

International Reinsurance: An American Perspective

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Agenda

- Differences in culture and actuarial practice
- Excess of Loss Pricing:
 - Different perspectives
 - Approaches for blending experience and exposure indications
- European Motor and Casualty
 - General differences between US & European casualty business
 - Reinsurance treaty indexation provisions
 - European motor overview
 - Unique issues concerning UK motor
- Summary of Lessons Learned

Importance of Exposure to International Markets

My History

- St. Paul Re
 - NY based international department
 - International Credit and Surety pricing
 - Model development
- Risk Capital Re (Arch): International aviation and marine books
- GE Employers Re: Moving toward common rating models
- Endurance
 - Internal audits
 - Managing London pricing actuaries
 - New offices in Zurich and Singapore
 - Actuarial and underwriting growing pains
 - Rebuilding pricing models
 - Reserving
 - Singapore Reserve Opinion: Provision for Adverse Deviation
 - UK & Bermuda: Solvency II best efforts Technical Provision

Making a good first impression on my international colleagues...



Cultural Differences

- Knowledge of languages.
 - American actuaries need to learn to love Google translator.
- Roles of account managers, underwriters and actuaries – varies quite a bit by company too.
- Account management approach “a mutual fund strategy”.
- Underwriting and Claims audits are extremely rare outside the US.
- Actuarial training (I’m not an expert on worldwide actuarial training)
 - CAS provides more specific property & casualty training than any society in the world.
 - Some international actuaries take US exams.
 - In some countries exams are not required, requirements are fulfilled via university training and work experience.
 - UK exams are rigorous but not solely focused on property & casualty
 - European actuaries tend to have stronger math, language, and programming backgrounds. Some are less practical and business focused than US actuaries.

Differences in Actuarial Practice: US Line of Business/Parameter Studies

- Available Data
 - ISO trend circulars and reinsurance package.
 - NCCI data for workers comp.
 - D&O Security Class Action – Cornerstone Research, NERA, Stanford, etc.
 - US Statutory statement data services, such as SNL.
 - CIAB, Marketscout, & ISO Marketwatch rate change projections and commentary.
 - Investor Relations Websites – Allstate (Homeowners & Auto frequency & severity trends).
 - Reinsurance submission data.
- Endurance US studies – Other US reinsurers do similar work.
 - Review of underwriting, claims & other qualitative issues impacting a line of business.
 - Determining default rate changes based on client and industry data.
 - Review of frequency & severity trends based on ISO, NCCI and other outside data.
 - Testing of selected trends versus industry and client loss ratios.
 - Projecting loss ratios by sub-segment – identify better and worse areas.
 - Test exposure rating curves by comparing to excess of loss experience.

Differences in Actuarial Practice

International Line of Business/Parameter Studies

- Challenges
 - No real equivalent to ISO and NCCI.
 - Data sources similar to those that access US statutory data are generally not available.
 - Industry exposure/ILF curves are usually not available.
 - Deal with multiple country/line of business combinations – biggest challenge.
- Typical approach
 - “The US approach is a far more stable and reproducible method.” European actuaries are more comfortable treating pricing as more of an art than a science – partly due to necessity.
 - Have default severity trends for property, sometimes add social inflation for liability.
 - May have default rate changes by line of business.
 - Frequency Trend: Less likely to analyze this issue, may use stabilization factors that combine rate change and frequency trend.
 - Exposure/Market Curves:
 - Not always available for non-property lines.
 - Can be based on judgment and experience.
 - Curves are often quite old, such as Lloyd’s scales and Swiss Re curves often used for property per risk treaties.

Sources of Data for Business in Europe

- Company Websites: Triangles from many companies (Scor & Partner Re), some publish rate changes by line (Amlin),
- Market reports (Swiss Re, Munich Re, Aon, Carpenter, and Willis)
- Economic data: Eurostat, IMF, OECD
- Insurance Associations: FFSA (French Insurance Association), Insurance Europe (CEA)
- Government Agencies: Transportation departments – auto premium, units, frequency
- Axco
- Reinsurance submission data
- Submission data: common limitations
 - Gross loss data is almost never provided when rating excess of loss treaties.
 - Rate monitoring is rarely available – industry sources are also not as good.
 - Property limit profiles are often poor (i.e. not on a per location basis, can be on PML basis, etc.).
 - Often do not get cat modeling data for per risk excess of loss treaties, and if provided, it is rarely on a location level basis.

Renewal Season Differences

- Reinsurance renewal seasons are insanely hectic during 1/1 renewal season in Europe. Illustrative January 1 renewal season statistics by office:

	Programs Priced	Programs per FTE Actuary	Bound Premium	Bound Premium per Program Priced
US	80	13.5	\$ 150,000,000	\$ 1,875,000
London	63	20.5	\$ 30,000,000	\$ 476,190
Singapore	84	42.0	\$ 26,000,000	\$ 309,524
Zurich	268	45.0	\$ 84,000,000	\$ 313,433

- Impact on underwriting:
 - Need very quick turnaround time on referrals.
 - Expect key issues to be discussed at pre-renewal meetings.
 - Expect actuaries to do pre-pricing.
- Impact on pricing: Limits peer reviews. Attempts not to price business are difficult – brokers want quotes even on small deals.
- Impact on system needs: Quick turnaround time, real time rollups, & strong preference for programmed models versus Excel.

