C-11: Global Property Risk Pricing: What is a Good Reinsurance Submission in Actuariastan

CARe Seminar, June 1-2, 2015

Philadelphia, PA

John Buchanan, Principal – Excess and Reinsurance, Verisk / ISO

Enrico Biffis, Associate Professor, Imperial College of London

Adam Shrubshall, Vice President Pricing, Tokio Millennium Re Zurich

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C-11: What is a Good Reinsurance Submission in Actuariastan
Session Description

This session will discuss various issues related to pricing Property Risk contracts and explore "What makes a good reinsurance underwriting submission" in the generic country of Actuariastan. The discussion will include a status update from the newly formed joint GIRO-CARe International Reinsurance Pricing Research Working Party. Panelists are drawn from the Working Party, which represents a global cross-section of actuaries, underwriters, and educators.

Moderator / Presenter:
John W. Buchanan, Principal, Excess & Reinsurance, Verisk / ISO
Presenters:
Enrico Biffis, Associate Professor, Imperial College of London
Adam Shrubshall, Vice President Pricing, Tokio Millenium Re Zurich

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C-11: What is a Good Reinsurance Submission in Actuariastan
Agenda – June 1, 2015

- **GIRO-CARe Working Party Formation**
  - Scoping Document
- **Prior Literary Research**
  - Benchmarking Experiences
- **Overview of Survey**
- **Initial Survey Results – CARe**
  - Exposure and Experience
- **Audience Polling**
- **Next Steps**

To the extent there is time, will pause for questions after each of the main sections. Otherwise, will have questions at the end.

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Audience Polling Test

- https://cas.gatherdigital.com

- Why are you at CARe?

  - To escape from work

  - To escape from family

  - To earn CPD points

  - Because I love reinsurance

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GIRO-CARe Working Party Scoping Document

What issue is this research topic trying to address:-	"What makes for a good reinsurance underwriting submission". Will start with Property Risk for 2015 and a generic territory such as "Actuaristan". May investigate various levels of what makes a good submission. For 2016 and beyond, may extend to other property or casualty lines such as e.g. property cat, crop insurance, motor, employers liability, cyber or other emerging issues.
Who will be the audience for this research:- (We need to understand who we believe this research will be of interest to – to ensure we have an end consumer for the research)	Reinsurance and primary pricing practitioners, actuaries, underwriters, brokers or reinsurance purchasers in various global settings depending upon scope of lines and territories.
What do we see as being the output/deliverables of this research:-	Potentially a set of suggestions, guidelines or/or framework possibly including advantages for pricing reinsurance submissions by various methods that can be referred to by interested parties. A White Paper on the topic would potentially be produced and available for usage by any interested parties.
What are the time scales of this research:-	Initially producing discussion documents for 2015 as above, with extensions as noted for future years. Depending upon timing, may include 2015 status presentations at the CARe conference in June (Philadelphia), and the GIRO presentation in October (Liverpool).

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Actuariastan
From the Guidebooks

"Actuaristan has the great misfortune of having uneven water supplies, inferior construction materials, fire department labor reductions, high hazard occupancies set next to schools and hospitals, on multiple hurricane paths, on an undiscovered fault line, wildfires, very subject to droughts from ENSO pattern and climate change, rising sea levels, unstable snowdrifts due to avalanche, doctor/nurse shortage, hotbed of cyber piracy, driverless cars and drones all over the place, you name it.

Just a place where risk prone actuaries love to vacation!"

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GIRO / CARe Working Party – Property Risk in Actuariastan
"What Makes for a Good Underwriting Submission" - Outline

1. Levels of "Goodness"
   – Acceptable
   – Good
   – Preferred
2. Types of Submissions
   – Individual Exposures - Recommended
   – Banded Limit Profiles
   – Banded Attachment / Limit Profiles (US, some other countries)
3. Amount of Insurance
   – What does it really represent
   – MPL, PML, MFL, average location, top/largest location, key location…
   – Shares of excess policies
   – Ventilated layering
   – Historical profiles
4. Large claim information
   – Above certain thresholds, cat/non-cat indicators
   – FPA's; other sources
5. Link of AOI to claims
   – Necessary for testing / validating size-of-loss scales
   – ECO / XPL claims / PML Bust claims

