

Product Matters!

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Chairperson's Corner: Improving and Refining

by Dale Hall

Chances are that at some point already in your actuarial career—whether you've been at it for two or 20 years—you've benefited along the way from learning something new from a professional development education activity. It may have been something as simple as learning a new pricing technique, or as dramatic as tackling a new line of business to develop. Somewhere along the way, continuing education has given you an improved set of skills.

Continuing professional development helps even the most talented people in the world around us. A-Rod moves from shortstop and learns to play third base. Tiger Woods re-creates his golf swing. Jimmy Buffett now opens up restaurants and produces motion pictures. Drew Carey moves from singing "Cleveland Rocks" to determining whether "The Price is Right." And recently, my pre-teen daughters have let me know that even Billy Ray Cyrus can improve upon the mullet and learn the art of television acting—alongside his now-slightly-more-famous-daughter, Miley—and create an amazing rejuvenation of his career.

With the SOA moving towards requirements for Continuing Professional Development, the Product Development Section is taking strides to make sure



that actuaries have a broad selection of effective ways to develop their skills. In addition to supporting the traditional learning methods like sessions at SOA meetings and periodic webcasts, we are creating new ways that will deliver educational material straight to your computer desktop over the coming months. Our first pilot involved videotaping sessions at the Product Development Symposium in May 2007, and using that material to produce a repository of product development educational videos for all SOA members to use. Imagine being able to go to the SOA Web site from anywhere in the world, querying a data-

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base of product development topics, and immediately having complete audio, video, presentation slides and examples that stream in front of you on your computer. Our Product Development Section Council believes that this can be an additional way to expand your knowledge base to make you a more effective actuary.

We hope that this investment in actuarial education provides additional ways for actuaries worldwide to expand their product development knowledge and complete their Continuing Professional Development requirements in a convenient and interactive environment. It is just one of an increasing number of ways the SOA as a

whole is committed to fulfilling its promise as a research and education organization.

We're excited to be helping champion new ways for actuaries to learn and share their knowledge. Our section council has been a strong supporter of using section finances in constructive ways to provide increasing value to the Product Development Section members. So whether—like me—you've retained the same haircut from the 1980s or—like Billy Ray Cyrus—you've found a way to improve upon your look, you'll be pleased to know that the Product Development Section is finding new ways to bring education to a computer near you. □



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Product Development Section Plans Annual Meeting Offerings

Are you looking for a relevant structured learning opportunity and the chance to network with 1,500 other actuaries? Pack your Mickey Mouse ears and plan to attend the 2008 SOA Annual Meeting from Oct. 19–23 in Orlando.

The Product Development Section Council has created a slate of sessions providing information on the current issues you face, including: a session exploring the use of product development tools common in other industries and their application to insurance development processes; a teaching session on managing and measuring life insurance company expenses; and a session on the opportunities with an aging population.

Other sessions include the perennial favorite updated year in review for life and annuity products. In addition, there will be sessions devoted to indexed products, payout annuities, protection products, mortality update, recent SOA survey results and hot topics in life insurance. These are a sample of the sessions, and the full agenda can be found at www.soa.org. We look forward to seeing you in Orlando.

Summary of the March 2008 NAIC/LHATF Meeting

by Donna R. Claire

The March 2008 NAIC meeting was held in Orlando. As with the past meeting, the Life and Health Actuarial Task Force (LHATF) of the NAIC is devoting just about all of its time to the principle-based approach (PBA) project. This project is also being discussed at the Statutory Blanks Task Force as to what changes are needed in the Annual Statements. A commissioner-level work group called PBR (EX) is also working hard on this project. Besides PBA, there were a few other issues discussed at LHATF. A summary of the issues discussed follows.

Standard Valuation Law

The major topic of conversation at the LHATF was the Standard Valuation Law and discussion of the proposed amendments to it. There were about 100 comments received; the LHATF got through about 75 percent of them in the two-day meeting. The major changes from the last draft were (1) to determine that the valuation manual only applied to new business (it was the intent all along that PBR only be prospective, but originally it was left open for the valuation manual to cover all business); and (2) to add some minimum reserve standards to the law as opposed to having them only spelled out in the valuation manual. The timetable is to have the law final by the September 2008 NAIC Meeting.

Valuation Manual

The valuation manual is an extensive document that will contain many more details as to what needs to be done on reserves. The LHATF has broken into six subgroups; they have been meeting by conference calls. At the LHATF meeting, there were brief discussions by the

subgroups and the latest versions of the subgroup documents were exposed. This included updates from the Procedural Issues, Life Reserving, Reinsurance, Experience Reporting, Health and AOMR updates and Report Formats Groups. All these groups are still working and expect to have a more completed document in the fall.

Preferred Mortality:

There was a presentation on the joint Society of Actuaries/American Academy of Actuaries project on preferred mortality. The basic tables are completed. There are also reports available on the SOA Web site on both the basic table and on the data validation, underwriting criteria and experience analysis work. The questions for the LHATF were on what type of margins and the level of margins that should be included. Another issue is whether the margins should result in an actual set of tables or whether the format should just be a formula.

Concern Regarding Any Disruptions Because of Market Turmoil

Commissioner Gross gave a short presentation to the LHATF regarding potential future problems that could be caused by the current market turmoil. A specific example is that securitization of XXX reserves is currently harder to do. This may eventually cause some companies problems, potentially causing term price increases or reducing margins for companies. It was pointed out that the long-term answer to the issue would be to have PBA, which would require a level of reserves commensurate with the risks. In the meantime, the LHATF agreed to set up a subgroup to monitor the situation in conjunction with the ACLI.



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VACARVM

Discussion on VACARVM was postponed in order to give time for Commissioner Gross to address the LHATF.

Group Term Waiver of Premium

There is a proposed Actuarial Guideline on Group Term Waiver of Premium, which includes a new table to replace the Krieger Table. There was a discussion on whether the table should be used as is or whether company experience adjustments should be allowed. The decision on this was deferred to a conference call.

Pre-Need Mortality

A guideline that specifies that pre-need companies use the 1980 CSO for reserving has passed through the A committee of the NAIC.

PBR (EX) Committee

The Commissioner level group is moni-

toring and shepherding the PBA process through the NAIC. At the March NAIC meeting, this group heard reports of the progress of the various groups, including the LHATF and a Corporate Governance Subgroup. They also have been alerted to some sticky issues, such as whether there should be penalty reserves for deliberate understatement of reserves.

Summary

PBA is the right answer. As there should be, there are a number of groups looking at the PBA impact on all aspects of insurance (e.g., regulation, examination, corporate governance and taxes). This is a huge project, and it appears that the significant parties are engaged and working on the answers that would best satisfy all needs. When a PBA approach is adopted, it is quite likely that there will be significant pricing work that will be done to reflect updated reserve requirements. □

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Challenges and Opportunities of Longer Life

by Anna M. Rappaport, Tim Harris, Steve Siegel and Ronora Stryker



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In January 2008, the Society of Actuaries and over 40 other collaborating organizations held the third in the series of Living to 100 and Beyond Symposia. The 2008 Living to 100 Symposium, building on the success of the previous two in 2002 and 2005, gathered together a diverse range of professionals, scientists and academics, in an interactive, multidisciplinary forum for three days of highly engaging sessions. In keeping with one of the motivating factors for the series, the symposium organizers were pleased to have overwhelming feedback that all three of the Living to 100 Symposia have showcased the SOA's goal "to be recognized as the organization of experts in the field of risks and, in particular, the fields of survival and health risks." Based on the strength of the program and the organizational leadership provided by the SOA, the symposium, according to Event Co-Chair Bob Johansen, "has achieved a position of international prestige among not only actuaries, but also demographers, gerontologists, government offices and others concerned with increasing longevity, its implications for the future and possible solutions."

