Actuaries and Underwriters - a Rose War?

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IUMI ZURICH 2010
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WARS OF ROSES??

- A civil war (House of York versus Lancaster)
- A war finished a long time ago (1487)
- Red and white roses symbols of the parties
- Partly caused by the King’s periodical insanity
- Some friends portrayed as more annoying than enemies (Edmund Blackadder)
- A distant relative of one part brought an end to the war (Henry Tudor)

IUMI ROSE WAR?

- A civil war
- A war finished ~~a long time ago~~
- Red and white rose a symbol of IUMI
- Partly caused by the UW's periodical insanity
- Some friends portrayed as more annoying than enemies (Actuaries)
- A distant relative of one part brought an end to the war (Bill Gates)

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WHY SPEND 1 OF 15 MINUTES ON THE ABOVE?

Insignificant arguments:

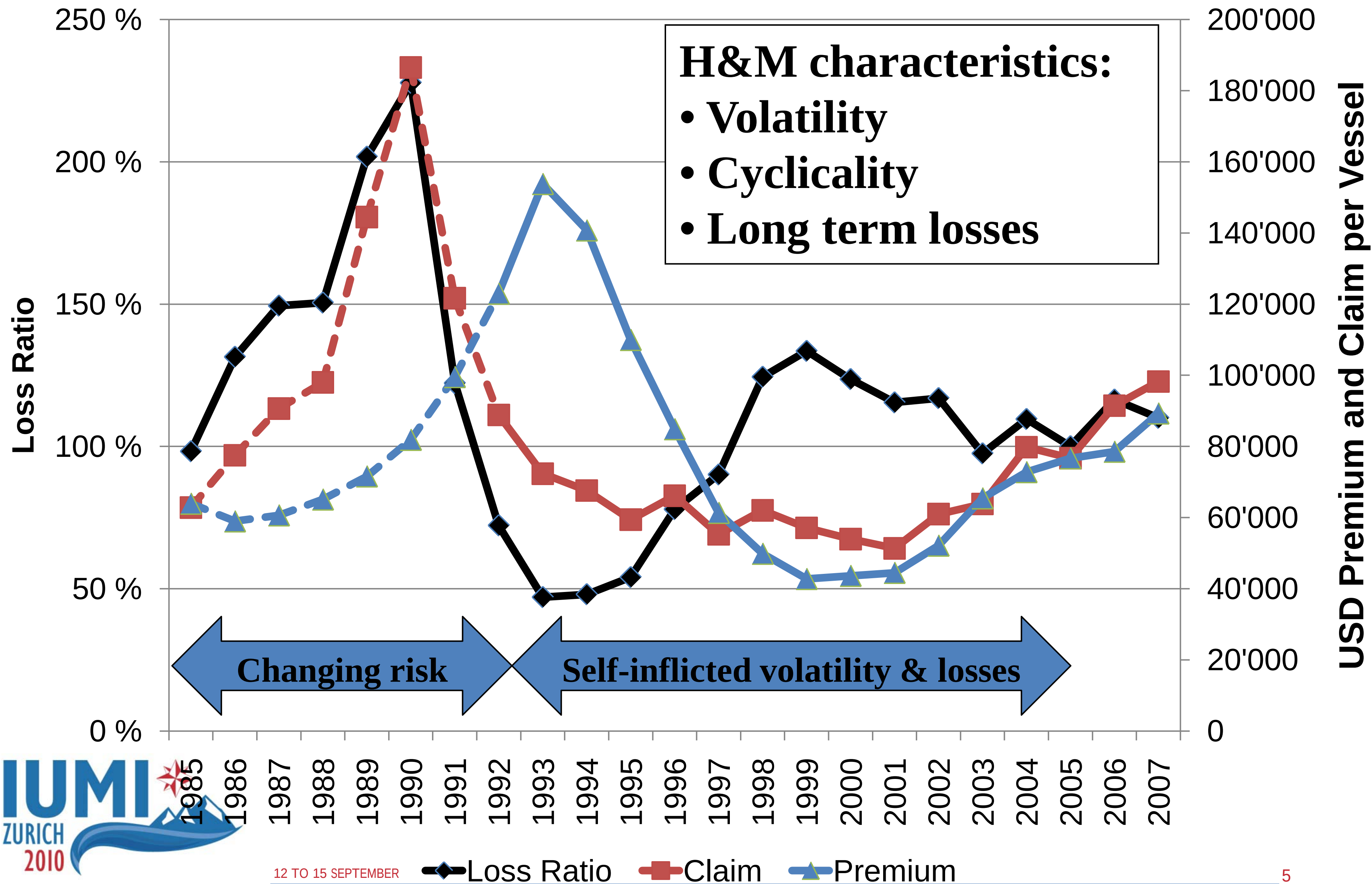
- To honour the title of the session
- When 1 against 500 facts are of the essence
- To prove actuarial ignorance of American comedies