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6. Occupancy
   – Definitions
   – SIC, NAICS, ATC, Lloyd's, ISO,…
   – Multi-location / policy / country issues
7. Protections and other COPE characteristics
8. Loss ratio information
   – Cat / non-cat / types of cat loss ratios
9. Price monitors
   – Renewal
   – New policies / definition
10. Benefits to primary / ceding companies (may be embedded in the other sections)
   – Reduced risk margin from better information

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Existing Literature

Most works focus on methodology (experience vs. exposure rating, or integration of the two approaches, in the face of limited data available)
   – Clark (2014). **Basics of Reinsurance Pricing.** *CAS Actuarial Study Note Revised*
   – Desmedt *et al.* (2012). **Experience and exposure rating for property per risk excess of loss reinsurance revisited.** *ASTIN Bulletin.*
   – Buchanan and Angelina (2007). **The Hybrid Reinsurance Pricing Method: A Practitioner's Guide.** *CARe-London (accepted in Variance)*
   – Mata and Verheyen (2005 Spring) **An Improved Method for Experience Rating Reinsurance Treaties using Exposure Rating Techniques.** *CAS Forum*

Some works emphasize importance of exposure info in specific lines
   – Riegel (2010). **On fire exposure rating and the impact of the risk profile type**. *ASTIN Bulletin.*
   – Michaelides *et al.* (1997**). The premium rating of commercial risks**. Working Party on Premium Rating of Commercial Risks, General Insurance Convention, Blackpool.

Recent work linking claims and exposures to understand tail risk in large commercial risks
   – Biffis and Chavez (2014). **Tail risk in commercial property risk.** *Risks.*

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Some recent data projects

- **London market large commercial risks dataset**
  – Lloyd's syndicates, Insurance Intellectual Capital Initiative (IICI), and Imperial College London

- **Asia-Pacific large commercial risks dataset**
  – SCOR, Hiscox, Liberty, Nanyang Business School, and Imperial College London

- **Fire Protection Agencies**
  – Verisk/ISO and Imperial College London

- **LMA Loss & Exposure Data Working Group**
  – Property & Energy, Cargo & Hull data enrichment strategies

- Limited claims data for some geographical regions

- Linking claims and exposures is a challenge

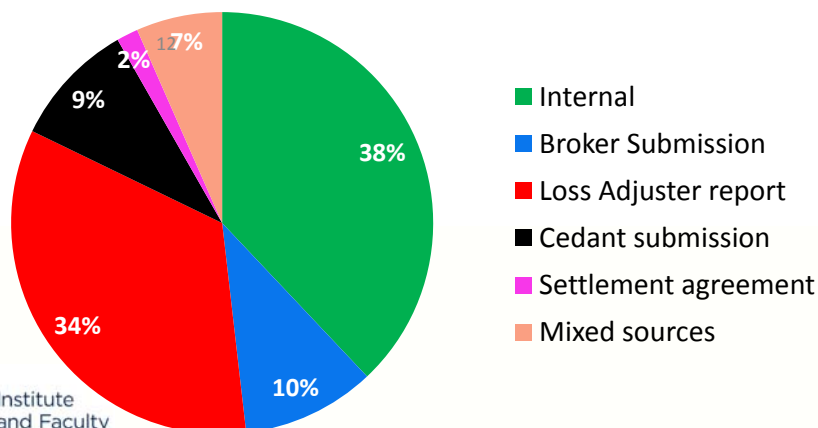- Significant heterogeneity by occupancy type & location

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Example: FGU losses

- **(Re) insurers**
  – FGU loss available through a variety of sources, but often in no systematic way
  – Data sourcing / validation can be a long and costly process

- **London market**
  – FGU loss typically <u>not</u> available via Xchanging

- **Illustration:** Asia-Pacific FGU loss data sources across anonymous contributors

Legend:
- Internal — 38%
- Broker Submission — 10%
- Loss Adjuster report — 34%
- Cedant submission — 9%
- Settlement agreement — 2%
- Mixed sources — 7%

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Example: Occupancy classification

- **IICI data snapshot (anonymized figures)**

    - Claims and exposures inflated to 2014 levels to ensure comparability
    - USD as reference currency, but original currency (Ocy) info available
    - Data validated across contributors (London market overlap rate clearly high)

Policy ID	Claim ID	YoA	Ocy	Region	Country	Lloyd's risk code	Occ1	Occ2	Occ3	FGU	TIV	TSI	Narrative
xxx	yyy	2002	MYR	AS	MY	EF	EON	P	19	USD x,x10,344	USD yy,y37,218	USD v,v52,095	CONTAMINATION OF PROPYLENE FOLLOWING LEAKAGE IN HEAT EXCHANGER

- **Refinements**

    - FGU split into PD, BI, TPL, fees often available
    - TIV information still a challenge (both sourcing and anonymization): band, average, median, min/max, top location, etc.

