Commutations A Cedant's Perspective on Risk Load Brian MacMahon, FCAS Erin Bellott, ACAS Liberty Mutual. 2010 CAS Spring Meeting May 23-26, 2010 Liberty Mutual. Anti-Trust Notice The Casualty Actuarial Society is committed to adhering strictly to the letter and spirit of the antitrust laws. Seminars conducted under the auspices of the CAS are designed solely to provide a forum for the expression of various points of view on topics described in the programs or agendas for such meetings. Under no circumstances shall CAS seminars be used as a means for competing companies or firms to reach any understanding – expressed or implied – that restricts competition or in any way impairs the ability of members to exercise independent business judgment regarding matters affecting competition. It is the responsibility of all seminar participants to be aware of antitrust regulations, to prevent any written or verbal discussions that appear to violate these laws, and to adhere in every respect to the CAS antitrust compliance policy. Liberty Mutual. What's in it for the Cedant? Commutation Considerations Case Studies Pricing Commutations – general approach and examples

| Liberty Mutual. | Commutation Considerations |
|---------------------|--|
| Mutual | |
| | Reinsurer in financial troubleLondon reinsurer proposing a "scheme of |
| | arrangement" – Forced Commutation Reinsurer paying slowly, often due to financial |
| | condition, but sometimes due to contract disputes |
| | Costly claim by claim litigation Mandatory commutation |
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| Liberty Mutuál. | Commutation Considerations |
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| | Cedent exiting a segment of business with consequent "run off" issues |
| | Administrative costs |
| | Recoverable concentration with particular reinsurer |
| | - Cash flow |
| | Reinsurer motivated |
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| Liberty Mutuál | Commutation Considerations |
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| Liberty Mutuál. | Income hit from taking back discounted reserves |
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| Liberty Mutual. | Income hit from taking back discounted reserves Uncertainty of ultimate value of liabilities re- |



Reinsurer in Financial Trouble Case Study 1

- New Jersey decision 2007 Integrity Insurance Company
 - IBNR claims are not "absolute" and thus not covered in liquidation
- Can apply equally to Reinsurer liquidations
- Importance of "getting to the table" first.
 Negotiate commutation before reinsurer goes into liquidation



Solvent Scheme of Arrangement Forced Commutation

Case Study 2

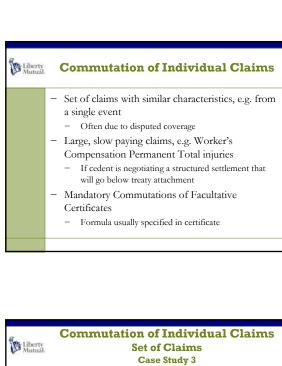
- UK or EU company doing substantial UK business wants to extinguish their liabilities and return capital to shareholders
- Generally done on a "cut-off" basis, there is a fixed time period often as short as 6 months for reporting claims
- Majority in number and 75% in value of creditors must approve
- BAIC decision in 2005
 - Creditors must be separated into classes: those with substantial IBNR and those whose recoverables are reasonably certain to be fully reported
 - Direct policyholders must be excluded (not in the "risk business", unlike insurers)

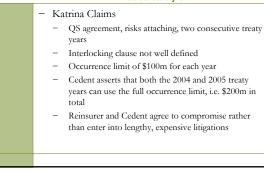


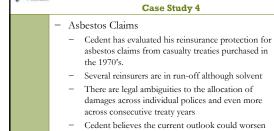
Solvent Scheme of Arrangement Forced Commutation Case Study 2

- 100 cents on the dollar as opposed to an insolvent scheme
- Discounting decided by scheme adjudicator
- IBNR can be included in two ways:
 - Scheme may approve a formula which is then applied universally to all creditors
 - IBNR calculation may be submitted by cedent and then reviewed by scheme actuary
- Biggest issue: Can creditors be forced to accept commutation for recoverables which are highly uncertain, when the valuation of these by the scheme determines their voting power?

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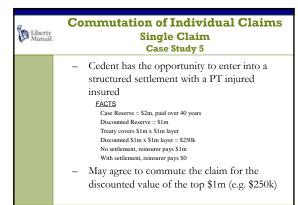




Liberty Mutual. Commutation of Individual Claims

Set of Claims

- in ultimate valuesIn treaty attachment to the latent exposure
- Cedent may be motivated to commute



Liberty Mutual.

Mandatory Commutation Language can be as specific as:

- Mortality assumptions based on latest US Census Tables, adjusted for mortality improvement
- Future medical costs projected cash payments will be based on the average annual Medical CPI over the last 20 years
- Future indemnity costs projected cash payments will be based on the average annual cost of living increase over the past 20 years as available from the State governing body
- Discount rate will be the yield of the Treasury Bill maturing 10 years from the date of commutation.

