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LIFE PRODUCTS

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This session will provide an update of current topics relating to individual life insurance. Tentative subjects include (1) discussion of Guideline XXX – where does it stand and what is the prognosis for level term products? (2) "traditional products" – what is happening in the participating whole life arena? and (3) equity-based products update.

MR. JOHN M. FENTON: Our first speaker will be Bob Smardon, who is the Vice President of Individual Products for the U.S. operations of Sun Life of Canada. He is responsible for all aspects of the company's development and management of the individual life and annuity products in the U.S. He also has financial responsibility for their agency force. Bob has been with Sun Life of Canada since 1971, and he is a graduate of McGill University. He will talk about whole life products and will focus particularly on par products, approaching them from the marketplace point of view. He will also offer a few comments on the financial factors impacting whole life products.

Our second speaker will be Andy Ware, Vice President and Corporate Actuary of Northwestern Mutual Life. His responsibilities there include financial reporting and valuation of liabilities for all lines of business. He is also directing the product development activities of annuities and other investment products. Andy has been with Northwestern Mutual since 1987, and prior to that he was with National Life of Vermont. He is a graduate of R.P.I., and a member of the American Academy of Actuaries Committee on Life Insurance. Andy will be talking about Guideline XXX, its current status and the impact on level term products. Finally, I am going to be speaking briefly about variable life insurance.

MR. ROBERT J. SMARDON: Before I begin my presentation, I would like to relate to you a story about a man who was so impressed with a speech that afterwards he approached the speaker, but temporarily lost track of his choice of words. The following conversation ensued. Filled with enthusiasm, the admirer said, "Sir, I think your speech was absolutely – superfluous." The speaker said, "Um, well, thank you. I think I will have it published, posthumously." Then the admirer said, "That's good. The sooner, the better." I hope that I will present my topic more understandably than indicated by the exchange these two people had. My topic is, "What Is Happening in the Participating Whole Life Arena." Some of you may, in fact, think that this topic is a bit superfluous, given the higher level of product development activity going on in some other product lines. My contention is that there is definitely activity in the participating product area, but that activity is more subtle than evident if we look purely at new product activity in the industry. It could even be said that the major focus of the industry, in the recent past, has been to deal with financial issues and emphasize actions that lead to an improved capital base. New product development in any line tends to require capital initially, and many companies may have decreased emphasis on product development at this time. On the other hand, pricing changes

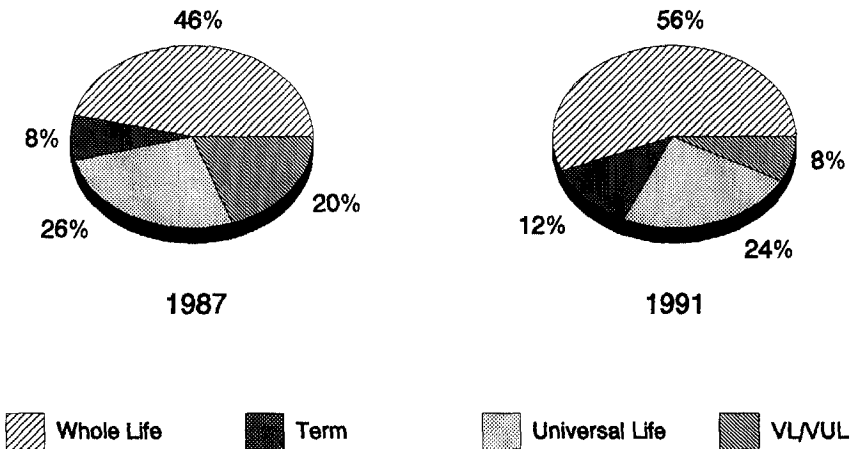
that boost margins and profits enhance capital, and there has been a growing interest in product changes of this sort.

The relative levels of product development activity for the different product lines are in the following order:

1. Health/living benefits
2. Term
3. Annuities
4. Universal life (UL)
5. Par products.

This is relevant for par products, since product changes in other lines compete for the attention of distributors and consumers. These other lines also compete, in many companies, for internal manufacturing resources such as product actuaries or systems experts. The most prolific level of product development has been seen in the health product and living benefits area. This level of activity is a reflection of the tremendous concern of the American public about health care. Certainly, living benefits riders have become popular on par products as well. Term products have enjoyed a high level of activity, due to a need for low-cost products in a recessionary environment. Annuities continue to benefit from excellent demographics as more of the U.S. population reaches the savings years with growing concern for retirement. Consequently there continues to be significant product activity here. As we look at universal life and par products, let's examine Chart 1.

CHART 1
Industry Product Mix



If we compare the industry's product mix by premium from 1987 to 1991, we can see that the share of sales for whole life has gone from 46% in 1987 to 56% in 1991. This increased share has been possible because of a decrease in variable life share, from 20% to 8%, and a slight decrease in universal life share from 26% to 24%. In general, I would say that par products have benefited from a flight to guarantees following the stock market crash. More recently, they have benefited

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from a flight to higher-rated companies within the industry, with a high proportion of these higher-rated companies being more par product-oriented. In addition, over the past few years, the investment returns passed along to par policies have been extremely competitive compared to universal life interest rates. I would also say that par product development in the past few years that has focused on flexible paid-up additions riders has enabled these products to better compete on design with universal life.

In Chart 2, you can see that par, or whole life, was Sun Life of Canada's most popular line in 1987 at 35.8% of premium. By 1991, this share had grown to a dominant 84.1% of sales. In 1987, we were selling single premium, fixed and variable products, which had been withdrawn by 1991. If we redid the product mix in 1987 without that 20.1% of single premium products, whole life would have represented about 45% of sales. Nonetheless, growth in mix to 84% is very significant. A major factor in this growth for us, in addition to the factors identified for the industry earlier, was the emergence of our presence in the joint life, last-to-die market. In 1991, this product alone accounted for 56% of our par business, or 46% of our insurance business overall.

