Evaluating Variations in Contract Terms for Casualty Clash Reinsurance Treaties

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Abstract: The authors examine variations in event definitions
and commutation clauses which are commonly encountered
in casualty catastrophe reinsurance contracts in the market
today. Changes in these aspects of the contract may affect
the exposures the reinsurer is asked to cover. In this article,
the variations are contrasted with special emphasis given to
the effects this may have on the pricing/underwriting process.

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I. Introduction

Look across our industry and you will find among the most critical issues one factor that is that huge casualty catastrophe losses do happen. They occur in many forms ranging from a large extra-contractual obligations (ECO) award under a single policy to workers' compensation multiclaimant losses to multipolicy losses (true clash) or runaway allocated loss adjustment expense (ALAE). In light of this, casualty catastrophe reinsurance remains an integral part of most companies' reinsurance programs.

Over the years, the clash product has become more sophisticated and more tailored to the specific cedent's needs. Therefore, any reinsurer selling clash protection must carefully evaluate the various contract terms that have also evolved for their effect on the exposures for which protection is being sought. Reinsurers also must be able to model and compare the different coverage that different contract terms will produce.

Our purpose here is to analyze event definitions and commutation clauses and to examine how changing contract clause provisions can affect both the exposures and the modeling needs. We also will look at the modeling process itself. We will briefly discuss the different ways in which these covers attach and then examine commutation clauses.

For each variation in the clauses under discussion, we will consider related potential changes in the reinsurer's exposure to loss. We will provide examples of the types of loss covered under one definition which are excluded from others. We will then look at the types of information needed for the reinsurer to price these added exposures.

II. The Modeling Process

Before jumping into the various examples, it will be helpful to lay out the structure of our modeling/pricing process. The three general steps are: (i) determining the expected losses; (ii) building a discrete aggregate distribution; and (iii) calculating the return on equity (ROE) for each point of the aggregate distribution.

To determine the expected losses one must first identify the type of event that can cause a loss. Such an event can include ECO and excess of policy limits (XPL) judgments. It may also include such things as workers' compensation multiclaimant losses, multipolicy losses, the stacking of uninsured motorist limits or runaway allocated loss adjustment expenses. Once the causes of loss have been identified, we determine a frequency and average layer severity for each cause.

Models can be constructed to estimate the frequencies and severities for each cause based on exposure.[1,2] Certainly, experience can be used, where available. If neither of these are available, the frequencies and severities can be selected judgmentally.

These selections, of course, will vary with each cedent and each reinsurance program. As an example, consider the runaway ALAE exposure on a clash layer attaching at $5 million for two hypothetical cedents. Cedent A writes policies with ALAE payable in addition to the policy limit of $1 million. Clearly, the ALAE exposure will come about from paying very large ALAE amounts on comparatively small insured indemnity losses.

Cedent B uses the same policy form, but writes maximum policy limits of $5 million. All else being equal, Cedent B has about the same exposure to large ALAE losses that Cedent A has. In addition, Cedent B has exposure to relatively small ALAE losses from insured indemnity losses which are at, or near, the $5 million policy limit. Not only does Cedent B have the runaway exposure exhibited by Cedent A, but it also has a "trickle" exposure. The runaway exposure will be characterized by comparatively high severity and low frequency losses. In comparison, the trickle exposure will be characterized by higher frequency, but lower severity, and could result in higher expected losses than the runaway exposure. Both of these exposures should be considered when determining the expected losses.

The next step is to develop an aggregate distribution for the various causes of loss. This can be accomplished by methods such as described by Panjer[3] or other methods.[4] For example, a clash aggregate distribution may indicate the following: 90% chance of no loss; 4% chance of expected losses equaling half the layer; 3% chance of expected losses equaling the full layer; 2% chance of two full layers of losses; and 1% chance of three full layers of losses.

The final step is to calculate return on equity using the aggregate distribution as input. This means modeling cash flows for each point of the aggregate distribution, calculating a return on equity (net present value return, in dollars, divided by the surplus allocated to the specific layer) for each point, and weighting these ROEs together using the probabilities of achieving each expected loss outcome.

This process provides a structure for assessing the implications of the pertinent contract terms. If a change in a contract term can affect expected losses, the reinsurer needs to modify the inputs used in determining the aggregate distribution, produce a new aggregate distribution and recalculate the ROE. If a change affects cash flow only, this can be modeled in the ROE calculation, without change to the aggregate distribution.

