



Chairperson's Corner

by *Phil J.T. Cernanec*

Here we are on the doorstep of the "new millennium," at the start of the un-named decade, in the 50th anniversary year of the Society of Actuaries, and in my 25th year of association with the actuarial profession!

So, what is going on in our industry (primarily life insurance and annuities), our profession, and our area of interest—product development? My observations in this column today are primarily personal and anecdotal.

First, with regard our industry, life insurance and annuities no longer carry an industry identification, but are now a segment of the broader industry of financial services. The convergence of banking, brokerage, and insurance has been driven by technology, demographics, consumers' perception of needs, and the combination of competitive pressure and struggle for profitability. The implications of this convergence of offerings certainly resonates around distribution of product, with many organizations moving to multi-channel approaches to the market.

The challenge seems to be providing a differentiated product/service that interfaces with the customer in the way of the customer's choice. And, customers will choose different media at different times, not based solely on product. Today's media choices include an agent, the telephone (to a call center/possibly "voice response unit" or VRU), the Internet (from information exchange to e-commerce), and the postal service. The spectrum of life insurance and annuities sales and services today are still dominated by agent interface, with other media growing in frequency and preference of use as consumers' expectations and comfort grow. The traditional value proposition for life insurance and annuities is under pressure. What had been nontraditional even five years ago, is becoming common practice today.

(continued on page 2, column 1)

Long-Term Care Topics

by *Michael S. Abroe*

Editor's Note: This article is based on a speech prepared for the Southwest Actuaries Club Meeting on November 20, 1998. This is intended as a primer for long-term care insurance and is geared for one with limited knowledge. This is the first two articles that will appear in this newsletter and is a general overview of long-term care insurance and related business issues.

This is not intended to be a technical discussion, as no details on modeling or pricing are presented. Part Two of this article will appear in a future issue of Product Development News.

This article is organized into the following sections:

- Long-Term Care Market—An overview will be presented
- Regulatory Environment—The environment will be outlined.
- Product—Typical product design features in today's market.

Long-Term Care Market

The long-term care (LTC) market in the United States has experienced considerable (25% average annual) growth rates in recent years. This high growth is believed to be the result of several factors: the relative "newness" of the market; the aging of the U.S. population, increased media attention, Health Insurance Portability and Accountability Act (HIPAA) legislation, limitations of government funding sources, and the increase in the number of companies selling long term care insurance.

The following data is excerpted from the *Long-Term Care Insurance Experience Reports for 1996*, published in December 1997 by the NAIC. The 1997 report was scheduled to be released in December 1998.

(continued on page 3, column 1)

In This Issue

	Page		Page
Chairperson's Corner by <i>Phillip J.T. Cernanec</i>	1	Underwriter's Corner by <i>Jim Maher</i>	13
Long-Term Care Topics, Part I of II by <i>Michael S. Abroe</i>	1	Multiple Medical Impairment Study Available.....	15
Part II: Segregated Funds: "No Loss" Proposition by <i>Boris Brizeli</i>	7	Spring Meeting in Atlanta.....	15
Ten Years Ago.....	11	Product Development Photos.....	16

Chairperson's Corner: continued from page 1

Our profession is likewise under pressure and is changing, with the new syllabus and path to Fellowship looking much different than that of 25 years ago. This year will include significant efforts in establishing what are the minimum requirements or skills necessary to a product development actuary. And, the method of transitioning from Associateship to Fellowship level will include professional development specific to the area of practice, though much less "country-specific" (US/Canada) than previously. This involves taking stock of the roots of product development, and a healthy review of what is a profession, versus the completion of an academic program.

Interesting issues in interesting times.

With regard to product development, we will focus on three "tiers" of interest: strategic, process, and specific topics/techniques. The strategic tier links product development to the organizations strategy and value chain. Here product development is a competence, possibly a differentiator, that includes product portfolio planning, contribution objectives, and certainly macro-modeling for an organization. Product process involves choosing what to do, designing, implementation and performance measurement. The product process has been impacted significantly by technology, with "targeted performance levels" taking the stage versus "assumptions," "customer intimacy" enabled through technology versus mass market approaches, and "knowledge management" and "rapid application development" over "product specifications."

We, the council, are looking forward to a stimulating and challenging 1999 in service to the membership. If you have any thoughts, ideas, or comments, please contact me by email (pcernane@usa.capgemini.com). Thank you for your support.

Phillip J.T. Cernanec, FSA, is Director, Cap Gemini in Littleton, CO, and is Chairperson of the Product Development Section.

Long Term Care Topics continued from page 1

Long-Term Care Insurance Experience Group and Individual Combined			
Year	Cumulative Premiums (millions)	Yearly Premiums (millions)	Growth Rate
1996	\$12,727	\$3,218	40%
1995	9,509	2,298	20%
1994	7,211	1,921	

The NAIC report is based on long-term care experience data included in the Statutory Statement. The NAIC annually compiles and publishes the results. Please note the NAIC does not audit the data as it is not used for statutory income purposes. However, note the growth rate in premium shown by the data.

Health Insurance Portability and Accountability Act of 1996

This Act contains provisions for establishing "tax-qualified" LTC policies. These tax-qualified policies allow some portion of their premiums deducted from a person's taxable income, if the person has total medical expenses high enough to qualify as a deduction. Since

Issue 48

March 1999

PRODUCT DEVELOPMENT NEWS from the Individual Life Insurance and Annuity Product Development Section

Published by the Product Development Section Council
of the Society of Actuaries
475 N. Martingale Road, Suite 800
Schaumburg, IL 60173-2226
Phone: 847-706-3500 Fax: 847-706-3599
World Wide Web: <http://www.soa.org>

This newsletter is free to Section members. A subscription is \$20.00 for nonmembers.

Current-year issues are available from the Communications Department. Back issues of Section newsletters have been placed in the Society library. Photocopies of back issues may be requested for a nominal fee. Back issues are also on the website (www.soa.org) in Special Interest Sections.

Expressions of opinion stated herein are, unless expressly stated to the contrary, not necessarily the opinion or position of the Society of Actuaries, its Sections or Committees, or the employers of the authors. The Society assumes no responsibility for statements made or opinions expressed in the articles, criticisms, and discussions contained in this publication. The Section would like to encourage articles and papers on product development topics or subjects of interest to product development actuaries. If you have an article or an idea for an article that you think might interest Section members, please contact:

David G. Whittemore, FSA
Product Development News Editor
Tillinghast/Towers Perrin
12377 Merit Drive, Suite 1200
Dallas, TX 75251

Phone: (972) 701-2744

Fax: (972) 701-2575

E-mail: whitted@tillinghast.com

Copyright © 1999 Society of Actuaries
All rights reserved.