CHART 2
Sun Life of Canada Product Mix

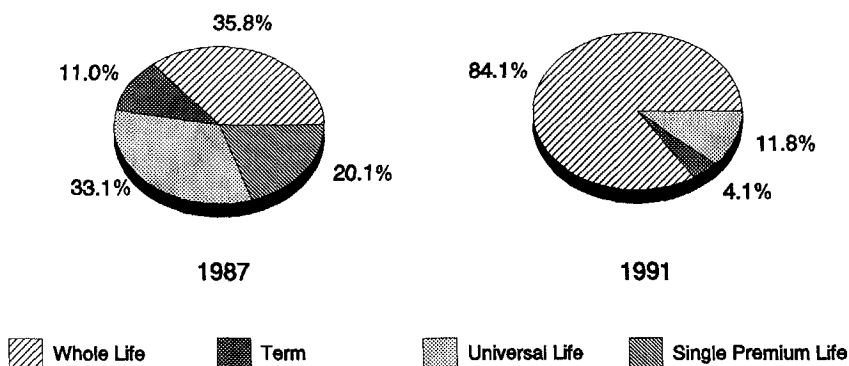
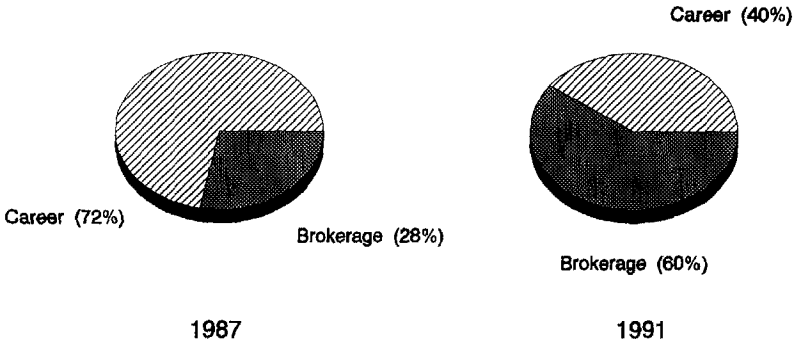


Chart 3 shows that within Sun Life of Canada, our par products sales success is also due to a basic broadening of our distribution systems.

We have gone from 28% brokerage business in 1987 to 60% brokerage business in 1991. This dynamic distribution change has enabled us to upgrade the markets where we are selling our par business. Once given attractive products in these markets, our career system has adapted and grown in the process. As we look at where all product changes, including par, are headed in the future, I believe there will be less dramatic product changes, such as when universal life or variable life were introduced, and more marketing-driven product change. Products will be designed for specific market applications and for specific distribution channels. Demographic groups and demographic changes will be important to product developers. I believe we will see more products crossing internal organizational boundaries, such as between the individual and the group sides of a company. The joint life, last-to-die market is really a good example of three of these trends.

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CHART 3
Life Insurance Sales by Distribution Channel
Sun Life of Canada 1987 vs. 1991



The product is aimed largely at the estate planning market. It is most effective when sold with the help of sophisticated distributors who can deal with the complexities of this business. Finally, the product is aimed largely at the faster-growing, older segments of the U.S. population.

From a pure par product design perspective, I feel we will continue to see fine tuning of current design trends. The market will continue to desire lower cost-based policies. The most popular way to cut base premiums is through a modified premium design, where the premium starts low and then jumps up once, or perhaps twice. It is also common for the jump in premium to occur after the vanish year. Low-cost riders will continue to be popular for purchasing part of the insurance on more of a term-type basis. This low-cost rider insurance can be funded either from additional rider premiums or directly from dividends. Premium payment riders, which permit single premiums or extra annual premiums, also will continue to be important.

Table 1 below shows some experience that we at Sun Life have had with the popularity of our riders. This is based on the percentage of policies electing them.

TABLE 1
Rider Utilization at Sun Life
(% Policies Electing)

	Single Life	Joint Life
Low Cost Rider	15%	70%
Single Premium	24	9
Extra Annual Premium	11	7

Our low-cost rider shows quite a difference in popularity, with 15% of our single-life policies opting for it, but 70% of our joint-life policies selecting it. The difference here would be due to the heavy emphasis on estate protection versus cash values in the

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joint life market. The single premium rider is elected by 24% of our single life policies, compared to 9% of our joint life policies. The most frequent usage of this rider is to shorten the vanish period by prepaying several premiums. The extra annual premium rider shows an 11% election rate, versus 7% for joint life. Again, this rider can be used to accelerate the vanish period, but involves payments that are spread over a period of time. It should be noted that to fully exploit the range of possible combinations of riders, together with base policies in various sales situations, the use of quite sophisticated illustration systems is required.

Part of the news in the par product area these days is falling investment returns. Largely as a result of this phenomenon, mutual companies have steadily been reducing dividends in the past few years. The advent of additional premium riders has brought significant investable cash flow at a time when the yields on new money have decreased. Consequently, companies that distribute investment income on a portfolio basis will notice that this additional cash flow accentuates the decline in their dividend rate. We at Sun Life of Canada felt that the discretionary nature of these additional premiums warranted separate dividend interest treatment. We implemented this change on a prospective basis beginning in the middle of 1991.

The sale of par business on a vanishing-premium basis has been well established in the last few years. Dividend reductions can lead to unpleasant surprises, to the extent that policyholders and agents have relied on a continuation of the current dividend scale to fund the vanish year. Prudence and recent history suggest that vanish years should be carefully explained, and perhaps illustrated, with some margin for dividend reduction. Companies and agents that are service-oriented will find ways to communicate to policyholders changes in their vanish year before the arrival of a surprise announcement that more money is necessary or that the insurance program will either pay less than expected or terminate prematurely.

The last implication of falling investment returns that I have identified is the impact on the dynamic interest rates permitted by the 1980 amendments to the standard valuation and nonforfeiture laws. The workings of the applicable indexes, together with the threshold requirement of 50 basis points for a change, has led to maximum rates for valuation and nonforfeiture of 5.5% and 7% respectively, for the last five years. These interest rates apply to guarantees of 20 years or more. It now appears almost certain that the indexes to be published in mid-July will trigger a maximum valuation rate for 1993 of 5%. The maximum nonforfeiture rate is calculated at 125% of the maximum valuation rate, which will produce 6.25%. However, although the maximum reserve rate must be used for 1993 business, companies may elect to defer the application of the 6.25% to cash values for one year to 1994. I suspect that these new maximum rates may well prompt some product changes in certain companies.

I found it interesting to consider the interaction of interest rates in the income tax rules for the definition of life insurance with the valuation and nonforfeiture rates I have just discussed. Let us consider, as a simple example that I think I am still capable of handling, paid-up additions purchased from dividends. The tax test applicable to paid-up additions will require at least a 4% rate in the calculation of the cash values of the paid-up additions. Many companies, in fact, use 4%. This rate certainly falls within the 6.25% maximum for cash values. Now, reserves for paid-up

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additions are commonly held equal to the cash values. Still, the use of a 4% rate falls within the 5% maximum for reserves. However, if the maximum valuation rate were to keep falling – and some investment experts do see a scenario of continuing declining rates in the future – then the appropriateness of the 4% rate in the tax test may be called into question. Also, some companies may want to build in more conservatism in interest rates, and the tax test effectively prevents interest rates below 4% for paid-up additions. Bear in mind that companies may also need to earn a spread on top of that 4% guaranteed rate. I must add, though, that however compelling the logic is for that 4% tax rate to be lowered, politically it may be difficult to loosen it up at a time when most tax bills we have seen are attempting to tighten things up.