Cultural Differences: What they think of us

European view of US business culture and presentation style

- Directness:
 - “American speakers come to the main point quickly”
 - “The US is known for the use of the executive summary...’just give me the bottom line”
- Informality:
 - “The use of first names is common. Individual from a more formal culture are surprised by the ease with which people use first names with superiors”
 - “Another part of this informality is a tendency to feel comfortable discussing private issues with a variety of individuals”
- Avoid Ambiguity: “Many people in the US see issues in black and white”
- Practicality/logic: “Action-oriented Americans prefer the practical and specific and lack patience with the abstract and general”
- Use of Emotions and Humor: “It is common to show a some anger or pleasure...In addition, Americans use humor often. It is common to begin a speech with a joke.”
- Visual: “Americans generally enjoy presentations with charts, graphs, and other visuals.”

*.The above is per an INSEAD executive education program.

What They Think of Us: A Summary



I'm kidding of course...

Cultural Differences

Tips for Americans dealing with Europeans

- Informality and humor: Most Europeans seem to enjoy this about Americans.
- Ambiguity: You need to show that you are ok dealing with grays. You need to get nuance.
- Europeans presentations often start with background information.
 - “This is the size of the French insurance market, here’s how it is split by line of business, these are some mostly irrelevant changes in French law, etc.”
 - Often feel a need to show academic or subject knowledge before getting to the point.
- They sometimes enjoy debating for sport (especially the French) don’t get offended.
- To gain any credibility, you must demonstrate that you know the specifics of the business under discussion.
 - Analogies to similar situations in the US undermines your credibility.

Excess of Loss Rating Approaches

Standard Excess of Loss Rating Approach – US Approach

- Sample Program: \$1 million xs \$1 million, \$3 million xs \$2 million, \$5 million xs \$5 million.
- Project gross loss ratio to be used in exposure rating.
- Project experience and exposure loss cost (burn) for each layer.
- Weigh experience and exposure loss costs using default credibility weighting approach

	(A)	(B)	(C)	(D)	(E)	(F)
	Limit	Attachment Point	Experience Loss Cost as % of Subj Premium	Exposure Loss Cost as % of Subj Premium	Credibility Weight to Experience	Selected Loss Cost as % of Subj Premium
First Layer	1,000,000	1,000,000	5.0%	6.0%	70.0%	5.3%
Second Layer	3,000,000	2,000,000	3.2%	3.0%	40.0%	3.1%
Third Layer	5,000,000	5,000,000	0.0%	1.5%	20.0%	1.2%

- Advantages:
 - Strong focus on exposure rating
 - Disciplined approach, especially if a default method is selected to weigh experience and exposure loss costs

Standard US Excess of Loss Rating Approach – European Critique

- Less confidence in exposure rating - Europeans often do not have reliable industry exposure curves (esp. Casualty), usually do not get client gross loss ratio data & property limit profiles are often poor (often not location based, PML profiles often provided, etc.)
- Americans treat the layers as if they are completely independent. When selecting the 3x2 layer burn it doesn't matter to them that experience for the other layers is less than the exposure burn.
- American approach can produce loss costs with an illogical shape – see below

	(A)	(B)	(C)	(D)	(E)	(F)	(G) Selected
	Limit	Attachment Point	Experience Loss Cost as % of Subj Premium	Exposure Loss Cost as % of Subj Premium	Credibility Weight to Experience	Selected Loss Cost as % of Subj Premium	Loss Cost as a % of Exposure (Experience Mod)
First Layer	1,000,000	1,000,000	5.0%	6.0%	70.0%	5.3%	88.3%
Second Layer	3,000,000	2,000,000	3.2%	3.0%	40.0%	3.1%	102.7%
Third Layer	5,000,000	5,000,000	0.0%	1.5%	20.0%	1.2%	80.0%

Column F: Selected Loss Cost = Experience x Credibility + Exposure x (1 - Credibility)

Column G: Loss Cost as a % of Exposure = Selected Loss Cost / Exposure Loss Cost

- If the client needed an alternative structure, the actuary would have to re-price everything.
- Since it is not a frequency/severity approach, pricing loss sensitive features (such as profit commissions or annual aggregate deductibles) require additional work.

Typical European Excess of Loss Rating Approach

- Project an average number of claims above the program attachment point (\$1 million) or lower if the data is not sufficiently credible.
- Fit a severity curve to losses in excess of the selected attachment point, consider modifying curve shape based on selections for similar business.
- Use above to simulate losses to selected layers in excess of the attachment point.
- Advantages:
 - Very easy to price alternative structures.
 - Can use above simulation to price loss sensitive features (Profit Commissions, AADs, etc.).
- Critique by US actuaries:
 - Completely ignores the client's exposure (when pricing a \$5 million xs \$5 million layer, isn't it important to reflect what percent of their business has limits above \$5 million?)
 - Experience is usually not sufficient to price middle to high layers, i.e. pricing a layer that the market prices to have a loss once every 10 years with 5 years of data.
 - Ignores industry frequency of large losses.
 - Significant flexibility in selecting curve parameters – can easily back into market price.
 - Curve fitting usually ignores the impact of loss development.