III. Event Definitions

The event definition is the linchpin in underwriting and pricing clash covers. It should reflect both parties' expectations as to the scope of coverage provided. Although the event definition has become somewhat standardized, increasing litigiousness, unpredictable jury awards, emerging toxic torts and new theories of liability also are defining the type of catastrophic events casualty insurers can expect to face. In light of the uncertainty that these emerging trends impose on clash pricing, it is critical that all parties to the reinsurance contract agree on the intent and construction of an event definition.

For example, if a cedent is expecting clash coverage for losses that are of a continuous or latent nature, rather than the result of a spontaneous occurrence, the event definition should include language that refers to repeated exposures. If the cedent expects the cover to respond to economic losses arising out of E&O and D&O policies it has issued to financial institutions, the event definition should specifically include wrongful acts and errors and omissions in addition to the standard language appearing in element 4 below. In simple terms, the crafting of an event definition should encompass a careful review of the underlying business and the scope and extent of catastrophe coverage desired. Failure to do so could result in unnecessary contract disputes.

An event definition typically includes the following elements:

1.   Damage, injury or loss arising out of one or more than one policy; that is the

2.   direct consequence of one particular accident, disaster or casualty; that

3.   takes place in its entirety at a specific time and place; and

4.   is traceable to the same single accident, disaster or casualty.

A. "Damage, injury or loss arising out of one or more than one policy." The terms "damage, injury or loss" typically relate to the terms used in the insuring agreement of the underlying policies being covered, i.e., the CGL, umbrella policies etc. If both clash and contingency protection are being purchased to protect against loss arising under a single policy involving, for example, runaway ALAE and a clash of two policies, this intent is captured in element 1 above. However, if the catastrophe protection purchased is strictly clash, then this element should be tailored to read "arising out of more than one policy."

Another variation on this theme occurs with definitions using "more than one insured," rather than "more than one policy." For instance, if an insurer writes commercial auto and workers' compensation using separate policies, an auto accident involving one insured car driven by a worker where the worker's employer is also the car owner, could be a clash loss under the "more than one policy" scenario, but not the "more than one insured" wording.

This part of the event definition comes into play when the pricing actuary or underwriter is selecting the types of occurrences which are intended to be covered by the clash layer. Runaway ALAE and ECO/XPL are not nearly as great if the coverage is limited to events arising out of two or more policies. On the other hand, if two or more policies must be involved, one might expect the selected severity to be higher and the payout somewhat quicker than would otherwise be the case. Ideally, the cedent should be able to provide historic losses accumulated using the appropriate event definition.

B. "Direct consequence of one particular accident, disaster or casualty." This element sets forth the requirement that recoverable losses be caused directly by a single event and that there be an appreciable degree of causation between the single event and the loss. An example of the

difficulty with the common factor requirement is illustrated by the following example. Loss attributable to an explosion in a factory gives rise to claims under an insured's liability and workers' compensation policies and would be treated as caused by one event. However, if the cedent's loss was due to two separate explosions occurring at different times during the year could the cedent lump the two incidents together and consider them one event if both incidents resulted from defective made boilers from the same manufacturer? In other words, if the cause of each explosion proved to be the defective made boilers, would that common factor satisfy the criterion that the losses were the result of one particular manufacturing accident? These are, admittedly, difficult questions without clear cut answers as indicated by court decisions in the US and England[5].

Another example illuminating the difficulty in causation analysis is the determination of proximate cause. Proximate cause in a chain of several events refers to the nearest cause preceding the final event. Thus, in a causal sequence of events resulting in damage to a California condominium complex, would a subsidence problem be a direct or intervening cause of damage where the builder already had a judgment against it for construction defects?

Pricing for these exposures depends on how well both parties identify and address the problem areas during the underwriting process. Given the uncertainty in judicial outcomes, it is reasonable to assume that half the decisions will favor the cedent and half the reinsurer. Thus, setting up an additional occurrence type in the expected losses for this exposure may be appropriate in the reinsurance analysis.

C. "Taking place in its entirety at a specific time and place." This element requires that the event must commence and end within a specific time period and occur in its entirety at an identifiable site. Explosions such as occurred in Bhopal, India, or fires like the Puerto Rican Dupont Plaza Hotel are concrete examples of how this element is traditionally interpreted. However, workers' compensation catastrophe covers often are intended to provide protection against occupational disease or cumulative injury, which, by definition, are gradually occurring injuries. Hence, specific wording should be added to the event definition to encompass this different criterion. Consider, for example: "As respects occupational disease or cumulative injury under workers' compensation policies suffered by an employee for which an insured is liable, such occupational disease or cumulative injury shall also be deemed to be an "event" within the meaning of this contract."