Significant Issues for the Elderly

While the success of the symposium is a cause for celebration, many of the sessions over the three-day event conveyed a more serious tone and highlighted growing challenges for the elderly in the face of increasing longevity. Among the issues discussed, research from the Society of Actuaries and other sources indicates that many workers and retirees do not plan long term, and there are significant gaps in knowledge on planning for post-retirement risks as well as the risks themselves. Furthermore, the research revealed that the less than optimal strategy of reducing spending remains the favored method of dealing with post-retirement risk, rather than through financial protection products (although supplemental health benefits products are an exception). At

the same time, employers have reduced their commitment to traditional pensions that provide lifetime income, forcing individuals to become increasingly responsible for managing their own retirement funds and making them last longer. This combination of more individual responsibility and greater longevity presents a growing market for financial products to help retirees cope with several risks:

- Guaranteeing sufficient investment returns on retirement assets
- Converting retirement assets into guaranteed lifetime income
- Funding the costs of long-term care
- Supplementing Medicare coverage
- Protecting a surviving spouse through provision of regular and sufficient income
- Converting home equity into retirement income through products such as reverse mortgages
- Managing retirement assets in the event of diminishing mental and physical capabilities through Alzheimer's and other health conditions.

Topics Covered by the Symposium (... And What Was Missing)

The symposium provided insights into the diverse views of the scientific basis of aging, offering a revealing look into mortality models and data. As well, the sessions included a combination of both biological and health perspectives on aging along with statistical analysis. But open questions remain and were not covered on how to reconcile the differences in viewpoints or provide guidance regard-



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ing how to handle the consequences of extreme longevity scenarios, which might be considered the equivalent of a 100-year weather event.

In addition to the scientific basis of aging, the symposium provided a range of programs dealing with the implications of increased longevity for the private sector, for employers in general and for individuals. One of the sessions highlighted the special issues for women as a result of longevity trends. Other sessions dealt with the need to work longer than planned before retirement and the impact of declining health and disability on the lives of increasing numbers of the elderly population. From an international perspective, there were comparisons of aging data from a number of countries, and the symposium boasted attendees from 15 different countries. Attendees, no doubt, were left with the impression that the issues discussed have global implications.

The Future of Survival

A primary objective of the Living to 100 event is to showcase the latest in thinking on the science of aging. The 2008 symposium led off with a spellbinding presentation by Dr. Cynthia Kenyon on her work with the *C. elegans* worm and the consequences of dietary restrictions on longevity. Through genetic manipulation, the normal two-week life span of the worm has been extended to four weeks or, as SOA President Bruce Schobel aptly put it in his introduction of Kenyon, “Four weeks has become the new two weeks.” Kenyon also raised a number of social and economic implications that would need to be addressed if such dramatic extension of longevity could be applied to humans.

While Kenyon’s work focused on genetic manipulation as a way of impacting longevity, Dr. Leonard Hayflick, in a later session at the symposium, provided an alternative viewpoint on how this type of manipulation may affect the aging process in humans and its ultimate



applicability—or, more accurately, inapplicability. Related to this, Hayflick further discussed a number of theories on the distinction between the biology of aging, the aging process and age-related diseases. Kenyon and Hayflick’s differing perspectives on the biological questions related to aging reinforced to attendees the complexity of the issues as well as the diversity of opinion in the scientific community—clearly, this was one of the major takeaways of the symposium. Further discussion by the organizing committee after the symposium highlighted the need to understand and think about the range of different opinions on aging, and the related challenges in deciding how a product development actuary best makes use of this information for price-setting, risk evaluation and designing guarantees within products.

Measuring and Projecting Improved Survival

The challenges of measuring high age mortality and the difficulty in securing reliable data to do so were important motivators for the first Living to 100 Symposium. These challenges persist.

In this regard, Dr. Jean-Marie Robine, a demographer and gerontologist who is probably best known as the co-validator of the oldest verified supercentenarian of all time, discussed the concept of the compression of mortality and morbidity. This phenomenon can be observed when the shape of recent mortality and morbidity curves is compared to curves from a hundred years ago. When viewed side by side, it appears that the curves have moved towards a rectangular pattern



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over time. This movement or apparent compression is sometimes referred to as “squaring of the curve.” The implication of this trend is that increasing numbers of persons born in the same year are living similar life spans, further implying the potential for a fixed maximum life span. Robine concluded that there is probably a limit to the ultimate amount of this compression, and further conjectured on alternative patterns of mortality that may emerge. In either case, questions remain as to whether or not a fixed maximum life span exists when viewed from the lens of mortality trends.

To truly gauge mortality trends, it is vital to measure mortality levels on a precise and consistent basis. Given the fundamental importance that measurement represents for all aspects of the study of longevity, the symposium included presentations from several of the world’s leading thinkers in this area. Included among the topics discussed in the sessions on mortality measurement were data validation techniques and integrity checks. As in many other disciplines, data is the fundamental building block and foundation for new breakthroughs.

The measurement of mortality also bears directly on the projection of future mortality levels. The need for mortality level projections that are thoughtfully developed cannot be overstated for many of society’s key financial security systems. For instance, government social security systems around the world depend on solid mortality projections for planning purposes to ensure long-term fiscal soundness. In recognition of this, an enlightening session was held at the symposium with prominent actuaries from social security governmental agencies in the United States, United Kingdom and Canada, presenting their most recent mortality projections and methodologies. It was readily apparent from this session that these countries are contending with many of the same longevity issues that may ultimately challenge the long-term solvency of their public programs.



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Product Ideas

It is wonderful that we are able to live longer, but longevity is accompanied by increasing challenges. The challenges and opportunities present themselves across a far-reaching range of stakeholders including society as a whole, financial service companies and other institutions and individuals. For individuals, the challenges primarily concern what they plan to do with their lives, financing of life choices and managing health. For product development actuaries, the focus is largely on the financing concerns, including the funding of retirement income and the appropriate distribution of that income. Furthermore, this focus extends to providing products that will help to manage investment and longevity risk over an uncertain lifetime.

Many financial products are already on the market, some with greater acceptance than others. Mutual funds are developing new approaches to the payout period. Some of the product areas that actuaries may want to think about include:

- Longevity insurance
- Longevity reinsurance
- Combination products
- Products that share risk in different ways, e.g., a product that guarantees a lifetime income but with some adjustment for aggregate mortality risk experience outside of a certain range

Interesting Material for Product Development Actuaries

Over 30 papers were presented at the symposium in addition to several panel discussions. While all papers are worth taking the time to read, the list below highlights papers and session material that may be of special interest to readers with a product development background:

- Leonard Hayflick’s “Entropy Explains Aging, Genetic Determinism Explains Longevity, and Undefined Terminology

Explains Misunderstanding Both,” which discusses the theory of aging.

- Papers presented in the session titled “Social Insurance Perspectives and Implications.” These papers describe social security mortality projections for the United States, Canada and the United Kingdom.
- Papers discussed in the session titled “Longevity Risk Pricing.” These papers and the topic, in general, may also make for an interesting listserve discussion among Product Development Section members.
- Eric Stallard’s “Estimates of the Incidence, Prevalence, Intensity and Cost of Chronic Disability Among the Elderly” provides an insightful view into expected periods of retirement in various states of health.
- Mike Cowell’s “Health, Wealth and Wisdom—Living Long, Living Well” enlightens readers with an actuarial perspective on health and aging.
- Material from the session “Implications of Longer Life Spans: What Does This All Mean To Us,” which describes the impact of increased longevity on a variety of financial systems and stakeholders.
- Beverly Orth’s “Evaluation of Approaches to Reducing Women’s Longevity Risk” focuses on several alternatives for providing lifetime income.