Mandatory Commutation Liberty Mutual. **Single Claim Calculation** Case Study 6 Date of Loss Evaluation Date: Current Age: Gender Est'd Annual Indem Est'd Annual Med. 63 20 RT Per State Formula 50,000 Extinated by Codent 2,00% Specified in Certax 20 year COLA per State 3,00% Specified in Certax 20 year Medical CPI 1,000,000 5,000,000 Discount Rate: 100% Expected I 3.51% Sp 973.645 250,000 400,042 51,235 72,314 53,796 75,297 56,486 78,415 56,59 18,003 68,659 92,398 72,092 96,306 75,697 100,395 79,482 104,673 83,456 109,151 400,042 472,353 547,653 626,070 707,750 792,843 881,306 973,904 1,079,210 1,170,404 1,275,278 1,384,429 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 0.98 0.95 0.92 0.89 0.86 0.83 0.80 0.77 0.75 0.72 0.70 99% 97% 95% 94% 92% 90% 87% 85% 83% 80% 70,210 170,604 275,278 384,429 70,210 100,395 104,673 109,151 0.33 0.32 0.30 0.29 0.28 7% 5% 4% 3% 0% 283,855 296,856 229,064 0 6,606 5,132 2,875



Cedent Exiting Surety Business Case Study 7

- Cedent has a national surety book composed of multi-year contract surety bonds
- Excess of Loss reinsurance treaty on a "losses discovered basis"
- Recent years have produced few losses "discovered"
- Current year premiums are strong after hardening of the
- Reinsurer expects good results from prior years but fears bad results from current year due to economic downturn
- Cedent thinks the losses from the current economic downturn will not be "discovered" this year
- Both sides are motivated to commute the agreement



Liberty Mutual. Old Treaty with Administrative Costs Case Study 8

- Cedent has a very long tail casualty excess of loss and clash program on a risks attaching basis for the years $1950\,$
- Several non-admitted reinsurers are on the program, some in financial difficulty
- Asbestos and environmental exposures have been commuted
- Remaining claims are mostly precautionary notices
- Ongoing reporting costs to broker, data systems maintenance, held IBNR, credit concerns, Sch. F penalties, LOC maintenance, etc.



Pricing a Commutation

Formula from Connor and Olsen

Reinsurer Ambivalence Point

Cost to not Commute = Cost to Commute Cost to not Commute = NPV(Loss) - Tax Benefit (unwind of discount) Cost to Commute = Cash Payment + Tax (Profit on transaction) $Price \equiv NPV(Loss) - Tax \; Unwind \; Benefit - Tax \; on \; transaction \; profit$

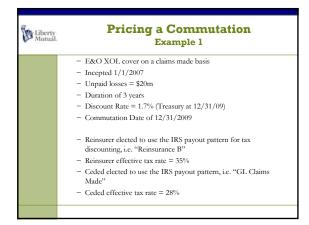
Now including Cedent side

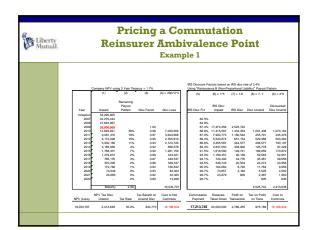
Cedent Ambivalence Point

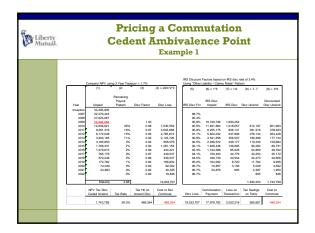
Cost to not Commute = Cost to Commute Cost to not Commute = Tax Loss (unwind of ceded discount) Cost to Commute = NPV(Loss) - Cash - Tax(Loss on transaction) Price = NPV(Loss) - Tax Unwind Hit - Tax on transaction loss

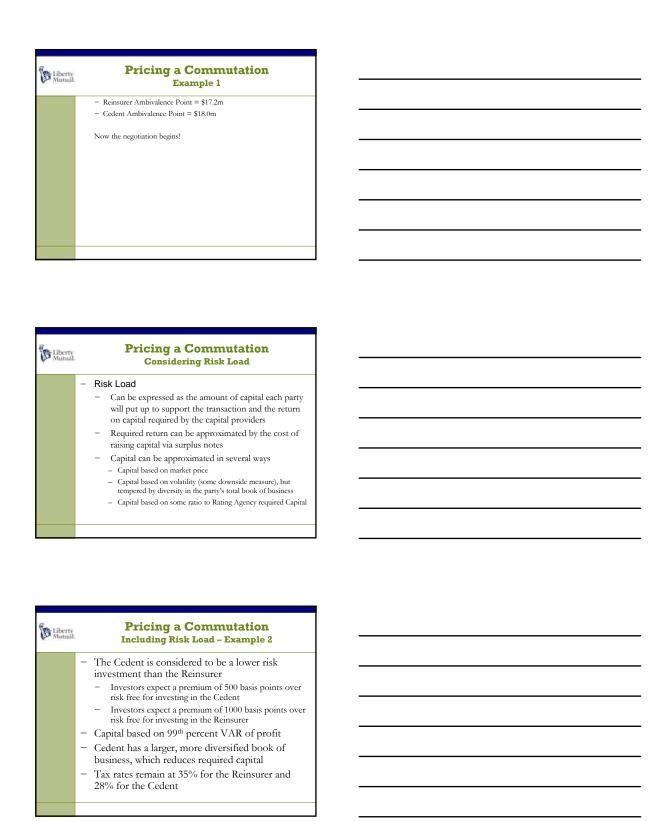
- It appears that these two are equal to each other
- Are they?