Loss aggregation in a clash cover is another problem, particularly with respect to products liability losses and occupational diseases or cumulative injuries. For example, reinsurers should be clear on whether all carpal tunnel claims incurred by the cedent for workers doing essentially the same functions can be accumulated across insureds. This can be the case if the clash cover is worded to provide aggregate extraction coverage. Aggregate extraction allows a cedent to extract an original insured's policy loss that is related to a specific clash event and combine it with the losses from other insureds involved in that same event.

Again, from a pricing standpoint, the first step is to make sure the desired coverage is understood. It is always worthwhile to discuss intent with the cedent and/or broker to ensure all parties share a common understanding of the coverage sought. Model parameters can then be selected and matched accordingly.

D. "Is traceable to the same single accident, disaster or casualty." This element requires that losses under a catastrophe cover be connected to each other in the sense that they arose out of the same single event. This is the essence of a catastrophe cover. It is not intended to give protection for losses which do not arise out of the same event and so are unrelated. An example of ambiguous wording sometimes used in this context is the term "causative agency." The ambiguity arises because that term could be used as a basis on which to allow losses from unrelated lead claims to be aggregated. For example, a cedent could accumulate all its lead paint claims based on a "causative agency" theory that lead is the causative agent of all lead paint claims. Unless this "batch" type of exposure is explicitly understood, priced for (a very difficult exercise due to not knowing with certainty what types of events can lead to a batch loss) and expressed contractually, catastrophe covers would not be expected to respond to losses that while alike in nature are not connected to each other. Simply put, clash covers provide protection for a clash of policies or insureds, but not a clash of events.

Disputes over whether an event loss is directly traceable to a single cause or is really the result of multiple unrelated occurrences are becoming more common in casualty insurance and reinsurance. This is particularly true for pollution, toxic torts and more recently property construction defect claims. Consider a case similar to our earlier case where a cedent writes a large book of California contractors business, and a major earthquake hits. Insurers writing homeowners business in the state look for subrogation possibilities and tie losses from many of the individual homes back to specific construction defect claims brought against the cedents' insureds. A cedent might argue that the single or proximate cause is the earthquake, allowing all its construction defect claims to be aggregated into one clash loss to meet the contract's retention. In contrast, a reinsurer might contend that each construction project claim is a separate event, that the earthquake was merely an intervening cause, and therefore the losses cannot be aggregated. Further difficulties arise when trying to assign these losses to policies and underwriting or accident years.

IV. "Business Disaster" Event Definitions

Over the years, buyers have been exploring other definitional options for obtaining broader clash coverage. The coverage provided by the event definition we discussed above has left uncovered an entire complement of losses often referred to generically as "business disasters." An example of a "business disaster" cause of loss would be the Savings and Loan crisis, which resulted in multi-policy losses for insurers under both D&O and E&O policies. Where such coverage is contemplated, it is necessary that the event definition clearly reflect that coverage is being provided for all wrongful acts, offenses, omissions or errors committed by professionals acting in their professional capacity in connection with losses sustained by a financial or commercial institution. An example of a business disaster event definition appears at the end of this article in Exhibit A.

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One of the most difficult aspects of the "business disaster" event definition is clarifying what business risk is being covered. The cedent will often have specific exposures in mind, but the wording is nonspecific. The reinsurer usually wants the coverage defined as narrowly as possible. Both parties to the contract negotiations should strive for the same understanding of what is and is not covered.

V. Attachment Basis

Generally, casualty catastrophe covers respond to losses provided that the event occurred during the term of the reinsurance contract. This is the typical "losses occurring during " (LOD) basis. The exposure to loss can be measured by looking at the projected makeup of the book for the coming year. Compared to claims-made catastrophe covers, the LOD catastrophe structure has drawbacks for the reinsurer that are similar to those occurrence policies compared to claims-made policies have for insurers. Casualty losses covered by an occurrence structure arise from later calendar periods (are projected further into the future), adding greater uncertainty in expected losses by virtue of the longer tail.

Moving along the attachment spectrum towards claims-made, some clash covers are written on a "losses discovered" basis. In this case, coverage depends on whether the cedent has established a reserve of a specified dollar amount for an event that occurs after the inception of the catastrophe contract. The difficulty in pricing for this exposure depends, to a certain extent, on the adequacy of the reserves for potentially covered claims immediately before the inception of the reinsurance. A claims audit prior to binding the reinsurance can be helpful.

Finally, there is the pure claims-made clash cover where several requirements must be met to qualify for coverage: (i) the event must occur during the term of the reinsurance contract; (ii) notice from the original insured to the insurer has to be given during the term of the reinsurance contract; and (iii) the cedent must provide notice of all claims arising from the same event within a specific period of time (e.g., 24 months) from the date of the first notice.