Significant argument:

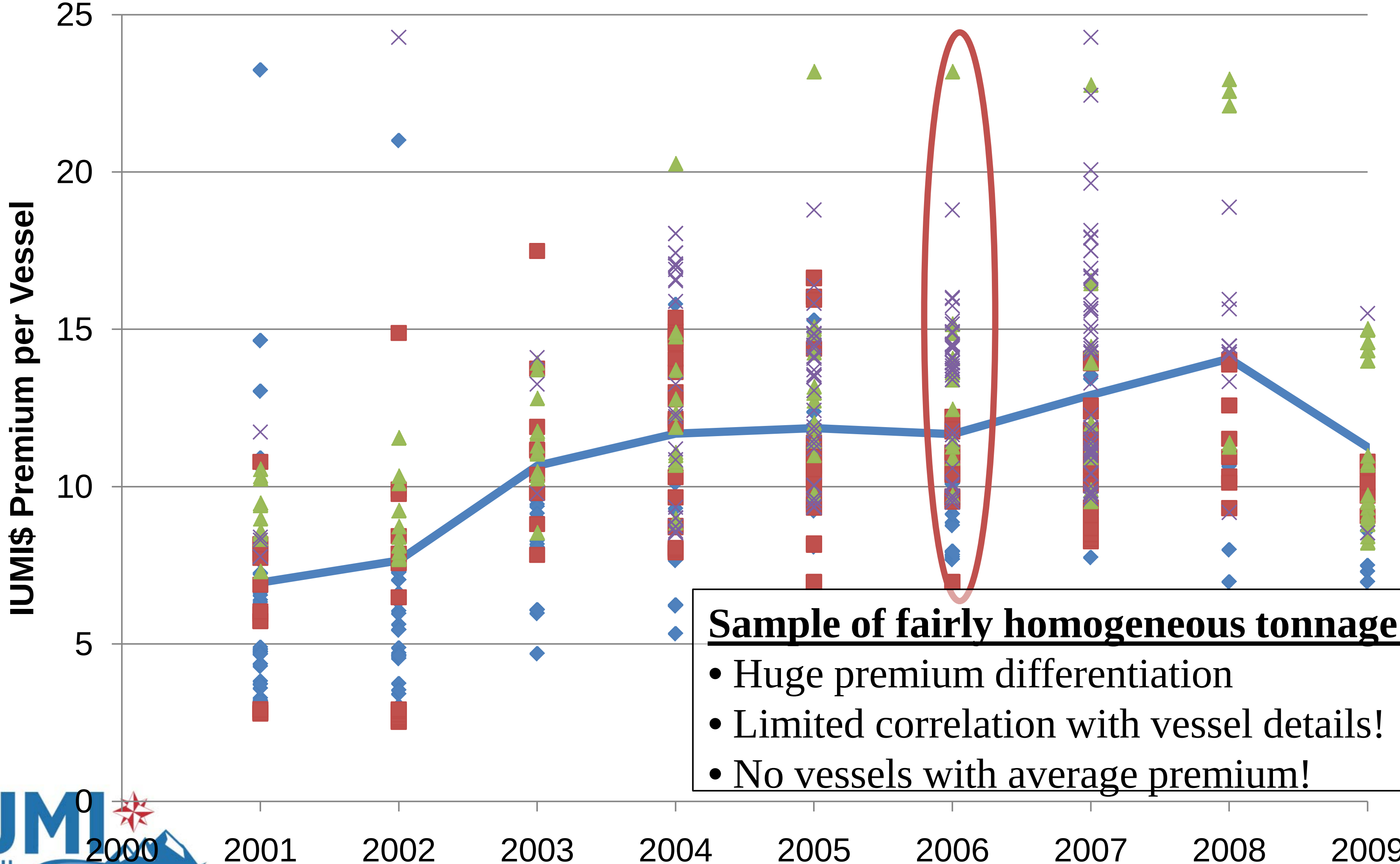
- There is no event for which you can't come up with a plausible explanation in hindsight…