To conclude this presentation, let me say that par products still account for the largest portion of product sales in the industry. In my mind, the future looks bright for those companies that are willing to make the marketing and the financial adjustments to keep their products at the cutting edge.

MR. P. ANDREW WARE: I have been asked to discuss the draft regulation that implements the recommendations of the joint American Council of Life Insurance (ACLI) and National Association of Life Companies (NALC) Advisory Task Force, which was appointed as a result of the controversial proposed Guideline XXX. This regulation not only introduces a reserve methodology for nonlevel-premium life insurance plans, but also allows the use of new 15-year select factors to be applied to the 1980 CSO. These new select factors can be used to determine reserves for all life insurance plans, not just term. Because this regulation is so far-reaching, it is important that all life insurance actuaries, both valuation and pricing, understand this new regulation and its implications. The agenda for my presentation is to give you a brief history of the proposed regulation and then to describe it. I will also give you a little flavor for how the regulation affects a 10-year level term plan. Finally, I want to discuss my interpretation of the part of the regulation that permits justification of lower deficiency reserve mortality rates.

Late in 1988, Roy Olson, then the actuary in the Washington Insurance Commissioner's office, proposed Guideline XXX to the Life and Health Actuarial Task Force. The guideline prescribed a segmented method of calculating reserves for increasing premium policies that do not produce a cash value in the first 10 policy years. At the June 1989 meeting of the Life and Health Actuarial Task Force of the NAIC, several actuaries from the industry opposed Guideline XXX. This controversy resulted in the formation of a joint ACLI/NALC Advisory Task Force to advise the Life and Health Actuarial Task Force on what should be done. The first report of this Advisory Task Force was submitted in November 1990, with the final report submitted in September 1991, only slightly changed from the first report. At that point, the Life and Health Actuarial Task Force requested that the Advisory Task Force draft a regulation consistent with its recommendations. That regulation was drafted and submitted in March 1992. This regulation was officially voted by the NAIC Actuarial Task Force to be exposed for comment at its meeting last week. Comments on it should be sent to Jean Olson at the NAIC office in Kansas City, with copies to Tony Spano at the ACLI.

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Before I go into details, I would like to discuss some terminology. The first term is the unitary method for calculating reserves. In this method, net premiums are calculated as a constant percentage of gross premiums for the entire length of the plan. Alternatively, a segmented method divides up a policy into segments of varying policy years and then calculates net premiums as a constant proportion of the gross premiums within each segment of the plan. The determination of the segments is what differentiates these methods. An example of a segmented method is the unified method, which was described in a paper by Stephen Beach, published in the *Transactions*, entitled "Statutory Reserves for Nonlevel-Premium Policies" [TSA XLII (1990): 11-34]. Another example is the net-to-gross ratio method, which is part of this regulation. The net-to-gross premium ratio method is only slightly different from the unified method. And another example, of course, is Guideline XXX.

All of these examples produce very similar results for the plans that were tested by the Advisory Task Force. The biggest controversy in this entire process was not the method used to calculate reserves, but rather the mortality assumptions required to be used in calculating the reserves.

Guideline XXX was brought about by regulatory concerns over the use of the unitary method in calculating reserves for nonlevel-premium products. Frequently, the unitary reserve method produced negative terminal reserves. At the time of a negative terminal reserve, future premiums are actually being used to pay past benefits. This is the flip side of prefunding, and to the regulators it meant that companies were betting that future inflated premiums would actually be paid. The regulators also believed that negative terminal reserves were caused by premium manipulation in order to avoid deficient premium reserves. Under the unitary method, tilting the premium slope so that premiums in later years are very high, produces early-duration net premiums that can be quite low, thus avoiding deficiency reserves. In fact, these net premiums can be significantly lower than the statutory cost of insurance. Many thought that these later premiums would never be paid, or if they were, would be paid only by people who were so sick that significant antiselection would result. The industry actuaries working in this area felt that Guideline XXX produced huge reserves at the wrong time, mainly due to the valuation mortality assumption. These reserves were not necessary, given the current level of experienced mortality. Also, they cited the Guideline XXX reserves as difficult to calculate.

In both its reports, the ACLI/NALC Advisory Task Force cited many failures of the standard valuation law. Major points included the fact that the standard valuation law does not consider lapses, and it does not deal with mortality changes that can occur over time. It also does not reflect risk classes, in that preferred risks are not specifically allowed for. Finally, it does not recognize that there are interrelationships among the above factors, especially between lapses and mortality. The report not only cited that Guideline XXX produced inappropriately high reserves, but also found that the unitary reserves can be insufficient. The report then makes several recommendations that are included in the draft regulation.

The first part of the draft regulation allows for the use of optional, 15-year select factors for all life plans. These 15-year factors differ depending on which type of reserve is being calculated. For basic reserves or, in other words, reserves without consideration to the size of the gross premium, the select factors allowed result in

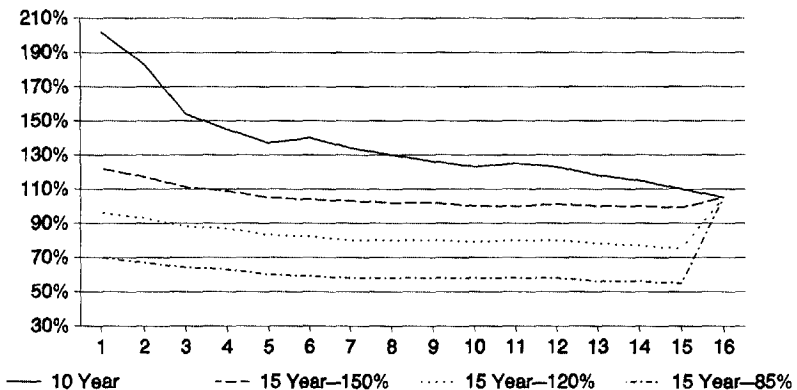
mortality rates approximately equal to 150% of industry mortality. For this purpose, an industry mortality table was constructed using Society of Actuaries data from 1983-86 policy anniversaries.

When the size of the gross premiums is considered, the deficiency reserves can be calculated using a set of select factors based on only 120% of industry mortality. Going further, the deficiency reserves may be based on a result as low as 85% of intercompany experience if the actuary can demonstrate that company experience is, or will be, low enough. This provision would enable preferred-risk carriers to use their actual, or expected, experience in justifying deficiency reserve mortality levels. I will discuss this point in more depth later in the presentation.

