MULTIPLE-LIFE DEVELOPMENTS

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Panelists:	STUART KWASSMAN
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	ROBERT J. REALE
Recorder:	LARRY N. STERN

- Last to die
- First to die
- Variable products
- Market trends

MR. LARRY N. STERN: I'm a consultant with Tillinghast in Hartford. I've been with Tillinghast for the last two years, and prior to that, I was chief actuary, senior vice-president for United Presidential of Kokomo, Indiana. I will begin our presentation with an overview of current market analysis based on some sales surveys that the Tillinghast office has conducted with regard to first-to-die products and also last-survivor products. We will divide our time in three segments, dealing with first-to-die products, last-survivor products, and reinsurance.

The panelists include Stu Kwassman from Phoenix Home Life, Richard Payne from Genesis Development, and Bob Reale from North American Reinsurance.

Tillinghast has conducted sales surveys of first-to-die and last-survivor products for the last couple of years. We sent out requests for this year's survey in February, hoping to get responses by the end of March. A few significant companies that we knew marketed these products had not responded by the end of March, and we kept the time period open until the end of April. A number of companies did respond to our survey. I will present a sampling of the results that we had time to tabulate in time for this meeting. The rest of the results will be tabulated, and we hope to get the survey responses mailed soon.

Let's first take a look at the first-to-die marketplace (see Table 1). One hundred nine companies responded to our survey last year (1991), and 97 did this year. Eleven companies identified with the product, but we do know that there is one significant marketer of this product that has not responded to our survey, and we still hope to get the results from it as well. As far as the proportions this year, the percentages were about the same as they were in 1991 (see Chart 1).

In 1992, the total face amount is about $730 million, average of about $61 million a month but, for the most recent month of February 1993, the sales were about $93 million (see Chart 2). So, there's been an increase over the average for 1992. The results for the 1991 survey showed a total face amount of about $350 million being sold. The 1992 results more than doubled what was sold in 1991. The total premium for 1992 was $13.8 million; for 1991, it was about $11 million. There's been an increase of almost $3 million in premium. The number of policies sold for 1992 was 4,700; for 1991 there were about 2,200 policies sold, for an average face amount of about $150,000 in both years and an average premium of about $5,000.

TABLE 1
1992 First-to-Die Sales Survey
Average Face Amount and Premium

	1992 Total Sales	1992 Monthly Average	February 1993 Sales
Total face amount	$730,203,849	$60,850,321	$92,944,932
Total premium	13,824,451	1,152,038	2,615,119
Total number of policies	4,702	392	451
Average face amount	155,296		206,086
Average premium	2,940		5,798

CHART 1
1992 First-to-Die Sales Survey
Market Response from 97 Companies

(27) 27.8%
(11) 11.4%
(59) 60.8%

Now Selling First-to-Die Products
Considering
Not Considering
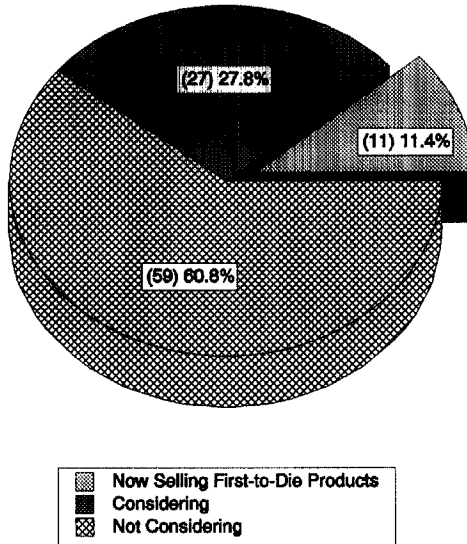
The monthly average of premium income has been about $1 million for 1992 (Chart 3); in the most recent month of February, the premium was about $2.6 million. We have about a $150,000 face-amount policy being sold, with an average premium in 1992 of about $3,000, but for the most recent month of February, that's about $6,000 in premium.

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CHART 2
1992 First-to-Die Sales Survey
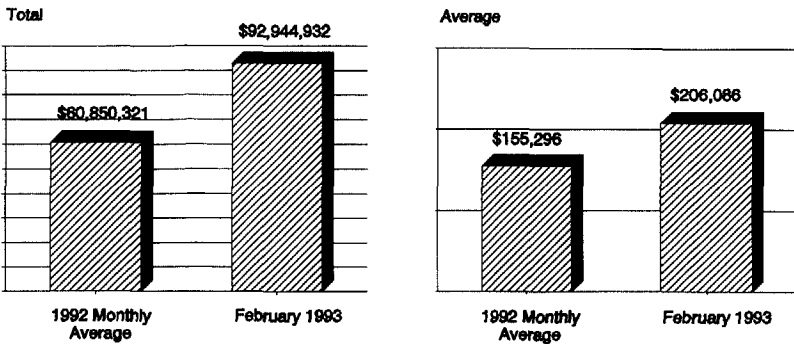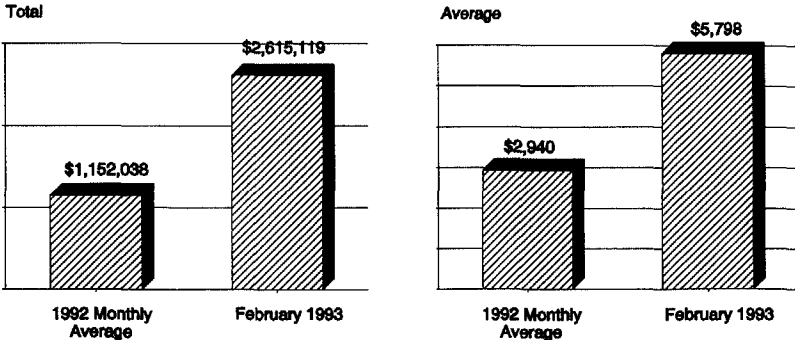### Face Amount

Total
$92,944,932
$80,850,321

1992 Monthly
Average

February 1993

Average
$206,086
$155,296

1992 Monthly
Average

February 1993

CHART 3
1992 First-to-Die Sales Survey
Premium

Total
$2,615,119
$1,152,038

1992 Monthly
Average

February 1993

Average
$5,798
$2,940

1992 Monthly
Average

February 1993

The breakdown between universal life, par whole life, and interest-sensitive whole life, for 1991 is very similar to what is being shown here in Chart 4 for 1992. Most of the policies from a count standpoint are universal life or interest-sensitive in nature for first-to-die products, but there has been an increase in the number of participating whole-life writers.

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CHART 4
1992 First-to-Die Sales Survey
Annual Product Sales

Policies

Face Amount   Premium

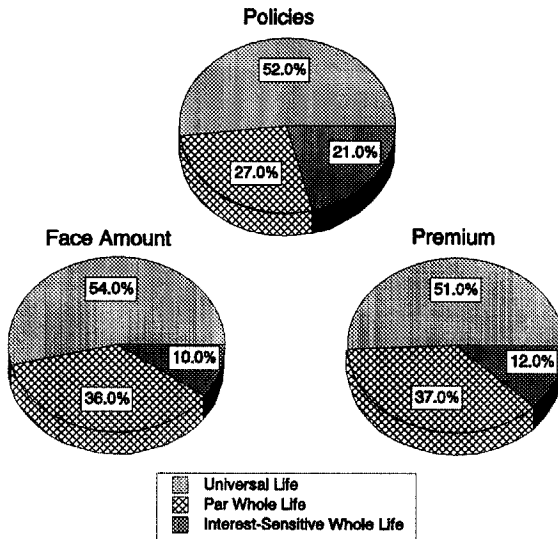|	Universal Life
	Par Whole Life
	Interest-Sensitive Whole Life

Chart 5 shows the breakdown for the most recent month of February 1993 between universal life, par whole life, and interest-sensitive whole life, for number of policies, face amount, and premium.

We have some results from our last-survivor sales survey. This market has been in existence for a little bit longer than the first-to-die market. The number of policies sold in 1992 was about 22,000. In 1991, there were about 23,000 policies sold. For the face amount, we broke down policies sold, where there is just a base-policy coverage (which excludes the last-survivor riders), and then the total face amount, including last-survivor riders (Table 2).

The preponderance of policies in this marketplace are participating whole-life policies, and the top five companies seem to have most of the business being produced in this marketplace, which is why we make a distinction between including and excluding last-survivor riders. The purpose for the riders on these policies is to help leverage the premium at the point of sale. The average policy size with riders is a bit more than $1 million, and it is a bit less than $1 million without riders. The results for 1991 showed that the average policy size was about $1.3 million with riders and just about $1 million without riders.