  Why refer to medieval England in the title?
  Why did the stock market drop 1% today?
  Why has client A got a clean record?
  Why has client B got a bad record?
  Most likely: A pure coincidence

HULL & MACHINERY 1985-2007 (Cefor)



PREMIUM FOR 100 VLCCs OF 250-299' DWT



Sample of fairly homogeneous tonnage:

- Huge premium differentiation
- Limited correlation with vessel details!
- No vessels with average premium!

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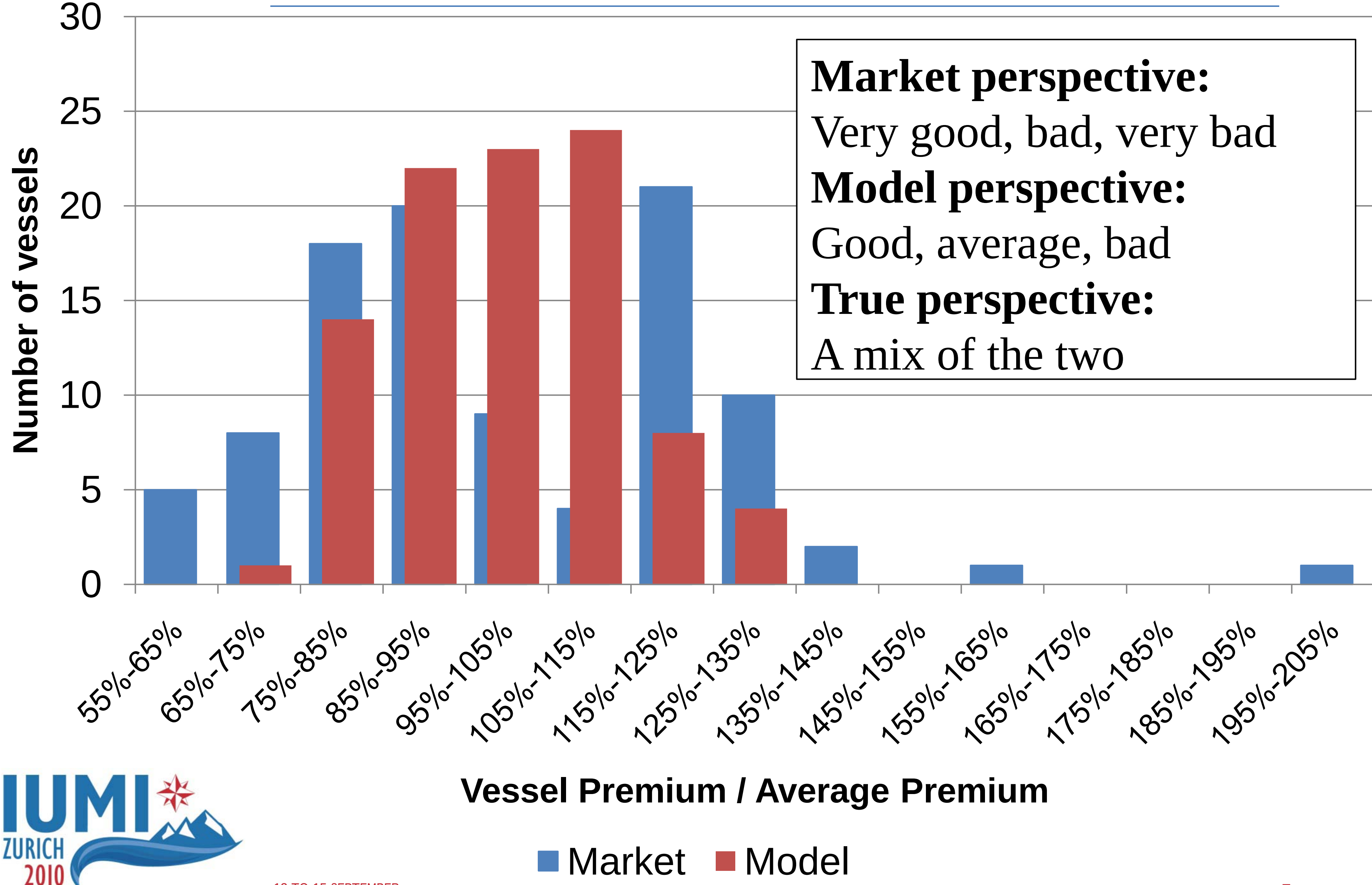
UWY 2006 VLCC Premium Distribution



