LOSS PORTFOLIOS: FINANCIAL REINSURANCE

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In reviewing Lee Steeneck's excellent paper on loss portfolio transfers, it became clear that two distinct sets of issues should be covered in any discussion of this particular form of reinsurance. The first area which needs to be addressed deals strictly with the pricing considerations involved in any of these deals. The second, and perhaps more important area, is that of the non-pricing considerations, in which both the justification and impact of discounting loss reserves are covered. I will present a few of my thoughts in each area, expanding on points brought out in the article.

I. Pricing Considerations

While many topics related to the pricing of loss portfolios could be addressed, I will limit my discussion to two items which have a tremendous influence on the ultimate adequacy of the reinsurance premium - reinvestment risk and underwriting (acceleration) risk.

A. Reinvestment Risk

The author makes the statement that reinvestment risk is of "staggering" importance. While this may be a questionable assertion for a majority of the deals currently taking place, there are certainly specific transactions in which the reinvestment risk is sizeable. The impact of changes in the reinvestment rate on the ultimate adequacy of the reinsurance premium can be illustrated through a simple example. Suppose that after all the actuarial analysis has been completed, the following expected payout pattern is chosen as the basis for pricing the cover:

Year	Paid Loss*(000's)
1-5	$ 0
6	2,000
7	2,000
8	2,000
9	2,000
10	2,000
Total	10,000

*Assume losses paid at year-end

As is pointed out in the article, the reinsurer will attempt to match bond maturities with this expected payout pattern, resulting in a dedicated portfolio of bonds which is immunized from any interest rate changes during the holding period. An immunized portfolio, as defined by Ferguson, is one in which the desired wealth level of the portfolio is achieved at the end of the investment horizon (holding period) regardless of any interest rate changes which may take place during the holding period, while also meeting all intervening cash flows during the holding period. An immunized portfolio is not achievable in this example, however, since there is a reinvestment exposure present during at least the first five years of the payout.

As shown in Exhibit 1, the present value of the above paid loss stream is $4707, assuming annual coupons of 10% and a 10% reinvestment rate. If the reinvestment rate assumption is changed to 7%, however, it can be seen that the cost of funding this loss payout increases to $4888 (Exhibit 2). Obviously, the anticipated five-year "waiting period" prior to the initial loss payment results in reinvestment risk being present in this example. For payout patterns which possess a shorter period of time prior to the initial loss payment, the reinvestment exposure is substantially reduced. Table 1 outlines six progressively "quicker" payout patterns, and illustrates the impact that a 3% reduction in the reinvestment rate has on the pricing. As expected, as the "waiting period" decreases, so does the impact of the reinvestment rate assumption, until the point is reached (Pattern #6) where there is no reinvestment risk present. It is only then that an immunized portfolio can be achieved through the exact matching of cash flows, as illustrated in Exhibit 3.

B. Acceleration Risk

The term "acceleration risk" simply refers to the possibility that reinsured losses may pay out sooner than that pattern which was anticipated in the pricing of the deal. Since this will result in the reinsurance premium being inadequate to fund the reinsured losses, it can be seen that "acceleration risk" is simply another name for "underwriting risk".

As Table 1 illustrates, varying the payout pattern assumption has a considerable impact on the pricing of these deals. For example, if payout pattern #1 is the expected result, a present value of

TABLE 1

ALTERNATIVE LOSS PAYOUT PATTERNS

Year	#1	#2	#3	#4	#5	#6
1	$ 0	$ 0	$ 0	$ 0	$ 0	$ 2,000
2	0	0	0	0	2,000	2,000
3	0	0	0	2,000	2,000	2,000
4	0	0	2,000	2,000	2,000	2,000
5	0	2,000	2,000	2,000	2,000	2,000
6	2,000	2,000	2,000	2,000	2,000	-
7	2,000	2,000	2,000	2,000	-	-
8	2,000	2,000	2,000	-	-	-
9	2,000	2,000	-	-	-	-
10	2,000	-	-	-	-	-
Total	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000

