Calculating the Benefit Offset

WHEN A PARTICIPANT TERMINATES HIS DEFINED BENEFIT PENSION PLAN, his accrued benefit is determined based on his service and pay history. At commencement, the amount paid equals an accrued benefit, multiplied (if appropriate) by an early (or late) retirement factor, and an optional form-of-payment factor.

After receiving benefits for a time, participants are sometimes re-employed by their former employer. Benefit payments in such situations are usually suspended. Upon the participant's subsequent retirement, a new accrued benefit is calculated (to reflect the new service and pay) and then multiplied by a new early (or late) retirement factor and optional-form factor.

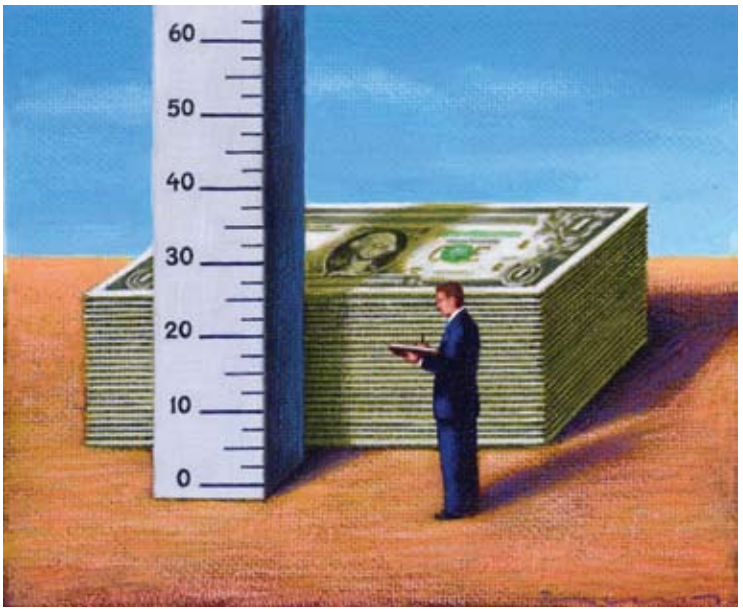
If this benefit includes the first period of service, the benefit is further reduced by the actuarial equivalent of benefits already paid by the plan. Plan documents usually specify that such an offset shall not reduce the participant's benefit below the amount he was receiving previously, but the documents often don't explain how to calculate the offset.

If a benefit is paid under an optional form other than a single life annuity or a lump sum, direct calculation of the offset is difficult and some approximation is normally used. Below is the derivation of a formula to determine an offset when an optional form of payment is elected. As an example, we'll assume that payments were made under a 50 percent joint-and-survivor option. The same reasoning can be applied to more complicated scenarios.

Let's assume that the plan participant terminated employment on date t_0 and commenced his benefit under a 50 percent joint-and-survivor option on date t_1 ($t_1 \geq t_0$) and for such commencement date his annual benefit is B_1. If he further deferred his commencement until date t_2, his benefit would be B_2, and for a later date t_3, this benefit would be B_3. Please note that benefits B_1, B_2 and B_3 are based on the same accrued benefit and calculated for the same payment option.

Now let's assume that the participant received benefit B_1 only from t_1 until t_2. At t_2 he began working again and his benefit was suspended. At t_3 he stopped working and resumed receiving his pension. The participant's benefit at date t_3 should be recalculated, based on total service, pay, and new ages. It's offset by the actuarial value of the payments he received from t_1 to t_2.

ZINOVY LIPKIN is a consulting actuary with Buck Consultants in Secaucus, N.J. He wishes to thank Jay Rosenberg of Buck Consultants for his fruitful discussions on this topic.



IMAGES.COM

Let's create some notation: Offset(B, t_1, t_2, t_3) is the offset calculated at t_3 for benefit B paid from t_1 to t_2. Our goal is to calculate this offset.

The development of the offset formula is based on four common-sense principles:

(a) The offset for benefits already paid does not depend upon the benefit accrued at a subsequent retirement date.

(b) A return to work for a very short period (with pension suspended) will not change the pension benefit. "Short period" here means that benefit payments, for all practical purposes, haven't been missed and the accrued benefit hasn't changed. That is, upon subsequent retirement, the benefit should remain the same.

(c) The total offset for several periods of benefit payments (they may be adjacent) equals the sum of the offsets for the separate periods, i.e., Offset(B, t_1, t_3, t_3) = Offset(B, t_1, t_2, t_3) + Offset(B, t_2, t_3, t_3).

(d) The offset is proportional to the benefit paid, i.e., Offset(k x B, t_1, t_2, t_3) = k x Offset(B, t_1, t_2, t_3).

