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GENERALLY ACCEPTED ACCOUNTING PRINCIPLES (GAAP) FOR MUTUALS

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Panelists: PHILLIP J. GRIGG
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Recorder: J. PETER DURAN

The panel will present Financial Accounting Standards Board/American Institute of Certified Public Accountants (FASB/AICPA) pronouncements concerning application of GAAP to mutual life insurance companies. Panelists will discuss practical issues, including materiality and use of approximations. Issues of particular concern to smaller companies will be discussed.

MR. J. PETER DURAN: I have been very interested in the GAAP for mutuals movement. I think we have an excellent panel. We're going to start with Andy Ware, who is vice president and corporate actuary at Northwestern Mutual Life and has been responsible for implementing its GAAP for mutuals project. He's going to talk to us about Northwestern's experiences and how the company has addressed the various issues that it encountered during its implementation. Andy does valuation and financial reporting for all Northwestern's products as well as product development for its variable products. He is currently the chairperson of the Academy of Actuaries (AAA) Committee on Life Insurance, and he was very active at the AICPA during its deliberations on mutual GAAP.

Next will be Phil Grigg. Phil is vice president and associate actuary at Prudential. Phil has been with Prudential for 18 years and does valuation for individual life and health products. I asked Phil to speak to us about its implementation of GAAP for mutuals, particularly with respect to variable products and variable life insurance. Prudential is a major writer of variable life insurance, and even though the guidance that's being applied is not new, in the case of variable life, I think the mutuals may very well be in a position to set some precedents because most of the variable life business is, in fact, written by mutuals.

Finally, Tom Kabele is going to speak to us. Tom is senior vice president of Reinsurance and Tax at the Guardian Life Insurance Company. He has been with the Guardian since 1979 and is responsible for Guardian's reinsurance and tax operations. Tom has contributed various papers over the decades to the actuarial literature. One that has some relevance to this session is a discussion that he wrote of a paper by Donald Cody called "An Expanded Structure For Ordinary Dividends," which some of you may be familiar with. It came out in the *Transactions of the Society of Actuaries*, vol. XXXIII (1981): pp. 313–65. It was a classic paper. Unfortunately, I can't say that there's a lot of resemblance between the methodology elaborated on in that paper and what came out of the AICPA in the form of Statement of Position 95-1. Tom is going to talk to us about some issues in the reinsurance area and some of his views on the current approach to GAAP for Mutuals.

I'd like to introduce our topic by pointing out that there are really three pronouncements that govern GAAP for mutuals. It started in April 1993 when the FASB issued Financial Interpretation 40. Interpretation 40 prohibits auditors from giving a clean GAAP opinion

unless the financial statement is prepared in accordance with GAAP. The Interpretation notes that statutory accounting does not conform with GAAP, despite the fact that auditors' opinions have been reading that way for all these years.

The FASB then asked the AICPA to establish a committee to define GAAP for mutuals. Andy and I were both very active on that AICPA committee. After a considerable discussion, two pronouncements were issued. *Financial Accounting Standard (FAS) 120*, issued in January 1995, simply lifts the exemptions that had pertained to mutual life insurance companies in *FAS 60* and *97* and requires mutual life companies to apply the guidance in those statements to all their products except for "traditional" participating products. Finally, the third pronouncement, AICPA Standard of Practice (SOP) 95-1, elaborates on the methodology that has been established for accounting for traditional participating business.

MR. P. ANDREW WARE: I'm going to discuss some aspects of implementing GAAP for mutuals, concentrating specifically on participating whole life. I will not be discussing the relative merits of this accounting method or will I be discussing how useful the resulting numbers are to mutual company policyholders.

I'd first like to give you a quick perspective of the importance of participating whole life to my employer. Northwestern Mutual is a large mutual with $50 billion in assets. From a liability perspective, 81% of the reserves held by the company are for participating whole life. From an income perspective, 68% of the premiums are from participating whole life. And to get an idea of the influence on the deferred acquisition costs, 81% of the commissions paid by Northwestern Mutual are for participating whole life. By the way, Northwestern Mutual does not sell universal life (UL).

The most difficult aspect of the SOP and *FAS 97* is the amortization of deferred acquisition cost (DAC). I will summarize our approach and then discuss some of the issues dealing with estimating gross margins and determining the amortization period.

In order to manage the data requirements of DAC amortization for participating whole life, we are using what we refer to as a DAC register to record the data needed to calculate and amortize DAC. The DAC register is organized by issue year, reporting year, and product class cells. We also need to keep track of a shadow DAC to record the effects of *FAS 115* using a similar approach.

The register contains a cell for each calendar year and issue year combination dating back to the number of years prior to the initial reporting year for which DAC is amortized. If the initial reporting year is 1993 and the number of years to amortize DAC is 30, then the initial issue year we must worry about is 1963.

Data needs to be projected into the future for the period of the amortization. If DAC is amortized over 30 years, then the number of cells for each product line would be at least 900. In each cell there are many data pieces. Some of these data would be used to validate the model and some would be needed to calculate the gross margins and unamortized DAC.

To obtain gross margin estimates, we use a model similar to our existing corporate model. However, due to the need for a split by year of issue, this model will contain more representative cells than the corporate model. We plan to run the model annually and the output is data for the DAC register.

Once the actual data have been allocated by year of issue and the projections have been adjusted, then the DAC amortization ratio and ending DAC balance can be calculated.

Whenever the company has significant capital gains or losses, it will be necessary to offset future investment income by those gains or losses so that gross margins are not misestimated.

One of the most interesting problems we had to solve was providing the historical data needed for the DAC register in the detail that is needed. We did not have all of the historical data broken down in the categories that we needed, specifically issue year category. We decided to use our model to do that allocation. Basically, the approach involves using the projection model to simulate historical experience. This requires generating a group of representative policies for each historical year of issue and simulating their experience up to the present day. Assumptions are chosen so that the ending inventory amounts correspond reasonably well to the actual ending inventory by issue year.

One of the things we've been looking at from the start is the sensitivity of gross margins to our assumed interest rate spread, lapse rates and dividend options. Under the original draft of the SOP, you were only permitted to use dividends paid in cash and not the margins generated from dividend additions to run off DAC.

Chart 1 shows that DAC runs off on a relatively even basis under those assumptions. The top line is the unamortized DAC from a single year's issue. The lower line shows the gross margin estimate at issue for that block of business. For these examples, I'm running DAC off on these policies over 40 years. We haven't made a decision on the run-off period. I want to note here that the acquisition costs being amortized are not incurred all in the first year under these examples. In fact, in the first ten years, all of the renewal commissions are assumed to be amortized because there is nothing assumed to be paid after ten years. So all commissions are paid above the ultimate level.

When you put dividend additions into the model, you get a little different result. Chart 2 is the same policy I illustrated on the previous graph only with dividends buying additions instead of paid in cash. The runoff is slower. This is because dividend additions have, in themselves, a gross margin that will actually tend to increase over time so amortization is deferred. Over half the DAC remains to be amortized after 25 years in this example.

Now if we did the same calculation but doubled the assumed spread between our gross interest rate and our paid interest rate in the dividend formula, then the DAC actually goes back up above the original level and stays there until year 25. (See Chart 3.) This is because the interest margin on the additions substantially increased the total gross margins in later years substantially.

CHART 1
DAC AMORTIZATION
DIVIDENDS PAID IN CASH

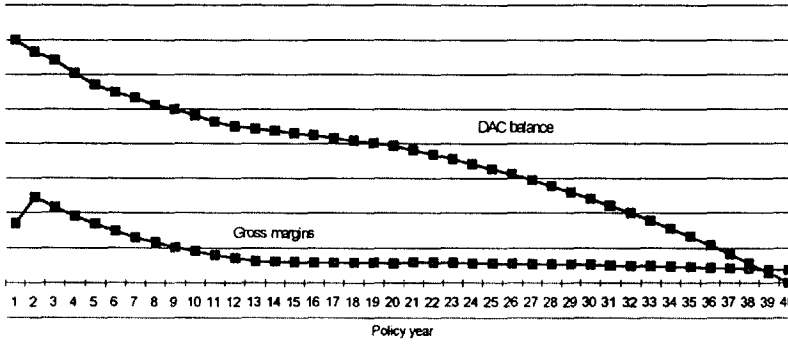
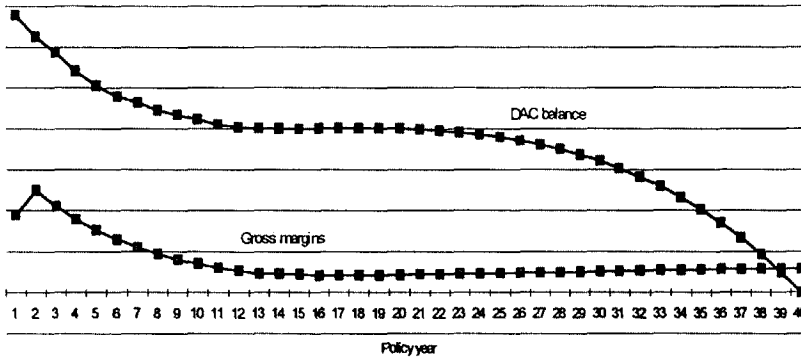


CHART 2
DAC AMORTIZATION
DIVIDEND TO ADDITIONS/NORMAL LAPSES/NORMAL SPREAD



If we went even a step further and had company experience of half the lapses I assumed in this model, you can see that the resulting pattern of DAC is ridiculous, increasing for 25 years and not dropping below the original level until year 35 (See Chart 4). I'm sure that the writers of the SOP for mutuals or *FAS 97* for that matter, did not contemplate this kind of pattern of DAC amortization.

Now if we look in the aggregate and not at just one block of issues, our work shows that, for Northwestern Mutual, if we amortize DAC over 30 years versus 40 years, it makes a significant difference in the amount of initial DAC that we would show on our books and at the end of 1994. In fact, $3.5 billion would be left in unamortized DAC at the end of 1994 using a 30-year amortization period and $4 billion in DAC if we amortized over 40 years.