Payout Pattern	Interest (Coupon) Rate	Reinvestment Rate	Present Value of Paid Losses	Increase in Price due to 3% Reduction in Reinvestment Rate	
				$	%
1	10%	10%	$4,707		
	10%	7%	4,888	$181	3.8%
2	10%	10%	5,178		
	10%	7%	5,313	135	2.6
3	10%	10%	5,696		
	10%	7%	5,787	91	1.6
4	10%	10%	6,266		
	10%	7%	6,312	46	.7
5	10%	10%	6,892		
	10%	7%	6,910	18	.3
6	10%	10%	7,582		
	10%	7%	7,582	0	0

$4707 is developed, whereas if a quicker payout such as pattern #3 is employed, a substantially greater present value ($5696) results. The worst-case scenario under this example would be a payment of the entire $10,000 in Year 1, with this payment having a present value of $9091. Thus the reinsurer is clearly exposing itself to a substantial amount of underwriting risk by entering into one of these deals. As the author alludes to in his article, to the extent that a structure of reimbursements exists as to timing and amount, this lessens the reinsurer's risk. The following are three approaches designed to lessen this risk to the reinsurer, with the basic thrust being to have the reinsured and the reinsurer share in the acceleration risk.

1. First Payment Date

One method by which the acceleration risk can be shared is through the implementation of a first payment date, which would specify that the reinsurer will not be required to make a loss payment prior to a certain date. For example, if a first payment date of the fourth year-end is implemented, then the reinsurer would not be required to make any payments up until that time, at which point it would be required to reimburse the reinsured for all losses paid in Years 1-4, up to the $10,000 limit. If we had priced this deal at $4707 using payout pattern #1, we can quantify the acceleration risk as follows:

Total	$9091	(Present Value of $10,000 paid in Year 1)
Acceleration	-$4707	(Present Value of expected payout pattern)
Risk:	$4384	

The total acceleration risk of $4384 thus represents the difference in the present values between the worst-case payout of $10,000 at the first year-end, and the expected payout of $2000 in each of the Years 6-10.

How does the implementation of a first payment date reduce the risk to the reinsurer? The worst-case scenario for the reinsurer now is that it would have to pay $10,000 at the fourth year end, with the present value of this payment being $6830. Therefore, the reinsurer's acceleration risk is now

$$\$6,830 - \$4,707 = \$2,123$$

rather than the previous figure of $4384. The reinsured would now share in the acceleration risk, with its total amount at risk being

$$\$9,091 - \$6,830 = \$2,261.$$

While at first glance it might appear that, due to the amounts at risk, no reinsured would ever agree to such a first payment date plan, it should be remembered that probabilities must be assigned to the respective risk elements, with the reinsurer's risk potential being much greater than the reinsured's. While the first payment date plan succeeds in sharing the acceleration risk under the worst-case scenario, it fails to protect the reinsurer from any accelerated payout which might occur subsequent to the first payment date.

2. Aggregate Paid Loss Caps

A second approach to sharing the acceleration risk is through the implementation of aggregate paid loss caps, which specify the maximum amount of losses which the reinsurer will pay at any point in time. For example, aggregate paid loss caps can be structured for the $10,000 example as follows:

Year	Paid Loss
1	Up to $ 2,000, total, inception-to-date
2	Up to $ 4,000, total, inception-to-date
3	Up to $ 6,000, total, inception-to-date
4	Up to $ 8,000, total, inception-to-date
5	Up to $10,000, total, inception-to-date

By limiting the total amount that the reinsurer would have to pay in each year, this method succeeds in sharing the acceleration risk. If the total acceleration risk is again set equal to $4384, the risk would be shared as follows:

Reinsurer: $7,582 (Present Value of $2000 paid in Years 1-5)
-$4,707 (Present Value of expected loss payout)
$2,875

Reinsured: $9,091 (Present Value of $10,000 paid in Year 1)
-$7,582 (Present Value of $2,000 paid in Years 1-5)
$1,509

As in the case of the first payment date, however, the probability of the reinsured being forced to make payments far in advance of the corresponding reinsurance recovery is slight.