OBSERVATIONS

- Volatile premium in periods of stable claims
- Long term insufficient premium
- Huge premium differentiation for identical risks!
  "There is no such thing as a VLCC market premium"
- All risks are priced as (very) good or (very) bad!
- *Zurich we have a problem…*

- Who's to blame?
  Actuaries have been less involved in running marine insurance companies than running them off…

VALUABLE BUT CONFLICTING PERSPECTIVES

The Underwriter/Market

- Clients / brokers
  Client claims
  Client profitability
- Gut feelings
- Optimism (or pessimism)
- Dining and w(h)ining

The Actuary/Model

- Portfolios and risks
  Portfolio claims
  Portfolio profitability
- Statistical analysis
- Cynicism
- Nothing to do but work…

GOOD FLEET STATISTICS…

- Do they exist?
  Not even a clean record is necessarily significantly better than average
- As long as a client has no claims the underwriter has limited insight into the client's operations
- As long as a client has no claims the underwriter searches for (and finds) reasons for the good performance and ignore latent risks
- As long as a client has no claims the client might become complacent
- As long as a client has no claims he is able to negotiate a discount
- Fleets with good statistics are not necessarily bad(!); but are seldom as good as they seem and will usually become poorly priced

BAD FLEET STATISTICS...

- Do they exist?
  Yes – the sky is the limit...

- As long as a client has ~~no~~ claims the underwriter has ~~limited~~ insight into the client's operations
- As long as a client has ~~no~~ claims the underwriter searches for (and finds) reasons for the ~~good~~ bad performance and ignore ~~latent risks~~ the rest
- As long as a client has ~~no~~ claims the client might not become complacent (and might learn)
- As long as a client has ~~no~~ claims he is not able to negotiate a discount
- Fleets with bad statistics are not necessarily good, but can be and/or become good