Accessing the Information

Complete versions of the papers and material described above as well as others produced for the symposium will be available later this year in an online monograph on the SOA’s Web site at *www.soa.org*. Readers may also be interested in viewing the monographs from the 2005 and 2002 events, also available on the SOA’s Web site.

Related Material on Post-Retirement Risk Research

Those interested in the research presented at the Living to 100 Symposium on the risks of aging and its implications may wish to read further about related work the Society of Actuaries has completed. A substantial number of research studies have been conducted to gauge what the public knows about post-retirement risks and how they expect to manage these risks as well as a number of other aspects relating to these risks. The findings from this research reveal gaps in the public’s knowledge of these risks and present opportunities for improvement through products and education. The research can be found on the SOA Website at <http://www.soa.org/research/pension/research-post-retirement-needs-and-risks.aspx>. The Web page includes findings from a series of surveys conducted in 2001, 2003, 2005 and 2007 on awareness of post-retirement risks as well as results from several focus groups held to study how the public expects to manage assets post-retirement. Many of the findings from studies appearing on this Web page were presented at the symposium and these studies provide a worthy supplement to the Living to 100 material.

Final Acknowledgment and Thanks

The symposium organizers wish to thank the Product Development Section for being one of the event co-sponsors. It was truly gratifying to have so many product development actuaries attending the event. In this regard, the organizers would value any comments or suggestions for making future Living to 100 events as worthwhile as possible for product development actuaries and others. Please feel free to contact any of the authors of this article with your thoughts. □

Lapse Experience under Lapse-Supported Policies: Updated Studies from The Canadian Institute of Actuaries

by Dominique Lebel



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The Canadian Institute of Actuaries (CIA) recently updated its studies of lapse experience under universal life (UL) level cost of insurance (COI) and term-to-100 (T100) policies. These studies can help U.S. actuaries set lapse assumptions for other lapse-supported products where no or little ultimate lapse experience exists, such as return of premium (ROP) term and UL with no lapse guarantees. The financial implications of overestimat-

ing ultimate lapse rates for these products can be significant.

This article provides an overview of the results of the following two CIA studies:

- 1) "Lapse Experience under Term-to-100 Insurance Policies," Canadian Institute of Actuaries, October 2007
- 2) "Lapse Experience under Universal Life Level Cost of Insurance Policies," Canadian Institute of Actuaries, October 2007

Universal Life Level Cost of Insurance Products Sold in Canada:

Similar to U.S. universal life with no lapse guarantee products in that this product is frequently sold for the lowest premium that will keep the policy in force until the policyholder's death. Cost of insurance charges are level and guaranteed.

Term to 100 Products Sold in Canada:

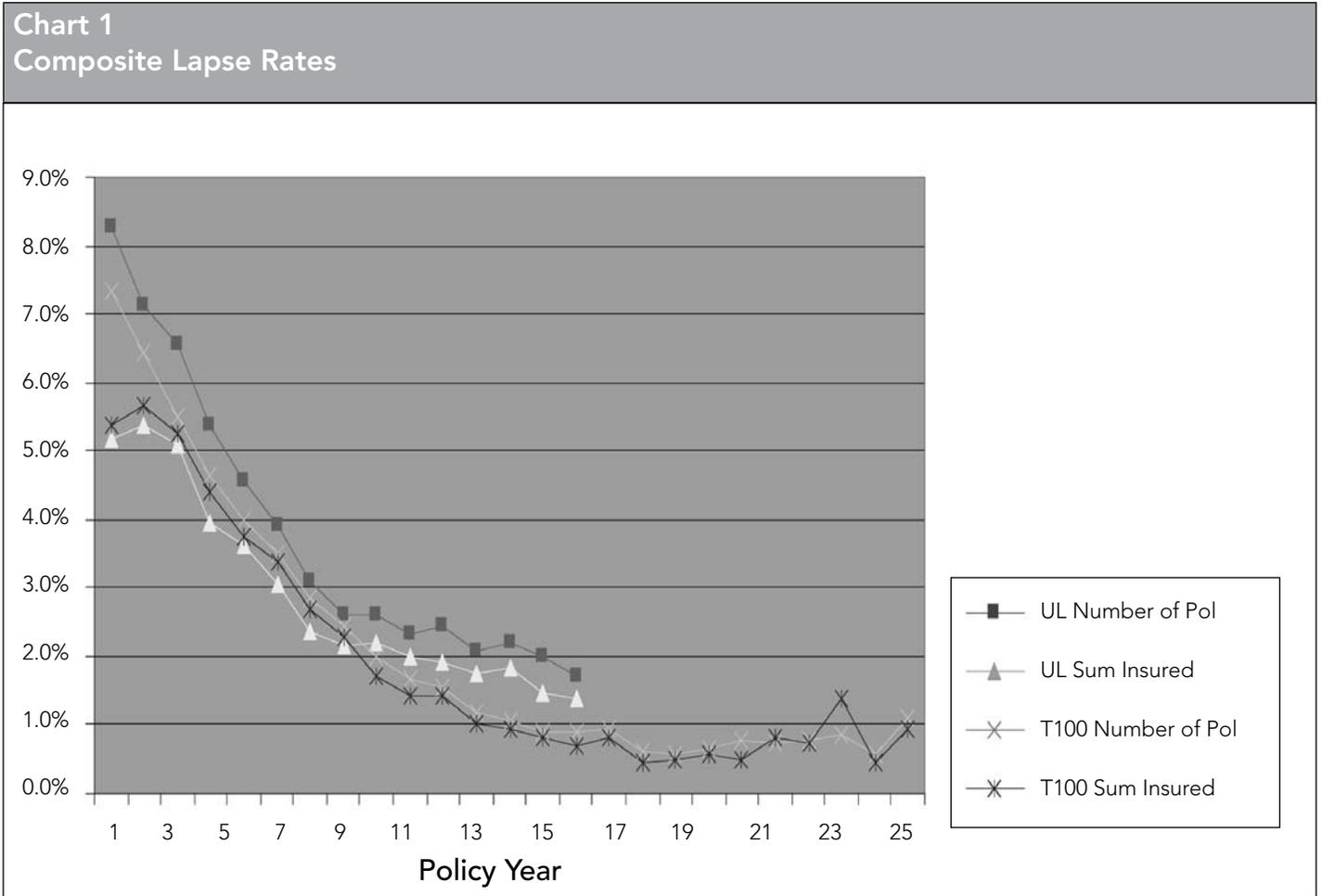
Guaranteed level premium whole life products generally without cash values.

Table 1 summarizes some of the key statistics from each study.

TABLE 1 Summary Statistics				
Study	Study Years	Number of Policies Exposed	Last Duration Published	Relatively Low Statistical Credibility Beyond Duration ¹
T100	1999–2004	4,057,080	25	20
UL Level COI	2002–2004	2,130,860	15	12

¹ As described in the study reports.

Composite lapse rates by number of policies and sum insured are presented in Chart 1 below. Ultimate lapse rates are in the 0.5–2.0 percent range, which is quite low. Both types of products exhibit similar lapse rate patterns.



