# MUTUAL COMPANY REPORTING TOPICS

Moderator:     ARNOLD A. DICKE
Panelists:     JOSEPH L. DUNN
               ROBERT W. STEIN
               RICHARD M. STENSON
Recorder:      STANLEY FOX

o     Need for internal management reporting on a "GAAP"-like basis in mutual
      companies
o     Difficulties in adapting stock GAAP accounting to traditional
      participating product lines
o     Need for consistency with pricing/dividend practices
o     Alternative accounting models: A review of theoretical work and computer
      modelling of several accounting alternatives will be given

MR. ARNOLD A. DICKE: In this panel discussion, we plan to cover some work
that was done by the panelists for the Subcommittee on GAAP Issues Of the
Society of Actuaries Task Force on the Conversion of Mutual Insurance
Companies, which is under the leadership of Harry Garber. In the course of its
work, the task force discovered a need to study the accounting consequences of
demutualization. For this purpose, it formed a subcommittee chaired by Charles
Greeley. The subcommittee in turn formed further subcommittees, one of which
was to investigate accounting models that might be applicable to individual
participating insurance sold by mutual companies. This subcommittee, chaired
by Ed Colton, motivated the work that we will be discussing. A paper, based on
the subcommittee's investigations, is being prepared.

However, let me state clearly that, although all of the panelists are members
of the last-mentioned subcommittee, they are not speaking for the subcommittee

or its parent committees, but rather the results and opinions expressed will be those of the individual panelists only.

MR. ROBERT W. STEIN: Most of the comments we will be making are based on discussions, conversations, analyses, and so forth that the Society's Committee on Mutual Reporting has been examining for two years.

During the last several years, the mutual companies have been trying to take a real close look at financial reporting. There has been a considerable amount of interest in Stock companies, as well, which have begun to enhance financial management systems. During the last several years mutual companies have moved more quickly towards more sophisticated financial management systems and methodologies.

Initially, Demutualization was a kickoff point for mutual companies. A number of mutual companies have exhibited a considerable interest in Demutualization. I think that has waned over the last two years. More recently, the efforts to develop more sophisticated financial management systems have been more related to the underlying causes and problems which the mutual industry as well as the stock industry have encountered. In general, the insurance industry has had difficulty understanding what is driving its operations, how it should manage operations, how it should react and control what is going on. We've been pressed on all sides. Competition from within and without the industry has been extremely intensive in the last five to ten years. The economic situation, interest rates, inflation rates, and so forth has been difficult for the industry to manage. Cost pressures throughout have been difficult. Home office and field costs have been difficult to identify and control to keep in line with pricing expectations. Technology is almost out of control in many organizations meaning management and control of data processing organizations.

I think all of these underlying causes have led the financial management aspects to be somewhat strained, forcing companies to examine much more closely how to run their operations from a financial standpoint. In simple terms, in large numbers of companies it is difficult to determine whether they are doing well or not. By well or not I mean your gut feel. I think as actuaries we tend to get an appreciation for the underlying aspects of good and bad in terms

of financial performance. Financial Statements don't often relate to that, unfortunately.

The problem isn't just a mutual company phenomenon. It has been present in the stock industry as well. We've all been buffeted by the problems and pressures, but mutual companies have had a more difficult time evaluating the situation. The financial information that a mutual company gets is not fundamentally related to the economics of the business. Statutory financial information, presented on a quarterly basis, is not, in an underlying way related to the economics of the business. As a result, mutual companies have had more problems evaluating their position with respect to the basic financial aspects of their operations. This has led them to look at their financial management systems and then to try to decide what to do to enhance them and make them more sophisticated, to deal with the situation, to provide information that will better allow them to manage their operations.

Stock companies have had more guidance in this aspect of defining what they need to do, what kind of information they need to develop. They have the outside world pressuring them. Financial analysts, stockholders, and so forth. They invest capital, and return on equity concepts become a relatively easy conclusion for stock companies. Many stock companies have also gone through a process of sophistication in their financial management systems. Generally speaking, these systems have been geared toward managing capital, investor provided capital.

Historically, mutual companies have said, "We're somewhat different than stock companies." Managing capital, return on equity, is just fine for stock companies. They have investors, an equity provided capital base, so return on equity is a fine financial performance measure and standard to use. Mutual companies are different, or so I have heard. If that's the case, what should the financial management standard be for mutual companies?

This committee that Arnold referred to has been looking at that for a good many months now. In my opinion, it reached a relatively surprising conclusion, on the one hand, coming from a mutual company standpoint, and also a non-controversial conclusion from the standpoint of the membership of the

committee. The committee is composed of many, if not all of the large mutual companies of the east coast; many of the mutual companies are from the midwest and west coast as well. The conclusion was that the financial management concepts of a mutual company are no different than those of a stock company.

