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**TERMINAL FUNDING**

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**ABSTRACT**

*Terminal funding* in the context used in this paper refers to the purchase of annuities by a pension plan (usually at termination of the plan). Terminal funding annuities can also be used to buy out portions of liabilities under an ongoing plan or to provide annuity options to individuals terminating or retiring under defined contribution plans.

With the increase in asset reversions in recent years, this market has grown dramatically. Sales of terminal funding annuities exceeded \$10 billion in 1985 and are approaching the level of guaranteed investment contract (GIC) sales. There are less than twenty insurers competing in this market compared to up to fifty in the GIC market. Prior to the change to the valuation law in the early 1980s, large amounts of reserve strain resulted from writing this business. Thus, the market was dominated by a few large mutual companies which could afford to take the reserve strain, and these companies continue to dominate the market.

This paper is intended to be a practical guide to the terminal funding product. Actuarial considerations, investment strategies, administration, and marketing aspects are discussed.

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**I. INTRODUCTION**

The growth of the market for group annuity purchases under defined benefit plans has been phenomenal in the past few years (reaching \$12 billion in 1985<sup>1</sup>) and is approaching the GIC market in size.<sup>2</sup> During the 1970s,

<sup>1</sup> 1985 *Annual Group Pension Survey*, Life Insurance Marketing and Research Association (LIMRA), Inc., January 24, 1986. This survey includes seventeen companies which comprise the major underwriters of terminal funding annuities. It excludes a few major domestic writers and the Canadian companies which may account for an additional billion dollars. Also much of the general account annuity purchase represents terminal funding for clients with existing contracts. Annuity purchases from closeouts increased from \$1.6 billion in 1983 to \$4.2 billion in 1984 to \$8.1 billion in 1985, while total group annuity purchases increased from \$3.4 to \$7.1 to \$11.1 billion, respectively.

<sup>2</sup> Ed Christman, "GIC Firms Surge Ahead, Move to Defined Contribution Plans Cited," *Pensions & Investment Age*, February 3, 1986, p.36. GIC revenues were \$16.9 billion in 1985. This report also collaborates with the numbers in the LIMRA survey.

this market consisted primarily of plan terminations due to business necessity, such as plant shutdowns and bankruptcies. Due to the reserve strain required to sell these annuities on a nonparticipating basis, only a few large mutual companies were active in this market during that period.

The increase in activity in this market in the 1980s was driven by the following forces:

- The most severe recession of the postwar period produced a record number of bankruptcies. Many companies experienced cash-flow problems during this period which were aggravated by high interest rates. Import competition also increased as the dollar strengthened against other currencies.
- A change in the valuation law for annuity reserves in 1982 decreased the amount of reserve strain needed to write this business. Thus, more insurers were able to enter this market. Furthermore, high interest rates and the instability in the capital markets forced insurers to seek new products and sources of revenue.
- Several years of funding under the requirements of the Employee Retirement Income Security Act of 1974 (ERISA) and conservative assumptions relative to investment performance resulted in many plans being overfunded. High interest rates and more competition among insurers decreased annuity purchase rates, increasing surplus available for recapture under pension plans.
- A flood of unfavorable legislation and regulation—Deficit Reduction Act of 1984 (DEFRA), Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), Retirement Equity Act of 1984 (REACT)—encouraged terminations of defined benefit plans. Accounting changes also encouraged terminations in favor of defined contribution plans.<sup>3</sup>
- Demographic and sociological changes were creating a preference for defined contribution plans as younger “baby boomers” who change jobs frequently saw little value in defined benefit plans. Highly favorable regulations in 1982 issued for 401(k) salary reduction plans led to a growth of these defined contribution plans in preference to or as a replacement for defined benefit plans.
- Changes in the tax laws and lax antitrust enforcement were encouraging leveraged buyouts and mergers which were partially financed through

<sup>3</sup> Financial Accounting Standards Board, *Statement of Financial Accounting Standards No. 87 and No. 88* (December 1985). No. 87 deals with employer accounting for pension plans and requires unit credit cost methods and market valuation of assets to be reported in financial statements generally starting in 1987. No. 88 deals with accounting for settlements and curtailments of defined benefit plans.

asset reversions from plan termination. Corporate cash flow from accelerated depreciation and undervaluation of the resulting lower earnings by the stock market created a historic opportunity to convert equity to debt financing.

While the preceding factors favoring termination of defined benefit plans remain in effect, the pendulum is starting to swing in the other direction with unfavorable legislation proposed for 401(k) plans, proposed elimination of ten-year averaging, and tax accounting changes which will discourage leveraged buyouts.

## II. MARKET AND PRODUCT DESCRIPTIONS

Terminal funding typically utilizes a nonparticipating single premium group annuity contract designed to take over the liability of a terminating pension plan which has sufficient assets as determined by the Pension Benefit Guaranty Corporation (PBGC). These contracts (also referred to as nonpars or closeouts) can also be used to buy out a portion of the liability (e.g., retired and terminated vested lives). This may be done as an investment in place of an immunized bond portfolio or as a settlement of the liability for accounting purposes. These contracts are used for asset reversion by termination/reestablishment of a plan or as investment for nonqualified plans. For retired lives, the contract is relatively simple. For a single premium, the insurer will take over benefit payments as of a given date. A list of annuitants with census data and amount and form of benefit is included in schedules attached to the contract. Where deferred annuity is involved, the contract must provide many of the preretirement benefits provided by the plan. These include early retirement benefits using plan factors which are usually subsidized when compared to the insurer's purchase rates, death benefits, spouse's benefits, and optional forms.

The contract is usually issued to the trustee or employer, and certificates are issued to the individual annuitants or employees.

Terminal funding is typically sold through fee-for-service consultants although some of the smaller cases are handled by life insurance agents or brokers who work on a commission basis. The plan's enrolled actuary will frequently place the annuity purchase. Some of the large national consulting firms have offices that specialize in this business, and there are independent brokers and consultants who specialize in these purchases.

Master terminal funding (MTF) contracts provide for purchase of nonparticipating annuities on an ongoing basis. They can be used to provide

annuity options under defined contribution plans or to purchase annuities as an investment for an individual terminating or retiring from a defined benefit plan. The contract can be issued to brokers, consultants, or third party administrators who handle a large number of plans; or to a single plan. In the latter case, unisex purchase rates can be guaranteed for a period of time based on the expected purchases under the plan if all annuity purchases during the period must be placed through the contract. Individuals receive certificates describing the benefits purchased while the contract which is issued to the plan sponsor or broker gives the right to purchase annuities. In most cases, current rates, which may vary daily, are used to purchase annuities while the contract contains nominal guaranteed rates. The contract may be canceled or guaranteed rates may be changed at any time with ninety days notice.

Other variations of terminal funding include participating approaches which may involve the use of separate accounts and purchase of nonvested or projected benefits of active employees under an ongoing plan.

### III. PRICING

In order to develop a single premium for the benefits being valued in the terminal funding contract, assumptions must be developed regarding interest, mortality, expenses, and, in some cases, rates of retirement, disablement, marriage, and election of optional forms of benefit. Finally, a minimum profit objective must be set. This is usually based on a return on capital requirement on the imputed amount of surplus needed to support this business.

#### A. *Interest Assumptions*

The development of a gross interest rate is discussed later under investment strategies. A net rate is developed from this rate by deducting investment expenses, risk charges for asset default and cash-flow mismatch, and possibly charges for overhead expenses and profit.

The cash flows for terminal funding cases extend over fifty years with average duration in excess of ten years. Thus if we assume the funds would be invested in an immunized dedicated bond portfolio, 10–20 percent of the present value of the cash flows extend beyond the thirty-year maximum horizon for bond immunization. The cash flows which extend beyond thirty years can be discounted at a conservative interest rate (e.g., 4 percent) and then used to purchase zero-coupon thirty-year Treasuries in developing a

gross interest rate, or the interest rate used in annuity pricing could be reduced to 4 percent after the immunization period.

Another approach which was used in the 1970s involved the use of declining interest assumptions since most terminal funding cases (except those covering only old retirees) had positive net cash flow in the early years making reinvestment of interest the primary risk. Funds were assumed to be invested each year in an asset representing the average cash flow for investments that year, and any net cash flow from the product was assumed to be reinvested at a lower rate in future years. This approach had a number of problems. It produced noncompetitive rates for deferred annuities. It was difficult to reconcile with the need to spot price, especially in the extremely volatile fixed-income markets of the 1980s. The use of forward commitments for the expected cash flow of the year underlying the investment year method became generally discredited when interest rates spiked in 1980.