For the losses discovered and pure claims-made structures, the exposure can be estimated by looking at reporting patterns for the various types of possible losses. Usually premium brought to current level is used as a proxy for comparing historic exposure to current exposure. When doing this, an additional area of concern is changes in the claims adjusting practices of the cedent. The occurrence of ECO/XPL claims tends to be related to the claims management practices of the cedent. Historic problems in this area for a cedent can indicate increased exposure to ECO/XPL claims in a claims-made clash structure.

VI. Commutation Clauses

Most typically, commutation clauses allow the parties to extinguish the reinsurer's known and unknown -- but predictable -- liabilities under the reinsurance contract by the reinsurer's payment

to the cedent of a sum of money that is discounted to reflect the time value of money. In exchange, the cedent gives the reinsurer a full and final release of all its past, present and future obligations under the contract.

The items that determine the settlement amount of a proposed commutation include: (i) the value of paid losses and ALAE recoverable; (ii) the estimated value of unpaid losses and ALAE, which includes reserves for outstanding losses, ALAE and IBNR; (iii) the value of disputed items; (iv) the value of present balances due; (v) the value of return premiums and future premiums due; and (vi) the value of credits, such as cash, letters of credit, funds withheld, etc. Calculations done to determine the present value as respects items (ii) through (vi) above should include assumptions for payout patterns, current interest rates, reinvestment and tax considerations. The pricing procedures should also include trend analysis, benefit escalation analysis, reserving analysis, in-depth pricing/reserving by treaty or by claim including an analysis of the value and adequacy of the commuting party's IBNR.

The determination of the commutation values include a stochastic analysis of the claims. This includes, at the least, an analysis of the ultimate claim value, and, if possible can also include escalation rates, discount rates, mortality and any other necessary variables.[6] Above all, the commutation clause may limit the reinsurer's options on how the calculations are performed to determine commutation values. Appropriate attention to these issues should be addressed in the contract negotiation process and the original pricing of the reinsurance deal.

Commutation clauses in casualty catastrophe covers, particularly workers' compensation clash covers, are usually desirable to reinsurers for two key reasons. First, reinsurers can reduce the volatility in financial results that occurs when a reinsurer experiences an unanticipated escalation in frequency or severity of covered losses or ALAE by capping adverse loss experience. Second, a commutation can enable a reinsurer to minimize or eliminate the ultimate liabilities on its books at an early date by making a cash payment that reflects the net present value of the losses in return for a full and final release. Where claims involve long-term periodic payouts which can be affected by the escalation of indemnity benefits, inflation of medical costs and increased life expectancies These goals are accomplished, however, by shifting the potential volatility back to the cedent, who must be comfortable with the reassumption of this exposure. If the cedent is uncomfortable with this, a clash product without the price benefit of the commutation clause may be more appropriate.

In a commutation, the cedent receives a cash payment from the reinsurer and reassumes the ceded reserves for outstanding losses, allocated loss adjustment expense and any premium reserves. The balance sheet effect of the commutation for the cedent depends on the answers to a number of questions: (i) does the reinsurer carry its reserves on an undiscounted (most typical) or discounted basis?; (ii) will the commutation payment be discounted (typical) or not?; and (iii) has the cedent written off the reinsurance as uncollectible?

Generally, U.S. reinsurers carry loss reserves on their books on an undiscounted or minimally discounted basis. Where the commutation is effected on a discounted basis, a reinsurer will

usually increase its underwriting income and its surplus. If the reinsurer carries its reserves on a discounted basis, surplus will either increase or decrease depending on the assumptions used in determining the discount rate applied in the financial statement and the discount rate that applies to the commutation. Normally, if the discount applied to commuted losses is greater than the financial statement discount, the reinsurer will sustain a statutory increase in surplus. The cedent will reduce its surplus if it reflects the undiscounted value of the reserves being reassumed but records the cash payment on a discounted basis. For workers' compensation reserves, if any applicable statutory benefit escalation is not reflected in the reserves, the reserves are effectively discounted.

The tax implications of a commutation are also important to by both parties. Some factors for reinsurers to consider are: (i) U.S. reinsurers carry their loss reserves on their financial books on an undiscounted basis, while for tax reporting purposes reserves are discounted. Where the reinsurer may carry its reserves at slightly less than their full future value, a commutation may not increase underwriting income, and so, for tax purposes, there may be a decrease in taxable income; (ii) the impact on IBNR reserves following a commutation may have significant tax consequences for the reinsurer. Factors to consider from the cedent's perspective include: (i) the effect of reassuming loss reserves that are greater than the cash payment received. This could result in a statutory reduction in surplus and thus have tax implications; and (ii) the deductibility of any decrease or increase in IBNR.