I'd like to walk through that since it surprised me at the time. I remember the meeting we had when everybody nodded in agreement without any real conversation. In the end, the financial management standards of a mutual company were no different than a stock company. Return on equity criteria for financial performance were the underlying objective to be used for developing financial standards and for financial reporting systems.

In the discussion that led up to that, first was the concept that mutual companies' primary objective was to develop and provide insurance at cost. The definition of cost was, of course, the key problem. Once we understand what goes into the cost basis of the product, we can define a better financial management system to evaluate cost and how that cost impacts how we should evaluate information on a monthly basis.

Given that we are coming from providing insurance on a cost basis, we then say we have to fund new business. The life insurance business is certainly very capital intensive. We have to provide and maintain the capital and surplus in the organization. We need to be able to support the new business strain. Also, there is a general recognition these days of the need for additional surplus over and above the basic statutory surplus strain. There are some additional surplus requirements that must be maintained in order to continue to assure the ability of the organization to meet its obligations with respect to its policy-holders. So the business is very capital intensive.

On the one hand, the mutual companies say we need to provide insurance at cost. That is our underlying objective. At the same time, we have these capital requirements, not unlike the stock companies. In fact, they are identical to stock companies. We need to support and fund the investment in the new business and be able to maintain the ability to provide for adverse deviations and relatively severe fluctuations from expected experience.

The need for capital is relatively intense. The only source of capital, of course, is from policyholders. Putting that together, the Committee concluded providing insurance at cost is fine, and part of that cost is for use of capital. Typically, the capital invested in one block of business is provided by a prior block of business. As a result, it is not uncommon that charges for the use of that capital be made in any block of business. A part of the cost of insurance is partly for the use of capital. There is a general recognition that the business is capital intensive and charges have to become part of the cost of insurance, assessed against policyholders. Mutual companies find themselves in a position more closely related to the management of capital in a stock company.

A stock company, if it mismanages its utilization of capital, can go out and get more capital. Mutual companies cannot. Mutual companies have to very carefully manage the balance between the level of capital in the organization on new capital invested in business and the charges for that capital that are embodied in product pricing, dividend scales, and so on, regardless of how it's done.

One of the basic conclusions of this subcommittee was that regardless of how the dividend setting process is done, the financial management process of the company is primarily related to achieving a certain balance of the level of new business, the charges for capital, meaning the profitability of the business, and the level of capital in the organization. A mutual company cannot, in the long run, survive with a significant imbalance in the level of new business being written, that is the rate it uses capital and the rate at which capital from the business which it invests is returned.

Returns, profits from that business, are primarily to fund new business, to replace that capital which has been used and to go on to support new business. The committee concluded that, from a financial management standpoint, the overall objectives of mutual companies are not any different than a stock company. The stock company perspective is to maximize returns on capital or equity, for stockholders and investors. The mutual company perspective is somewhat different than the rationale for relying on returns from capital as a management criteria. In the end, we need to manage capital, we need to watch

returns on capital from the business, and therefore financial standards are perhaps the same. The committee concluded the standards are fundamentally the same, and when evaluating financial management systems, specifically financial reporting systems, even more specifically financial performance criteria, return on equity is the best measure for a mutual company.

That struck me at the time as a relatively radical, surprising concept to arise from a mutual company committee, and with hardly any controversy. The discussion the committee has had since that time is in the framework of return on equity, utilization of capital. Financial reporting analysis, the kinds of accounting methodologies that had been examined for the financial reporting systems in mutual companies have tended to focus on the ability of that reporting system to provide information to assess the returns on invested capital.

That, obviously, is not inconsistent with stock company objectives and generally might lead one to conclude that, if we have the same financial objectives of stock companies, than we should look at their financial reporting models, meaning stock life GAAP.

Stock life GAAP is certainly on easy place to start to develop a system for financial management reporting in a mutual company. However, stock life GAAP has many problems. It was not designed for mutual companies. It is not really the initial place to begin to define a financial reporting system for mutual companies. The underlying problem in stock life GAAP is that it was really not designed to consistently report with the financial management standards. We go through this rationale we discussed, that is effective management of capital is a financial objective of both types of organizations.

Stock life GAAP is not really designed either in a theoretical sense or a practical sense, the way it is applied, to generate rates of return on invested capital in the manner which that capital is invested. Fundamentally, from an actuarial standpoint, the pricing process is not consistent with stock life GAAP to the extent that organizations use return either on statutory estimates or more broadly defined equity estimates of the business. Stock life GAAP does not really try to report in a consistent manner. It was developed only to

consistently report revenues, benefits, and expenses. It is not trying to define net income as a function of invested capital.