Blending the US and European Approaches – Best of Both Worlds

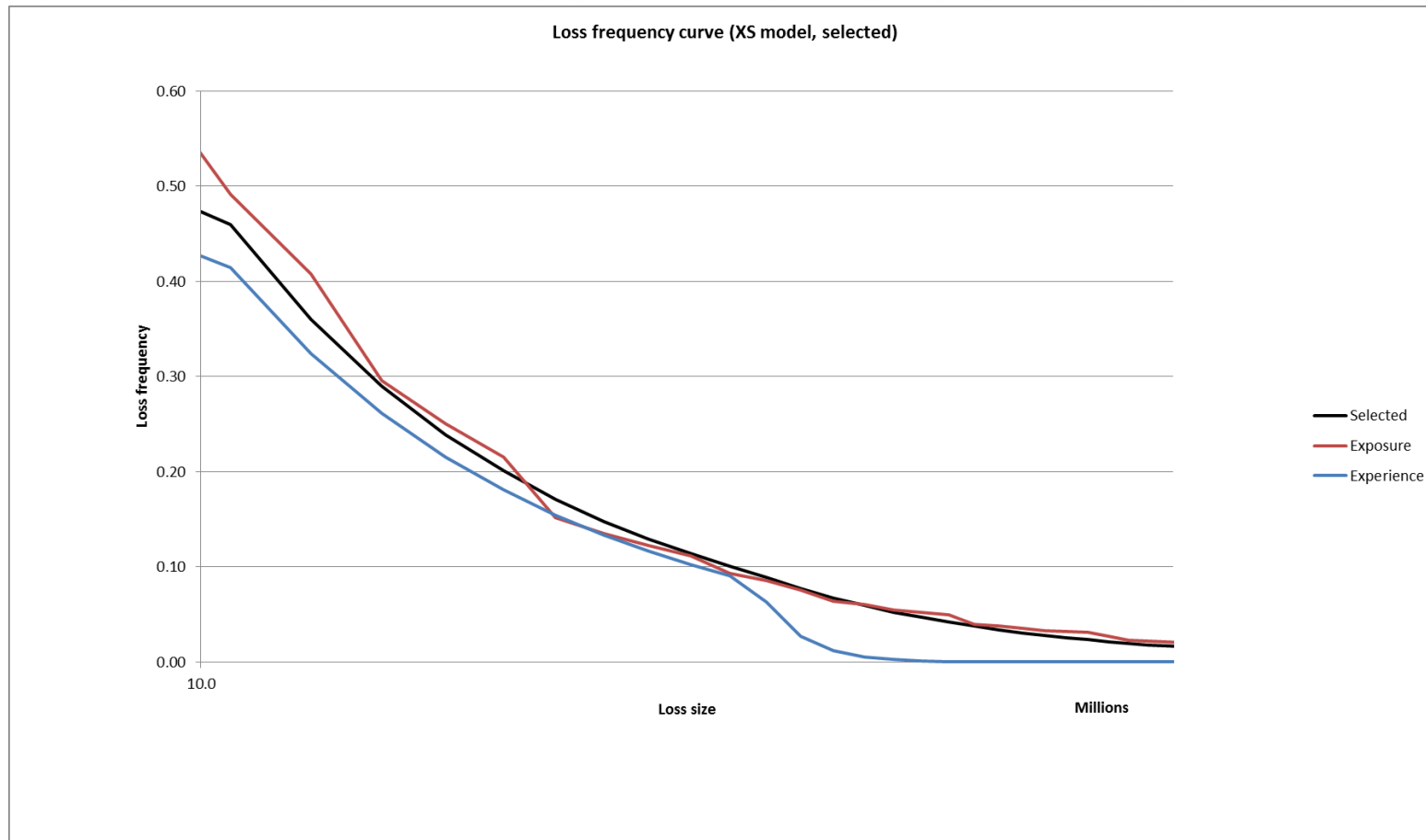
- Exposure rating can be based on the experience of a lower reinsurance layer; so, exposure rating can be done without client gross loss ratios – “**exposure relativity method**”

	(A)	(B)	(C)	(D)	(E)	(F)
	Limit	Attachment Point	Experience Loss Cost as % of Subj Premium	Exposure Loss Cost as % of Subj Premium at a 100% LR	Exposure Loss Cost as % of Base Layer	Exposure Loss Cost Using Experience of Base Layer
Base Layer	500,000	500,000	7.0%	15.0%	100.0%	7.00%
First Layer	1,000,000	1,000,000	5.0%	10.0%	66.7%	4.67%
Second Layer	3,000,000	2,000,000	3.2%	5.0%	33.3%	2.33%
Third Layer	5,000,000	5,000,000	0.0%	2.5%	16.7%	1.17%

Column F: Exposure Loss Cost = Experience for Base Layer x Exposure Loss Cost as a % of Base Layer

- Experience and Exposure rating can be expressed as an excess frequency curve.
 - **Excess Frequency as a % of subject premium excess of \$5 million, equals the loss cost for a \$1 xs \$5,000,000 layer.**
 - Can easily fit curve to interpolate between selected burns (we use a Pareto).
 - Can use a default approach to weigh experience and exposure excess frequency curves.

Blending the US and European Approaches Excess Frequency Perspective



- Could easily add a Pareto or other European style frequency/severity indication to the above.

Blending the US and European Approaches

Advantages and Requirements of Excess Frequency Approach

- Suggestions for smoother application:
 - Experience Rating: Avoid varying weights by year for different layers, i.e. don't pick the five year average for the first layer and the all year average for the next one.
 - Always price the top layer, i.e. do not attempt to extrapolate beyond the indications.
 - Credibility weighting between experience and exposure should not ignore the experience of the prior layer.
 - Suggested approach: "An Alternative Approach to Blending Experience and Exposure Rating Analyses" presented by Michael Caulfield at the 2009 CAS Reinsurance Seminar.
 - Approach blends the experience and exposure relativities (decay) to the prior layer.
- Advantages:
 - Multiple alternatives can be priced quickly.
 - Produces program and contract aggregate distributions and analyzes loss sensitive treaty terms.
- Confessions:
 - US actuaries still mostly using standard experience/exposure blending
 - European actuaries still mostly using frequency/severity method, but are at least doing an exposure rating and considering it in their severity curve selections.

