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**INVESTMENT STRATEGY FOR INDIVIDUAL LIFE INSURANCE**

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Recorder: CHRISTINE A. M. STRAATE*

MR. JAMES F. REISKYTL: The first portion of our presentation will be devoted to the actuary's involvement in investment strategy and new investment instruments. It will be presented by Jim Tilley, who is Vice President and Product Manager in the Fixed Income Analytical Research Group at Morgan Stanley and Company. He heads a special effort to apply fixed income products to the specialty investment needs of the life insurance industry. Recently Mr. Tilley was a Vice President of Equitable Life Assurance Society and managed a group pension department responsible for new product research and development. He has published papers and articles on asset liability matching and other methods of managing investment risk.

Barry Allen will handle the second section on investment strategy and product structure for flexible cash value policies. Barry Allen is Associate Actuary at Phoenix Mutual Life Insurance Company. Previously he was with Massachusetts Mutual. He has worked with individual pensions, reinsurance, experience studies, investment allocation and product development. Currently universal life is one of his responsibilities. This morning Mr. Allen was recognized for his paper on enhancements to investment year allocation of income

Traditional products will be presented by Arnold Dicke. Arnold Dicke is Vice President and Chief Actuary at Provident Mutual. Previously he was an individual life actuary at Penn Mutual where his responsibilities included developing their universal life product in a subsidiary.

MR. JAMES A. TILLEY: I am going to set the stage for the other panelists by laying out the investment background and outlining the basic principles. We'll go through it fairly quickly, discuss options and futures briefly, and then analyze an example where options can be quite useful for managing interest rate risk.

I'll start off with a menu of the key things one should do in tying together asset and liability operations for a company:

1. Design, underwrite, and price products that provide fair and reasonable value to policyholders. Avoid giving away "free lunches" through mispriced options.
2. Acquire a mix of assets and underwrite a mix of liabilities to achieve expected portfolio balance under a range of likely interest rate environments.

3. Apply optimization techniques to maintain adequate liquidity and a balanced portfolio of assets and liabilities. Use futures to fine tune the duration of assets in relation to liabilities.
4. Purchase fixed-income option instruments to provide a "stop-loss" hedge against "options" written to policyholders through product design.
5. Use futures, forward, or cash market hedges to reduce "naked" liability or asset inventory risk.

The first point can be paraphrased a little differently by saying "do not start off behind the eight ball". If you design products that have mispriced options, or provide features to the policyholders that have not been priced well, you have given away a free lunch. All your best modeling and all the best strategists really won't be able to put that Humpty Dumpty back together again. You may be able to follow a risk control strategy where you minimize the extent of losses you are going to realize, but you started off behind the eight ball, and unless you take a very risky position and hope for some extraordinary event, you are not likely to get out of it. Of course, even if you do okay, one had to really ask beforehand whether you had a proper risk/return profile.

Assuming you haven't started off behind the eight ball, the next thing you should do is plan for a fairly stable range of interest scenarios. You can look at sharply up and sharply down and sharply fluctuating scenarios, however, you will find that actually tailoring an investment policy and fitting a product design to cover you under a wild range just is not possible. There are other ways to protect against the extremes, as my example later will demonstrate. Model how well your existing product line and assets will do against a fairly moderate range of scenarios. Then make sure you structure your liabilities and investments to achieve a balance you'd like. That doesn't mean you absolutely have to cash match or immunize. But, if you choose to go away from either of those, you should at least understand what the consequences are.

The third point says that you don't have to go about the second point in some haphazard fashion. There are optimization techniques - a lot involve linear or quadratic programming. They should not be viewed as the final black box answer, but certainly they are a starting point.

Regarding futures to fine tune the duration of assets in relation to liabilities, how useful is Macaulay duration and classic immunization? Let's assume we are dealing with a situation for which it is useful. Immunization may not be the answer, but it's at least some indication of what to do. If you want to shorten the duration of your assets relative to liabilities, you can sell futures contracts. You can purchase futures to lengthen the duration of the assets. That is quite useful if you are trying to achieve immunization for a longer product (with Macaulay duration of 10 years or so) for which no bond or mortgage exists other than a zero coupon (or pure discount) instrument. When we have a duration that long, futures is a way of fine tuning. You could ask a tough question about whether the Helman legislation in New York would allow that use of futures because it's pretty clear that one will have to use options and futures for hedging applications.

The fourth point refers to situations of one-sided interest rate risk. Disintermediation is a good example. You have a balanced, intermediate to longer term investment strategy underlying a set of liabilities. If interest rates spike quickly, stay there for awhile or spike a great deal more, you can be subject to a tremendous cash flow risk. My comments earlier suggest that it may be suboptimal to actually try to invest behind that type of liability. One probably wants to purchase a stop-loss cover of some kind for those effects, and that can be done through options.

The final point is not as relevant to an individual product audience as it is to a group product audience. One can use futures, forward and cash market hedges to reduce naked liability or asset inventory risk. Let's take a GIC situation. You often write a GIC before you have an asset behind it. You have the liability but no asset. You may get the cash from writing the liability but you cannot invest it immediately into the ultimate asset which might be a private placement bond or mortgage that cannot be circled today. You certainly want to take action to guard against the drop in interest rates.

Conversely, you might actually have an investment operation that is good at producing a stream of private placements. You will then often have assets before you've written liabilities against them. Your assets in inventory will be naked because they have no related liability. You would want to take a hedge until a liability can be found.

A good illustration of the principles I have described is the Single Premium Deferred Annuity (SPDA) problem. Even though this is an individual life insurance audience, I will use the SPDA example because it is a classic.

On the first point about not starting behind the eight ball and providing fair and reasonable value to the policyholders, insurance companies have tried to cater to marketplace needs. Clearly the ideal product is one where account balances are maintained on a book value basis, and the policyholders have immediate access to account balances. It also would have rate floors. In some contracts there is a long term guaranteed interest rate with guaranteed escalators, so if rates go up (the policyholders expect rates to go up), the contractual floor rate would rise. Even without a contractual escalator, when interest rates rise, many companies would unfortunately have to increase the rates to hang onto the funds.

That's an ideal product, but unfortunately the ideal investments do not exist. They would have to be long term bonds to make good on the floor rate guarantee, would have to have adjustable coupons, and they would always have to be puttable to the insurer at par. If rates do spike and there is disintermediation, it would be nice to be able to take that instrument, put it back to the issuer, and get paid off at par without bearing the market value loss. Clearly those things do not exist, at least not with all of those features and certainly not with a combination and at a price that would support a competitive product.

That is the SPDA problem--fair and reasonable value was not given. The customers wanted an ideal product, and many insurers got behind the eight

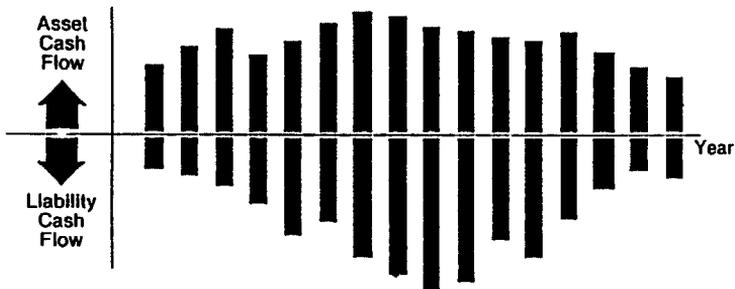
ball and found it hard to get out from behind it. You'll see that if there had been options available and it was permissible to use them, one probably could have gotten around the asset/liability matching problem, but not by using a single investment strategy with just bonds and mortgages and cash.