So stock life GAAP, even though it was defined about fifteen years ago for the stock life industry, which, as all other investor owned entities, has had the objective of reporting returns on equity maximization of returns on invested capital. Stock life GAAP really does not fundamentally, even in its principles, try to do that. When mutual companies look at stock life GAAP, they should really say, "That's not really trying to do what I want to do. Maybe I shouldn't use that basis of reporting. I should go on with something that more consistently reports my financial results with my underlying objectives." Keep in mind we're trying to report information to management to use in the decision making process and assess the success of investment of capital in the organization. So stock life GAAP has some problems.

Secondly, it was designed for guaranteed cost products. The non-guaranteed nature of mutual company products, in particular, the traditional par line, leads one to immediately question the applicability of stock life GAAP to a mutual company environment. Many mutual companies have adopted procedures that smell and look a lot like stock life GAAP, but not for the reason it is stock life GAAP. In many cases, it is able to be managed and manipulated to represent returns on equity, but it is not fundamentally related to traditional par products.

There are a lot of problems with par products. The continual repricing makes it difficult to apply stock life GAAP. Stock life GAAP was generated for a fixed guaranteed cost product assumptions and prices that not inconsistently were locked in at issue. In a mutual company environment, traditional par products are continually repriced. Assumptions are continually reset in the dividend setting process. As a result, you may question the applicability of concepts that were applied for guaranteed cost, fixed cost environment.

More fundamentally, you have to assess the ability of stock life GAAP to report earnings in a manner consistent with underlying financial objectives. Does stock life GAAP try to identify and report earnings in any way related to invested capital? I don't think that is the case.

Stock life GAAP is really percentage of premium oriented, adverse deviation oriented, not necessarily and fundamentally tied to reporting earnings consistant with returns on invested capital. From an actuarial standpoint, from a fundamental relationship of the financial information presented in reports, to the objectives of the organization, stock life GAAP really doesn't cut it. It's got different objectives in mind.

In addition, there are some technical problems. Dividend Scales are after tax. There is a whole bunch of problems trying to apply Stock life GAAP to a mutual company and achieve the financial reporting objectives of a mutual company. The committee considered this and concluded that stock life GAAP is a nice frame of reference but the fundamental objective in managing the financial performance of a mutual company is utilization of capital. As a result, methods of accounting and actuarial reporting provide information consistent with the utilization of capital and should be the standard to judge other accounting systems. The committee concluded that return on equity type methods of accounting (actuarially and accounting wise, those methods that fundamentally and theoretically, if assumptions equal expectations in the accounting model, provide information that give you return on equity measurements) is the way to go.

The underlying preferred accounting model that should be used for mutual company reporting is a model that, by its nature, provides information that allows you to evaluate the relative success of utilization of capital meaning the return on equity measurement as a fundamental standard and criteria.

Stock companies cannot necessarily do that. Mutual companies have much more flexibility in this regard, and that model was adopted as a kind of standard to evaluate other kind of models. Both Joe Dunn and Dick Stenson will be discussing the specific models that we studied during the last few years. Dick will be illustrating results of those models, which are illustrative in nature, to suggest how different accepted accounting models, those practiced in the stock world apply to mutual companies and how well they achieve the goal of reporting the effective utilization of capital.

In this regard, our committee also looked at the emerging definition of accounting for stock companies of Universal Life business. There was a general perception that Universal Life business is not dissimilar from traditional par business. From a standpoint of stock and mutual companies both are trying to effectively utilize capital, it is not surprising we looked at the emerging accounting for Universal Life products in the stock industry.

When we began our discussions, it seemed that composite, some variation of the UL traditional GAAP, was going to be the accepted practice. In the stock world, that would have left it consistent with traditional non-par business and would have achieved a sort of consistency of reporting results in the stock industry.

Recent developments during the last month suggest that Deposit Type methods, methods that approximate those used for deferred annuities, are more likely to be adopted or recommended or mandated by FASB for Universal Life. As a result, there is a problem for mutual companies for using the UL model in the stock world as a model for accounting for traditional par business.

In addition, stock life GAAP is not consistent with results on invested capital. The UL situation causes one to question the applicability of GAAP. The stock companies are beginning to wonder how they will report financial results and evaluate financial performance if they stick to stock life GAAP.

At this point, we have inconsistencies if FASB goes forward with its proposal with reporting traditional guaranteed cost business and Universal Life.

Mutual companies can neatly avoid that whole exercise and problem of trying to resolve the consistency of reporting and evaluating financial performance, since GAAP is not defined for them and adopt methods they feel are consistent with meeting their financial reporting objectives. While we looked at UL initially and there was much discussion that the composite method of proposed accounting for UL be adaptable and appropriate for par business, I'd have to say there are serious questions whether the methodologies applied to stock life GAAP for UL products should be applied to traditional par business in a mutual

company. Therefore stock life GAAP has really not been the salvation for mutual company reporting.

Many companies believe they have developed systems that report results that are related to financial measurement standards. How well is capital being used? How is it deployed? Where is it deployed? And what are the returns on invested capital? The underlying objective is to create an integrated system of financial management. In the beginning, we have stock and mutual companies trying to develop financial management standards.

