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TERM TO 100 PRODUCTS -- CANADIAN PERSPECTIVE

Moderator: CLIFF OLIVER
Panelists: MARIO GEORGIEV
ROBERT G. TIEDE
ROBERT J. TIESSEN
Recorder: CLIFF OLIVER

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MR. ROBERT G. TIEDE: Since the term to 100 or T100 product was first introduced to the Canadian marketplace in the early 1980s, many variations of the original product design have developed. The product originally appeared as a low cost variation on traditional whole-life products. As such, it was typically a no cash value, guaranteed premium product with premiums payable for the entire coverage term. Over the years, variations have developed in such areas as: adjustable versus guaranteed, with cash values versus no cash values, with reduced paid-up values versus no reduced paid-up values, high compensation/high premium versus low compensation/low premium, and limited pay versus premiums payable for the entire coverage term.

Currently the market for individual life insurance in Canada is extremely competitive from the viewpoint of both price and compensation. As a leading product in the marketplace, T100 is subject to these competitive pressures. Accordingly, in the years since its inception, there has been a gradual move towards lower premiums. This is perhaps most apparent in the brokerage market where a number of smaller companies are competing for market share. Much of the business written is either replacing policies issued under the more traditional whole life or endowment plans or replacing other T100 plans. Some T100 is even replacing five- or ten-year renewable and convertible (R&C) term plans, since the T100 rates, while still higher than R&C products, are nevertheless attractive in light of the nonincreasing nature of the premiums.

However, there is now some indication that rates may have bottomed out. Various factors have been operating to cause this, and much of the remainder of my presentation will address the nature of these factors and their impact on the price levels and marketability of the T100 product.

As you know, a critical assumption in the pricing of many life insurance products is the lapse assumption. This is perhaps nowhere more salient than in the case of T100. Historically, most concern has been addressed towards the level of lapse rates in the early years of a policy. If, in

the early policy years, a company experiences lapse rates higher than what were priced, losses can result because the recoverability of high acquisition expenses would be compromised. While this traditional concern is still salient to T100, because of the design features of the plan and the highly competitive nature of the market, a great deal of care needs to be taken in the selection of lapse assumptions in later policy years, particularly the ultimate lapse assumption.

This can be illustrated by examining a sample T100 product. Let's consider a T100 plan issued to a male nonsmoker age 45. It has neither cash values, nor reduced paid-up values. Premiums are level, guaranteed and payable for the entire coverage term. We'll examine the effect on profits of varying only the ultimate lapse assumptions. The following table will illustrate the results.

TABLE 1

Policy Year	Lapse Scale A	Lapse Scale B
1	2.5%	2.5%
2	7.5	7.5
3	6.5	6.5
4	5.0	5.0
5	4.5	4.5
6	4.0	4.0
7	4.0	3.5
8 & thereafter	4.0	3.0
Present Value at Issue of After Tax Book Profits	$0.06	$(2.82)
Percent of Premium	.7%	(34.2%)

This dramatically illustrates the crucial nature of the ultimate lapse assumption. A reduction in the ultimate lapse rate of only 1% changes the plan from being profitable to being a loser, to the tune of over 34% of a premium. This is mainly attributable to an increase in the cost of death claims under lapse scale B. With the ultimate lapse rate being lower, more people terminate as a death claim than as a lapse. This has a "double whammy" effect. First, terminating as a lapse any time after duration two would cause a profit on termination because the asset share is positive and there is no cash value. The lower ultimate lapse rate robs the company of these gains on lapse. Second, the cost of death claims at later durations is higher than under a traditional product with cash values. Since under the T100 plan the cash value is zero, the amount which hits bottom line is the excess of the death benefit over the reserve, not just the excess of the death benefit over the cash value.

By the mid-1980s regulators became more and more concerned that overly optimistic lapse rates were being used in the pricing and valuation of T100 plans. In an intensely competitive market, pricing and valuation actuaries were failing to recognize the full impact of this assumption. The Canadian Institute of Actuaries responded by developing the first "valuation technique paper." A technique paper is a paper which provides valuation actuaries with more specific guidance than that contained in the recommendations. Attention can be directed to specific issues and practical, specific guidance can be given to provide valuation actuaries with techniques which must be used. The operative word here is "must." These are not just "suggested" methods. They are mandatory in the same way that the recommendations are. Valuation Technique Paper #1 addressed itself to the problem of so-called lapse-supported products, i.e., products (mainly T100) where an inappropriate choice of lapse rates could result in significant underpricing and underreserving.

