



## UNIVERSAL AND VARIABLE INSURANCE PRODUCTS

### Overview

This guide is intended to provide a broad introduction to several performance-oriented products. It distinguishes variable (equity-linked) life insurance, universal life (flexible payment and current fixed yields), variable universal life, and current developments in variable annuities (primarily minimum death benefits).

A great deal has been written and spoken on these topics, and our objective has been to select those references providing the most complete and most clearly presented ideas. We have also attempted to offer a range of complexity to respond to the actuary's general and technical interests.

A final introductory observation is that these products are part of a dynamically changing marketing and regulatory environment that is itself producing change even as this summary is produced.

### The Role of the Actuary

Performance-oriented products have broadened the actuary's traditional role beyond assumptions, pricing, expense analysis, and reserves. Anticipated investment performance has been a stronger part of marketing activities, and actuaries and sales personnel have joined forces for mutual understanding and effective sales activities.

Dual regulation by state and federal bodies has increased restrictions on sales loadings, printed materials including projections, and specific language describing how each product performs. Actuaries have worked more closely with legal professionals and marketing forces to accomplish optimal presentations while abiding by regulatory limitations.

Finally, actuaries have worked more closely with investment personnel to better communicate, both internally and externally, the objectives of various products and most effectively translate those objectives into investment decisions and continuing review of portfolio compatibility with both risks and opportunities. In certain instances, actuaries have worked closely with investment personnel to ensure immunity of asset durations with expected timing of benefit obligations.

Variable insurance products have presented opportunities for actuaries to expand their roles in many nontraditional areas. At the same time, they have broadened the responsibility of actuaries to follow professional and environmental requirements, subject to new risks and new scrutiny.

### Historical Perspective

The development and emergence of what will be generically referred to in this guide as "variable insurance products" has been one of the most exciting and productive eras for the life insurance industry in many parts of the world. It has provided life insurers with vehicles to meet varying needs for flexibility and investment performance in the face of growing competition from the banking and securities industries. It also helped major life insurance companies prevent future recurrence of problems created in the late 1970s by soaring interest rates, when market values of their assets temporarily fell below the book value of their corresponding liabilities. The creative development process for variable and universal products has been the forerunner of dynamic organizational and structural movements by American life insurers to become more active partners of the world's broader financial community.

The Life Insurance Specialty Guides Committee of the Society of Actuaries has provided this Specialty Guide for continuing education purposes. It is intended to provide the user with a summary of representative sources of current general knowledge. Neither the Society of Actuaries nor the Committee intends or represents Specialty Guides to be complete or their use necessarily required or sufficient for meeting continuing education requirements or any other professional competency standards of any organization.

American insurers faced a series of hurdles unique to the U.S. in their quest for participation in the insurance marketplace—laws and regulations of 50 states, federal investment laws, Securities and Exchange Commission regulations for investment products, and a strong actuarial heritage based on decades of emphasis on the “fixed” nature of life insurance guarantees. For this reason, European, Canadian, and Latin American actuaries produced “unit-linked” and other types of variable life products before actuaries of the U.S. They served as both guides and inspirations for the major efforts of American actuaries and life insurance companies.

It is important to recognize the pioneers who led the way and their supporters:

- The insurance actuaries who linked mutual fund and annuity concepts in their development of variable annuities
- Actuaries who developed the key technical components of variable (equity-linked) life insurance and shared them with the actuarial community
- Life actuaries who developed the forerunners of today’s universal life. This opened the door for a future product generation, variable universal life.

The Securities and Exchange Commission staff met with and listened to industry representatives and company delegates. Their scheduled hearings built roadblocks and led to several years’ delay before practical opportunities existed for the developers to begin marketing variable life. This was attributable to the vast differences in insured equity products from traditional securities.

The actuaries and insurance industry began with variable annuities in the 1960s. Adjustable and flexible premium life products were primarily created by midwestern actuaries focusing on payment flexibility as well as cash value performance. However, these remained “sleeping giants” for many years, until the regulatory constraints and administrative complexity of variable life insurance led the actuarial profession to develop universal life, one of the most significant products of our industry.

It was only a matter of time until advancing computer technologies and marketing realities led to our development of variable universal life, which combines the desirable features of universal life and variable life products. By 1990, insurance companies throughout the industry were able to offer a full range of performance-oriented and flexible products. These included updated versions of variable annuities, featuring guaranteed-minimum death benefits.

## Variable and Universal Life

### History of Variable Life Insurance Development

“Equity-Oriented Products. III. Variable Life Insurance,” *Transactions of the Society of Actuaries* XXI, Part 2 (1969), p. D176-83.

The discussion is a presentation of variable life product developments in the U.K. and Canada approximately 10 years before variable life insurance was first offered in the U.S.

Level: Basic

Pages: 8

Walker, H. and Golden, J.S. “Variable Life Insurance,” in *Life and Health Insurance Handbook*. Homewood, Ill.: Richard D. Irwin, 1973, p. 227-39.