A. Contract Options

There are a range of contract variations that the parties to a commutation can negotiate.

1. Mandatory v. Optional. From the reinsurer's point of view a forced or mandatory commutation is often the more desirable. This depends in large part on the line or class of business covered by the reinsurance contract. Many workers' compensation clash covers include mandatory commutation wording. A mandatory commutation clause provides that after a specified period of time, usually from the inception date of the contract, both parties must come to an agreement on the commutation payment and terms to discharge the reinsurer of its liabilities under the contract. A mandatory commutation can require that the parties appoint one or more actuaries (or other qualified parties) to determine the net present value ("capitalized value") of the claims in an arbitration-like proceeding or specify other methods upon which the parties can, by a formula, reach an agreed value.

Where the commutation clause sets forth the specific basis for calculating the final value of the claim or claims being commuted, this type of mandatory commutation is commonly referred to as an "Agreed Value Commutation." In such a clause, various escalation and discount percentages are agreed to (or can be simulated) for index-linked benefits, un-indexed or fixed benefits and future medical costs. Tables are also identified for use in calculating impaired life expectancies, survivors' life expectancies and remarriage probabilities. At the end of a predetermined period, the final agreed value is calculated based on the above factors. An additional alternative sometimes included in an Agreed Value clause is that: (i) the parties may mutually agree to use another method; (ii) an annuity may be purchased or a quote obtained

which will determine the agreed value; or (iii) reinsurance may be purchased or a quote obtained which will determine the agreed value. For a smaller cedent, purchasing an annuity or reinsurance provides a way to avoid having the reassumed reserves show up on its books and can thus stabilize its financial results.

In a mandatory commutation, the issues arising from the Financial Accounting Standards Board (FASB) Statement No. 113, should be reviewed to ensure that the catastrophe cover qualifies for risk transfer accounting treatment. In this regard, the cash flow analysis should include the contemplated commutation settlement amount. A mandatory commutation should be carefully evaluated by the reinsurer to determine its effect on the price, depending on the exact structure and application of the commutation, as discussed below.

Optional commutation wording entitles either party to request commutation a certain period of time after the effective date of the contract. If the parties do not agree to commute or fail to agree to the commutation settlement, there is no legal requirement to proceed. A variation on this theme is where either party after a specific period of time may ask to commute, and if agreed to by the other party, the commutation then becomes enforceable. Optional commutations normally have little or no value from a pricing standpoint. Theoretically, any reinsurance contract can be commuted at any time, so long as both parties agree. All the optional commutation clause can do is predetermine some of the parameters to be used in case of commutation, which can, in fact, be more limiting than helpful.

2. Known and Unknown Liabilities. It is usually desirable from a reinsurer's perspective that when agreement is reached on the value for a claim or group of claims subject to commutation, the final value should include IBNR. Commutation wording such as this the identification of the liabilities being commuted should specifically identify IBNR in addition to paid losses and allocated loss adjustment expense recoverable and reserves for losses and ALAE. In the event the commutation is for known liabilities only, the wording should reference that the adverse development on the known claims is included in the commutation amount.

The value of the nominal losses to be commuted can be estimated by a variety of processes. All known losses in the layer and open potential losses below the layer should be examined. These can be evaluated using the parameters set out in the commutation clause. By examining as many potential losses (losses which may develop into the layer) as possible, the uncertainty surrounding the unknown liabilities should be minimized. As mentioned earlier, a stochastic process of evaluating the claims and parameters can be helpful. Claim reporting patterns for each of the types of occurrences which can cause losses can also be helpful in estimating the remaining liability from unknown losses.

3. Discount Rates and Escalation Rates. To reflect the net present value of the ultimate losses being commuted, the discount and escalation rates may be selected at the time of commutation, based on agreed objective measures. Often in commutation clauses applicable to workers' compensation clash covers, separate escalation rates for indemnity and medical benefits are considered where applicable. (Escalation rates are typically unnecessary for other lines of business or types of loss.)

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When selecting escalation and discount rates, it is important to remember that these are normally variables. As discussed in *Levels of Determinism in Workers' Compensation Reinsurance Commutations*, by Gary Blumsohn[7], these can be simulated as a measure of the variability in the rates. The importance of selecting proper escalation rates can be magnified when combined with certain commutation mechanics, such as commuting between the layers, discussed below. When applying escalation rates, it is also important to determine whether the losses are reserved by the cedent on a nonescalated basis, to prevent escalating the losses twice.

The bottom line is that the pricing actuary should be aware of the values to be used for the escalation and discount rates, and form an opinion on the adequacy of these rates. Any perceived differences should be considered in the cash flow modeling.