CHART 5
1992 First-to-Die Sales Survey
February 1993
Policies

Face Amount   Premium
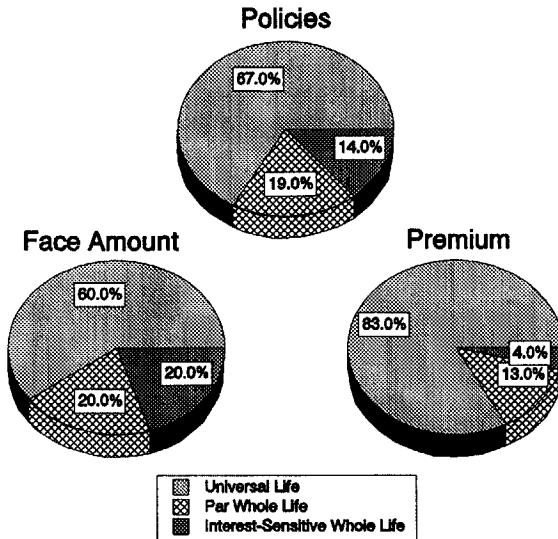
Universal Life
Par Whole Life
Interest-Sensitive Whole Life

TABLE 2
1992 Last-Survivor Sales Survey

	Number of Policies Sold	Face Amount ($00)	
		Including Last-Survivor Riders	Excluding Last-Survivor Riders
Totals	21,758	$25,146,971	$14,605,720
Average per policy		1,156	671

The total premium income generated in 1992 was about $565 million (Table 3); in 1991, it was about $550 million, with average case sizes running about $25,000-26,000.

TABLE 3
1992 Last-Survivor Sales Survey
Premium ($000s)

	Ongoing	Lump Sum	Total
Totals	$420,549	$145,114	$565,663
Average per policy	19	7	26

Chart 6 shows new premiums written in the marketplace for each year since 1988. The premium income has been growing from about $100 million in 1988 to $566 million for 1992. For the last couple of years, the new premium income in the industry has been rather static.

CHART 6
1992 Last-Survivor Sales Survey
New Premiums Written

(Millions)
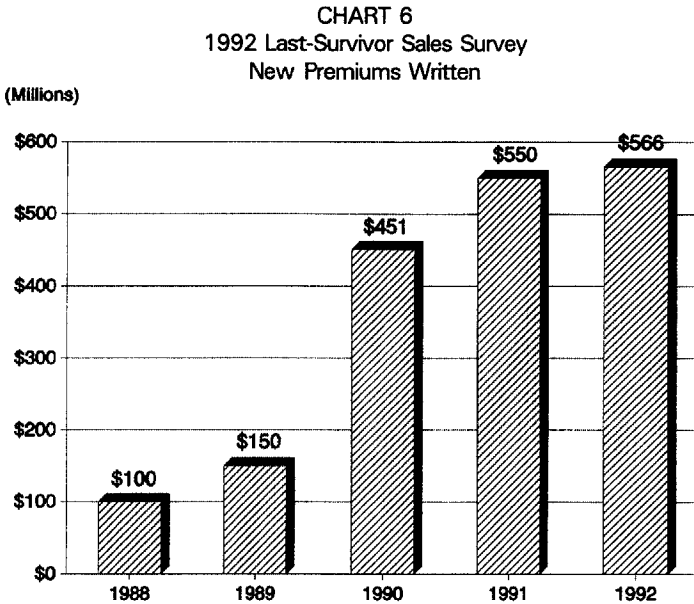
All figures are estimates based on sales surveys.

Chart 7 shows a breakdown between 1991 and 1992 of premium and face amounts. The top five companies in this marketplace are producing a significant amount of business. We've also broken it down to show you the second five companies and then all the others that have responded to the survey.

Chart 8 shows the distribution of the total death benefits broken down between the base policy and rider for the top five companies, the second five, and all others.

One important statistic that we've captured with the survey are the not-taken ratios (Chart 9). With the last-survivor marketplace, a significant number of the policies are shopped because of the involvement of lawyers and accountants in the decision-making process, so companies are experiencing, on average, about a 25% not-taken ratio. One company responded with as high as a 34% not-taken ratio.

Chart 10 involves policies with at least one person that has been rated; the last-survivor marketplace is very keen to this. One company had as many as 90% of the cases with an impairment, but on average, about 30-32% of the policies have at least one person with an impairment.

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CHART 7
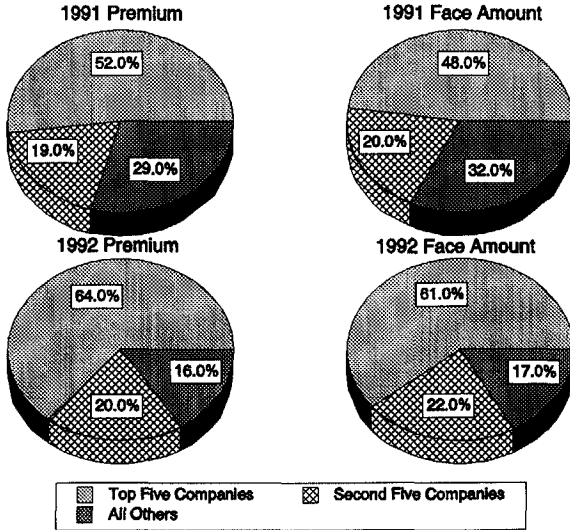### 1992 Last-Survivor Sales Survey
Relative Market Share

1991 Premium

52.0%
19.0%
29.0%

1991 Face Amount

48.0%
20.0%
32.0%

1992 Premium

64.0%
16.0%
20.0%

1992 Face Amount

61.0%
17.0%
22.0%

▨ Top Five Companies ▨ Second Five Companies
■ All Others

CHART 8
1992 Last-Survivor Sales Survey
Distribution of Total Death Benefits
Top Five Companies

55.0%
45.0%

Second Five Companies

65.0%
35.0%

All Others

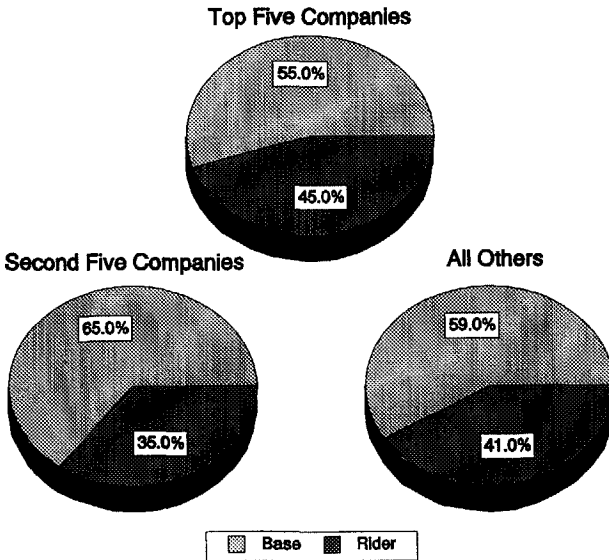59.0%
41.0%

▨ Base ■ Rider

CHART 9
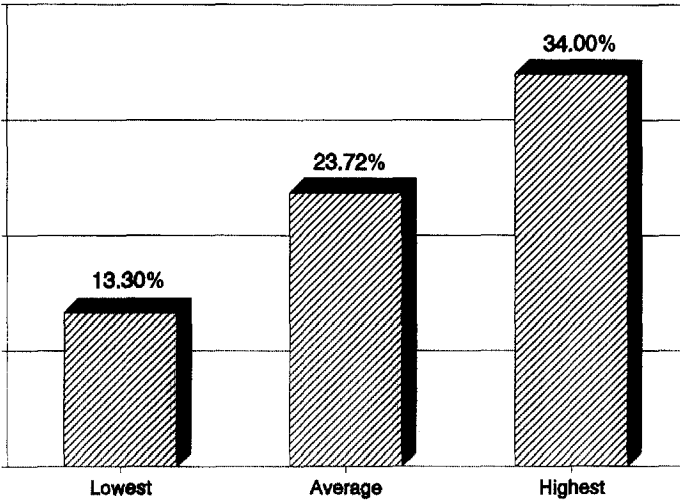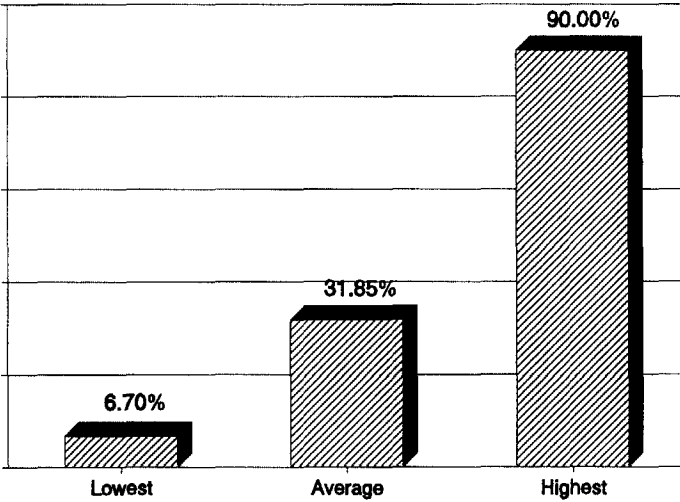1992 Last-Survivor Sales Survey
Not-Taken Ratios