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Survey

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Overview of Survey

- **Aim to gather information on:**

  – **Current quality of submissions**

  – **What items are commonly provided in a submission?**

  – **What items are not commonly provided in a submission?**

  – **What items are important for pricing?**

  – **What is the effect of poor / good quality submissions on pricing?**

Sample Survey Questions

5. How would you rank the general quality of submissions from risks in the territories that you are familiar with:

	1=Poor	2=Below Average	3=Average	4=Good	5=Excellent
US / Canada	○	○	○	○	○
Europe	○	○	○	○	○
Middle East / Asia	○	○	○	○	○
Latin / South America	○	○	○	○	○
Other (please specify)	○	○	○	○	○

Other (specify from above)

9. Which of the following common items do you usually receive in exposure rating:

	Yes	No	Hardly Ever
a. In-force risk profile (banded)	○	○	○
b. Historic risk profiles (banded)	○	○	○
c. Individual risk listing (all cat/non-cat exposures)	○	○	○
d. Individual risk listing (above certain threshold)	○	○	○
e. Historic from ground up loss ratios (cat and non-cat)	○	○	○
f. Written explanation of risk profile (e.g. how is amount of insured defined, what is meant by a risk, usage of fac, etc.)	○	○	○
g. Risk profile detail (occupancy type, protections including sprinkler, shares/syndication layering, coinsurance, etc.)	○	○	○
h. Link of claims to risk profiles	○	○	○

Other (please specify)

[   ]

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10. Order the following items **that you would like to receive** in exposure rating in terms of use in pricing (1=most important, 9=least):

▼	a. In-force risk profile (banded)
▼	b. Historic risk profiles (banded)
▼	c. Individual risk listing (all cat/non-cat exposures)
▼	d. Individual risk listing (above certain threshold)
▼	e. Historic from ground up loss ratios (cat and non-cat)
▼	f. Written explanation of risk profile (e.g. how is amount of insured defined, what is meant by a risk, usage of fac, etc.)
▼	g. Risk profile detail (occupancy type, protections including sprinkler, shares/syndication layering, coinsurance, etc.)
▼	h. Link of claims to risk profiles
▼	Other (specify in Q13)

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11. Which of the following common items do you usually receive in experience rating:

	Yes	No	Occasionally
a. Large loss listing (no triangle)	○	○	○
b. Historic large loss listing (triangle)	○	○	○
c. Large loss claim description including cat/non-cat indicator	○	○	○
d. Historic premium	○	○	○
e. Historic exposures (# of risks, # of exposures / risk)	○	○	○
f. Projected rate change	○	○	○
g. Historic rate change	○	○	○
h. Rate monitor (renewal policies)	○	○	○

Other (please specify)

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12. Order the following items that you would like to receive in experience rating in terms of use in pricing (1=most, 9=least):

▼	a. Large loss listing (no triangle)
▼	b. Historic large loss listing (triangle)
▼	c. Large loss claim description including cat/non-cat indicator
▼	d. Historic premium
▼	e. Historic exposures (# of risks, # of exposures / risk)
▼	f. Projected rate change
▼	g. Historic rate change
▼	h. Rate monitor (renewal policies)
▼	Other (specify in Q13)

Slide 21

14. What do you do when exposure based pricing information is not provided or insufficient?

○ No rating

○ Pure experience rating

○ Experience + extrapolation

○ Experience + benchmarks

○ Experience + judgement

○ Other (please specify)

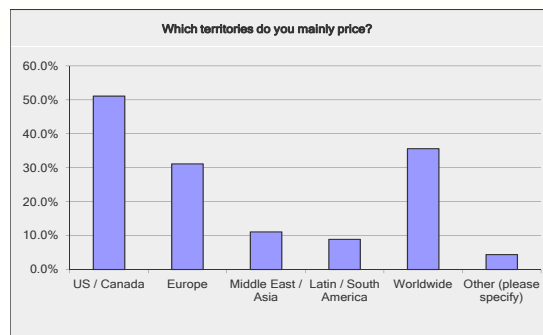Institute and Faculty of Actuaries

Slide 22

Participation

- 44 responses – 86% Actuary, 14% Other (Actuary Turned UW, UW Turned Actuary, CRO)

What actuarial or underwriting organization do you belong to (if any)?