## B. *Mortality Assumptions*

While many pension plans have substantial preretirement death benefits, the incidental rule, which requires that such benefits be incidental to the primary purpose of providing retirement benefits (and limiting the value of all death benefits to 100 times the monthly annuity), means that the primary risk is longevity and mortality improvement and that annuitant mortality tables should be used.

### 1. MORTALITY ASSUMPTIONS FOR SALARIED EMPLOYEES

Many insurers use the 1983 Group Annuity Mortality (GAM) table for pricing. This table was prepared by the Society of Actuaries Committee on Annuities for annual statement valuation purposes. While it may not be representative of mortality experience under terminal funding contracts, we will use it as the basis for the mortality of salaried employee groups from which other groups will be rated. Due to the extremely rapid improvement in mortality in recent years, it is imperative that a current, conservative mortality basis be used in pricing these annuities.

The 1983 GAM table is based upon the 1966 experience table updated by changes in population mortality with a 10 percent margin added. This table reflects the experience of insured plans during the early 1960s—primarily salaried employees of large corporations. Terminal funding is sold primarily to closeout terminating pension plans. These are uninsured plans which

frequently cover hourly employees in heavy industries. Table I compares population mortality with the 1983 GAM at sample ages.<sup>4,5</sup>

TABLE I  
1980 U.S. POPULATION MORTALITY—MALES

Male Age	1983 GAM Male	All Causes	Accident, Homicide, Suicide	Heart Disease	Cancer	Ratio 1983 GAM/1980 Population
40	.001238	.00303	.001031	.000675	.000445	.41
50	.003909	.00775	.001043	.002863	.001851	.50
60	.009158	.01846	.001070	.007629	.005195	.50
70	.027530	.04207	.001261	.016675	.010621	.69
80	.074070	.09069	.002244	.039227	.017650	.82

The extreme conservatism of the GAM at the younger ages is apparent by comparing the GAM to population mortality. It is unlikely that the super select group underlying the GAM experienced the same mortality improvement during the 1966–83 period as that of the population. Table II shows the ratio of actual group annuity mortality in 1981 compared to the GAM and appears to confirm this hypothesis.

The Committee on Annuities recommended Scale H, which is a modification of Scale G, for future mortality improvement. This scale, which ranges from 1.25 to 2 percent at important ages, is somewhat less than the rate of improvement experienced since 1975 but is still quite high from a long-term perspective.

Historically, periods of rapid mortality improvement such as experienced in the 1970s have been followed by periods of slow improvement or stability. Rapid improvement in mortality during the 1940s due to the introduction of antibiotics and improved surgical techniques was followed by stability in the 1950s and early 1960s. More recently, improved treatment for heart disease and hypertension, more healthful lifestyles, less smoking, and improved access to medical services (medicare, medicaid, higher social security) have led to a period of rapid mortality improvement. Perhaps we are entering a new era of permanent rapid mortality improvement fueled by advances in the medical sciences. New anticancer drugs, artificial hearts, and successful organ transplants could lead to further improvements. As was the case with antihypertensive drugs, the improvement may be spread over a period of time as these drugs become accepted. On the other hand, historical trends

<sup>4</sup> Committee on Annuities, "Development of the 1983 Group Annuity Mortality Table," *TSA XXXV* (1983), p.859, ff.

<sup>5</sup> Robert J. Myers and Francisco R. Bayo, "United States Life Tables for 1979–81," *TSA XXXVII*, (1985), p.303, ff.

could reassert themselves. Natural disasters, environmental carcinogens, acid rain, nuclear accidents, higher homicide and suicide rates, AIDS, budget cuts, toxic wastes, and the growing acceptance of euthanasia could enter the picture.

If all cancer deaths were eliminated from population mortality, population death rates would still be higher than the 1983 GAM as shown in Table I. If we eliminate 50 percent of heart disease deaths, it is not until age 70 that population death rates fall below the GAM rates by an amount equivalent to twelve years of projection H improvement. Thus, the 1983 GAM with projection scale H provides a reasonable, conservative mortality basis.

In developing a pricing mortality basis, the 10 percent margin for valuation could be stripped out of the GAM rates. Then a static projection to the year of purchase followed by a generational projection for future improvement using scale H could be added.

Generational projections produce mortality rates that are a function of year of birth. They produce voluminous commutation function tables although only one set of purchase rates is needed for a given year of purchase. Because of the complexity of generational projections and the potential amount of computer time and disk storage involved in using them, approximations are frequently used. A 2 percent load on a deferred annuity should be approximately equal at current interest rates to a generational projection H.<sup>6</sup> Such a load on an immediate annuity would be excessive at the older ages where there is little time for future improvement. The younger immediates include a disproportional number who elect early retirement due to poor health. Those who retire late are in much better health than average, but since most pension plans provide for no increase in benefits for late retirement, interest gains will offset mortality losses for late retirees. Table II compares actual group annuity experience for 1981 against the 1983 GAM.<sup>7</sup>

Note that mortality ratios decline with age reflecting:

- poorer mortality of early retirees;
- the conservatism of the GAM at the younger ages; and
- the concentration of terminal funding business at the younger ages.

Terminal funding business did not become significant until the 1970s. It also includes many younger lives. Deferred annuity contracts which were issued primarily before the 1950s are heavily represented at the older ages.

<sup>6</sup> "Projected Annuity/Pension Mortality," *Record*, Society of Actuaries, Vol. 8 No. 4, p.1484.

<sup>7</sup> Committee on Annuities, "Group Annuity Mortality Experience for Calendar Years 1981 and 1982," *TSA 1983 Reports*.

TABLE II  
1981 GROUP ANNUITY EXPERIENCE  
RATIO OF ACTUAL TO EXPECTED DEATHS BASED ON 1983 GAM  
ALL CLASSES COMBINED  
Based on Income (Exposure in \$ Millions)

CENTRAL AGE	MALES		FEMALES	
	Exposure	Actual to Expected	Exposure	Actual to Expected
50 .....	5	3.67	1	3.96
55 .....	34	1.70	8	3.93
60 .....	149	1.59	29	2.35
65 .....	408	1.27	75	1.90
70 .....	338	1.19	78	1.45
75 .....	224	1.19	46	1.19
80 .....	103	1.08	21	1.04
85 .....	40	1.06	8	1.19
90 .....	11	1.11	2	1.15

Other tables used for pricing mortality include the Unisex Pension Table for 1984 (UP84), the 1971 GAM, the Individual Annuity tables and population tables. The UP84 is used by the PBGC and by many pension plans for actuarial equivalence. It is based upon noninsured pension plan experience in the late 1960s projected to 1984 (using about .5 percent per year improvement). It is a unisex table with about a 20 percent female content.<sup>8</sup> This table may have become inadequate for groups of salaried employees. Table III compares mortality rates for these tables.

TABLE III  
COMPARATIVE MALE MORTALITY RATES

Age	1983 GAM	UP84(-1)	1971 GAM	1980 Population
35 .....	.00086	.00151	.00112	.00216
45 .....	.00218	.00377	.00292	.00476
55 .....	.00613	.00988	.00852	.01206
65 .....	.01559	.02485	.02126	.02817
75 .....	.04460	.05788	.05529	.06167
85 .....	.11484	.13217	.13010	.13419

The 1983 GAM has a separate mortality table and projection scale H for females. As an alternative to using a separate table, a six year age setback could be used which may be decreased after age 70 to five years.

<sup>8</sup> William W. Fellers and Paul H. Jackson, "Noninsured Pensioner Mortality, The UP84 Table," *Proceedings of the Conference of Actuaries in Public Practice*, XXV (1975), p. 405, ff.



2. MORTALITY OF HOURLY, DISABLED, AND SPECIAL GROUPS

Once the mortality basis for salaried employees has been set, mortality of groups with different characteristics can be obtained by adjusting the ages or by using a different table. Several groups such as coal miners and asbestos workers have been subjects of special mortality studies. These groups can be given special mortality discounts based on the studies. On the other hand, certain groups such as teachers or clergy may be given mortality surcharges. In some large cases, the actuarial report may include a mortality study of the plan.

For standard rating purposes, employees can be divided into three groups: salaried, hourly, and disabled. Hourly in this context refers to blue collar workers rather than for the payment basis for the employees. Studies have shown 12 to 21 percent higher mortality for hourly compared to salaried employees, and thus, a one-year setforward in salaried assumptions would be conservative.<sup>9</sup> The difference in mortality between these groups is due primarily to socioeconomic status and not actual work conditions which would affect mainly active employees. Many believe that the mortality difference is due to less healthful lifestyles among hourly employees.