Blending the US and European Approaches

Alternative Credibility Method (per Caulfield presentation)

(A)	(B)	Traditional Credibility Weighting Method					Alternative Method					
		(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	
Limit	Attachment Point	Experience Loss Cost as % of Subj Premium	Exposure Loss Cost as % of Subj Premium	Credibility Weight to Experience	Selected Loss Cost as % of Subj Premium	Selected Loss Cost as a % of Exposure (Experience Mod)	Experience Relativity to Prior Layer	Exposure Relativity to Prior Layer	Selected Relativity to Prior Layer	Selected Loss Cost	Selected Loss Cost as a % of Exposure (Experience Mod)	
First Layer	1,000,000	1,000,000	5.0%	6.0%	70.0%	5.3%	88.3%				5.3%	88.3%
Second Layer	3,000,000	2,000,000	3.2%	3.0%	40.0%	3.1%	102.7%	64.0%	50.0%	55.6%	2.9%	98.2%
Third Layer	5,000,000	5,000,000	0.0%	1.5%	20.0%	1.2%	80.0%	0.0%	50.0%	40.0%	1.2%	78.6%
			8.2%	10.5%		9.6%					9.4%	

Column J: Selected Relativity to Prior Layer = Experience Relativity x Credibility to Exper + Exposure Relativity x (1 - Credibility to Exper)

Column K: Selected Loss Cost = Prior Layer Selected x Selected Relativity to Prior Layer

Column L: Selected Loss Cost as a % of Exposure = Selected Loss Cost / Exposure Loss Cost

- The above method more appropriately considers experience to the prior layer and produces a smoother indication.
- This method can be applied when blending experience and exposure excess frequency curves.

European Motor and Casualty

European Casualty – General Comments

- Liability climate and severities are usually tamer than in the US.
- Coverages can be broader and rates are usually lower.
 - European GTPL (GL) policy coverages may provide, products recall, employers liability, cross liability, and environmental liability on a sudden and accidental basis – however, these exposures do tend to be sub-limited.
 - Some coverages in the US, such as advertising injury are rarely provided.
- Be aware of US exposures.
 - Can be US subsidiaries of foreign companies (IKEA for example).
 - International approach can underprice these exposures and provide overly broad coverage. Most international reinsurance underwriters are careful regarding US exposures.
- Local liability issues can arise. Need local underwriting and claims expertise, or a local partner.
 - Medical malpractice has been an unprofitable and high severity exposure in many countries.
 - In some markets it is still written on an occurrence basis (sometimes in Germany, Austria, and some markets in Central & Eastern Europe).
 - Hospitals present particularly tough exposure, OBGYN particularly.
 - Reinsurance: Sometimes medical malpractice is put into casualty portfolio without providing separate experience.

International Casualty

Dealing with a lack of industry exposure curves

- Typical approach: “experience and guessing”
- Riebesell Curves:
 - $ILF(\text{Limit}) = (\text{Limit} / \text{Base Limit usually 1 mil})^{\alpha}$, where $0.25 \leq \alpha \leq 0.75$
 - If Alpha is 0.25, $ILF(2 \text{ million}) = (2 \text{ mil} / 1 \text{ mil})^{0.25} = 1.19$
 - Usually based on judgment.
- Sometimes develop exposure curves based on excellent work.
- A good approach
 - Start with apriori exposure curve based on judgment or what has been used before.
 - Compare an apriori exposure model output to excess of loss experience over multiple clients & layers.
 - Modify initial curves until a good match is achieved.

International Casualty – Indexation Clauses

- Used for most excess of loss contracts.
- Concept: Adjust treaty attachment points and limits to reflect inflation.
- Typically based on wage inflation.
- Types of Indexation:
 - Full Indexation – from treaty inception.
 - Severe Inflation Clause (SIC) – excess inflation from when the cumulative index reaches a threshold.
 - Franchise – from treaty inception only applies when the index reaches an agreed threshold.
 - All indexation provisions are applied to incremental paid loss.
- How to reflect in pricing:
 - Determine an incremental payout pattern for the layer.
 - Based on estimated future inflation, estimate the value of the index for each point .
 - Calculate weighted average index using the incremental payment streams.
 - Determine effective limit and attachment point by multiplying each by the average index.
 - Price treaty based on the indexed retentions.

International Casualty – Applying an Indexation Clause

	Nominal Layer	Projected Average Index	Effective Layer - Price Treaty Based on these
Limit	3,000,000	1.27	3,821,159
Retention:	2,000,000	1.27	2,547,439

Selected Future Wage Inflation: 4.0%

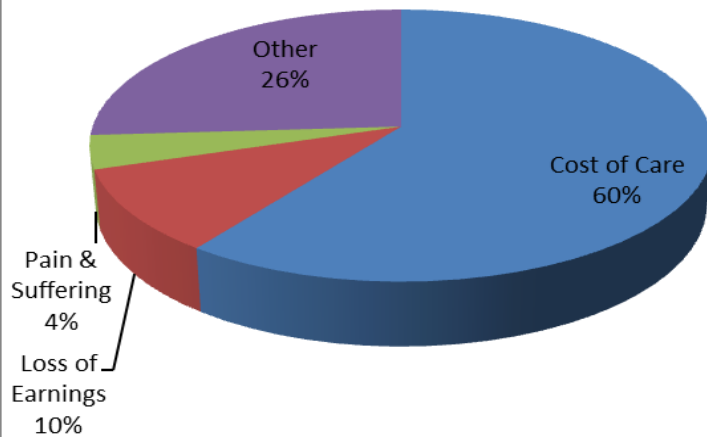
Years from Inception	Cumulative % Paid for Layer	Incremental % Paid to Layer	Full Index	Severe Inflation Clause (10% threshold)	Franchise (10% threshold)	Index Specified in Sample Treaty - Full
1	0.0%	0.0%	1.04	1.00	1.00	1.04
2	5.0%	5.0%	1.08	1.00	1.00	1.08
3	20.0%	15.0%	1.12	1.02	1.12	1.12
4	35.0%	15.0%	1.17	1.07	1.17	1.17
5	45.0%	10.0%	1.22	1.12	1.22	1.22
6	55.0%	10.0%	1.27	1.17	1.27	1.27
7	65.0%	10.0%	1.32	1.22	1.32	1.32
8	80.0%	15.0%	1.37	1.27	1.37	1.37
9	90.0%	10.0%	1.42	1.32	1.42	1.42
10	100.0%	10.0%	1.48	1.38	1.48	1.48
		100.0%	Index Wtd on Inc. Payments to Layer:			1.27