CHART 10
1992 Last-Survivor Sales Survey
Policies With At Least One Life Rated

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For the last four and a half years, Stu has worked at Phoenix Home Life Insurance Company in the individual life and product development areas. He's worked on the design, pricing, and policy-form filing of traditional, participating, first-to-die products, as well as their traditional, participating, second-to-die products. He is also very familiar with the design and pricing of universal life first-to-die products. Prior to working at Phoenix Home Life, Stu worked for six years at Connecticut Mutual in the individual-life product development area. Prior to Connecticut Mutual, he worked for six years at Travelers. Stu will now present his perspective of first-to-die products.

MR. STUART KWASSMAN: The joint first-to-die product provides for the payment of the face amount of coverage upon the first of the insureds to die, where coverage is provided for two or more lives. After the insurance payment is made, the policy terminates without further value. Premiums are payable during the joint lifetime of the insureds. This describes the basic structure of the joint first-to-die product. Other variations may be found in the marketplace.

The primary reason for developing this type of product is to reduce the gross premium, relative to what would otherwise be charged, by using multiple, single-life policies covering the same insured lives. Consumers nowadays are seeking shorter-term, lower-cost, and more flexible insurance products. The premium requirements are presented under a joint first-to-die policy as compared with the sum of multiple single-life policies with the same amount of insurance on identical insureds.

Table 4 is based upon two insured lives, where the premium requirements on the joint policy are approximately 21% less than that on multiple, single-life policies. Of course, the internal rate of return to a policyholder upon surrender in 20 years is not as good under the joint first-to-die policy, due to a smaller investment being made on the joint policy with relatively greater insurance costs. The internal rate of return upon death is better for the joint policy, due to the smaller investment in the contract.

TABLE 4
Comparison of Policyholder Cost
Joint First-To-Die and Multiple Single-Life Policies
Two Insured Lives
Both Insureds: Male/35/NS

	Joint First-To-Die Policies	Multiple Single-Life Policies
Premium	$7,002 (79%)	$8,890
Internal rate of return cash value @ 20 years	−0.3%	3.5%
Internal rate of return death benefit @ 20 years	16.5%	15.7%

Table 5 is based upon three insured lives. In this case, the reduction in premium for the joint policy is even greater than the two-life case, at a premium savings of 28% over that from multiple, single-life policies. Now, the internal rate of return to the policyholder upon surrender is even less, relative to the multiple, single-life policies.

TABLE 5
Comparison of Policyholder Cost
Joint First-To-Die and Multiple Single-Life Policies
Three Insured Lives
Each Insured: Male/35/NS

	Joint First-To-Die Policies	Multiple Single-Life Policies
Premium	$9,570 (72%)	$13,335
Internal rate of return cash value @ 20 years	-1.4%	3.5%
Internal rate of return death benefit @ 20 years	14.1%	13.3%

Table 6 is based upon four insured lives. In this case, the reduction of premium for the joint policy is even greater than that in the three-life case, at a savings of 33% over that from multiple, single-life policies. The internal rate of return to the policyholder upon surrender is even less favorable than the two- and three-life cases relative to the multiple single-life policies. So, as you can see, savings and premium requirements in the neighborhood of 25-35% are not unusual.

TABLE 6
Comparison of Policyholder Cost
Joint First-To-Die and Multiple Single-Life Policies
Four Insured Lives
All Insureds: Male/35/NS

	Joint First-To-Die Policies	Multiple Single-Life Policies
Premium	$11,954 (67%)	$17,780
Internal rate of return cash value @ 20 years	-2.4%	3.5%
Internal rate of return death benefit @ 20 years	12.3%	11.8%

To gain the perspective as to why the first-to-die policy requires less premium than multiple, single-life policies for coverage provided only upon the first death, consider what monetary value the first-to-die product provides after the first death; the answer is nothing. Multiple, single-life policies, on the other hand, will still provide the cash value of the remaining policies on the surviving insureds. It is the present value of these remaining cash values upon first death that effectively reduces the cost of the first-to-die product relative to the single-life plan. Note that, if the first-to-die and single-life plans were term policies, the present value of such savings would effectively equal zero, since there wouldn't be any remaining cash value on first death.

JOINT, FIRST-TO-DIE PRODUCTS
Joint, first-to-die product designs are typically based upon some degree of cash-value buildup. Joint, first-to-die term products have very little marketability, if any value at all, in providing reduced premium amounts for a consumer. The mechanics of the

first-to-die product that primarily provide the means by which the premium can be reduced is due to the sharing of the cash value, thus reducing the net amount of risk and the cost-of-insurance charge for all insureds combined. Without this feature, any significant reduction of premium would not be possible. As stated earlier, there is virtually no difference in cost between first-to-die and multiple single-life term plans.

MARKETS FOR THE PRODUCT

This product is designed for use in both the personal and business markets. In the personal market, it may be desirable for use in two-income households, where death-benefit protection may only be needed upon the death of either insured, but not necessarily for both insureds. For example, a husband and wife who are both gainfully employed may require life insurance coverage to pay up a mortgage on their house if either life were to die prematurely. However, insurance coverage may not be required upon a death of the survivor.

Another personal sales situation is where lifetime insurance coverage is desired for both insureds, but the initial cost to provide that coverage is relatively too high. In such a situation, the first-to-die policy could provide a lower initial premium than that of two single-life policies; and, if combined with a guaranteed insurability rider, could provide lifetime insurance protection on both lives.

The third use for the product in the personal market is what has been referred to as joint-pension maximization. Under this approach, instead of both the husband and wife each electing a joint-and-last-survivor annuity option under a company pension plan upon retirement, each would elect a single-life-only annuity, which provides higher income when both are alive. A portion of the difference between what the couple would have received after the first death of the joint and survivor annuity option and what they'll receive under the life-only option is deposited into a joint first-to-die policy. The proceeds from the policy upon first death would provide the survivor with income, as if the joint-survivor annuity option were selected.

In the business market, in buy-sell arrangements, the surviving partner or partners will need additional cash to purchase the interest of the business from the decedent's estate upon the death of the business partner. The cost to provide such coverage could be kept to a minimum by using a first-to-die policy. Once again, a guaranteed insurability rider could be attached to the policy to provide a continuation of coverage for the surviving insureds. In the business market, the product also may be used in key-person sales situations at a lower premium than by using multiple, single-life policies.

PRODUCT DESIGN ISSUES

What about traditional participating versus fixed, flexible universal life (UL) design? Most companies' first-to-die products on the market are structured as either a fixed or flexible premium universal-life-type design as opposed to a traditional whole-life design. This is the case primarily because the UL-type design provides for much greater flexibility in terms of pricing and administration of multiple-life contracts, especially when the number of insureds permitted is greater than two lives. The UL-type contracts on the market oftentimes provide for coverage for up to 5-8 or even 10 lives. A UL design lends itself more easily to expanding the number of covered insureds permitted under the contract.

A traditional, participating whole-life design, on the other hand, would typically provide for only two insured lives. The pricing of the traditional product involves setting the dividend scale based upon the risk-class combination of insureds. One of the major problems in trying to accommodate more than two insured lives under a traditional plan, using an exact-age approach, is the enormous number of dividend-scale factors that must be priced and stored. The process of pricing every quinquennial risk-class combination based on sex, smoker or nonsmoker, and age is equivalent to pricing and storing dividend factors for over 1,100 risk-class combinations. For three insured lives, the number of unique combinations increases to more than 19,000.