4. Commuting Ground-Up v. Commuting by Layer. The more standard commutation clauses in the market today work by first determining the discounted value of the covered loss. At that point, the retention and reinsurance layers are applied which generally have the effect of collapsing the losses into the retention and the lower layers of a reinsurance structure. On the other hand, commuting by layer means that the ultimate covered loss would first be apportioned to the layers before any discounting occurred. If this is contemplated, the pricing assumptions for all layers should reflect this.

The interplay between this mechanism and the discounting/escalation form the heart of the commutation provision. The simplest case is where the loss does not escalate and discounts from the ground up before layering. Say the nominal loss is $11 million ground up and the reinsurance layer is $10 million excess $5 million. Further assume the discounted value of the $11 million loss is $7 million. Then under the ground up commutation, the reinsurer will pay $2 million, but that isn't the whole story. Looking at the original $11 million as the sum of the $5 million retention and the $6 million excess loss, suppose the retention discounts to $4 million and the excess to $3 million. In this case, the reinsurer saves $1 million ($3m - $2m) off of the discounted value of the reinsurer's payments had the loss not been commuted. This $1 million has discounted out of the layer, and will revert to the cedent. From a modeling point of view, this approach affects the expected losses as well as the cash flow and investment income.

On the other hand, using the same example, assume the clash contract has a commutation provision where losses are commuted between the layers. Then, the original $11 million is divided into the $5 million retention and $6 million excess loss before discounting. Using the above figures, the reinsurer will pay the discounted value of the $6 million, or $3 million. In this case, the savings to the reinsurer (and thus on the price the cedent pays), result mainly from a reduction in loss adjustment expenses which would have been paid had the claim not been commuted. The present value of the expected losses at treaty inception is unchanged; only the cash flow and realization of investment income are really affected. (There is no real economic savings on the loss.)

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For a third example, assume the same reinsurance layer of $10 million xs $5 million, but a nominal loss of $30 million. Further assume the $5 million retention still discounts to $4 million, and the $25 million excess loss discounts to $12 million. Thus, the discounted ground up loss is $16 million, and using the method discussed above of discounting ground up and then layering, the reinsurer suffers a full loss to the $10 million xs $5 million layer. The loss has actually collapsed into the reinsurer's layer at commutation. The reinsurer pays the full $10 million, as it would have without commuting, but pays it much earlier than the payments would have come without the commutation. Note that using the method of commuting between the layers, the reinsurer would only have paid the discounted value of the $10 million nominal loss in the layer.

Thus it is possible for the ground up method of discounting to be worse for the reinsurer than the layer discounting method, but it isn't likely. Given the shape of most loss distributions and the size of losses affecting most clash programs, smaller losses are usually more frequent. Thus, losses tend to discount out of clash layers more than collapse down into them, particularly for higher layers. An exception to this might be a low excess layer on an exposure suffering from very high severity casualty losses.

An additional difficulty may arise in the case of commuting workers' compensation losses which have escalating benefits. When valuing a commutation clause which discounts between the layers, losses will be escalated, layered and then discounted. If the escalation rate is consistently overestimated, losses can be overinflated into the reinsurer's layer, then trapped there by the commutation calculation. Regardless of the discount rate used, the losses aren't allowed to discount out of the layer. (Conversely, a consistent underestimation of the escalation rate, such as using 0%, will reduce the reinsurer's liability at commutation using this method.)

5. **Mechanisms for handling disputes concerning valuation.** To facilitate agreement on the value of the claim or claims to be commuted, the parties can agree to submit any disputes to a panel of arbitrators who are actuaries, either members of the American Academy of Actuaries or Fellows of the Casualty Actuarial Society or both.

6. **Full and Final Release.** The reinsurer will want to be assured that its payment of the commutation amount where it covers both known and unknown liabilities will completely and finally release it from all past, existing, and future obligations with respect to the liabilities commuted, including any contingent liabilities. This acts to commute the entire contract as the release of the reinsurer of liability for future loss development acts as a sunset provision. If only known liabilities are covered, the full and final release applies to the known liabilities and the adverse development on the known liabilities. In essence, the parties are essentially commuting losses within the contract. After the commutation of the original losses occurs, subsequent losses are also subject to commutation.

B. **Additional contractual terms.**

1. **Offset.** The decision to commute may be affected by the existence in the contract of offset provisions that allow the parties to offset debts and credits under the contract in the ordinary

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course of business and in the event of a party's insolvency. Of course in the latter situation offsetting may be subject to legal challenge by regulators or the debtor party on the basis that policyholders, claimants and all other general creditors have priority over reinsurers claims under reinsurance contracts. In the absence of an offset clause, commutation may be the only reasonable alternative for a cedent to secure large recoverables.