For this discussion we identified return on equity and return on capital as the primary financial standards to measure success of the organization. That will lead you to develop financial reporting systems that mirror those standards that produce information to allow you to evaluate the ability to achieve those financial management standards. What is my return on equity? How well have I used capital? At the other end is the pricing process. Financial reporting standards and reporting mechanisms should be consistent with those pricing standards. Maybe the pricing standards should be modified but consistency with financial standards is needed. If we use return on equity, we should price that way. Stock companies have priced that way for a long time. Mutual companies are beginning to price on a return on equity basis.

You arrive at a financial management reporting system for mutual companies that focuses on capital investments in its businesses. Return on equity performance is used to evaluate the success of those businesses. Pricing methods which mirror those financial standards are based on invested capital concepts so that they can be integrated to develop financial management of the business and to really price products and more actively manage the financial position of the company.

Mutual companies have had, on financial reporting and management side, meaning the active management of its capital base, have done more reporting than managing of financial results. During the last few years, the implicit recognition and direct recognition of capital management is a key problem for mutual companies. We'll see much more active management of financial results, not just reporting financial results.

MR. JOSEPH L. DUNN: Now, as Bob mentioned, this is a rather technical subject. For further information, please see Appendix C. The committee originally considered many more methods than now. At least we originally had them on our list. I don't know whether we considered them extensively. At one stage in the earlier discussions on GAAP for mutual companies, there were some companies lobbying for statutory methods that treated dividends to policyholders as if they were dividends to stock holders. We did not really consider such methods seriously. We felt that the general consensus on the committee that the kind of GAAP that we would be considering would be very similar to that of stock company GAAP. In all the methods we have considered, the dividends to policyholders are treated as a benefit or just another type of expense.

We use GAAP somewhat loosely. Technically it means generally accepted accounting principles. It is clear that many of the methods are not generally accepted in the sense that FASB blessed them. Please bear with us if we are not precise in our nomenclature.

When we say GAAP, we generally mean a method that might be used as GAAP or that we think should be used as GAAP. Now Dick Stenson, who will be following me, will present the numerical results. He did not consider all the methods that I will discuss, but I thought I ought to include them for completeness just so that you would have some idea how the methods relate to each other. Again, Appendix C presents all details.

When evaluating a GAAP method, GAAP generally considers an insurance contract a service contract, and generally on the service contract we report profits in accordance with performance of service. The problem with insurance company contracts is that it is rather difficult to define what the service of the company is under the contract.

There are many different candidates we might consider: investment management, pooling of mortality or morbidity, the sales in insurance needs analysis, and contract for maintenance and settlement. But most important is one service that hasn't been included in the usual list, the long term rate guarantees usually offered by insurance companies. We think those long term guarantees are probably the most important aspect of the insurance company product in

terms of financial reporting, and it is these long term guarantees that gener-
ate many of the difficulties. To the extent you are making long term guaran-
tees, I think we can say the service you are performing is best measured by the
capital you have to put at risk in order to guarantee you can perform on those
guarantees. Now let us go through the methods. (See Appendix A.)

We will discuss the level return on equity method, then the level percentage of
premium method, which is the method that actuaries are probably most comfort-
able with. Then the release from risk methods. Full Release from Risk, the
Composite, and the Source of Earnings. Incidentally, this classification is my
own. I think Dick Stenson might consider the Source of Earnings method as a
special case of the Deposit Method. There are many different perspectives that
you can use to analyze these methods. The perspective that I'm using is the
form of the formulas. It turns out the formulas that you set up to analyze one
release from risk method can be used for any of the other ones to be used up
there, the Source of Earnings in particular. Finally, the last two methods up
there are the Deposit Method and methods based on dividend charges.

*Level Return on Equity:* As Bob mentioned, this is the method that the com-
mittee considers the most theoretically correct and most consistent with what
we think the service performed on these contracts are, that is provision of
capital. It directly addresses that issue. In order to address that issue,
you have to address first the issue of what are the required assets that the
company must keep in order to issue the business. There are several reasons
why you have to have assets. For one thing, the state requires that you keep
assets at least equal to the statutory reserve and in fact you usually need
more assets than that. In particular, the kinds of assets you might consider
to be required are 105% of statutory reserve. This particular issue is
probably the biggest difficulty with this method. Although there is a lot of
literature on how you define required assets, it is by no means a settled
issue.