CHART 3
DAC AMORTIZATION
DIVIDEND TO ADDITIONS/NORMAL LAPSES/DOUBLE SPREAD

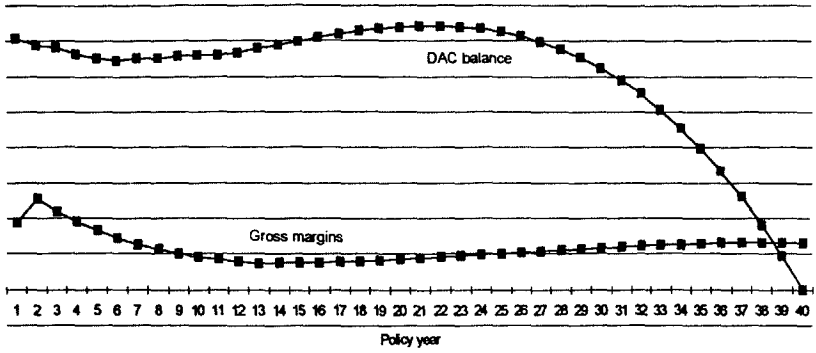
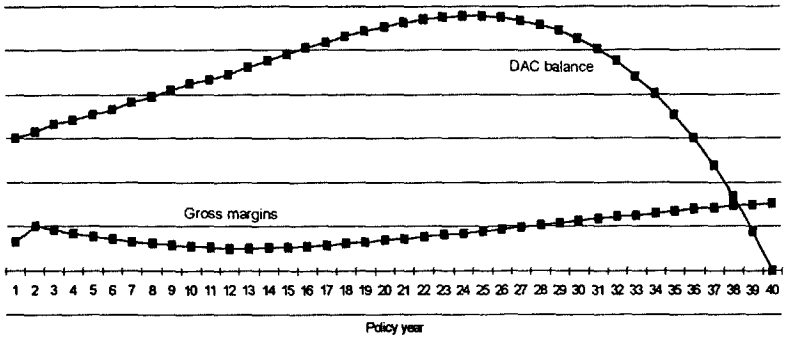


CHART 4
DAC AMORTIZATION
DIVIDEND TO ADDITIONS/HALF LAPSES/DOUBLE SPREAD



We've also done some calculations to estimate the sensitivity to changes in other assumptions. For example, under the 30-year amortization, if we increased the spread between the gross earnings rate and the net rate by just ten basis points, then the initial DAC balance would increase by 3.5%, so in our example, a ten-basis-point increase in the assumed margin increases the initial DAC amount by $100 million. Assuming lapse rates were 1% lower also increases the DAC by about 3%, or just under $100 million.

These sensitivity studies showed us the importance of accurately estimating lapse rates and the interest rate margin. But how do we determine our future assumed interest margin that we're using in our model?

Because Northwestern bases the dividend interest rate on total return, the gross interest rate includes capital gains and losses, both realized and unrealized. Looking historically, we have had quite a range in the actual spreads between gross interest rates and dividend rates if you look on a year-by-year basis. Over the last 30 years, the range of actual spreads has

been between -2% and 2.5%. Even a 5-year average doesn't smooth these out considerably; there is still a range of between -60 basis points and 130 basis points. The average spread over this period of time was 50 basis points but the variability is quite wide.

Another complication is that mutual companies have had to provide for an equity tax. In other words, DAC amortization is deferred when the spread increased to pay for taxes. All GAAP calculations are done on a pretax basis even though the tax formula for mutuals is not totally reliant on income. So if a company provides for equity tax in its spread between gross interest rates and paid interest rates in the dividend formula, then a large portion of the gross margins might be in the later policy years which is intended to pay the equity tax. And for that matter, I would imagine quite a few mutuals price to recover acquisition costs in a much shorter time period than 30–40 years.

I know I said at the beginning of this talk that I wasn't going to mention the usefulness of these numbers, but if this methodology in the SOP is significantly different from the pricing methodology, the results may be hard to explain.

Let me switch my attention over to reserves for the final part of my presentation. The basic reserves for participating policies are very straightforward. However, the additional reserves that many companies set up for substandard risks, additional benefits and term conversion are not specifically addressed by the SOP. At Northwestern, we do believe we need to hold additional reserves for these features mainly because they fit the definition of liabilities. Also, to be consistent with the spirit of the SOP, we are using methodologies that are consistent with how we treat them for dividend purposes.

For substandard life reserves, we will be calculating a net level premium reserve based on expected mortality but we don't expect these reserves to be material and plan to take some shortcuts in approximating the theoretically correct results. For additional benefits like waiver of premium or additional purchase benefit, we will take a similar approach. However, since we include gains from those benefits in our dividend formula, we will be using reserves that use assumptions consistent with statutory reserves for those benefits. The DAC from additional benefits is included with the other deferrable expenses on policies to which they are attached and margins from these benefits are included in the gross margin analysis.

For term policies which offer the right of conversion over a long period of time, Northwestern sets up a statutory reserve on both the preconversion and the postconversion policy. At Northwestern, these reserves are large—larger than the term reserves themselves. And even though the term policy will be a *FAS 60* policy, the converted policy is participating whole life, and there will be a postconversion reserve associated with any participating whole life policy that was issued as a result of term conversion. We plan to hold a postconversion benefit reserve for the first 20 policy years roughly equal to the present value of excess mortality costs less the expense savings and savings due to better persistency on converted policies. However, we have calculated the reserve using simplified assumptions and are locking them in based on the calendar year of conversion.

At Northwestern Mutual, term and permanent business is tracked in its own line of business, which means that when a term conversion occurs, there is a transfer of the initial

postconversion reserve from the term line to the permanent line. The DAC for a term policy is amortized over the length of the term policy where conversions are treated as additional lapses. A new DAC is established for the new permanent policy based on the deferrable expenses associated with that new policy.

MR. PHILLIP J. GRIGG: Andy described the process of converting a mutual company to GAAP accounting focusing primarily on traditional participating business. At Prudential, the bulk of our in-force business consists of traditional participating policies. However, over the last decade, our emphasis has been on selling variable products, both life and annuities. Variable life sales in 1994 comprised roughly 50% of total life sales by number of policies as well as premium volume. At year end, we had more than 1.7 million variable life contracts in force with total policyholder fund values exceeding $7 billion. It's not surprising that, at Prudential, a significant amount of the time and resources spent on converting to GAAP have concentrated on variable products. My comments focus on issues surrounding implementation of GAAP for variable life products.

Variable products, by their very nature, are accounted for under GAAP according to *FAS 97.* Given their fund mechanics, they cannot escape classification as UL-type contracts. There are several areas in the GAAP conversion of these products that require actuarial or accounting judgment. Let's call them looking backward, projecting forward, and defining parameters for calculating the DAC asset.

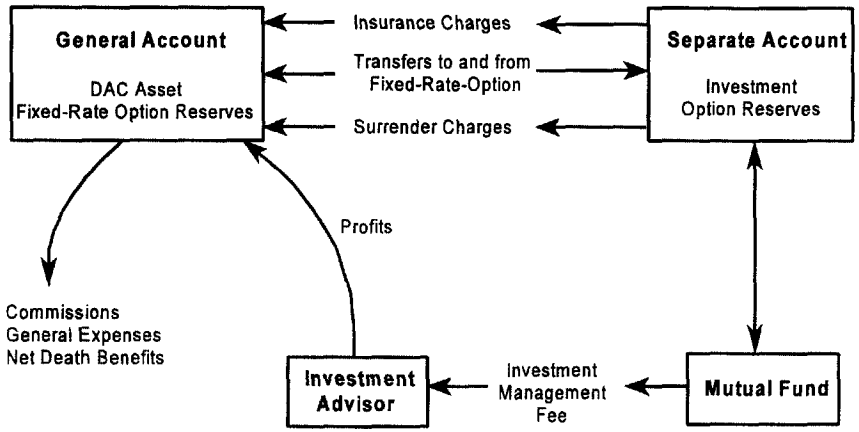
Looking backward, one needs to find methods for restating historical periods. *FAS 97,* like the SOP regarding traditional participating contracts, uses both actual historical experience and projected experience to determine the overall pattern of DAC amortization. Thus, considerable effort is spent determining not only historical acquisition costs, but also the historical gross profits used to amortize them. As Andy had noted in his remarks, this requires a lot of judgment, particularly when faced with incomplete data.

Looking forward requires sound assumptions for the projection of gross profits. These would include assumptions about policyholder behavior, such as expected lapses and mortality, and about future expenses. Also, for flexible premium products, premium persistency assumptions are needed. For variable products, assumptions about future investment returns must be decided.

Regarding calculation parameters, the actuary must decide what the length of the amortization period will be, balancing the *FAS 97* requirement that it be over the life of the book of business with the practical realities of doing such calculations. If a company can demonstrate that the differences between a 20- or 30-year amortization period and a lifetime amortization period are not material, the use of the shorter period should be acceptable. Last, the actuary must choose a method to set the discount rate for determining the present value of gross profits, deferred acquisition costs and unearned revenue. That choice is linked to the assumptions about future investment returns and it affects results for variable products more so than those for fixed interest UL and annuities. I'm going to confine my remaining remarks to the determinants of these interest rate assumptions for variable products, and then I'll comment briefly on assumptions about premium persistency.

It is important to understand how the various pieces of accounting come together for variable products. Chart 5 shows how a typical separate account set up works for a variable life product. Let me make a few key observations.

CHART 5
SEPARATE ACCOUNT STRUCTURE



First, while the reserves for all the investment options reside in the separate account, the DAC asset resides in the general account. Reserves for any general account or fixed rate option will also reside in the general account, but they tend to be small relative to the DAC asset and the separate account reserves. Policyholders have discretion over how they allocate their funds between the investment options and the general account option. Thus, while the general account option may be small, that could change in the future.

Note that the various *FAS 97* revenue items—cost of insurance charges, mortality and expense risk charges, and surrender charges—flow from the separate account to the general account. The company pays commissions, general expenses and net death benefits from the general account. Significant profits for variable products typically come from the investment advisory services.

A company needs to keep this structure in mind when determining the rates used for discounting gross profits, deferred acquisition costs and unearned revenue. *FAS 97* requires that the present value of estimated gross profits be computed using the rate of interest that accrues to policyholder balances. Estimates of expected gross profits are to be reviewed regularly.

FAS 97 offers two choices for the interest rate used to compute the present value of revised estimates of expected gross profits as follows:

> The rate shall be either the rate in effect at the inception of the book of contracts or the latest revised rate applied to the remaining benefit period. The approach selected to compute the present value of revised estimates

shall be applied consistently in subsequent revisions to computations of expected gross profits.

The choices are clear for fixed interest UL type contracts. Pick the crediting rate you started with or what you're using today, but it's not at all clear what to use for variable contracts.

How is either the rate in effect at inception or the revised rate determined for variable contracts? Actual returns fluctuate and may in fact be negative. Further uncertainty is introduced because the mix of investment options is at the policyholder's discretion and, depending on the range of options offered and the markets in which the products are sold, those investments may be very conservative or very aggressive. For example, high wealth individuals or corporate contract owners may pursue much more active and aggressive strategies than middle income owners. Different investment options may produce different margins depending on how investment advisory fees are priced and how efficiently they are managed, so the mix of options chosen by policyholders can affect investment margins overall. The general account option must also be reckoned with. Policyholders determine the utilization of the general account option and while that may be stable, they always have the ability to transfer in and out of it. The general account option will typically have a different investment margin than the separate account options.