A number of companies will elect to use joint equivalent age as opposed to exact-age computations in developing this type of product. One obvious advantage of using a joint equivalent-age design is that the pricing is simpler and rate manuals are easier to produce, since you don't have to concern yourself with a large number of risk-class combinations. However, deriving the formula used to determine the age adjustments necessary to form the appropriate joint equivalent ages requires a great deal of analysis and trial and error. The major advantage of working with exact-age computations is that you'll not need to concern yourself with the task of developing an appropriate joint equivalent-age formula. Also, joint equivalent-age formulas may result in some unintended product-performance nuances that are difficult to overcome for all situations. In addition, it is not clear whether joint equal age is an acceptable approach under Section 7702 reasonable mortality rules.

UNEQUAL DEATH BENEFITS
One primary design consideration of these types of products is whether to provide for unequal amounts of death-benefit coverage, depending upon which of the covered insureds is the first to die. The need for unequal amounts of coverage is present in both the personal and business markets. In the personal market where a husband and wife have significantly different amounts of annual income, the individual with the greater income most likely is the life upon which greater coverage would be desirable. In a business buy-sell situation, where the business partners own unequal shares in the business, coverage would typically be desired based upon that unequal share amount.

Will the unequal amounts of coverage be provided for directly by the basic policy or by policy rider? In a UL-type design, it may be possible to produce a more cost-efficient product by providing for the unequal amounts of coverage in the basic policy. The basic policy could automatically reflect necessary death-benefit corridors specific by insured. Under a traditional policy, the term rider is the only means of providing for unequal amounts of coverage.

FORM-FILING CONCERNS
The preparation and filing of the joint first-to-die policy form is not much different from that of a single-life policy. Obviously, changes are made throughout the contract to recognize that death proceeds are payable upon the first of the insureds to die, at which time the policy terminates without further value. It is important that it is made very clear in the policy form that the contract will terminate after proceeds are payable upon the first death.

Another issue that must be addressed in the filing preparation and design is the presentation of the policy schedule pages. This becomes especially cumbersome under a UL-type design, where the number of insureds permitted under the form can be as great as eight or ten lives. Where do you place all these insureds in the risk classifications on the schedule pages without the pages getting bogged down by all of this data? This will require a significant degree of planning and coordination with the new business unit of your company. Also, you will need to decide whether the guaranteed cost-of-insurance rates should be presented for each individual insured or as a blended rate.

Another concern is the modification that must be made to the application form to accommodate a multiple-life sale, especially when more than two lives are permitted. This will be the only plan of insurance that offers coverage on so many lives and will disrupt the normal make-up and processing of the application form.

Another issue that must be resolved is that which results from simultaneous death. Will the basic policy form provide for multiple benefit payouts upon simultaneous death? If so, how many payouts will it provide if, for example, three insureds died simultaneously? Although this would be a rare occurrence, it must be addressed in the policy form.

ADMINISTRATIVE AND PROPOSAL SYSTEM CONCERNS
Administrative and proposal systems that did not provide for any multiple-life-type policies, such as a survivorship policy, will need to undergo careful analysis to appropriately plan for the additional input and output that will become necessary under a multiple-life plan. If a survivorship plan already exists, this will help a great deal, especially if the first-to-die policy only allows for two insured lives. For those first-to-die plans that permit up to five, eight, or even ten lives, the administrative and proposal systems will need to be designed based upon this requirement, even though very few cases will be sold on so many lives.

Both the administrative and proposal systems will need to produce reports that display all of the insureds' names and risk classifications, multiple columns of death-benefit output, possibly depending upon which of the insureds is the first to die, and stating which riders are applicable to which insureds. And next, the policy record will need to reflect all of this multiple-life data. Careful design will also be required to make it less confusing to those who enter data for the issue system.

The mechanics of the various riders and their interaction with one another, especially when more than two insureds are permitted, can become very complicated. It doesn't matter if most of the case sizes involve only two lives, because you will still need to address the large number insureds type case, which will undoubtedly drain resources.

SUBSTANDARD RISKS
There are two basic methods for handling table-rated substandard risks. One method is used with the traditional products, and a second method is used with a flexible-premium UL-type design. Fixed-premium interest-sensitive designs may use either approach.

For a traditional first-to-die product, the method used would be to increase the gross premium by a flat amount, either for life or for the later of 20 years and when the insureds attained age 65. The amount of the increase could be a percentage less than 100% of that used on a single-life policy. The percentage selected may vary by issue age of the insured or be related somehow to the other insured life's issue age and rating. The substandard flat extra needs to reflect the joint-life expectancy of both insureds, assuming both insured lives are standard as compared with the actual ratings of the insureds. Some degree of analysis, including the running of substandard asset shares, will be required. In the end, it will be very important to keep the percentages and the formula used relatively simple, especially since your proposal and administrative people will have enough other issues to worry about.

For the flexible-premium UL-type designs, the process will be much easier. In fact, it will be similar to what is currently used with single-life plans. Typically, the single-life cost-of-insurance rate will reflect the substandard rating directly. The substandard rate will usually equal the standard cost of insurance rate plus a factor times the standard or smoker cost of insurance rate. After the cost-of-insurance rate for each life is determined, the rates are blended. Thus, the blended costs of insurance rates will automatically reflect any substandard rating. This is very convenient, because it will automatically be reflected in the computation of the commissionable target, minimum target, and guideline premiums.

I suppose a third method can also be used if the product uses joint equivalent age. The joint equivalent-age formula could reflect a table rating for each insured life. I would think a word of caution would be wise here, however, because this method may present problems under the Section 7702 definition of life insurance.

SIMULTANEOUS DEATH
Due to the design of the product, you will need to decide whether multiple payouts will be made upon simultaneous death. The monthly insurance charges that are being assessed usually do not reflect the cost of providing for multiple payouts upon simultaneous death, because the monthly charge is based upon the net amount of risk applicable to each insured, plus a payout of the cash value upon death. Arguably, the policyholder pays for the net amount of risk for each insured life and should be paid multiple times upon simultaneous death. The cash value should only be paid out once, however.

The simultaneous-death payout feature may provide coverage on all lives or just, say, coverage of up to two or three lives. There may be age limitations in effect or a reduced amount payable upon simultaneous death of an older insured.

The amount paid out on simultaneous death will be an important product feature, because most of the first-to-die products on the market offer some degree of multiple payout upon simultaneous death. The chances for simultaneous death are so very small that many companies want to offer this feature automatically, because it provides greater marketability for the product at little additional cost. It must be decided how much benefit would be provided under simultaneous death of more than two lives. If it is decided to provide multiple payouts, catastrophic reinsurance coverage may be desirable.

The structure of the simultaneous death coverage will also be important. Will such coverage be provided under the basic policy form by rider or by administrative practice? If it is provided in the contract, it will need to be made clear how much payout is provided, and care must be taken to ensure that payouts are not inadvertently provided for in both the basic contract and in a rider form.

RIDERS AVAILABLE/TERM-INSURANCE RIDER
The term-insurance rider provides for varying the amount of benefit payable depending upon which of the insureds is the first to die. The term rider, however, is offered more as an accommodation, because the term rates under the rider do not provide much in terms of cost savings to a consumer by being made available on a first-to-die basis. In other words, as stated earlier, a first-to-die term product is approximately equal in cost to the sum of single-life term products. Thus, the more term-insurance coverage being provided under a first-to-die policy, the less the savings that would result, relative to the sum of multiple single-life policies.

For traditional participating policies, many companies now offer a combination paid-up-additions and term rider, where the amount of term insurance under the rider decreases as the face amount of the paid-up additions increases. Under the traditional first-to-die policy, the paid-up additions being provided for are first-to-die paid-up additions. The process works the same way as for a single-life policy, but operates more efficiently if both insureds are being provided the same target face amount of coverage. Some companies with such products will only offer such a rider with equal target face amounts.

Under a UL-type design, the term rider is fairly straightforward. Limits on maximum ratios of term-insurance coverage to basic policy face amount are usually set. Some companies permit term coverage to maturity of the basic policy, and other companies limit coverage to an insured's attained age, such as 65 or 70. Sometimes these riders are convertible.