To the extent that one actuary's definition of required assets differs from
another, you're going to get a different incidence of reported profits. In any
case having defined required assets, the next step in applying this method is
to determine the resultant capital flows. The cash flow to and from the policy

holder together with the investment earnings on the assets that the company must keep determine when capital must be put into the product, usually at issue, and when capital is released from the product. Having determined those capital flows, you could then determine an internal rate of return on those capital flows. That will be the level return on equity. Now the reserve is defined as that reserve which will produce a level return on equity each year equal to the level return on equity determined in step three. In general, throughout all these calculations, the assumptions that you are using are generally best estimate assumptions which by and large the committee assumed are assumptions consistent with those used in setting the dividend scale. Issues that we won't be discussing here are locking and unlocking, at least in our numerical presentations. They are important issues, and they have to be addressed, but I think we felt it will confuse the issue if we started discussing those at this early stage.

Finally, one of the virtues of this method is that it produces reasonable results on both single premium products and level premium products. One of the obvious defects of the traditional audit guide GAAP is that it produces results that most people consider inappropriate when it is applied to single premium products. We felt that when a correct method is developed, it will produce reasonable results on all types of products, and you won't have to switch from method A on product A to method B on product B. Again, as I mentioned earlier, implicit in the use of this model is the assumption that the primary service that the company performs is the provision of capital. That assumption is most appropriate on non-participating products, where there is a greater risk that the company might have to make good on its guarantees. We think it is still a significant service on most par products, especially life insurance products, where the company puts up its capital at risk simply to pay for the acquisition cost. At least until those acquisition costs are recovered, they are at substantial capital risk in the product. If however you have a participating product under which there are no substantial long term risks and therefore no real capital requirements, this method will not work too well, and therefore you have to fall back on the other types of methods that view other services as the primary service provided under the contract.

*Level Percentage of Premium:* This is the method actuaries are most comfortable
with. It doesn't have a theoretical justification other than the fact that it
is easy to compute and because it is very difficult to determine the
service that companies perform under the contract that is really proportional
to the premium. The main virtue of this method is that it might approximate
theoretically accurate methods in certain circumstances. I'm sure you all know
how it is applied. Premiums are considered revenue when they are due. The
experience assumptions are consistent together with setting the dividend scale.
If actual experience equals expected experience, profits will emerge as a level
percentage of premium. The product where the defects are most evident is the
single premium products where you are reporting substantial profits at issue.

*Release From Risk Methods:* This is a category of methods, rather than a single
method, which I designate Release from Risk methods. In order to be a release
from risk method, the experience assumptions used to derive the reserve have to
differ from the best estimate assumptions. The name arises because the profits
will be recorded according to the difference between reserve assumptions and
the best estimate assumptions as those differences are released from risk.

Because you make assumptions as to interest and mortality in the reserve, you
can talk about the profit from interest, the profit from mortality, the profit
from expenses, and so on. The difference between the methods in this category
are how you determine the experience assumptions and what percentage of the
profits will be reported according to the various margins.

So let us go to the full Release from Risk method. Incidentally, the full
release from risk method is also called the prospective version of the deposit
method. Under this method you basically solve for an experience assumption
that will produce a net premium equal to the gross premium. It's usually the
interest assumption that is solved for, although in Dick Stenson's work we
added a uniform margin to three assumptions, withdrawal, mortality, and the
interest assumption in order to generate a net premium equal to the gross
premium. This method has theoretical merit if the service that you view you are
providing under the contract is investment management or mortality pooling.
Clearly, the interest rate margins being released under the contract provide a
reasonable index for your investment management services, and the mortality

profits provide a reasonable measure of the mortality pooling function. This method is usually the most conservative, although not in all cases.

The next method is the one that looked as though it was going to be adopted for Universal Life although now it's not clear. That is the composite method. Here the margins that you use in the experience assumptions are set so the net premium is less than the gross premium so that remaining profit will then be reported as a level percentage of premium. This method is very close to the audit guide GAAP. The only difference that I would see is more a difference in philosophy. That is, the margin that you are putting in the assumptions is there as a measure of your performance, of investment management service, rather than because you have a great uncertainty as to the assumption. It is not a margin for adverse deviation. At least in Universal Life, you could pass off a lot of the investment risk to the policyholder. There is no clear cut service that seems to be associated with this. You could associate the investment management service with the interest rate margins, but to the extent you are reporting profits as a level percentage of premiums, I don't see a service there.

*Source of Earnings Method:* This method was first proposed by the Equitable. Let me first describe it. The benefit reserve here is set equal to the net level premium reserve based on the interest and mortality guarantees in the policy. The next step is to define a revenue stream, and that revenue stream is the total income under the policy before any charge for deferrable acquisition expenses but after a charge for the increase in the benefit reserves. Then you amortize your deferrable acquisition expenses in proportion to your revenue stream. This is defined in the first step. When Equitable defined this, they thought it was pretty close to being a retrospective version of the deposit method. The reason this might be considered a deposit method is that if you compare it to the deposit method applied to a year end loaded Universal Life product, the net level premium reserve would correspond to the accumulation fund under the Universal Life product, and it is the accumulation fund that you are using as the reserve. There are some difficulties with this method in the first year, and if you just apply it as I stated up to now, then a lot of revenue would be reported in the first year, primarily because of the reserve being released on withdrawals in the first year. Now Equitable has

considered a couple of modifications: (1) It makes a charge for hypothetical first year dividend although it doen't pay dividends in the first year. (2) The Equitable also tried eliminating the gain on withdrawal in the first year. This tends to produce a pattern of earnings more close to what I would consider the best pattern, that which is produced by the return on equity method.