For lives on disability retirement, the basis for disability must first be determined. If it is occupational, there may be little effect on mortality (e.g., airline pilots). On the other hand, if social security disability is required to collect benefits under the plan, the impairment may be significant especially at the younger ages. At the older ages, this difference tends to disappear. Thus, an age setforward that grades down as age increases could be used to adjust the mortality for this group. Table IV compares mortality under social security disability to pricing mortality.<sup>10</sup>

TABLE IV  
COMPARISON OF DISABLED LIFE MORTALITY TO PRICING MORTALITY—MALES

AGE	SOCIAL SECURITY DISABLED $q_t$ 's		
	First Year	Ultimate	1983 GAM
30	.0399	.0115	.000607
40	.0643	.0187	.001238
50	.0980	.0335	.003909
60	.0969	.0556	.009158

<sup>9</sup> Committee on Self-Administered Retirement Plans, "Mortality Among Pensioners and Some Nonretired Experience," *TSA 1976 Reports*, p.151, ff.

<sup>10</sup> Bruce D. Schobel, "Experience of Disabled Worker Benefits Under OASDI, 1974-78," U.S. Department of Health and Human Services, Social Security Administration (SSA) Actuarial Study No. 81 (April 1980) SSA Pub No. 11-11528.

Note that there is additional conservatism in using these age setforwards since no allowance is made for recovery.

### 3. DEFINED CONTRIBUTION PLANS, UNISEX, AND MORTALITY ANTISELECTION

Under the Norris decision,<sup>11</sup> employers are required to use unisex rates in the determination of benefits payable under pension and profit-sharing plans for benefit accruals after August 1983. Almost all defined benefit plans use unisex factors for optional forms (discussed later). For defined contribution plans, the best approach is to use an age setback that reflects the proportion of the liability attributable to females. For instance, if 20 percent of the liability is female, a 1.2-year age setback ( $.2 \times 6$ ) should produce the same approximate result as using sex-distinct rates. However, if the plan allows the employee to take his account balance in cash, a disproportionate number of males may elect cash. Also those in poor health will elect cash, and the cross section of risk normally found in a defined benefit plan takeover and underlying the mortality table will not be present. This form of mortality antiselection will be discussed under optional forms.

#### C. Expenses

Expenses can be divided between first-year and future expenses and between administrative (case installation and benefit payment), sales and underwriting, and overhead. Administrative expenses are a function of the number of lives and a per case charge. The other expenses are usually a percentage of premium, an asset charge, or an interest takedown which may decline as premium or assets increase and may be subject to a minimum. Future expenses may be projected and then discounted to the present, or average assumptions could be used to develop charges. Using a low rate of interest implicitly allows for inflation equal to the difference between this rate and the current rate in discounting future expenses.

The administrative charges at issue include setting up the case in the accounting system and issuing a contract, both of which are per case charges; and setting up annuities on the payment system and issuing certificates, both of which are per life charges. Future administrative expenses are benefit payment expenses which include making payments to retirees and doing benefit calculations. These are event-oriented charges which may be discounted using average assumptions to a per life charge.

<sup>11</sup> *Arizona Governing Committee for Tax Deferred Annuity and Deferred Compensation Plans v. Nathalie Norris*, No. 82-52, 77 LEd 2d p. 1236 (1983).

All other expenses, including proposal work, field or home office sales support, recalculations on sold cases, and indirect or overhead expenses, are usually recovered from a premium charge, an asset charge, or an interest takedown.

Commissions and state premium taxes, if applicable, must be loaded into the cost by dividing by  $1 - \text{the tax rate} - \text{the commission rate}$ .

#### *D. Ancillary Benefits*

These benefits can sometimes equal or exceed the value of the retirement benefits. They include subsidized future early retirement and disability retirement, termination benefits, preretirement death benefits, and optional forms of benefits.

##### 1. EARLY RETIREMENT BENEFITS, DISABILITY BENEFITS, AND TERMINATION BENEFITS

Pension plans must have definitely determinable benefits. By regulation, early retirement benefits cannot be changed on an annuity that has already accrued. Furthermore, in asset reversion cases, the employee must continue to accrue service for purposes of eligibility for early retirement benefits.<sup>12</sup>

Thus, the pricing actuary is faced with plan factors which are usually more favorable than those that underlie the pricing basis. If he priced only for the benefit payable at normal retirement, there would be a loss for any employee electing to retire early.

Pension plans usually have a table of factors for early retirement which may be allowed after attainment of age 55 with a service requirement (e.g., ten years). In addition, some plans allow collection of the full accrued benefit without reduction upon attainment of age 62 with thirty years of service or when age plus service equals ninety, for example. Some plans use "actuarial equivalence," but this refers to the plan's actuarial basis (e.g., UP84 at 7 percent).

Thus, two sets of assumptions needed in situations where there is a continuing employment relationship after the annuity purchase are termination rates and rates of early retirement. In the event of a plant shutdown, all employees can be assumed terminated. Terminated employees can be assumed to retire at the earliest possible age or a very conservative retirement scale can be used.

Normally, using low rates of termination produces a higher (more conservative) cost since more employees are assumed to meet the service

<sup>12</sup> Revenue Ruling 85-6.

requirements for early retirement. However, some plans provide a lump-sum option in lieu of an annuity at severance which is subsidized when compared to the insurer's pricing basis, and could make a high termination assumption more conservative. This is also true if the early retirement subsidies are rich and terminated employees are assumed to retire at the earliest age while low rates of early retirement are assumed for the actives.

Termination rates are usually high at the younger ages and decrease as age increases.<sup>13</sup> Early retirement rates increase as age increases with a peak at age 62 when social security becomes available. It is usual to assume 100 percent retirement at age 65, or the normal retirement age (NRA), even though some plans have 10 to 15 percent of the actives past NRA.

A seriatim valuation of these benefits would involve a year-by-year calculation of those surviving in service multiplied by decrements for death, disability, and early retirement or termination. The amount of annuity subject to each decrement would be used to purchase the benefit payable to that status. As a simple alternative to this method, an assumed NRA can be used or a percentage loading calculated by looking at the ratio of the plan factors to the pricing basis early retirement factors.

In choosing early retirement and termination scales, plan experience can be examined by calculating the percentage of employees between 55 and 65—the early retirement age (ERA) and NRA, respectively—who are retired. The consultant or actuary will frequently provide plan experience and assumptions used in the valuation for these decrements as well as for disability, percent married, and deaths.

This historical experience may be of limited value in predicting the future experience of the plan. Many plans which are terminating are experiencing financial problems which will increase retirement and turnover in the future. In some cases, these plans have implemented early retirement programs which make their experience look much worse than it will be in the future. It is desirable to look into the financial condition of the firm and the industry in choosing a retirement scale. Also the employer/employee relationship must be considered. It may be difficult to verify whether those applying for benefits are actually retired under some multiemployer Taft-Hartley plans.

Some plans provide disability benefits which pay the full accrued benefit without reduction upon disability. There is usually a service requirement,

<sup>13</sup> Thomas F. Croker, Jr., Harry M. Sarson, and Byron W. Straight, *The Actuaries Pension Handbook*, (1955). Contains termination tables which include mortality. To get severance rates net of mortality, deduct mortality rates based on the Group Annuity 1951 table.

and there may be a minimum age required to collect benefits. In a few cases, the benefit may be less than full accrued benefit.

These benefits are not required to be carried into the terminal funding contract. Thus for corporate plans, they can usually be eliminated, and employees can be covered under a long-term disability (LTD) policy for future disability. Taft-Hartley plans with excess assets, which must be distributed to the participants, generally want to retain these benefits.

Because of the difficulty in determining disability, proof of qualification for social security disability should be required to collect benefits under the plan. Most Taft-Hartley plans will accept this requirement even if it was not in the original plan. Published social security data can be used for rates of disablement in this instance. Rates of disablement under social security have been going down following a peak in 1974, and tightening of this program will probably continue given the current financial problems. Thus, the use of current rates is conservative especially if no allowance is made for recovery. In the event social security disability is not required to collect benefits, group LTD experience for the definition of disability and class of employee may be usable. Presumably, the employer would make the initial determination of disablement.

## 2. PRERETIREMENT DEATH BENEFITS

These are usually in the form of lump sum or survivor benefits. REACT requires that the spouse of a participant who is married at the time of death should receive a spouse's benefit which is equal to 50 percent of the benefit the participant would have received if he had retired on the earliest possible date and elected a 50 percent Contingent Annuity (CA) option. If the participant is eligible for early retirement, the benefit would commence immediately. Otherwise, it will be deferred to the earliest date he could have retired.

