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Measuring Interest Rate Spread

by Selig Ehrlich

Over the last several years as interest rate sensitive products have begun to proliferate, the phrase "interest rate spread" has crept into common usage as well. As an example, in a recent article in the November 1987 *Actuary* entitled "Single-Premium Whole Life Insurance" by Gary E. Dahlman, determining the "target interest spread" was placed at the very top of the list of pricing issues. The basic concept is simple: by crediting to a contract holder a lower rate than is earned on his/her funds, a margin is introduced. Thus, pricing actuaries speak in terms of needing X basis points to cover expenses, profits, etc. This article will blur the issue somewhat—so as to permit sharper refocus—by drawing explicit attention to the fact that there are various ways in which one may choose to measure the investment/return spread actually "earned." Certain implications are then noted.

Background

Were insurance companies to invest purely in government bonds, purchased at par and held to maturity, there would be little point to this article since all of the investment's total return would consist of interest income; no mandatory securities valuation reserve (MSVR) contribution would be required; and Statutory and GAAP treatments are identical. But clearly, this is too simplistic a portfolio to be representative, as we all know that investing in Treasuries would leave little, if any, room in today's competitive market for subtracting any margins.

Moving just one step along the diversification/risk curve, however, to fixed rate corporate/private placement bonds or mortgages—assumed to yield a given constant spread from purchase until redemption at maturity—probably gets us to within the realm of most pricing work, with only an MSVR expense adjustment coming into play. It's small wonder then that we speak of spreads as if ten actuaries placed in a room and given the same investment performance data would agree on a single number for the spread earned against a given liability rate.

The Expanded Investment Horizon
Whereas bonds and mortgages still comprise a large percentage of insurance company portfolios and many may still be held to maturity, the mere existence of Annual Statement Exhibit 4 indicates that capital gains and losses—both realized and unrealized—are not a new phenomenon. New York's Regulation 130 is further testament to the fact that some insurers have embarked on investing in other instruments such as public and private high yield debt (junk)—often purchased with the intent of sale prior to maturity.

Add to this investments in (1) equity real estate, which typically carries the expectation of future capital gains; (2) common stocks, fraught with the volatility associated with changing market values; and (3) various and sundry limited partnership interests valued under the equity method of accounting, and you arrive at the possibility of a non-eligible portion of investment return coming in the form of realized and unrealized capital gains.

This being the case, let's say that for a given measurement period we can all agree that a portfolio of investments, totaling \$1,000, returned \$100 of interest income (II), \$50 of realized capital gains (RCG), and \$10 of unrealized loss (UCG). The question is: "Is there a single figure for this investment performance that can be used in calculating 'the spread' against a given liability credited rate?"

Measurement Bases/Purposes

While annoying in conversation, often a first step in answering any question is to ask: "Why do you want to know?" Another approach, when unsure of the exact answer, is to determine the range of possible values: "It's either '24' or 'last Tuesday.'" Let's see where these approaches lead us.

As stated earlier, interest rate spread has become a key element in the pricing of interest rate sensitive products. Since a central concern of pricing is to achieve a desired financial result, it follows that measurement of the spread should be consistent with the basis underlying the desired financial result.

Luckily, both the Statutory and GAAP bases carry established rules by investment category (i.e., controlled versus noncontrolled limited partnerships, trading versus nontrading portfolios, etc.), for treatment of the

various investment performance components above vis-à-vis the income statement and balance sheet. Therefore, if we limit our attention to these two bases, it is possible to arrive at exact figures for the dollar amounts bookable as current period earnings versus the amount reclassified to the equity or MSVR portion of the balance sheet—as appropriate.

GAAP

Using the performance numbers already suggested, let's say that the asset categories which gave rise to those numbers are such that \$150 (\$100 of II plus \$50 of RCG) would be permitted to flow into current period earnings, with the \$10 of unrealized loss being reclassified to the balance sheet as a change in equity. (Note: not all unrealized losses are excluded from current period earnings under GAAP, i.e., those arising from noncontrolled partnerships—such as the leveraged buy-out funds marketed to institutions like ourselves—would be included.)

Statutory

Here, \$100 will appear as investment income as part of gain from operations (GFO)—with the remaining \$40 (\$50 of RCG less \$10 of UCG) appearing in the Capital and Surplus Account as net capital gains. Assuming that \$40 out of the total of \$50—and all of the \$10 of unrealized loss—arose from investment subject to the MSVR, the resulting increase in MSVR would be \$30.

Under these assumptions, the relevant sections of the Income Statements and Balance Sheets for the two bases would show the following marginal changes:

GAAP	
Statement of Earnings	
Income	XX
NII	100
Bfts & Exps:	
DB etc.	XX
Income from Ops:	100
Net RCG	-50
Net Income*	150
*(ignoring taxes)	
STATEMENT OF EQUITY	
Retained Earnings:	
Beginning Balance	XX
Net Income	150
Ending Balance	150
Unrealized CG:	
Beginning Balance	XX
Net Increase	(10)
Ending Balance	(10)
Total Equity, End of Yr:	140

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Interest Rate Spread Cont'd.