Despite all these unknowns, a company still needs to select an interest rate. At Prudential, we are adopting an approach that uses a lot of hindsight and common sense. We estimated what net rate our policyholders would receive in aggregate if they allocate their funds among the general account and separate account investment options as the $7 billion in variable contract funds we hold currently is allocated. We assigned expected returns to each investment option reflecting broad risk categories, then calculated a composite return. While we're still considering how to reflect product differences, the rate or rates we will settle on will fall generally between 7% and 8%.

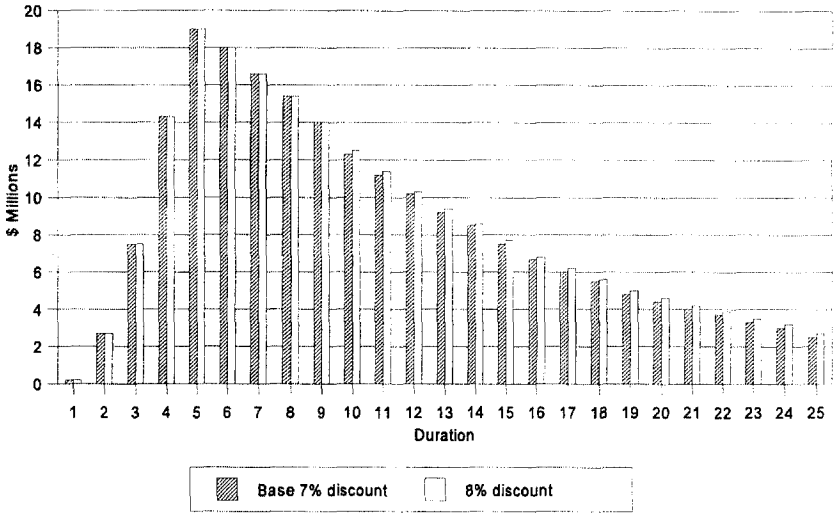
Having settled on crediting rates, we still must choose appropriate rates for discounting gross profits, etc. The key is to find a solution that provides minimal variability in the DAC asset because that variability directly affects surplus. We've done some testing with actual historical data on a sampling of policies for one of our variable life products. We started with a base case that projects future investment results at 7%. We chose *FAS 97's* first option for the discount rate for gross profits; that is, the crediting rate in effect at inception. Therefore, the base case uses a 7% discount rate in all years. The historical period covers durations 1–10. Results from the 11 and later durations are projected, using the 7% rate as the assumed crediting rate. In the model, we used a 30-year amortization period, but have aggregated several years of new business.

In our first test, we modified the base case by using 8%, instead of 7%, as both the projected crediting rate and the discount rate. This helps us determine how sensitive the model is to the assumed future crediting rate.

Chart 6 compares the results for the two cases showing the value of the DAC asset over time. The base case bars slashed on the left. The 8% test case bars are in white on the right. As you can see, there is little change in the pattern of amortization. At the end of the

historical period, the tenth duration, the difference between the DAC assets is less than a half percent of the base case DAC asset. As expected, the DAC asset under the 8% case is higher in the projected years than under the base case. That's because the projected 8% credited rate produces greater fund values and therefore greater investment margins in the out years. The resulting higher gross profits drive down the amortization percentage thereby increasing the DAC asset overall. Our conclusion for this product is that, within a narrow range, the discount rate one chooses when using a single rate for the life of the product has little impact on the DAC asset's behavior over time.

CHART 6
DAC ASSET

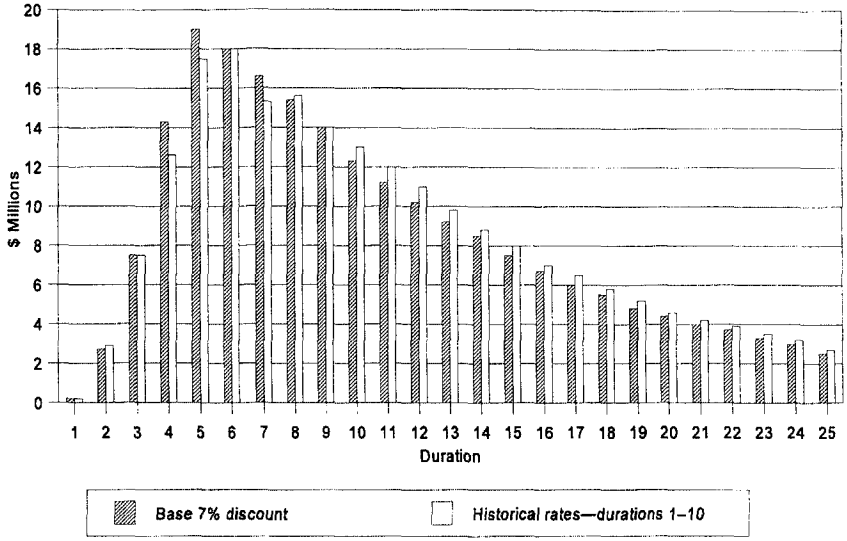


What if the latest revised rate is used? If we did that from inception, the discount rates used during the historical period in the model—durations 1–10—would be the actual crediting rates or investment results during that period.

Chart 7 again shows the DAC asset for the base case—the level 7% discount rate in slashed bars. The white bars denote the DAC asset calculated with historical rates in durations 1–10. The 7% rate is still used in the projection period. Note the volatility during the first ten durations. Such volatility in the DAC asset would be fully reflected in general account surplus. As the DAC asset goes, so goes surplus.

The actual investment result in the fourth duration in this example was negative, and because of the negative rate, the DAC asset shrinks. That is not readily apparent in this example since substantial amounts of new acquisition costs are being deferred in that year, but that accounts for the DAC asset using historical rates being 10% below the base case result. In contrast, significantly positive investment results will increase the DAC asset, effectively resulting in negative amortization despite positive gross profits.

CHART 7
DAC ASSETS



The tenth duration had strong investment results. If you compare the change in the DAC asset from the ninth to the tenth durations, you'll see that the DAC asset using historical rates declined about half as much as that in the base case. Using historical rates for discounting produces anomalies that are interesting, but probably in conflict with management's objectives and those of the FASB.

Before getting comfortable with a single fixed rate for amortization, we also explored the effects on DAC of substituting actual separate account investment results for those projected using a fixed rate. We know that actual investment results are not likely to be exactly 7%. They will be something different and could be dramatically different. Higher investment returns will result in higher investment margins in the future and may also have an impact on mortality margins and expense margins. Lower returns will have the opposite effect.

Using the same data shown previously, Table 1 shows the percentage change in the DAC asset when investment returns at duration 11 are 10 or 20 percentage points higher or lower than the projected 7% return. The investment returns in duration 12 and later are projected at 7% in each case. Not surprisingly, the result is symmetric around the 7% rate. If actual investment results were 27% in duration 11, then the DAC asset would be adjusted 2.6% upwards reflecting the anticipated higher gross profits in the future. There is really no way to dampen this volatility, but one needs to understand it, anticipate it and explain it to management as actual separate account results emerge.

To sum up, using a fixed rate from inception to discount gross profits provides stability in the DAC asset. Using rates that are revised each period based on actual results does not

make sense. It can result in negative amortization despite positive margins and introduces unwanted volatility in general account surplus.

TABLE 1
EFFECTS OF DAC OF ACTUAL SEPARATE ACCOUNT INVESTMENT RESULTS

Actual Separate Account Results for Duration 11					
	-13.0%	-3.0%	7%	17.0%	27.0%
Percentage Change in DAC	-2.7	-1.3	0	+1.3	+2.6

I did want to point out that consideration needs to be given to the ties between GAAP projections and pricing and asset adequacy testing methods. While ASP 10 regarding assumptions used for preparing GAAP statements states that there is no necessary relationship between best-estimate assumptions and those used for product pricing, the company should understand the implications of using different assumptions. Pricing and valuation actuaries need to coordinate this. Similarly, there should be recognition of differences in assumptions used for asset adequacy testing and GAAP calculations. There is no mandate to coordinate these and the reporting is meant for different audiences. Nonetheless, because these reports are presented to company management, the differences and similarities in assumptions should not be accidental, but well thought out.

The last topic I want to touch upon is premium persistency and the factors to examine when setting those assumptions. Historical experience on similar contracts may be one of the best guides. Prudential's variable UL product has undergone several face lifts and migrated from its stock subsidiary to the parent company over the past decade. For the most part policyholders behave in a similar manner regardless of which contract they have. While helpful, historical experience is limited to relatively recent history. It won't tell you how purchasers in their 30s and 40s will behave when they retire. That may be gleaned by considering how contracts are sold. For example, Prudential has sold corporate-owned life insurance (COLI) cases. These have been highly funded with premiums at the seven pay level. Or consider cases sold with illustrations that show how to supplement retirement income with policy loans or withdrawals. Premium flexibility allows a single UL-type contract to do duty in many different markets.

Policyholder expectations regarding vanish point need to be factored in, too. Policyholders may stop paying premiums even though they haven't actually reached a vanish point that will keep their policy in force as planned. The effect should first show up in worsening premium persistency, then later in increased lapses as policy values run out. Particularly for variable life, investment performance will also have an impact. Sustained high returns will tend to allow policyholders to skip more payments, and they may do so. Finally, the availability of data to track and monitor premium persistency is central to determining assumptions going forward. If you can't drill down to a small enough level of detail to see how COLI plans are operating versus policies sold to families, it will be difficult to develop meaningful, separate assumptions.

Just how important to DAC asset calculations is premium persistency? We looked at this for the same block of business shown earlier (see Chart 8).

