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THE "MODIFIED BORNHUETTER-FERGUSON" APPROACH TO IBNR ALLOCATION

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Abstract

Trent Vaughn and Phoebe Tinney have presented a valuable methodology for allocating IBNR to allocation units that do not always warrant separate IBNR analyses. Vaughn and Tinney properly warn that:

> *Actuaries should be aware, however, of the possible pitfalls of allocating IBNR down to an extremely fine level of detail. For instance, such allocations may incorrectly imply a degree of precision that does not exist. The actuary must be aware of this risk and communicate any concerns to the end user.*

But as we are quite painfully aware, there are times when the actuary has no choice. For instance, someone must allocate ceded IBNR to individual reinsurers in order to complete Schedule F—preferably someone who appreciates the implications of a misallocation. Though Vaughn and Tinney have suggested that their methodology may apply, the analysis process should not end there.

This discussion highlights an area that is typically a pro forma accounting function, virtually ignored by actuaries, yet it has profound actuarial implications that deserve significant attention not yet addressed in actuarial literature.

TABLE 1

REINSURANCE RECOVERABLE

Reinsurance Recoverable On:	
Paid Losses	$1,000
Paid LAE	200
Known Case Loss Reserves	1,100
Known Case LAE Reserves	200
IBNR Loss Reserves	500
IBNR LAE Reserves	0
Unearned Premiums	2,000
Contingent Commissions	0
Total	$5,000
Ceded Balances Payable	0
Other Amounts Due Reinsurer	0
Net Amount Recoverable	$5,000
Funds Held by Company Under Reinsurance Treaty	$5,000

1. THE PROBLEM OF ALLOCATING CEDED IBNR TO INDIVIDUAL INSURERS

The actuary makes one last review of his assumptions before signing his name to the loss reserve opinion. He reviews Schedule F to satisfy himself that he has no reason to question the collectibility of the client’s reinsurance recoverable. A particular unauthorized reinsurer catches his attention. The line for that reinsurer is shown on Table 1.

Just before he signs his name, he asks himself, “What happens if the ceded IBNR was incorrectly allocated to the unauthorized reinsurer?”

He has reviewed his analysis thoroughly, and is satisfied that the aggregate direct IBNR loss reserve of $2,000 is reasonable. He is even satisfied that the aggregate ceded IBNR of $1,500 is reasonable. The actuary used Vaughn and Tinney’s Modified Bornhuetter-Ferguson approach, and has allocated $500 of the $1,500 ceded IBNR to this particular reinsurer. For Vaughn

and Tinney have advised: “The approach can be used to allocate ceded IBNR to individual reinsurers for Schedule F purposes.”

The client acted on the actuary’s preliminary advice and withheld $5,000 to assure collectibility.

What happens if the $1,500 of ceded IBNR emerges in such a manner that the unauthorized reinsurer is liable—not for $500—but for $1,000 of the IBNR recoverable?

Assuming that the client is unable to secure the additional $500 in time for statement filing, that the actuary has no means of confirming the unauthorized reinsurer’s financial strength, and that $500 of upward reserve development is judged material, the ceded IBNR becomes of more questionable collectibility than Schedule F has made it appear.

Vaughn and Tinney concede: “The Annual Statement may require IBNR estimates at a finer level of detail than the reserve segment definitions.”

And as already noted, they wisely caution us:

> Actuaries should be aware, however, of the possible pitfalls of allocating IBNR down to an extremely fine level of detail. For instance, such allocations may incorrectly imply a degree of precision that does not exist. The actuary must be aware of this risk and communicate any concerns to the end user.

Schedule F indeed requires an allocation of ceded IBNR to individual reinsurers whether or not the actuary believes the resulting allocation is meaningful. In some cases, the allocation to reinsurer may not be a problem. For instance, the company may list only a single reinsurer, and no allocation of ceded IBNR to reinsurers is needed. The company may have separate reinsurers that align nicely with the actuary’s level of detail for analysis, such as line of business or accident year. Heavy use of quota share treaties can also facilitate the allocation of ceded IBNR.

Finally, in rare cases, there may be sufficiently credible loss experience by reinsurer that such separate analyses become feasible.

But for most companies with a comprehensive reinsurance program, the entries onto Schedule F result from some manner of allocation process. The fact that the company involved the actuary in that allocation process is likely a step up from most companies. Actuarial discussion on the process of allocating ceded IBNR to reinsurer seems terribly sparse, leading me to believe that in most cases, actuaries are not involved in the process at all. Even worse is the likely case that those who do allocate ceded IBNR to reinsurers are not necessarily trained to appreciate the relationship between the result of the allocation and collectibility from any individual reinsurer.