The authors provide an introduction to concepts, including historical discussion of developments in other countries and early developments in the U.S. Alternative product designs, special contract provisions, gross premiums, and dual regulation are discussed. There is also an excellent collection of selected references.

Level: Basic

Pages: 13

### History of Universal Life Development

Doll, Douglas C. “A Brief History of Universal Life,” in *Product Development News*, Issue 26 (December 1990), p. 8-9.

This summary, extracted from the universal life study note (see following citation), describes the introduction of UL by James Anderson in an article titled “Cannibal Life.” There is a summary of the introduction and early market development of universal life.

Level: Basic

Pages: 2

Doll, Douglas C. “Universal Life: A Product Overview,” *Society of Actuaries Study Note 340-41-91*.

This note gives the reader a history of the product’s development and emergence, descriptions of product and its regulatory environments, discussions of marketing and agents’ compensation, and an introduction to other universal life products.

Level: Basic

Pages: 20

## Product Development and Pricing

Black, K. Jr., and Skipper, H.D. Jr. "Flexible-Premium Life Insurance Policies," Chapter 6 in *Life Insurance*. 12th ed. Englewood Cliffs, N.J.: Prentice Hall, 1994, p. 124–46.

Chapter 6 provides a comprehensive description of adjustable-premium and flexible premium plans, along with the development of universal life insurance. An introductory description of universal life product features is also given.

Level: Basic Pages: 20

Fraser, John C., Miller, Walter N., and Sternhill, Charles M. "Analysis of the Basic Actuarial Theory for Fixed Premium Variable Benefit Life Insurance," *Transactions of the Society of Actuaries XXI*, Part 1 (1969), p. 343–457.

The authors present a classic scenario of the variable life insurance actuarial theory, where investment increments are used to purchase whole life additions, positive or negative. A key component is the equality of reserves per dollar amount of actual variable life insurance face amount with those for a corresponding fixed whole life insurance policy.

Level: Intermediate Pages: 114

Kabele, Thomas G. "Universal Life and Indeterminate Premium Products and Policyholder Dividends," *Transactions of the Society of Actuaries XXXV* (1983), p. 153–55.

Kabele gives a brief description of the similarities between universal life and indeterminate premium products and participating plans.

Level: Basic Pages: 3

Lynch, J. Timothy. "Universal Life Insurance: A Primer," *Journal of the American Society of CLU & ChFC*, (July 1982), p. 44–50.

This paper describes the historical environment and development of universal life, noting the product's similarities with and differences from traditional life insurance. It presents the specific ways in which universal life operates and discusses its anticipated marketing, profit, and tax issues.

Level: Basic Pages: 6

Murphy, James J. and Rohda, Rodney R. "Variable Life Insurance Viewed Via the Additions' Concept," *Transactions of the Society of Actuaries XXII*, Part 1 (1970), p. 377–80.

The speakers present a discussion of possible design variations for variable life insurance policies, depending on how investment increments are applied to purchase additional benefits.

Level: Intermediate Pages: 4

Polk, Ken E. "Variable Premium Life Insurance," *Transactions of the Society of Actuaries XXVI* (1974), p. 449–65.

Polk gives actuarial aspects of a life insurance product providing complete flexibility in the pattern of premium payments. Major issues discussed include profit impacts and compliance with the Standard Valuation Law and the Standard Nonforfeiture Law. It is an attempt at a realistic, life-cycle concept.

Level: Advanced Pages: 15

Scher, Edward. "The New York Life Variable Life Insurance Design on a Daily Basis," *Transactions of the Society of Actuaries XXIII*, Part 1 (1971), p. 367–89.

This paper discusses the development of the theoretical formula for the actual variable life insurance face amount under the company's variable life design adapted to a daily investment valuation basis.

Level: Intermediate Pages: 32

## Marketing Performance

Baldwin, Ben G. Jr. "Understanding and Managing VUL," *Journal of American Society of CLU and ChFC*, L, No. 5 (September 1996), p. 82–95.

Baldwin presents a comprehensive discussion from an agent's point of view of the origin and mechanics of variable universal life.

Level: Basic Pages: 14

Cunningham, W. Patrick. "Variable Universal Life: Product, Sales Ethics and Historical Perspective," *Journal of American Society of CLU and ChFC*, XLIX, No. 4 (July 1995), p. 78-85.

This article gives the reader a basic description of universal life and variable life with an interesting discussion regarding optimal funding levels and the effect of policy loans.

Level: Basic Pages: 8

Kingston, S. "On Universal Life," *National Underwriter*, January 2, 1982, p. 9 and 25, and "More On Universal Life," *National Underwriter*, January 16, 1982, p. 11 and 24.

These two articles present a discussion of the product developments within the generic universal life sector, in addition to discussions on tax concerns and predictions for the product's future growth.

Level: Basic Pages: 4

Life Insurance Marketing and Research Association. "Variable Life: A Look at Product Design and Experience," *LIMRA Research*, November 18, 1993.

This report is based on the results of two industry surveys of companies currently manufacturing variable life insurance and companies not offering variable life products. The report contains a future outlook for the product. (The report has been distributed only to insurers who are LIMRA members.)