CHART 8
DAC ASSET

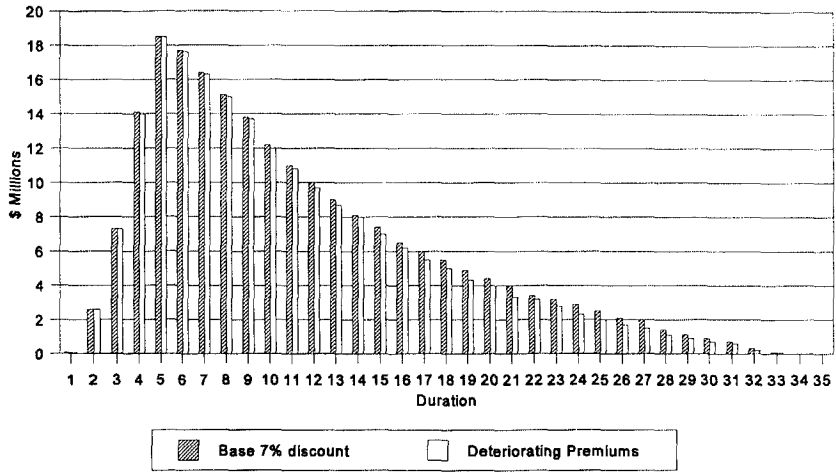


Chart 8 shows the impact of one scenario of deteriorating premium persistency. For comparison, slashed bars denote our base case as before. The white bars denote the deteriorating premium case. Actual history is reflected in the first ten durations. In durations 11 and later, the base case—the slashed bars—reflects a continuation of the premium pattern during the historical period. Premiums paid are level, but less than the amount billed. The alternate scenario—the white bars—show the result if premiums paid in durations 11 and later are only 90% of the previous year's. Lapse rates are the same under both scenarios.

The difference in the DAC asset in year ten is slight. With the deteriorating premiums, the DAC asset is still 98.4% of the base case DAC asset. That ratio gradually falls to 90% by duration 20 and 80% by duration 27. Our conclusion from this test is that, for this product, any gradual emergence of premium persistency problems is best handled on an ad hoc basis year by year with minimal impact on the deferred acquisition cost asset. Of course, if premium persistency drops very sharply and remains low for some time, the impact on the DAC asset will be severe. But predicting such events is difficult at best and, unless such predictions are accurate, will not dampen volatility of the DAC asset.

In closing, I would caution anyone with variable products from drawing conclusions based on this information. Patterns that we see are a result not only of our projection assumptions, but also of complex product mechanics. Even among Prudential's variable products separate testing needs to be done on each product before we can arrive at similar conclusions.

MR. THOMAS G. KABELE: During this session I refer to three documents:

1. Cody, Donald. "An Expanded Structure for Ordinary Dividends," *Transactions of the Society of Actuaries,* vol. XXXIII (1981): pp. 313–65. (Includes a discussion by Arthur Cragoe and a long discussion by me.)
2. *FAS 120,* Financial Accounting Standards Board, January 1995
3. AICPA Statement of Position 95-1—"Accounting for Certain Activities of Mutual Life Enterprises," AICPA, January 18, 1995.

MUTUAL ENTITIES

Mutual companies include fraternals and assessment mutuals. (See SOP 95-1, page 1.) There might be only one mutual assessment company left, a health company located in Texas; the others converted to *stipulated premium* stock companies. There are other types of mutual organizations that might use *FAS 120.*

1. There are mutual casualty and farm companies that have life affiliates, such as State Farm, Nationwide, Liberty, Sentry, Country, and Southern Farm Bureau.
2. There are mutual life-health companies that are taxed as "nonlife," and their life affiliates, including Mutual of Omaha and CUNA Mutual.
3. Some insurers that have a Blue Cross franchise have *mutual form.* Some sell group life.
4. Some property and casualty (P&C) companies are organized as *reciprocals,* which is similar to a mutual managed by an outside management firm called an attorney-in-fact. In some cases, the management company is a nonpublic such as USAA or Pekin. In other cases, such as Farmers and Erie, the management company is a shareholder-owned organization. Some of the reciprocals or their management companies own life insurers.
5. There are stock casualty companies without shareholders, and at least one has a life affiliate.
6. There are partially tax-exempt companies such as Teachers and Mutual of America, which may issue some life business. The state of Wisconsin owns a wholly tax-exempt life company. (Several states own tax-exempt P&C insurers.)
7. Some alien mutuals have U.S. affiliates including Nippon Life and several Canadian insurers.
8. Aetna had a "mutual life" block of business in which the policyholders received all of the profits.

Thus there are many different "mutual entities" that may be able to use *FAS 120.* (See *FAS 120* paragraph 6; and see SOP 95-1 paragraphs 5 and 21.)

In addition, several stock life insurers issue participating products in which the shareholders are subject to the New York Profit Limit (10% of gains before dividends or 50 cents per thousand face) or the Canadian profit limit (2.5% of dividends.) These companies would probably use *FAS 60,* but the products are not dissimilar to mutual company products.

REINSURANCE DAC

Various FASB announcements, including *FAS 60, FAS 97,* and *FAS 113,* mention reinsurance. *FAS 60* and *FAS 113* suggest the use of *deposit accounting* for reinsurance

agreements which do not pass sufficient risk. Deposit accounting, however, is also used for some annuity products. UL products use a *retrospective deposit* method. Thus the *deposit* accounting does not mean *little risk.* I believe that the deposit accounting technique may be useful for all reinsurance treaties that have a capped upside. Thus the cost of reinsurance is the *risk charge* if the business is profitable, but the cost is negative (to the ceding company) if the business is not profitable.

Consider two reinsurance treaties, both cash coinsurance, both covering whole-life policies. In the first treaty, the ceder can recapture after ten years, without a recapture fee. In the second, the ceder can recapture after a variable period if the experience account becomes positive, where the experience account equals profits less the risk charge. In both cases, the reinsurer has the same downside risk. The recapture period in the second treaty may also be estimated at ten years, and the upside potential in both may be similar. With the second treaty, however, you have a built-in deposit account, namely the experience account. Both treaties pass risk, and the deposit accounting should not mean little risk.

STOCK-LIFE GAAP

I believe that U.S. stock life insurance GAAP is not conservative relative to the GAAP for manufacturing companies. I have analyzed the *Business Week* 1,000 companies for many years, and have compared market-to-book ratios and looked at dividend-to-market value ratios. The dividend-payout ratios for industrial and insurance companies are both 2.5 to 3% of market value. The market-to-book ratio for industrial companies is about 3 to 1. The market-to-book ratio for stock life insurance companies has averaged about 1.25 to 1. Some insurers with alien business or with a heavy P&C concentration may have somewhat higher ratios. Assuming the market knows real values, the stock-life GAAP appears to be less conservative than industrial GAAP.

The accounting for life insurance companies overseas is often more conservative than in the U.S. I understand that in Japan, Switzerland, and Germany, assets are booked as the lowest historical cost. Thus, if a Japanese mutual life company bought Sony when it was at 30 Yen per share, and it went down to 20 Yen, the company might book the value at 20 Yen, even if the current price were 50,000 Yen (adjusted for splits). (For U.S. tax purposes, mutual life insurers are supposed to use the greater of cost or market. Thus if they bought a stock at $50,000 and it is now at $30,000, they still use $50,000.) My concern is that the mutual GAAP may be even more liberal than U.S. stock-life GAAP.

MUTUAL-LIFE GAAP

I will restrict myself to individual participating whole-life contracts. I have concerns about the reserves for benefits and terminal dividends, but the basic problem with mutual-GAAP is the treatment of DAC. I worry that the federal tax authorities may decide to use "GAAP" if the larger mutuals switch to a "GAAP" method. Already all other industries start with GAAP accounting. Up until now, the mutuals have saved the whole insurance industry by not using GAAP. GAAP has fewer restrictions on reserve assumptions than statutory, and they might generate endless arguments with the Internal Revenue Service. The material in the following pages represents my own opinion and not necessarily the opinion of my company.

FAS 120 Interest Rates

The AICPA SOP 95-1defines three interest rates on page 33:
Dividend fund interest rate: the interest rate determined at policy issuance used to determine the amount of the dividend fund. It is the rate used to credit interest to the dividend fund, and against which experience is measured to determine the amount of the interest portion of dividends paid to individual policyholders.

Dividend interest rate: the total interest rate the company pays on its dividend fund.

Investment yield: the interest rate the company expects to earn on the assets supporting the polices, net of investment expense.

The dividend fund rate is typically the common rate used to compute statutory reserves, nonforfeiture values and cash values. (See discussion SOP 95-1, page 47.) The dividend interest rate is the policyholder crediting rate. Typically, mutual insurers credit the investment income they earn to policyholders, with some smoothing effect, less a charge for investment defaults and catastrophic investment experience. In 1995, the dividend fund rate might be 4%, and the dividend crediting rate might be 8.5% less a 0.5% charge for investment defaults or smoothing dividends.

In the definition of investment yield, it is unclear if provisions for asset defaults are included as an investment expense. SOP 95-1, page 52, however, indicates that the expected gross margin (EGM) be computed without provision for adverse deviation, but suggests it should be reduced by "(g) Other expected assessments and credits, however determined." Presumably, either investment expense or item (g) includes charges to cover investment losses due to recessions and also to cover plagues and other catastrophes.

FAS 120 Method of Amortizing DAC

The expected investment yield affects DAC in two ways. First, and most important, it is used to determine expected gross margins (EGMs) (see SOP 95-1, page 22). Second, it is used to determine the interest added to the unamortized DAC (UDAC) (see SOP 95-1, page 21). The EGMs are profits after policyholder dividends and contingency charges, but before acquisition costs.

Under *FAS 120* the UDAC is paid down by a constant percentage of EGM (see SOP 95-1, page 20). If the EGMs increase by duration, then the "payments" on the UDAC increase by duration, and are smaller in the early durations; thus the early "payments" might not cover the interest added to the UDAC and the UDAC might increase by duration for 15–30 years, before starting to decrease. If the EGMs are level, then the UDAC is amortized like a mortgage; each year there is a constant payment until the UDAC is paid off. If the EGM decreased by duration, then more of the UDAC will be paid off in the early policy years, and the amortization will be faster than a mortgage.

We will show that the EGM are approximately level, if the investment yield is equal to the dividend crediting rate. We will show that the EGM increases by duration, if the investment yield exceeds the dividend crediting rate.

***FAS 120* Amortization Period**

The SOP 95-1, page 20 indicates that the DAC is amortized over the life of the business. Others who have studied the matter have concluded that something less than the maximum life is appropriate. For example, in a previous SOA meeting session on mutual GAAP, also moderated by Peter Duran, (*Record,* Vol. 20, No. 2, Schaumburg, IL: Society of Actuaries, 1994, pp. 65), Thomas Burke indicated that, as a rule of thumb, a period where only 10–15% of the business is left probably would give you an acceptable amortization period. This would mean that a 20–30 year amortization period would be acceptable.

Amortization of DAC Through the Dividend Formula

In the Don Cody dividend formula there is an explicit method of amortizing the DAC. The DAC is amortized with a level annual "payment" over 10–20 years, and the amortization for every in-force policy looks like a mortgage. (See Cody, Donald. *Transactions of the Society of Actuaries*, vol. XXXIII (1981): pp. 313, 320.) This mortgage technique is used in *FAS 60* and in the commissioners reserve valuation method (CRVM). (Lapse rates are used in GAAP, while lapse rates are assumed to be zero in the CRVM method.)