Bob Tiessen will be going into the details of this technique paper #1. Suffice it to say that the paper imposed restrictions on the level of the ultimate lapse rate which could be chosen for valuation purposes. Specifically, the lapse assumption after the fifth policy year could not exceed 3%. Let's see what effect this has on the pricing of our sample T100 plan.

Let's suppose that the pricing actuary has chosen lapse scale A as being representative of what the future will hold. If lapse Scale A is also used in the calculation of the actuarial reserves, as it was in the pricing detailed in Table 1, the plan meets our profit objective. However, according to technique paper #1, the ultimate lapse rate needs to be lowered to be no higher than 3% after year 5. Let's look at Table 2.

TABLE 2

Policy Year	Lapse Scale A	Lapse Scale C
1	2.5%	2.5%
2	7.5	7.5
3	6.5	6.5
4	5.0	5.0
5	4.5	4.5
6 & thereafter	4.0	3.0
Present Value at Issue of After Tax Book Profits	$0.06	$(1.00)
Percent of Premium	.7%	(12.1%)

So in practice, significant additional reserves need to be set-up to cover the risk that actual lapses may be lower than that assumed in the pricing basis. This is then one of the factors which is causing an upward pressure on T100 rates.

Another such factor is the recent introduction of a new level of taxation by the federal government called the investment income tax (IIT). Over the years, the federal government of Canada has attempted at various times and in various ways, to tax the investment build-up in life insurance policies. These efforts have always met with a great deal of opposition from the life insurance industry and from consumer groups. The result has been compromise solutions which, while not eliminating the tax altogether, at least afford some tax relief.

For example, in 1981 the federal government then in power brought down a budget which provided for the taxation of all the investment build-up in any type of individual life insurance policy. This would have placed a significant, additional tax burden on policyholders and also would have placed a huge administrative burden on insurers. Through extensive negotiations between the industry and the government, this was eventually watered down so that most policies became exempt from the tax. Only policies with significant inside build-up would not be exempted from the tax. And the level of inside build-up which was deemed to be significant was high enough so that these so-called "nonexempt" policies represented a fairly low percentage of all life insurance policies sold.

The IIT is another method which the federal government has devised to tax the investment income building up in life insurance policies. This new tax, which was introduced about two years ago, is a proxy tax. That is, the consumer is the party at whom the tax is aimed, but the insurer is the party that actually pays the tax. The government then assumes that the insurer will pass on the tax cost to the consumer through higher premiums or lower dividends.

In very basic terms, the method involves defining an net investment income base from which certain deductibles are allowed. The result is then taxed at a rate of 15%. In actual practice, the calculation of the tax is quite complex, partly because the IIT is deductible from the normal income tax base, and the normal income tax is deductible from the IIT. You therefore have a circular calculation of significant complexity.

The significance of the tax on T100 rates can best be illustrated by considering its affect on our sample plan.

TABLE 3

Pricing Lapses: Lapse Scale A
Valuation Lapses: Lapse Scale C

	Premium Rate Which Satisfies Profit Objective
No Investment Income Tax	$ 8.15
With Investment Income Tax	8.47
Percentage Increase	4%

Thus, the insurer needs to increase premiums by 4% in order to effectively pass on the cost of the tax to the consumer. IIT has an even greater impact on plans which have a higher investment income element. The impact can be as high as 8-10%.

Up until now, we have been dealing with a sample plan which has no cash surrender values. Since many T100 plans currently being sold do indeed have cash values, it will be instructive to examine the effect that cash values can have on the price of the product. Here is a summary of the cash values which have been used:

TABLE 4

Duration	Cash Value	Duration	Cash Value
1-19	0	40	514
20	127	45	688
25	187	50	861
30	259	55	1,000
35	341		

In addition, the plan will now mature at age 100 for the sum insured.

Let's now view Table 5.

TABLE 5

Investment Income Tax: 15%

	Premium Rate Which Satisfies Profit Objective
1. Pricing Lapses: Lapse Scale A Valuation Lapses: Lapse Scale C	8.70
2. Pricing Lapses: Lapse Scale D Valuation Lapses: Lapse Scale E	8.55

Line 1 illustrates that the cost of coverage appears to increase, as you would expect, when you introduce cash values. However, the real cost needs to be determined using a revised scale of lapse rates which takes into account the different level of terminations which will likely result from the presence of the cash surrender option. This is taken into account in line 2 where different lapse scales, called D and E, are used for both pricing and valuation. The corresponding no cash value premium was $8.47. Thus, the additional benefit of having the cash surrender option really adds little additional cost to the plan. This is because one is able to increase both the pricing and the valuation lapse rates because of the existence of the cash values. Let's examine Lapse Scales D and E to see how the incidence of termination is affected by the cash values.