The size of the select factors must be increased if gross premiums increase too rapidly. The regulation describes an algorithm that must be used to increase select factors if premiums increase at a rate faster than the rate of increase in valuation mortality. I will also describe this later with an example. The third part of the draft regulation describes the net-to-gross ratio method, which will be required for all nonlevel-premium, or nonlevel-benefit plans, with an explicit exclusion currently for universal life, variable life and modified guaranteed life plans.

To accomplish the use of a different basis for deficiency reserves than for basic reserves, the regulation defines deficiency reserves as a reserve to be added to the basic reserve by calculating a reserve equal to a segmented reserve, using deficiency reserve mortality assumptions, but using the lesser of gross premiums and net premiums, less the basic reserve. To give a better idea of the level of mortality being recommended by the Task Force, Chart 4 shows mortality rates expressed as a ratio of the 1975-80 basic tables. I am using the 1975-80 basic table here as a measurement device. It is a table constructed using the combined mortality of smokers and nonsmokers for a period that is quite old now, so there have been both mortality improvements and a more clear definition and distinction between nonsmoker and smoker mortality.

CHART 4
Comparison of Mortality Tables
(Ratio to the 75/80 Basic – Age 35 Male NS)

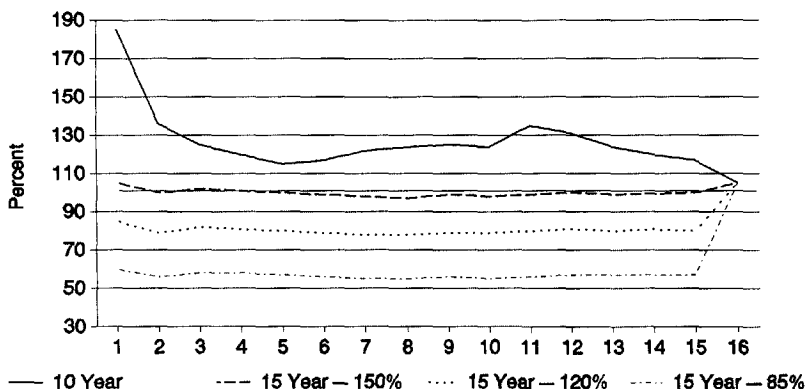


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In Chart 4, for a male age 35, the current 10-year select factors are compared to the 15-year select factors at all three levels: the 150%, the 120% and the 85% of current experience. When you express these mortality tables as a function of the 1975-80 basic table, it is evident that the current 10-year select factors are not a good approximation of true select mortality over the first 15 policy years. When you move down to the 150% factors, the initial rates start out at about 120% of the 1975-80 basic table. By year five, they are almost exactly equal to 100% and stay there, all the way to duration 15, when they jump back up to the ultimate 1980 CSO. Of course, the 120% and 85% follow similar patterns, with the 85% level being between 60% and 70% of the 1975-80 basic table.

At age 45 (Chart 5), you get a similar pattern and you can see again that the 10-year select factor line is much more jagged than the other lines and considerably above the other lines, whereas the 150% basic reserve table lies almost exactly on top of 100% of the 1975-80 basic table. This is just a coincidence, but it does show that the pattern of mortality being used under this new regulation is very close to the pattern of mortality that we are used to seeing on intercompany studies.

CHART 5
Comparison of Mortality Tables
(Ratio to the 75/80 Basic – Age 45 Male NS)

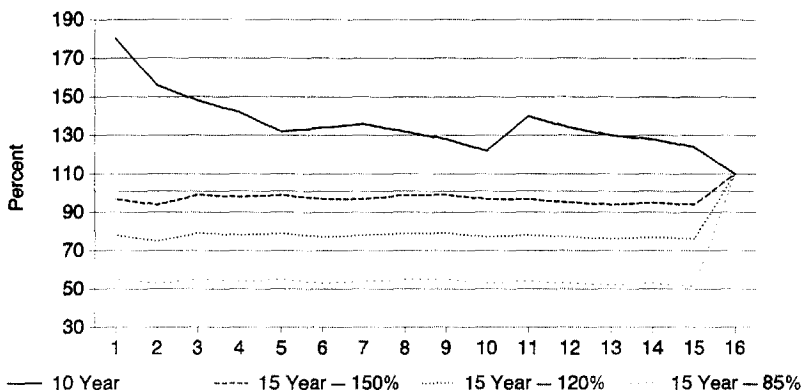


At age 55 (Chart 6), the pattern is very similar again, except that the overall mortality basis is lower, with the 85% line about 50% of the 1975-80 basic table.

Now, I will go to the algorithm that changes the select factors if premiums increase too rapidly. The increase in mortality is done through an algorithm that was not constructed scientifically but that seems to produce the proper result. The algorithm increases select factors by one-quarter of the cumulative difference between the percentage increase in gross premiums and the percentage increase in the ultimate 1980 CSO.

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CHART 6
Comparison of Mortality Tables
(Ratio to the 75/80 Basic - Age 55 Male NS)



For example, I have illustrated in Table 2 the first three years of an increasing-premium policy.

TABLE 2
Adjusted Select Factors

Duration	(1) Gross Premium	(2) % Increase Gross Premium	(3) 1980 CSO	(4) % Increase 80 CSO	(5) 0.25 (2)-(4)	(6) Sum of (5)	(7) Select Factors	(8) Adj. Sel. Factors
1	1.44		1.68				45%	45%
2	1.63	13.0%	1.77	5.4%	1.9	1.9	51	53
3	1.85	13.5	1.88	6.2	1.8	3.7	62	66

In this example, gross premiums are increasing at about 13% per year at ages where the 1980 CSO is increasing at about 5%. One quarter of the difference is 2%, so that the select factor for the second year was increased from 51% to 53%. For the third year, the select factor was increased from 62% to 66% because the algorithm is the cumulative difference. If I were to extend this example out further, the select factors would reach 100% at duration 11 instead of 15. Select factors are not increased beyond 100%, since the ultimate 1980 CSO was deemed conservative enough to handle most antiselection due to lapsation.

The final part of this regulation is the net-to-gross ratio reserve method. This is the method of dividing up a life insurance policy into segments in order to reserve each segment using a unitary type approach within each segment. The net-to-gross ratio method applies only to nonlevel-premium or nonlevel-benefit life insurance plans. Under the method, a ratio is computed for each possible segment equal to the present value of benefits divided by the present value of gross premiums. Since segments are only considered possible over complete policy years, the first possible

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segment would be the first policy year; the second possible segment is the first two policy years; and so forth. The length of the first actual segment chosen is to be the last duration at which this ratio is at its maximum value. Once the first segment is determined, then subsequent segments are calculated by repeating the process, but by starting at the end of the prior segment. This process is really not quite as difficult as it may first appear.