3. First Payment Date and Aggregate Paid Loss Caps

As was mentioned in the article, a loss portfolio reinsurance arrangement must exhibit legitimate risk transfer, i.e.,

there needs to be underwriting as well as investment (or reinvestment) risk present. While this eliminates a strictly structured payout schedule from being used, it does not prohibit the reinsurer from reducing its acceleration risk to more acceptable levels. By imposing both a first payment date and aggregate paid loss caps, the reinsurer can reduce its acceleration risk substantially, thereby enabling it to offer the lowest possible price to the reinsured. For example, suppose a first payment date of the fifth year-end is imposed, with aggregate paid loss caps as follows:

Year	Paid Loss
5	Up to $ 2,000, total, inception-to-date
6	Up to $ 4,000, total, inception-to-date
7	Up to $ 6,000, total, inception-to-date
8	Up to $ 8,000, total, inception-to-date
9	Up to $10,000, total, inception-to-date

On a worst-case basis, the present value of the reinsurer's paid losses would be $5178, thereby placing its acceleration risk at only $471 ($5178 - $4707). If both parties to the transaction are comfortable with the expected payment pattern used in the initial pricing, then the imposition of the first payment date and the aggregate paid loss caps could result in a substantial reduction in the reinsurer's risk charge, thus lowering the premium which must be paid by the reinsured. While admittedly this is providing the reinsured with less coverage than a totally unstructured deal, all of the business purposes served by loss portfolio transfers are still being met, while providing the reinsured with the lowest up-front cost option.

Other methods of sharing the underwriting risk can be devised; however, as the author points out, any deal which imposes any sort of structure on the reinsurer's payments may prove unacceptable to regulators, tax authorities, and auditors from a risk transfer perspective. The risk of this happening would naturally increase as the amount of structure present in the deal increased. Therefore, the decision on whether or not a loss portfolio transfer contains a sufficient amount of risk really needs to be done on an individual case basis.

II. Non-Pricing Considerations

A. Business Purposes Loss Portfolio Transfers Serve

Given the author's list of business purposes, I would have been interested in seeing how he would rank these in order of importance (or validity). While all of the items listed may be the end results of a loss portfolio transaction, several of them should not be classified as valid business purposes.

1. Improve NAIC Early Warning Test Results

Hopefully there is a more valid business purpose underlying the loss portfolio deals currently taking place than this one. However, the cosmetic effect that a loss portfolio transfer can have on a ceding company does appear to be substantial. Therefore, requiring proper disclosure of the terms underlying any such transaction is crucial. This requirement should go so far as to require disclosure of the ceding company's accounting

treatment for the transaction, since the impact on Schedule P differs depending on the accounting method chosen (premium method or loss method).

2. Discount Reserves

Inherent in any loss portfolio transaction is the discounting of loss reserves. Therefore discounting, per se, can be more properly classified as simply a vehicle through which certain business purposes can be served, and not as a business purpose in and of itself.

Also, because of the distorting effect that any loss portfolio transfer has on Schedules O and P, mandatory disclosure of the accounting transactions underlying the deal should be required.

B. Cost Considerations to Loss Portfolio Transfers

1. Potential Loss of Company Stature

While I agree that the potential exists for a loss of company stature, I think an argument could also be made that by not doing one of these deals a company might, at least in the short-term, do harm to its standing in the insurance community. For example, take two companies which have recently discovered that their loss reserves are ten million dollars inadequate. At this point they can take two courses of action. The first would be to simply strengthen their reserves by $10,000, resulting in a reduction in surplus. The second would be to employ a loss portfolio transfer which carried with it a $10,000 benefit, thus eliminating the inadequacy by discounting reserves.

If one company adopts the first approach, it risks showing unfavorable NAIC test results, a possible reduction in its Best's rating, and in general may produce a feeling that perhaps there are more problems with the company that just have not yet been discovered.

If the other company takes the second approach, without proper disclosure, it would appear to be in a much stronger position. Even if fully disclosed, the long-term impact is difficult to quantify and may not be fully appreciated. The question is, which company, on both a short-term and long-term basis, has taken the more prudent approach to dealing with its problems?