TABLE 6

Policy Year	Lapse Scale D	Lapse Scale E
1	2.5%	2.5%
2	7.5	7.5
3	6.5	6.5
4	5.0	5.0
5	4.5	4.5
6-11	4.0	3.0
12	3.5	3.0
13	3.0	3.0
14	2.5	2.5
15	2.0	2.0
16	1.5	1.5
17	1.0	1.0
18	0.5	0.5
19	0.0	0.0
20	15.0	12.0
21	10.0	8.0
22 and thereafter	5.0	3.0

As the time approaches where cash values will become available, the lapse rates start to decrease until they reach zero at duration 19. That is, it is assumed that no one will be foolish enough to terminate in year 19 and get nothing when, if he waits one more year, he can terminate and get $127 per thousand. Year 20 is what we call a "cliff." The high lapse rate reflects the pent-up propensity to terminate. This effect spills over into the next year before it levels off in the second year after the cliff. You will note in the far right column that the valuation actuary has been a little more conservative than the pricing actuary by assuming that the lapse rates at and after the cliff are not quite as high. Also, technique paper #1 constrains him to use a lapse rate no higher than 3% once the cliff effect has subsided.

Of course, the reason why the premium was not increased that much by the presence of the cash values is that the amount paid out upon surrender is significantly lower than that which would be paid out as a death benefit if the person were to persist and eventually die with the policy still in force.

MR. MARIO GEORGIEV: I have been asked to bring a U.S. perspective in this panel discussion on permanent products with no cash values. I will attempt to introduce what is actually happening in the U.S. and link it to the Canadian experience, when possible.

While term to 100 products, as they are known in Canada, are not available in the U.S., other forms of lapse-supported products are available in the American marketplace.

LAPSE-SUPPORTED PRODUCTS IN THE U.S.
For pricing consideration, there is a lot of similitude between a term to 100 issued at age 45 with some extended term forfeiture benefit for lapse beyond the fifth duration and cash values starting at age 65, and a universal life product with severe surrender charges grading down over 10 years and a "return of costs of insurance after 20 years" bonus.

The cost elements in these products may carry different names but they impact profitability the same way and experience the same type of sensitivity to lapses.

Other examples of lapse-supported benefits available in the U.S. include a cash bonus payable when the policy is still in force past a given duration or retroactive interest credit on accumulated funds. The pricing of these benefits sometimes involved a trade-off between higher interest return and lapsation risk where higher than expected lapses make up for lower than expected returns.

NO CASH VALUE WHOLE LIFE
While, very often, lapse-supported features are offered as extra benefits on a universal life product or riders attached to a policy; some companies have designed product packages that look like a no cash value whole life.

These packages offer level benefit to age 100 with no or limited cash value, reduced paid-up or extended term surrender benefit at all durations. Premiums are expected to be level and payable for life or to a given age (age 65) or duration (20 years) at which time the policy becomes paid up. Several approaches allow companies to put these packages together.

Decreasing Term Approach
While issuing a guaranteed decreasing term to age 100, the company offers dividends which buy one-year term additions that are designed to maintain the death benefit level. The initial face amount may remain level for the first 3-5 years on the decreasing term. Variation on the decreasing term coverage period, and the premium period would allow limited pay life coverage. Evidently, with this approach, if dividend options other than term addition are elected, the "package" terminates.

Universal Life Approach
A universal life policy may offer a "no lapse guarantee" which states that, even if your cash value goes to zero, the policy will not lapse, provided the insured paid the required minimum premium. While it is not possible to offer these guarantees for life, no lapse guarantee could be offered for very long-term periods with a zero cash value.

The Growing Whole Life Approach
Now, if the objective is to mimic a more "intricately" designed Canadian term to 100, I volunteer the following set-up.

Start with a nonrenewable term policy (say ten years) that automatically converts to a participating whole life policy -- which covers part of the face amount -- accompanied by an adjustable premium decreasing term rider. Dividends on the whole life are paid by participating paid-up additions. The premiums on the term policy and the adjustable rider can be set so that the total expected premium is level. You then get a zero cash value product while the original term policy is in force; cash value will be slowly developed on the whole life and the paid-up additions. Here again, election of a different dividend option would force termination of the "package."

THE "LOOK-ALIKE" PROBLEMS

As viewed from the insured, these look-alike products are very similar, when not identical to "Canadian term to 100." However, companies that wish to issue such product packages face basic problems.