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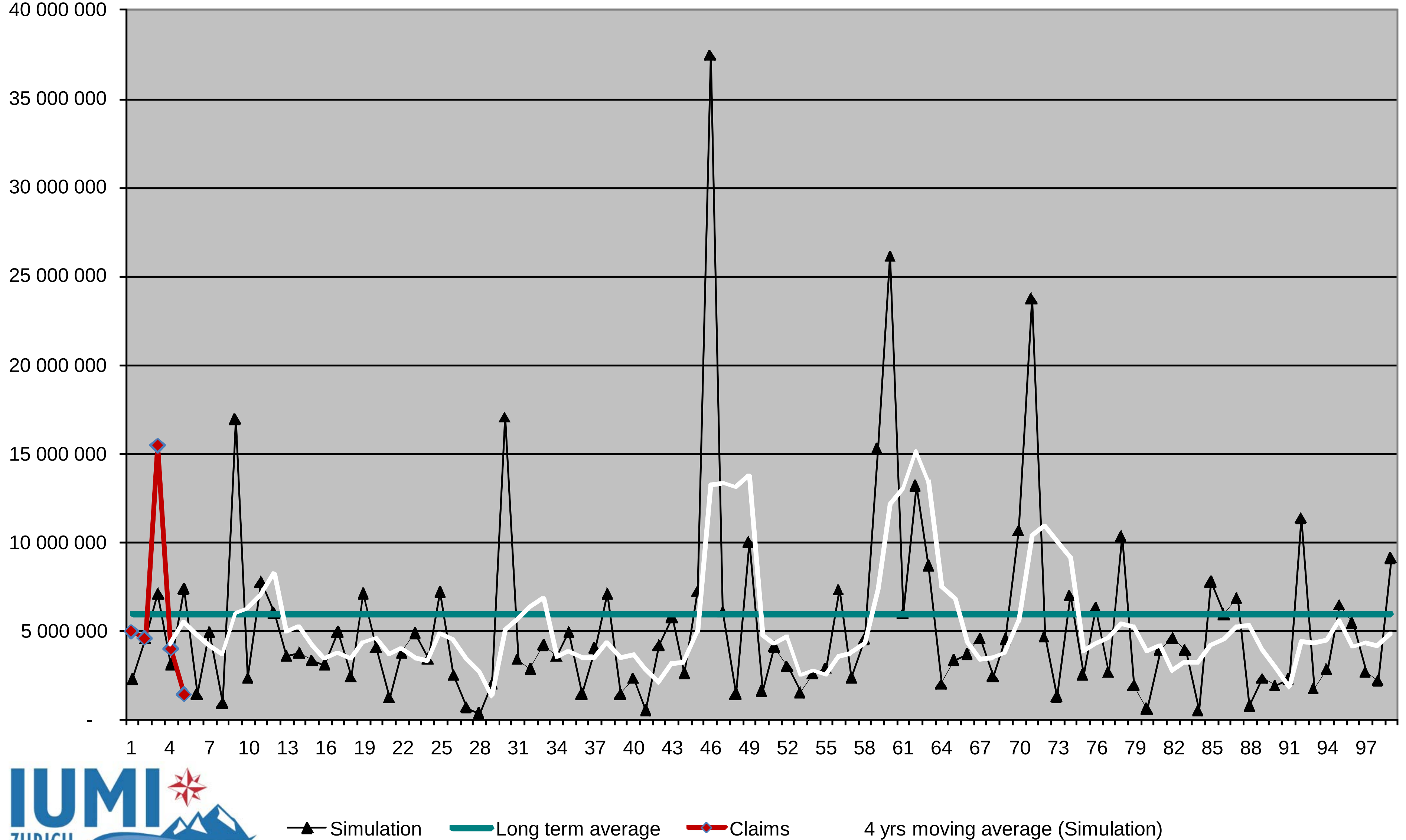
Claim-side of 3-5 years fleet statistics

- Often worthless in a statistical sense
- Make underwriters biased in risk evaluation
- Defies insurance fundamentals: "the burden of the few shall fall lightly on the many"
- Underestimate the risk
  - Skewed loss distribution (heavy tail)
  - IBNR, IBNER, CBNI (long tail)

Premium-side of 3-5 year fleet statistics

- Punish or reward clients for historic mispricing
- Contributes to premium cycles