Clarification Needed

We need some clarification from the AICPA on the investment yield. I believe that the investment yield net of charges for catastrophes should be capped at the dividend interest rate, at least after five to six policy years. This cap is consistent with the pricing techniques of most mutual company participating whole-life contracts (with fixed premiums and front-end loads). On these products the DAC is amortized in the dividend formula. Note that capping the investment yield does not necessarily result in DAC being amortized as a percent of premium on limited-pay contracts. If the dividend formula amortized the DAC over ten years, then the *FAS 120* approach would also amortize the costs over a longer period.

There might be a few participating whole-life products that are priced by determining excess interest and mortality margins first, and then determining dividends without regard to either the acquisition costs or the margins. These might be back-end loaded contracts. Even for these products, a case can be made that the profits in the distant future are less predictable than the current period, and the investment yield should be capped at the dividend interest rate after five to six years. Presumably, those selling back-end loaded products are trying to recover as much of their costs as they can in the first 10–20 policy years.

I believe it was the intent of the AICPA that profit emerge in a manner consistent with dividend determination, thus SOP 95-1, page 32 says the dividend feature introduces a variable that affects the substance of the earnings flow to the company. The dividend feature causes the contracts covered by this SOP to more closely resemble contracts in which the earnings emerge in relation to margins rather than contracts in which earnings emerge proportional to the level of premiums received in that year.

The dividend feature produces a roughly level EGM (on front-end-loaded, fixed-premium contracts). The cap helps ensure a level EGM and further tightens the connection between the EGM and dividends, which was noted by the AICPA in SOP 95-1, page 32.

What Can Happen if There Is No Cap?

I will illustrate what I believe are unnatural results that might occur if the net investment yield used to compute EGM is larger than the dividend interest rate by a constant amount. In particular, I will show that the UDAC might increase like the path of a mortar shell. I call this *trajectory DAC.*

Trajectory DAC

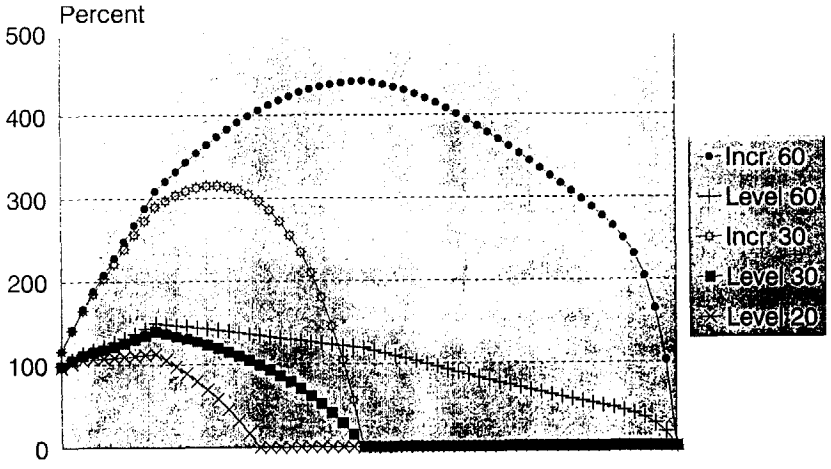
I tested the *FAS 120* DAC using the following EGM patterns, where k is the amortization period:

1. Level $EGM_t = 1$ $(t=1,\ldots,k)$
2. Uniform increasing $EGM_t = t$ $(t=1,\ldots,k)$

Cash values and reserves for fixed-premium whole-life products increase at roughly a uniform rate. If the investment yield exceeds the dividend rate by a constant margin, then the excess interest increases at roughly a uniform rate, and excess interest is an important component of EGM. In the following charts, I computed *FAS 120* DAC under both patterns 1 and 2, I assumed a male age 40 with a whole-life policy.

Chart 9 illustrates the UDAC for 30-year and 60-year amortization periods, using the uniform increasing EGM pattern, and the level patterns for 20, 30 and 60-year amortization periods. It is on a per-unit in-force basis.

CHART 9
TRAJECTORY DAC
PER UNIT IN FORCE



Whole Life Male Age 40; DAC = 100%, 9/10%, 50/2%
EGM Level (EGM [t] = 1) and Increasing [EGM [t] = t)

For the 60-year amortization period, and uniform increasing EGM, we produced a trajectory UDAC, which increased by duration for about 30 years. After 30 years, the

unamortized UDAC is 450% of the original DAC. For a 30-year amortization period, we also produced a "trajectory UDAC." After 15 years, the UDAC is 325% of the original DAC.

The level EGM produces the same amortization schedule as *FAS 60,* at least for level annual premium products. The UDAC decreases like a mortgage, slowly at first and then more rapidly.

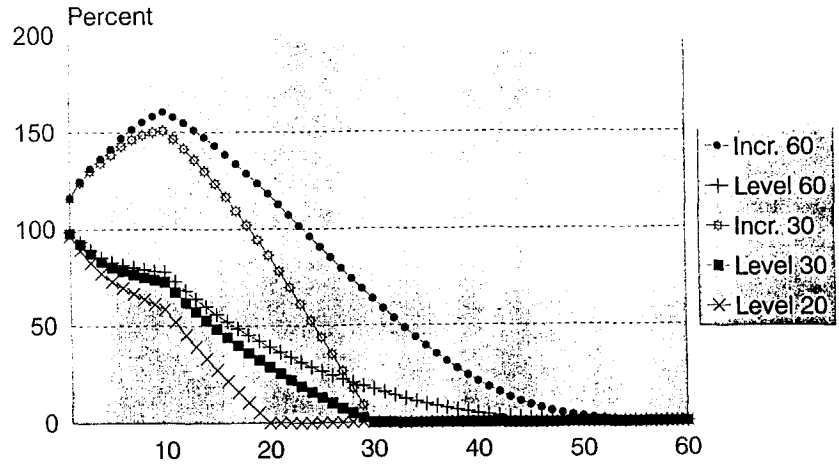
Chart 10 illustrates trajectory UDAC but on a per-unit issued basis. Even after allowing for lapsed policies, the UDAC actually increases by duration for many years. For the 60-year amortization period, after 25-years, the UDAC is about 100% of the original DAC. About half of the policies are left at duration ten, and only 26% are left at duration 20. The 30-year amortization period also showed some negative amortization, but it was not quite as peaked.

Trajectory UDAC produces large profits. Because of the inflationary bias in sales, an insurer's aggregate UDAC may always be increasing, even if lapse rates are much worse than expected, and even if business is not profitable.

Trajectory UDAC and Donald Cody Dividends

The trajectory UDAC charts were based on an arbitrary pattern of EGM. We will now show some charts based on the Don Cody dividend formula and a more realistic computation of EGM.

CHART 10
TRAJECTORY DAC
PER-UNIT ISSUED



Whole Life Male Age 40; DAC = 100%, 9/10%, 50/2%
EGM Level (EGM [t] = 1) and Increasing [EGM [t] = t)

The resulting EGM is roughly the average of a uniform increasing EGM (due to the excess of the EGM-interest rate over the dividend interest rate), and a level component (which arises since the dividend formula amortizes DAC using a *FAS 60* approach.) We assume the following for a male age 40: Cash Values are based on 4%, 1980 Commissioners Standard Ordinary (CSO), New Jersey method (20-year amortization of the CRVM allowance), curate functions (see Tables 2 and 3).

TABLE 2
DIVIDEND ASSUMPTIONS—DONALD CODY FORMULA

Item	Assumption
Mortality	100% 1975–80 Select Ultimate Male
Lapse	15%, 12%, 10%, 8%, 6%, then 5%
Interest Crediting	8%
Acquisition Expense (Chart 3)	100% first year only
Acquisition Expense (Chart 4)	Level 10%
Acquisition Expense (Chart 5)	100% first year only, 10% years 2–10, 2% thereafter
Dividend: DAC Amortization Periods	K=60, 30, 20

TABLE 3
EXPECTED GROSS MARGIN (EGM) ASSUMPTIONS

Assumption	Method 1 (Level EGM)	Method 2 (Increasing EGM)
Mortality	Dividend table	80% of dividend table
Lapse	Dividend table	80% of dividend table
Interest	Dividend crediting rate (8%)	Greater than the dividend crediting rate (9%)
Acquisition Expense	Dividend table	Dividend table
EGM: DAC Amortization Periods	K=60, 30, 20	K=60, 30

We computed EGM for Method 1, for three amortization periods: K = 60, 30, and 20 years, and for Method 2 for K=60 and K=30 years. We thus ran five projections for EGM:

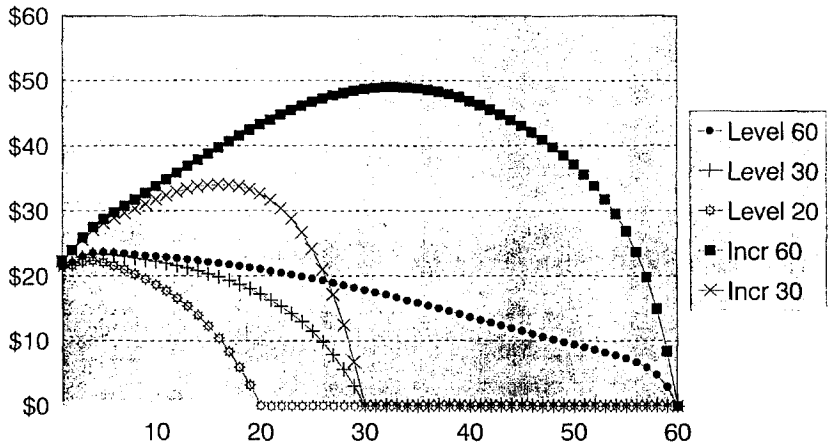
1. Level 60: Method 1, K=60
2. Level 30: Method 1, K=30
3. Level 20: Method 1, K=20
4. Increasing 60: Method 2, K=60
5. Increasing 30: Method 2, K=30

The dividend and EGM amortization periods were equal, so we computed three different Cody dividend scales for each of three whole-life plans.

The method one assumptions produce a level EGM (for the first K years) and the unamortized DAC is amortized like a mortgage. The method two assumptions produce an increasing EGM and a trajectory UDAC. The trajectory UDAC is caused primarily by the use of an EGM rate (9%) which exceeds the dividend crediting rate (8%). The mortality assumption may also produce a trajectory effect, but it is not as pronounced. The effect of lapse rates is not clearcut. In the following charts we applied the EGM to compute the UDAC, per unit in force, for three whole-life plans.

