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should not require the 30% RBC factor for common stocks held in the general account.

Both the Model Regulation and California Bulletin 95-8 require, *inter alia*, a plan of operation where there is a demonstration that investment strategy supports the index guaranteed. Under the Model, the actuary can propose an Asset Maintenance Requirement, which acts as a haircut to the market value of the assets in determining non-insulated deficiency reserves, to cover basis risk between the investment strategy and the index.

California appears to be on a pass/fail basis when it comes to basis risk between the investment strategy and the index.

Statutory accounting will follow the Model Regulation, which is part of the codification, to go into effect in 2001. For GAAP and tax accounting, these accounts could be treated as managed funds with operating income equal to the

fee withdrawn. Comprehensive income would include changes in market value of the assets relative to the liabilities. In order to smooth out GAAP operating income, it may be possible to use a formula that amortizes the withdrawal of overperformance or to set aside part of fee income in asset impairment reserves.

The primary market for index separate accounts are defined benefit pension plans, where these contracts are used as part of the core index fund. A typical contract might have a three-year tenure and have a .25% non-participating enhancement over the index.

The separate account is exempt from registration under 3(a) 2 for qualified pension plans. This is fairly expensive funding for LIBOR contracts. An alternative would be to issue a contract paying LIBOR to a money market or other short-term investment fund. These funds cannot hold investments with maturities

over one year and so the best liability that could be written would be a perpetual contract with a 12-month put. Since these are not qualified funds, a private placement exemption must be used to avoid registration. There are numerous requirements, such as a private placement memorandum and marketing through broker dealers, that must be met under this exemption.

The index separate account offers life insurers a capital-efficient structure for certain investment strategies and assets compared to funding in the general account, which could result in a higher return on capital.

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## Pension Forecasts, Part One: Some Questions

by Lawrence N. Bader

*Note: This article will be presented in two parts. The first part, appearing below, describes a simplified problem in pension plan financing and presents two questions about how that pension plan can be modeled. We hope that readers will ponder these questions and perhaps be moved to respond. The second part of the article, in the next issue of this newsletter, will discuss the answers to the questions raised below and their implications for traditional actuarial models.*

**C**onsider this simplified pension plan and funding system. The liabilities consist of a single known benefit payment to be made 20 years from today. That benefit payment can be matched in timing and amount by a portfolio of 20-year zero-coupon Treasury bonds with a market value of \$1 million.

The plan assets also equal \$1 million. The company will make no interim contributions to or withdrawals from the plan. At the end of year 20, the company will wind up the plan by withdrawing the surplus or contributing to cover the deficit. (We ignore taxes.)

The corporate sponsor of this plan asks for your help. The assets are currently invested in the matching Treasury portfolio, which will ensure full funding of the plan with a company cost of zero. The sponsor believes that, over a 20-year horizon, equity investments would give rise to potential withdrawals that greatly outweigh the potential contributions, in both probability and magnitude. So he asks you **Question #1:**

*Ignoring taxes, how would shifting the \$1 million from Treasuries into equities affect shareholder value?*

You decide to use a pension forecasting model. You prepare a series of 20-year simulations that show a range of terminal company contributions or withdrawals. To provide a single answer to Question #1, you need to discount each of these terminal payments to a present value. This presents **Question #2:** *What discount rate should you use — the Treasury yield, the expected return on the plan assets, the company's borrowing rate, the company's weighted average cost of capital, or some other rate?*

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