SURVIVOR INSURANCE PURCHASE OPTION RIDER
The survivor insurance purchase option rider permits the policyholder, on the first death, to purchase additional insurance coverage on the lives of the surviving insureds without evidence of insurability. This is effectively a means whereby insurance coverage is continued for the surviving insureds. Some companies allow the policyholder to increase coverage upon the first death by up to three times that under the original first-to-die policy. The new policy is based upon attained-age rates. Usually there will be a 60- or 90-day grace period during which the policyholder would have time to decide whether to buy a new policy.

Some companies will build the cost of this rider directly into the pricing of the basic policy; that is, the rider would be provided at no additional cost. Other companies have an explicit charge for the rider. The cost of the rider is dependent upon the amount of additional coverage being provided by the rider, as well as to what age or for how many years the rider will provide coverage. For example, a survivor insurance purchase option rider under our contract would provide coverage until the oldest insured has attained age 75. At such time, if a first death has not occurred, the rider will terminate without value. Thus, in order for the policyholder to be able to utilize benefits under this rider, a first death would have to occur before the oldest insured

attains age 75. In fact, this limitation is what keeps down the cost of the rider. A guaranteed insurability rider would be quite expensive if you provided coverage until the maturity of the contract, because the first death would be almost a certain event and would result in the offering of a standard policy without evidence of insurability, which has considerable cost at the higher ages.

Many companies provide rider benefits until the oldest insured attains age 75 or 80, or until each insured attains age 75. In setting the rates of this rider, although it may be desirable to recognize the interaction of the risk classifications for all the insureds, it would be too complicated to use and, therefore, impractical. Therefore, the pricing is performed based upon the insureds being of equal age in this classification. From there, testing would be undertaken to assure that a conservative posture was taken. The charges for the rider can then be set as the sum for all insureds of the product of the number of units of coverage multiplied by each insured's single-life rate.

POLICY-SPLIT OPTION RIDER
The policy-split option rider permits the policyholder to split the first-to-die policy to multiple single-life policies. Usually limitations exist as to how the split may be made, such as an equal split by face amount of coverage. Sometimes a processing charge is assessed at the time of the option, but some companies will opt not to charge for the split. The sum of the face amounts of the new policies must be no greater than that of the original policy. Some companies will permit, however if the survivor purchase-option rider is in effect, a split, such that the face amount of coverage for each insured under the new single-life policy will be equal to that under the original policy. Usually the split will be on an original-age basis.

Administratively, this could be a somewhat complicated procedure. On a traditional policy with tabular cash values, the process is not all that difficult. A reconciliation is made at the time of the policy split, resulting in either a refund or charge to the policyholder. Under a UL-type design, it may be difficult to implement the split on an original age basis, unless the administrative system is able to permit the input of policy values. It is desirable to make the exchange on an original-age basis to preserve the surrender-charge period. Otherwise, the exchange of policies could be undertaken on an attained-age basis. Of course, this method could result in future complaints from policyholders, because the surrender-charge period would then start anew.

The policy-split option is more commonly used than you might expect. It is used in the case of divorce, separation, business partners splitting up, or any reason whatsoever. There are no limits for what the option may be used. It is commonly used when an agent sells a first-to-die policy, and the policyholder later changes his or her mind as to what plan of insurance is right. He or she may later realize that, although there is a savings in gross premiums, the cash-value buildup and return on investment, assuming that the insureds live to the end of the observation period, is not as good as that under multiple, single-life policies.

ADDITION, DELETION, OR REPLACEMENT OF INSURANCE RIDER
This rider permits the policyholder to either delete, add, or replace one or more insured lives. This rider is of particular interest in the business market, where business partners or key employees are replaced by other individuals. The need for the rider is

to preserve surrender charges in the remaining surrender-charge period, as well as minimize any inconvenience to the insureds who will continue to be provided coverage under the first-to-die policy.

Although it is not entirely clear, there is strong reason to believe that an addition, deletion, or replacement of an insured would be considered a taxable event. This may not be of much concern in the early policy years, where there would be little, if any, gain in the contract. There may be administrative charges to process the addition, deletion, or replacement of the insured.

DISABILITY BENEFIT OR WAIVER RIDER
The benefits under a disability-benefit rider differ by whether the basic contract is a traditional plan or a flexible-premium UL plan. A fixed-premium interest-sensitive UL plan may use either approach.

Under a traditional policy, the disability-benefit rider will waive the gross premium upon the total disability of a covered insured. Even if more than one covered insured is totally disabled, the same premium is waived.

Under a UL design, the benefit under the rider is the credit of a specified amount to the policy value and/or a waiver of monthly deductions. If more than one covered insured is totally disabled, only one credit of a specified amount and/or a waiver of monthly deductions will be made.

When there are more than two insureds, the computation of the charges associated with the waiver of monthly deductions can become complicated, because the benefit waived is monthly deductions on the entire policy, including charges for other rider coverages on all insureds. The waiver charges for one insured have an impact on the waiver charges for other insureds.

Product designs differ as to which insureds are provided disability coverage if the rider is elected. One design permits the applicant to select which insureds are to be provided rider coverage, allowing picking and choosing. Another design requires that all insureds be provided coverage if the rider is elected.

THE CHILDREN'S PROTECTION RIDER
Another rider used with a first-to-die contract is a children's protection rider, which provides term coverage on the children of the primary insureds. This rider is of particular interest in the personal market.

There are pricing issues associated with the first-to-die product. The mortality assumption used in the pricing of these products is the same as that used in the pricing of single-life policies with appropriate blending of the rates.

PERSISTENCY
We use lapse rates similar to those used in the pricing of single-life plans. Our lapse assumptions vary only by policy duration, so that the mix of insureds does not complicate the setting of the assumption.

EXPENSES
The major additional expense over that of a single-life policy is the cost of underwriting multiple insured lives. Underwriting costs may be even higher than the sum of those under single-life policies, because if only one life is uninsurable or highly rated, the case may be shopped and a higher not-taken rate may result. Otherwise, the expense assumptions are fairly similar to those under a single-life plan. Sometimes commission rates are reduced for first-to-die plans to minimize the necessary premium.

SECTION 7702, DEFINITION OF LIFE INSURANCE
Guideline premiums, as described under Section 7702, do not explicitly state what to do in the case of multiple-life plans. Most companies, I believe, have followed reasonable extensions to the formulas which apply to single-life plans.

The current proposed regulations would tend to present a major problem in complying with the guideline premium test. The proposed regulations provide 1980 CSO as a safe harbor, but only for use in single-life plans. The thinking behind this proposal was to address the investment-oriented nature of survivorship plans. It is totally inappropriate for first-to-die plans, which are even less investment-oriented than single-life plans. Without the 1980 CSO safe harbor, the computation of guideline premiums would be based upon current mortality rates, which would tend to reduce the guideline premium limits significantly, and on traditional policies would force cash values to a level below the minimums permitted by state regulators.

The IRS has indicated that, in denying multiple-life contracts, the 1980 CSO safe harbor was intended to apply to last-to-die contracts only as final regulations will probably grant 1980 CSO safe harbor to first-to-die contracts.

AUTOMATED PRICING
The final subject that I will cover is what I refer to as automated pricing. Suppose you've been asked to price a traditional participating first-to-die product on an exact-age basis. The number of unique quinquennial risk-class combinations is approximately 1,100. The question is, how do you proceed to price such a product and produce internal product-performance consistency and still maintain equity with other plans? The answer, I believe, is to automate the pricing process. We were able to develop such a process at Phoenix Home Life by utilizing our homegrown asset-share program. In effect, the asset-share model has to be flexible enough to recognize a range of profit objectives and product-performance objectives provided to a consumer. The objectives have to be provided to the model with a large enough range of acceptability so that conflicting objectives could still be resolved interactively by the computer model. If the acceptable range is set too small, the model will not be able to solve. In addition, however, the range has to be made small enough so that senior management will find such results to meet its criteria.

One of the greatest benefits of the automated process is that, when you've completed the pricing process and examine the asset-share results, the profit margins for any cell are almost identical to any other cell. No longer do you obtain odd results at risk classes that are oftentimes overlooked, such as older-age female smokers. If you were to try to achieve these pricing results manually, through a trial-and-error process, it would probably take you about a year of continuous work to complete, at which

time senior management would probably alter its commission scale on you, and you would have to start all over again.

The asset-share model takes about four or five hours to price 1,100 distinct cells on a 486-50 megahertz personal computer by using APL. This has been a tremendous timesaver for us.