I'm now going to run through C-3 Risk methodology and how it's applicable to universal life insurance and other life products. You must start by analyzing cash flows on both sides of the balance sheet.

- Asset side
  - Investment income
  - Principal repayments (scheduled/unscheduled)
  - Investment expenses
  - MSVR contributions
  
- Liability side
  - Premiums, contributions, and deposits
  - Benefit payments
  - Insurance expenses
  - Commissions
  - Policyholder dividends
  - Debt service

You'll notice that it matters whether you're doing this for a product by itself, a product line, a line of business, or an entire company. If you're doing this for the whole company, MSVR contributions aren't really a cash flow item because they stay within the company.

The next thing to do, especially if you're talking to senior management, is to display your static cash flow projection diagrams. Chart the asset cash flow pattern against the liability pattern.



There is one picture like this for every interest rate scenario and every set of assumptions you make that are tied to that interest rate scenario. As you change interest rate scenarios, lapse assumptions, and various other things, you'll get different pictures.

Classic immunization would have you believe there is essentially one set of asset and liability cash flows. However, the cash flows are a function of the interest rate. As interest rates go up, you might expect a substantial compression of the liability cash flow through disintermediation. Unless some preventative action like raising credited rates were taken, all early liability cash flow bars would probably get longer. If interest rates go down, you can have calls on bonds and prepayments on mortgages, and you'd expect that early asset cash flow bars would lengthen. Given any scenario about those antiselective cash flow features, you can draw such a picture.

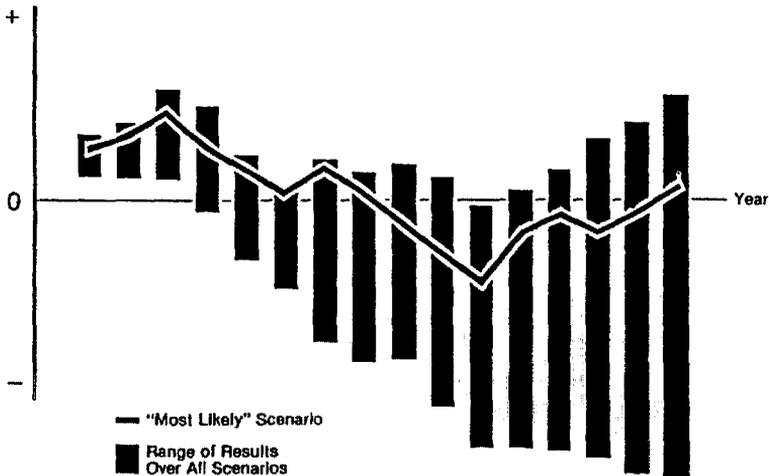
You then want to difference it and get the picture of the net cash flow. The bars above the line represent a positive net cash flow; there are net funds to invest. The risk is that the rates will be low. Bars below the axis represent net disinvestment. A liquidation problem exists with potential adverse consequences if interest rates are high.



The magnitude of exposure is measured by the height of the bars. Obviously you have greater mismatch the larger the differences. It also matters somewhat whether the business is participating or nonparticipating. However, most actuaries who price participating products don't really view the dividends as a very big adjustment mechanism.

Assuming a particular financial strategy converts static projections to dynamic projections implies that the strategies governing investment and disinvestment of net cash flows should be determined by management. In the static projection we had a net excess to invest or a net deficiency to disinvest, but no assumptions were made there as to what to do with them. Reinvestment assumptions and other things are applied to make the static projection a dynamic projection.

The static model is brought forward through time by investing and disinvesting net cash flows, paying federal income taxes, and paying stockholder dividends. Because the output becomes so voluminous, it is more effective to display the dynamic projection results via cash flow and earnings graphs. You'd want to run several dynamic projections. A useful way to present the results is as illustrated.



The vertical axis is net cash flow or earnings, or both. The lightning shaped line is the result for a scenario that you consider "most likely" or "average". Also show the extremes, the so-called range bars. The graph above shows significant mismatch, and the mismatch is amplified through time because of interest rate changes and cash flow antiselection.

What can you do about the mismatch? Or, what can you do to prevent such a situation? You want to determine asset/liability strategies that will minimize the amount of mismatch.

First, you should set senior management down. Get them to decide what the goals are, and what constraints are to be placed on product and asset managers. Otherwise any modeling you do will educate you and no one else.

Second, you're dealing with total portfolio decisions. I don't mean just the asset side. I mean the liabilities as well--they are controllable. Portfolio decisions can often be formulated as linear or quadratic programming optimization problems.

Third, what goals and constraints apply to the optimization? You need to decide what asset classes, maturities, sectors, and the quality of investments you're looking for. If you need to restructure the existing assets, you must decide the volume and mix of asset liquidations. You also need to determine a product strategy. What volume and mix of new business is desired? Is there a product strategy that allows you to rebalance existing business with cash flow from other product lines? I mentioned this because if negative cash flow is contemplated for a given block of business, you must decide how you will get the needed cash.

What should be maximized? Are you going to try to maximize earnings for a most likely scenario? A lot of people will opt for this even though a careful analysis would indicate other choices may be better. Should you

maximize average earnings over all scenarios? The problem is determining the scenarios and the weights to be used. You might be maximizing the average and sacrificing the variability of earnings. Do you want to minimize the variability of earnings? Then you might be doing something highly detrimental to the average earnings. One could maximize earnings for the worst scenario considered. This is another way of putting your eggs in one basket, but perhaps a more useful way. Instead of using a very wild set of scenarios, you might begin with a fairly stable group, one up for every one down so at least starting off you don't deliberately mismatch a portfolio long or short. By actually tailoring what that set of scenarios is against which you optimize, you can get very useful results. One can prove that classic immunization is a maximum solution. You're looking at the worst case and trying to make it the best it could possibly be. Alternatively, you could optimize a combination of several of the above. Set up an objective function that has as one component the average earnings and, as a subtraction item, some number of variances, and play those two off against each other.

I can think of several examples of possible constraints that could be placed on the optimization. Maximize the tolerable net cash flow imbalances by year. Maximize or minimize amounts in various asset categories - that's just a useful diversification constraint as well as a recognition that you have an overhead problem if you have both a mortgage and a private placement bond operation. Because of statutory accounting, you're not going to want to take more than a maximum net capital loss from asset liquidations. You may desire to limit the volume of new business in some lines and produce as much as possible in other lines. You could also put a limit on the cumulative "borrowing" by a given line of business.

Next I would like to talk about hedging interest rate risk, particularly options and their applications to individual products. The need for hedging arises because you have an asset/liability imbalance, and because management desires to control the related risk. Interest rates are volatile because if they weren't volatile and you knew it, then obviously you wouldn't hedge. If interest rates weren't very volatile and the world generally perceived it, however, options wouldn't cost very much, and you'd still be getting a fair deal if you used them!