The CIA studies provide additional information such as scope, methodology, limitations, contributing companies and results broken down along multiple criteria such as calendar year, gender, smoking status, policy size, issue age and premium frequency. The reader is encouraged to read each of the studies for additional details. □

Need for Change: Paradigm Shift Needed in LTC Product Development

by Sivakumar Desai



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The Congressional Budget Office reports that out-of-pocket expenses accounted for 19 percent of the total long-term care (LTC) expenses in the United States in 2006, and private LTC insurance accounted for only 8 percent of these expenses, which shows that Americans are underinsured for LTC expenses. While it is true that public programs like Medicaid and Medicare cover much of the nation's LTC expenses (68 percent of the total LTC expenses in the United States in 2006), eligibility for these programs comes at a great cost to the individual. Assets of the individual have to be divested in order to qualify, and coverage is often substandard to what private insurance would purchase. In addition, the Medicare and Medicaid programs will be under pressure as baby boomers age and the need for LTC services increases. To help consumers understand their LTC needs, LTC insurers should take proactive steps to educate consumers about private LTC insurance and the need for it. But in order to make the product more palatable over the long term, new thinking is required around product design and development.

Long-Term Care Insurance Product

LTC policies, as designed initially, used to pay for care in a nursing home only after staying in a hospital as per Medicare requirements. As the product matured and awareness of the product grew, LTC policies started to cover care in the insured's home or in an assisted living facility (ALF). The product now offers multiple options including how long the services will be provided and how many days the insured has to pay for care before coverage

begins. Return of premium and non-forfeiture riders were introduced to alleviate concerns that a person may die or lapse before needing LTC benefits. In addition to standalone LTC products, combination products that have LTC riders attached to life insurance and annuity policies are also available. Because of the addition of these options, many would argue that the product has become too complex and expensive.

Since the product was first designed and marketed about a quarter century ago, the chassis has remained the same with the exception of combination products. Based on the needs of certain customers, additional services were added to the policy to make the product more marketable. The main focus of LTC products has been to offer more services rather than to reduce the cost of services or to offer innovative ways to solve the LTC needs of individuals so that the product becomes less expensive and more attractive to a wide range of customer segments. Because of this, there is a narrow market for the LTC product, and it caters only to specific segments of the population who can afford to pay high premiums. In order to make the product more attractive to a wider customer base, new LTC products and radical changes in product design should be considered. I have included some LTC insurance product concepts in this article that can help mitigate customers' concerns about private LTC insurance.

Using Managed Care Concepts

In order to control costs and make LTC insurance more affordable, LTC plans can use some of the concepts of managed care. In addition to making the policy

less expensive, this approach will make the policy easier to understand because coverage will be similar to the medical plans that most people have. Medical and current LTC plans are compared along three dimensions or continuums.

The first dimension defines the services covered and the conditions under which they are covered. This dimension is comparable in both medical and current LTC plans.

The second dimension is the degree to which the insured shares in the cost of the benefit plan. This is where there are some differences between current LTC and medical plans. Medical plans usually control utilization, costs and risk to the insurers by using deductibles, co-pays and co-insurance. Most LTC plans have elimination periods (which are similar to a deductible), but don't have co-pays and co-insurance. Including co-insurance and other medical plan concepts in an LTC policy can help reduce the cost of care and make LTC policies more affordable. Genworth Financial has adopted these concepts and came up with their new product "Cornerstone Advantage," which makes LTC coverage really affordable with premiums as low as \$75 per month for a 55-year-old married customer compared to a typical LTC premium of \$115 per month for the same customer.

The third dimension is the degree to which the provider of care shares the cost of the benefit plan. This is where there is a big difference between current LTC and medical plans. Almost all medical plans use some kind of preferred provider network to reduce costs. There is no LTC plan that has such a provision built into it. Care Scout has a provider network that some LTC insurers use to get discounts for their claims. However, no company mandates the use of a care network to drive costs down. Networks can also help insureds with questions about coverage and what kind of care is best suited for

their situations, which can reduce the complexity of the product. These managed care concepts can reduce the cost of the LTC policies significantly and make these policies affordable to a wide range of customers.



Using 401(k) and Pension Plans as a Way to Cover Long-Term Care Costs

Many employees use 401(k) plans to save for retirement. In addition, many employers encourage their employees to start saving early by matching contributions. This plan may be a good way to encourage employees to think about making contributions early to fund LTC expenses they may incur in the future. One way to fit LTC benefits into 401(k) plans is through a combination product featuring an annuity product with an LTC rider. Employees can transfer money from and to the annuity product in a 401(k) plan, and the amount of LTC coverage they will receive will depend on the annuity fund value when the employee begins taking income distributions or when the employee reaches age 70.5 when mandatory withdrawals are required. In the accumulation phase of the annuity, surrender charges are waived for withdrawals related to LTC expenses up to the account value. In the distribution phase of the annuity, the income stream

continued on page 14

of the employee will increase to cover LTC expenses up to the annual maximum in the policy, which can be some multiple of the annual distribution amount for a certain number of years. An indemnity-type LTC policy can be used instead of a reimbursement-type LTC policy to make the product less complex. This rider would provide cash benefits, which would be paid as an increased distribution amount when the insured meets the triggers for needing LTC services.

This approach will ensure that the employee will not lose the premiums paid for LTC insurance in case the benefits are not needed and can help employees start thinking about LTC at a younger age, when rates are much cheaper compared to the rates at ages 65 and above. This kind of platform can also help employers encourage their employees to start thinking about their LTC needs by matching a certain percentage of the funds that employees put towards the combination product.

Disability Income-LTC Combination Product

Disability products have a much higher penetration than LTC products in employer group markets. A long-term disability (LTD)/LTC combination product may be more attractive in employer group markets than a standalone LTC policy. Disability income products reimburse a portion of the insured's salary until age 65 in case the insured becomes disabled and not able to perform his own occupation or any occupation during which time the LTC rider would cover expenses for care in a nursing home or an ALF up to the disability coverage limit. After the insured reaches age 65, LTC coverage would cover expenses up to the insured's disability coverage limit at age 65. Attained age cost of insurance premiums would be used to cover LTC premiums until the insured reaches age 65, after which the insured would have an option to buy an LTC policy

either at attained age cost of insurance rates or level premiums for life from age 65. Until the employee reaches age 65, adding LTC coverage at attained age rates to an LTD product would not increase the cost of coverage too much and it would cost much less to the employee compared to purchasing LTD and LTC insurance separately. With this product, employees would not be paying too much for LTC insurance before they reach age 65, when there is less perceived need for LTC insurance. After employees reach age 65, they would no longer pay LTD premiums and would be paying premiums for LTC coverage alone. They would also have the flexibility to opt for a level premium scale at age 65 when they are better aware of their LTC needs and need a regular periodic payment instead of an increasing scale.

This product would be better suited for employees who would like to have LTC insurance but don't want to pay the high premiums before age 65, when there is less perceived need for LTC coverage. Employers can help their employees start thinking about their LTC needs by paying LTC rider costs until employees reach age 65. The premium scale flexibility at age 65 would make this product more attractive to some consumers than a standalone LTC product.

Flexible Premium Universal Long-Term Care Policy

Universal life concepts can be applied to LTC policies as well with cost of insurance charges based on attained age and where insureds are allowed to pay flexible premiums. These premiums, after accounting for cost of insurance and expense charges, would accumulate at a rate that is earned on assets backing this product. Cost of insurance charges based on attained age would be very low at younger ages. So, younger insureds can use this product as an investment that they can use in case they need LTC services. This product can mitigate concerns that they may never need LTC services because they have

access to the fund value. One of the biggest advantages to the insurance company with this kind of product is that it reduces some of the key LTC risks. With this product, the insurance company is transferring some of the risk related to interest rate/investments to policyholders, since the benefits provided would vary depending on the rate earned on assets backing the product. Lower than expected voluntary terminations, which can hurt LTC policies, would help spread-based universal LTC policies effectively reduce the termination risk, because the insurance company can earn a spread on the assets backing the product for a longer time.