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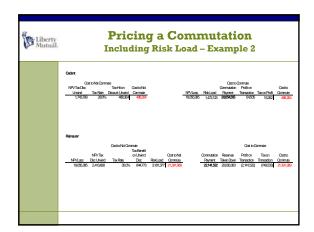


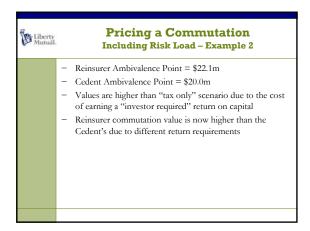






| Liberty Mutuál. | Pricing a Commutation Including Risk Load – Example 2 | | | |
|--------------------|--|---|--|---|
| | (1) (2) (3) (4)=1-3 Tax (6)=4*(1-Tax) (7)=1.7%*(1-Tax) (8) = 14 | Premium Expected Loss Discounted Loss Discounted Loss NPV Profit (fedore Tax) Tax Rate NPV Profit (fedor Tax) Passive Return Capital ROE Loss Ratin | Cedent 21,100,000 20,000,000 19,095,385 2,044,615 28,0% 1,472,123 1,2% 16,813,339 10,0% | Reinstrer 23,948,812 20,000,000 19,055,385 4,894,427 35,0% 3,191,377 1,1% 22,655,294 15,0% |
| | (9) Agg Loss Curve (10)=1-9 (11) Selected (12)=10*11 (13)=5um NPV(O/S) (14) = 12*13*-1 | Reinsurer Cedent 99th Downside Loss 99th Downside Profit Downsidy Factor First Year Capital Years Held Multiplier All Years Capital | Cost of Capital Risk Free 5.0% 5.0% Capital Calculatic 30,000,000 (8,900,000) 0.50 (4,450,000) 3.78 16,813,339 | Premium Total 10.0% 15.0% 5.0% 10.0% |

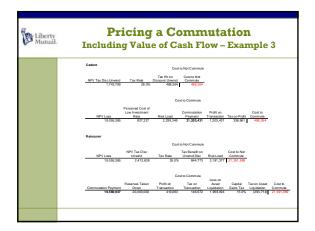




| Liberty Mutuál. | Pricing a Commutation Other Considerations affecting Price |
|--------------------|---|
| | Other considerations that affect the price of commutations: Value of cash flow LOC costs for the Non-Admitted Reinsurer Expected credit risk costs for the Cedent Schedule F penalties for the Cedent Rating Agency Capital requirements |
| | |

| Liberty Mutuál. | Pricing a Commutation Including Value of Cash Flow - Example 3 |
|--------------------|--|
| | Reinsurer has matched assets to the treaty liabilities (3 year duration) |
| | If assets are liquidated, the Reinsurer will realize a 10% loss |
| | Cedent's investment rate on new cash for a 3 year duration is 1.7% |
| | Cedent believes that the long-term average for 3 year investments should be 4% |
| | |
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| Liberty Mutuál. | Pricing a Commutation Return on Equity - Cedent Including Value of Cash Flow - Example 3 | | | | 3 |
|--------------------|---|--|---|---|--|
| | (1) (2) (3) (4)=1-3 Tax (6)=4*(1-Tax) (7)=1.7%*(1-Tax) (8)=14 | Premium Expected Loss Discourred Loss Discourred Loss NFV Profit (before Tax) Tax Rate NFV Profit (stier Tax) Passive Return Capital ROE Loss Ratio Cost of Capital Renaturer Codent | 4.0% Rate 21,100,000 20,000,000 17,906,460 3,193,540 2,299,349 2,299,349 16,095,318 17,2% 94.8% Risk Free | | 00 00 05 55 7% 23 1% |
| | (9) Agg Loss Curve (10)=1-9 (11) Selected (12)=10*11 (13)=Surn NPV(O.S) (14) = 12*13*-1 | 99th Downside Loss 99th Downside Profit Diversity Factor First Year Capital Years Held Multiplier All Years Capital | Capital Calculat 30,000,000 (8,900,000) 0.50 (4,450,000) 3.62 16,095,318 | ion 30,000,00 (8,900,00 (8,900,00 (8,900,00 32,190,60 | 00) 00 00) 32 |



| Liberty Mutual. | Pricing a Commutation Including Value of Cash Flow - Example 3 |
|--------------------|---|
| | - Reinsurer Ambivalence Point = \$19.6m |
| | Cedent Ambivalence Point = \$21.2m |
| | Reinsurer must offer less to offset the realized loss on investments |
| | Cedent requires more due to the perceived lower investment yield of cash today than an average return over recent years |
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