Which territories do you mainly price?

How many years have you been pricing reinsurance?

- 0-2
- 2-5
- 5-10
- 10-20
- 20+
- Other (please specify)

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Submission Quality

How would you rank the general quality of submissions from risks in the territories that you are familiar with:
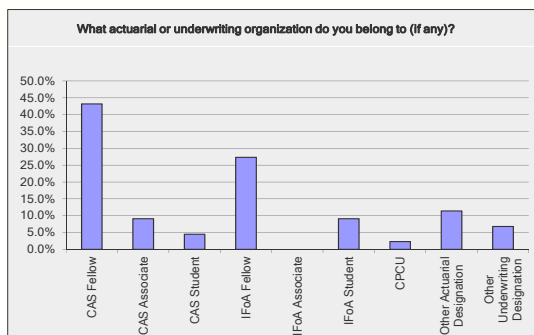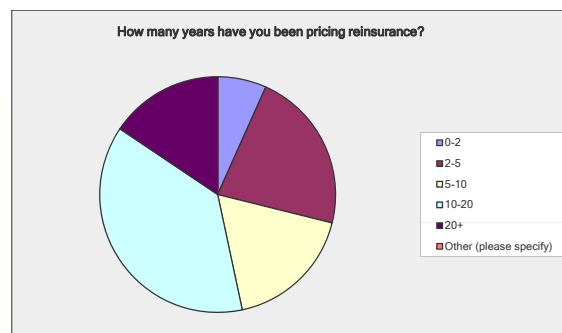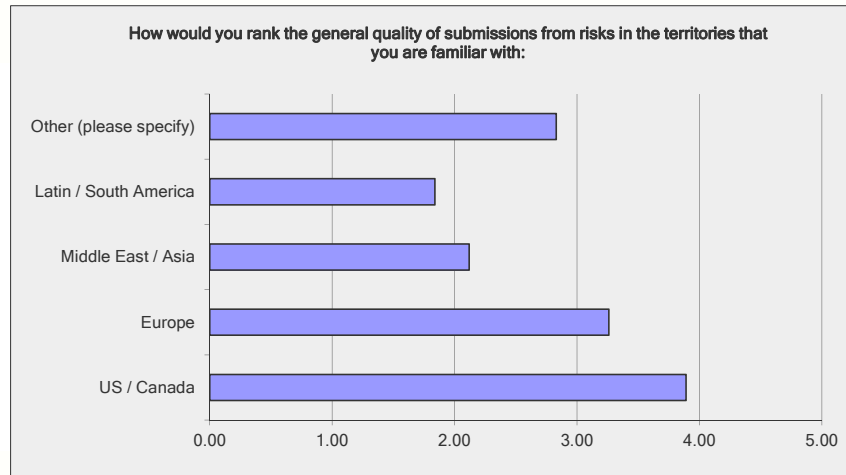
- **UK vs Europe?**
- **Australia?**
- **Ceding company size?**
- **Broker sophistication?**
- **Market cycle – provide only what you have to?**

Submission Quality - Exposure

Which of the following common items do you usually receive in exposure rating:

Answer Options	Yes	Desired Rank	No	Hardly Ever
a. In-force risk profile (banded)	41	1	0	3
b. Historic risk profiles (banded)	10	5	9	25
c. Individual risk listing (all cat/non-cat exposures)	13	3	8	22
d. Individual risk listing (above certain threshold)	21	7	7	14
e. Historic from ground up loss ratios (cat and non-cat)	25	2	5	14
f. Written explanation of risk profile (e.g. how is amount of insured defined,	11	4	11	22
g. Risk profile detail (occupancy type, protections including sprinkler,	15	6	11	18
h. Link of claims to risk profiles	3	8	22	19

Order the following items that you would like to receive in exposure rating in terms of use in pricing (1=most

- **What about on request?**

- **How often do you request extra items?**

- **Other items:**
  - **Historic prices**
  - **Inuring RI**
  - **Lead reinsurers**
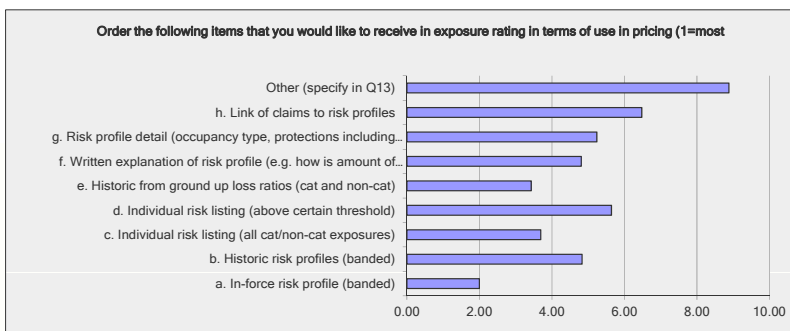
Exposure Info – More Detail