THE TRUTH, THE WHOLE TRUTH AND NOTHING BUT MONTE CARLO SIMULATIONS*



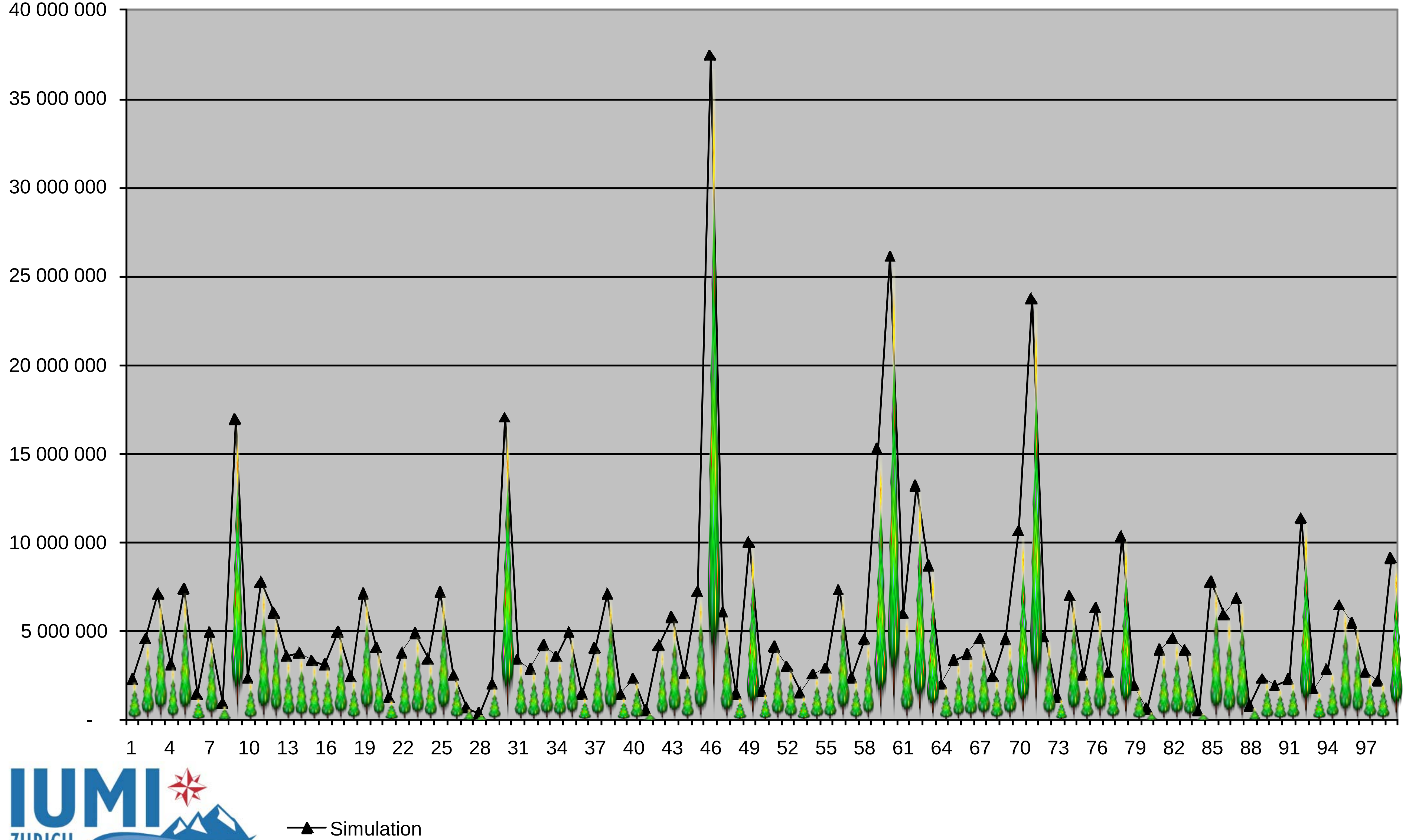
***100 simulated years in an 80 vessel fleet**

LESSONS LEARNED FROM SIMULATIONS (AND LIFE)

- Events within the scope of random variation:
  - Long periods of small claims
  - Short term ”trends”
  - Accumulation of big claims over a few years
- Clients have mostly good records, but sometimes very bad records…
- The typical 4 years average is significantly lower than the long term average
- Stop explaining and “fixing” randomness!

Long term client performance mirrors short time portfolio performance: Seeing the forest rather than trees

SIMULATIONS IN A PORTFOLIO PERSPECTIVE
100 IDENTICAL FLEETS IN ONE YEAR



NOT SEEING THE FOREST FOR TREES...