Level: Basic Pages: 9

Fenton, John M. and Roth, Stephen E. "Variable Products Update," *Record of the Society of Actuaries* 20, No. 2 (1994), p. 121-44.

The speakers provide a discussion-based update on variable products' market share, pricing, field compensation, and related current Securities and Exchange Commission issues.

Level: Basic Pages: 23

## Variable Annuities

### Historical Design and Recent Revisions

Biggs, J.H. "Alternatives in Variable Annuity Benefit Design," *Transactions of the Society of Actuaries* XXI, Part I (1969), p. 495-517.

Biggs gives the reader a discussion of relationships between fixed and variable benefits, benefits prior to retirement, assumed interest rates for post-retirement benefits, accounting choices, and the nature and level of possible guarantees.

Level: Basic Pages: 23

Campbell, Paul A. *The Variable Annuity—Its Development, Its Environment & Its Future*. Bloomfield, Conn.: Connecticut General Life Insurance Company, 1969.

Campbell presents a broad description of initial products, companies, and their marketing and regulatory (state and federal) environments, with a particular focus on tax-preferred market groups and products. An appendix contains detailed pricing and reserve formulas.

Level: Basic Pages: 71

Carney, G. "The Variable Annuity," *Society of Actuaries Study Note 44-31-92*.

This note gives a broad description of initial products, companies, and their marketing and regulatory (state and federal) environments.

Level: Basic/Intermediate Pages: 49

### Costs and Reserves for Minimum Death Benefit and Asset Value Guarantees

Bernard, Garth A. "A Direct Approach to Pricing Death Benefit Guarantees in Variable Annuity Products," *Product Development News*, Issue 34, (June 1993), p. 6.

Rapid growth in variable annuity sales has produced many new competitors and many innovative product designs, often relating to stepped-up or increasing death benefit guarantee provisions. Pricing formulas and practical considerations also are discussed.

Level: Basic Pages: 3

Mitchell, G.T. "Variable Annuity Minimum Death Benefit—A Monte Carlo Pricing Approach," *Product Development News*, Issue 35, (February 1994), p. 10–13.

Mitchell provides a study of the unusual risk structure of minimum death benefit guarantees; they normally cost little, but can be very costly under certain scenarios. By using Monte Carlo methods, risk characteristics, and cost variations due to issue age, the author estimates market volatility, market returns, lapses, and benefit designs.

Level: Intermediate Pages: 4

Turner, S.H. "Asset-Value Guarantees Under Equity-Based Products," *Transactions of the Society of Actuaries XXI*, Part I (1969), p. 459–77.

This paper considers the case in which a minimum value is guaranteed at the end of a specified investment period under an equity-based product. There is an analysis of probability density functions, a general simulation model, and determination of a net-risk premium.

Level: Intermediate Pages: 19

Bernard, Garth A. Sr., Habegger, Steven P., Mitchell, G. Thomas, and Slater, John Jr. "Variable Annuity Guaranteed Minimum Death Benefits," *Record of the Society of Actuaries 21*, No. 1. (1995), p. 249–66.

This session is a panel discussion of the structure, cost, and reserving practices of variable annuity guaranteed-minimum death benefits. Dynamics, costs, and risks also are discussed.

Level: Basic Pages: 18

## Results to Date—Actuarial, Environmental, and Market Trends

Bonorow, Gordon C., Mueller, Hubert B., Roth, Stephen E., and Truax, James M. "Individual Annuity Product Update," *Record of the Society of Actuaries 18*, No. 4B (1992), p. 1813–37.

This session is a panel discussion of market trends, market-value-adjusted annuities, the competitive marketplace, and product design developments.

Level: Basic Pages: 18

Ingraham, Harold G. Jr. "Nonqualified Variable Annuities Versus Mutual Funds," *Journal of American CLU and ChFC*, L, No. 2 (March 1996), p. 42–8.

The author gives a very complete analysis of the after-tax relationship between mutual funds and variable annuities.

Level: Basic Pages: 6

Mueller, Hubert B. "Variable Annuities in the 1980's and Beyond," *Actuarial Research Clearing House-1991.3*, p. 103–291.

Mueller presents both a review of the history of variable annuities, with updates on taxation and regulation, product designs and distribution channels, and a comparison of variable annuity and mutual funds, including historical investment performance and sales results.

Level: Basic Pages: 185

Mueller, Hubert B. "Update on Variable Products," *Product Development News*, Issue 32, (July 1992), p. 1, 3–5.

In this article, Mueller presents discussion of historical and current environmental forces, such as market and regulatory activity, with developments in variable annuity product design, along with a discussion of the growth potential for variable annuities.

Level: Basic Pages: 4

Star, Marlene Givant. "Firms Taking Different Variable Annuity Route," *Pensions & Investments*, June 12, 1995, p. 35.

Star gives a discussion of choices in distribution strategy: subadvisers or investment advisors. Specific industry and company examples of approaches also are given.

Level: Basic Pages: 1



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