Printed in the United States of America.

few people have medical expenses this high, the actual benefits of this law to the prospective insured may prove to be more illusionary than actual.

However, the law has heightened awareness of the private LTC market and has led to more companies entering the market. The growth in the long-term care market is expected to continue over the next year or so, due in large part to the passage of the federal Health Insurance Portability and Accountability Act of 1996.

Sales Environment

Long-term care has a complex sales environment. The products typically have multiple benefit options and riders. It is not uncommon for a product to have more than 100 benefit options based on the possible combinations of benefit period, elimination period and optional riders. For group, employers are not generally paying the premiums for their employees. Therefore most sales, even those made to individuals of a group, are generally made on a one-to-one basis, with the involvement of an insurance broker or agent.

Agents selling long-term care insurance often specialize in sales to the over age 65 market. These agents need to be licensed as health insurance agents with the state in which they sell. Some states have some additional training or continuing education requirements for agents who sell long term care insurance.

Independent brokers sell about 6.2 of every 10 policies issued and captive agents sell about 3.3 of every 10. The balance comes from other distribution sources (HIAA 96 Report).

Long-Term Care Sub-Markets

We have segmented the long-term care

market into the following sub-markets: individual, group and other (self-funded, association, life insurance and

mium per policy continues to decline although new, more expensive options have been added to the sales portfolio.

“Long term care has a complex sales environment. The products typically have multiple benefit options and riders.”

CCRCs). For purposes of this discussion, we are excluding CCRCs and life insurance.

• **Individual**

The individual sub-market makes up the vast majority (over 80%) of all long term care coverage in force. The individual sub-market consists primarily of guaranteed renewable policies sold to individuals. Some group products sold through "air breathers" associations would also fall under this category, however these types of products are not as popular as they once were.

Most insurers are selling tax-qualified and non tax-qualified policies. California requires insurers to sell both qualified and non-qualified products. However, there are some insurers who are selling only tax-qualified products. Tax-qualified products probably make up the majority of new sales. Both tax-qualified and non tax-qualified products are sold and make insurers sell more.

As an exception to prove the rule, the company selling the most business and its most popular product are not tax-qualified.

As mentioned above, most companies active in the market are experiencing significantly increased sales since HIPAA was enacted in 1996.

See the facts and figures in the table on this page.

Note the 5% lower premiums for 1996 relative to 1995. The average pre-

The lower average premium is most likely due to competitive forces, rather than a lower average age at issue or less costly benefit options sold.

• **Group**

The group sub-market has recently enjoyed more relative growth than has the individual sub-market. The HIPAA legislation is likely driving a lot of the growth. The average age of the employee electing coverage is 42 or 43, significantly lower than the average issue age of individual coverage at 67 or 68. Please note, this does not include spouse or parent coverage.

Companies in the group sub-market are generally more aggressive than those in the individual sub-market. For example, for large employers a five-year rate guarantee is common. We are aware of one very large employer coalition that recently asked for, and received, a 10-year rate guarantee.

One thing to keep in mind is the more liberal underwriting that is typical of the group market. Guaranteed issue, subject to actively at work requirements, is typical for the employee. The spouse is usually subjected to a short form application. Traditional long-term care individual underwriting would still hold for parents of the insured or for retirees. The typical group product is tax-qualified.

HIAA Research released September 1998	1997 Private Survey	NAIC Long-Term Care Insurance Reports for 1996
1996 Sales Volume—\$750 million 25% over 1995. Average premium per policy was 5% lower. Top 12 Companies wrote 80% of business.	1997 Growth Rate of 24%	1996 Market Share— Top 4 organizations have about 50% of experience to date.

(continued on page 4, column 1)

Long Term Care Topics

continued from page 4

Here are some facts and figures:

HIAA Research Report released September 1998	<ul style="list-style-type: none"> • 1996 sales about 1/4 of individual market. • Employer subsidizes about 25% of time • Number of employer sponsored plans 22% over 1995
1997 Private Survey	<ul style="list-style-type: none"> • Average size group in force - 300 lives • Average size group sold - 225 lives

• **Other Long Term Care Sub-Markets**

— **Self-funded**

To date, the self-funded sub-market consists primarily of state-run plans for retired individuals. Probably the best known self-funded operation is the CalPers plan. Florida and Washington have plans in the developmental stages. There are a half dozen other states that have fully insured LTC programs for state retirees.

— **True Association**

There continues to be some action in this area, but it is small relative to the individual and group markets.

— **CCRCs and Life Insurance** - we are not discussing in this article.

Major Players

The following table lists some of the major players. Major players include market leaders, companies with current market leading products and organizations worth noting for various reasons. The list is highly subjective in order to illustrate several points:

• **Individual Sub-market**

In the individual sub-market the majority of the business is written by a handful of companies. The first four listed organizations: GE Capital, CONSECO, CNA and Aegon—have about a 50% market share.

The number of companies selling long term care peaked in 1990 at 143 and has gradually declined to 120 at 1996. However, HIPAA has renewed interest in new companies entering the long-term care market. We expect the number to increase as more traditional life only insurers start selling individual long-term care.

Penn Treaty appears to have the hot product and is probably the current top seller. Time and Allianz are included in the list, as LTC marketers we deal with are always including them when discussing primary competitors or hot products.

• **Group Sub-Market**

In the group sub-market we expect the number of companies to expand greatly. Prudential is a relative newcomer and, we have been told, has an aggressive marketing plan.

Tax qualification has been a boon to the group sub-market. It is almost

impossible to find a group non tax-qualified product being presented to large employers. It appears that tax-qualification has brought credibility to the group long-term care sub-market.

• **TPAS/Other**

TPAs and other organizations are included, as many insurers are contracting with outside organizations to assist in the administration or implementation processes on a consulting basis. Several of the organizations listed provide actuarial and TPA tasks. Others provide turnkey products and actuarial assistance. Some will assist in developing internal processes on a consulting basis. Others will provide case assessment, underwriting and claims management functions.