In Chart 11, we assume the acquisition costs are 100% of first-year premium with no renewal costs. Using method 2 assumptions and 60-year amortization, the UDAC reaches 250% of the first-year premium of $19.81 after 30 years. Using method 2 assumptions and 30-year amortization, the UDAC reaches $34 at duration 20.

CHART 11
DEFERRED ACQUISITION COSTS PER UNIT IN FORCE
ACQUISITION COST = 100% FIRST YEAR ONLY

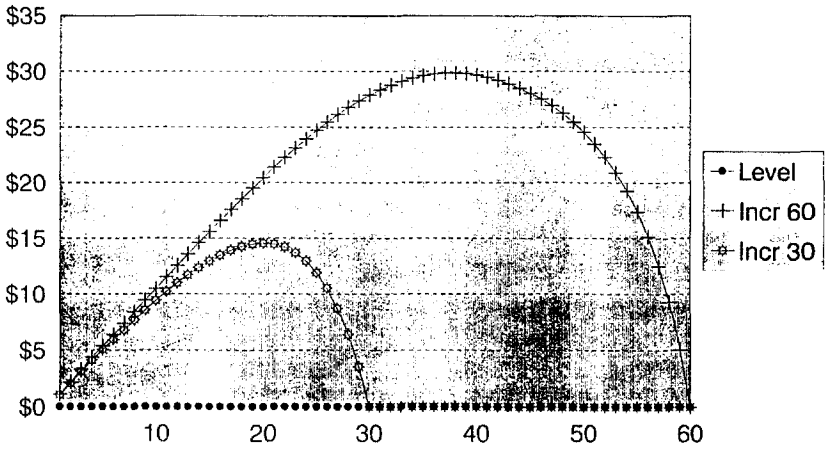


Whole Life Plan Male Age 40 - $19.81 Premium, Cody Dividends

In Chart 12 we assumed the "acquisition costs" were a level 10% of premium. Under the *FAS 60* approach or *FAS 120* method one, the DAC is zero. Using method two assumptions and 60-year amortization, we produce $30 per thousand unamortized deferred acquisition costs at duration 35. (If costs were level, one claim might be that *FAS 120* would not allow any DAC; but that might be remedied by using a level 10% commission for, say years 1–29, and then use zero.)

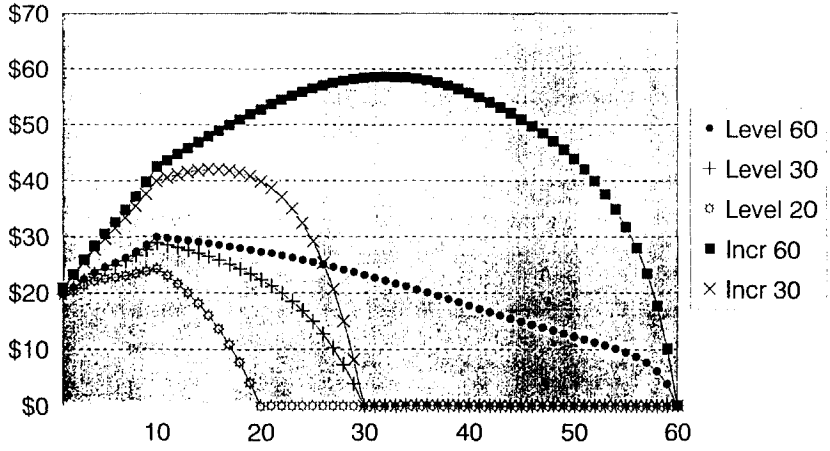
We assumed the acquisition costs in Chart 13 were 100% the first year, 10% in years 2–10, and 2% thereafter. Using method 2 assumptions and a 60-year amortization period you generate $60 UDAC by duration 30, or about three times the actual first-year acquisition costs.

CHART 12
DEFERRED ACQUISITION COSTS PER UNIT IN FORCE
ACQUISITION COST = LEVEL 10%



Whole Life Plan Male Age 40 - $19.81 Premium, Cody Dividends

CHART 13
DEFERRED ACQUISITION COSTS PER UNIT IN FORCE
ACQUISITION COST = 100%, 9/10%, 50/2%



Whole Life Plan Male Age 40 - $19.81 Premium, Cody Dividends

Note that the "trajectory effect" in Charts 11, 12, and 13 was flattened because we computed the dividends using the same amortization as we used for the *FAS 120* DAC. Had we used 20 years as the dividend amortization period, the EGM would have been more back-ended, and the trajectory would have been greater.

Conclusion

The trajectory UDAC is troubling. The unamortized trajectory UDAC is very large, and is much larger than the UDAC built into the dividend formula. Furthermore, with trajectory DAC, a hypothetical assumption about interest margins in the distant future affects the earnings in the present, even though the large interest margins in the distant future may never be realized. I suggest the following:

1. Cap the EGM rate at the dividend crediting rate (particularly at durations 5 and greater). The rationale is that the dividend and AICPA deferred acquisition costs should be roughly equal.
2. Cap the UDAC at the total DAC. The logic is that you shouldn't defer more costs than you incurred.
3. Limit the amortization period to at most 30 years. The rationale is that the future is less easily predicted than the present and future gains after 30 years should not be used to generate current earnings.
4. Subtract all dividend profit charges, that increase by duration from the EGM formula. The rationale is that these profit charges are used for specific purposes, such as covering investment losses or plagues (see Cody, Donald. *Transactions of the Society of Actuaries*, vol. 33 (1981): pp. 313, 322), and not to delay the amortization of acquisition costs.
5. Test all amortization techniques against the Don Cody/Frank Weck dividend formula described in more detail later. The formula is well quantified in the literature and is used by some companies.
6. The algebraic excess of the EGM rate over the dividend-crediting rate should be disclosed to management and added to the disclosures mentioned in AICPA SOP 95-1, page 24.

OTHER POINTS ON *FAS 120* LOCK-IN

FAS 60 has "lock-in" while *FAS 97* does not. If the initial investment yield (EGM interest rate) equals the initial dividend interest crediting rate, then one might rarely need to change the EGM pattern and lock-in on *FAS 120* may be feasible.

Benefit Reserves

SOP 95-1, page 15 said the net level reserve is computed for death and endowment benefits. Presumably the lapse rates are zero, as is typical for statutory reserves. Using lapse rates, however, usually increases the reserve. In effect, using lapse rates reduces the benefit net premium and thus the present value of future net premiums and the benefit reserve.

Discounting Using the Investment Yield Rate

It is possible to compute EGM by using the expected investment yield, but then use a lower rate to compute present values of the EGM. In fact, this possibility is suggested in SOP 95-1, page 59, sentence 4, where it was noted that a change in the discount rate would have relatively little effect.

Amortization of DAC for UL Contracts

FAS 97 defines the amortization of DAC for UL contracts, which includes both participating and nonparticipating contracts. For these contracts, the DAC is amortized as a constant percentage of EGP (see *FAS 97,* pages 23–24). A primary component of EGP is the amount expected to be earned from the investment of policyholder balances less interest credited to policyholder balances.

For annual premium products, the excess interest component of EGP also increases by duration. Many of the UL products, however, are back-end loaded while most fixed-premium participating contracts are front-end loaded. Also the UL products may be priced under the assumption that the acquisition cost is recovered by excess interest while the acquisition costs of fixed-premium participating products are typically amortized through the dividend formula.

The "emergence" of earnings for a flexible premium or a variable UL product might be in proportion to EGP but the emergence of earnings under the Donald Cody dividend formula is in proportion to premium, not expected gross margins. Sometimes the profit charge in the Donald Cody dividend formulas increase by duration, but I believe that the profit charges that are designed to cover investment defaults should not be considered as earnings, at least for the purpose of computing DAC.

TECHNICAL NOTES—DONALD CODY DIVIDEND FORMULAS

The Donald Cody dividend formula is based on a dividend fund. It is similar to the dividend formula developed by the late Frank Weck of The Metropolitan in the 1940s or 1950s. Sheppard Homans also used a dividend fund formula (see Homans, Sheppard. "On the Equitable Distribution of Surplus," *Journal of the Institute of Actuaries*, Vol. 11 (1863): pp. 121–29). Apparently Homans's associate, Fackler, converted the formula into the familiar three-factor formula.

Using Donald Cody dividends we will show algebraically that if the EGM interest rate equals the dividend crediting rate, then the *FAS 120* and the dividend amortization methods are exactly equal. If the EGM exceeds the dividend crediting rate, then we have an increasing EGM.

Dividend Fund

The dividend fund is usually a modified reserve (that is a reserve that is reduced by deferred acquisition costs). Some of the possible funds, which I listed in my discussion of Don Cody's formulas, are:

1. Cash value + terminal dividends (see Leckie, Robin B. "Actuarial Considerations for Mutual Companies," *Transactions of the Society of Actuaries,* Vol. XXXI (1979): pp. 191).
2. Modified statutory reserves (CRVM, NY, Illinois)
3. Statutory net level plus a reserve for DAC (see number 3 on page 341 and number 3 on page 347, in my discussion of Cody's paper in *Transactions of the Society of Actuaries*, Vol. XXXIII (1981)).
4. Natural reserves for benefits, expenses, terminal dividends (see number 4 on page 347 of my discussion of Cody's paper in *Transactions of the Society of Actuaries*, Vol. XXXIII (1981)).

In his paper (*Transactions of the Society of Actuaries,* vol. XXXIII (1981): pp. 319), Donald Cody used a net level dividend fund, but had a charge for acquisition costs. His approach is algebraically equivalent to using 3, without the explicit charge for acquisition costs (see my discussion in *Transactions of the Society of Actuaries,* vol. XXXIII (1981): pp. 341). Frank Weck used a modified reserve, similar to 3.

The AICPA 95-1 paragraph 44 considered the following for the benefit reserve:
(a) Dividend fund
(b) Net level statutory
(c) CRVM
(d) Cash value
(e) Net level using guaranteed mortality and interest
(f) Net level reserve using "guaranteed" mortality and the dividend fund interest.

Note that (c) and (d) were modified reserves, and as it turns out the "dividend fund" is also a modified reserve. Presumably, with (c), (d), and (a) the AICPA was thinking of reducing the acquisition costs by the CRVM or cash value, or dividend fund allowance. The "benefit" portion of the CRVM or cash value equals (b) or (e). Also (b) is usually the same as (e).

The AICPA chose (f), which is similar to the benefit component of 3; and 3 is one of the choices for the dividend fund (a).

