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## What is the MDIB?

It is not infrequent that a retiree names a beneficiary other than his or her spouse at retirement; but if a plan is qualified, IRS regulations place certain restrictions on such arrangements. The regulations are known as MDIB (minimum distribution incidental benefit requirement). These requirements were written to limit the ability of retirees to convert pension benefits into death benefits. The regulations do not apply to spousal beneficiaries but do apply to children, grandchildren, or any other non-spousal beneficiary. The limitations are complex and limit various aspects of the benefit payment methodology. However, insofar as joint and survivor amounts, regulations limit the percentage of the member's benefit that may be paid to the surviving beneficiary based on the age difference between the two persons. If the age of the member exceeds the beneficiary's by ten years or less the limit is simply 100%. However, in cases where

the member's age exceeds the beneficiary's age by more than ten years, the allowable percentage the beneficiary may receive is graded down based on the age difference. An excerpt of the table found in the regulation is given below:

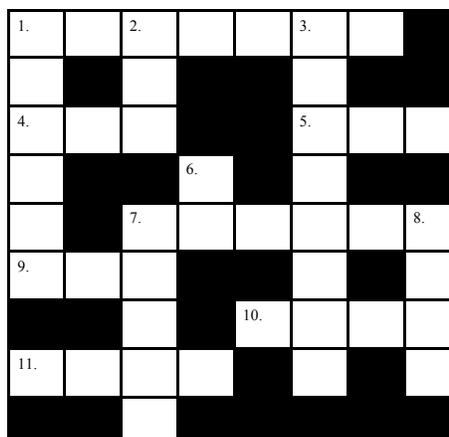
10 years or less	100%
15 years	84%
20 years	73%
25 years	66%
30 years	60%
35 years	56%
40 years	54%

The regulations state that if there is more than one beneficiary the age of the youngest person is used to determine the applicable percentage. As a result of these regulations, when members seek to name children or in some cases grandchildren as beneficiaries they find they cannot elect joint and 100% survivor annuities (typically option 2) but must reduce the amount payable to the surviving beneficiary to a lower percentage.

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## ACTUARIAL CROSSWORD



### ACROSS

1. Periodic Payment
4. Not Gross
5. Liabilities Minus Assets (abbr.)
7. Entitled to Benefit
9. Bond Index (abbr.)
10. None
11. Correct

### DOWN

1. Yearly
2. In No Way
3. Pension Board
6. Symbol for Mega Cap Stock
7. Current Worth; Present \_\_\_\_\_
8. Deferred Retirement Option Plan

## Optimal Portfolios

The Asset Allocation process is designed to produce an “optimal portfolio mix” given an investor’s risk tolerance and investment objectives. This optimal portfolio is determined by mixing different asset classes to achieve the maximum benefit of diversification. Most asset allocation models currently used to design optimal portfolios are based on a mathematical model published in the Journal of Finance by Harry Markowitz in March 1952. The mathematics of the model ensure that given a set of inputs, the optimal portfolio will provide the greatest level of expected return for a given level of risk, or conversely the lowest level of risk for a given level of return. However, the validity of the results depends upon the inputs. If future returns, standard deviations, and correlation coefficients are identical to the past, this “optimal” portfolio would be the most appropriate choice. Nevertheless, markets are typically cyclical and no one cycle truly looks like the average of all past periods.

The greatest problem in attempting to construct an optimal portfolio for the near term is the choice of inputs that are appropriate for the future. Often the choice is to simply use an average rate of return for the entire history of recorded financial statistics. An alternative method would seek to avoid using periods of extreme results such as the extreme market highs of the late 1990’s or lows of the 1930’s. Either way, the typical model boils an asset class down to

a single expected rate of return and a standard deviation number. The model also requires the use of statistics indicating how various asset classes are correlated. If the asset classes do not perform in that “expected” manner in the future, the portfolio built with such a model will not be “optimal”.

The model inputs for the expected rate of return on equities determined as the average annual rate of return on equities over the available history reached a high point at the end of 1999. An asset allocation study at that time, based on such an expected rate of return on equities, would have guided an investor to more heavily weight equities in his portfolio. This, of course, would have been the worst possible short or intermediate range investment strategy to employ as the equity market was just about to begin a sustained period of negative rates of return and under-performance relative to most other asset classes.

If over the long-run, future average rates of return, standard deviations, and correlation coefficients are likely to look like historical averages, an asset allocation study can provide a reasonable long-term asset mix. This is certainly a valid goal, but so many things cloud historical numbers that it is unreasonable to believe that by using history our results will be truly optimal for the short term. It is important to remember that optimal portfolios do not produce the highest possible rates of return,

but rather the highest return for a given level of risk if the input statistics are valid.