The nature of the interest rate risk is very important: it can be one- or two-sided. One-sided risks can be illustrated by traditional life insurance. You may have designed your products and chosen your investment strategy in such a way that you effectively assume that interest rates go one direction. If interest rates move that way, you make the profits you want but you get no extraordinary gains. If interest rates move sharply the other way you'd have extraordinary losses. Clearly traditional life insurance, universal life, and single premium deferred annuities, backed with some kind of intermediate term fixed income instruments will do reasonably well (depending on the nature of the long term guarantee) if interest rates stay the same or go down--nothing special happens other than the profits you price for come in. However, if interest rates go way up, even with the maximum surrender scales, you'll face quite a disintermediation problem.

GIC's provide the classic example of two-sided risk. Two-sided risk arises in situations of an unhedged (naked) inventory. You put the liability on the books first. You have not acquired the asset, so you are exposed. If interest rates go one direction, something bad happens; if they go the other direction, something equally good happens. Suppose the group pension area writes a GIC today but does not have the asset yet. If interest rates go down and you have taken no hedging action, that is obviously bad, because when you do get the asset, it will have a yield insufficient to support the GIC. On the other hand, it's great if interest rates go up and you wrote the GIC with a binder to make sure you get the cash. You can invest it well above what you guaranteed. So you can see that risk exists whether rates rise or fall.

The objective of hedging transactions is that they produce a gain or loss to offset a corresponding loss or gain on the underlying portfolio. Puts and calls are often used to hedge one-sided risk, and futures or forward instruments are generally used to hedge two-sided risk.

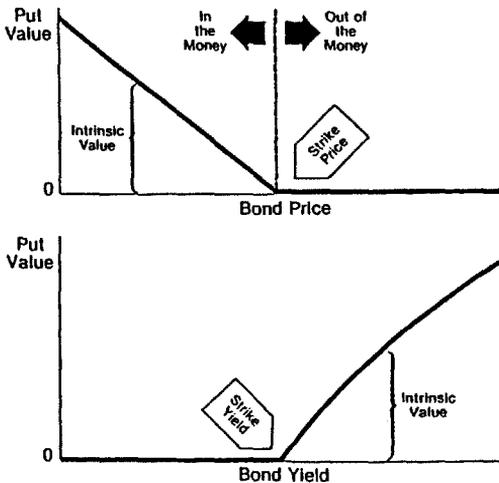
It should not be assumed that hedging eliminates all risk. It merely substitutes basis risk for yield level risk. Basis risk has many facets, but all of them relate to the difference in movement between two instruments. If you use a Treasury instrument to hedge a corporate instrument, the yields on the two may not move absolutely lock-step. The spreads may narrow or widen (more than you expect) and that constitutes basis risk. In formulating a hedging program, you decide whether in the particular circumstances you are getting equal, more, or less basis risk than you had yield level risk. If the hedge had to be in place for a day or two, you might actually be substituting substantial basis risk for fairly mild yield level risk, and you should probably not hedge. If the hedge is going to be in place for substantial periods of time during which the yield levels can really move around, you can probably tailor a very good hedging strategy that has minimal basis risk. You are substituting one kind of risk for another.

The accounting treatment is very important. The hedging objective is to produce a gain equal in size but opposite in direction to that which is experienced on the underlying portfolio. What's experienced on the underlying portfolio tends to be a present value effect, whereas on hedging transactions it's all at once. Current accounting treatment of hedges is mark to market. The AICPA has recommended that hedging gains and losses be written up or down much in the way you would account for discount or premium bonds to produce a good matching with the corresponding liabilities. That's good for those of you who have to worry about GAAP. However, if statutory treatment isn't the same as for GAAP, you may be in the same situation as the banks where the regulator said you can use wonderful instruments like GNMA futures to hedge your mortgage portfolios, but you're not allowed to match up the gains and losses. Unfortunately, banks had to recognize the losses immediately if interest rates move the wrong way on the hedging transaction. Instead of a fairly stable combined result, a result that's just as wild as if they didn't hedge can occur. If we get the right statutory treatment, hedging may become a fact of life. If that takes awhile, I think there is a possibility for reinsurance transactions appropriately structured to produce some of the effects that a sensible statutory accounting scheme would otherwise provide.

Financial futures contracts are transferable, standardized agreements which are traded on regulated exchanges. If you buy a futures contract, you have an obligation to receive the instruments (take delivery) unless you close out your position (reverse the hedge) before the seller can deliver against you. If you've sold such an instrument, you have an obligation to deliver unless you close out your transaction before delivery is required. Interest rates affect financial futures in a manner similar to what happens when bonds are bought in the cash market. If interest rates go up, you lose; and if they go down, you gain. If you're shorting futures contracts, it is the same as shorting bonds, which is the opposite of buying. If interest rates rise, you gain; and if they fall, you lose.

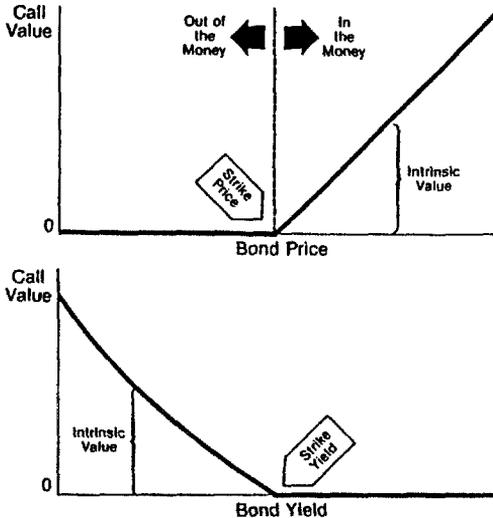
A fixed income option is a contract that gives the buyer (holder) the right (but not the obligation) to buy (call option) or sell (put option) Treasury securities or futures contracts from the writer (seller) at a set price (strike or exercise price) for a specified period of time. Suppose we're selling options in the market today and the option contract says you can sell the underlying instrument anytime from now until the expiration date at a price of 70. Let's suppose it's selling at 90 in the cash market. Now that's not a valuable option at this point because if you hold the instrument, you could sell it for 90, and the option contract gives you the right to sell it for 70. On the other hand, if the cash market is at 50 and the option instrument gave you the right to sell for 70 that would be very valuable. You could produce an immediate gain of 70 minus 50 or 20, and we call 20 the option's intrinsic value.

These graphs show the intrinsic values of puts and calls as a function of underlying bond prices or yields:



If you want to produce a one-sided hedging result, you could buy put options. The result is one-sided because if you buy a put option and bond yields end up below the strike yield, you have no gain or loss. If they end above the strike yield, you have a gain.

Similarly, the graphs for a call option are a mirror image of those for put options.