For a policy that has guaranteed gross premiums that are level for 10 years and then increasing thereafter, in all likelihood the end of the first segment will be the end of the 10th policy year. Then the resulting net premiums for the first 10 years would be just the net premium for a 10-year level-premium term policy. In this way, a policy that has 10 level premiums, followed by increasing premiums, would have the exact same reserves during the first 10 years as a 10-year level-premium term policy. It did not seem logical to the advisory group that a policy would be reserved on a lower basis just because ART-type premiums continued beyond the end of the 10th policy year. However, the consequence of changing the reserve method without changing the mortality would, for many companies, produce deficiency reserves where there had been none before.

Chart 7 shows the consequence of using the current 10-year select factors for a term policy with level premiums for 10 years and increasing thereafter. A premium of \$1 per thousand at age 35 was assumed to be guaranteed for 10 years, and under the net-to-gross ratio method, the valuation net premium was \$1.80 during the first 10 years. *That deficiency would produce initial reserves of more than \$6 per thousand on a \$1 premium!* These reserves were viewed as redundant by the actuaries on the advisory task force, and therefore, the reduced select factors were recommended. The effect on this plan of using the 15-year select factors is shown in Chart 8.

The top line represents the reserves calculated on the 10-year select factors shown in Chart 7. The next lower reserve line shows the reserves including deficiency reserves that were calculated using the 150% select factors only. The bottom line shows a combination of basic reserves using the 150% select factors and deficiency reserves using the 120% level of mortality to calculate the small level of deficiency reserves that would still exist. This shows that even if there are no or very little deficiency reserves, this regulation introduces what one of our task force members called the humpback reserve for a level-premium term product. For this age, the reserve reached a maximum of about \$2 per thousand in the sixth year. Even though the reserve releases by the end of the 10th year, if pricing is done on a rate-of-return (ROR) method, then there is a cost of setting up those reserves.

I will follow through by constructing a hypothetical policy (Table 3), with guaranteed premiums for the first 10 years of \$1 and increasing thereafter. The current premiums will follow the same pattern but at a lower basis. I will assume a \$50 fee.

I will use pricing assumptions that are purely hypothetical, and mortality of 50% of the 1975-80 basic table for the first 10 years and then grading up to 60% of the table in the 20th year. I will assume lapses are level for nine years and then jump up, with no conversions and relatively reasonable expenses and average sizes. I will price on a rate-of-return basis, with a goal of 15% at 20 years on aftertax book profits and use a required surplus of 75% of expected mortality (Table 4).

CHART 7
 Net to Gross Ratio Method vs. Unitary Method
 [Terminal Reserves (Including Deficiency Reserves)]

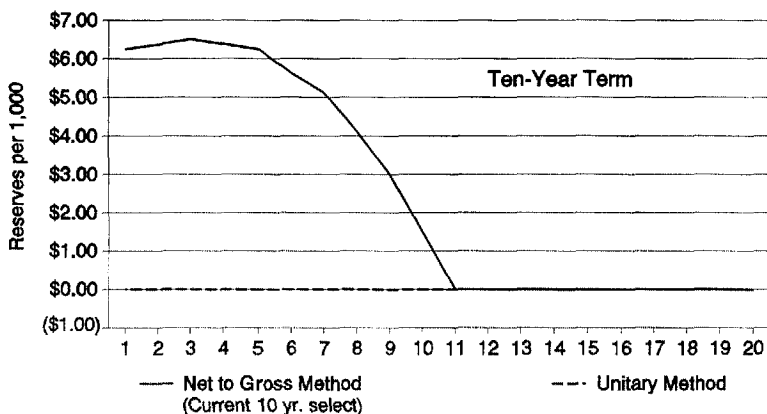
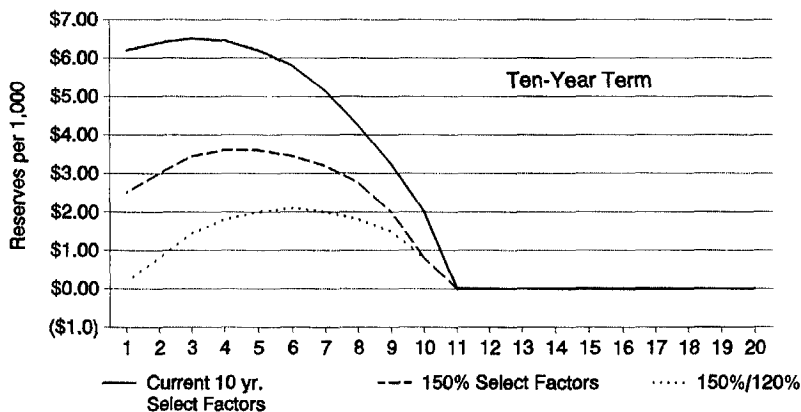


CHART 8
 Net to Gross Ratio Method
 [Terminal Reserves (Including Deficiency Reserves)]



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TABLE 3
10-Year Level Term
Age 35 Male NS

Year	Guaranteed Premiums	Current Premiums
1-10	\$1.00	\$1.00
11	6.64	1.83
12	7.18	2.05
13	7.78	2.29
14	8.40	2.57
15	9.08	2.87

NOTE: Add \$50 fee

TABLE 4
Pricing Assumptions

Mortality	50% of 1975-80 basic (grading to 65% in year 20)	
Lapses	8% for 9 years, 30% in year 10 grading down to 12% in year 15	
Conversions	None	
Expenses	<u>1st Year</u>	<u>Renewal</u>
Per policy	\$250	\$20
Per unit	\$0.50	0
Percent of premium	65%	9%
Average size	\$350,000	
Required surplus	75% of expected mortality	
Pricing goal	15% return on book profit in 20 years	

Running the profit test using unitary reserves, a pattern of book profits resulted that showed the usual statutory strain in year one, followed by a series of book profits that decline by years until reaching zero in the 10th year and then jump back up and stay level thereafter (Chart 9).

When I introduce the net-to-gross ratio into the reserves (and overlay the two on Chart 10), I got a slightly higher strain in the first year, followed by an increasing pattern of net profits which leveled out eventually.

As you can guess from comparing these two patterns, the rate of return after I introduced the net-to-gross method, went down. A complete picture of how much the ROR went down depended on which set of reserves I introduced (Table 5).

If I had introduced the full reserves, including deficiency reserves based on the current 10-year select factors, then the 20-year rate of return dropped from 15.2% to 4.7%. If I had introduced the deficiency reserves on the 120% basis, it brought the ROR back up to 9%. If I completely eliminated deficiency reserves by assuming my mortality is going to be better than the 120% level, the ROR got up only to 11%.