European Motor Overview

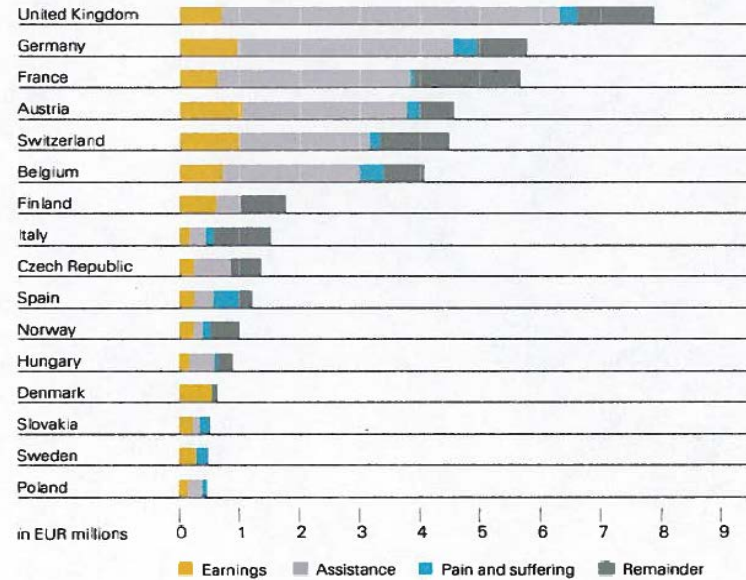
- Typical US Personal Auto Limit – NY: \$25,000/\$50,000 for bodily injury, \$50,000/\$100,00 for death, \$10,000 for property damage liability.
- EU Sixth European Motor Directive: Minimum BI limits of 1.12 million Euros per victim 5.6 million per accident. Effective June 2012.
- Minimum Limits for Select Countries:
 - UK, France, Belgium & Ireland – Bodily injury is unlimited.
 - Germany – 7.5 million Euro for bodily injury, although 15 million Euro is the market standard.
 - Italy: Minimum limits increased from 775,000 to 2.5 million Euros in 2010. Increased again in mid 2012 to 5.6 million Euros.
 - Using experience prior to 2010 or 2012 will likely understate the ceded loss cost for most reinsurance layers.
 - The above situation is also an issue in dealing with exposures in Central & Eastern Europe, where minimum limits have increased dramatically.
 - Green Card Exposure - provides driver with required limits of country visited.
- Reinsurance Limits: Due to the green card exposure & unlimited BI in many countries, the top reinsurance layer is nearly always unlimited throughout Europe.

European Motor Serious Injury Statistics

Approximate Serious Injury Cost Drivers - UK



Estimated 2006 level loss for 30 year old quadriplegic with 2 kids & average income.



- Cost of care refers to home based nursing care. Hospital & physician services are typically provided via nationalized medical plans.
- “Other” costs include costs of adaptation & third party pain and suffering.
- Estimated serious injury losses by country are per a 2007 Swiss Re motor study.
- A recent Scor Re study has the average costs in France surpassing Germany.
- Belgium and Spain are believed to have lower costs due to having a more structured regulations with regard to awarding damages.

European Motor Overview – Key Information by Needed

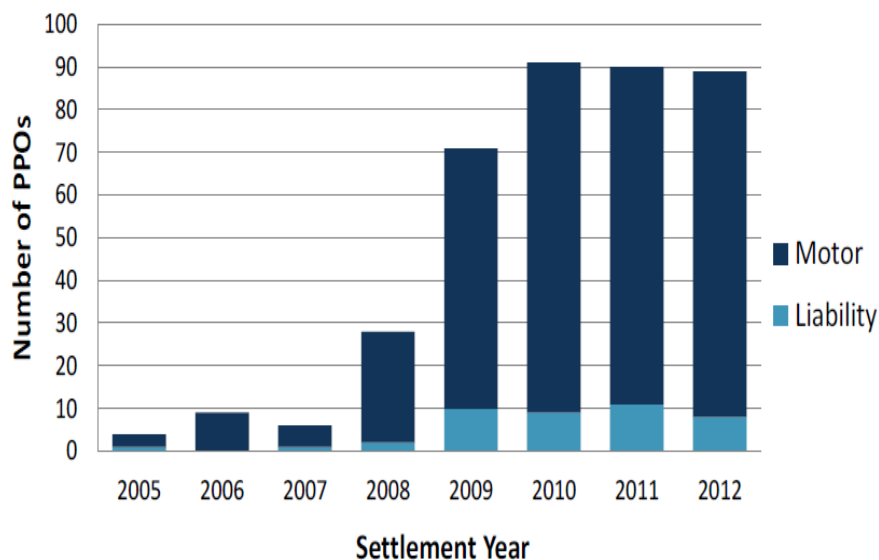
- Claim settlement standard by country: Lump sum, annuity, or a combination.
 - See Scor Re June 2013 Technical Newsletter “Motor Third Party Liability: Analysis of Serious Bodily Injury Compensation from a European Perspective”. Provides details regarding the above as well as other interesting work.
- What are the minimum required limits, have they changed recently in a way that would mitigate the value of past experience for pricing?
 - Central & Eastern Europe had very low limits in the past, now that they are in the EU, limits have gone up enormously. Will growth in compensation follow those increased limits? Yes it will, but not sure when.
- Reinsurance claim settlement: Does contract or custom require commutations, if so make sure you understand the terms.
- In the large loss listings, are ceding company case reserves discounted?
- Is layer loss development distorted by changes in interest rates – big issue for French Motor.
- Are there additional circumstances impacting loss trend? For example, in France the number of hours of care per day allowed has increased over time.