2. REQUIRED SECURITY TO GUARANTEE COLLECTIBILITY

In cases where the company is reinsured by a collection of authorized reinsurers whose financial security raises no concerns, allocation may not be a concern. But even when unauthorized reinsurers are involved, ceded IBNR continues to be allocated without the influence of the actuary. This could have adverse implications for the actuary who will eventually opine on the collectibility of the ceded IBNR, however it was allocated. Multiple unauthorized reinsurers can seriously add to the risks of improper allocation.

Vaughn and Tinney deserve credit for noting that the allocation method deserves more careful attention than it normally gets. However, it seems that Vaughn and Tinney's Modified BF allocation method merely replaces one mechanical methodology with another. In cases where security is required to guarantee collectibility, whether arising from lack of jurisdiction or from financial concerns, the amount of IBNR to be allocated to that particular reinsurer should receive more careful attention than a passing remark in a *Proceedings* paper on IBNR allocation.

The amount of security a company holds should not be a function of any particular ceded IBNR allocation methodology, but rather should be carefully considered as a function of the probable maximum amount ceded to a reinsurer. Consider the following much simplified example.

A company insures two large buildings (A and B) for $1,000 each. Separate unauthorized reinsurers fully reinsure each of the two policies that protect the buildings. During the reserve review, the company and the actuary become aware that one of the buildings was destroyed just prior to year end, though there is no information on which building. The actuary adds a $1,000 IBNR reserve, and a $1,000 ceded IBNR reserve, with no effect on the net reserves. These entries are made on Schedule P and on all Annual Statement pages that depend on Schedule P.

On Schedule F, the $1,000 ceded IBNR reserve must be assigned to specific reinsurers. If building A was the one destroyed, then reinsurer A should be assigned the $1,000 ceded IBNR, and to the extent that security is required, it should be demanded. The same scenario applies to building B if that was the one destroyed. In practice, the $1,000 ceded IBNR reserve will almost certainly be allocated between the two reinsurers, either fifty-fifty, or through some other methodology that guarantees that one of the reinsurers will be inadequately secured. A probable maximum ceded methodology would require the company to secure a full $1,000 from both reinsurers.

A ceded IBNR allocation will balance to the correct total, but will expose the company to inadequate security for one reinsurer. A probable maximum ceded allocation will generate adequate security from each reinsurer, but will result in an excessive ceded IBNR total for Schedule F, and an inadequate, perhaps even a negative, net IBNR. The only way to assure adequate security would be for each reinsurer to place the full $1,000 in trust.

Perhaps this discussion concerns the rationale of Schedule F security, whether funds withheld, letters of credit, ceded balances

payable or any other form of collateral, more than it does what method is used to allocate ceded IBNR to reinsurer. For in the case of a single reinsurer, 100% of the ceded IBNR is allocated to that single reinsurer. If that single reinsurer were unauthorized, then collateral would be demanded and received. But even at 100% allocation, the security can prove inadequate. Reinsurance collectibility, though fully secured, is not assured, and the methodology of ceded IBNR allocation is not at fault. At this level, it seems more prudent to base the collateral on a probable maximum ceded methodology.

Realistic applications of the probable maximum ceded method are generally not as extreme as the simplistic example set forth for illustration. But where security is required for at least one reinsurer, the aggregate probable maximum ceded IBNR can easily become significantly and materially higher than the aggregate ceded IBNR. It may be a challenge for a company to obtain the security beyond that implied by a ceded IBNR allocation. But the difference between the aggregate probable maximum ceded IBNR and the aggregate ceded IBNR is simply the amount of adverse reserve development to which the company is exposed, arising from possible ceded IBNR misallocation.

There are several difficulties associated with a probable maximum ceded methodology. Among these difficulties are the burden on the actuary to calculate it, the burden on the company to obtain higher security, and the burden on the reinsurer to commit additional funds to this new standard. Of course the burden of adverse reserve development arising from a ceded IBNR misallocation to a troubled reinsurer can be significant as well.

I do not anticipate that Schedule F will be transformed to a probable maximum ceded basis of security. Just as primary insurers cannot possibly reserve for probable maximum loss risk by risk, few reinsurers, even the financially healthiest, can possibly post collateral at probable maximum loss by risk. If a reinsurer could secure its liabilities on a probable maximum basis by risk, its financial condition would appear better. There is hope that

primary companies can look beyond the Schedule F criteria in demanding security, and there is hope that opining actuaries can be more conscious of the implications of misallocating ceded IBNR to a reinsurer.