Since spouse's data are usually not available for deferred annuitants, the actuary must make assumptions regarding percent married and age of the spouse relative to the employee. Even if such data were available, they would be of limited value since it is the spouse at the time of death, not the spouse at the time of purchase, who gets the survivor annuity.

Lump-sum death benefits must be paid to the surviving spouse in the form of an annuity unless the spouse elects an alternate form. Some plans pay a lump sum or an annuity certain to the beneficiaries of single employees and a spouse's benefit for married employees. One form of a lump-sum death

benefit is return of premium. This is commonly used in defined contribution plans where the account balance plus interest is returned upon death and is standard under MTF contracts. It makes little sense for a defined benefit plan but is frequently requested by agents who are accustomed to individual annuities. The present value of an individual's annuity (which may or may not include ancillary benefits and expense loadings) is paid with interest at death. Note that if the participant is married, this must be converted to a life annuity for the spouse unless the spouse agrees to an alternate form of payment.

### 3. OPTIONAL FORMS OF ANNUITY AND LUMP-SUM PAYMENTS

The normal form of annuity for married participants must be at least a 50 percent spouse's annuity unless both the spouse and annuitant elect otherwise. However, plans can actuarially adjust for this benefit, and most plans express the normal form as a life annuity (which would be payable to single employees) and reduce the annuity payable to a married participant using plan actuarial factors. Some plans provide the spouse's benefit without reduction.

For plans with employee contributions, the accumulation of these contributions with interest is payable upon death making the normal form a modified cash refund annuity for single employees and a 50 percent CA with modified cash refund for married employees. Some plans allow the employee to take his contributions in a lump sum at termination or retirement. ERISA requires that a residual annuity be provided equal to the annualized annuity payable at normal retirement less 10 percent of the employee contributions withdrawn accumulated with interest at 5 percent to the Normal Retirement Date.

The common optional forms include 100 percent CA and ten years certain and life. Other forms include various percent CA options, a Joint and Survivor annuity, annuity certain, various years certain and life, flat death benefits, full and modified cash refund annuities, and lump sums.

Except for spouses' annuities of up to 100 percent, the death benefit cannot exceed 50 percent of the value of the annuity. For a certain and life annuity, the period certain cannot extend beyond the joint expected lifetime of the annuitant and his spouse.

The CA option is the same as the spouse's annuity—it decreases only upon the death of the primary annuitant. The joint and survivor annuity decreases upon the death of either the primary or contingent annuitant. Oc-

asionally plans have a feature where the annuity reverts to the normal form (i.e., increases) if the contingent predeceases the primary annuitant.

In pricing for these optional forms, the actuary must determine if they are subsidized (more favorable) than the optional form factors underlying the pricing basis. Lump-sum options allow financial antiselection while the availability of optional forms with high death benefits may result in mortality antiselection.

In most cases, optional forms are increased death benefits (e.g., the normal form is life annuity). The higher the mortality rates, the greater the benefit reduction with the optional forms. Since most plans use obsolete mortality tables such as the 1971 GAM and UP84 while the pricing actuary is using a current (1983 GAM) table, the pricing basis produces the lower reduction, so gains would result from election of optional forms. The exception would be where the plan has arbitrary factors (or no reduction) or in cases where female unisex factors are used for groups with high male content.

While it would be possible to price subsidized optional forms using methods similar to other ancillary benefits (i.e., using assumptions regarding rates of election and doing an exact calculation for those electing the option), an approximate method will be illustrated. The ratio of the optional form factors to the pricing basis is taken at important ages (62 or 65). If this ratio exceeds one, the factor is subsidized. The deferred net cost is then loaded by this ratio, minus one, times the proportion assuming to elect this option.

Since all plans must have a minimum REACT preretirement death benefit, the cost of mortality antiselection has become less significant. A plan with minimum death benefits prior to retirement but which allows optional forms with high death benefits or lump sums will experience lower mortality gains than a plan without these options due to selection by the unhealthy lives. Since the underlying mortality table assumes a cross section of risks, an antiselection charge may be levied in these cases.

For plans with lump-sum options which are heavily subsidized, it would be safe to assume that all participants elect cash and price accordingly. When given the option for cash, most participants take it. However, with the elimination of ten-year averaging, this may not hold true in the future. Plans which offer cash on a fixed basis risk having the participant annuitize if interest rates are low and elect cash, if they are high, making cash flows uncertain and immunization difficult. Many insurers decline to underwrite this option, and I have seen plans successfully amend it out prior to termination for this reason. Some plans try to specify that only those meeting

income and wealth requirements can elect a lump sum although this seems to be running afoul of Internal Revenue Service (IRS) antidiscrimination rules. Finally, some plans have lump-sum options that are indexed to PBGC rates or a bond index. This subsidy is fixed in relation to the market value of the underlying assets and can be priced accordingly with assets assumed to be invested long.

#### E. *Profit Margins and Return on Capital*

My philosophy in pricing is to have a profit margin built into each assumption which reflects the risk of adverse variance from expected for that assumption. The mortality and expenses are relatively predictable and unlikely to cause sudden losses. If the 1983 GAM with scale H is assumed for mortality and an inflation assumption is built into expense charges, the contribution to profit can be calculated by comparing these assumptions to current experience. Likewise, investments involve asset default risks and cash-flow mismatch risks which can be covered by an interest takedown. Cash-flow risks can be minimized if a dedicated bond portfolio is used. In many cases, the early retirement risk represents the greatest potential for adverse variation in experience. I have seen cases where the premium would be \$80 million if all employees retired at 65 versus \$120 million if they retired at 55.

Corporate Return on Capital (ROC) formulas have come into use as a method of allocating resources between competing product lines. An imputed amount of surplus is assigned to each product depending on the risks. The pricing is then required to earn a minimum return. The decision to enter a market may be based on ROC analysis.

The surplus used in these formulas is a generally accepted accounting principles (GAAP) surplus. Statutory reserves for terminal funding are discussed later. The pricing may limit the amount of statutory reserve strain a given case may take, and/or a charge may be included based on what a reinsurer would charge for surplus strain relief.

A summary of the risks involved in terminal funding follows:

- C-1 Risk:* Asset default—This depends upon the asset type. One to 2 percent should suffice for investment grade bonds.
- C-2 Risk:* Mortality, expense, and underwriting losses—These depend on conservatism of assumptions. One to 2 percent should suffice if assumptions are conservative.
- C-3 Risk:* Cash-flow mismatch—This would be 0 percent if an immunized bond portfolio is used and there is no disintermediation risk.



*C-4 Risk:* Primarily political risks of unfavorable changes in tax laws and regulations—This is the most troubling risk since terminal funding is a long-term business and the tax law changes each year in ways which may alter the after-tax profits. This is best handled by not passing through the full effect of the tax savings discussed in investment strategies. Another risk is that administrative expenses may be increased as a result of regulation.

If from this analysis we conclude that 3 percent surplus is required to support this business, the after-tax profit expected each year as a percent of assets would be divided by 3 percent to determine the ROC.

#### IV. INVESTMENT STRATEGIES

The expected cash flow of the typical terminal funding case extends well over fifty years. Moreover, there are usually no cash surrender values and, thus, no problems with financial antiselection since funds can flow out only as benefit payments. Variations in expected cash flow should be relatively minor. They are a function of mortality experience and, if applicable, early retirement. The appendix contains sample cash flows. For groups of retired lives only, the cash flows gradually decrease over a period of twenty to thirty years. For cases which have deferred and immediate annuities, the cash flows increase for about ten years to double the original; then remain roughly level for ten years; then decline gradually for ten years back to the original level; and then fall off sharply thereafter.

The average duration of these cash flows exceeds ten years. Most investments that pay interest would have cash flows in excess of benefit payments, making declining interest rates the primary risk. Thus, appropriate investments would include instruments with reasonable call protection, such as deep discount corporate bonds. Since liquidity is not a requirement, the investments used for this product could include private placements and mortgages. Indeed, a private placement which prohibits external refinancing may be preferable to a marketable corporate bond that is callable.

The funds received under these contracts are usually segregated from other assets in the general account and pooled with shorter-term GICs. In a positive yield-curve environment, immunizing the assets and liabilities of a short-term GIC and long-term terminal funding can produce favorable results. If the yield curve flattens or inverts, this becomes less true, but since both products are spot priced (prices change daily in response to bond market conditions), they need to be managed separately in a designated fund within the general account.