2. Loss Caps and/or Sunset provisions. Contractual terms that place limits on the amount of money a reinsurer can lose may mitigate the need for the parties to enter into a commutation. For example, a loss ratio cap will limit reinsurance coverage when paid losses exceed some multiple of reinsurance premiums earned over the course of the treaty term. A sunset provision will likewise end the reinsurer's payment obligations after a specified number of years from the inception date of the contract. Claims that are not notified to the reinsurer before the sunset date are not recoverable.

C. Other Considerations.

Beyond the above, there is an additional exposure presented by commutation clauses of which the reinsurer should be aware.

Consider the situation where a cedent has significant workers' compensation exposure. One approach for reinsuring large workers' compensation exposures used frequently in today's market is to buy "carve-out" coverage, typically from Accident and Health (A&H) markets. These products will usually be sold with commutation and sunset clauses. Complementary coverage can then be purchased from property and casualty markets to reinsure other exposures excluded from the carve-out cover. These will typically include EXO/XPL, Employers Liability (EL), possibly multiclaimant losses (depending on the carve-out product) and non-workers' compensation losses.

As an example, assume a cedent buys carve-out protection for workers' compensation single claimant losses with a layer of $10 million excess of $5 million. Then, the cedent buys traditional P&C protection for $10 million excess $5 million, as well. Further assume that the carve-out cover has a commutation clause but the P&C cover does not.

The P&C cover can be worded any number of ways in order to have it apply only after the carve-out cover, and so avoid double coverage or coverage gaps. At times, more than one method to achieve this will be used in a single contract. One method is to have the P&C cover contain a "maximum any one life" (MAOL) warranty or representation which, for our example, would of $5 million or less. This will cause the loss amount from any single claimant to be limited to the MAOL and so under this cover there would be no recovery for a single claimant. A second method is to exclude workers' compensation in the "Business Covered" clause of the contract. Since this method could also exclude losses otherwise covered resulting from workers' compensation occurrences, such as ECO or EL, care should be taken to clarify the scope of contractual coverage. A third method is to specifically list in the Business Covered article only the types of loss which will be covered, such as occupational disease, cumulative injuries,

employers' liability and ECO. This type of P&C cover is often called a Difference in Conditions (DIC) cover.

A fourth method is to state that the carve-out cover inures to the benefit of the P&C cover (assuming it is not used in combination with any of the foregoing). There are two exposures worthy of mention with respect to this approach. The first is fairly obvious. In our example, if the cedent has a workers compensation loss which is greater than $15 million (ground-up), then the excess amount above $15 million can attach the P&C cover. For example, say the cedent has a $16 million loss. The carve-out will pay $10 million, leaving a net loss to the cedent of $6 million. The P&C cover attaches at $5 million of ultimate net loss to the cedent after inuring reinsurance, so it provides an additional $1 million in protection. Excluding complications caused by the carve-out's commutation or sunset clause, this exposure is fairly easy to price.

The second potential exposure caused by the inuring reinsurance wording relates directly to the commutation clause on the carve-out cover. Consider the following example. Say the carve-out has a commutation clause which is mandatory after five years from expiration with the losses discounted and then layered. The P&C cover has no commutation clause. Assume the cedent has a ground-up loss of $14 million, and at the time of commutation this discounts to $7 million. Thus, the carve-out cover pays $2 million at commutation, and the cedent has its $5 million retention. However, these are discounted amounts. Say the $2 million carve-out portion represents $6 million undiscounted. Thus, the $5 million cedent retention represents $8 million undiscounted ultimate net loss. Herein lies the problem.

Consider the retention, first. By the time this pays out, the inuring carve-out has long been commuted. The P&C cover attaches based on the cedent's ultimate net loss. The cedent has very good arguments for claiming a $3 million recovery from the P&C cover.

Taken a step further, the ultimate gross loss is our original $14 million. The recovery from inuring reinsurance is $2 million. Unless the P&C cover has a provision which takes credit for the implied future investment income determined in the carve-out commutation calculation or for investment income from annuities purchased with the proceeds of the commutation, the cedent has an argument that its ultimate net loss to the P&C cover is $12 million ($14 million gross - $2 million ceded). This would mean the P&C cover potentially responds for $7 million.

This coverage is not what the P&C reinsurer is normally intending to do. It also isn't necessarily the coverage the cedent is trying to purchase to begin with, but could be worth pursuing in the event of a large loss. The reinsurer should therefore be aware of the ambiguity presented here and structure the contract such that this exposure is either excluded or paid for.