We can use an example to see how hedges can be used to cover disintermediation risk. This illustration utilizes Single Premium Deferred Annuities (SPDAs), but the same principles apply to other products, especially universal life. Take the case of an insurer who suffered severe disintermediation during 1980-82 from its SPDA line but wants to continue offering its product and to retain the bail-out feature. (That's a feature that permits policyholders to cash out without a surrender charge if the insurer drops the interest rate credited to policyholder funds by more than a threshold amount.) Its investment strategy is 5 to 8 year par bonds, a balanced strategy very typical for many insurers. We're going to buy deep out of the money put options on fixed income futures every six months to hedge a portion of the portfolio. This action provides the ability to meet surrenders if interest rates rise sharply. The reason I'm using put options on fixed income futures rather than on the fixed income bonds themselves is that the options market on the actual bonds is not very liquid now. Options on bonds may pick up in liquidity, but options on futures are particularly liquid--not as much as the futures market itself, but liquid enough to hedge successfully.

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On 1/1/83, a block of SPDAs has the following characteristics.

Assets:

Book value: \$101.7 million  
 Market value: \$96.8 million  
 Average maturity: 6.41 years  
 Average coupon: 12.35% B.E.

Liabilities:

Account balances: \$100.0 million  
 Average surrender charge: 5.24%  
 Average credited rate: 11.20%  
 Current competitive SPDA rate: 12.00%

One has to decide what experience to hedge. Here are my assumptions:

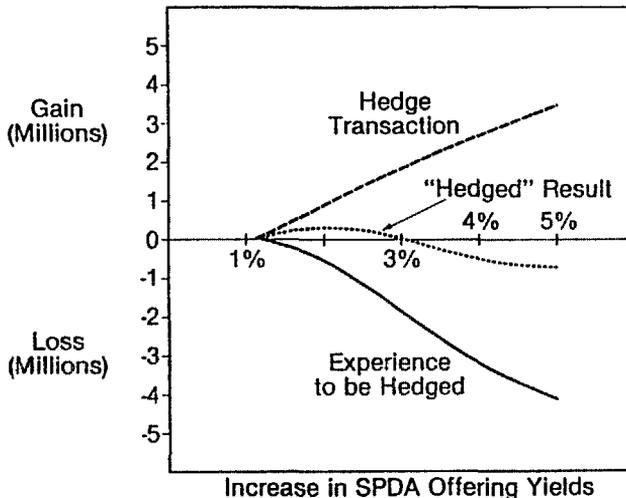
Interest Rate Increase	Lapse Rate To Be Hedged	SPDA Amounts Cashed Out			Offsetting Hedge Gain Required
		C.S.V. Liability	B.V. Asset	M.V. Asset	
0.0%	—	—	—	—	—
0.5%	—	—	—	—	—
1.0%	—	—	—	—	—
1.5%	7.5%	7,494,432	8,098,498	7,324,150	170,282
2.0%	15.0%	14,988,864	16,196,996	14,379,763	609,101
2.5%	20.0%	19,985,151	21,595,995	18,824,269	1,160,882
3.0%	25.0%	24,981,439	26,994,994	23,105,680	1,875,759
3.5%	27.5%	27,479,583	29,694,493	24,961,168	2,518,415
4.0%	30.0%	29,977,727	32,393,993	26,746,664	3,231,063
4.5%	30.0%	29,977,727	32,393,993	26,275,338	3,702,389
5.0%	30.0%	29,977,727	32,393,993	25,816,025	4,161,702

The first column shows interest rate increases from today's level. The second column contains the lapse rates to be hedged. Interest rates and lapse rates are correlated.

Given the assets, interest rates, and lapse rates, determine what the book values and market values are. You will notice the market value is less than the cash surrender value, which means a hedge should be put in place to offset losses upon lapsation. There are dashes for interest rates going up to 150 basis points because the surrender charges cover the amount of market value loss. Because we don't have to put a hedging transaction in place until interest rates rise above 150 basis points, what we need is an out of the money put option. In other words, buy a put option where the cash price of the underlying instrument is higher than the strike price of the option.

I determined that it would take 215 Chicago Board of Trade put options on T-bond futures that expire in September, 1983 at the strike price of 70 to produce the sequence of gains needed in the last column. The listed options traded on exchanges don't actually have strike prices low enough

or strike yields high enough (they're not enough out of the money) to produce an exact hedge. The only thing I could do using listed options was to overprotect for interest rate changes under some amount and underprotect beyond that.



How much does the hedge cost, and who will to bear the cost? The cost was \$315,781 which, amortized against the fund balances for a 6 month period, produced an equivalent 63 basis point charge. You'd have to repeat this process every six months. Anyone involved in the GIC business knows that a 63 point deduction would affect your competitive situation severely.

The same is somewhat true in the SPDA market, but individual products are not as competitive. The specialty SPDA carriers have suggested to me that a 50 basis point charge throughout the worst of 1981-82 could easily have been tolerated. They could have funded such an option premium just by cutting the credited rate. This example ties product design, product pricing, and investment strategy all into one package. If you had offered the SPDA without pricing this feature, you would have given the policyholder the right to disintermediate without a fair charge.

Finally, I'd like to turn to indexed products and indexed investments. Indexed life insurance products like indexed universal life and indexed SPDAs need indexed assets to cover the associated risk. Let's suppose that we're not talking about products indexed to something like 90 day T-bills. One can invest in 90 day T-bills without needing a special instrument. Let's suppose you credit the greatest of 90 day T-bill, 10 year T-note and 20 year T-bond yields. There is no such investment instrument other than adjustable rate preferreds, which are a tax preference instrument. Not all insurers are in a position to use tax preference instruments to great advantage. Companies that can use them could be so successful that their tax situation might become one where they would no longer be useful.

With the impending tax law, you'd need adjustable rate debt instruments to support indexed products consistently. Adjustable rate debt instruments don't exist in abundance right now. I hope over the next several years that investment bankers will look at the demand side of the market and see the tremendous pools of capital in the insurance industry instead of servicing just their corporate banking clients' financing needs. Indexed products could be tremendously valuable to policyholders, and insurance companies would like to offer indexed products. To do that they have to have some cleanly created paper that is adjustable the right way. The careful packaging and bundling needed to create it could be done with the investment banker's usual client, the corporate treasurer.

The type of index will be very important. Will it be a corporate or Treasury index? Short, intermediate, or long-term indexes can be used. Perhaps you'll really need a "greater/greatest of" index to be used with products like Life of Virginia's Challenger policy -- the adjustable rate preferred type of index. By the way, there are new kinds of adjustable rate preferreds which provide substantial principal protection to the holder.

How frequently you reset the rate credited is also important. It can be monthly, quarterly, semiannually, or annually. Most importantly, what kind of spread are you going to get off the Treasury curve? You're actually getting yield level protection with an adjustable instrument. If it's one of those "greater/greatest of" indexes (i.e., adjustable rate preferreds) you're also getting yield curve protection. For an A or Baa quality instrument you can't expect to get more than about 50 to 75 basis points, and not even that at all times! Some say that's not enough -- for those with heavy distribution costs it is probably not nearly enough! The instrument itself eliminates at least 100 basis points of C-3 Risk, however. Distribution costs will just have to come down! Typically for the policies that are indexed to the greater of two rates, the rate offered is generally 50 basis points through the Treasury curve. One credits what is really a bond equivalent rate as if it were an annual effective rate; that conversion at 10% gives you another 25 points. So 75 plus 75 is a 150 basis point spread. That's getting close to the range you need to cover your expenses and profit objective.