2. Letter of Credit Charge

As the author states, there is definitely an additional cost involved in transacting a loss portfolio deal with an unauthorized reinsurer rather than an authorized reinsurer. This is due to the cost of the letter of credit which must be posted on the ceding company's behalf, thereby allowing it to receive credit for the reserves taken down. Going back to the original example, an estimate of the letter of credit charge can be calculated as follows:

Year	LOC Amount	LOC Charge @ .25%	Present Value of LOC Charge
1	$10,000	$25	$25
2	10,000	25	23
3	10,000	25	21
4	10,000	25	19
5	10,000	25	17
6	10,000	25	16
7	8,000	20	11
8	6,000	15	8
9	4,000	10	5
10	2,000	5	2
		$200	$147

Therefore, if this loss portfolio were done with an unauthorized reinsurer, an additional up-front cost of $147 would be required, with this being slightly more than 3% of the loss fund amount of $4707. Obviously, the impact of this letter of credit charge will vary depending on the loss payout pattern which is assumed in the pricing.

As a final note, the author mentions a 1983 proposal to discount liabilities for Schedule P lines at a 5% rate of interest. If this is eventually adopted, it is hoped that every effort is made to insure the clarity of the company's published results. For the Annual Statement, this would involve leaving Schedule P on an undiscounted basis, while establishing an asset equal to the amount of the discount. As is also pointed out, a change in statutory accounting principles to accept discounted loss reserves might obviate the need for many of these loss portfolio transfers.

In conclusion, I think the author should be commended for his fine discussion of this complicated and increasingly important form of reinsurance.

10% REINVESTMENT RATE EXAMPLE
(figures in thousands)

Year	Principal	Coupon Income	Reinvested Funds	Interest on Reinvested Funds	Total Income	Paid Losses	Year-End Balance
1	$ 0	$ 471	$ 0	$ 0	$ 471	$ 0	$ 471
2	0	471	471	47	989	0	989
3	0	471	989	99	1,558	0	1,558
4	0	471	1,558	156	2,185	0	2,185
5	0	471	2,185	218	2,874	0	2,874
6	0	471	2,874	287	3,632	2,000	1,632
7	0	471	1,632	163	2,266	2,000	266
8	1,236	471	266	27	2,000	2,000	0
9	1,653	347	0	0	2,000	2,000	0
10	1,818	182	0	0	2,000	2,000	0
Total	$4,707	$4,297		$997		$10,000	

EXHIBIT 2

7% REINVESTMENT RATE EXAMPLE
(figures in thousands)

Year	Principal	Coupon Income	Reinvested Funds	Interest on Reinvested Funds	Total Income	Paid Losses	Year-End Balance
1	$ 0	$ 489	$ 0	$ 0	$ 489	$ 0	$ 489
2	0	489	489	34	1,012	0	1,012
3	0	489	1,012	71	1,571	0	1,571
4	0	489	1,571	110	2,169	0	2,169
5	0	489	2,169	152	2,810	0	2,810
6	0	489	2,810	197	3,495	2,000	1,495
7	0	489	1,495	105	2,088	2,000	88
8	1,417	489	88	6	2,000	2,000	0
9	1,653	347	0	0	2,000	2,000	0
10	1,818	182	0	0	2,000	2,000	0
Total	$4,888	$4,441		$675		$10,000	

EXHIBIT 3

REINVESTMENT RATE EXAMPLE
(figures in thousands)

Year	Principal	Coupon Income	Reinvested Funds	Interest on Reinvested Funds	Total Income	Paid Losses	Year-End Balance
1	$1,242	$ 758	$ 0	$ 0	$2,000	$2,000	$ 0
2	1,366	634	0	0	2,000	2,000	0
3	1,503	497	0	0	2,000	2,000	0
4	1,653	347	0	0	2,000	2,000	0
5	1,818	182	0	0	2,000	2,000	0
Total	$7,582	$2,418		$ 0		$10,000	