Regulatory Environment

State Regulation

Like life insurance in the United States, LTC insurance regulation is primarily the responsibility of the states through their insurance departments. However please keep the following in mind:

- The National Association of Insurance Commissioners (NAIC) has had significant input into LTC policy regulation. In particular, the NAIC has passed a “Long-Term Care Insurance Model Act” and a corresponding “Model Regulation” to promulgate minimum standards for LTC policies and sales.
- The NAIC has, over the years,

Individual Sub-market	Group Sub-market	TPAs/Other
GE Capital CONSECO CNA Aegon Time Allianz Penn Treaty (including Network America)	CNA Hancock Hartford Metropolitan Prudential Travelers UNUM	LifeCare LTC Group LifePlans Duncanson and Holt Wakely

proposed several amendments to its model regulation (e.g., non-forfeiture requirements, rate stability requirements, etc.) that have not been consistently passed by the states.

- Most states have, in turn, proposed legislation either similar to but not identical to the NAIC Models. Also, a few "maverick" states have implemented regulations that are unique, usually with additional benefit mandates.
- Thus, an insurance company wishing to sell LTC insurance nationally must do a detailed search of each state's LTC regulations, in order to detect and price for variations in risk levels.

NAIC Model Act

The NAIC Model Act and Regulation is meant to apply to all health insurance based LTC insurance contracts, sold by any organization, whether individual or group.

Model Law Provisions

Some of the more important provisions of this regulation are:

- requiring guaranteed renewability
- limiting policy exclusion,
- establishing minimum benefit standards
- mandating certain disclosure and reporting forms
- establishing advertising and marketing standards
- requiring that a minimum 60% loss ratio (ratio of claims incurred to premiums earned) be met over the lifetime of the policy
- Rate Increases/Stabilization
LTC policies are generally not subject to statutory limitations on future rate increases. However, any rate increase must be approved by the state insurance departments, and practically speaking, many of them would be very hesitant to approve high or frequent rate increases,

unless company solvency was truly in jeopardy.

The NAIC Model Law has a "rate stability" requirement (and Wisconsin for example, has passed such a requirement). The requirement restricts the number and magnitude of future rate increases. No other states have passed this feature.

- **Non-forfeiture**

The NAIC Model Law (working version) has a new proposed contingent non-forfeiture option. The law requires that a non-forfeiture option must be implemented whenever a rate increase exceeds the threshold amount and a lapse occurs within 90 days of the rate increase. New Mexico has proposed this requirement but it has not been implemented.

The following table illustrates the variability of states adopting various elements of the Model Law.

States Adopting	Provision
50	No Prior Institutionalization
44	Mental/Alzheimer's
36	Prohibition-Post Claims Underwriting
14	Unintentional Lapse
14	Premium Rate Restrictions
14	Non-forfeiture
1	Rate Stability

Health Insurance Portability and Accountability Act

At the end of 1996, the federal government passed a law which has substantially impacted the current LTC market.

This "Health Insurance Portability and Accountability Act" (HIPAA) contained federal mandated benefit standards which must be included in a policy in order for it to be a "tax-qualified" policy.

If tax-qualified, the law clarifies that the premium of the policy can be included as a deductible medical expense for purposes of an individual's personal income tax calculation, and the

benefits paid by such a policy would not be included as income.

However, the law did not discuss what is to be done with either premiums or benefits for new nonqualified policies. This has caused some confusion in the current marketplace. It's our perception that most insureds have typically been excluding LTC premiums from medical deductions and have also been excluding LTC (and other health) benefit payments from income.

Changing this latter practice, in particular, could have major ramifications for other health products and would most likely result in the elimination of future non-qualified long-term care sales.

Clarifying interpretations have not been forthcoming from the Treasury Department. The Treasury maintains it can only issue regulations based on what laws are passed, not what is not passed.

In the meantime, many new companies are entering the LTC market, and existing LTC insurers are developing tax-qualified policies.

The benefit standards established by HIPAA are quickly becoming industry standards.

In addition under HIPAA for insurance companies, a 1-year preliminary term reserve method is allowed for tax-qualified business in determining taxable income. Non tax-qualified business is still required to use a 2-year preliminary term method.

Long Term Care Topics

continued from page 5

Product

Types of LTC Policies

Three basic types of LTC policies are being sold:

- nursing home only policies
- home care only policies
- comprehensive policies, providing coverage for both nursing homes and home care.

Historically, the majority of LTC policies provided nursing home coverage. Based on a Health Insurance Association of America survey done in 1990, 63% of sales were for nursing home only policies, while 37% were for comprehensive policies. This product mix has changed in recent years, though, with more emphasis being given to comprehensive products. In 1994, 33% of sales were for nursing home policies, 61% for comprehensive policies, and 6% for home health care policies.

Typical LTC Policy

- Non Tax-Qualified Policy

The typical LTC policy provides benefits on an indemnity basis, or for expenses incurred up to a daily maximum. The average daily benefit being selected was \$85 in 1994. (It is now thought to be around \$100.)

The policy will pay the daily benefit when a person qualifies for nursing home or home care benefits, after satisfying the policy's "gatekeeper" provision. For older generations of policies, this "gatekeeper" provision was typically defined in terms of "medical necessity" - i.e., a doctor had to certify that the nursing home or home care was needed due to a medical need. Current generations of policies some-

times maintain the medically necessary definition, but have almost always added two other gatekeepers: (1) a person's ability to perform the activities of daily living (ADLs) and (2) the existence of a cognitive impairment.

Only one of the gatekeepers must be met in order to qualify for benefits.

LTC policies generally provide benefits for all levels of nursing home care (skilled, intermediate, custodial).

Policies vary regarding what level of home care will be provided, with some companies only paying for the services of nurses, therapists, and home health aides, while others might also pay for homemaker and chore services, adult day care, and/or "meals on wheels."

Home care benefits are sometimes paid at a lower daily indemnity or daily maximum than the nursing home benefit (e.g., 50%).

Alternate types of care, such as stays in assisted living facilities or hospice facilities, provision of respite care benefits, or caregiver training benefits are often included.

LTC benefits are almost always subject to implementation of both elimination and benefit periods, with the insured being given multiple options on each. An elimination period is most often defined in terms of the number of days of care that a person must have before benefits are payable. Common elimination periods being used are 0, 7, 20, 30, 60, and 90 days.

Benefit periods are defined either in terms of the number of years or days for which benefits are payable, or as a "pot of money." The "pot of money" may be defined as the total dollar amount of benefit payments that will be made for a given episode of care or over the policy's lifetime.



Most commonly, companies usually offer a choice of benefit periods or the benefit-period equivalent of a "pot of money." These choices usually are one to six years or unlimited.

In a comprehensive policy, the elimination and benefit periods are often integrated, i.e., days count toward a single elimination or benefit period regardless of whether the care is in a nursing home or home health care.

The majority of policies on the market will waive a person's premium once he has been in the nursing home for a period of time.