There are two approaches to managing the immunization of the assets and liabilities of the designated fund: duration matching and cash-flow matching. These can be combined with cash flows being matched for the first five years and durations matched beyond that. Unlike many GICs which have predetermined cash flows, the cash flows for terminal funding are estimates. Thus, it makes sense to use duration matching on a case-by-case basis while periodically cash-flow matching the entire fund.

#### A. *Bond Dedication*

The simplest form of cash-flow matching for a terminal funding case is a dedicated bond portfolio. Many bond brokers provide free software for their clients who are doing this. A large fund is also needed. The expected cash flow for the first twenty-eight years is entered, and a list of bonds which have that cash flow (and meet other requirements such as call protection) is output. Cash flows beyond twenty-eight years are discounted back to the twenty-eighth year at a conservative rate (e.g., 4 percent) and invested in zero-coupon Treasuries. The internal rate of return of the portfolio is the gross interest rate to be used in pricing. The use of deep discount bonds for call protection also produces favorable tax treatment since the accrual of discount on other than original issue discount bonds is taxed as a long-term capital gain for bonds issued prior to 1985. No tax is paid until the capital gain is realized at maturity or sale, and such gains are taxed at a lower rate under the current law. While the law may be changed, part of this tax advantage might be passed on in the gross rate.

Investment people generally quote bond-equivalent yields (nominal semi-annual rate), while actuaries use effective annual rates. It is thus necessary to convert rates before using them. Since annuity cash flows are actually monthly, there is no need to worry about reinvestment of the semi-annual coupon in calculating the effective annual rate.

#### B. *Coupon Stripping*

On a practical day-to-day basis, money committed under terminal funding cases is put out as long as possible. Since the duration of the liabilities is longer than that of the assets, the coupons at the early durations may be stripped out and used to fund bullet GICs. If the yield curve is highly positive, these GICs can be sold at very favorable profit margins. Periodic matching of the assets and liabilities of the designated fund may also produce opportunities to sell GIC products at certain durations at favorable rates.

### C. *Other Investments*

Even with coupon stripping and partial pass-through of tax advantages, it is unlikely that maximum profits will be achieved in investment grade corporates. Investments which might be used in place of these bonds include private placement commercial loans, commercial mortgages, and junk bonds. Investments suitable for the "tail" of the liabilities (i.e., the 10–20 percent of the liabilities that extend beyond the twenty-eight-year horizon of immunization) include preferred stock, utility common stocks, and equity real estate.

*Private Placements:* These are equivalent to bonds except that they are not registered and not readily marketable. The issuer gets funds when he needs them without the expense of a bond issue while the insurer gets a higher rate and can get call protection since the loan may prohibit refinancing through external sources. Credit rating is similar to that of bonds. These are excellent investments for terminal funding since marketability is not needed.

*Mortgages:* Commercial mortgages can provide call protection for up to ten years and thus may be usable for terminal funding. Residential pass-through mortgage loan instruments allow refinancing which will increase as interest rates fall making them unsuitable for terminal funding. With the glut of office buildings in many areas and the overappraisal of much real estate, the safety of even the first trust deeds (which cover 70 percent of the appraised value) is being questioned. Another problem with these loans is that, if interest rates fall rapidly, the borrowers may "walk" from commitments. The securitization of real estate and other debt (auto loans, second trust deeds) is increasing, and the securities industry is responding creatively to the needs of insurers with instruments such as zero-coupon mortgages.

*Junk Bonds:* These are bonds that are rated lower than Baa by Standard and Poor's or are unrated. They provide yields up to 500 basis points over Treasuries compared to less than 200 basis points for investment grade bonds.

One source of these bonds is the emerging growth companies. These are the future IBMs. Due to rapid profitable growth, they have external capital needs. They are sometimes referred to as high-yield bonds. Another source is companies that have had their credit rating reduced, e.g., defunct nuclear utilities, referred to as Fallen Angels. The final category includes the paper issued for leveraged buyouts and takeovers.

Historical studies have shown that the risk-adjusted yield for these bonds is much higher than that for investment grade bonds, implying market inefficiency. Some have argued that the popularity of these bonds in recent years has reduced the inefficiency in this market. Active management of these

bonds and fixed-income securities in general has become more important with the search for inefficiencies and high risk-adjusted yields needed for competitive rates.

*Equity Investments:* The 10–20 percent of the liability of a terminal funding case which lies beyond immunization, from the twenty-eighth to the seventieth and over year, may be invested in equities for highest yields. These include preferred stocks, utility common stocks, and equity real estate. Preferred stock which is not callable and dividend paying common stock of regulated monopolies are like bonds without call provisions or maturities, and thus, their projected dividend yields can be built into the investment rate. Under the current tax law, 85 percent of the dividends of qualifying domestic corporations is excludable from corporate income tax, making stock pretax yields somewhat lower on a risk-adjusted basis. Equity real estate—real estate investment trusts (REITs) or direct investment in fully leased office or commercial space—has similar long-term yield characteristics.

#### D. *Advanced Commitments and Option Strategies*

Private placements and commercial mortgages are usually committed several months in advance of funding. Attractive investments also appear on the market periodically. The insurer will have several terminal funding bids outstanding with finals pending, commitments, and funding at various times. The investment opportunities and sales rarely happen at exactly the same time, and the coordination of these items involves interest rate risks.

For small cases, it is desirable to maintain an inventory of assets. These cases are not as interest rate sensitive, and the agents who sell these cases are unaccustomed to having rates that vary by the hour. It is customary to guarantee MTF bids for three to five days for amounts under some maximum. For very large cases, investments may not be put into place until a commitment is made, although investments frequently will be lined up or even made during the finals if the case looks like a sale.

If a sale is made without investments in place, there may be some time before suitable investments can be found. To immunize the interest rate, a call on thirty-year Treasury futures could be purchased and sold when investments are made. Another factor that has to be considered in the interest rate is the cost of carry. If the investment closes three months after being circled, while the money moves for the terminal funding case within one month of commitment, there is a two-month period during which funds must be held short. The difference between the short- and long-term rate must be factored into the yield.

If investment commitments are made in advance of sales, there is the risk that interest rates could rise, which would force the insurer to sell at a higher rate. This risk can be immunized through the futures market or the inventory could be dumped if interest rates appear to be rising by either selling the investment (if marketable) or selling products at market. Since terminal funding would depend upon a case going to finals at the time the sale is needed, it may be necessary to sell long-term GICs at market to dump inventory.

Option strategies can also be used to meet special needs of plan sponsors. For example, plan sponsors may wish to give employees the right to cash out for sixty days after the sale of the contract, or perhaps the sponsor wishes the right to terminate the contract without penalty during this period. If the need to terminate the contract is based upon lack of regulatory approval (an unlikely event), it is best to offer the funds at market indexed to ten times the change in thirty-year Treasury yields for a typical case. Options can also be used in cases where the client wishes to participate in future increases in interest rates without downside risk.

In these option strategies, the money can be held short and a call option purchased, or it can be put out long and a put option purchased. While put options are normally more expensive, the cost of carry must be factored in. Option-time premiums vary depending upon perceived market volatility. The use of options may be prohibitively expensive during some periods.

#### E. *Managing Terminal Funding Assets with Other General Account Products*

Due to the extremely long-term locked-in nature of terminal funding liabilities, they can also be used to offset an asset/liability mismatch in an insurer's other general account products. For instance, if an insurer has a large amount of low-yielding nonmarketable securities and products which allow book-value withdrawal, terminal funding annuities could be sold and the proceeds invested appropriately for the book-value contracts while the illiquid old investments are used for the terminal funding liabilities.

The secular bull market in fixed-income securities which appears to have started in 1981 makes insurers with unfunded forward commitments and those which mismatch with assets longer than liabilities winners. Someday this trend will reverse. Rather than giving away interest gains from advance commitments during periods when interest rates are falling, these gains should be used to increase profit margins to offset losses that surely will occur when interest rates go the other way.

## V. STATUTORY RESERVES AND FINANCIAL ANALYSIS

The minimum statutory reserves under the dynamic valuation law are based upon Moody's Corporate Bond Average for the period of July of the previous year through June of the current year. This average is then applied as follows with rates being rounded to the nearest .25 percent:

<i>Annuity Type</i>	<i>Rate Calculation</i>
Immediate and deferred less than five years:	$3\% + .8(\text{Average} - 3\%)$
Deferred more than five years but less than ten years:	$3\% + .75(\text{Average} - 3\%)$
Deferred more than ten years but less than twenty years:	$3\% + .65(\text{Average} - 3\%)$
Deferred more than twenty years:	$3\% + .45(\text{Average} - 3\%)$

For 1986, these rates are currently estimated to be 9.25, 8.75, 8, and 6.5 percent, respectively.<sup>14</sup> The mortality table required by most states is either the 1983 GAM or the 1971 GAM. Late in December of 1985, the American Council of Life Insurance (ACLI) issued a bulletin indicating that twenty-six states had allowed the use of the 1983 GAM for valuation of group annuities. This is important since tax reserves are based upon the minimum reserves required by twenty-six of the states.