One way the reinsurer may avoid this problem is if the contract is worded such that it is warranted or deemed that the cedent will "maintain" the inuring coverage. This causes the P&C cover to apply as if the carve-out were never commuted. (The alternative to this is that the contract may be worded such that the cedent "is allowed to purchase" or "agrees to purchase" inuring coverage, which doesn't necessarily require its existence throughout the term of the P&C cover.)

An additional consideration is that a judge or arbiter could find that this interpretation goes against the custom and practice in the insurance and reinsurance industry. Yet bear in mind that this type of reinsurance structure--a workers compensation carve-out cover followed by a P&C wrap-around cover--has not been in general use long enough to have acquired a customary interpretation.

From the reinsurer's point of view, the desirable outcome may be to exclude this exposure, because accurately measuring it is virtually impossible. The exposure to the reinsurers on the P&C cover depends on intricate negotiations in which only the carve-out market and cedent participate, thus precluding any meaningful input from the P&C reinsurers in the determination of the ultimate value or discounting of the claim being commuted, which values determine, in part, the P&C markets losses.

VI. Conclusion

In this paper, we have considered some of the more pivotal sections in a clash reinsurance contract, and some of the variations in these clauses, to show how they can affect the reinsurer's exposures and the modeling process. Overall, the key is to understand what exposures the cedent has and what exposure it is seeking protection for. If the pricing actuary and underwriter know what coverage is desired and why, the modeling process becomes more enlightened.

Business Disaster Event Definition

1. "Event" shall mean all damage, injury or loss covered by one or more policies of insurance issued by the company, which is a direct consequence of one particular accident, disaster or casualty which takes place in its entirety at a specific time and place and is traceable to the same single act, omission, mistake, error or series or acts, omissions, mistakes or errors.

    As respects coverage provided under policies classified by the company as Professional Liability, Directors and Officers Liability, Public Officials Liability, Educators Legal Liability or other liability coverages written by the company on a claims made, losses reported or losses discovered basis, the term Event shall also mean, all damage, injury or loss covered by one or more such policies which arises out of a claim(s) against more than one original insured of the company by:

    a) the same allegedly injured third-party or parties and/or

    b) other original insureds of the company that have had a claim(s) against them as in paragraph (a) above and, the alleged act, omission, mistake, error or series of acts, omissions, mistakes or errors are traceable to the same Central Loss.

        "Central Loss" shall mean the failure (including but not limited to liquidation) or impairment (including but not limited to severe financial loss and/or the need to seek or receive protection under State or Federal statute or regulatory authority) of one or more nonprofit institutions, public entities, or commercial enterprises, without whose failure or impairment there would have been no claim(s) against the original insured(s).

Footnotes:

1. Pricing Extra-Contractual Obligations and Excess of Policy Limits Exposures in Clash Reinsurance Treaties, Paul Braithwaite and Bryan Ware, Journal of Reinsurance, Spring 1995.

2. On Pricing Multiple-Claimant Occurrences for Worker's Compensation Per-Occurrence Excess of Loss Reinsurance Contracts, Gregory Graves, Casualty Actuarial Society Discussion Paper Program, 1990.

3. Recursive Evaluation of a Family of Compound Distributions, H.H. Panjer, ASTIN Bulletin. 12, Part 1.

4. The methodology for accomplishing this is beyond the scope of this paper.

5. The "Event" Debate in Asbestos Related Excess of Loss Reinsurance Disputes. Tort and Insurance Law Journal, Vol. 31, Number 3, Spring 1996.

6. The CAS literature includes a number of good articles on this topic: See e.g., Conner, Vincent and Olsen, Richard (1991): Commutation Pricing in the Post Tax-Reform Era, PCAS, vol. LXXVIII; Ferguson, Ronald (1971): Actuarial Note on Workmen's Compensation Loss Reserves, PCAS, vol. LVIII; Steeneck, Lee (1996): Actuarial Note on Workmen's Compensation Loss Reserves - 25 Years Later, Casualty Actuarial Society Forum, Summer 1996.

7. Blumsohn, Gary (1997): Levels of Determinism in Worker's Compensation Reinsurance Commutations.

Additional Reading:

1. The Decision Making Process For A Commutation. Terrence M. O'Brien, Coopers & Lybrand. April 2, 1989.
2. Commutation is A Useful Alternative To Solving An Insurance Dispute. Peter Matthews. Post Magazine. November, 1987.
3. As The Reinsurance Industry gradually Becomes More Aware Of the Benefits To Be Gained From the Commutation Of Losses. Ken Louw. Reuter Textline. September 23, 1987.
4. Commute or Not To Commute. Phillip Wolf. Best's Review. April, 1987.