The advantages of using indexed investments for indexed life insurance products also carry over to your regular portfolio. If your portfolio were entirely indexed instruments, the portfolio rate would become a new money rate. You wouldn't get lags typically found with a traditional portfolio. There would generally be price support near par, which is obviously useful in a situation of disintermediation.

The jury is still out as to whether adjustable rate instruments can be created synthetically. I believe there are modern options techniques for managing yield curve risk that will actually produce a result similar to that derived from adjustable rate bonds. Insurers could use such techniques either for indexed or traditional products.

Mr. REISKYTL: Thanks, Jim. I am sure you will raise a question or two in the audience. Let's move on to flexible products.

MR. BARRY ALLEN: My discussion of universal life investment strategies will start off with a general description of universal life plans and basic product design strategies. I will then present an eight step process for developing product perspective in order to select an appropriate investment strategy.

Universal life unbundles traditional insurance products and presents the policyholder various combinations of expense charges, mortality charges, and direct interest credits. In an effort to have the product appear simple to the client, many companies at least combine some expense and mortality charges. Another way to keep a simple structure is to assume that some expenses will be covered by hidden factors such as a company determined skim on the interest actually earned or by a surrender charge that is designed to disappear by the main durations used for competitive analysis, for example 20 years. Simplifications are highly important in establishing investment strategy, which I will get to in a moment.

Universal life policies might be classified by their premium structure. Premiums may be flexible (possibly after a short initial requirement) or required. Required premiums may in turn be fixed like traditional products or periodically redetermined by the company in a manner analogous to indeterminate premium products. Since the investment considerations are most apparent with the flexible premium form, I will focus on flexible premium products. The points made will generally apply to the other forms of universal life as well.

A general strategy for a flexible premium product is to balance the company sources of gain between those expressible as a function of premiums and account balance versus those expressible as a function of net amount at risk. This makes the company more independent of the actual premium pattern established by the client. One approach, but certainly not the only one, is to assume that the increasing amount of interest margin will be offset by declining profits when the corresponding net amount at risk decreases. This pricing strategy can lead to inappropriate conclusions if dissimilar products are compared at the same interest rate. Sometimes marketing people ask for both a large interest skim for competitive illustrations as well as a large declared rate. The resulting pressure on investment goals can be enormous, possibly causing some companies to take very aggressive investment strategies and risks. Alternatively, it appears that some companies may be investing surplus in new business by temporarily declaring an interest rate higher than they may be earning. Pressure to declare a high interest rate is often greater than the need to simplify design by hiding profits and/or expense charges in the interest margin.

The development of product "simplicity" by means of a surrender charge also has an investment pitfall that may not be as readily apparent. Properly designed and understood surrender charges may falsely imply that longer term investments are appropriate. Flexible premium products allow greater financial anti-selection by agents and policyholders. For example, "premium repositioning" can be used to the agent's advantage. Whenever an account value is large enough, aggressive interest assumptions might be used to illustrate paying little or no premiums on existing contracts and redirecting previously stable premium flow to purchase additional coverage from the same or another company. This

possibility implies that it may be better to assure minimum future cash flow by investing such that portions of principal are returned throughout the invested period instead of just at the end of the period.

Premium repositioning is just a variation of the replacement game where you don't have to suffer a surrender charge penalty immediately. Instead you let it run off. Just as universal life policies appear to make replacement of mature traditional policies very attractive, improper illustrations of universal life policies themselves can cause these policies to be replaced by the premium repositioning mechanism. Anyone with a home computer who has worked out a UL illustration can make a reproposal of existing universal life products based on any interest rate assumptions.

Another pitfall that should be avoided is one that is only recently being appreciated. Under extreme economic conditions, actions by formerly unsophisticated clients may begin to parallel those of more sophisticated clients. This may result from either increased sophistication or simply from media bombardment by those wishing to spread their own insights, for example on morning talk shows.

All of these potential problems involving volatile policyholder behavior and economic conditions imply a complex set of situations that should be tested in product design and pricing. Multiple scenarios should be developed in which various assumptions are interdependent. High vs. low premiums and high vs. low interest rates by themselves suggest starting scenarios. Each of these may in turn interact with other factors to multiply the possibilities. Obviously, one must put a practical limit on the combinations to be tested.

Investment strategies will vary between companies. Differences should primarily be determined by type of universal life plan. However, strategies will also vary with the objectives and goals of each company as well as by the risk tolerance capabilities of each company. The following is an attempt to organize various steps that the investment officers and actuaries should take to establish product perspective before defining specific investment strategies and pricing scenarios.

1. Universal life is a generic term for a large family of products. It's possible that many of the more potent members of this family have not yet been developed. Each company should develop its own definition and periodically review the accuracy of that definition. The definition may separately classify all product variations or it may only reflect the company's own philosophy of what universal life is. For instance one company may have a general description that is only applicable to a particular product when a sufficiently large number of possible characteristics have also been chosen. Another company might narrowly define universal life as the particular type of product that they perceive it will eventually evolve into such as a different form of permanent insurance that currently offers policyholders the opportunity to invest in a new portfolio.
2. Develop a list of alternative characteristics that are possible under the company's definition. Some examples are:

- a. Flexible vs. indeterminate vs. fixed premium
  - b. Front end load vs. rear end load vs. combined load
  - c. Indexed vs. non-indexed interest
  - d. Frequency and structure of declared interest rates
3. Develop the theoretical relationships between the above characteristics and various investment possibilities. Make sure that the relationships are appropriately responsive to the degree of client sophistication.
  4. Develop an accurate picture of the client sophistication that will be encountered by your company. Include your market, the potential for agent education, the potential for client education, and be realistic about the company commitment to such education.
  5. Examine the company's entire portfolio of products and the marketing thrust of each of these products for present and future. Make sure that the relative position of universal life is clear, which doesn't necessarily mean unique. Then, if necessary, redo the picture of client sophistication. If any particular product implies a distinct cash flow pattern, then at this point its market potential should be added to the list of distinguishing characteristics developed in step 2. At this point there should exist a set of relationships with a general picture of where any particular product might theoretically fall. However, there are other factors which may be used to adjust this first answer and to focus more narrowly on the characteristics that you want to study.
  6. Define the company's expectation for the direction of future interest rates, the potentials for extra profit or loss with different investment scenarios, the company's ability to handle losses or hedge against losses, and the company's willingness to take risk. Now this is a very big job, especially when you're getting into the area of ability to handle loss and the willingness to take risk. That ties directly with what Jim Tilley was saying regarding methods that may be used to determine exactly what investments would be needed. This may include a wide variety of scenarios including risks that are partially hedged with the purchase of interest rate futures.
  7. Develop a model of relationships between sales goals and various items such as advertising, compensation, and declared interest rates. Use this information to judge the relative size and importance of the universal life assets. It should also help to determine how competitive you want your declared interest rate to be. There may be practical goals that initially appear unrealistic but after modeling seem realistic. Some adjustments might have to be made to one or more goals or perceptions that helped determine the rate prior to this step. If that isn't enough, the company may be faced with some tough decisions. One extreme decision, which I don't recommend, might even be to purchase more new business by means of a subsidized declared interest rate.