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CHART 9
Ten-Year Term Book Earnings
Unitary Method

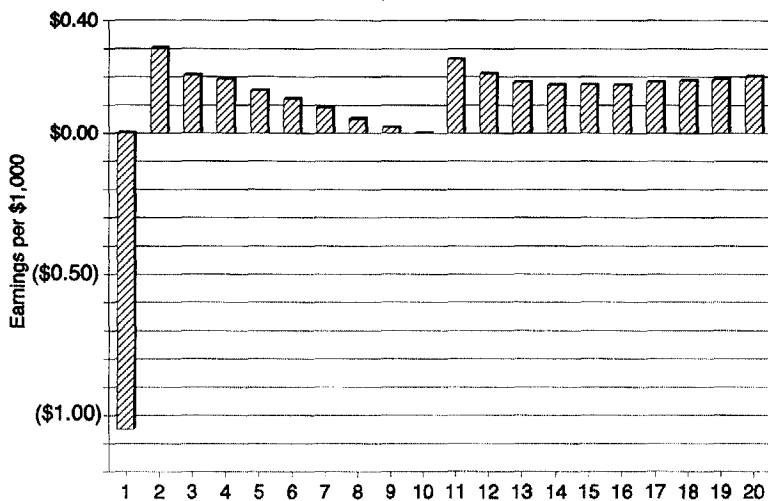
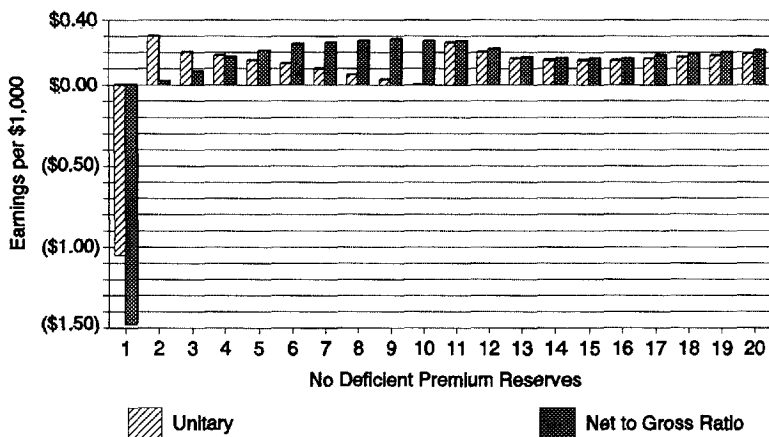


CHART 10
Ten-Year Term Book Earnings
(Unitary vs. Net to Gross Ratio Reserves)



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TABLE 5
Ten-Year Level Term
Pricing Results

Reserve Method	1980 CSO Select Factors		Year 20 ROR
	Basic	Deficiency	
Unitary	None	10 Year	15.16%
Net to Gross Ratio	None	10 Year	4.66
Net to Gross Ratio	150%	120%	9.13
Net to Gross Ratio	150%	85%	11.11

Now if I were going to get back all the way to the 15% ROR by increasing premiums at that point, I found I would have to increase premiums by 10%. Of course, that is using my hypothetical pricing assumptions and my hypothetical goal, which is not necessarily what any company would do.

I now want to turn your attention to the provisions in the regulation dealing with justifying deficiency reserve mortality levels at lower than the 120% level. This provision was added primarily to accommodate preferred risk underwriting. The first way an actuary can justify lower rates is called the retrospective experience in the regulation. An actuary needs to have at least 100,000 life-years of exposure in order to justify mortality at lower than the 120% level. However, if a company is just starting out in the preferred-risk area and expects to have lower mortality on this block, then for a period of three years, or until 100,000 life-years of exposure is accumulated, whichever comes first, the company may base the assumption on "prospective experience," or in other words, opinion. However, if the three years comes without 100,000 life-years of exposure being accumulated, then the actuary must grade the deficiency reserve assumption up to the 120% level, using a weighted average of the amount of experience that the actuary actually has.

Another way an actuary can justify experience is to use reinsurer's experience, where a reinsurer is assuming at least 10% of the risks on the block. This provision was designed for small insurers. In this way, a reinsurer can pool similar blocks of business from many insurers and use combined experience. I should add that when we are talking about justifying experience, we are talking about blocks of experience on the same class, not necessarily on just the policy forms that may produce deficiency reserves. A company could have a preferred-risk class that it offers to whole life, universal life and term, but only choose to use select factors for deficiency reserves on the term. It can use the whole block of experience to justify that level of mortality. By the same token, adjustments must be made to risk classes that are not as good as the best class to account for the cream being skimmed off. After initially justifying the experience, the actuary must annually rejustify the mortality basis. The data used to do this rejustification must include data up through 12 months prior to the valuation date.

The mortality table used to calculate deficiency reserves cannot be less than 85% of intercompany experience, as I mentioned. Nor can it be less than 120% of the company's actual experience. In other words, a company must maintain at least a

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20% margin between its actual experience and the experience table used for calculating deficiency reserves.

The regulation specifies 100,000 life-years of exposure as a minimum. However, the distribution of policies by size can have a very large bearing on the degree of variance that actual experience can exhibit. I have done some Monte Carlo testing on two different size distributions, each with 100,000 life years of experience. In one block, I assumed that all the policies are the same size, and the other block has policies of various sizes (Table 6).

TABLE 6
Monte Carlo Testing Size Distributions

Policy Size	Uniform	Various Sizes
50,000	100,000	16,000
75,000		5,000
100,000		25,860
200,000		22,500
300,000		20,000
600,000		7,500
1,000,000		2,500
5,000,000		120
10,000,000		20
	100,000	100,000

A wide variety of policy sizes greatly affects the degree of confidence the actuary can have that actual underlying experience is being accurately portrayed by experience studies. The wider the variety of sizes, the wider the variance in the distribution of possible claim amounts.

After running a Monte Carlo test simulation with 100,000 life-years of exposure 1,000 times, I came up with two frequency distributions that I have overlaid on Chart 11.

The distribution for policies with various sizes is significantly wider than the distribution for policies with the same size. From these distributions, I tried to answer the question "What is the chance that a company would get a reading about experience from a mortality study and then add 20% to it for safety and still be using mortality, which is actually less than the underlying mortality?" (See Table 7.) For the uniform distribution, the chance was about 7%. However, that chance grew to about 18% when you had various sizes.

Thus, even with a 20% margin, a company with only 100,000 life-years of exposure may run close to a 20% chance that actual underlying mortality exceeds the deficiency reserve mortality, which has a 2% margin. Of course, if the company had a million life-years of experience, these numbers become negligibly small. My conclusion is that when justifying deficiency reserves, the actuary must be very careful in ascertaining whether the experience is being accurately portrayed by the experience study.