STATUTORY		
Summary of Operations		
Prem	XX	
NIL	100	
Bfts & Expns.		
DB etc.	XX	
Gain from Ops.	100	
CAPITAL & SURPLUS (C&S)		
ACCOUNT		
Beginning C&S	XX	
GFO	100	
Net RCG & UCG	40	
Change in MSVR	(30)	
Ending C&S	110	
Balance Sheet		
Assets	Liabs	
XX	MSVR	+ 30
	C&S	+ 110

As the chart indicates, there are some decisions yet to be made before any conclusion as to spreads can be drawn—the first of which is whether Statutory, GAAP, or both bases are to be the standard of measurement.

If all we are doing is measuring past spread results, deriving answers for both merely involves the extra work of doing the calculation on two bases. If, however, the intent is to develop a new rate recommendation, any differences between the bases creates a more complex problem since there is no way to declare separate Statutory and GAAP rates to the contractholder. Choices will have to be made, or the asset allocation decisions will have to be adjusted to balance potential differences.

If GAAP basis results are chosen to govern, a key remaining decision is to determine the treatment of the \$10 of unrealized loss. Electing to ignore it could be justified, either on the basis of a focus on the earnings statement or by arguing that the loss may likely reverse itself. (Note: these two are not independent, since the "reversal argument" is the logic behind the GAAP treatment of excluding it from current earnings.)

Alternatively, a company may wish to conservatively state its past earnings position to management by immediately recognizing any unrealized losses. In setting new rate actions, it may also choose to scale back its total return expectations. Much may depend on the length of the guarantee being declared and the inherent volatility of the underlying assets.

On the Statutory side, the key issue is the treatment of the MSVR as it relates both to the required annual contribution and the absorption of all realized and unrealized capital gains. As the chart shows, the required statutory contribution to MSVR effectively removes \$30 (plus whatever the required annual addition

is) from the current period's contribution to ending capital and surplus. Therefore, depending on whether true statutory surplus (TSS) or strategic surplus (TSS + MSVR) is the target result being managed to, the earnings assumed would be either \$110 or \$140. Earnings of \$150 would be considered only if unrealized losses were backed out.

Additional Observations/So What
That different answers are possible raises some interesting points regarding asset allocation and competitive standing—even among companies with identical proclaimed interest margins of X basis points.

Those companies managing to Statutory Ending Capital and Surplus results (i.e., \$110 in our example) reap little competitive benefit from assets subject to MSVR whose total return is weighted toward capital gains. Therefore those companies are likely, if competitive credited rate considerations drive the asset allocation decision, to avoid heavy positions in those types of assets regardless of their positive impact on strategic surplus.

Alternatively, those companies are in a much better competitive position (albeit the possible hit to strategic surplus) regarding assets subject to large realized losses absorbed by the MSVR. To see this, just compare the Statutory C&S and GAAP results substituting a realized loss totally subject to MSVR of \$40 for the gain of \$50 in the example. In light of recent market events, this is more than an academic point. (Note: Even with identical performance and spread targets, differences in credited rates could still arise among companies managing to the Statutory C&S financial target based on each one's current level of MSVR—as it impacts the required annual contribution and degree of absorbable gains and losses.)

Lastly, lest a mistaken impression be created, absent any and all differences arising from varying financial targets, investment portfolios or target spreads, a range of credited rates is still likely to be found in the market. This is so because different companies—managing to GAAP results for example—may choose to pass along varying amounts of current period realized gains, based on each one's own assessments as to likely future performance, desired variability in declared rates, and current market demand. Stated differently, even in stable interest environments, the target spread may reflect more of an

average to be achieved over the product's perceived time horizon than a rigid period-to-period requirement.

Conclusion

When presented with a given period's actual (or assumed) investment performance—which includes realized and unrealized capital gains as well as plain vanilla interest income—it is not immediately obvious which figures should be used in calculating the spread earned (or alternatively, in setting new liability credited rates to achieve a given spread). The choice may well hinge on the basis chosen for measuring the financial results the company is trying to achieve—and within a given basis on its attitude toward recognition of realized and unrealized gains/losses and the status of the MSVR.

Not all companies or actuaries are likely to agree on a given approach—a fact which carries financial statement, asset allocation, and competitive implications. Even where agreement exists as to financial targets, individual company preferences as to the timing for recognizing results in rate actions or management financials all but guarantee a wide range of outcomes attributable to identical combinations of investment performance results and spreads.

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Practitioner's Award Announced

The Actuarial Education and Research Fund is pleased to announce the introduction of a new award that will be presented for the first time in 1988. The purpose of this award—the Practitioner's Award—is to:

- recognize the research which is done in the non-academic actuarial community, and,
- encourage the publication of research conducted during the actuary's daily work.

The rules of the award can be found in our insert to this mailing.

If you have any questions or comments about the award, please do not hesitate to contact Randall J. Dutka at (416) 863-3634 or Douglas C. Burton, Chairman of A.E.R.F., at (201) 449-6713.

We will look forward to a successful competition.