8. The company's philosophy on rollover of existing traditional business already on the books to a particular universal life policy must also be considered. All else being equal, a higher declared interest rate may encourage more rollover than a lower declared rate. Some questions that must be answered include:
  - a. Will the same declared rate apply to both rolled over funds and new money? If yes, then isn't a portion of the portfolio already determined?
  - b. If a different rate applies to rolled over funds, then how will the two rates meld over time? Will cash be transferred between portfolios as old assets mature, or will the cash be reinvested in the same segment from which it arose?
  - c. Will the company encourage or discourage internal rollover and what factors other than the declared rate will be used to accomplish the company's goals? This is helpful in defining just how important the declared rate will be.

Some items have not yet been mentioned. They would include any differences between sales in a subsidiary vs. in the parent company, differences imposed by investment income allocation methods such as segmented portfolio vs. single portfolio, policy loan interest deductibility, etc. Any such additional factors or characteristics should be factored into steps 2 - 5 above as appropriate.

For your convenience I will summarize all 8 steps:

1. Produce your company's definition of universal life.
2. List alternative characteristics that apply to that definition.
3. Develop relationships between characteristics and investment possibilities.
4. Develop a picture of client and agent sophistication now and in the future.
5. Develop a cohesive marketing thrust for each product in the ratebook including universal life.

At each and every one of these first 5 points and in the next 3, always go back and make sure that you do not have a built-in contradiction. If so, you have to go back and rework the previous steps that apply.

6. Analyze future direction of interest rates and accompanying risks as they may impact the company.
7. Analyze the relationship of sales goals to advertising, compensation, and declared interest rates to determine the necessary function of the declared interest rate.
8. Clearly define and integrate the company's philosophy on internal rollovers of existing products to universal life.

As a practical matter these steps may be applied somewhat out of order because the investment actuary is going through these steps at the same time that the product development actuary is putting the product together. However, you cannot have the pricing actuary going off in the corner assuming a lot of interest skim in his product design when the investment actuary has numerous reasons why he doesn't want him to do so.

I have outlined the steps that should be applied to make sure that you don't put yourself in a position where you're giving something away. I feel the safest thing to do is to make sure you realize the ramifications of every single thing that you are doing. If you want to purchase new business by subsidizing the interest rate, do so knowingly and with appropriate adjustments elsewhere. The same thing applies to any other option that you may add to your policy for competitive measures. Make sure that you know what it implies and what it's going to cost. That means that the steps should be discussed very thoroughly upfront with the pricing actuary and the investment personnel.

MR. REISKYTL: Thank you, Barry. Next Arnold Dicke will discuss the investment strategies underlying new and inforce traditional policies.

MR. ARNOLD DICKE: Before turning to traditional products, I wish to make some comments on indexed products. In projecting the liability cash flow, it is important to recognize that the index acts like a secondary guarantee, in addition to the statutory guarantee. Of course, the index guarantee is reset from time to time. For example, a product indexed to the 52-week Treasury bond rate may credit the current rate to the current month's deposits for a year, then reset the guarantee to the new T-bond rate. In effect, the cash value liability can be thought of as "maturing" after a year. If each month's deposits are treated similarly, the liability cash flow will have an average duration of 6 months. Thus, the index effect dominates the calculation of the liability duration.

Finding appropriate investments to back an indexed product such as described can be difficult. Investing in the index itself - for example, 52-week T-bonds - usually will not provide a sufficient margin, especially if the product is sold through an agency force. Sometimes instruments can be found that are tied to the index used in the product but with some kind of margin. For example, adjustable-rate mortgages yielding the 52-week T-bond plus 3% or so are sometimes available in some quantities. However, large blocks of such investments do not exist.

Ultimately, longer duration assets are usually necessary, which means assets and liabilities will be mismatched. It is the responsibility of the actuary to determine to what extent the mismatch risk may be safely undertaken, and contingency reserves and/or margins must be retained.

It is also the actuary's responsibility to monitor the profitability of the product. In other words, the actuary must be involved in managing the indexed product.

Managing indexed products requires at least an informal version of segmentation, as well as continual modeling of the product. There are four steps in this process.

1. Choose an investment philosophy. Decide the types of investments you're going to buy, including the credit and maturity structure. Here, the actuary's major role is to assure communication between product line management and investment personnel.
2. Determine the amount of assets that are required to match the present value of the asset cash flow with the present value of the liability cash flow. In modeling the liability cash flow, actual mortality can be put into a general account segment; one projects only the development of the cash value liability.

The model must be validated frequently, perhaps quarterly. Such things as premium payment frequency and the rate of policy lapses change quite a bit and are functions of the interest rate environment, so you must do a good job in modeling your experience.

A retrospective model is quite different from a prospective pricing model. You have a look at what has really happened. However, you may not want to give immediate recognition to market value adjustments. If you are mismatched, there are going to be times when the rate you are invested at will not give you the rate that you need in the marketplace. In effect, there may have been a market value loss which has to be made up. You must decide how you will cover the difference. The best thing is to deal with this independently rather than trying to recoup the whole loss in a single setting of the rate.

3. Set the credited rate. This is done by equating average credited rate plus spread to average investment earnings rate. This can be tricky; using unweighted average rates of return can be misleading. If you have an assortment of credited rates where some of the rates last longer into the future than others, you have to be sure that your average is correctly weighted. An equivalent level credited level rate, i.e., a rate that produces the same present value of cash flow of the liabilities as the actual rates did is the most accurate approach. For assets, rather than using pre-tax yields, taxable equivalent rates should be used. The net result is an approach that allows some assumptions about the next months' (or next quarters') likely level of investable cash and available investment to be presented to senior management.

Senior management must understand the trade-off between the credited rate that they may offer (in other words the degree of competitiveness) and the risk they're taking by mismatching assets and liabilities. One way to do this is to calculate the credited rate and Macauley durations that would result from each of several alternative investment actions.

4. Monitor profitability of the product.
  - a. Actual vs. expected profits. While this may be meaningful in the long run, in the short run, you have to be careful because actual book profits are hard to determine in a short time period, especially in a dynamic universal life product.

- b. Another thing to account for is the market value adjustments that I mentioned earlier. If they all are in one direction, you have to amortize the cost and make an appropriate charge to the product.
- c. You need to watch Macaulay durations or an alternative which addresses the risk of mismatch of liabilities and assets.
- d. Average credited rate plus spread vs. average investment performance should be monitored on the basis indicated above.

Indexed products are good for the consumer, but they require tough discipline of the company. In reality indexing is probably the most stringent guarantee that can be given to a policyholder without undue risk to the company. I'm hopeful that more indexed products will emerge in the marketplace, especially if the interest rate environment remains as flexible and variable as it has been recently.

Now let me turn to traditional products. Traditional life insurance cash flow is a function of the market interest rate. This fact must be taken account of in monitoring the mismatch risk and setting investment philosophy. While mortality can be assumed to be unaffected, it is certainly necessary to allow policy loan activity and lapses to be functions of the interest rate. Since on the asset side most companies have low yielding, long duration assets, it is clear that a potential mismatch problem exists.