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CHART 11
 Monte Carlo Testing
 (1,000 Trails 100,000 Life-Years Each)

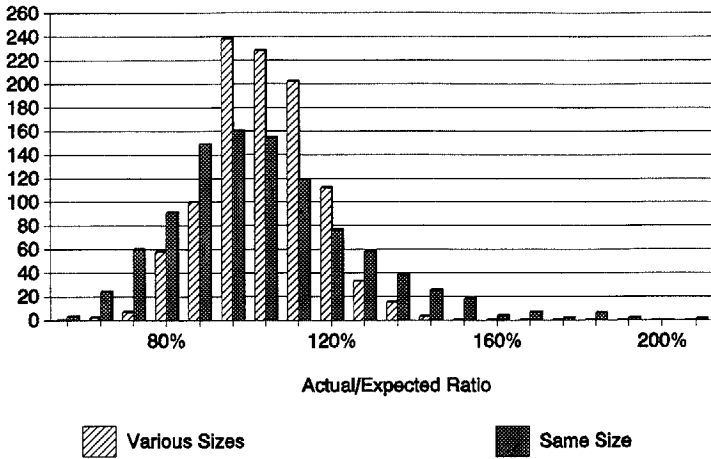


TABLE 7
 Monte Carlo Test
 Chance That Actual Underlying Mortality
 Is More than 120% of Experience

Size Distribution	100,000 Life-Years
Uniform	6.6%
Various	17.8%

There are at least three remaining controversies being debated when it comes to this regulation:

1. I mentioned that 15-year select factors would be required for basic reserves if they were used for deficiency reserves. That is a departure from general understanding of the current law.
2. Some believe that the current premium scale would be a more accurate reflection of the premiums expected to be paid in the future and that they should be used to calculate the basic reserves rather than the guaranteed maximum premiums.
3. The third controversy is universal life with long nonlapse guarantee provisions at very low premium levels, in other words, a universal life look-a-like term product that falls outside this regulation. Therefore, the deficiency reserve and

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basic reserve requirements can be avoided. This loophole will probably be filled before the regulation is adopted.

In closing, I would like to reiterate that this regulation is complicated, it is far-reaching, and it brings with it a new responsibility for the actuary. It seems that deficiency reserves can largely be avoided if the company currently has extremely low mortality experience. However, there is a chance that the mortality experience will deteriorate, and reserves will then be required. As was the case when many companies realized that Guideline XXX could have put them at the brink of insolvency, so could this regulation, if deficiency reserves are avoided by companies with experience that turns out to be above the levels prescribed in the law. As actuaries, we must take this new responsibility that is being thrust upon us and not abuse the new freedom that we may have.

MR. JOHN M. FENTON: I would now like to talk briefly about equity products and specifically variable life insurance. As an overview of my presentation, first I will look at recent sales results and product trends. After that, I will address a few miscellaneous issues, including the new SEC proposal on the 1940 Act. Then finally, I would like to talk about the outlook for variable life products.

Table 8 shows variable life sales results since 1987. As we can see, the mix of variable life sales has shifted quite a bit since 1987. Total premiums were about \$3.8 billion in 1987; that has dropped down to only \$900 million by 1991. But as you can see, the big drop came from the loss of the single-premium sales, which was triggered by the tax law change in 1988. Annual premium sales, including variable universal life (VUL) and variable life insurance (VLI), have been more stable. There has been some downturn there, moving from \$1.2 billion in 1987 down to \$900 million by 1991, however, nothing like the single-premium life drop-off. The important item that Table 8 shows here, however, is that the production for the first three months of 1992 has been \$300 million. On an annualized basis, this would give us \$1.2 billion of new premium in 1992, or a 33% increase over 1991. Therefore, we are seeing a significant pickup in sales in the first three months of this year. I should mention that the source for these figures is the Tillinghast VALUE survey.

TABLE 8
Variable Life Sales Have Shifted Since 1987

Year	Annual Premiums* (Millions)	Single Premiums (Millions)	Total Premiums (Millions)
1987	\$1,225	\$2,600	\$3,825
1988	1,225	525	1,750
1989	750	100	850
1990	950	100	1,050
1991	885	15	900
First quarter 1992	290	10	300

* Includes dump-ins.

Now, let us take a look at the market share of variable life (Table 9).

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TABLE 9
Market Share of Variable Life Products Has Increased Recently

Product Type	1987	1988	1989	1990	1991	February 1992
Whole Life	51%	53%	53%	54%	56%	54%
Universal Life	27	26	27	26	24	22
Term Life	12	13	13	13	12	13
Variable Life	10	8	7	7	8	11

We see that variable life had about a 10% market share in 1987. These are LIMRA (Life Insurance Marketing and Research Association) statistics, so they include single-premium products at 10% of the single premium. Variable life dropped down to about 7% in 1989 and 1990, but has picked up recently to reach 11% for the first two months of this year. I understand this has grown to 12% in the first three months of this year. So again this shows the upturn in variable life that has been going on. I think part of the reason for the upturn is new companies are entering the market. Previously, Prudential and Equitable were really the only players in town (Table 10).

TABLE 10
Variable Life Sales Have Recently Expanded to Other Players

Company	First Quarter 1991 (Millions)	Full Year 1991 (Millions)	First Quarter 1992 (Millions)
Prudential	\$75	\$356	\$89
Equitable	51	186	68
All other companies	74	358	143
Total	\$200	\$900	\$300

They had about 63% of the market one year ago (in the first quarter of 1991), while everyone else (another 30 companies or so) had about 37%. Now Equitable and Prudential's combined share of the market has dropped down to 52% for the first quarter of this year. This is despite an increase in sales for Equitable and Prudential. So we see a significant upturn in sales from the other players in the market. As a matter of fact, many companies have reported increases in sales of 200-500% over the first quarter of last year. We also hear from a few companies that their production from variable life represents about 30-50% of their total individual life production, which is significant.

Let us now take a look at what a typical VUL product looks like. It is generally front-end loaded, with a sales load ranging from 3-6% of premium. There are a few products that do not have a front-end sales load, but it is often difficult to reach your profitability goals without it. Virtually all contracts have a premium tax load of 2.0-2.5% of premium. There is also a 10- to 15-year surrender charge, consisting of a sales charge and, more and more, an administrative charge. The standard design would have an initial back-end sales load of about 25% (which is derived from the 30% maximum less the 5% front-end load).

The standard design would also have asset charges of 100-165 basis points, consisting of the mortality and expense (M&E) risk charge of 60-90 basis points; 90 basis points is the effective maximum the SEC will currently allow on a flexible-premium variable life product. That may change, as we will talk about later. We also have an investment advisory fee of 40-75 basis points. This charge will vary depending on the type of fund and fund manager. The contract also has administrative loads. The initial charge is roughly \$250-400 and is generally assessed on a per-policy or per-unit basis. There is also an ongoing monthly charge of \$4-8 to cover maintenance expenses.