*Deposit Method:* There are some difficulties in defining a deposit method for a traditional product. On a Universal Life product you have an accumulation fund, and that is the natural candidate for use as the benefit reserve. On the obvious analog in the case of a traditional product, it is the cash value. The problem here is that the cash value usually is derived from a first year expense allowance, and therefore if you just use the cash value without any further modifications, you report an enormous revenue in the first year and therefore an enormous profit. Therefore, when this method is normally applied, you assume that the only charge for acquisition expenses is a cash value expense allowance and include a charge for the increase in benefit reserves. The benefit reserve is the cash value with the proviso that if the cash value happens to be negative, take the negative rather than the zero which you would show in the policy. And the deferrable acquisition expenses in excess of the cash value expense allowance is amortized in proportion to revenue. Now there are certain places that you could obviously define variations on this and I learned of some variations which have not even been considered. This type of method is of interest to this committee primarily because it is easy to do and you usually have all the numbers. Also it provides a reasonable approximation in certain circumstances to what we would consider an ideal method. I think I could speak for the committee when we say the best way to determine the various issues on which deposit method is the right one is to see how close the final numbers come to what the level return on equity method would produce.

*Dividend Charges:* This final method is included for completeness, although it is not actually a method. Many companies, including my own, have an explicit charge for contributions to surplus in the dividend formula. You might also call it a Risk charge. This is basically money that would stay with the company unless a substantial catastrophe occurs. Now for companies that have such a charge, the obvious candidate for an accounting method is one that

reports profits basically in proportion to that profit charge. Doug Jangraw of the Mass Mutual has defined a method called the modified composite method that is based on these kinds of procedures and, by appropriately choosing the surplus charge or the profit charge, can reproduce many of the other methods which will be presented here later.

MR. RICHARD M. STENSON: Appendix B includes the numerical results. I'd like to make just a couple of general remarks. First, Stan Fox of the Equitable and I worked quite a bit on this. We didn't do everything on it. Many people were actually involved. Harry Garber, the chairman of the committee actually started it out on his PC at home, developing a basic model which Stan picked up, put on another machine with another language. There were other contributions from Arnold Dicke and his people (particularly Joyce Weisbecker), and Al Spooner of the Mutual helped us with it. So we thank a lot of people for getting involved with it.

The model is based on a single issue cell of a participating, plain vanilla Ordinary Life type of policy. We started out just to get a sense of where the numbers came from and the dimensions of the size.

TABLE 1 -- There were a hundred million dollars of issues in the beginning cell, twenty-one dollars and fifty cents a thousand was the premium, just to get a sense of where this size came from. We followed this policy for thirty years. It had built in an assumed set of lapse rates, perhaps a little hefty but realistic lapse rates. We assumed an 11.5% gross interest rate throughout. We assumed a basic dividend scale and cash value scale. The policy uses reserves that are modified reserves, commissioner type reserves grading to net level over ten years. The cash values and reserves, as was commented earlier, are quite close throughout. There are no taxes assumed in this model; this is a pure pretax model. The commission rate is 55%. There are other expenses built in. Another simplifying assumption made is that all expenses were assumed to be deferrable. When we get to the GAAP-type model, there are no non-deferrable acquisition expenses, only a level maintenance expense is not included in the GAAP calculations. When I say GAAP, it has quotes around it as the commentators have earlier said. This first table structures the basic output of the model as we used it under all the GAAP accounting methods.

As Joe said, we focused in on a return on equity model as being a benchmark we might want to look at for all the various methods. We set up this model with a real world capital structure where we capitalized the policy so that total assets would always be 105% of reserves for a simplifying assumption. And that is the first part, required assets, and that is what really drives the rest of it. We start with an assumption that you will have 105% of reserves as total assets to back the contract. As Bob had commented, it could come from an older block of policyholders, but you could think of them as coming from another corporation, in a sense, to the extent that the policy itself doesn't support those levels of required assets in the early years. That is the beginning point. The second column is the insurance cash flows -- just the premiums, minus the expenses, the claims, the surrenders, and the dividends. The policy has dividends beginning in the second year -- just the cash flow with no investment income. You get a total investment income at 11.5%. The sum of those two items are the total cash flow from operations. Insurance cash flow is coming out of the contract; investment income from the total funds is allocated to the contract.