Policy loan activity has been studied by many companies. It can be regressed against the interest rate spread. Each company will find a slightly different relationship, but loans are definitely dependent on the gain which a policyholder perceives he may make by investing the proceeds of a policy loan at the "market interest rate".

The perceived "market interest rate" is often taken to be the short-term, money-market rate, although another likely candidate is the rate which is numerically highest, regardless of maturity. In order to gain by investing at this rate, the after-tax market yield must exceed the after-tax cost of the policy loan plus any potential dividends foregone. Policy loan utilization will be a function of this gain, which is in turn a function of the market rate.

On the other hand, the lapse rate is more complicated. A study that I was involved in showed that most surrendered policies are actually replaced. Although there is a LIMRA study that seemed to show the opposite, we found that if you ask the surrendering policyholders what they did, at least half of the time they usually admit to replacing surrendered policies. The lapse decision is not purely an investment decision. It also depends on the new products that are available, on field force attitudes and other things that are hard to model. Still, in most cases our study showed that what the customer was looking for was higher interest rates. Thus, in modeling, it is important to make the lapse rate interest-sensitive.

Next I will discuss several new developments and how they might affect

the liability structure. These developments are direct recognition, adjustable loan rates, the investment generation method that's been used recently in dividends and otherwise, and the 1980 NAIC model valuation and non-forfeiture laws.

Let us start with direct recognition. The policyholder's potential marginal gain from reinvesting a policy loan may be seen to depend on the differential between the market rate and the marginal dividend interest rate.

If the dividend rate is calculated on a portfolio-average basis, it will be a slow reacting function of the market interest rate. It's not going to change much in the short run. If market interest rates jump up, you'd expect high loan activity. On the other hand you'd expect repayments if the market rate fell significantly. Thus, you may want to invest shorter - there are indications that a lot of companies are doing this. There is an ACLI study that compares the breakdown between investments less than and greater than 10 years in 1979 vs. 1982. The study that shows the split between shorter and longer was 47%/53% in 1979. In 1982 it went to 58%/42%, a pretty significant shift. Some companies have made an even greater move to short term assets and have done very well recently as a result.

Some companies have developed a liquidity reserve, a large amount of assets in a fairly liquid form - very short term or even cash. In the situation that we have been describing, cash flow is likely to be countercyclical. You are likely to get more money when interest rates are low and less when interest rates are high. Possibly a hedging technique that Jim Tilley discussed would be useful here.

MR. TILLEY: It is the extreme interest rate environments that cause tremendous problems. Prepayment on assets is likely if rates drop suddenly, and disintermediation is the problem if rates quickly rise.

Perhaps a good strategy is to get out of the part of the yield curve where everyone is looking for investments. Move to the longer part of the yield curve and purchase a stop-loss cover for extreme interest rate movements. Design a strategy with options of various kinds to hedge that risk, and fund them in the pricing of your policy. My intention would be to move into a part of the yield curve that isn't saturated with demand. People, after the last two or three years, have dug in their heels, turned around 180 degrees to shorten, shorten, shorten, shorten, and you know that is just about the wrong thing to do, especially if everyone is doing it.

MR. DICKE: When you use the term "stop-loss", is that something you're coining or is that something that I should put on Part 11?

MR. TILLEY: I'm coining it; you can still put it on Part 11. I think stop-loss is a good term because it suggests alteration of the return pattern; the chopping off of one end of distribution.

MR. DICKE: I was just discussing direct recognition when the portfolio average method was used. Let's consider what would happen if direct recognition of policy loans is used with an investment generation

method. There are actually two kinds of investment generation methods. One is a lot like the portfolio average method. I call it the partitioned portfolio method. Under this method, a particular group of contracts - let's say all the contracts issued after 1980 - are given a different interest rate than those issued at other times - e.g., before 1980. Basically, each group of policies has its own portfolio average interest rate. Each group of policies acts like a separate portfolio-average company, having its own rate, a rate which is not very sensitive to changes in the market rate. This means the interest rate differential is different for each policy group. In particular, when you model lapse rates, you should recognize that older policies are stuck with a lower interest rate.

Under "true" investment generation methods currently being used by a few companies, annual increments to cash flow are credited with new money rates. This has the effect of making the gain from borrowing and reinvesting policy loan proceeds a function of the marginal dividend interest rate - i.e., the new money rate.

In modeling such an animal, however, it is not clear what the policyholder will perceive the gain to depend on. Will it be the marginal dividend rate, the average dividend rate, or something else altogether? If policyholders do perceive the gain to be related to the spread between market rate and marginal dividend rate, policies using "true" IGM dividends, together with direct recognition may be relatively more stable in times of changing interest rates than those utilizing other approaches.

With investment generation methods you have to be very aware of the base that you credit interest to. Is the base the increment to cash value gross or net of policy loans? If it is net of policy loans, then (without regard to tax) the marginal gain is only the excess of the market rate over the new money rate, and the approach should show good stability under interest rate changes.

Incidentally, there are non-par policies which effectively are direct recognition policies. Several companies sell a current assumption whole life in which a different rate is credited on borrowed and unborrowed funds. I would call them direct recognition policies, and I believe they fit in the basic structure I've described.

Companies that use an adjustable loan rate can go the direct recognition route or not. If there is no direct recognition of policy loans, the potential gain is approximately the market rate less the adjustable loan rate plus tax savings. The tax savings are related to the policy loan rate. Since currently the adjustable loan rate is higher than 8%, the tax savings are higher; therefore, such policies are preferred for minimum deposit sales, and cash flows are correspondingly lower. The adjustable loan rate is, of course, tied to Moody's Index which means you have a legged index based on long term investments being compared to short term market rates. This may be something you want to take into account. Another point you need to consider is how long the market rate has been where it is.

If you have an adjustable loan rate with direct recognition, the most

complex combination, then the potential marginal gain depends on the market rate less the marginal dividend interest rate credited on unborrowed funds (which might be lower than the adjustable loan rate even if an investment generation method is used) plus the tax savings which are a function of the adjustable loan rate. Experience will show whether policyholders react "rationally" or whether, for example, the adjustable loan rate acts as a psychological deterrent to sales.

We can also look at the effect of changes in the market rate on policy loans when the investment generation method is used without either direct recognition or the adjustable loan rate. If the policy loan is made in one investment generation and the repayment is made in another generation, differences in market values should be considered. Financial antiselection is quite likely to occur and should be taken into account in the modeling process.

You can see that policy loans are very tricky to model. The lapse rate is trickier yet but probably based on the same considerations. I've seen studies that had lapse rates expressed in terms of a fixed floor rate plus an additional term which depends on both the interest rate spread and policy duration. Some people cap the possible lapse rate which results. To me, 100% is a safe cap.

Finally, let me touch on how the new valuation and non-forfeiture laws affect investments. The most dramatic effect is to allow a higher interest rate assumption that may result in lower premiums. Effectively, you could have a high guarantee built into your product. How can we invest for a 6% guarantee while paying current interest? You have kind of C-2 Risk here, a risk that the pricing will be inadequate to pay benefits.

Perhaps Jim can address a new technique called contingent immunization. I heard about it in regard to pension funds. The idea is that you leave yourself a little margin in the declared interest rate and arrange an investment strategy that allows you to lock in a floor rate.