Answer Options	Yes - qualitatively	Yes - direct quantitative impact	No	
Does having historical profiles affect how much you rely on historic claims experience?	22	14	6	23% receive
Does a written explanation of the risk profile construction affect your pricing?	20	15	7	25% receive
Does risk profile detail (occupancy type, protection measures, excess layers, first loss, coinsurance etc.) affect your pricing?	15	21	6	34% receive

- **80-90% say these items impact the pricing in some way**

- **Only 1/3 or less say they normally receive these items**

- **Do cedants know this?**

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Exposure Info – More Detail

What do you do when exposure based pricing information is not provided or insufficient?

- No rating
- Pure experience rating
- Experience + extrapolation
- Experience + benchmarks
- Experience + judgement
- Other (please specify or explain above more fully)
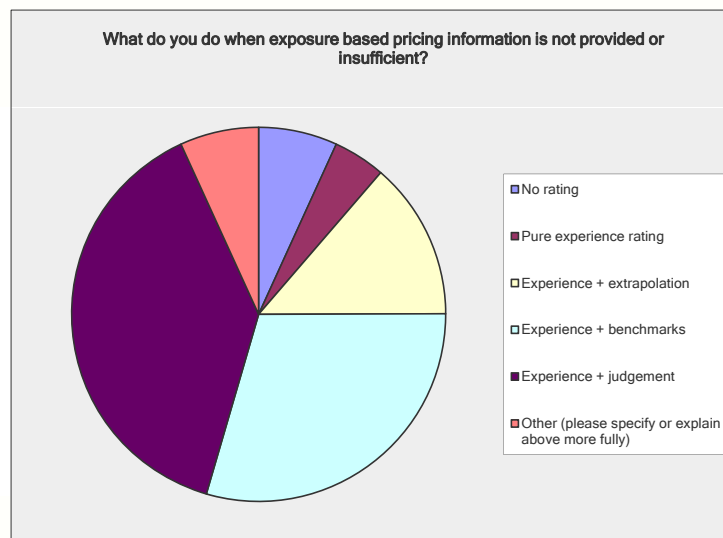
- **Comments?**
- **Is there deliberate caution when no exposure data provided?**

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Submission Quality - Experience

Which of the following common items do you usually receive in experience rating:				
Answer Options	**Yes**	**Desired Rank**	**No**	**Hardley Ever**
a. Large loss listing (no triangle)	44	1	0	0
b. Historic large loss listing (triangle)	13	3	8	23
c. Large loss claim description including cat/non-cat	36	4	1	7
d. Historic premium	41	2	0	3
e. Historic exposures (# of risks, # of exposures / risk)	13	6	9	22
f. Projected rate change	19	7	8	17
g. Historic rate change	26	5	3	15
h. Rate monitor (renewal policies)	8	8	11	25

- **What about on request?**

- **How often do you request extra items?**

- **Other items:**
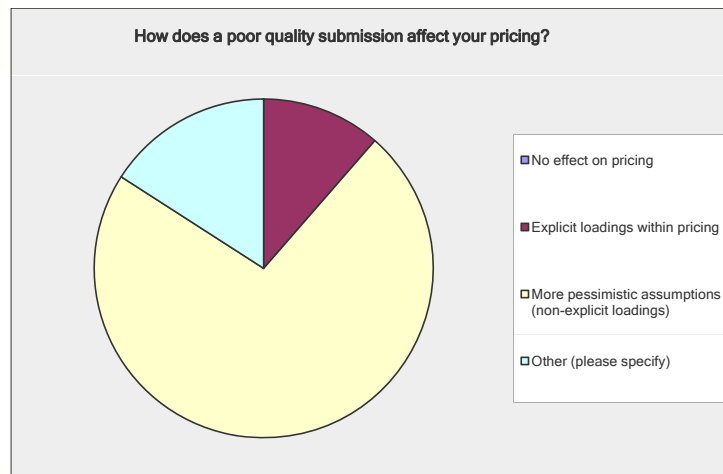 - **Historic prices**
  - **Inuring RI**
  - **Lead reinsurers**