Nonguaranteed Benefits
Since the "lapse-supported" portion of the product is usually nonguaranteed, the standard valuation law does not force the writing companies to "prefund" the benefits on a statutory basis. Evidently, it is more of a problem to pay a tenth year retroactive interest credit when it was not prefunded. I am not suggesting that companies systematically do not prefund such benefits nor do I presume that they do not plan on meeting the expected benefit. But the statutory valuation law allows them not to. The same reasoning applies to the term to 100 look-alike packages described earlier. The costs of the one-year term addition, for example, will increase through time because of the age increase and because of the decrease in the guaranteed decreasing term benefit. This expected increase in future costs call for some prefunding. So, companies face a situation where they have to postpone immediate statutory profit or expect large fluctuation in income in the years the nonguaranteed benefits are provided. GAAP accounting should alleviate the problem since it assumes prefunding of all benefits -- including the nonguaranteed ones -- and is designed to produce levelized income.

Tax Reserve
Because the maximum tax reserve rules do not allow for contingency reserves that would provide for prefunding, it further discourages prefunding. Companies that do prefund will have to incur an early tax cost that may jeopardize the profitability of the product.

Deficiency Reserves
Lapse-supported benefits in the U.S. are always nonguaranteed because, should they be guaranteed, they would trigger deficiency reserves that would create a severe burden for the issuing companies and may even kill the statutory profitability of the product. Even if customers are now used to nonguaranteed premiums and/or benefits, the lack of availability of those products on a guaranteed basis is a problem.

ADVANTAGES OF TERM TO 100 PRODUCTS

Let us focus now on a "pure term to 100" product. We will assume life coverage with level premiums and no nonforfeiture benefits at any duration. Here are the advantages associated with such a product.

Customer
Sales success in Canada surely demonstrates the interest for a level premium, level death benefit, no nonforfeitures product. The product combines permanent coverage with low level costs and is very simple to understand. It also provides the customer with a tool to estimate the value of nonforfeiture benefits on other products: the premium differential being the cost associated with nonforfeiture.

Agents
The agent definitely benefits by having an intermediate product between the whole life and the annual renewable term with a premium that allows for sensible commission while remaining affordable to the customer.

Companies
The premium income that comes with the product eases amortization of costs when compared to shorter-term insurance. It allows the company to generate substantial assets and to plan on long-term investment strategies while avoiding the disintermediation risks. Finally, the product does not induce mortality antiselection because of its premium structure.

DISADVANTAGES
There are some disadvantages often associated with the product. Allow me to comment on each.

Inequities for Surrenders
Equity among insureds is established at issue. A parallel with single premium life annuities shows that equity at issue is -- if not the only way -- at least a satisfactory way to insure equity for some products.

Lapsation Risk
Lapse-supported products involve an unusual treatment of the lapse risk, the lower the ultimate lapse risk, the less profitable the product is. Prudent reserving assumptions should allow companies to issue the product with no more "uncalculated" risks than other insurance products.

Secondary Market
The development of a secondary market for this type of product is often raised as a serious problem. Assuming that the available product is a "pure term to 100," I see a few objections against the development of such a secondary market.

First, unless the insured is expected to die very shortly, how will the "purchaser" keep in touch with the insured -- who may die only ten years later -- and know when to collect the face amount? Remember that the insured no longer has an interest in the policy.

Consider also that the proceeds will be taxable to the purchaser, thus reducing his financial interest in such a deal.

I really do not foresee more of a secondary market on these policies than what currently happens with ordinary life policies under living benefit programs, and I assume that it should not have any impact on the pricing of the product.

OVERVIEW OF THE U.S. REGULATORY ENVIRONMENT
Missouri and Kentucky
The states of Missouri and Kentucky have laws allowing the sale of permanent products providing for no cash values. The products, however, have to offer equivalent reduced paid-up or extended term surrender benefits. Such products are not lapse supported but allow the companies to avoid the disintermediation risks.

NAIC's Actuarial Committee
In 1987, the NAIC Actuarial Committee was presented with a model bill allowing the issuance of life insurance policies with no nonforfeiture benefits.

The main elements of the bill were:
- o Valuation -- Same method as a whole life except that a withdrawal rate, not exceeding 3% annually, may be used.
- o Nonforfeiture -- The only nonforfeiture benefit permissible is reduced paid-up (but no minimum set).
- o Policy Provisions -- Proper disclosure including an extended grace period and the right to continue coverage for a reduced amount at the original premium on adjustable premium products.

The NAIC Committee postponed the decision on this model bill until the American Academy of Actuaries (AAA) task force on nonforfeiture produces its report.

AAA Task Force
The AAA task force on the review of the standard nonforfeiture law has recently produced its report. It concludes that the nonforfeiture principles actually included in the law still work and

should remain the basis to establish nonforfeiture benefits. However, the Task Force proposes that paid-up insurance is a benefit that satisfies nonforfeiture equity.