Policies also generally exclude care that is needed only for mental and nervous disorders (other than those of cognitive origin) and do not make payments that duplicate Medicare.

- Tax-Qualified Policy

Tax-qualified policies are required to use gatekeeper provisions that are based only on ADLs and cognitive impairment.

Six ADLs are defined in the HIPAA legislation: bathing, eating, dressing, transferring (e.g., from a bed to a chair), continence, and toileting.

Most policies require that a person be unable to perform two or more ADLs or be cognitively impaired in order to receive benefits (though some companies require impairment in three or more ADLs with tax qualified policies).

In order to be considered impaired, a person must be in need of "hands-on" assistance.

"Based on a Health Insurance Association of America survey done in 1990, 63% of sales were for nursing home only policies, while 37% were for comprehensive policies"

Most policies being developed today request or require that the insured make use of a company "care coordinator," who will review the person's need for services at claim time and develop a "plan of care," making use of the most effective and cost-efficient services.

Long Term Care policies are required, under the NAIC Model as well as under tax-qualification requirements, to offer the insured both inflation protection and a nonforfeiture option (in the form of a shortened benefit period).

Results vary by company, but about 1/4 to 1/3 of insureds are selecting the inflation protection.

Nonforfeiture options are very recent developments, and it's believed that less than 5% of insureds are selecting them.

Michael S. Abroe, FSA, is a Consulting Actuary at Milliman & Robertson in Chicago, IL. The second part of this series will appear in the next issue of the newsletter.

CELEBRATE SOA'S 50TH



ANNIVERSARY!

Make your reservation now at the San Francisco Marriott for the SOA 50th Anniversary Celebration, October 17-20, 1999, (415) 777-2799 or (800) 228-9290. Rooms will fill quickly as members find out about the great lineup of speakers and entertainment: "Point-counterpoint" discussion with Bill Bennett and Gov. Mario Cuomo; Gen.H. Norman Schwarzkopf; deputy executive director of UNICEF, Stephen Lewis; and gala dinner entertainer, Tony Bennett. Check out the 50th Anniversary web pages at www.soa.org.

Part II: Segregated Funds— "No Loss" Proposition

by Boris Brizeli

Editor's Note: This is the second part of a two part article. Part I ran in the June 1998 issue of Product Development News.

Risk Management Tools for Segregated Fund Guarantees

Running the risk

An insurer that decides to run the risk may have many justifications for this approach, among them historical market performance of the guarantee, diversification across markets or high lapse expectations.

Accepting the risk, without any hedging, is consistent with the view that accumulated option payoffs will be less than the accumulated value of the guarantee fees, at a very high degree of confidence. Such an approach has the appeal of being profitable in several scenarios, especially those that involve rising markets. The resets are then "free" and the company realizes a profit from the collected fees. The risk that the adopted market view is incorrect and corresponding option payoffs are less than the accumulated guarantee fees, is compounded by the following issues:

- Potentially volatile earnings, given that the reserves would likely capture any market volatility.
- Potentially severe required capital requirements.
- Marketing risk of having to increase product prices.

The exposure under this approach is extremely high on the downside, but is only limited to receiving the fees on the upside. This is effectively a put option exposure.

When running the market risk naked, insurance risks (lapse and mortality), while lesser in magnitude, are also retained.

One approach of running simula-

tions to estimate the loss distribution and calculate prices sufficient to fund the benefit with a specified degree of confidence is sometimes suggested to manage the risk of the SF guarantees. In addition to the above issues, this approach's main limitation is model mis-specification (the capital markets behavior is different from the one modeled).

Static Hedging

Under this risk management approach, the insurer exchanges with a third party, for a price, the market risks of the guarantees and accepts the resulting counterparty risk (credit risk). The potential third parties in such an arrangement are investment banks since such long dated and complex options are not currently traded on any exchange.

When approached with requests to structure customized options for these risks, some investment banks have quoted guarantee prices significantly (as much as 100%) in excess of the prices implicit in currently marketed products. Several other constraints exist, such as:

1. minimum and maximum volume restrictions
2. unwillingness of investment banks to transact in certain markets and strike prices
3. high and unstable prices
4. unwillingness to take basis or correlation risks
5. high bid/ask spreads
6. regulatory constraints on assuming non-capital market risks

Thus, such an approach would provide only partial mitigation of the market risks and the insurance risks would still remain with the direct writer.

Reinsurance

Few reinsurers in the Canadian market are prepared to accept the GMB (Guaranteed Maturity Benefit) risk at a

(continued on page 8, column 1)

Canadian Corner

continued from page 7

marketable price. Those reinsurers that transact in this market place volume restrictions on their clients and are prepared to transact in the necessary markets and prices. They are also prepared to accept the insurance risks of the product, of which the lapse risk is the most significant. The prices quoted by the reinsurers exhibit high variability at different points in time and between different reinsurers. Reinsurers also appear receptive to unbundling the risks and reinsuring only specific components of the total risk.

Given the scarcity of the reinsurers in this market and the size and nature of the risk, counterparty risk is of paramount importance, if this risk management approach is adopted. Given the catastrophic risk profile and the size of the liabilities, balancing the prices with the reinsurer's credit quality and size is significantly more important than in a traditional reinsurance transaction.

An additional consideration in using reinsurance is the potential use of unlicensed retros by the reinsurer. Given the virtual absence of the reserve and surplus requirements, the price is not affected by the unregistered retro's status. However once such requirements come into existence if such retros are the sole source of capacity, the lack of reserve and MCCR credit to the reinsurer could imply price increases to in-force and new business.

Dynamic Hedging

In this instance, dynamic hedging is a risk management approach that pursues as its objective the ability to replicate the liability payoffs through synthetic manufacturing. Dynamic hedging can only address the investment, and not the insurance risks. It is similar in concept to duration and convexity ALM of interest sensitive liabilities. Below are the

most common "Greeks"—sensitivity parameters used:

Delta	Change of derivative price with respect to changes in equity markets
Gamma	Change of Delta with respect to changes in equity markets
Vega	Change of derivative price with respect to changes in equity market volatility
Rho	Change of derivative price with respect to changes in interest rates
Theta	Change of derivative price with respect to time drift

"Greeks" based on other parameters or combinations of parameters can also be used depending on the situation or hedger's objectives or constraints.

The process of dynamic hedging involves, in this case, the "manufacturing" of complex long-term options using in exchange traded underlying assets, interest rate futures and short-dated options on the underlying assets. Through a process of re-balancing, based on frequency or shift in parameter criteria, these securities are combined to track some or all of the Greeks of the liability.