## Costs Depend on Experience

How do earnings and mortality affect pension costs? The charts below illustrate the impact these two factors have on funding retirement benefit costs. The cost to provide a life annuity of \$1,000 per month for a male age 60 is given below as a present value for two sample mortality tables and various interest rates.

	Low Mortality*	High Mortality**
3%	180,907	164,628
4%	163,779	150,184
5%	149,236	137,798
6%	136,796	127,104
7%	126,082	117,810
8%	116,791	109,684
9%	108,685	102,539
10%	101,569	96,221

All of the costs listed above are to provide the same benefit. Yet the cost of this benefit in the illustrations can vary by up to 88% depending upon the earnings rate and mortality experienced. The mortality tables used in the illustration are standard pension tables based on experience studies done over different periods of time and for different groups of pensioners.

- \* 1994 Uninsured Pension Table
- \*\* 1971 Group Annuity Mortality Table

## Adjusting Assumptions

Analysis of pension costs is not a static process. Each input to the process is continually reevaluated based on experience and expectations. Inputs such as mortality and disability rates are generally based on standard tables, but the choice of which table to use will depend to some extent on past experience. If a system is large enough, past experience may be a good predictor of future results. However, small plans often have insufficient data to be reliable indicators of future experience. Even for large plans past experience must often be modified to account for future events such as the improvements

in mortality.

In the case of other parameters which affect costs, such as rates of retirement or withdrawal, past experience may be a poor indicator of the future if circumstances such as plan provisions change. Even general economic conditions often have an impact on pension costs. Such factors as these need to be considered in setting assumptions for a plan. Since plan experience is dependent upon benefit structures, any change in benefits can produce experience which requires a change in assumptions. Often estimates are made of the impact

the new benefits will have on experience, and subsequent studies are used to confirm or modify the initial estimates.

All plan assumptions should be monitored on an annual basis, but in-depth studies are usually done approximately every five years. The choice of proper assumptions is critical to reliable results for pension plan cost analysis, and these assumptions are based on a combination of detailed analysis of prior experience and expectations of how the future may reshape such experience.

## Transfer and Purchase Costs

Members who are interested in purchasing or transferring service credit often seek cost estimates prior to making a decision. If a member does not execute the transfer or purchase at the time of the initial estimate, it is not unusual that a second cost estimate some years later will indicate a significantly higher cost. Several factors can cause costs, which are based on actuarial values, to increase over the course of time. The progression of time itself ordinarily causes actuarial values to increase. As a member gets closer to retirement there is less time for the system to earn interest on invested funds. As time passes, the probabilities associated with retirement, disability, and withdrawal can change. Eligibility for various benefit categories changes as members age and accrue addition-

al service. Also, if salary increases over the intervening time period exceed the assumed rate of increase for the general population of the system, actuarial values will increase; this typically occurs when a member secures a higher paying position or the employer revises the pay plan. Finally, significant changes in actuarial costs are often the result of changes in the benefit structure of a retirement system. If cost estimates are given after a change in a system's benefits, the cost of the additional benefit is factored into the cost of the additional credit. If a system lowers its benefit eligibility rules, the increase in the actuarial cost can be substantial. In general, transfer and purchase calculations are complex because they involve benefits which vary by amount and timing. Hence predicting fu-

ture cost levels can be difficult particularly for transfers where calculations involve not only the benefits payable by the receiving system but also the accrual of funds in the transferring system.

## Crossword Key

### Across:

1. Annuity
4. Net
5. UAL (Unfunded Accrued Liability)
7. Vested
9. LBA (Lehman Brothers Aggregate)
10. Zero
11. True

### Down:

1. Annual
2. Not
3. Trustees
6. GE (General Electric)
7. Value
8. DROP

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### One Actuary's Perspective



As employer contribution rates continue to climb for both public and corporate pension funds, investment markets remain the chief concern of trustees. Alt-

hough 2003 follows three consecutive down years in investment performance, there is no guarantee of a recovery during this year. Even after a recovery

begins, it is likely employer rates will continue to be under pressure for some time since funding mechanisms often do not immediately respond to shifts in investment income.

On a personal note, it is a pleasure to announce that Greg Curran has completed the required examinations to be named an Associate of the Society of Actuaries. Examinations cover the mathematical, statistical, and financial areas necessary for an actuary to master the skills required to perform asset and liability analysis for pension and insurance arrangements.

Gary Curran, A.S.A