Conclusion

As baby boomers reach retirement age, there will be a significant need for LTC services. If people don't have insurance to cover these expenses, this is going to put a huge strain on already feeble public programs like Medicaid and Medicare since they are forced to cover the expenses of the uninsured that qualify. This can also

put a lot of strain on individuals because they will have to spend down their assets in order to qualify for these programs. LTC insurers have to be proactive and pay more attention to customer needs and develop products that not only take care of the LTC needs of wider segments of the population, but also help federal and state governments reduce their LTC expenses. If not enough people have private LTC insurance, then the government may be forced to cover LTC expenses of all people, and this can increase the strain on public programs and everyone may have to pay extra taxes to sustain these programs. So, employers and private LTC insurers should be proactive and take steps to create innovative LTC solutions that meet the needs of their customers and mitigate their concerns about LTC insurance. Some of the concepts presented in this article can increase the complexity of the product, but insurers can reduce the complexity by encouraging their customers to use care coordinators who can help insureds with questions about coverage and what kind of care is best suited for their situations. □

Let Your Voice Be Heard!

THE SOA 2008 ELECTIONS ARE JUST AROUND THE CORNER! POLLS OPEN ON AUGUST 7 AND CLOSE ON SEPTEMBER 10 AT 11:45 A.M. CENTRAL TIME. ONLINE VOTING FOR THE ELECTION WILL BE OPEN 24 HOURS A DAY.

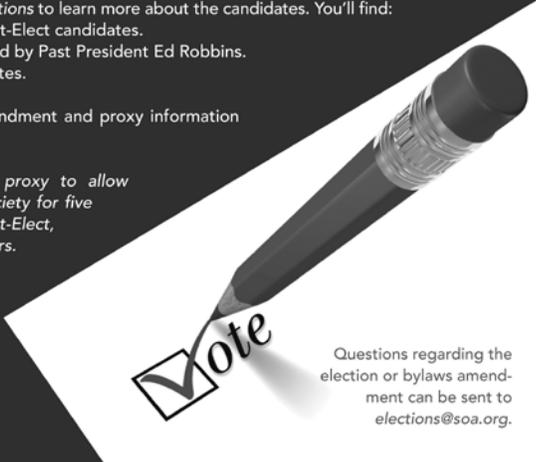
Visit the SOA Web site at <http://www.soa.org/elections> to learn more about the candidates. You'll find:

- Video recorded campaign speeches by President-Elect candidates.
- President-Elect roundtable discussion moderated by Past President Ed Robbins.
- Photographs and biographies of Board Candidates.
- Biographies of Section Council candidates.
- Entire ballots including the Board, Bylaws amendment and proxy information and Section Council candidates.

This election has a SOA Bylaws amendment proxy to allow Associates—who have been members of the Society for five years or more—to vote in elections for President-Elect, Vice Presidents and elected Board of Directors. Remember: all information—including the suggested Bylaws amendment—can be found at <http://www.soa.org/elections>.

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Questions regarding the election or bylaws amendment can be sent to elections@soa.org.

Nested Stochastic Pricing: The Time Has Come

by Craig Reynolds and Sai Man

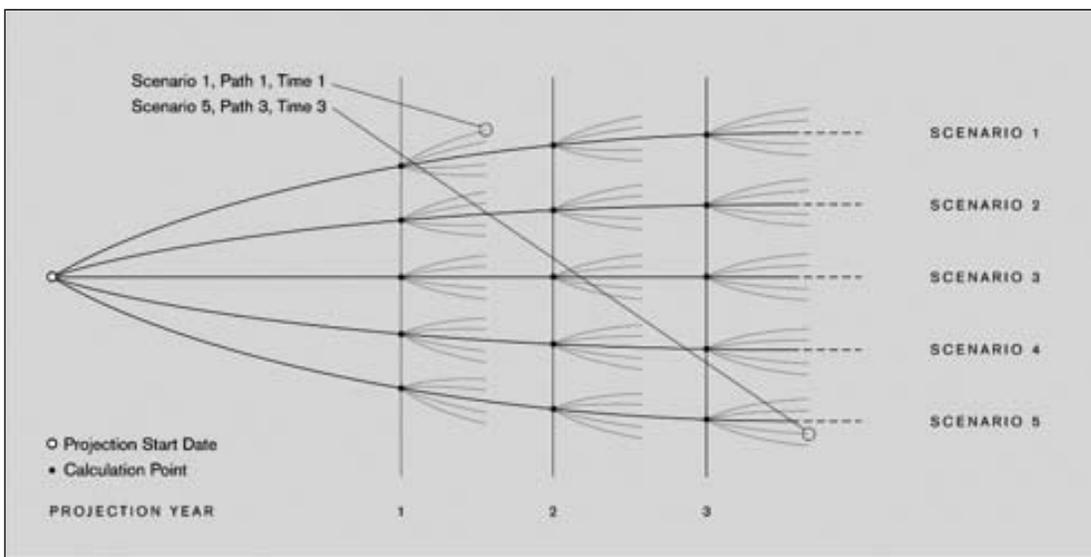
The last few years have seen a dramatic change in the way that insurance products are priced. If we traveled back in time 15 to 20 years, we would see a world where most insurance products were priced on the basis of a few static scenarios, perhaps including selected stress tests for changes in interest rates, policyholder behavior, mortality deterioration and/or expense changes. In the last several years, pricing on a stochastic basis has become more mainstream—at least for contracts with embedded guarantees.

The New World Order

What has caused the paradigm shift? We believe it is driven primarily by two factors. First, product designs have evolved that cannot be effectively priced using deterministic scenarios because of the options embedded in the designs. Two prime examples include secondary guarantee universal life (SGUL) and the alphabet soup of GMxBs now offered on variable annuity contracts. Second, technological advancements are acting as a catalyst for

this paradigm shift. Twenty years ago, hardware and software limitations would have made stochastic pricing of insurance contracts for a large number of scenarios almost prohibitively impractical.

We are now on the verge of another similar paradigm shift. This time, the jump is to what we call nested stochastic pricing. Nested stochastic pricing refers to stochastic pricing where, at each node in the projection, a nested stochastic projection is used to determine reserve, capital or deferred acquisition cost (DAC) levels. Visually, nested stochastic pricing can be represented as in the diagram below, where four paths are initiated each year along five scenarios. (Note that in this article we use the term “scenario” to represent outer loops and “path” to represent inner loops.). The actual number of scenarios and paths to use will, of course, vary from application to application and will generally be much larger than is shown here. We have used five and four, respectively, for illustrative purposes only.



Again, we are the beneficiaries of advances in hardware and software that make the jump to nested stochastic pricing possible. Nested stochastic pricing causes a geometric increase in runtime. Suppose, for example, that we want to use 100 paths for 30 years at each annual node of a 30-year projection over 1,000 scenarios. Effectively, this is approximately equivalent to a stochastic projection of $1,000 \times 30 \times 100 = 3$ million scenarios. Clearly, this requires a very efficient hardware and software package—one that would have been unthinkable more than a few years ago.

This is the first article of a two-part series. In this article we comment on some of the factors driving the change to stochastics and nested stochastics, and we discuss some of the issues an actuary must consider in moving to a world of nested stochastic analysis. In part two, which we hope to publish in the October issue of *Product Matters!*, we will shift the focus to a case study to illustrate the impact of nested stochastic analysis on an illustrative product.

Why Nested Stochastic?