Reserves are set up on the normal retirement benefit only. Reserves are not set up on other ancillary benefits except for lump-sum death benefits. Reserves could be set up for early retirement benefits by using an assumed NRA which is lower than the plan NRA and for spouse benefits by using assumed spouse data. Reserves set up in this manner would be considered tax reserves, making this one of the few opportunities for tax planning through reserve manipulation under the new tax law.

One result of the valuation law is that reserve rates can only be estimated at the beginning of the year since six months experience remains to determine the average. Another result is that reserve strain becomes a function of the trend in interest rates. If interest rates are going down, there may be no reserve strain, whereas if interest rates go up, there could be substantial strain. This happens because a historic moving average of interest rates is used for reserves while pricing is based upon a current spot rate. Another result is that cases rich in ancillary benefits, which increase the gross premium, have less reserve strain than cases without such benefits. Thus, these

<sup>14</sup> ACLI, "NAIC Standard Valuation and Nonforfeiture Laws, Statutory Calendar Year Interest Rates, Status of 1980 Amendments," General Bulletin No. 3378, July 29, 1983. Also California Assembly Bill No. 1146 (1981).

benefits, which are frequently the riskiest to underwrite, reduce the amount of reserve strain. The valuation law apparently was designed for individual annuities written on a nonimmunized investment year basis.

For most years, reserve strain should average about 5 percent of premium. So long as more business is written each year, aggregate minimum statutory reserves should exceed gross premium reserves. Periodic gross premium valuation of this business will assure this and provide management information regarding the profitability of this business.

One approach using gross premium reserves is to value each case on its original pricing assumptions. The net rate from investments is assumed to be earned, and the analysis focuses on the underwriting gains and losses. The original premium deposit plus interest at the pricing rate less benefit payments and expenses is compared to the gross premium at the same point in time needed to purchase the benefits using the original pricing assumptions. The projected cash flows from this analysis can be combined with expected cash flows for GICs in the designated fund, and this combination can be compared to the expected cash flows from the investments. The net cash flow is the profit, and the present value of this can be determined. In this analysis, federal income tax can be factored in so that the tax benefits of discount bonds, stocks, and reserve strain can be included.

Another approach to financial analysis is to value the benefits at current interest rates and the assets at market. This could be done on an aggregate basis if ancillary benefits were valued through use of average retirement age and data assumptions for spouses' benefits.

The rapid emergence of statutory surplus is likely after the initial surplus strain. Interest gains equal to the difference between the reserves and the actual earnings may equal 2 to 4 percent of assets. If reserves were set up on the 1983 GAM, mortality gains are also likely in the early years, with mortality losses delayed until many years in the future if mortality improvement continues. Early retirement losses will also be concentrated in the early years.

The actual profit or loss for a given case cannot be finally determined until the last annuitant has died, which may be seventy or more years from now. The gross premium valuation, while dependent on assumptions relative to future experience, provides the best measure of financial results.

#### VI. CASHOUTS—PBG RATE BASIS

ERISA allowed the involuntary cashout of annuity benefits with a present value of less than \$1,750. Terminating plans were allowed to cashout using

the insurer's purchase rates. Many insurers used net rates as high as 15 percent in the early 1980s in calculating lump sums, which left younger participants with very small amounts. A 35 year old with an accrued benefit of \$100 per month might get a lump sum of less than \$100 as settlement for his pension.

As a result of these abuses, regulations for cashouts under a sufficient plan now require that the greater of the PBGC or plan basis be used to calculate lump sums, and the cashout level was raised to \$3,500. Because of the conservatism of the PBGC rate basis, most plans will maximize their reversion by buying benefits down to a minimum annuity amount such as \$25 per month.

PBGC mortality is based upon the UP84 with a one-year setforward for males and a four-year setback for females. Interest assumptions have a rate for the annuity period and the three declining rates for the deferred period—a rate for the first seven years, next eight years, and deferral beyond fifteen years. For January of 1986, the rates were 9 percent for the annuity period, 7.5 percent for the first seven years deferral, 6 percent for the next eight years, and 4 percent thereafter.

Thus deferred annuity interest rates increase, which is the opposite of what most insurers assume. The rates for a 35 year old with an NRA at 65 would be 4 percent for the first fifteen years, 6 percent for the next eight years, 7.5 percent for the next seven years, and 9 percent thereafter.<sup>15</sup> Only the normal retirement benefit is valued; the cost for ancillary benefits is not included. There is no loading for expenses. Since most insurers have per life charges and load for ancillary benefits, the level at which it becomes more favorable to cashout compared to purchase varies depending upon the richness of the ancillary benefits and the per life charges.

In the past many defined benefits plans that terminated amended the plan to pay lump sums and settled the obligation this way, avoiding an annuity purchase. Small plans which have difficulty getting annuity quotes may still use this method. In some cases the lump sums can be rolled into a new defined contribution plan. With the increased lump sums required and the possible elimination of ten-year averaging, this approach will become less popular. Some consultants are getting around this requirement by purchasing annuities with a sixty-day window to cashout on the insurer's basis. Option strategies to immunize this were already discussed and generally cost less than 2 percent of premium.

<sup>15</sup> PBGC, "Actuarial Tables and Rates," January 15, 1986.



## VII. ADMINISTRATION

This section traces the terminal funding case from receipt of the proposal at the home office through installation and payment of benefits.

A proposal request should include plan specifications and employee census data needed to price the case. It may also include a valuation report and a plan document. An underwriter reviews the case for completeness and acceptability of the benefits. If the request is incomplete or plan specifications not acceptable, the underwriter may discuss the problems with the consultant and resolve them or decline the case.

Upon acceptance, the data must be converted and the plan specifications entered into a pricing system. A preliminary proposal is prepared with a listing of life-by-life costs. A preliminary rate which may be based upon an index such as thirty-year Treasuries plus .75 percent could be used. This is sent to the consultant who analyzes the bids for correctness and consistency. There may be several months delay while the consultant files with the PBGC and awaits approval. If many companies bid, the consultant may choose the best three or four bids for finals.

During the day of the finals, projected cash flows are given to the investment department and a rate determined. (For small cases, a sheet rate may be used.) The bid is then adjusted for any change in interest rates. In some cases more changes are requested in data and/or plan specifications, in which case a rerun may be necessary. During the finals, there may be further negotiations between the consultants and the finalists as the consultant gives second looks or a last look to the carriers.

When a case is sold, a verbal commitment is given by the consultant, and the investment department is informed so that the funds can be invested. This commitment is followed immediately by a deposit and a preliminary application which holds the client responsible for investment losses if the premium is not paid. The balance of the premium is then transferred as scheduled.

The proposal has a benefit takeover date for retirees. If the insurer is unable to make individual payments on that date, a bulk check may be paid to the current payor (usually a bank). The insurer will get individual annuitant information from this payor and install the annuitants on its payment system. Deferred annuitants must also be added. Address information on terminated/vested participants may be out of date. When all the data are complete, the case will be rerun using the original pricing dates and assumptions and financial adjustments made if required. If significant changes

have occurred and interest rates changed during the period, such adjustments may be subject to market values.

In some cases, the employer wants to continue benefit payments and administration. The insurer would issue a bulk check each month to cover benefit payments but would still need to keep individual life data for valuation and control purposes.

After data are finalized, a contract can be issued and certificates issued to the participants with their benefits under the plan. The insurer will usually handle benefit calculations and administration thereafter.

### VIII. PARTICIPATING CONTRACTS

These contracts started to gain popularity in 1985 following PBGC approval in cases where the insurer unconditionally guaranteed the benefits. However, the IRS discouraged them by requiring that requests for determination letters in these cases be referred to the national office. The IRS was apparently concerned about tax deferral on the asset reversion which could take place using these contracts (although the employer could leave the money in the trust and avoid taxation completely).

Participation has two advantages. In years when there is significant surplus strain, the insurance industry may have a capacity problem and participation may be the only way that large cases can get a good price. In 1985, interest rates were declining, and this surplus problem did not impact. A second advantage is, in cases where there are rich early retirement subsidies, participation gives the employer incentive to control early retirement costs, and the employer should get significantly lower net costs because the insurer will need to make conservative assumptions in pricing the subsidy.