Donald Cody Dividend Formula

Notation:
m = coverage period (m=60)
t = policy year (t = 1,2,. . .,m)
k = amortization period for acquisition costs, k = 20, 30, or 60, G = gross premium
A_t = acquisition costs
B_t = profit charge
CV_t = cash value
DB = death benefit ($1,000)
Div_t = dividend
e_t = nonacquisition costs
EGM_t = expected gross margin
G = gross premium
TD_t = terminal dividend = 0
V_t = dividend fund
VA_t = acquisition reserve; PA = net premium
VB_t = benefit reserve; PB = net premium
i = interest rate
q_t = mortality rate
w_t = lapse rate
Dividend fund rates (i,q,w)
Dividend crediting rates (i^*,q^*,w^*)
EGM rates (i'',q'',w'')

In the examples below i=4%, i^*=8% and i'' = 8% or 9%. Also q = 1980 CSO, while q^* = 100% 1975–80 and Select and Ultimate male. Also q'' is 80–100% of the q^* table. The lapse rates are assumed to be realistic rates.

Profit Goal

The dividends are reduced by a profit charge—B_t. The following are some examples:

a. B_t = 0 for first k = 10 (or 20) years
   $B_t = 0.005\ V_t > k$ (Cody)
b. B_t = \$0.10 + $0.005\ V_t$ (Kabele, Weck)
c. B_t = 10% Div_t (NY profit limit)
d. B_t = \$0.50 (Alternative NY profit limit)

We let BL_t = level portion of the profit charge, and BI_t be the increasing portion. In (b) $BI_t = 0.005\ V_t$, and BL_t = \$0.10.

If the increasing component of the profit goal, BI_t, is not subtracted from the expected gross margin, the *FAS 120* approach could produce trajectory DAC. The purpose of the profit goal is to provide for catastrophes, like investment losses and the 1918 flu pandemic, and not to delay the deferral of acquisition costs.

DEFINITION: *The benefit reserves {VB_t and the net premium PB} satisfy:*

$$Vb_t(1 - q_t - w_t) = \{VB_{t-1} + PB - q_t\, DB/2\}(1+i) - q_t\, DB - w_t\, Cv_t = \#1, \ldots, m$$

$VB_0 = 0$, and $1{,}000 = VB_m$

DEFINITION: *The acquisition reserves satisfy*:

$$VA_t(1 - q_t - w_t) = \{VA_{t-1} + PA_t - A_t\}(1+i') \quad t=1, \ldots, k$$

$VA_0 = 0$, and $VA_t = 0$ $t = k$ or $t > k$.

and

$$VA^*_t(1 - q^*_t - w^*_t) = \{VA^*_{t-1} + PA^*_t - A_t\}(1+i^*) \quad t=1, \ldots, k$$

$VA^*_0 = 0$, and $VA^*_t = 0$ $t = k$ or $t > k$.

DEFINITION: *Dividend Fund Method C.*

$$V_t = VB_t + VA^*_t$$

DEFINITION: *Dividend Fund Method D.*

$$V_t = VB_t + VA_t$$

DEFINITION: *Don Cody Dividend Formula, using any dividend fund, including Methods A, B, C, or D.*

$$\text{Div}_t = G + i^* \{V_{t-1} + G - e_t - A_t - q^*_t\, DB/2\} - DB\, q^*_t - CV_t\, w^*_t - e_t - A_t - \{V_t(1 - q^*_t - w^*_t) - V_{t-1}\} - B_t$$

DEFINITION: *Expected Gross Margins*

$$\text{EGM}_t = G + i''\{VB_{t-1} + G - e_t - q''_t\, DB/2\} - DB\, q''_t - CV_t\, w''_t - e_t - \{Vb_t(1 - q''_t - w''_t) - VB_{t-1}\} - \text{Div}_t - BI_t$$

The increasing component of the profit charge (BI_t) is subtracted from the EGM. This is consistent with AICPA 95-1, page 22, wherein point (g) included "other expected assessments and credits, however characterized." The BI_t is suppose to cover investment losses or plagues and should not be used to amortize acquisition costs.

DEFINITION: *Amortization of DAC using EGM.*
$P120\%_t = EGM_t / EGM_1$
$VA120_t(1 - q''_t - w''_t) = (PA120_t + VA120_{t-1} - A_t)(1+I'') \quad t = 1, \ldots, k$
$PA120_t = C \; P120\%_t$ where C is a constant
$VA120_0 = 0 = VA120_k$

We prove the following results:
LEMMA: *(Cody Formula, compare. Transactions of the Society of Actuaries, 33: (1981) pp. 313, 319 eq. (2)) The Don Cody dividend can be computed as:*

$$\begin{aligned} Div_t = {} & G + i^* \{VB_{t-1} + G - e_t - q^*_t DB/2\} \\ & -DB\, q^*_t - CV_t\, w^*_t - e_t \\ & - \{VB_t(1 - q^*_t - w^*_t) - VB_{t-1}\} - BL_t - BI_t \\ & + (1+i^*)\{VA^*_{t-1} - A_t\} - VA^*_t(1 - q^*_t - w^*_t) \end{aligned}$$

THEOREM 1: *Expected Gross Margins are given by the following alternate formula, if dividends are based on Fund Method C:*

$$\begin{aligned} EGM_t = {} & BL_t + (1+i^*)\, PA^*_t + (i'' - i^*)\{VB_{t-1} + G - e_t\} \\ & + (DB - VB_t)(q^*_t - q''_t) + (CV_t - VB_t)(w^*_t - w''_t) \\ & + (i^* q^*_t - i'' q''_t)\, DB/2 \end{aligned}$$

PROOF: Use the Lemma and the definition of EGM:

$$\begin{aligned} EGM_t = {} & G + I''\{VB_{t-1} + G - e_t - q''_t DB/2\} \\ & -DB\, q''_t - CV_t\, w''_t - e_t \\ & -\{Vb_t(1 - q''_t - w''_t) - VB_{t-1}\} - Div_t - BI_t \end{aligned}$$

$$\begin{aligned} = {} & BL_t + (i'' - i^*)\{VB_{t-1} + G - e_t\} + (i^* q^*_t - i'' q''_t)\, DB/2 \\ & + (q^*_t - q''_t)(DB - VB_t) + (w^*_t - w''_t)(CV_t - VB_t) \\ & - (1+i^*)\{VA^*_{t-1} - A_t\} + VA^*_t(1 - q^*_t - w^*_t) \end{aligned}$$

The last two terms equal $(1+i^*)\, PA^*_t$

COROLLARY 1: *If BL_t and PA^*_t are a level percentage of premiums, and if $i''=i^*$; $q''_t = q^*_t$; $w''_t = w^*_t$; then EGM_t is a level percent of premium.*
PROOF: Obvious from the theorem.

COROLLARY 2: *If the hypothesis of the corollary holds, then FAS 120 DAC equals the Internal dividend DAC.*
PROOF: The internal dividend DAC and the *FAS 120* DAC satisfy:
$VA^*_t(1 - q^*_t - w^*_t) = \{VA^*_{t-1} + PA^*_t - A_t\}(1+i^*) \quad t=1,..,k$
$VA^*_0 = 0$, and $VA^*_k = 0$.
$VA120_t(1 - q''_t - w''_t) = \{PA120_t + VA120_{t-1} - A_t\}(1+i'') \quad t = 1,...,k$
$PA120_t = C$, where C is a constant
$VA120_0 = 0 = VA120_k$

Since $i''=i^*$; $q''_t = q^*_t$; and $w''_t = w^*_t$, the equations which define the reserve are identical, and hence the reserves are identical.

Conclusions

If the EGM interest rate (i'') is greater than the dividend crediting rate (i^*) then the EGM_t will increase by duration. This produces trajectory DAC.

Numerical Results

Tables 4–8 are some numerical results, assuming the acquisition costs are 100% the first year, 10% in years 2–9, and 2% in years 10–30. The premium is $19.81 and the dividend fund rate is 4%, the dividend (crediting) rate is 8%, and the EGM rate is 9%. The cash values are 4%, 1980 CSO, with the full preliminary term allowance amortized over 20 years, with curate functions.

TABLE 4
COMPARISON OF RESERVES AND EGM

Policy Year	Cash Value at 4%	Net Level Reserves	Cody			EGM
			Benefit Reserves	DAC	Dividend Fund	
1	0.31	13.42	15.00	-19.63	-4.63	4.73
2	14.56	27.16	30.03	-21.17	8.86	4.73
3	29.16	41.24	45.20	-22.57	22.63	4.73
4	44.11	55.64	60.43	-23.72	36.71	4.73
5	59.41	70.37	75.71	-24.56	51.15	4.73
10	141.31	149.07	156.31	-29.25	127.05	4.73
15	231.83	235.67	244.62	-26.79	217.83	4.73
20	327.76	327.76	337.82	-22.62	315.20	4.73
25	423.68	423.68	434.73	-15.06	419.68	4.73
30	519.16	519.16	531.33	0	531.33	4.73
35	610.67	610.67	624.03	0	624.03	0.43
40	690.77	690.77	705.27	0	705.27	0.43
45	760.51	760.51	776.08	0	776.08	0.43
50	816.00	816.00	832.47	0	832.47	0.43
55	876.41	876.41	893.96	0	893.96	0.43
60	1000.00	1000.00	1000.00	0	1000.00	0.43
Assumes $i=4\%$, $i^*=8\%$ with $K=30$-year amortization of DAC						

TABLE 5
CALCULATION OF DIVIDENDS—DONALD CODY FORMULA

Policy Year	Gross Premium	Interest at 8%	Increasing Dividend Fund	Death	Surrender	Acquisition	Expense	B (Profit Charge)	Dividend
1	19.81	-0.11	-3.93	0.82	0.05	19.81	0.99	0	1.96
2	19.81	0.93	12.41	1.07	1.75	1.98	0.99	0	2.54
3	19.81	2.00	11.47	1.52	2.92	1.98	0.99	0	2.93
4	19.81	3.09	11.07	1.80	3.53	1.98	0.99	0	3.52
5	19.81	4.20	11.26	2.05	3.56	1.98	0.99	0	4.16
10	19.81	10.12	8.78	3.51	7.07	1.98	0.99	0	7.60
15	19.81	17.14	6.37	6.64	11.59	0.40	0.99	0	10.96
20	19.81	24.66	0.90	10.75	16.39	0.40	0.99	0	15.04
25	19.81	32.63	-7.04	17.71	21.18	0.40	0.99	0	19.20
30	19.81	40.97	-18.58	28.69	25.96	0.40	0.99	0	23.33
35	19.81	48.16	-41.91	45.54	30.53	0.40	0.99	0	32.42
40	19.81	53.77	-70.68	72.18	34.54	0.40	0.99	0	36.15
45	19.81	58.07	-112.34	111.41	38.03	0.40	0.99	0	39.40
50	19.81	60.45	-171.76	169.12	40.80	0.40	0.99	0	40.71
55	19.81	62.19	-245.35	240.77	43.82	0.40	0.99	0	41.37
60	19.81	65.80	-288.47	322.92	0	0.40	0.99	0	49.77
with $I^* = 8\%$ and DAC amortized over $K = 30$ years									