Most variable life contracts are combination contracts. That means they have a fixed account as well as a separate account. Fixed accounts are still attracting about 30% of new money, so it still is a popular feature. Of course, by its very nature, VUL has premium flexibility. I would also like to note that there still is interest in scheduled premium products that have dump-ins and the ability to skip premiums. Finally, many contracts have the guaranteed minimum death benefit feature. A typical load here is one cent per thousand per month. This feature is offered either for life or until age 65, and can be an important selling feature, agents tell us. So that is what a standard VUL design looks like.

There have been several enhancements that have come out in the marketplace recently. I would like to touch upon a few of them. The first is that we have seen several companies who have reduced their M&E charge after 10 years, down to as low as 25 basis points. This allows you to get your profits up front and then in later years improve policyholder values. There is also a feature that enhances account values in later policy years. As I understand it, Equitable has a feature like this, where a percentage of the account value is returned back to the fund value by reducing the cost of insurance charges starting in policy year six. I would expect to see more features like this in the future, similar to the persistency bonuses on universal life (UL) products. We are also noticing a shift to back-end loads, expanding use of the back-end load for charges other than sales loads. This makes the VUL product look more like a UL product.

Another new trend is to differentiate current loads and guaranteed loads. For example, a contract may guarantee a 6% sales load for the life of the contract. On a current basis, it may go to 0% after seven policy years. Again, this improves the later year values. Another new trend is increased minimum face amounts. In general, variable life has been perceived as attracting an upper-scale market. If the product can be targeted at a higher face amount, it will perform better. We are aware of at least one company that has an explicit Deferred Acquisition Cost (DAC) tax load. This operates similar to a premium tax load. A typical load may be 1-1.25% of premiums. It could be used in addition to a sales load, allowing the contract to charge more loads up-front. Low-cost loan features are also becoming more popular. These enable the policyholder to get money out of the contract on a favorable basis at, say, 50-75 basis points. Finally, use of the preferred risk class; this is another way to improve values by offering both preferred and standard risk classes. A few companies have introduced this recently.

Now I would like to talk a little bit about the new SEC proposal on the Investment Company Act of 1940. The proposal covers many aspects of the securities business,

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but I am just going to focus on the portions applicable to variable life insurance. The proposal would remove explicit limitations on sales loads, administrative loads and M&E charges. These would be replaced by standards that the SEC would establish for determining the reasonableness of aggregate charges. If the marketplace failed to deliver competitive prices, the SEC would retain rule making authority in this area to correct this problem. Other provisions of the federal securities laws pertaining to variable products would not be changed. Separate accounts would still have to be registered, and a prospectus would still have to accompany the sale. But overall I think you would agree that this proposal could have a significant impact on the design of variable life. Right now, we are not yet really sure what the SEC would consider a reasonable aggregate charge, but there are a few considerations. We would expect M&E charges to increase over the 90 basis points. The refund requirement would be gone; you could have a higher sales load in the first two years. You would also be allowed to have profit in your administrative load. Of course, with all these changes the state nonforfeiture requirements would still apply. In terms of when the new law might be enacted, it is hard to say just yet. The SEC will most likely be focusing on other aspects of the proposal first. It is likely to be at least a year or longer before a regulation on variable products would be passed.

Now, I want to turn briefly to the fund performance of variable life.

I think it accounts for some of the success that we have seen recently on the product. Table 11 shows the amount of money split by type of fund. The amounts are as of March 31, 1992. We see most of the money is in the stock funds, domestic stock and managed. The general account is still popular, with \$1 billion in that as well. The overall average return for the 12 months ending December 1991 was about 31%. I think this figure alone tells us why variable life sales have been increasing so rapidly, particularly when we are seeing credited rates on universal life of 7% or so. The average return on variable life dropped down when we look at the 12 months ending March 1992, but it is still a fairly strong 12%.

TABLE 11
Distribution of VLI Monies by Type of Fund

Type of Fund	As of 3/31/92 (Billions)	Average Return 12 Months Ending 12/31/91	Average Return 12 Months Ending 3/31/92
Domestic stock	\$2.2	38.8%	15.1%
Managed	0.9	24.6	11.7
Domestic bond	0.5	18.6	14.3
Money market	0.5	5.0	4.3
International	0.1	16.7	3.0
General account	1.0	—	—
Total	\$5.2	30.7%	12.1%

Now, what does the future hold for variable life? In the past, many people have talked about it as being the ultimate product. It has not yet lived up to this billing; however, I do think that the outlook is strong. There are good fundamentals supporting the product. Variable products are less capital-intensive than other products.

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They have lower target surplus and reserve requirements. I think the low credited rates on UL will continue to shift money to variable products, particularly with the investment performance that we have been seeing. It does not take much to exceed the 7% return on UL. The variable life is often perceived as an accumulation product, so I think the demographics in the U.S. will work well; because as the baby-boomers age, more money will be generated for investment. I think variable life products will be a natural place to put part of this money. Another factor is that as younger agents, who might be more in tune to variable products, become a larger proportion of the distribution force, I think variable life will be sold more prevalently.

As I have already mentioned, the recent investment performance has been a key ingredient to the success of variable products. Of course, the key question is, What is going to happen when the market has its inevitable correction? Many people say that the drop in the market in 1987 led to the sharp decline in variable life. However, I think the bigger factor was the introduction of the 1988 tax law. But I think, going forward, the market performance will be a key item in determining the success of this product.

In terms of ongoing keys to success, I think there are a few that we have to look at. First is the distribution channel. Career agencies have really been the ones that are most successful in selling this product so far. However, if we are going to expand its success, we really need to overcome the licensing issues in the companies with General Agent (GA) and Personal-Producing General Agent (PPGA) channels. Another key is the ability to offset the downturn in investment performance. There have been some investment programs implemented in the past few years that I think will help with this, such as dollar-cost averaging. Another factor is the potential for variable life, either single-premium or VUL, as a potential replacement for variable annuities. I believe it is likely that the tax advantages of annuities may be restricted in the future. If this were to happen, I think variable life would be a natural place to turn. I think also the SEC proposal on the 1940 Act could have an important impact on what happens with variable life. If it eases the barriers to entry and reduces carriers' costs, it will make variable life more widely available.

In conclusion, I would like to say that there are many positive factors going for variable life. The key question is whether it can overcome some of the barriers we have identified. There were great things predicted for variable in the past, including a 50% market share. I am not sure we are going to get that far, but I think we will continue to see an improvement based on the things we have talked about.