Because of their fundamental value, these contracts may make a comeback. Three possible approaches will be outlined. They include limiting participation to early retirement risk, "Floored Immediate Participation Guarantee (IPG)" contracts, and separate accounts. The separate account approach would be economical for very large cases (with premiums in excess of \$25 million). An IPG is an investment year deposit contract that was popular in the 1970s.

#### A. *Participation Limited to Early Retirement Risk*

This is the simplest form of participation which can be used for large or small cases. It is particularly suitable for plans which allow full accrued benefits to be collected prior to NRA where the employer believes that a significant number of employees will not elect to retire under this provision.

The case is priced using the age at which early retirement without reduction is allowed as the NRA. For any employee who defers retirement past this age, a dividend is paid equal to the payments not made to the employee. In its simplest form, the payment the employee would have collected is paid to the employer or trust. An alternative would be to price the case using the earliest possible age. For any employee who defers retirement beyond the ERA, an amount equal to the subsidy (the difference between the benefit payable under the plan and the benefit payable using the insurer's factors) is paid to the plan sponsor as a dividend. The disadvantage of this approach is that the premium can be significantly higher than the nonparticipating premium, making it difficult to sell. The future stream of dividends under this method should be illustrated using current plan early retirement experience.

#### *B. Floored IPG Contract*

For this approach, 105 percent of the nonparticipating premium (but not less than the minimum statutory reserves) would be placed in a deposit fund which would be credited with the net terminal funding rate. Nonparticipating annuities could be purchased for those retiring. A gross premium valuation is done annually on the original pricing basis using current data. If the funds fall below a trigger point (which might be 102 percent of the gross premium), the annuity purchase is executed. If they rise above a trigger point (e.g., 110 percent of premium), the excess is refunded.

Under this approach, certificates are issued guaranteeing benefits for all employees. Investments and reserves would be the same as if annuities had been purchased. When the purchase is executed or when the last employee retires or when agreed to by the parties, the contract reverts to nonparticipating and a terminal dividend is paid.

Under this approach, for an additional margin of 5 percent (or more), the insurer allows participation in early retirement and preretirement mortality risks. Normal interest takedowns should provide sufficient profit margins, and the insurer may want to assess special charges for the administrative costs (i.e., setup and maintenance of the gross premium valuations).

#### *C. Separate Account Approaches*

Under these approaches, a separate account is set up to hold the assets underlying the annuities. Because of the expenses of setting up a separate account, this is suitable for very large cases. Having funds in a separate account also provides additional security if the insurer becomes insolvent

(an event about which sponsors of large plans appear to be excessively concerned).

Under this approach a percentage of the nonparticipating premium (ranging from 105 to 130 percent) is deposited in the separate account. Three possibilities for the investment manager exist:

- The insurer may control the investment manager, in which case the smallest percentage over nonparticipating cost is required.
- The employer may appoint the manager subject to the insurer's approval or subject to investment restrictions imposed by the insurer.
- The employer may maintain complete discretionary control over the investments, in which case the highest amount over the nonparticipating premium is required.

In the first case, the insurer would invest in a dedicated bond portfolio using a strategy similar to that for nonparticipating cases except with an emphasis on marketable securities to ease valuation of the fund. In the second case, the insurer may require passive management such as a dedicated bond portfolio as provided by Wall Street bond brokers with periodic rebalancing or may specify diversification and investment characteristics designed to prevent sudden premium inadequacy due to asset default or asset/liability mismatch. In the third case, the employer has the same freedom to invest as if he had never guaranteed the annuities, although the fiduciary requirements of ERISA still apply.

In each case, a series of trigger points are set up under which risk charges and frequencies of valuation may increase as the percentage over nonparticipating cost decreases. Eventually an annuity purchase may be triggered and funds moved into the general account.

Since funds in the separate account are valued at market, the nonparticipating cost must reflect the interest rate in effect on the day of valuation. This may be accomplished by using an index rate such as yield to maturity of thirty-year Treasury plus 70 basis points. Using an index exposes the insurer to two risks—basis risk that the spreads between Treasuries and the actual investments may change and duration risk that as the case matures the thirty-year Treasury may not be the best proxy for the duration of the liability.

As a result of these risks, the insurer must be relatively conservative in defining the trigger points and the nonparticipating valuation basis. Thus, when the time comes to terminate this arrangement, the employer should be given the option to accept the insurer's purchase price or to put out bids to

other carriers for the annuity purchase. Since the original insurer has issued certificates and guaranteed benefits, the purchase with another insurer must be made through reinsurance. The credit quality of the reinsurer must be at least as good as the original insurer.

Charges for this arrangement include:

- expenses of opening and maintaining a separate account;
- expenses in setting up and maintaining a gross premium valuation;
- risk charges for this arrangement; and
- investment management expenses, if applicable.

In the event an annuity purchase is triggered, full profit margins on the nonparticipating premium will be realized. These arrangements are good for the plan sponsor because they allow it to realize an asset reversion while maintaining desired investment strategy and participating fully in favorable experience, and they are good for the insurer since they allow collection of fees and risk charges without undertaking significant risks.

I have also heard of arrangements where the assets are not owned by the insurer and are held by a third party (usually a bank). The annuity purchase is transferred to the insurer in the event funds fall below the trigger point, and annual risk charges are paid to the insurer for the arrangement.

#### IX. PURCHASE OF PROJECTED OR NONVESTED BENEFITS

Some plan sponsors may wish to purchase benefits for active employees under ongoing plans which are not vested and may be projected. Projected benefits are benefits the employee would be expected to receive if he survives in service to retirement. For pay-related plans, a salary scale assumption may be used. If an employee terminates employment with an unvested benefit, he would receive a deferred annuity for the vested portion (which may be paid as a lump sum if the annuity is small), and the unvested portion would revert to the plan sponsor. In the case of projected benefits, it is unlikely that the benefit actually received will equal the benefit purchased, and thus, adjustments are made upon termination or retirement.

The plan sponsor under this arrangement is purchasing benefits as an investment and possibly as a settlement for accounting purposes. In the event of an asset reversion, the accrued benefits, which must be guaranteed by an insurer, would become vested, and a regular terminal funding contract would be used. Thus, the asset reversion rules do not apply, and the preretirement ancillary benefits need not be purchased. The annuities usually have return of premium with interest at death prior to retirement. The death benefit is

payable to the plan sponsor which then provides death benefits payable under the plan, if any. Likewise, early retirement subsidies may be paid or purchased when incurred.

In some cases, particularly those involving projected benefits, the amount of annuity reverting to the plan sponsor can be significant. Rather than taking the refund in cash, the annuity would be applied to new employees who are being added as they are covered by the plan.

Rates which vary and the reverting of annuities make record keeping quite complex. This arrangement is reminiscent of the old deferred annuity contracts which were used prior to the 1960s where the accrued benefit was purchased each year. Since there is no preretirement mortality, a GIC arrangement could be used for the preretirement funds. An additional advantage of this approach would be that GIC contracts can be structured in most states (but not in New York) to avoid surplus strain.

#### X. NONQUALIFIED PLANS

These plans are usually excess compensation plans for senior executives. They are used for retirement benefits in excess of the Internal Revenue Code Section 415 limits or benefits which are to be provided without regard to antidiscrimination requirements of qualified plans. With the lower Section 415 limits (currently \$90,000 per year but may be further reduced) and other adverse legislation and regulation, these plans are growing rapidly in popularity. They are not subject to PBGC or IRS regulations and need not be funded.

The plan sponsor is usually purchasing annuities for retirees as an investment. Ownership of the annuities must remain with the employer and no certificates can be issued to the individual employees. If rights of ownership were given to the participant, the value of the annuity would be taxable income in the year of purchase. The insurer may make the annuity payments to the individuals at the direction of the plan sponsor.

These plans are simpler than typical qualified plans, and there are no differences in pricing. Some states impose different premium taxes on non-qualified annuity premium. California, for example, imposes a .5 percent premium tax on qualified annuity premiums and a 2.35 percent tax on non-qualified ones. Note that many other states which do not tax annuity premiums have retaliatory premium tax laws that would require an insurer domiciled in California to pay tax on the higher of the California basis or their basis. Thus, insurers domiciled in California would pay premium tax in many states that do not tax annuity premiums, such as Arizona. For

multiline companies, estimating the premium tax may be difficult since the basis may vary depending on the mix of business sold and the relative tax rates between the states for different products.

