchmarks with other methods for assessing the central estimate
- LAT benchmarks need further analysis /data

Summary

- Ultimate liabilities are very predictable
- However, the monthly payment pattern is not
- Our approach takes account of the ultimate liability stability
- Risk margins are significantly lower than for short-tailed general insurance classes
- At a 75% PoA, our risk margins for outstanding claims vary from 2% - 14% of the central estimate by size of insurer
- As a percentage of the central estimate, risk margins for premium liabilities are lower than for outstanding claims