European Motor Overview – UK

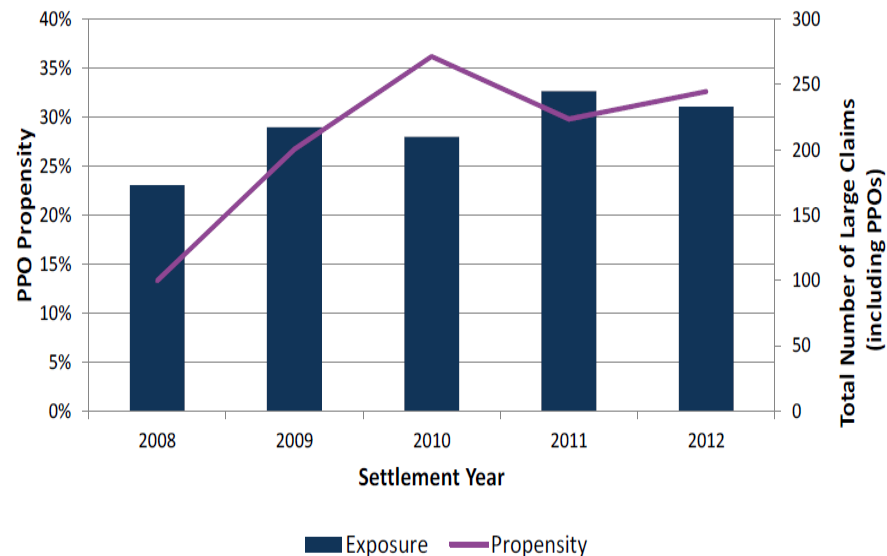
- Largest Claims: 42 million Euro (Selby rail crash - 2001), but have also seen individual claims as large as 30 million Euros.
- Loss Settlements:
 - Had been nearly all lump sum settlements – insurer liability extinguished at payment.
 - **Ogden Tables** provide a multiplier reflecting mortality & int. rates of 2.5% above inflation.
 - Selected Ogden Table factor based on impaired mortality, for example, a 25 year old seriously injured may be deemed to have a life expectancy of a 40 year old.
 - Lump Sum Settlement = Annual Cost x Ogden Table Multiplier.
- Big Changes: PPO's
 - Courts Act of 2003 allowed judges to impose annuity (PPO's) rather than lump sum settlements.
 - PPO's did not become common until a few appeals rulings in 2008 (Thompstone).
 - Also established use of ASHE 6115 care cost workers index for cost of care inflation rather than standard wage index.
 - Financial crisis brought home realization that the average person (or even professional) can't be expected to earn 2.5% above inflation.
 - Judges concerned about lump sums being used up or squandered.