The need for nested stochastics is driven by a number of changes in the regulatory and accounting world. In the last few years, we have seen the advent of:

- Statement of Position 03-1 (SOP 03-1)
- Fair value option (FAS 157/ FAS 159)
- FAS 133
- C-3 Phase II
- Economic capital

In the next few years, we are also likely to see:

- VA CARVM
- Principle-based approach for capital (C-3 Phase III)

- International Financial Reporting Standards (IFRS)
- Principle-based approach (PBA) for reserves

All of these calculations require a multi-scenario (usually stochastic) projection. Reflecting them fully in a deterministic projection like a business plan forecast requires stochastic projections nested inside a deterministic projection. Reflecting them fully in a stochastic pricing exercise requires stochastics nested within a stochastic projection. While the details of the mechanics of the above applications vary, all share some common attributes:

- They are based on actuarial models.
- They require multiple scenario projections (some real-world, some risk-neutral).
- They are dependent on actuarial judgment for many assumptions.
- They often require modeling dynamic policyholder and company behavior.

Fundamentally, there is no reason why the same basic model platform could not be used for any combination of these applications. The key is to build a model that is suitable for nested stochastic functionality; then it should be usable for most or all of these applications with only minor adjustments.

Characteristics of a Good Nested Stochastic Model Platform

Many of the traits that define a good nested stochastic platform are common to all good actuarial models. Others are unique to this particular problem. A few of these traits are as follows:

- **Flexibility:** There must be sufficient flexibility in the model to allow specification of relevant product features and policyholder/company behavior both on the scenarios and the paths.



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- **Interaction:** It will be helpful in many applications to be able to model company behavior (e.g., crediting rates) and policyholder behavior (e.g., lapse rates or premium patterns) as a function of both the economic environment and the portfolio yield.
- **Internal consistency:** All aspects of liability and asset behavior need to be consistent with the economic environment and portfolio performance.
- **Controls:** Particularly because these models are very complex to create and maintain, it is important to have structures and processes to control and validate model changes to ensure that such changes do not endanger the integrity of the results.
- **Auditability:** As a nested stochastic run can easily generate millions of paths, tools and processes to audit paths and verify that they are working as intended are critical.
- **Reproducibility:** Random number generation and seed control must work in such a way that the same results are produced if the same model is run twice in a row. As many such runs may be distributed across grids of machines, it is important that random number generation is not dependent upon which machine is used for which path.
- **Speed:** Of course, the model must run exceptionally fast. Realistically, for large models or large numbers of paths-scenarios, grid-enabled applications will often be required.
- **Dial-a-granularity:** Nested stochastic pricing may often be run with just a few cells, but for other applications, it may be necessary to use varying levels of granularity that are appropriate for the purpose at hand. A well-constructed model can be used for any level of granularity simply by asso-

ciating it with a more or less granular file of sales or in-force profits.

- **Appropriate scenarios and paths:** Scenarios and paths must be appropriate for the purpose at hand. In some cases, realistic scenarios or paths are appropriate. In other cases, risk-neutral scenarios or paths—or perhaps realistic scenarios with deflators—are needed. Most systems likely allow the import of scenarios from your favorite generator. But this is likely impractical for the paths. Thus, it is important that the actuary be comfortable knowing that the path generator has the appropriate characteristics for the application.
- **Support for non-economic stochastics:** For some applications, it may be desirable to make mortality rates, claim costs or other parameters stochastic instead of or in addition to economic conditions.

The Move from Stochastic to Nested Stochastic

Most systems and most actuaries can handle stochastic projections. When are nested stochastic projections appropriate? A few examples are as follows:

- **Asset valuation:** In any application where credible market values are required for assets with embedded options, such as callable bonds, multiple paths may be required to accurately estimate the market value of the assets. Market value may not be critical unless assets are being sold, but if any assets are marked as “available for sale” or “trading,” such market values may be required at each projected reporting date in order to properly project GAAP or IFRS earnings.
- **Dynamic hedging:** In C-3 Phase II modeling or related applications, the ability to model dynamic hedging

might be useful. Typically, this may require running hundreds of risk-neutral paths before and after various shocks in interest rates, equity indices, or volatility in order to calculate delta, rho, vega or other Greeks of the assets and liabilities.

- **SOP 03-1:** With the advent of SOP 03-1, even a deterministic scenario forecast of GAAP results will require nested stochastic projections to calculate the SOP 03-1 reserve at the end of each projection reporting cycle. When doing stochastic pricing of a related benefit, such as a GMDB, nested stochastics might be required in order to appropriately capture the distributions of GAAP earnings patterns.
- **FAS 133:** As with SOP 03-1, inner path calculations—this time on a risk-neutral basis—are required to project GAAP earnings.
- **FAS 97:** Even “normal” FAS 97 projections might require deterministic path projections to be nested at each node. For example, when running a single scenario along any given path, it will often be useful to project DAC unlocking occurring periodically along the way, with DAC balances at the end of a given projection period consistent with the actual emerging experience to date and what the prospective assumptions would be at that time.
- **IFRS:** International Financial Reporting Standards appear to be heading toward fair value as the basis for valuing liabilities. For most products, this will require inner risk-neutral paths to value the liabilities, similar to what we do for assets.
- **PBA:** The principle-based approach to reserves and capital will require mechanics very similar to those of IFRS to calculate reserves or required capital at each projection node.

Managing Nested Stochastic Runtime

The move to nested stochastics will require some thought as to how to manage the runtime. As noted above, geometric expansion in the calculations will require huge amounts of computation time if certain efficiency steps are not taken. As an example, consider an insurer who wants to perform the following calculations in a seriatim projection of a block of in-force business:

- 30-year projection with quarterly reporting cycles
- 1 million liability model points
- 1,000 scenarios
- Dynamic hedge rebalancing at the end of each quarter, with each rebalance requiring path projections to maturity with the following specifications:
 - 30-year projection
 - 100 paths for the base case and each of the 20 shocks (10 up and 10 down). This results in 2,100 paths at each projection node.

The total number of liability cell projections for this liability portfolio is:

$$(30 \text{ years}) * (4 \text{ quarters / year}) * (1 \text{ million cells}) * (100 \text{ paths}) * (1 + 2 * 10 \text{ shocks}) * (1,000 \text{ scenarios})$$

$$= 252 \text{ trillion cell-path projections}$$

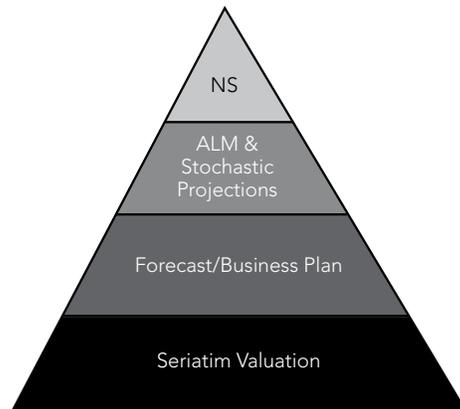
Assume for the moment that you have an extraordinarily fast system that can project 10,000 cell-paths per second. This would still add up to about 25.2 billion seconds, or around 799 years. This is clearly not practical in the real world!

Fortunately, in a pricing context, we can usually run with far fewer cells than this, but the runtime might still be unacceptable. So what can we do to optimize these calculations? Fundamentally, there are a few basic options:

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- Faster hardware and software
- More machines
- Fewer cells
- Fewer scenarios
- Fewer paths or shocks
- Less frequent rebalancing

In reality, a combination of these will likely be required. Fortunately, in a pricing context the cell count might shrink dramatically—perhaps to as few as 10 cells or so. We view the diagram below as representative of the levels of granularity that a well-designed model must be prepared to accept. Ideally, a user should be able to change the granularity, scenario count, or path count on the fly with minimal model changes.