Dynamic hedging has the appeal of being a flexible process, which can apply to changing liability profiles over time. It also transacts in liquid, market-traded securities, thus minimizing credit risks and the bid/ask spread on the transactions in the underlying securities.

A few of the main issues to consider while adopting this approach are:

- Specialized risk management expertise needs to be developed.
- The risks of managing an equity derivative's portfolio are very different from those that an insurance company usually takes.
- Since the cost of the dynamic hedge price depends on actual volatility encountered during hedging, adverse outcomes are possible—this

is not a foolproof solution.

- Extreme events (crashes, stam-

pedes, and liquidity holes) can cause significant trading difficulties if not properly managed.

- Correlation risks remain and cannot be dynamically hedged. The reason for this follows from the fact that no correlation bearing instruments trade readily in the marketplace.
- Significant model risk.
- Lapse and mortality risks still remain with the hedger.

Dynamic hedging is an approach that should be considered only by those companies that understand the consequences of retaining the risk, and are prepared to develop the necessary internal expertise or hire the necessary expertise from the outside. In deciding to use dynamic hedging one should answer the question: "Why won't investment banks do it at a good price and we can?"

Securitization

Using a conduit to repackage the cash flows corresponding to a particular risk of the segregated fund guarantees, into a marketable security, has proven to be a successful risk management approach for some insurance risks. Examples of such successful securitizations include catastrophic event bonds and notes backed by future profits of a company or a product line. One of the main sources of appeal for these securities is their use as a diversifying component in a portfolio exposed to capital market risks.

The basic rationale of securitization is to create an asset with significant

“Reinsurers also appear receptive to unbundling the risks and reinsuring only specific components of the total risk.”

negative correlation to a material risk of the liability. If this approach is applied (and it hasn't been yet) to segregated fund guarantees, some of the risk candidates from the segregated fund's guarantees are market and basis risks, and the insurance risks. The purchaser of the securitized market risk would be essentially writing long-dated puts and it is not known whether there's an appetite for such a risk from investors. Securitizing the lapse and mortality risks of the guarantees is certainly possible and represents, in our opinion, an interesting risk management vehicle for the asset issuing company and for the purchasers of the assets. Any attempt at securitization would depend on market demand for the resulting assets and other critical mass considerations.

It is interesting to observe that if a diversified company has a risk exposure in one of its businesses that is negatively correlated to segregated fund's guarantee risks, then deciding to sell segregated funds is similar to securitizing the risk exposure. Making markets in other products can also be seen as an implicit securitization.

Developing a Risk Management Approach

When developing a risk management approach, particularly for the SF guarantees, one has to first clarify:

- I. Management and stakeholders risk attitude toward specific classes of risk
- II. Presence or absence of expertise in risk management of specific risk classes
- III. Willingness to manage or sell the risk in specific risk classes.
- IV. Market price dynamics (price taker or setter) and marketing strategy (penetration, skimming, price leadership or differentiation).
- V. Risk size and correlation to other company risks.

The lack of complete or efficient markets for many of the segregated fund's risks and lack of uniformity in the modeling of the liability risks implies that the risk management tools will impact the total risk distribution in

"The basic rationale of securitization is to create an asset with significant negative correlation to a material risk of the liability."

different ways. Combining different tools to manage different portions of the risk is a valid risk management approach. Consider the following examples:

1. A company feels comfortable in retaining the GMDB (Guaranteed Minimum Death Benefit) risk and hedges the capital market risks through buying appropriate market traded hedges. The GMB risk is considered one that the company is not prepared to retain. Reinsurance is used in this instance.
2. A company feels that the upside momentum in the market will remain over the term of ten years. It is concerned about the extreme catastrophic risk for GMB of market dropping 25% or more and staying there. They choose to hedge this risk with deep out-of-the-money, high quality, OTC put options. The lapse risks are retained. The company believes that mortality experience on their product will be favorable and they manage the corresponding market risk through dynamic hedging.
3. A company monitors the "Greeks" to evaluate the capital market risk exposure. Based on market conditions, they pursue a scheme of using different management tools based on their relative attractiveness, including running the risk in times of high volatility.

Development of the risk management approach must account for the model risk, especially if running the risk or dynamic hedging is considered. Depending on the model used, the margin necessary to cover this risk can exceed the price generated by the model!

Given the distinctness of the pros and cons of the different risk management approaches of SF guarantees, when a company is clear about issues

I-V, the choice of the risk management approach most consistent with its views can be methodically developed.

Pricing of the Guarantees Modeling

When we consider the nature of the premium for the guarantees segregated fund, we observe that few funds provide a meaningful limitation on the fees. The reinsurers may, on the other hand, guarantee their fees up to the earliest of next reset or maturity date. We have already described the option to reset as completely analogous to a full surrender and redeposit (without any adverse tax or expense consequences to the policyholder). Now, assuming that the new business price is "fair," meaning that, at issue, the market value of the guarantee fees is equal to the market value of the guarantees, we can make the following observation:

It is "optimal" to reset (i.e. surrender and get a new "fair" price contract) if at the point of reset the market value of the guarantee fees that the client will pay is above the market value of the guarantees.

An alternative description is this: at issue, the buying of the guarantees is equivalent to entering into a swap of guarantee fees for the value of the guarantees. The option to reset is then equivalent to an option to terminate this swap early. This is known as a puttable swap. Mathematically, reset if:

$$MV(\text{GuaranteeFees}) > MV(\text{GMB}_{FR}) + MV(\text{GMDB}_{FR})$$

To restate in option terms this is a chooser with the payoff:

$$\max[0, MV(\text{GMB}_{FR}) + MV(\text{GMDB}_{FR}) - MV(\text{GuaranteeFees})]$$

The FR subscript reflects the valuation, at a given decision point, of the value of

(continued on page 10, column 1)

Canadian Corner

continued from page 9

the future reset options. This condition establishes an optimality barrier that needs to be monitored. We can now describe some key modeling considerations to value the guarantees under a simulation approach:

1. Process: Geometric Brownian motion is assumed for the fund price process. The drift of the distribution is adjusted to reflect the deduction of the fund management fee and the SF guarantee fees. This is a key point as it increases the price of the guarantees.
2. Process parameters: As much as possible capital market parameters are used (this presumes that hedging approaches will be based on capital markets). That means that interest rate and volatility curves need to be modeled. The "volatility smile" (variation by strike price) needs to be reflected. Since we are including the guarantee fee as a process parameter, we need an initial guess and a numerical procedure to calculate the final guarantee fee.
3. Reset: If the reset can occur only at specified points in time the barrier needs to be monitored only at that point of the simulation. If resets are to be elected within a period of time, the barrier monitoring frequency needs to be simulated, and a somewhat different optimality condition must be used (this is an additional American feature). Since the barrier monitoring depends on value of future resets, the valuation has to proceed backward, recursively calculating the barrier.
4. Scenario Generator: Since the option is Bermudan or American in nature, the scenario generator has to be modified to value such options. Tilley's [1] algorithm allows such modifications.