- Most fleets have good statistics. Avoiding (small) reductions (and bonuses) on ”good clients” has a larger portfolio impact than getting large increases on ”bad clients”
- Lessons learned from big claims should be applied on the entire portfolio, not just the client having had the claim
- Big claims should be compared to the premium of all risks with the potential of similar claims

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PART 1 SUMMARY - in a pre lunch mood

- UW based on gut feelings suffers from:
  - Gastric instability
  - Bulimia

  due to market and fleet statistics bias

- When it comes to underwriting, the proof of the pudding is <u>not</u> in the eating:
  Bad UW decisions do not turn good by profits
  Good UW decisions do not turn bad by losses

- Underwriters need good actuarial tools
  – and actuarial tools need good underwriters

ACTUARIAL TOOLS

Strengths and Weaknesses

Marine (non-cargo) playing field

- Abundance of data from third parties
  - Enables easy analysis
  - Enable non-disclosure of risk factors
- Increasing regulation implies more homogeneous risk within a given trade and vessel type
- Fairly standardised wording
- Short tail (non P&I)
- Fairly high frequency
- Limited accumulation risk
- Severity controlled by sum insured

- A perfect world for actuarial modelling

WHY UNDERWRITERS NEED ACTUARIAL TOOLS

- Common frame of reference
- A far better benchmark than last year's premium or competitors' premium
- Consistent pricing over clients and time
- A clear description of the past (i.e. a model) makes it possible to predict the future
- Done right, its quicker and simpler!
- Valuable tool for portfolio monitoring and management

WHY ACTUARIAL TOOLS NEED GOOD UNDERWRITERS

- Pre selection
  Dangers of extrapolating into atypical portfolio experience (e.g. Cambodian flag etc.)
- Dangers of discounting or loading the premium several times for the same feature (e.g. age)
- Non causal risk factors – never disclose a model! (e.g. ice class)
- Non constant risk factors – never disclose a model! (e.g. value change premium principle)
- “Winners curse” - never disclose a model!

SUMMARY ACTUARIAL TOOLS

- Many marine lines are well suited for actuarial modeling
- Most models requires sensible selection (i.e. underwriting) before considering application
- Most models are not tariffs, but guidance on the minimum price
- *A good model in the hands of a bad underwriter can be worse than a bad model in the hands of a good underwriter!*

- Underwriters need actuarial tools, and actuarial tools need good underwriters!

Further reading:

- ”The failure of current market pricing”
  IUMI presentation 2004
  http://www.iumi.com/index.cfm?id=7199
- Lloyd's List 19. September 2006: "Why good statistics are just a myth"
  http://www.norclub.no/there-is-no-such-thing-as-good-statistics/
- Insurance Day and World Insurance Report 14. April 2008: "Why bad statistics are not a myth”
  http://www.norclub.no/why-bad-statistics-are-not-a-myth/

Appendix: Winner's curse example

Assumptions

- Three companies writing identical, but independent risks (constructed by splitting the Cefor database in three random samples)
- 6 years experience 3200 vessels per company per year
- Pricing based on vessel type only
- Company premium tariff
  = 6 years average pr. vessel type
  (targeting 100% loss ratio)
- Market premium = Minimum tariff
- History repeats itself

RESULTS

	Company A	Company B	Company C	Market	Market/Minimum
Bulk	81 179	**56 327**	56 703	64 710	**115** %
Car/RoRo	111 060	**70 371**	110 921	97 397	**138** %
Cargo	50 481	66 456	**41 741**	53 007	**127** %
Chem./Prod	**49 727**	61 528	61 679	57 739	**116** %
Container	85 498	**74 000**	77 788	79 070	**107** %
Fishing	**34 804**	40 652	44 761	39 956	**115** %
LNG/LPG	125 864	**54 674**	128 450	103 180	**189** %
OBO	**27 067**	36 316	102 177	55 108	**204** %
Other	163 067	119 801	**39 251**	107 741	**274** %
Passenger	161 484	205 588	**159 853**	175 670	**110** %
Suppl/Off	37 327	73 552	**33 184**	47 664	**144** %
Tank	**62 175**	69 863	85 933	72 645	**117** %
Total	**77 315**	**72 823**	**70 416**	**73 518**	**123** %

All companies aim for 100% loss ratio, but as the minimum of the three estimates is applied, the market gets 123%.