Let's first consider a simple situation: A participant

commenced his benefit B_1 and received it from t_1 to t_3. At t_3 he returned to work for a very short time (with pension suspended) and immediately thereafter resumed his pension. It follows from (b) that, in this case, his benefit should stay the same = B_1. At the same time, since there was an interruption of benefit payments, the offset calculation approach can be used, and it should produce the same result.

Since the accrued benefit did not change because of the very short period of work, at the participant's second retirement on t_3, the benefit (before offset) should be equal to B_3. Therefore we have the equation:

$$B_3 - \text{Offset}(B_1, t_1, t_3, t_3) = B_1 \textit{ or}$$
$$\text{Offset}(B_1, t_1, t_3, t_3) = B_3 - B_1. \quad (1)$$

The above means that an offset, calculated at the end of the period during which a benefit was paid, equals the difference between the benefits calculated for these two commencement

THE APPLICABILITY TO QDROS

Quite often, qualified domestic relations orders (QDROs) provide an early retirement subsidy to the alternate payee (AP), but only after the participant commences his benefit.

QDROs can also allow the AP to begin payments before the participant, with the benefit reduced actuarially. In such cases, upon the participant's commencement date, the AP's benefit is recalculated. It's increased by the annuitized value of the subsidy on the AP's share of benefit at that time.

Application of the offset approach (formula (1)) produces the same result if B_1 and B_2 are calculated using actuarial equivalents and B_3 subsidizes the plan's early retirement factors.

The derived formula provides a practical method for determining an accurate offset to the ultimate defined benefit.

dates. It is essential that, in this case, the benefit paid was really the benefit calculated for commencement at the beginning of the period.

Dividing period (t_1, t_3) in two pieces, (t_1, t_2) and (t_2, t_3), and using (c), we can rewrite (1) as:

$$\text{Offset}(B_1, t_1, t_2, t_3) + \text{Offset}(B_1, t_2, t_3, t_3) = B_3 - B_1 \quad \textbf{(2)}$$

Substituting index "1" with index "2", we can rewrite (1) as

$$\text{Offset}(B_2, t_2, t_3, t_3) = B_3 - B_2 \quad \textbf{(3)}$$

Comparing the above with the second term on the left side of (2), we can see that they differ only by the benefit paid and therefore due to (d):

$$\text{Offset}(B_1, t_2, t_3, t_3) = (B_1/B_2) \times (B_3 - B_2) \quad \textbf{(4)}$$

By substituting Offset(B1, t2, t3, t3) from the formula (4) into (2), we finally obtain:

$$\text{Offset}(B1, t1, t2, t3) = B3 \times (1 - B1/B2) \quad \textbf{(5)}$$

Thus, we've achieved our goal by expressing the offset in terms of the benefit amounts at the various points in time.

Please note that this formula implicitly depends on plan early retirement and optional-form factors used to calculate B_1, B_2, and B_3 and that the actuarial equivalent basis wasn't used in the derivation of the formula.

Let's consider the situation where the participant received his benefit under a single-life option, and early retirement factors in the plan were based on actuarial-equivalence. Then, using standard actuarial notation, we can write $B_2 = B_1 \times N_1 / N_2$ and $B_3 = B_1 \times N_1 / N_3$ and finally $\text{Offset}(B_1, t_1, t_2, t_3) = B_1 \times (N_1 - N_2) / N_3$. This is the formula typically used in the offset calculations even if the option paid isn't a single-life option and early retirement factors aren't based on actuarial equivalence.

The formula **(5)** will never result in a benefit at the second commencement date that's smaller than the original benefit (if the accrued benefit doesn't decrease with time). As an example, let's consider a fully subsidized early retirement (early retirement factors equal 1 for all dates under consideration) and any joint-and-survivor option. The older the couple, the more valuable the survivor benefit. Therefore, for the later commencement dates, the option factors will be smaller. As a consequence, $B_1 > B_2 > B_3$ and $\text{Offset}(B_1, t_1, t_2, t_3) < 0$. This result may be surprising, but a negative offset is needed to keep the benefit on the second commencement date at least equal to the original one.

The offset formula in **(5)**, with small modifications, can be applied to payment options in which the benefit amounts change during retirement. Examples include: benefits that change at age 62 or 65, pension options with a period certain or a leveling feature, and cases in which a different optional form was chosen on the second commencement.

In summary, the derived formula provides a practical method for determining an accurate offset to the ultimate defined benefit when the participant has previously received a series of payments.

Several assumptions have been made in developing the offset formula above:

The plan document doesn't contain specific language on calculating such an offset, benefits are below the IRC 415(b) limit, and plan factors don't change with time. ●