5. Actuarial Assumptions: Mortality and lapse (those that do not monitor optimality of reset) assumptions need to be made. This lapse assumption has a significant impact on the ultimate guarantee price.
6. Asset Modeling: If hedging is pursued, especially dynamic, the bid-ask spreads and transaction costs upon rebalancing need to be modeled. This allows to reflect in the model the impact of differences in liquidity. An additional degree of realism is thus introduced, especially if a rebalancing criterion (regular frequency, magnitude of price move) that is used in the model, is the one that will be followed in practice.

The model can be further enhanced by modeling fund correlation to a market benchmark and correlation of different funds if Type II (on sum of all fund balances) guarantee is used. Modeling of fund transfers as a financial option has several challenges and has not been fully addressed by the author at this point.

Some Observations

The above model comes at a very high computational expense as do any Monte Carlo simulations. Variance of estimates is compounded by the fact that estimates are used recursively in the valuation (thus errors would propagate). Variance reduction procedures may need to be used, see for example Hull [2] for six different approaches. One notable advantage of the above approach is that, with some modifications, other product's guarantees can be priced in a capital market framework, notably the minimum interest rate guarantee in universal life.

Alternative methodologies can be used to value the segregated fund guarantees. For example, processes can be based on parameters derived from historical data and resets can be modeled behaviorally. The assumed process and derived parameters carry significant



model risk. In absence of experience data, behavioral modeling is at best tentative, and an error in estimate can mean an insufficient hedge if hedging is pursued. Even if experience is available one could argue that using data from one past scenario to generalize scenario-based behavior is unsound. In other words such models can be viewed as bets. We would prefer to use the above approach as it allows for risk measurement and valuation in a capital market framework and with sufficient enhancements can be used for hedging purposes.

The implementation of pricing and hedging examples of the segregated fund guarantees, using the above approach, will form the subject of an upcoming paper.

Boris Brizeli, FSA, FCIA is a Principal with Insource Limited in Toronto, Canada and a member of the Product Development Section Council. He would like to thank Alan Ryder (ERC) and Dr. Ravi K. Ravindran (RGA Financial Products) for their review and thoughtful suggestions.

References

1. Tilley J.A. 1993. "Valuing American Options in a Path Simulation Model." *Transactions of the Society of Actuaries* 45, pp.449-549.
2. Hull J.C. 1997. "Options, Futures and Other Derivative Securities." 3rd Edition, Englewood Cliffs, New Jersey: Prentice Hall, pp.365-368.

Ten Years Ago

by Deb Sloan

Editor's Note: The following articles appeared in the December 1988 edition of the Product Development Section Newsletter.

The Surprising Impact of Smoking Assumptions on Mortality by Mel McFall

This article discussed the impact on mortality from different assumptions as to the percentage of smokers, and the relationship of smoker to nonsmoker mortality. Mel McFall stated that there was a decreasing percentage of smokers in the population and that the difference between smoker and nonsmoker mortality was narrowing. The following table was contained in the article.

The author suggests providing for some conservatism by using a lower percentage of smokers and a lower ratio of smoker-to-nonsmoker mortality to be used. He also stated that this problem would be eliminated when we develop separate mortality tables for smokers and nonsmokers.

Smoker Percentage	SM/NS Ratio	Nonsmoker Rates	Smoker Rates
45%	2.25	64%	144%
25%	2.00	80%	160%

LIMRA Long-Term Lapse Survey by Lucian J. Lombardi

The article reported on the LIMRA lapse study that looked at the lapse experience between policy anniversaries from 1983 to 1984, from 1984 to 1985, and from 1985 to 1986. The study found that compared with prior long-term lapse studies, these periods had unusually high lapses for policies in their renewal years. The lapse rates were based on non-pension whole life products and excluded interest-sensitive business.

The following LIMRA Table comparison showing the increase in renewal lapse rates was included in the article. (While the article did not speculate as to any reasons, one wonders if this was partially impacted by policyholders replacing traditional policies with universal life policies.) See table below.

LIMRA Tables			
Policy Year	'71-'72	'77-'78	'83-'86
1	20.0%	16.4%	19.8%
5	4.9	5.5	14.7
10	2.8	3.6	12.3

Accelerated Death Benefit Policies by Douglas C. Doll

In this article, the addition of accelerated death benefits to policies via riders or built into the contract was discussed. The article concentrated on the form of acceleration, lien, or partial surrender, and the potential impact with respect to Section 7702. In the discussion, the author showed that a policy using the cash value accumulation test could use either the lien or the partial surrender approach, but that a policy using the guideline premium test should probably use only the lien approach.

Life Insurance Sales Illustrations by Anthony T. Spano

The article discussed concerns with illustrations, particularly the fact that interest rates had been trending downward, and universal life purchasers did not always understand the nonguaranteed nature of the contract. It described the proposal at the NAIC level concerning illustrations involving nonguaranteed elements. At that point in time there was debate over allowing for a range approach. This would allow the illustration to use interest rates greater than the current scale provided that values also would be illustrated values based on correspondingly less favorable assumptions. Mortality and expense were to be limited to the current scale. There was debate as to whether companies should be allowed to use anything greater than the current scale. It was

(continued on page 12, column 1)

Ten Years Ago

continued from page 11

expected that final action would have been taken at the December 1988 NAIC meeting. (We are all aware of the many changes since then with the Model Illustration Regulation that has been adopted by a large number of states. The concern with illustrations has been around for a number of years - since interest rates started to fall from their all time highs.)

Playing "Chicken" with Ledger Illustrations by Roger R. Heath

This article raised the concern over some of the bonuses that were being illustrated by companies ten years ago on universal life products. These bonuses included retroactive bonuses on interest rate and mortality deductions as well as prospective bonuses of interest and projected mortality expense improvements. The author raised the issue of setting aside additional reserves to provide for these bonuses, as current earnings at the point the bonuses would be due might not be sufficient. He closed the article noting a concern that if bonuses are not paid the consequences to insureds and the industry might be disastrous.