Increasing PPO Propensity

Number of PPOs by Settlement Year



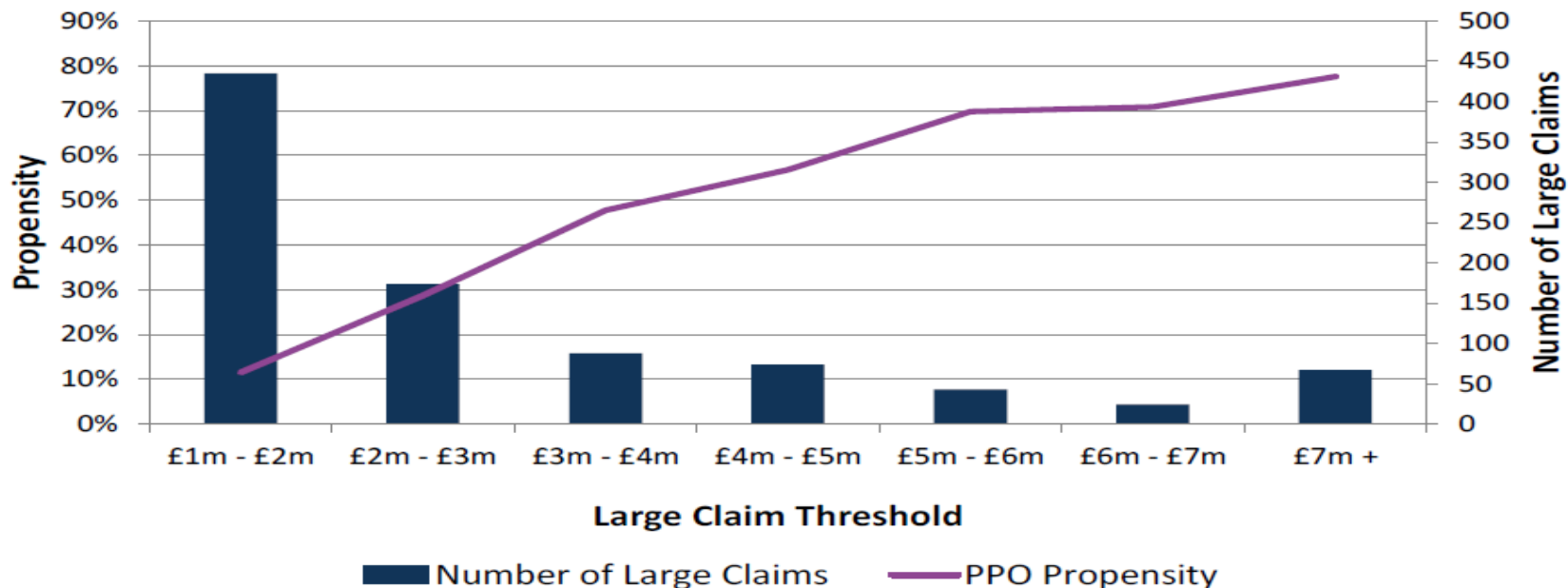
PPO Propensity of Large Claims - Motor



- Exhibits are from the 1/24/2014 Institute of Actuaries “Periodical Payment Orders Working Party – GIRO 2013 Report.” It is based on data provided by companies representing 90% of the UK motor market.
- Large claims are defined as ones over 1 million GBP at 2011 inflation levels.
- 2012 claims may be understated due to a lag in data for some carriers in 4Q2012.
- PPO’s are also an issue for Employers Liability & Public Liability (GL).

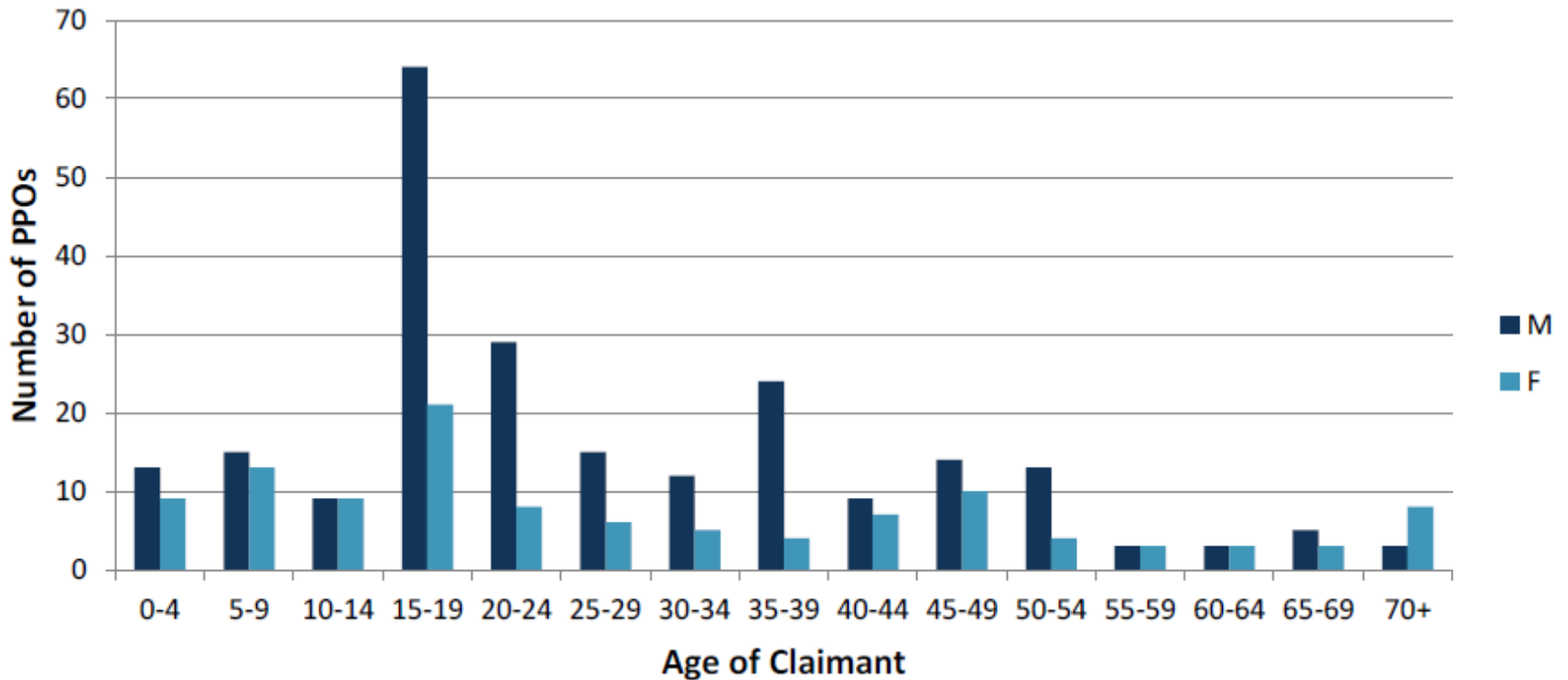
PPO Propensity Increases by Size of Claim