TABLE 6
CALCULATION OF EXPECTED GROSS MARGINS (EGM)-*FAS 120* FORMULA

Policy Year	Gross Premium	Interest $i''=8\%$	Increase in Reserves	Death	Surrender	Expense	Dividend	EGM
1	19.81	1.47	12.74	0.82	0.05	0.99	1.96	4.73
2	19.81	2.66	11.40	1.07	1.75	0.99	2.54	4.73
3	19.81	3.85	10.58	1.52	2.92	0.99	2.93	4.73
4	19.81	5.05	10.29	1.80	3.53	0.99	3.52	4.73
5	19.81	6.26	10.57	2.05	3.56	0.99	4.16	4.73
10	19.81	12.53	8.43	3.51	7.07	0.99	7.60	4.73
15	19.81	19.36	4.26	6.64	11.59	0.99	10.96	4.73
20	19.81	26.58	-1.51	10.75	16.39	0.99	15.04	4.73
25	19.81	34.02	-9.98	17.71	21.18	0.99	19.20	4.73
30	19.81	41.32	-22.56	28.69	25.96	0.99	23.33	4.73
35	19.81	48.19	-41.91	45.54	30.53	0.99	32.42	0.43
40	19.81	53.80	-70.68	72.18	34.54	0.99	36.15	0.43
45	19.81	58.10	-112.34	111.41	38.03	0.99	39.40	0.43
50	19.81	60.49	-171.76	169.12	40.80	0.99	40.71	0.43
55	19.81	62.22	-245.35	240.77	43.82	0.99	41.37	0.43
60	19.81	65.83	-288.47	322.92	0	0.99	49.77	0.43
Level 30 method with DAC amortized over K = 30 years								

TABLE 7
BEGINNING IN FORCE AND UDAC:
VARIOUS *FAS 120* AMORTIZATION METHODS

Policy Year	Projected In force	Level 60 $i''=8\%$ $K=60$	Level 30 $i''=8\%$ $K=30$	Level 20 $i''=8\%$ $K=20$	Increasing 60 $i''=9\%$ $K=60$	Increasing 30 $i''=9\%$ $K=30$
1	1.000	19.68	19.63	19.38	20.77	20.65
2	0.849	21.29	21.17	20.63	23.57	23.30
3	0.746	22.76	22.57	21.69	26.25	25.81
4	0.671	24.01	23.72	22.46	28.74	28.10
5	0.615	24.93	24.56	22.88	30.92	30.05
10	0.465	30.30	29.25	24.57	42.80	40.23
15	0.351	29.17	26.79	16.18	48.31	42.31
20	0.260	27.68	22.62	0	53.15	40.19
25	0.187	25.77	15.06	0	56.83	29.43
30	0.129	23.46	0	0	58.79	0
35	0.083	20.82	0	0	58.56	0
40	0.048	17.94	0	0	55.97	0
45	0.023	15.06	0	0	51.20	0
50	0.008	12.36	0	0	44.06	0
55	0.002	9.61	0	0	31.91	0
60	0.0002	0	0	0	0	0

TABLE 8
ACQUISITION COSTS AND EXPECTED GROSS MARGINS (EGM)—FAS 120

Policy Year	Acquisition Cost	Level 60	Level 30	Level 20	Increasing 60	Increasing 30
1	19.81	4.68	4.73	4.94	4.59	4.64
2	1.98	4.68	4.73	4.94	4.86	4.91
3	1.98	4.68	4.73	4.94	5.14	5.19
4	1.98	4.68	4.73	4.94	5.41	5.45
5	1.98	4.68	4.73	4.94	5.67	5.71
10	1.98	4.68	4.73	4.94	6.72	6.77
15	0.40	4.68	4.73	4.94	8.04	8.08
20	0.40	4.68	4.73	4.94	9.42	9.47
25	0.40	4.68	4.73	0.43	10.99	11.03
30	0.40	4.68	4.73	0.43	12.67	12.72
35	0.40	4.68	0.43	0.43	14.41	10.15
40	0.40	4.68	0.43	0.43	16.17	11.91
45	0.40	4.68	0.43	0.43	17.78	13.53
50	0.40	4.68	0.43	0.43	19.27	15.01
55	0.40	4.68	0.43	0.43	19.56	15.30
60	0.40	4.68	0.43	0.43	15.82	11.56

MR. DURAN: I'd now like to talk about a few miscellaneous topics and then take questions. One of the issues that has arisen at some companies in their GAAP for mutuals implementation is whether a liability can be set up for capital gains that will be paid to policyholders in the form of increased future dividends. I would say it has been a relatively common practice among many stock companies to set up liabilities for capital gains with respect to certain participating group pension business—for example, immediate participation guarantee business where the company might realize a capital gain, but not pay it out in the year the gain is realized, but rather over a period of time. Many mutual companies

reflect capital gains and losses on a smoothed basis in their dividends, and a question that has come up at a number of companies is whether it's permissible under GAAP to establish a liability for capital gains with respect to the traditional participating business. I don't believe there's a clear answer in the literature; it's somewhat untested ground. The SEC's pronouncement in mid-1994 relating to *FAS 115* adjustments talks about liabilities for capital gains when the contract entitles the contractholder to participation in those capital gains. So the question is, does there have to be a contractual entitlement or is an established practice sufficient? Different people have different views.

Another question that has come up at a few mutual companies is the use of hindsight in adopting *FAS 115*. Under *FAS 115*, you have to classify your securities into held-to-maturity or available-for-sale or trading. If a company wants to classify all its securities as available for sale, it's probably not a problem. But if you want to go back to, let's say, December 31, 1993, and split the portfolio at that time into held to maturity and available for sale, you probably are going to have to prove that, at that time, you really had the ability and positive intent to actually hold the held-to-maturity securities. That can be difficult to establish, especially if there have been any sales out of the held to maturity portfolio since that date.

I also want to briefly discuss the interaction between *FAS 115* and *FAS 109*. Under *FAS 109*, if the company has an unrealized gain or loss on the available-for-sale securities, it has to set up a deferred tax liability or asset. It turns out that under *FAS 109*, the changes in the deferred tax liabilities and assets that are caused by changes in tax rates go through income. So, if the Republican Congress is successful in lowering the capital gains tax rate, the effect will go through income with respect to the unrealized gains and losses on available-for-sale securities.

The last topic I'll mention is equity tax. I think Andy alluded to this earlier in another context. Mutual companies are the only companies that pay equity taxes, and since they've never done GAAP financial statements before, nobody has ever had to account for equity taxes under GAAP. It will be interesting to see how practice develops. There's no guidance that specifically tells you, for example, whether you must look forward to a true up or true down and how you would calculate the true up or true down. It's expected that equity taxes over the next few years will be very significant compared to their levels over the prior few years. It will be interesting to see how companies account for this.

I have a question for Phil on variable life. I would imagine that you have many different, separate account options that the policyholder can choose from. Some of them may have relatively thin management fees associated with them and others may have higher management fees associated with them, so that the profitability of the product could depend on where policyholders put their money. I'm wondering how you handle that in your GAAP accounting?

MR. GRIGG: Well, you're right. Our first generation variable products had a cap on the management fee, which persists despite redesigns of the product which now have a higher management fee. So relative to some of the newer business, they have much thinner margins. The way we handle those margins is to look at what we're actually getting. We've looked at what we've obtained historically. Perhaps the best predictor of where

people will put their money is where people have put their money. And that's basically what we've used as a guide. And we find, looking historically, that policyholders tend not to move their money around. If you go back and look at the fixed-premium variable product that we had first issued in 1983, a lot of people put their money in the money market fund and it's probably still there today. There's a lot of stability in what people have done with their money, and that's basically what we capture.

FROM THE FLOOR: Am I going to run into a situation whereby DAC is negatively amortized?

MR. KABELE: Yes you could. What will happen is, you're amortizing in proportion to the EGM. The EGM is increasing, assuming you have a whole life plan with cash values that increase. Also, you get some impact on mortality as well. If you use lower mortality in your expected gross margin than you do in the dividend, you might get an additional kick.

MR. DURAN: Tom, I noticed that one of your slides assumed that the gross profit in year one was one and the gross profit in year two was two and the gross profit in year three was three. I'm wondering if you think that linear projection of gross profits is realistic? Isn't that part, at least, of what's driving your trajectory DAC?

MR. KABELE: There are two additional slides that I made. One, a level and two, a strictly linear increasing gross margin pattern. The other trajectory DAC slides however, were based on a Don Cody Dividend Formula. Since excess interest is very important, and since cash values are linearly increasing, that portion of the EGM does increase linearly.

I showed one chart that was on a per-issue basis, and I still got some trajectory impact on that. So you still get a trajectory impact on it. As far as the margin, I'm concerned about using that margin to, in effect, bring future earnings into the present. And I think that is improper. In other words, yes, you might earn 50 basis points in the distant future based on a $1,000 cash value, but rates can go down. Maybe you have a 4% guarantee. Rates 30 or 50 years ago were less than 4%. They can be in the future. Why should we assume or allow anyone to assume that you're going to make a level spread forever? One could assume that the interest margin actually decreases. It would be one way of reducing the trajectory DAC. Or possibly, just don't allow people to take it into account. In other words, they can't capitalize future earnings today.

MR. WARE: Well, I'm not exactly sure what Northwestern will use. But there definitely is an effect here that we're showing but I think that effect is real and will be a part of mutual company GAAP, because you're going to be using gross rates, whether you call them Mark's tax and surplus charges in the dividend formula or whatever. However you do it, the gross margin from interest is going to be there and it's going to increase over time on some policy blocks.

MR. DURAN: I think it would be very difficult not to take that spread in account if, in fact, you do have a spread there. That was very deliberate in the design of the SOP. I'm not sure all the consequences that have been described today were intended when the SOP was designed, but there were many people saying that we should have a spread from

interest because that's how we make our money. They also said we should amortize our DAC against that, and that argument won the day, so that is an intended effect. The trajectory effect, certainly wasn't looked at, but the idea of amortizing against margins, including investment spread margins, was very much an intended consequence.