MR. STERN: Our next presenter is Richard Payne. He is with Genesis Development Company. Richard has ten years of experience in the insurance marketplace and has worked extensively on the development and pricing of U.S. and Canadian insurance and annuity products during that time. Prior to joining Genesis Development Company, Richard developed Manulife Financial's first 1980 CSO survivorship policy and has considerable experience with both participating and UL product designs. More recently, he has focused on asset/liability issues from both a product design and corporate modeling perspective. Richard joined Genesis Development Company in 1992 and is currently working on a variety of unique life insurance and annuity products targeted for the U.S. marketplace. Richard will now present his perspective on last-survivor products.

MR. RICHARD C. PAYNE: The topic is survivorship insurance. And I guess the best way to frame this is to imagine that you're sitting, taking an actuarial exam, and the following question has been asked: The CEO of the company has called you into his or her office and wants you to design a survivorship product by next week. What should you think about before rushing off to do this?

You first need to think about the survivorship marketplace as a whole, as it exists right now and how well the survivorship marketplace fits in with the objectives of your carrier or vice versa; what the key competitive measures are in that marketplace, so that you focus on the right things in your product development process; what the product-design process works out to be and how it differs from single-life product development; and what some of the emerging trends in the survivorship marketplace are.

The first thing you have to know, and this was brought out by the data that Larry presented earlier, is that the survivorship market is very different from the single-life marketplace in that it has a much larger average-size policy. All your unit expense assumptions are going to be different. You need to pitch your marketing material differently than you normally do. You're dealing with affluent consumers and, especially, you're dealing with their advisors; so there's no such thing as kitchen table survivorship sale. By the time you actually get the policy sold, you can guarantee it will have been spreadsheeted against the competition. The lawyer will have looked very carefully at your wording; the accountant will have taken a look at his favorite competitive measures to see how your company stacks up as far as financial stability. It's not anywhere near as straightforward a sales process as you may be used to in a single-life sale.

The price competition in this marketplace is very keen. As you can see from the material that Larry showed you earlier, at any one time there tends to be a few top companies in this marketplace and over time they change. But, at any one time, the ones that are selling the most survivorship are the ones with the hottest rates, and

that is just a fact; there's a lot of brokerage in this marketplace. Obviously, because of the nature of the survivorship sale, where it's an estate-planning sale through and through, for the vast majority of cases you're dealing with older aged couples; you're dealing with more underwriting issues than normal. When you take a look at all those things together, you can see that to go through and take a look at what happens if we do a couple of 35-year-olds is not going to be relevant, and your $100,000 face amount is not relevant either, you really look at what's different about this marketplace.

Now given that, how does it fit with the objectives of your carrier? First of all, are the target markets of your carrier and the survivorship market anywhere close together? Is there any reasonable chance that what you can sell in the survivorship marketplace has anything to do with what you've shown yourself to be good at selling in the past?

How will survivorship fit in with your distribution system? If your distribution system is not prepared to deal with the level of financial expertise the clients and their advisors are going to be bringing, then there's very little chance that you're going to be selling anything. You may develop a technically excellent product, but it won't be able to make it through the sales process. So that's why you need to think very seriously about the business volume that you're going to get in this marketplace. And, you can't fool yourself, you can see that the top carriers dominate the market; they have the majority of the market share. So, if you're going to be developing survivorship, you're swimming against a pretty fierce tide.

The underwriting approach that you need to look at is that a large number of survivor-ship cases are rated relative to single-life coverage. The industry likes to talk about the fact that 93% of cases are placed as standard cases. I don't think that's the percentage for survivorship. So, given that you do want to create a survivorship product, what are the key competitive measures you need to look at? Cash to vanish is obviously an important one, but another that tends to be favored by accountants, and you probably know about this, although it's a little artificial, is internal rate of return on death at 80 CSO life expectancy. This is a pretty simple model of the mortality table. We've all heard about the squaring of the mortality curve, but this is an extreme case. Everybody lives to the life expectancy and that's it. So that's how you're going to have to design your product to compete.

You need to look at agent compensation. The fact is that agent compensation is going to be a factor in the sale, both in terms of comparing the kind of commission that you can pay against what other companies are paying and in terms of how much flexibility you have to riders. So that's going to be an important point.

There's minimal emphasis on cash values in this market. If you're taking a look at 20-year returns on cash or something like that for survivorship, that is typically not a measure that clients care about. These products are bought to be placed in an irrevocable life insurance trust, and there is usually no intent that they're ever going to access the cash. They're buying the product for the death benefit. There are some business cases where survivorship is sold on a split-dollar basis, and there you are going to have to worry about how much cash you have when it comes time to roll

out the policy to avoid the vast increase in the economic benefit that's imputed because of the term coverage.

You need to set your product objectives when you're starting your product development process. You need to determine your pricing assumptions, develop a first design of the product, get feedback from all the different stakeholders in the process, and then finally decide on a marketable product. Setting your objectives is going to involve taking a look at your sales targets; what you can reasonably achieve there and how that impacts your unit cost. Who are the credible competitors? You will probably not be able to realistically formulate an objective that you're going to be number one at every age combination in every case; that's not likely. So you need to look at that.

DISTRIBUTION OBJECTIVES
How well does this fit in with your distribution system? Are you asking them to do something that they're just not equipped to do? What kind of profitability targets does your company have? These vary from carrier to carrier, but they can have an effect. What kind of perceived value can you add to the product to make it other than a commodity sale? You want to have something that provides enough perceived extra value in the product that it's going to help counteract some price competition.

The pricing assumptions that you need to look at are generally different than what you'll have in single life. You need to look at your lapse assumptions, your interest rates, and you need to take the duration of the business into account; what kind of mortality can you expect on survivorship, the expenses versus single life? There are some miscellaneous pricing assumptions as well.

Lapses on survivorship historically have been very much lower than on single life. Part of that is because of the sales process. By the time somebody actually ends up buying a survivorship product, they've been around with a few carriers, they've been around what their financial objectives really are. These products, when they're sold, tend to be sold to someone who knows exactly what they're buying and why. Part of the reason is the target market. The ages of the people that these products are being sold to imply that you're not going to see a lot of business moving every year like the old select YRT products. People are not going to get reunderwritten periodically to move their survivorship contract.

A lot of the lapse experience available was gathered before the growth of the universal life and variable designs that are becoming more popular as time goes on. So you may need to take into account the fact that there were not the same opportunities to replace business that may exist today.

Finally, there are interest rate cycles. Survivorship has been undergoing its greatest boom during a time of declining interest rates. Whether lapse rates would continue to remain low if interest rates suddenly spiked is anybody's guess. I suspect not. For interest, you need to take a look at your average-versus-new-money philosophy. You may have an average-money philosophy in your portfolio, but the amount of single premium that you may get in on survivorship may force you to consider this very seriously. You need to look at the cash-flow characteristics of both the base policy

and any dump-in riders. Survivorship is probably your longest insurance liability; taking the low lapse rates that we've experienced so far, together with the vast deferral of mortality, result in a very, very long liability. You probably want to invest accordingly.

For mortality, you need to look at a number of different factors. You can, obviously, take your single life rates and put them together in a formula and come up with joint last survivor rates. But, you need to take a look at some other factors. You need to look at the joint accidental-death probabilities. You can get some idea of that from motor vehicle records. You need to look at what you expect the heartbreak effect to be. How much does mortality really go up for the surviving spouse? You need to think about differential lapses. The fact that most carriers are using a Frasierized design implies that they at least implicitly have assumed that all the lapse rates from the different statuses are the same. That may not be the case, and you might want to take a look at the impact. These are all factors that tend to increase mortality relative to just using the textbook approach.

But, there are two things that I think also lead to an improvement in the mortality assumption. One is the low lapses that have been experienced. Once again, this means that if you have been working with a single-life mortality table that has, for instance, a 7% underlying lapse rate implicit in it, then, if you're not getting those antiselective lapses on survivorship, you're going to have better mortality, even without imagining that there's going to be any projected improvements in mortality. And, the second point, given the target market that survivorship is being sold to, you have to wonder if there's any socioeconomic group that's going to benefit from improvements in medical care in the future. Who is it likely to be? It's probably the people who can afford to buy survivorship.

Your expense assumptions need to cover the standard product development and system development. There are a few wrinkles in the system development that you'll probably want to take into account. Underwriting and issue expenses will be higher than for single life, at least because you're underwriting two people. They're also older and tend to have more impairments. You need to look at your maintenance expense, and you need to look at your reinsurance costs.