* NS represents nested stochastic

Cell count alone will not be enough, however. No doubt, the science of scenario and path reduction techniques will need to continue to evolve. And it seems increasingly likely that more and more companies will acquire or rent large “grid farms” or 500 or more personal computer engines. In the example above, a 500-machine grid and a reduction in cell count from 1 million to 10 (assuming no loss in efficiency) would reduce the 800 years to eight minutes. That’s more in the range of a viable answer!

Why Now?

One might logically ask why we should worry about this now. If your company is not GAAP-focused (so that FAS 97, SOP 03-1 and FAS 133 are not relevant) and not engaged in dynamic hedging, the immediate need may not be clear. But with IFRS and PBA coming soon, now may be the time to begin modeling your products to see how they behave under the new regime.

As an example for how this can come into play, consider C-3 Phase II. For several companies that we worked with when this first came out, the standard scenario was the driver for capital requirements on in-force profits. Given this, one might argue that it would be appropriate to price products using the standard scenario to measure required capital. This has a definite impact on product pricing, as, for example, a ratchet design for a guaranteed minimum death benefit on a variable annuity contract is likely to have little or no marginal contribution to required capital in the standard scenario. In contrast, a roll-up looks very expensive under the standard scenario. This certainly has implications for how these products should be priced and marketed.

Many actuaries have done some modeling as PBA and IFRS have evolved. But we have observed that few companies are using PBA or IFRS on a nested stochastic basis in their current pricing. It may be time for this to change. Even though we may be years away from a time when companies will need to be valued on a PBA or IFRS basis, products priced today may well be the products that are being sold when PBA comes into effect.

In the next issue we will provide a case study of nested stochastic pricing to show how principle-based reserves and capital impact product profitability when viewed on a nested stochastic basis. □

Key to Success in Life Insurance Product Development

by Andy Ferris, Alice Kroll and Charles Brinkley

Organic, top-line growth is key to life insurance companies for creating shareholder value and achieving long-term success. Companies that do not position themselves for organic growth risk falling behind as competitors seize market opportunities for expansion.

Last year, in a study around organic growth in the life insurance industry, Deloitte Consulting LLP surveyed 20 C-suite executives from top life insurance companies, and, according to those executives surveyed, the top three growth strategies today are product innovation, improved distribution and service enhancements to improve retention.

While new products are critical to the growth strategies of life insurance companies, too many product launches fail, resulting in lower sales and slower growth than anticipated. Given the importance of this topic and the apparent difficulty involved in successful product development, Deloitte chose to study the topic in depth. We wanted to understand what companies are doing, where they are struggling and what makes one organization more successful than another in product development.

Similar to the way we approached the organic growth study, we worked together with a group of leading life insurance companies to understand their product development process, their supporting organizational structure, their measures of product development success and a host of related concepts. Through written questionnaires, in-depth interviews and ongoing analysis, we have identified a set of characteristics that appear to differentiate the more successful product development processes from the less successful. In this article, we hope to share some of

those characteristics and insights in hopes that you might find them useful at your own company.

Methodology and Approach

The primary goal of the Product Initiation, Development and Effectiveness (PRIDE) Study was to gain insights into critical factors that lead to success in the life insurance product development process. For the purpose of the study, the product development process was defined broadly to include:

- The sourcing and generation of new product ideas
- The evaluation, selection and prioritization of those new ideas
- The translation of the selected ideas into potential product offerings
- The design and pricing of those products
- The product implementation and rollout process
- The post-launch review and evaluation process

The approach for thoroughly understanding the product development process at the participating companies included two primary components: a written questionnaire and a set of face-to-face interviews. The written questionnaire collected information from all departments involved in the product development process with a comprehensive set of quantitative and qualitative questions around topics summarized in Exhibit A. After the completed questionnaires were collected and analyzed, interviews with participating companies were conducted to confirm understandings and allow for greater depth of discussion and analysis in areas identified by the participants as being of particular interest.

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Two important themes emerged from the review of the data collected. These themes were that there are differences in product development practices for companies whose strategic intent is to be a market leader, fast follower or “other” and that there are differences for companies whose product launches are highly successful, moderately successful or less successful. Companies self-reported both their strategic intent and the success rate for their product launches. These themes were used as the frameworks for our analysis.

The companies included in the study collectively received over half a million paid applications with \$3.8 billion in first year premium, which comprised over 30 percent of the industry’s new life insurance premium for the year. Collectively, survey respondents had launched a total of 149 products in the three-year study period.

With two exceptions, the companies had more than one channel distributing their products. Channels included career, independent, wholesale, joint venture partners, brokerages, banks, wirehouses and Personal Producing General Agents (PPGAs). The companies sold in all the major market segments, including middle market, mass affluent and high net worth. One of the challenges in analyzing the survey results was that the different markets, different distribution channels and different strategic intents regarding product positioning could all impact a company’s product development.

Selected Key Findings

Several detailed reports and presentations were prepared around the study’s analysis and findings. The following is a set of selected high level findings extracted from the more detailed analysis.

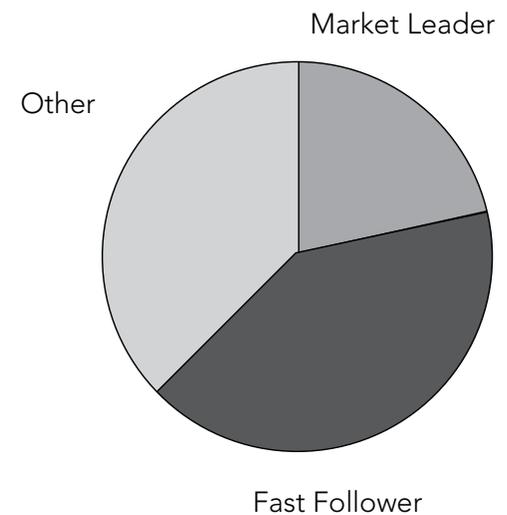
1) The companies with the most product development success had a clearly articulated and broadly understood strategic intent in terms of product development. For these companies, the strategic intent served as the fundamental component upon which the product development process was designed.

All those involved in the product development process knew that it was the company’s goal to be:

- Either a product manufacturer, a distributor or both
- Either producer-focused, customer-focused or both
- To compete on features, price, compensation, service or some combination thereof
- To be a market leader, a fast-follower or some other type of player in the marketplace

Not every company in our study desired to be a market leader. In fact, the majority of companies had a strategic intent to be a fast follower. These companies explained in the interviews that they felt that there was only a limited advantage in being first to market and that it was more important to establish a reputation with their producers for delivering quality, error-free products on the announced schedule.

Market Strategy



When viewing the product launch success rate by strategic intent, we saw that on average those who aspired to be market leaders reported higher success rates than those who aspired to be fast followers. However, two of the fast followers and two of the others reported success rates approaching those of market leaders.

Key to Success in Life Insurance Product ...

Strategic Intent	Self-Reported Product Launch Success Rate (%)
Market Leader	90
Fast Follower	49
Other	67
Overall	64

Companies defined a successful launch as one that met sales goals, met profit goals and was perceived by producers as timely and competitive.

2) The companies with the most product development success had a well documented, predictable and repeatable product development process. The companies reporting the greatest success were those whose product development process was both clearly defined and directed by their strategic intent.

The most successful companies had a clearly defined and recognized organization and process in place to ensure that product development decisions at every stage of the process were guided by the company’s strategic intent. Although it was not observed at any of the companies in the study, a way to enhance this concept would be to tie performance measurement for the product development area directly to success of the products developed in support of the company’s strategic intent in terms of product development. Ideally companies would have the organization and process in place to periodically reassess the strategic intent in light of changing economic, market and competitive conditions.

3) Companies that introduced products on a regular cycle were more successful than those that introduced products on an ad-hoc basis.