Texas
The Texas laws, since 1987, permit the sale of no cash value whole life policies. In fact, similar policies up to a maximum of $10,000 have been long sold by stipulated premium companies in Texas. The new law removes the $10,000 limit and makes the product available for all life insurance companies.

The 1987 law also specifies that such policies can neither be issued nor approved until the Texas Department issues regulations on:
- o Valuation basis and methodology
- o Required policy provisions
- o Disclosure requirements
- o Experience reporting requirements

While the Texas Board of insurance has not yet approved of any measures, the recommendations, so far, would allow for the following:

1. Product Design -- product specifications particular to this product, as under consideration in Texas:
   - o It would be level premium for life.
   - o No nonforfeiture benefits of any kind at any duration are allowed.
   - o Participating products are allowed, but adjustable premiums are disallowed.
   - o No rider that would have the indirect impact of adding some form of surrender benefit can be added to the policy.
   - o The grace period on the policy has to be 91 days minimum.
   - o It must include a disclosure provision on the cover page of the policy specifying that there is nonforfeiture benefit.

2. Valuation Basis -- the valuation methodology currently under study split the reserve calculation in two components: the basic reserve and the deficiency reserve. Again, a final valuation basis has not been approved yet, and it may ultimately differ from the one outlined here.
   - o Basic Reserve
     Method -- Commissioners' reserve valuation method or net level premium allowed
     Mortality -- The appropriate 1980 CSO Table.
     Interest Rate -- An interest rate equivalent to 125% of the calendar year statutory valuation interest rate that would apply to comparable life insurance contract with nonforfeiture values.
     Lapse Assumption -- Year One: 6.0%; Year Two: 5.0%; Year Three: 4.0%; and Year Four to Ten or to age 65 if later: 2.5%; thereafter until age 84: 1.5%. Attained age 85 and after: 0.0%.

   - o Deficiency Reserve
     For the purpose of testing for deficiency, rather than comparing the gross premium with the net valuation basic premium, it would be compared with a "benchmark" premium.

     The benchmark premium would be 1.075 times a net premium for a comparable life contract calculated with the basic interest rate plus 1%, the basic reserve lapse assumption and a modified 1975-80 mortality table.

   - o Reporting Requirements
     Every company will have to report annually to the state board of insurance its lapse experience on no cash value whole life. The collected statistics would be used to revise lapse assumptions for valuation purposes from time to time.

CONCLUSION
While the Texas proposal is still subject to discussions and the final valuation methodology and assumptions are not yet definitive, I think that Texas is taking the right approach. No nonforfeiture whole life should be allowed since the policies benefit both the industry and the customer. The laws should be amended to provide sound statutory provisions that allow companies to sell the

product at rates which pass the savings on to the insureds and yet do not place insurers in an uncomfortable tax or income position.

MR. ROBERT J. TIESSEN: One of the more interesting product developments of the past ten years is term to 100. I will focus on the valuation implications of term to 100 products. Now I am not a valuation actuary, and my message is by no means a technical primer on valuation techniques. I do hope to cover the main features that need to be considered in the valuation of term to 100 and some of the wider implications of these features. By term to 100, I mean level premium, no cash value policies.

Recently, many products have been developed based on the opportunities offered by various tax and regulatory rulings. Term to 100 is perhaps a product that is both the result of, and more importantly the generator of, regulatory provisions for Canadian actuaries.

In valuation, some history is often helpful. In Canada, there was not and still is not a minimum nonforfeiture law. We had no Armstrong Investigation. However, companies in Canada sold products comparable to those available in the U.S.; renewable premium, term insurance, and level premium policies that had cash values, generally comparable to policies issued under U.S. nonforfeiture laws.

About ten years ago a new product appeared, designed mainly for the business market. It had level premiums, (payable for life or sometimes to age 65 or for 20 years) level death benefits, coverage to 100 or some similar age and no nonforfeiture values. Premiums were much lower than for whole life policies.

Before we get too deeply into valuation, I would like to reiterate the general pricing parameters Bob Tiede and I agreed to use (Slide 1). The CIA 1969-75 table is approximately 125% of the 1975-80 table. Mortality is for nonsmokers and includes a loading for AIDS. Premiums are guaranteed in all cases.