There are some minor things that really don't fit in anywhere else: risk-based capital; the face-amount related factor. It is kind of odd that it doesn't vary by age even for single-life business, but for survivorship at the younger ages, the risk-based capital factor for net amount at risk is pretty high relative to your underlying q, so you may have a lot of contributable surplus, whatever you want to call it, that's related to that factor. You need to look at the impact of taxes; how they interact with the cash-value scale that you have on the product. And, finally, you might want to consider having higher retention for survivorship than for your single-life business.

So the first thing to do, having gone through these assumptions, is a first-cut design. The choice of chassis may be pretty easy with most carriers if you don't want to spend the money to develop a variable UL product. If you're a stock company, then it's pretty easy which design you're going to use.

Most carriers are using single-status cash values now. This tends to make the state-approval issues easier, and it certainly simplifies the administration.

You want to set your premium. For a UL design, that would be your target level. For a traditional design, you want to set the level, and you also want to set the pattern. Not all of the products that have been selling in the marketplace have had level premiums.

You want to take a close look at your guarantees and credited interest. I don't want to rehash sessions, but you might want to be thinking seriously about some of the guarantees that you may in the past have assumed would never kick in.

Obviously, there's a mine field here. How do you treat substandard lives for survivorship? There was a bit of a slinging match last year between companies and how to do this. I don't know what the correct answer is, and I'm not sure anybody does at this point, but you certainly want to take into account what the IRS has said so far.

So, from this first-cut design, you get feedback from all the different stakeholders: clients and their advisors, agents, your underwriting, administration, and systems groups, and, obviously, marketing, valuation, and financial. It's quite likely that valuation and financial may have some issues in trying to value this business for the first couple of years, but you can generally get around that with a couple of APL programs.

Having gone through a couple of iterations, you develop your final rates. This takes a little longer than you might expect. As Stu alluded to, you need to look at many different age combinations. You file your product, you develop your proposal system and marketing material, and you take it out to market. So you now have your survivorship product.

The next thing you need to think about is what to do for an encore. The demand outlook for survivorship is very favorable; it's hard to imagine that estate taxes are going to go down in the near future.

Variable products are beginning to become a force in the marketplace. It's a little bit early to say anything about that; we don't have sales results yet. At this point, there's a lot of euphoria about the stock market, but you will recall that it dropped sharply in October 1987. So, you might want to think about some kind of hybrid design where you have a variable product but with some kind of underlying guarantees that are meaningful to policyholders.

We all tend to think of survivorship as being the ultimate, complicated, agent-sold product. But it's not hard to imagine circumstances in which you might want to sell survivorship through a simpler, alternate, nonspecialist distribution channel. For example, if the unified credit was vastly reduced, or if it went away, more people would be interested in survivorship. You might want to think about whether you can efficiently deliver it to them by using your existing distribution system.

MR. STERN: Rob Reale began his actuarial career at Mutual Life Insurance Company of New York in 1978. After various rotations in group health, corporate actuarial, and

reinsurance, Bob settled in the individual life product area. For two and a half years, Bob was responsible for the actuarial support and direction of all new business and in-force illustration systems. In 1986, after Bob attained his Fellowship, he soon was reassigned to the individual-product pricing area as a product actuary. After support-ing the pricing efforts of various par whole-life product developments, Bob was responsible for the pricing and the implementation of a last-survivor whole-life plan. In 1989, Bob left Mutual of New York to become a marketing actuary for North American Reinsurance. And, in 1990, he was promoted to his current position as head of the marketing actuarial department, with responsibilities including review of pricing and establishment of pricing guidelines. Bob will now present his viewpoint on the reinsurance angle to multilife products.

MR. ROBERT J. REALE: We've heard about the pricing and design issues of both first-to-die and last survivor. Although I will present the reinsurance view here, I was, back in 1988, a pricing actuary who developed a last-survivor plan. The policy was a Frasierized participating whole-life plan, with the typical bells and whistles like one-year term and single-premium riders. There are four points of interest from that job I'd like to share with you.

The first point is on the mortality results to be expected. For the mortality pricing assumption, I assumed a slightly conservative mortality level for each life to recognize, to some degree, the contagion risk. After Frasierizing the rates, I assumed that during the life of the plan, mortality results would be as expected. From the reinsurer's perspective, people don't die off in bits and pieces, obviously. With the typically large face amounts or relatively few policies associated with last survivor, the year-to-year volatility of claim results can be quite high.

Second, I included a statement in the policy that asked that the insurance company be notified of the first death as soon as possible. Most last-survivor policy forms I have seen include a similar statement, so that timely investigations and appropriate contestability are still an option. Yet, I wonder how well we are being informed of the first death. Someone told me of a study conducted by a company to find out how many of its last-survivor policies were in a single-life status. It found more policies in a single-life status than expected. This study indicates that we may be giving away the contestability protection as well as being underreserved.

The third point is related to underwriting. In discussing the last-survivor product with the company's underwriters, one underwriter asked if the older life really needed to be underwritten, because the younger life would probably live longer. I stressed to these underwriters that the assumed mortality counted on normal underwriting of both lives. I mention this to point out that the practices adopted by an underwriting department should be known, either informally or formally, and reflected in the mortality rates and also communicated to your reinsurer.

My final point is related to obtaining reinsurance. My prior company had a $3 million retention limit. For single-life products, retention costs typically did not impact results to any great degree; however, reinsurance would certainly have an impact on last survivor. The initial reinsurance rates I received were quite high. I thought these reinsurers were crazy. Additional reinsurance quotes came in that were acceptable and reinsurance terms were agreed to. Having spent the last four years at North

American Reinsurance, I still think some reinsurers are crazy at times, but my definition of craziness has changed.

I will compare my view of reinsuring first to die with that of last survivor. For the most part, my perspective is focused on the mortality aspects. I have noted six areas that differentiate these two products for reinsurers. The reinsurance needs for first to die are typically much less than for last survivor, due to the market that each of these products are focused on. Although first to die face amounts can be quite large, especially when purchased for certain business situations, the average policy size is typically under $200,000. Last-survivor average sizes range from $1 million to $3 million, due to the estate tax-planning sales. If the unified credit for an estate decreases from the $600,000 level to the $200,000 level, the last-survivor average size may come down. Also, if last survivor gets popular as a family-type plan, face amounts will also be low there.

We see the issue ages for last survivor, mostly in the 40s through 60s, frequently in the 70s, and sometimes higher. We also notice a higher percentage of rated business. Both of these typically generate more reinsurance needs, as retention limits are usually reduced at higher ages and ratings. If the first to die has a large simultaneous death benefit or a guaranteed insurability option to continue insurance on the survivor, coupled with an increasing coverage, reinsurance would be needed. This would be similar to the beneficiary insurance rider sometimes used in the second-to-die market. The last survivor, the estate preservation rider, where coverage is typically doubled in the first four years, calls for additional reinsurance attention.

Reinsurers feel comfortable about reinsuring first to die. The mortality aspects are much closer to single life, and, certainly, premiums are larger, and that's always nice. The concerns would primarily be related to the simultaneous death payments and continuation of coverage. Reinsurers don't like to reinsure only this potential risk and typically like to have some portion of the base policy at issue. This will allow reinsurers to participate in the more stable mortality results of the policy to offset the antiselective forces of these riders. Also, limits to the potential increase are needed so as to reduce the potential risk as well as to find the capacity to reserve on these lives in case additional insurance is purchased and retrocession is then needed.

For last survivor, about a half-dozen reinsurers in the U.S. market readily accept this business. There is over $25 billion of reinsured last survivor in force as of December 1992. Over $20 billion is reinsured by these active reinsurers, each with from $1 billion to $5 billion in force. The remaining reinsurers will either decline to participate or reinsure last survivor only if they are reinsuring the company's single-life business as well. Given the relatively limited number of policies sold, as well as potential volatility of mortality results, the reaction by the reinsurance industry seems appropriate. To reduce the volatility, last-survivor reinsurance with more than one reinsurer is almost always done on a quota-share basis rather than on an alpha-split basis. Some companies have set up a pool of reinsurers to obtain the necessary reinsurance support.

Besides the different overall mortality levels one might expect, as a result of selling to different markets, last survivor has some unique mortality risks. Simultaneous death risk is more evident in last survivor, as almost all sales are to a married couple;

certainly it has more importance than for first to die, where a death benefit would be payable anyway. We have estimated the expected extra mortality due to this contagion risk; and, suffice it to say, we would need much more last-survivor business to test our assumptions. I'm well aware of a few simultaneous deaths to date where both lives were killed in airplane crashes or mountain-climbing accidents, so it does happen.