Development of a Product for the Last Survivor Market by Philip K. Polkinghorn

The author states that the last survivor market was very competitive among a small number of key players. He notes that other players were trying to make an entry to the market. A list of key product features was included that differentiated the competition, including things such as method of age calculation, form of coverage, treatment of contract upon first death, method for achieving premium flexibility, and special product features. He noted that flexibility was a key to success in this market with products normally being sold in one of two ways: as a short pay

sale or as a low net outlay case. Additional product development considerations were outlined.

The Independence Assumption in Stochastic Modeling of Interest Rates by Harry Klarinstenfeld

The issue of whether interest rates are independent random variables is raised in this article. The author's company had examined this assumption in detail looking at the average monthly yields of Moody's Baa corporate bonds from 1918 through 1987. They found a high degree of serial correlation as to the direction in interest rate changes, with a pronounced bias toward "runs" or streaks of uninterrupted increases or decreases. Runs ranged in duration from one month to 21 months, and 12.6% of all runs had duration of seven months or more. They used the model to adjust interest rate scenarios to be more consistent with the historical patterns observed. He notes that actuaries who assume that month to month changes interest rates are independent variables could inadvertently underestimate the risk they are attempting to quantify.

SOA Task Force on Nonforfeiture by Douglas C. Doll

The article summarized work being done by the Society at the request of the NAIC with respect to how nonforfeiture benefits should consider the concepts of equity and solvency. The motivation was a desire to have a revised Standard Nonforfeiture Law that would address all life products, including universal life. The article included the executive summary of tentative conclusions. One particular conclusion still has discussions going today; that is, the task force is presently studying three alternatives for regulating cash values. These are:

- a. There should be no restrictions on setting cash values.

- b. There should be no minimum cash value standards. However, if cash values are provided, they must develop from year to year in a "reasonable" way.
- c. If a policy provides cash values, these values must exceed prescribed minimum values.

Tax Notes by John J. Palmer

The article summarized highlights of a technical corrections bill dealing with single premium life insurance issues.

1. Definition of a category of contracts called MECs.
2. Distribution rules for MEC contracts.
3. Material changes initiating a new 7-pay test.
4. Limits imposed on mortality and expense factors.
5. Aggregation of all contracts issued in a 12-month period for purposes of taxing distributions.
6. Effective dates for various parts of rule.
7. Fact that Treasury was to do studies of the effectiveness of the rules and the justifications for continued favorable treatment of inside build-up.

John Palmer noted how the bill became increasingly complex and requires much study.

Deb Sloan, FSA, is Senior Vice President and Actuary at United Heritage Mutual Life in Nampa, Idaho and Secretary/Treasurer of the Product Development Section.

UNDERWRITERS' CORNER

Automated Underwriting and Distribution for Life Insurers

by Jim Maher

Editor's Note: This article is reprinted with permission from "On the Risk," Vol. 14, N. 4, 1998. Richard L. Bergstrom, FSA, is a Consulting Actuary at Milliman & Robertson in Seattle, WA. He is responsible for resubmitting this article.

Desktop computer technology has already had a big impact on the way we work and communicate. However, the traditional ways in which insurance is sold through agents have been more or less unaffected so far. This is set to change. The rise of the Internet and e-commerce are having a major impact on the way life insurance is sold and underwritten. Two key technologies are responsible for this change—automated distribution and automated underwriting. Both are available today and bring major benefits for consumers, agents, insurance providers, and their underwriters.

Consumers are able to buy simple, cheap, life insurance products quickly and easily. Providers benefit from massive reductions in the cost of doing business, less lost business, and are able to exploit previously untapped market potential. Underwriters benefit from automation software that takes the drudgery out of dealing with straightforward cases, leaving them to concentrate their skills on the more challenging tasks of assessing complex cases and creating and refining underwriting rules.

Automated Distribution

Traditionally, insurance products have been distributed through agents in the field. Although agents deal with consumers on behalf of the insurance provider, they are separated from the provider by a slow communication process that brings delays into the sales process. During these delays, many potential sales are lost. Automated dis-

tribution bridges this communication gap and massively reduces delays. In many cases, a process that normally takes four to six weeks can be reduced to 25 minutes. This streamlined process increases both the number of contacts that result in applications and the number of applications that result in sales.

Newly available software allows agents to get immediate online quotes for any of the provider's products. The agent can then submit an application online and get an immediate answer. In simple cases where no medical evidence is required, this could result in the acceptance and close of sales in a single online session. Even where disclosures lead to a requirement for further questions or medical evidence, these questions can be asked interactively on-line and medical appointments can be organized on the spot. The time savings, even in non-straightforward cases, greatly reduce the number of consumers lost during the sales process.

The key technology for running the new automated distribution software is the Internet browser—that copy of Netscape or Internet Explorer that you routinely use at home for surfing the web, or in the office for accessing your corporate intranet. The automated distribution software uses a program that appears in the agent's Internet browser. The agent uses this browser-based program to request product information, enter prospect details, select face amounts and riders, and receive an immediate nonspecific quotation. They can now proceed through a complete risk assessment process on-line, involving disclosures, automated underwriting, follow-up questionnaires and, finally, the underwriting result. This immediate result may indicate premium loadings, special conditions, requirements for medical reports and/or manual underwriting.

In clean cases, there may be no further requirements. Low amounts of term insurance, say below \$100,000, may not even require a saliva test, so the sale can be wrapped up on the spot. The decisions are made by intelligent software running at the provider's site.

Automated Underwriting

The benefits of automated distribution are not restricted to improved communication and information passing. What makes it possible to go through the complete quotation and sales process on-line is the new generation of automated underwriting software. This software runs at the provider's site, providing on-line risk assessment and fully personalized quotations.

First, a set of base questions appears in the agent's browser. These are designed to prompt disclosures of pertinent conditions, in much the same way as the questions on a traditional insurance application form. For example, one question might be: "Have you ever suffered from any disease of the heart or circulatory system, chest pain, stroke, high blood pressure, or other blood disorder?" Medical conditions are disclosed by selecting them from a controlled list. Each condition has an associated set of supplementary questions that are designed to discover enough details of the disclosed condition to make an underwriting decision. So supplementary questions for hypertension might include: "How long ago was high blood pressure diagnosed?" and "Has any underlying cause been identified?" The answers given by the prospect to each question determine which question is asked next. Questions continue until a decision can be reached, using underwriting rules created by the provider's underwriting professionals.