Only one-third of the companies in the study introduced products on a regular schedule. At these companies, product introduction schedules were planned in advance

and consistently communicated to all those involved in the product development process including the producers. Companies that introduced products on an ad-hoc basis rather than during scheduled system releases not only reported a lower product launch success rate but they were also less satisfied with their speed to market.

Product Release Schedule	Distribution of Companies	Self-Reported Product Launch Success Rate (%)	Satisfaction with Speed to Market (On Scale of 1-5)
Defined Cycle	33%	89%	3
Ad-hoc	67%	52%	2

In addition, the most successful companies tracked and reported success rates in introducing products on the published schedule. Even the most successful companies can improve in this respect by periodically reexamining with the producers the continued appropriateness of the company’s current product release schedule given changing market conditions and competitive landscapes.

4) The most successful companies demonstrated the will and the capacity to manage multiple simultaneous product development streams with staggered completion dates. Often this involved significant use of project and program management personnel, techniques and tools.

Building upon the fundamental characteristics described above in terms of predictability and repeatability of the process leading to regular product launch cycles, the next level of maturity that was observed in the product development process was to involve multiple simultaneous product development streams. To optimize this process typically meant to employ distinct product implementation work streams or teams, each led by a project management professional reporting to a project management office (PMO) organization. In these cases, professionals with project management back-

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grounds were highly effective in structuring and employing a proactive decision-making and monitoring process to manage the multiple product development work streams in terms of resources, communication, prioritization and escalation/appeal processes. It was even more critical that the product development manager have a strong knowledge of life insurance products, operations and systems.

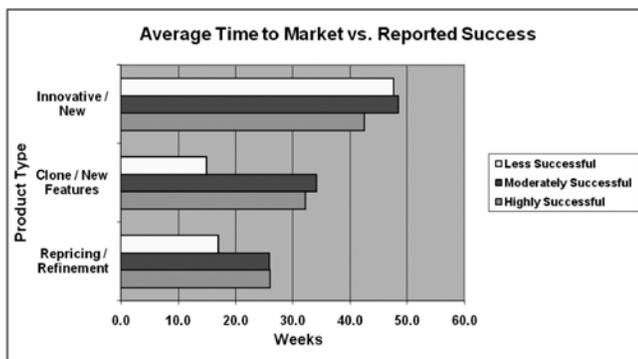
Furthermore, to achieve optimal effectiveness in the product development process, the most successful companies were structured with resources dedicated to the product development function. This included not only actuarial resources, but also those with systems, compliance and other types of backgrounds.

5) In the majority of cases, speed to market was not a predictor of success.

For the purpose of this study, product development initiatives were classified into three broad categories:

- Repricing or refinement of existing product
- Clone or replacement of existing product/addition of new features
- Innovative/new product

The following graph shows the average time observed to complete all the steps in the product development cycle and launch a product for each of the product development initiatives and success categories. As the graphs shows, the most successful companies were fastest to market only with innovative or new products and, even then, only by about 10 percent.



The “highly successful” companies reported, on average, a speed to market with “innovative/new” products that was only slightly faster than that of the other companies. They reported, on average, a speed to market with “refinement/repricing” and “clone/new features” products that was almost the same as that of the “moderately successful” companies, and significantly slower than that of the “less successful” companies.

Interestingly, the companies that reported the fastest speed to market with “refinement/ repricing” and “cloned” products were in fact the “less successful” companies.

6) The most successful companies focused on building and sustaining producer commitment to new product developments, from the sourcing of the ideas all the way through launch.

These results were investigated further during the follow-up interviews and the subsequent presentation of the results to the participating companies. During those discussions, one of the differences that became clear was that the most successful companies focused more on establishing a reputation with their producers for delivering quality, error-free products on time than on speed to market. The less successful companies sometimes felt the need to accelerate a product launch because their prior launch had been unsuccessful and, in doing so, often missed the mark again.

These most successful companies stated that building and maintaining producer commitment to the new product launches was the critical ingredient to the success of the product. Some of the least successful companies indicated an inability to build and maintain producer commitment to the new product launch simply because the product development process itself was not predictable enough to allow the company to promise a product launch date and commit to a design with confidence far enough in advance. Even more fundamentally, during the initial stages of product design, these

least successful companies could not reliably state, within a reasonable range, the amount of time required to develop and implement the product. This lack of predictability and reliability in the product development process limited the company's ability to build and maintain producer commitment to the launch, which then detracted from the success of the product.

7) The most successful companies have adopted product design and engineering concepts that are commonly seen in more consumer-oriented, product-driven manufacturing industries such as consumer products and electronics.

Successful companies tended to adapt new approaches to product design and manufacturing that were aimed at increasing both the efficiency and the effectiveness of the process and therefore enhancing the predictability and reliability of the process.

First, some companies reported having used concepts of parallel processing to eliminate unnecessary sequential staging in the life insurance product development process. This was most successful in cases where teams had significant experience working together and had a thorough understanding of the products, processes and systems. A smaller number of the companies stated discomfort with parallel processing out of a concern for the potential cost of rework introduced by the parallel processing.

Secondly, some companies employed a concept called design for manufacturability (DFM) where they consciously looked for ways to uniquely involve their administrative operations and systems in the product development process to ensure that they were designing products that would not only sell well but that they could cost-effectively manufacture and service. When asked how they had been successful in doing so, many pointed less to formal, structured DFM methodologies and more to the deep experience of their product design staff with not only the companies' products and distribution, but also with their operations and

systems. Others pointed to the early and active involvement of their operations and systems staff in the product design process itself.



Thirdly, companies adopted the idea of reusable component-based or template-based design. They made a concerted effort to leverage the results of prior product development efforts in both design and manufacturing through the development of accelerators or reusable templates.

Lastly, the most successful companies adopted more scenario-based economic testing and planning so that products, when introduced, produced the anticipated profits with the appropriate level of risk.

Summary

Having an excellent product development process is an important factor in achieving the consistent, organic, top-line growth that companies are seeking today. In our study of the product development process, we have identified a set of characteristics that appear to differentiate the processes of companies that have successful product launches from those that do not. In this article, we have described some of those characteristics in hopes that you might find them useful at your own company.

Exhibit A

Brief Listing of Topics Covered in the Written Questionnaire

- A. Background
 - Company size and historical product lines sales
 - Strategic intent
 - Product mix
 - Distribution channel mix
 - Time to market
 - Capacity of product development process
- B. Product Idea Initiation and Generation
 - Process by which new product ideas are generated and evaluated
 - Organizations and individuals involved in new product idea generation
 - Sources for new product ideas
 - Market research techniques
- C. Product Design and Pricing
 - Steps in product design/pricing process
 - Software and other tools used in product design/pricing process
 - Sequencing and timing of steps in process
 - Pricing methodologies by product line
 - Development of policy form and prospectus
 - Development of pricing assumptions and experience studies
- D. Project Management/Product Implementation Process
 - Extent to which dedicated project management personnel and techniques are involved
 - Extent to program management personnel and techniques are involved
 - Process for decision making and escalation of project management issues
 - Day one vs. day two functionality
 - Timing of product launch
 - Analysis of critical path
- E. Product IT Infrastructure
 - New business systems involved
 - Administrative systems involved
 - Versions, manual workarounds required
 - Year acquired
 - Support and flexibility for new products
 - Expectations for IT systems and support in the future
 - IT costs associated with new product development
- F. Product Development Assessment
 - Post-launch review process/lessons learned
 - Definition of product launch success
 - Practices used to measure and achieve product development effectiveness
 - Strengths and weaknesses of product development process
 - Current initiative to improve effectiveness of product development process □

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