Indexed Retentions And Multiple Claimant Losses In Nonproportional Reinsurance

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Ronald Ferguson, in his "Nonproportional Reinsurance and the Index Clause," discusses the motivation for and procedures of using an index clause in nonproportional reinsurance.(1) When there is a single claim subject to the retention, determining the indexed retention is straightforward: one adjusts the retention by the change in the inflation index between the policy inception date and the claim settlement date. When more than one claim or payment is subject to a single retention, the procedure becomes more difficult, since there is no single date to which the retention should be indexed. Ferguson recommends deflating all loss values to time 0, summing the deflated values, determining the percentage of the total deflated value that the original retention forms, and then applying that percentage to the settlement values to determine the primary insurer's share of the loss. Ferguson's example, which succintly illustrates the entire procedure, is reproduced below in Figure 1; the example assumes an original retention of $50,000 in a policy effective in 1974, and inflation of 10% a year.(2)

	Year Settled	Loss Amount	Index	Deflated Value
Claimant A	1975	$ 10,000	1.10	$ 10,000/1.10 = $ 9.091
Claimant B	1976	15,000	1.21	15,000/1.21 = 12,397
Claimant C	1980	150,000	1.77	150,000/1.77 = 84,746
Total		175,000		106,234

Original retention as a percent of deflated losses: 50,000/106,234 = 0.4707
Excess recovery (deflated basis): 56,234/106,234 = 0.5293

Thus, the $175,000 should be allocated as follows:

Retention: 50,000 * 175,000 / 106,234 = 175,000 * 0.4707 = $82,372
Recovery: 56,234 * 175,000 / 106,234 = 175,000 * 0.5293 = $92,628

Figure 1. Index clause procedures for a multiple claimant loss

There are two problems with this procedure. First, as Ferguson himself notes, this procedure assumes that the retention amount is not determined until after all claimants have been paid. One can solve this problem by having the retention determined as soon as enough loss payments have been made to exceed the indexed retention. For instance, if the $150,000 payment in 1980 in the example above were replaced by two payments of $75,000 each in 1979 and 1981, the retention would be determined after the 1979 payment, since

(1) Ronald E. Ferguson, "Nonproportional Reinsurance and the Index Clause," PCAS LXI, 1974, p. 141.

(2) Ferguson, op. cit., Table VI on p. 151 and Table VII on p. 152.

10,000 / 1.10 + 15,000 / 1.21 + 75,000 / 1.61 = 68,071 > 50,000

The second problem is more serious. In the example above, the primary insurer pays the first two claims in 1975 and 1976, and receives a recovery from the reinsurer only in 1980. Since inflation is positive, the value of the dollar declines in real terms over the years. The retention and excess percentages of 0.4707 and 0.5293 refer to amounts in real dollars, but they are applied to amounts in nominal dollars (the settlement values). Yet the nominal dollars paid by the primary insurer are worth more in real terms that the nominal dollars paid by the reinsurer, since they are paid earlier.

To determine the amount retained by the primary insurer, one should index the original retention to the date of the first claim settlement, subtract the amount of the settlement, index the remaining retention to the time of the second settlement, subtract the amount of the second settlement, and so forth. This procedure is illustrated for Ferguson's example in Figure 2.

Year	Retention	Loss Amount	Remaining Retention	Paid by Insurer	Paid by Reinsurer
1975	50,000 * 1.100 = 55,000	10,000	45,000	10,000	0
1976	45,000 * 1.100 = 49,500	15,000	34,500	15,000	0
1980	34,500 * 1.464 = 50,508	150,000	0	50,508	99,492
Total		175,000		75,508	99,492

Figure 2. Revised calculation of retention for multiple claimant loss

The difference between the two procedures is quite large. Using the first method, the primary insurer pays 9% more than it actually should.

Both procedures may require detailed arithmetic calculations in a large multiple claimant loss. However, if we wish to persuade American primary insurers to accept index clauses in their nonproportional reinsurance contracts, we must be careful not to allocate to them more of an indexed retention than is justified. Ferguson's reasons for using an index clause are entirely convincing; this modification of the procedure for determining the retention in a multiple claimant loss should remove one possible inequity in the application of this clause.