SLIDE 1

BASIC ASSUMPTIONS

Mortality	CIA 1969-75 66% year 1 - 15 61% year 16+
Interest	10% year 1 . . . 6% year 17
Lapses	2.5, 7.5, 6.5, 5, 4.5, 4 - >
Expenses	127% year 1 10% renewal

For demonstration purposes I have developed a regular whole life product, that is, a product with level premiums, level death benefits and nonforfeiture values based on the 1980 CSO table at 5%. I will call this policy product "A." All values relate to a male age 45 nonsmoker, age nearest. The net premium is $14.41.

Product "A" can be used as a benchmark for the various versions of term to 100 that will be described later (Slide 2). You might wish to make note of some of the reserve values for comparative purposes minus $6 in year one and $44 in year five. Reserves for this product are sometimes below the cash value. Adjusting for these minor anomalies has not been done.

SLIDE 2

PRODUCT A
WHOLE LIFE

Year	1	2	3	5	10
Reserve	(6)	6	18	44	121

Let's compare this product with an early term to 100 product, product "B." This product has the following characteristics:

1. Level premiums guaranteed for the lifetime of the product.
2. Level death benefit.
3. Coverage expires at age 100.
4. The plan has no nonforfeiture values of any kind.

The net premium is $10.42 or 28% below whole life. Product "B" would not be allowed under current U.S. nonforfeiture laws. There were no legal restrictions against such a product in Canada then or now, also there were no valuation guidelines for such a product when they were first introduced.

For those of you not familiar with the Canadian valuation system, it can be briefly described as using the valuation actuary concept. That is, the government does not specify any particular mortality tables, interest rates or valuation methodologies. Instead it relies on the valuation actuary's certification that the reserves established are adequate to cover the liabilities of the company. For many products, of course, there are historical precedents to act as guides for valuation actuaries. Unfortunately, there were few milestones to refer to when term-to-100 products were first developed.

Let us examine the reserves on product "B" using two lapse assumptions that may have been used by a valuation actuary (Slide 3). Assumptions except for lapses in years six and later, are pricing plus a small margin. The gross premium is the same in both cases, $10.42. This premium is based on an ultimate lapse assumption of 3%. Reserve values exclude IIT reserve. Reserves are calculated with ultimate lapses of 0% and 6%.

SLIDE 3

PRODUCT B
NO VALUES

Reserves

Year	1	2	3	5	10
0% Ultimate Lapses	21	32	45	77	153
6% Ultimate Lapses	(3)	1	6	18	54

The initial reserves and the increase in reserves are substantially different for product "B" than they were for product "A," our normal whole-life product. Increases in reserves over five years average $12 for "A," and in "B" $5 using 6% ultimate lapses, $14 using 0% ultimate lapses. The average increase over five years is one-fourth of the difference between the first and fifth reserve so that the impact of negative first-year reserves is reflected. The initial reserve difference is even greater being $24 or over 200% of first-year premium. A major reason for the difference is that the $10.42 premium is deficient with zero ultimate lapses.

The large reserves required by the zero lapse assumption would likely require an increase in premium to reduce them to manageable levels. A premium of $11.44 would eliminate deficiencies, a 10% increase over the rate that could be charged otherwise.

With this premium of $11.44 the reserves with 0% ultimate lapses are minus $5, plus $44, and plus $120 at durations 1, 5 and 10 respectively. It is readily apparent that a change in lapse rates can impact reserves to a large extent.

Reserves are impacted not only by the lapse assumption but also by the interest assumption (Slide 4). Using an interest assumption of 10% in all years with 3% ultimate lapses produces reserve values similar to those with a 6% ultimate lapse rate and valuation interest which was 10% in year one grading to 5.4% in year 16 and later. Recall that the 6% ultimate lapse rate values were considerably below our other option.

SLIDE 4

PRODUCT B
NO VALUES

Reserves

Year	1	2	3	5	10
10% Interest	(2)	2	7	17	50
6% Ultimate Lapses	(3)	1	6	18	54

which ever came later (Slide 5). At this point a high value, $400 was a common figure, became available, and afterwards the cash values increased at a normal rate until they reached $1,000 at age 100.

SLIDE 5

PRODUCT C
Level Premium and Death Benefits
Coverage to age 100

Year	1-24	25	55
Cash Value	0	400	1,000

Reserve values for this product, product "C" are as follows (Slide 6). Both assumptions assume zero lapses prior to the cliff, pricing for ten years prior, the 6% ultimate assumption uses zero lapses for five years prior to the cliff. Ultimate pricing lapses are 3% for reserve purposes. The presence of values has narrowed the gap.