MR. TILLEY: Contingent immunization is a synthetic options technique. The principle is very simple. Macaulay duration is a very useful single index if cash flows are fixed. You can modify your duration measure so that when you take the derivative with respect to interest rates, you recognize the cash flows themselves and not just how they discount. If you are in a situation where cash flows are fixed, classic immunization makes sense. You simply keep the durations of your assets and liabilities the same. The maximum rate you can lock in is essentially today's yield curve structure

What Arnold is talking about in contingent immunization is if you back off the maximum rate you can lock in and say, "I'm not going to credit that because I don't want to push myself to the limit. I want to back off 50, 100, 150 or 200 basis points." When you do that, you buy yourself some flexibility. You could lock in a floor rate with some indexing features on top of it. The more you back off on the floor rate, the more margin you have for indexing.

MR. DICKE: Perhaps Barry would like to make a few comments about how secondary guarantees might affect the universal life design, particularly when there are fixed premiums.

MR. ALLEN: Perhaps I would credit 4% annual interest as a minimum rate on a universal life policy every month. I'd also determine the level premium to fund the designated benefits assuming a 6% rate of interest, and make an absolute guarantee that this premium on the policy will be sufficient if paid periodically. In the early durations as you are crediting the current interest rate, the extra cash value built up has to be retained in the policy until such time as the reserves or account value under the policy funds a 4% reserve. You're going out on a limb a bit in the earlier years saying that you're willing to guarantee 6% on a lifetime basis, but not year by year. I think that this approach in combination with various required premium structures is in the future development of universal life.

MR. DICKE: In New York for certain products, in order to use the highest interest rates that are allowable under the new law, an actuary must make a certification with respect to the immunization of the product. I wonder if the new products with secondary guarantees will require certification and to what extent. Perhaps this type of actuarial certification will develop even for traditional products.

More and more companies will incur negative cash flow on at least some blocks of business. It could result from the run off on matured blocks, when most new business is placed in a subsidiary, or from a segment experiencing a great deal of replacement.

One result of negative cash flow would be pressure on forward commitments. I've seen companies set up large amounts of liquid assets to provide cash for a block of business which is essentially withering away. If assets are segmented, the problem worsens.

Another strategy to deal with mature blocks of traditional life insurance policies is to spend surplus to retain business. If companies are willing to use surplus to improve existing policies, more business might be retained. For mutual companies, the new tax bill penalizes high surplus and there might be some thought about adopting such a strategy. Another possibility would be a program of bond swapping. You'd absorb the market value loss on a bond that's deeply discounted and use the market value to purchase higher yielding assets. Some companies have done that with their GIC portfolios recently. Would you like to comment on that, Jim?

MR. TILLEY: The proposed tax law would subject existing portfolios to new analysis. If assets were purchased to take advantage of the old tax law, especially if tax savings were passed to the policyholders (e.g., in GICs), they will have to be reevaluated. Any time you get a major shock to the environment, whether it's through interest rates or a new tax law, it's a good time to examine those old portfolios. Certainly there might be swaps that make sense, even though an insurer is subject to statutory accounting constraints.

MR. DICKE: Another possibility would be to pass some older low yielding

securities to a subsidiary at book value to cover new business strain which may be developing from, say, a universal life product. This can be done tax-free, which is a big advantage. If you then sell single premium immediate annuities (SPIA's) through the subsidiary, cash will be produced, which can be used to fund the strain from the universal life product. The transferred bonds can back up the SPIA's. In effect, this approach postpones the recognition of the market value loss on the old bonds.

One last point to make is that immunization is a function of both the assets and liabilities. To look at it another way, it's a function of the net cash flow. There are investment strategies, and there are also strategies which involve selling certain products. For example, SPIA's have a long duration, so can be used to lengthen liabilities and shorten assets. Actuaries are uniquely able to monitor both assets and liabilities.

MR. REISKYTL: Thank you. Are there any questions from the audience?

MR. LORNE CAMPBELL: I have a question for Jim Tilley regarding higher interest rates on participating products. For instance, Philadelphia Life has a new low cost par product with a 7% guaranteed rate. I believe Great West has a 6 1/2% guaranteed rate product. Immunization or contingent immunization makes sense for a fixed period like 15 to 20 years. How can you immunize guarantees of 6 1/2% or 7% for 30, 40, or 50 years for younger ages? What types of investments are of that duration?

MR. TILLEY: Now that futures are available, I can create a duration 100 portfolio quite easily. Many people think of duration as a more scientific time measure for a portfolio of assets or liabilities. That concept doesn't allow you understand negative duration or zero duration for real estate. Think instead of duration as a measure of the price sensitivity of an asset or liability to interest rate fluctuation. Thus, I can buy a future, which involves almost no capital outlay, and create very long duration investments in terms of their price sensitivity.

MR. CAMPBELL: I have one additional observation about direct recognition. It seems that the large mutual companies are slowly but surely going to direct recognition. I think some of these companies have computer problems. Eventually the companies that choose against direct recognition of policy loans will be subject to extreme anti-selection.

If you offer a variable loan rate product without direct recognition, suppose the variable loan rate is above your portfolio rate. If yours is a portfolio rate company, the dividends will be calculated at a rate above the portfolio rate. You'd need high loan utilization in order to afford your product!

MR. REISKYTL: I agree. A policy loan rate designed to discourage borrowing may end up encouraging borrowing! It is a crazy world we are living in.

MR. TILLEY: Indexed policies are becoming more popular with consumers. If the instruments to back them existed in sufficient quantity, they'd become a lot more popular with insurance companies. Perhaps borrowers

willing to enter into indexed loans or mortgages are poorer risks. Then you'd have substituted credit risk for investment yield risk. If the company holds such riskier assets and interest rates spike, defaults could then cause problems worse than those encountered so far. Ideally, investment bankers will create indexed instruments from creditworthy corporations. Otherwise, all you're substituting is a severe potential credit risk for an investment yield risk.

MR. CAMPBELL: That's true even for some short term paper in the market. I'm referring to paper of credit companies owned by major corporations, which are basically consumer credit companies to finance consumer products. You must realize that again it flows through to the consumer credit level. Investment people are less concerned because it is short term paper, but a company might get into trouble because of the associated credit risk.

MR. SHIRAZALI JETHA: Could you give me some specific information on the futures market? What do I specify if I want to enter the market? Do I specify the term of the bond I want? Do I specify the coupon or the class of the bond I want?

MR. TILLEY: You have to take what's listed on the exchanges. You can buy a delivery month; you can get something that's delivered at the end of March, June, September or December, for example. You can get a long Treasury bond, in which case a variety of instruments are deliverable. You can buy a note or a bill. You can't specify the exact instrument. Many things cannot be tailored. That's also an advantage because it results in a very liquid market. The challenge is to determine what and how much you have to buy to fit your purpose. Alternatively, an investment bank will tailor specific instruments for you, but there is more credit risk. Of course, the credit risk exists on the exchanges, even as it does for the Federal government, but it's minimized on the listed futures and options. Exchanges have compiled a fairly enviable track record.

MR REISKYTL: Thanks Jim, Barry, and Arnold for your fine presentations today.