Another contagion risk is the heartbreak effect, where the surviving spouse's expected mortality increases as a result of losing a loved one. This increase in mortality may also be evident prior to an impending death, which may have some impact on the insurable life's mortality when coupled with an uninsurable life.

The lapsation effect is another factor. Many companies assume a level pricing lapse of 5% for all in-force, last-survivor policies. It seems that for Frasierized policies, however, lapse rates are likely to be higher for those policies where both insureds are still alive. I give three reasons for this. The split option for tax changes and divorce apply only when there is a two-life status in force. Divorce would not apply to those in a single-life status. Second, those in a single-life status have a good deal and are likely to hold onto their policy. And, third, replacement activity is likely to happen, and I'll give four reasons for that.

First, last survivor is typically sold in a competitive market with sophisticated buyers looking for the lowest price. This would generally lead to replacing if the next generation of products is cheaper. Second, the select-and-ultimate mortality, as a result of underwriting, applies to two lives, creating a more dramatic select-squared versus ultimate-squared comparison. Third, after 10 or 15 years for Frasierized products, the mortality charge is a blend of single- and joint-life statuses. A replacement to a new last survivor, starting with only joint-life charges, again, can be a better deal despite the older issue ages. And fourth, given the high sizes and correspondingly high commissions involved, agents may push harder for these replacements.

The results of the lapsation effect can be dramatic over time. For example, assuming a 10% lapse rate for those in-force policies where both are alive, and no lapses after one dies, the mortality rate in the twentieth policy year would be 160% of the Frasierized rate assuming no differential. A 22% rate differential would generate a mortality rate in excess of the Frasierized 80 CSO rate. These numbers were based on a 55-year-old couple and a typical mortality assumption.

Normal underwriting typically applies to both lives for first to die policies. For last survivor, a number of issues arise. To save some underwriting cost, requirements by policy size may be lowered, or more liberal standards may apply to the older life. Second, the underwriter may give a lower rating than warranted, due to the minimal impact in premium. In some cases where a joint equal-age approach is used, there may be no impact on rates. Such actions will, of course, affect mortality and should be accounted for in the rates or discouraged.

Many of the underwriting rules for assigning debits and credits were based on data for the under-70 age group. These rules may not be appropriate for those aged 70 and older, a significant last-survivor market. Also, if your company has traditionally

not written large policies, the underwriters may not be familiar with the financial underwriting needed. When uninsurables are involved, the uninsurable risk still needs to be underwritten for possible contagion risk.

Finally, for certain risks, such as aviation, they present a problem. If the flat extra for a pilot is, say $3.50 per thousand, how does this get applied in last survivor? If the extra mortality is blended into a Frasierized rate or a rate-up in age is used, the $3.50 rate practically disappears. Can we assume that the contagion risk is minimal? A wealthy pilot may travel with his or her spouse quite often, and what if they're both pilots?

We have found the expenses incurred for last survivor to be much more than twice the level of single-life business. The older ages and larger face amounts typically generate a lot of underwriting material to review, with cases taking three or four times longer for the reinsurer's underwriter to complete. Because some companies have set up pools or reinsurers where some reinsurers may not provide facultative services, the ratio of facultative to automatic cessions is higher than otherwise would be. And, due to the higher percentage of rated cases, more facultative shopping typically occurs. Second, agents also shop the case among a number of companies. Both of these contribute to a lower placement rate. Administrative expenses and retrocession costs in handling multilife cases are high as well. And, for last survivor, these expenses are a significant percentage of the reinsurers YRT rate.

Finally, when negotiating for a reinsurer for YRT rates, what may make it difficult is what I'm calling the assumption impact on rates. A higher, single-life mortality assessment by the reinsurer will have more of an impact on last survivor. For example, suppose the reinsurer has assumed a mortality rate that is 10% higher on each life than you assumed. Let's ignore expense and profit charges for now. For single-life business, the reinsurer's rates will be 10% higher than your rates. For last survivor, in the first year, it's the 1.1 squared or 21% higher and over 18% higher in the first 20 years on a present-value basis. And for first to die, the reinsurer's rate will be slightly less than 10%. This could add to more difficult negotiations.

I'd like to finish with a comment on volatility of last-survivor mortality. I did some Monte Carlo simulations on single and last-survivor business and had some interesting results. The simulations were based on actual in-force single- and joint-life business from one of our clients, reflecting actual age, smoking status, sex ratings, and reinsured risk amounts. I assumed 1,000 single and 1,000 last-survivor policies were issued for one year. The single-life block had an average size of about $400,000 and an average age of 45. The last-survivor block had an $1.8 million average size and an average age of 53. Over the first five years, the probability of losing $2 million or more in any one year for both single and last survivor is around 2%. The probability of losing $5 million or more is 0.2% for last survivor and zero for single life.

Looking at durations 16 through 20, the probabilities for losses for single life are similar to those during the first five policy years, but for last survivor, there's more than a 17% chance for a $2 million or more loss in any one year and a 6.5% chance for a loss of $5 million or more. These results were based on similar mortality assumptions and the appropriate YRT rate schedules. The above results do not reflect any charges for expenses and profit that were built into the YRT premium-rate

schedules. Although these results are illustrative, they do point out the need to consider some analysis in determining your retention limits for last survivor. Remember that, unlike your single-life portfolio, the average retained last-survivor face amount may be very close to your retention limit.

In closing, I'd like to say that, as a reinsurer, multilife products present an exciting and challenging opportunity. Much of the multilife business is an additional market, rather than replacing what would have been issued as a single-life coverage. For last survivor, the large face amounts have generated a fair amount of new reinsurance, and that's pretty good.

MR. SOLOMON GOLDFINGER: I have a question on first to die. About what percentage of the cases involve more than two lives?

MR. KWASSMAN: That I don't know. Our product is a traditional product with two lives. I commented on the UL design to give a perspective. We have looked at UL-type designs, but I have no idea. I was speculating that most of the cases would be two lives because, of course, the personal market would be all two-life cases. But I don't know how many would be more than two-life-type cases. Do you know, Larry?

MR. STERN: Our survey did ask the number of lives that are covered under the policies, but it didn't ask the question with regard to how many are being issued. It's my gut reaction that Stu's answer is probably right. For the most part, I think first to die products have been incorporated in the family-needs market so it would be two lives. We are definitely seeing much development, where up to ten lives can be added. But as to how many policies are being issued for more than two lives, we don't have the number on that yet.

MR. GOLDFINGER: The reason I asked the question is because the premium difference is not as much as your client would think. You can often sell two separate policies when it's two lives, because the extra premium is only 20% or so. But, if it involved multiple lives, that probably would be more difficult. In terms of the comments made as to why lapses could be higher, I just want to caution that survivorship tends to be lapse-supported in terms of profitability. So if you're making an assumption that has a higher lapse rate, if in fact you're experience turns out to be better from a lapse perspective, that could affect your profit-ability in dividend scales. There is some balancing that needs to be done there.

MR. BENJAMIN L. MARSHALL: Larry, you had information about the top five JLS carriers, and I wonder if you'd be able to share who those top five are.

MR. STERN: Our practice with regard to our surveys is to not identify companies by name. We do list the companies that have supplied information in alphabetical order, but we don't associate any of the numbers with the companies themselves; we give all results in aggregate.

MR. MARSHALL: Richard, regarding your JLS choice-of-chassis comments, you indicated that the choice may be made for you, depending on your circumstances. I

wonder if you might comment on the pros and cons of the variable UL and the par designs, if more than one option is available to you.

MR. PAYNE: Sure. If you're designing a two-life product, I'm not sure if there's any particular advantage or disadvantage to the different chassis. At this point, variable products, as we've been hearing, are hot in the marketplace. So that's not really a function of the product design; the investments are doing better backing the product. Clearly though, if you're looking at a product that covers more than two lives, to try to do it in a traditional framework becomes increasingly difficult as you get more and more lives. It depends on what your administration system can do obviously, but you can easily foresee singlehandedly reviving IBM's fortunes by ordering a few billion disk drives if you have a ten-life product, so you probably want to stick with a UL-type design in that case.

The other advantage that the UL design has is, of course, that you can have target premiums that are relatively low, so the way that you want to address the market-place is to have a price-competitive product. If agent compensation is not as high on your list as a competitive product, then a UL design may be the correct approach for you.