#### XI. MTFs

MTFs, which are also referred to as master annuity contracts, annuity purchase contracts, or terminal funding contracts, provide for the purchase of nonparticipating annuities on an ongoing basis. They can be issued to brokers or directly to plan sponsors. They are used to provide annuity options to terminating or retiring employees under defined contribution plans. They can also be used to purchase annuities as investments for retirees and termines under ongoing defined benefit plans. In the past, they were used for small plan terminations, but since these annuities do not provide all the preretirement ancillary benefits (particularly subsidized early retirement) now required, they are no longer suitable for this purpose. They can be used for annuity purchases under nonqualified plans. They can also be used for some annuity purchases (such as structured settlements) which are commonly purchased as individual annuities. Securities and Exchange Commission (SEC) and Insurance Department regulations are more favorable for group annuities.

When MTFs are issued directly to sponsors of defined contribution plans, the contract can provide that all annuities purchased during a period of time (typically six months or one year) under the plan be placed through the contract. The insurer can then estimate the amount of annuity that will be purchased and the sex composition of the annuity purchase from plan historical data or by examining the characteristics of those likely to retire during the period. It is thus possible for the insurer to provide unisex rates reflecting the expected composition of the annuity purchase and, if desired, fix a rate basis for purchases during the period.

The investment strategy would be similar to that for a window GIC for a 401(k) plan. The estimated cash flow would be invested in advance by borrowing the funds or using options. If interest rates go up, there is the risk that less annuity will be purchased since participants have the option of electing a lump sum, rolling it into a conduit individual retirement account, and purchasing an annuity from another insurer. The participants under these plans are less sophisticated and less likely to select against the insurer than those covered under individual policies.

Another risk is that more money will come in than planned when interest rates are falling. Tax law changes under consideration, which would

eliminate ten-year averaging and impose an excise tax of 15 percent on distributions for those under age 59.5 unless an annuity is purchased, may greatly increase MTF purchases.

It is possible that MTF revenues, which have been less than a billion dollars in recent years, could increase dramatically in the next few years and exceed terminal funding revenues. The MTF also has the advantage of cross sell opportunities for window GICs for the guaranteed account and separate account-managed funds for the equity account.

The other type of MTF is nonexclusive and is typically issued to brokers who shop several insurance companies for the best rate each time an annuity purchase is made. Most companies will guarantee a quote for three days to allow the broker to present it to the annuitant and get authorization to purchase. Under this arrangement, if unisex rates are requested, female rates must be used to prevent financial antiselection. The Norris decision makes the employer, not the insurer, responsible for unisex determination of benefits. The employer could buy up female annuities to the male rate instead of using blended unisex factors. Also an individual participant can take his lump-sum amount and purchase an annuity. For whatever reasons, most annuity requests are sex-distinct when placed through a broker.

The investment strategy for MTFs is the same as for terminal funding, and these annuities can be pooled with terminal funding and GICs. In many cases, preretirement lump-sum options are requested. This happens because the individual had an account balance under a defined contribution plan which he could have taken as a lump sum. If the lump sum is based on a book value (i.e., the premium plus interest less a fixed surrender charge), this is similar to an SPDA, and the investments should be managed accordingly. The interest assumptions and annuity purchase rates should also reflect this strategy.

One alternative for lump sums is to use a market-value adjustment indexed to Treasuries. Instead of having a fixed surrender charge, the annuities could have a charge which varies depending on interest rates. For example, the surrender charge could be defined as six times the increase, if any, in the yield to maturity of twelve-year Treasuries between the date funds were transferred and the date the request for cash surrender was received. In this case, the interest rate and investment strategy would be the same as that for terminal funding.

Another alternative which would allow immunized management is a "one-life GIC" where the funds mature at book in a given number of years but are subject to market-value adjustments if withdrawn prior to maturity. These



contracts, which typically run five or ten years, have conservative minimum guaranteed annuity purchase rates (similar to single premium deferred annuities). The funds can be managed as if they were bullet GICs with interest rates and investments on that basis, and the contract can be structured to avoid reserve strain.

Variable annuities can also be issued under MTF contracts. Since these are group annuity contracts, they do not entail the SEC regulations for individual variable annuities. The funds received under these annuities are invested in a separate account-managed fund which is usually invested in equities but could be in a bond fund. A unit value is calculated each month which reflects the value of the fund less the insurer's charges. Variable annuities have an assumed investment return (AIR) on which the annuities are calculated. For example, if the AIR is 5 percent, the annuity pricing might be based on the same mortality and expenses as fixed annuities with an interest rate of 4.65 percent (the .35 percent is an overhead expense charge and risk charge for the annuity guarantees). The unit value must then be divided by  $(1.05)^{n/12}$ , where  $n$  is the number of months from inception, to calculate the unit value at AIR = 5%. The monthly annuity calculated with the 4.65 percent interest rate is then converted to units by dividing by the unit value on the purchase date. Future annuity payments are calculated by multiplying these units by the unit value for the month. Preretirement death benefits and surrender values can be calculated by accumulating the net premium at 4.5 percent (here we are using a .5 percent takedown for expenses) and multiplying it by the ratio of the unit value at time of calculation to the unit value in effect at purchase.

## XII. CONCLUSION

Terminal funding annuities, with their positive cash flow and lack of financial antiselection, turned out to be winners in the 1980s for those insurers who issued them in the 1970s on a nonimmunized, investment year basis. The 1980s are turning out to be a different environment; one of the strongest bond market rallies in history has pushed yields on thirty-year Treasuries down to 8 percent, a level not seen since 1978. Bonds which looked safe from call a few years ago are now becoming questionable. Those insurers with assets longer than liabilities are the winners compared to those that immunized or that created and held large "liquidity reserves." The importance of investment strategy and immunization in producing consistent profits and financial safety and in the need to coordinate investments and pricing is clear when examining the last twenty years.

Terminal funding cash flows are unique in the extreme length of time they extend and the lack of financial antiselection. They have risk characteristics that form a good counterbalance to other products sold by insurers. Unlike most individual life products, where recovery of acquisition expenses is dependent on assumptions regarding persistency and profits are dependent on assumptions regarding future cash flows, all expenses are collected up-front and cash flows locked in under terminal funding. Unlike most group products, which are one-year term, it would take over thirty years for the funds to turn negative under the worst-case assumptions.

The growth of asset reversions and terminations and of the replacement 401(k) plans has come to the attention of those in Congress and the Treasury who are seeking "revenue enhancement" and others who oppose defined contribution plans or favor defined benefit plans or otherwise oppose corporations recovering actuarial surplus from overfunded plans. A legislative committee is studying the issue of asset reversions. Tax legislation could result which is either unfavorable to defined contribution plans, particularly 401(k) plans, or which will tax asset reversion.

## APPENDIX

### SAMPLE TERMINAL FUNDING CASH FLOWS

PRESENT VALUE OF TOTAL CASE IS  
APPROXIMATELY \$25 MILLION AT 12 PERCENT

Year	Inactives*	Actives
1985	\$1,529,137.90	\$ 324,093.46
1986	1,506,311.46	421,403.54
1987	1,511,468.80	528,201.78
1988	1,530,647.20	730,209.76
1989	1,534,328.00	789,657.69
1990	1,556,789.35	914,196.85
1991	1,578,396.82	1,051,145.75
1992	1,574,696.49	1,126,032.19
1993	1,563,154.55	1,184,543.84
1994	1,573,472.58	1,296,042.13
1995	1,639,631.38	1,438,131.31
1996	1,660,134.99	1,476,317.69
1997	1,685,732.45	1,535,955.75
1998	1,657,434.11	1,575,812.72
1999	1,655,814.13	1,615,112.39
2000	1,649,053.11	1,651,238.58
2001	1,626,395.77	1,648,159.34
2002	1,591,964.91	1,643,229.26
2003	1,577,724.35	1,649,138.14
2004	1,561,028.39	1,800,916.67
2005	1,529,676.08	1,868,652.80
2006	1,480,914.36	1,889,340.11
2007	1,422,769.28	1,877,558.57
2008	1,360,542.56	2,058,122.71
2009	1,303,462.70	2,014,252.99
2010	1,259,630.07	1,987,247.86
2011	1,179,466.50	1,895,882.44
2012	1,100,795.94	1,849,887.40
2013	1,023,909.17	1,757,630.71
2014	949,104.09	1,663,268.49
2015	876,619.49	1,562,911.49
2016	806,595.32	1,463,259.58
2017	739,248.30	1,364,756.70
2018	674,735.64	1,267,800.59
2019	613,238.93	1,172,717.59
2020	554,838.15	1,079,884.41
2021	499,596.10	989,616.66
2022	447,604.37	902,297.65
2023	398,936.58	818,293.12
2024	353,639.26	737,896.77

\*Primarily retirees but includes some terminated/vested.