Order the following items that you would like to receive in experience rating in terms of use in pricin

- Other (specify in Q13)
- h. Rate monitor (renewal policies)
- g. Historic rate change
- f. Projected rate change
- e. Historic exposures (# of risks, # of exposures / risk)
- d. Historic premium
- c. Large loss claim description including cat/non-cat indicator
- b. Historic large loss listing (triangle)
- a. Large loss listing (no triangle)

(0.00, 2.00, 4.00, 6.00, 8.00, 10.00)

Submission Quality – Impact on Price

How does a poor quality submission affect your pricing?

- No effect on pricing
- Explicit loadings within pricing
- More pessimistic assumptions (non-explicit loadings)
- Other (please specify)

- **Other:**
  - **Mixture of above**
  - **No pricing performed**
  - **More uncertainty in communication of pricing**

Submission Quality – Impact on Price

How does an excellent submission affect your pricing?

- No effect on pricing
- Below normal margin requirements
- More optimistic assumptions (non-explicit benefits to price)
- Other (please specify)
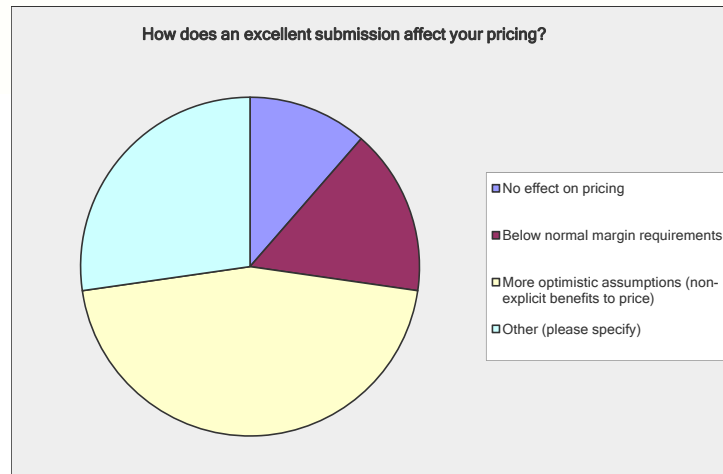
- **Other:**
  - **Tailor to cedant (not benchmarked), might not be more optimistic**
  - **Adds to cedant credibility**
  - **Insights for further discussion**
  - **More confidence in pricing**
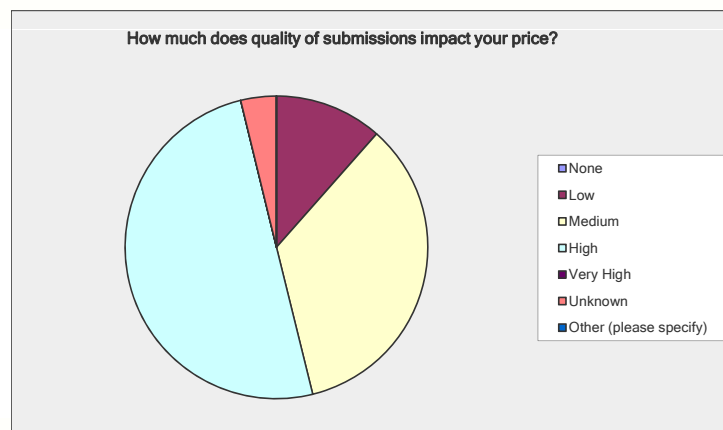 - **More credit to what cedant believes (trends etc.)**

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Submission Quality – Impact on Price

How much does quality of submissions impact your price?

- None
- Low
- Medium
- High
- Very High
- Unknown
- Other (please specify)

- **Is there a relationship between submission quality and price level or does the quality just affect the price but can't say whether higher or lower?**

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Summary

- **Submission quality impacts price**

- **Key information is often not provided in submissions (at least as standard)**

- **Why is this?**

- **Are we partly responsible for submission quality?**

- **=> Audience Polling?**

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Audience Polling

Questions

- Why do we not have standard submission guidelines in the market?

- Do cedants generally understand what makes a good submission?

- Why do you believe submissions are not always perfect?

- What do you initially do when submission is poor?

- What do you initially do when submission is good but not perfect?

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What's next?

- What would you like to see as outcome of the working party?

- Which lines of business should the working party cover next?

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Questions

Speaker Bios