SLIDE 6

PRODUCT C
CLIFF

Reserves

Year	1	2	3	5	10
Pricing Lapses	(5)	4	15	38	115
6% Ultimate Lapses	(3)	3	10	27	86

Even with the cliff product, which had reserves close to whole-life products, reserve values for term to 100 products had considerable range based on the valuation assumptions used. The magnitude of this range in the valuation assumptions naturally worked its way into the range of gross premiums charged. Every company wanted to have competitive rates, but this could be stymied by your valuation actuary. There were some ways of getting around that. If your own valuation actuary was conservative, maybe your reinsurer's valuation actuary was not. However, if you didn't reinsure much business or did not want to reduce your retention in order to reinsure more business, or even worse your reinsurer's valuation actuary agreed with your own valuation actuary, you might find yourself at a competitive disadvantage. Being at a competitive disadvantage due to your valuation assumptions undoubtedly put considerable pressure on the valuation actuary. This pressure brought results, although perhaps not exactly those that were intended.

What we did get in fact was "revenge of the valuation actuary," also known as valuation technique papers.

Valuation technique papers are developed by the Canadian Institute of Actuaries as guides for Canadian valuation actuaries. If the methods outlined in these guides are not followed, the actuary must demonstrate the reasonableness of the different assumptions.

The various steps in the development of valuation technique papers as well as any debate on how they have affected the actuary's job are outside the scope of this discussion. Highlights of valuation technique papers are as follows. Valuation technique papers 1 and 3 directly address term to 100 situations.

Valuation Technique Paper #1, which was published in June 1985, addressed the valuation of lapse-supported products such as term to 100. It states "an actuary should not use an ultimate lapse rate in excess of 3% unless he has relevant experience data." The impact of cliffs, return of premium riders and paid-up situations were also addressed. A zero lapse rate should be assumed in some situations, prior to a cliff, for example.

Valuation Technique Paper #3 addressed the investment assumption on future cash flows. It was recommended the reinvestment rate not exceed 5% after 20 years.

Valuation Technique Paper #2, September 1986, addressed the valuation of renewable term policies. A method for adjusting mortality rates in situations of above average lapses was provided.

Valuation Technique Paper #4 addressed the valuation of reinsured policies.

Valuation Technique Paper #5 addressed the valuation of adjustable policies.

Valuation Technique Paper #6 describes the factors to be taken into consideration when setting the mortality assumption for individual business. The underwriting classification system, selective lapses, AIDS, smoker misrepresentation are all dealt with. The actuary is required to include a provision for adverse deviations. A paper on adverse deviations has not yet been approved. All six valuation technique papers (VTPs) are Canadian Institute of Actuaries' policy and must be followed by Canadian valuation actuaries. All valuation technique papers to date relate to individual life insurance.

Let's go back to product "B" and see what the valuation technique papers have done to the reserves on this product (Slide 7). As expected, reserves are higher than the 6% lapse values but still well below the 0% lapse values.

SLIDE 7

PRODUCT B
NO VALUES

Reserves

Year	1	2	3	5	10
0% Ultimate Lapses	21	32	45	77	153
6% Ultimate Lapses	(3)	1	6	18	54
VTP	(3)	3	11	28	80

Obviously, these valuation technique papers acted to change the design of term to 100 products. For a current term to 100 product I have reviewed a recently designed product, some small adjustments were made for consistency. This is the product illustrated by Bob Tiede.

This product, product "D" (Slides 8 and 9) had the following characteristics:
1. Level premiums for life.
2. Level death benefit for life.
3. Nonforfeiture values beginning in the 20th year.

SLIDE 8

PRODUCT D

Level Premium and Death Benefits
Coverage to age 100

Year	1-19	20	25	30
Cash Value	0	127	187	259

TERM TO 100 PRODUCTS -- CANADIAN PERSPECTIVE

SLIDE 9

PRODUCT D
Current

Year	1	2	3	5	10
Product D Reserve	(5)	4	14	38	111
Product A Reserve	(6)	6	18	44	121

The reserves for this product applying the valuation technique papers are compared to our product "A" regular whole-life product. Product "D" reserves are close to whole-life reserves with average five-year reserve increases of $10, compared with $12 for product "A" and $5 for product "B." While nonforfeiture values of current products are well below classical whole-life plans, they are considerably higher than the original version.

There are special valuation considerations. Obviously, the main focal points of valuing term to 100 products are the interest and lapse assumptions to be used.

These and other factors will now be considered. Is a high interest rate justified? It might be reasonable to use a high interest rate if you could immunize yourself against interest rate changes by proper asset liability matching techniques. Unfortunately, the average liability duration of term to 100 products is much longer than for other products, due to the low lapses. This makes the matching procedure much more difficult due to the inability to purchase assets, even zero-coupon obligations, that have the appropriate duration.