Column five shows the capital flows under the contract. These capital flows are the amounts that are necessary to establish the required assets in the first place, and then they can be drawn out of the contracts. Capital inflow in the beginning of the first year is to offset the initial strain of the contrast. We made this very simple and just dumped everything in the beginning that we needed to cover the first few years until we can begin to draw items out, thinking as though the corporation has put up that money in the beginning so that you can have the total assets required at the end of the year. Remember that is what really started you going, the assets you needed at the end of the year, and then solving for those flows you can reproduce over at column six, the assets that you actually wanted in the first place, and therefore the capital flows are the result the company would have as a sponsor of the business if you put in the capital flow at the beginning of the year and pulled out those values going down the line in subsequent years. We assumed everybody surrenders at the end of thirty years. View it as though it is an endowment for the cash value at the end of thirty years. Just so we could get everything off the deck at that point. Column five shows when you solve for an internal rate of return on those capital flows, this has been set up so that

you get a 15% level rate of return, and that is the return on equity that is associated with this model. This is the Life Insurance model and I want to reemphasize that we used these figures for all of the various methods of accounting that we tried to test.

TABLE 2 -- This table illustrates the return on Equity accounting method that would be consistent with what we have in Table 1. The total invested assets are from column six in Table 1.

The first three columns can be thought of as the balance sheet. You have total invested assets, net liability, and the equity resulting from that, which is the excess of the total invested assets over the net liability. However, in this method, you actually start with the equity and solve for the net liability as Joe explained. The equity is the present value of the capital flows that you saw in Table 1. Then the difference between column one and column three actually becomes the net liability under the method. That produces an equity, or excess of assets over liabilities under the accounting model, such that you will receive the 15% level return on equity under the policy. As I mentioned, every following model used the same cash flow from operations and impacted it by a change in liability under the different accounting methods as in column five for the return on equity method to produce a net income. This means that if you add the net incomes in Table 3, you get the same result under every method because you start at zero for your liability and end at zero since everybody surrenders. So every method will produce the same sum of net incomes over the years. This is not the same present value but the same sum. We thought this was a good benchmark to look at because we are thinking of it in terms of a real life kind of capital structure where in fact the corporation has to have this block of business in a solvent condition. This means it has to have assets somewhat equal to the reserves, and that was our 105% basis. That is the return on equity model, and what it would look like if we were able to use that as an accounting model and set it up more as a benchmark for the other methods. It is conceptually really a very simple method, but I think it will be a difficult method to use practically. I think accountants would probably have many problems with it, if I understood Bob correctly, but I think it's a good theoretical benchmark that could be used.

TABLE 3-- We have illustrated a number of the adjusted or GAAP type of methods. These are the net income results with the return on equity from Table 2 Column 6, shown in Table 3 last column. These were done by the formulas that Joe described and I'll just make some very brief comments as I go through them. The level of percentage premium is really based on the GAAP for a stock kind of environment except that we assume that the presence of the dividend means there is no real need to put in an explicit margin for adverse deviations since dividends can be changed in the future. Therefore all of these runs assume that the experience is the same as the assumptions that are used on the GAAP modeling in developing the reserves and amortizing the acquisition cost with the exception of the composite and full release from risk which I will cover in a moment. The level percentage of premiums is the one that uses the premiums as the revenue and, as Joe described, sets up a separated deferred acquisition cost and benefit reserve including dividends. It gives you that kind of a stream of income that would flow out of it.

I'm going to skip from the composite method to the full release from risk method. As Joe pointed out, while doing the model for the deferred acquisition cost we built in additional conservatism in the assumption so that the GAAP net premiums for benefits and expenses together with a maintenance expense were exactly equal to the gross premium. In other words, had those conservative assumptions been realized, there would be no income. Then, under the full release, the income flows out as a release from the risk. At the bottom, the percentage that we are talking about is that we made the conservative assumptions of (100% - 7.30887%) times the 11.5% investment income that was assumed. We assumed mortality and lapses would be 107.30887% higher. It was handy to do it that way because then we could solve for this percentage and it gives that set of patterns. If you used different percentages or based it all on investment income you would get somewhat different looking results. The composite is done fairly simply in this illustration. We just literally used half of those percentages and applied the same technique, so it fell halfway in between.

These first three are a family from a calculation point of view in that they are driven by the premium because the calculation device is to basically start with the premium as the revenue. The difference between the three is due to

the assumptions that are used for the GAAP model. The sources of earnings used a net level premium reserve on a guaranteed statutory basis as the benefit reserve and as income, amortized deferrable expenses. We used the margins before expense but after dividends and charges for benefit reserves. In this case we did make an approximate adjustment because there wasn't a first year dividend under this policy, the adjustment being to use some of those margins to directly write off some of the initial acquisition cost rather than deferring that portion of it. It tends to depress income a little in the first year over what it would be without that adjustment.