PPO Propensity at different Large Claim Thresholds - Incremental thresholds



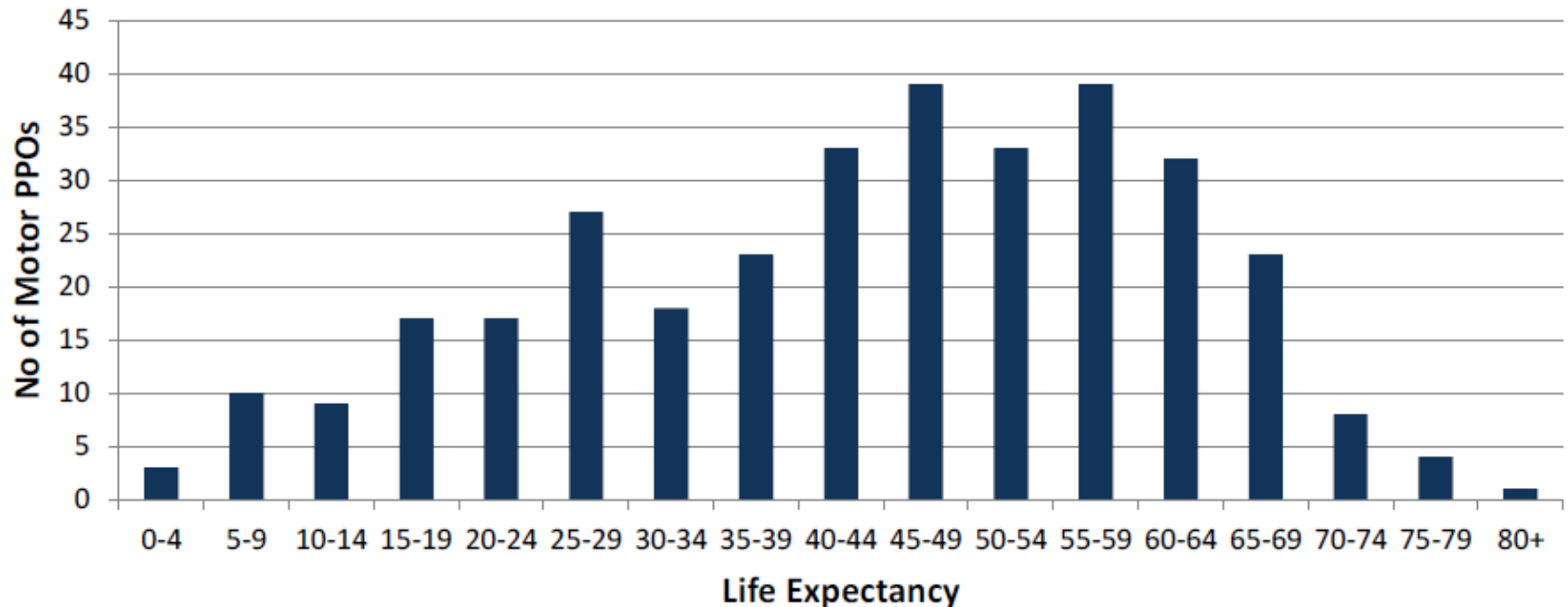
- Impact of PPO's is mostly assumed by the reinsurers, particularly in the higher layers.
- Exhibit is per the GIRO PPO Working Party 2013 Report.
- Large claim threshold is based on the lump sum equivalent.

PPO Claims – Age of Claimant at Time of Accident



- 93% of PPO settlements in the survey were for brain and spinal injuries.
- Data is per the GIRO PPO Working Party 2013 Report.

PPO Claims – Distribution of Life Expectancy at Time of Settlement



- Average PPO Claim Loss:
 - 80,000 GBP per year PPO (for an average life expectancy of around 40 years)
 - PPO payments are indexed using the ASHE 6115 care cost workers index.
 - Plus 1.8 million GBP average lump sum (usually covers lost wages, redesigning home, pain & suffering, etc.)
- Data is per the GIRO PPO Working Party 2013 Report.

UK Motor PPO Issue Summary – The Problem

- Ogden tables use interest rate of 2.5 points above inflation, insurers can't earn that today.
- P&C insurers and reinsurers are assuming significant mortality & inflation risk.
 - Carriers have been largely unable to find life companies willing to sell annuities to cover this exposure due to it's long term nature and the inflation risk – interesting...
- Insurance carriers had been generally unwilling to agree to buy programs on a capitalized basis.
 - Those deals require reinsurer settlement at a lump sum amount.
 - According to the 2013 GIRO study, only 20% of survey respondents bought some reinsurance on a capitalized basis – I hear that the proportion is growing.
- Reinsurers that don't discount will likely experience large underwriting losses.
- The economic and rating agency capital needed to support these long term liabilities is high.

UK Motor PPO Issue Summary – Quantifying the Impact

- We had a data set of 267 PPO claims (latest GIRO study contains 388 PPO claims).
- Data includes age of claimant, life expectancy at time of settlement, initial payments, annual PPO payment prior to inflation, etc.
- (A) Determine Lump Sum Cost.
- (B) Determine cost of a PPO settlement based on the above.
- Vary individual inflation & mortality assumptions to add variability.
- Compare (B) to (A) to get the undiscounted cost multiple.
- **Overall, we estimated that PPO's increase ground up loss costs by a factor of 2.5 to 3**
 - The above assumed short term inflation of 2% & long term between 3% and 4%.
- 2013 GIRO Study did a similar analysis, using 2% inflation, they estimated that ground up undiscounted losses would increase by factor of 2.05.
- Impact on reinsurance layers is somewhat mitigated by the indexation clause, but particularly due to a portion being paid as a lump sum, the impact is still substantial.

Special thanks to Matt Dobrin & Paul Figg who did this great work on this issue.

Summary of Lessons Learned

Final Comments

- Becoming familiar with non-US actuarial approaches and markets is not really a choice.
 - Employers are becoming more global.
 - The US market is shrinking as a percent of the world's insurance and reinsurance markets.
- Our actuarial tools and approaches improved due to the input (insistence) of our European colleagues.
 - Special thanks to Simon Niemann, Markus Knecht, and Pierre Balthazard. We learned from each other and found a way to make a common rating process & model work across very different markets.
- International markets provide diversification from the two major company killers: US liability and US catastrophe exposure.
 - But plenty of dangerous areas outside the US as well.
- Data and industry parameters are less available outside the US.
 - Provides more opportunity to do interesting and ground-breaking work.