Decisions that can be automatically made include acceptance, decline or

(continued on page 14, column 1)

Underwriter's Corner

continued from page 13

postponement, premium loadings, and medical report requirements. This identifies those cases which need manual underwriting and those which don't.

In straightforward cases where there are no further requirements, the coverage can be purchased immediately. Because applications can be referred to manual underwriting, cases of any complexity can be dealt with, although it is not then possible to make a firm offer and complete the sale on-line.

This approach presents professional underwriters with an exciting new challenge—creating rules that can be used by the automated underwriting software. The software enables each provider to create its own questions, conditions, and underwriting rules, so it retains full control of the risk assessment process.

Multiple Distribution Channels

As well as offering major benefits for consumers, providers, agents, and underwriters, automated distribution and automated underwriting are set to radically alter the life insurance market, bringing in new providers and new consumers. In many cases, the new providers will be marketing their prod-

efficiency makes it cost-effective to sell cheaper life insurance to the vast market of lower income consumers who currently have no coverage.

Specifically, organizations that already offer a familiar, regular point of contact for customers, such as banks or even supermarkets, are ideally placed to

“Automated distribution opens up a range of other possibilities because the software is capable of supporting sales through multiple channels.”

Agents suffer from low productivity, spending up to 40% of their time trying to find prospects. A McKinsey study in the United States discovered that, for every 100 leads, an average agent generates only seven appointments and one sale. The inefficiencies of the sales process allied with compensation rates mean that selling cheap insurance to low income consumers is not cost-effective for agents or providers.

Automated distribution opens up a range of other possibilities because the software is capable of supporting sales through multiple channels. The same software that the agent uses to sell insurance can be used in call centers and remote branches to sell simple products direct to the consumer.

cash in on this situation. Such alternative distributors are already grabbing a large share of European markets and look set to do the same in the United States. Their ready-made distribution networks can mean vastly reduced prospecting costs.

The logical extension of this multiple distribution channel approach is to sell life insurance over the Internet, direct to the consumer from the provider's website. Robust software products capable of doing just this are appearing right now. The use of Internet browser-based applications for each distribution channel results in an easy transition path from one channel to another and an integrated, easily administered approach. As banking is moving towards home banking via Internet, so insurance will move with it.

“The software enables each provider to create its own questions, conditions, and underwriting rules, so it retains full control of the risk assessment process.”

ucts to the new consumers, rather than taking a share of the existing market from existing providers. However, existing providers will have to embrace the new technologies themselves to remain competitive.

The key points are that the new technologies open up new channels for selling insurance products and greater

Cheaper low-coverage term insurance can be sold quickly and easily on the basis of a saliva test administered by representatives at the remote branch.

This brings the prospect of new players entering the arena as providers of life insurance—players who are in a better position to take advantage of the new way of doing business.

Jim Maher, is CEO of FMS in Ireland.

Multiple Medical Impairment Study Available

The Multiple Medical Impairment Study is a study of medical impairment mortality of insured lives with two or more impairments. This is a follow-up to a study of insured lives with a single medical impairment published in 1986. Both studies deal with the mortality experience between 1962 and 1977 policy anniversaries on nearly 2,400,000 policies issued at standard and substandard premium rates.

This is the first study ever of the effect on mortality of insured lives with more than one impairment, and therefore the results are of great value and interest. Moreover, the analysis and presentation of results will serve as a model for future studies.

The results generally are comparable to those in the Single Medical Impairment Study and continue to demonstrate that life insurance underwriting practices have been successful in classifying risks in the appropriate premium classes.

The publication of the Multiple Medical Impairment Study has been delayed because of the complexity of presenting multiple impairment data. The results are presented for each impairment in combination with groups of impairments. The presentation enables the reader to determine the mortality effect of a specific impairment (e.g., Diabetes Mellitus) in combination with groups of impairments having similar degrees of severity as related to extra mortality or in combination with groups of impairments of a similar nature. For the more frequently occurring impairments, impairment groups of a similar nature are shown in combination with other impairment groups. Also shown are the mortality results for insured lives with three or more impairments.

This book has been produced under the auspices of the Mortality and Morbidity Liaison Committee (MMLC), which is comprised of members of the Society of Actuaries (SOA), the American Academy of Insurance Medicine (AAIM), the Home Office Life Underwriters Association (HOLUA), and the Institute of Home Office Underwriters (IHOU). Financial support was provided by MIB, Inc. Statistical analysis and publication were provided by the Center for Medico-Actuarial Statistics (CMAS).

Cost: \$145 U.S. + shipping and handling (\$5 U.S., \$10 Canadian, \$20 Foreign)

Call: MIB @ (781) 329-4500 for more information and to obtain an order form.

☛ For Product Development Section members, the shipping fee will be waived if you identify yourself as such.

SPRING MEETING IN ATLANTA

May 24 - 25, 1999

Hyatt Regency

The following Spring meeting sessions will be sponsored or co-sponsored by the Product Development Section:

Monday, May 24

10:30 am - noon

Changing Patterns in Insured Mortality: Do We Understand Them?

Instant Issue for Life Insurance Products

Noon - 3:30 pm

A Field Trip to The Center for Disease Control (CDC)

1:30 pm - 3:00 pm

XXX Update

Next Generation Universal Life Laboratory Science in the Underwriting Process

3:30 pm - 5:00 pm

Clustering of Annuity Benefits: Fad or Trend?

Dynamic Product Development

Tuesday, May 25

8:30 am - 10:00 am

Variable Annuities, A Riskless Business?

Impact of Regulatory Uncertainty on Product Innovation

Underwriting Issues/Processes in Foreign Jurisdictions

Integrated/Transitional (IT) Products

10:30 am - noon

What's Hot in Term Products Illustrations - Year 3

1:30 pm - 3:00 pm

Bells and Whistles or Time Bombs: The Costs of Long Term Guarantees

Guarantees on Variable Products: How are Companies Assessing the Risks?

"Only the Good Die Young—Why Men Die Younger: Causes of Mortality Differences by Gender"

Product Development Photos



Product Development Section Council meeting in New York, October 1998, to plan the activities of the coming year
Standing—Left to Right: Deb Sloan, Phil Cernanec (1998-99 Chairperson), Kathy Anderson, Larry Stern, Deanne Osgood
Seated—Left to Right: Rick Bergstrom, Mike McMahon, Mark Milton (1997-98 Chairperson)



Greg Serio, Deputy Insurance Commissioner of New York, speaking at the Product Development Section Breakfast in New York.



Section Chairperson Mark Milton thanking retiring Council members Rick Bergstrom and Mike McMahon.