Picking the right lapse assumption is equally tricky. Some people have considered using the lapse experience of deposit term contracts as many of these had no value for many years then had a lump sum. However, the time period under most deposit term contracts was, at ten years, shorter than for term to 100, and the premium rate under deposit term contracts was much less competitive than the rate under most Canadian term to 100 products.

Might the lapse experience under tontine dividend policies be used to estimate the experience under term to 100 contracts? This experience might be available from the older companies. As most of these tontine dividend policies were issued over 70 years ago, their experience is likely not representative. Naturally, the best guide is experience under current term to 100 contracts. Unfortunately, little of this experience has yet reached the ultimate durations where the assumption is most important.

Our own experience on term to 100 products would indicate that the lapse rate is even lower than was initially expected, being approximately 5% in the first year and 2% in renewable years. While usually we would expect a drop in the lapse rate of several percent on a product such as term to 100 in the later years, I have convinced our own valuation actuary not to drop the rate by more than 2%.

Another point to keep in mind when trying to determine what the lapse rate on these products might be is the possibility of a secondary market developing in life insurance policies. If the policies have intrinsic value but no cash value, an opportunity exists for outside parties to arbitrage the difference between the reserve value and the cash value by buying and holding these policies. A secondary market in life insurance policies is already present in the United States. This market is designed to buy life insurance on policyholders who are essentially terminal and wish to realize some proceeds of the policy while they are still alive. While the creation of a secondary market to capture the value in low or no cash value products on essentially normal lives would require companies that are sophisticated and capital rich, this possibility cannot be ignored. One Canadian insurance company had plans to enter the secondary market to buy its own policies should such a market develop.

Especially if you have sold your policies in business situations involving considerable outside expert opinion, it would appear to be unrealistic to expect sophisticated owners to lapse their policies when there is inherent value in them, even if this is not readily available to them.

Every cloud has a silver lining, and term to 100 is no exception. Because the Canadian valuation standards do not specify particular assumptions for calculating reserves in general, the taxation

authorities are not able to specify any particular basis in calculating tax reserves. As a result of this position and the desire not to complicate matters a great deal, it was decided that tax reserves would be calculated using pricing assumptions except for expenses and lapses. Both are set equal to zero for tax reserve purposes. While the impact on most plans is minimal, obviously if you've been following this so far, you'll realize that there will be a considerable impact on reserves if a zero lapse rate is used.

Investment income tax reserves are a significant factor in term to 100 contracts. They have been omitted from previous values to keep the comparisons with whole life valid.

So there you have it. A new product caused some confusion in the valuation field, but the good guys came over the hill and set reasonable standards so that all parties would be on equal footing. Maybe not quite so.

While each Canadian valuation actuary must specify the assumptions used in his valuation, the document in which this information is reported is naturally confidential. Most such documents are also very lengthy. These documents are submitted to the superintendent of insurance in Ottawa who reviews them. The superintendent of insurance is part of the Office of the Superintendent of Financial Institutions (OSFI). Financial institutions include banks, trust companies, etc., and fortunately, or unfortunately, more of these organizations have been going bankrupt than life insurance companies in Canada over the past few years. At times, the superintendent was not able to fully review all submissions for compliance with valuation technique papers.

Therefore, if you felt for some particular reason that your own term to 100 product would have a high ultimate lapse rate, you might have felt justified in using this assumption even though the valuation technique paper guideline indicates that a 3% ultimate lapse rate is the highest general lapse rate that should be used. Perhaps no one would notice.

A recent survey of valuation actuaries on the subject of compliance with technique papers indicated compliance percentages ranging from 40-85% for the six papers, average value 63%. Compliance with Valuation Technique Paper #1, which addresses lapse rates on term to 100 type contracts, was 70%.

The CIA, in order to get more information in this area, is drafting a compliance questionnaire for valuation actuaries. The questionnaire, which is ten pages long, asks among other things if you are part of the 63% who follow technique paper guidelines or part of the 37% who do not. If you're in the 37% group, the CIA Review Committee may forward your response to the Committee on Discipline.

Now I am straying into material best left for another session, but I would like to give some indication of the consequences that were started by valuation of term to 100 products. This product is more sensitive than most to minor changes in the assumptions. Changes in the valuation assumptions, with their impact on reserve increases and especially first-year reserves, affect pricing.

Everyone wants to work on a level playing field. However, the playing field on which pricing actuaries operate is being graded by valuation actuaries. In this process some valuation actuaries are using a trowel, others a bulldozer, to make changes from the level used by the pricing actuary. The field is not level in Canada. If your pricing people are about to join the game, make sure they know your valuation rules and those they will be up against.