At the Equitable we are applying this technique for internal management purposes where we are using an adjustment to use part of the gain on early surrender rather than making the adjustment that I described here. I do personally view it more as a retrospective deposit method from the comparison with the Universal Life type policy. The margins you are using here, if you think of them before the dividend, you are bringing in the premium and taking out a charge for the net level reserve. Thinking of that as the comparison with a policy account value, amounts to putting in a margin before you take the dividend out that includes the loading and that includes the excess of the valuation mortality over the actual mortality results you got, the excess of investment income over the actual investment income that you got. Then if the dividend is a contribution type of dividend, and you subtract that which has distributed the excess of the dividend interest rate over valuation and the excess of valuation mortality over experience, you end up with a provision for expenses in the dividend formula, plus the actual margins. This is why I think of it as a source of earnings kind of an approach. The margins left after the dividend for mortality and for investment income etc. That is just the basis behind that.

Then we illustrated the statutory method. A couple of things have become obvious. First, if you cut off the statutory column and just look at the various adjusted methods and the return on equity and said the return on equity is the benchmark, the full release from risk seems to be the closest of all the various adjusted methods. On the other hand, it almost depends on your perspective, either half empty or half full. If you now include the statutory column, what really jumps out at you is the enormous difference between the

statutory results and all the families of GAAP results. If you look at it from that point of view, they all look reasonably representative of some sort of more realistic reporting that you might want to use if you wanted to show the long term effect of the business that you are putting on the books.

TABLE 4 -- Since we emphasized the return on equity approach, it was suggested that we look at the return on equity as a percentage of all of those various methods. Table 4 shows the ratio of Net Incomes to the ROE Net Income.

TABLE 5 -- This table shows the yearly returns on equity that these various methods produced. Again, our benchmark is 15%. The pattern under the statutory model is a negative in the first year followed after the first couple of years by very large positives which is naturally what we expect. In the various methods, the full release from risk method relative to the return on equity is the closest, but if you look at all the patterns as contrasted to the statutory, you do see huge differences, and that's what I find the most striking about all these observations. I do have to add this is one policy, one model, and one set of assumptions, and how do you rely upon that?

TABLE 6 -- One very interesting thing that we did is to run some books of business of this model with repeated issues year after year. We finally used 5 and 10% just to see what would happen to a book of business, and then we ran it at a 15% growth rate each year. Table 6 shows the returns on equity for the book of business if this single policy were issued repetitively at a 15% growth rate for fifty years. It shows two very interesting things, I believe. In the first place, after a few years, if you just look down five, six, or seven years, you can see all of the GAAP type methods becoming much closer to the return on equity method as you begin to develop a book of business of some size. Most of the differences tended to be in the early years and tended to be numbers that, when you get a book of business, are not significant when compared to the whole. The other thing that is very interesting is that it shows the theoretical basis when you see the line drawn down at the end of thirty years, the policy has a thirty year life span because everybody pulls out at the end of thirty years and by the time you get there, having grown at the 15% rate, it is really growth that you need in a mutual company environment. Your capital is really needed to finance growth and everybody is making

15% on every method. In fact, at the bottom of the chart, if you go on growing at 15% forever more, every method including statutory produces a nice 15% return on equity.

TABLE 7 -- The company now is assumed to have grown at the same 15% rate for thirty years. But now it goes wild into a 30% growth rate phase. The various GAAP type models continue to show fairly stable income and of course, the statutory at that rate of growth, even though it had stabilized after thirty years, begins to fall apart.

TABLE 8 -- These, incidentally, were Al Spooner's contributions and ideas. We show what happens when it drops to zero. Similarly, the patterns again diverge from the 15% level everywhere but remain clustered about it for the GAAP methods and begin to show enormous growth in profit on the statutory methods.

That is the end of the numerical illustrations that we selected. I've given you some comments on their results. We also did a few runs and rather quickly abandoned the possibility of showing what happens if experience begins to deviate from the assumption that you had in the first place. These all assumed that our original assumptions were borne out. It depends on what you do with dividends. If you think about it, it is pretty logical, almost a tautology. If you assume you have interest rates jump up by .5% in the tenth year but adjust your dividend formula by an exactly equal amount and assume that you could respond directly and immediately and with a formula that is fairly precise that offsets it, you don't change the results. In essence, that is part of a theory we are using at the Equitable in our model, essentially not planning in general to unlock. In other words, using the assumptions under-lying the dividend scale at the time we issue the policy. That dividend scale and the GAAP numbers, with the theory that, as experience changes in the future, the dividend will change by a similar amount and we will not need an adjustment in the valuation practice for the policy is an issue the committee has to do a lot more work with and give a lot more thought to.

MR. R. LARRY WARNOCK: I have a question about exactly what the committee is doing, specifically are you looking at both internal methodology for internal reporting as well as for external reporting, and secondly, is the

committee at a point to recommend one of these various methods that was presented?

MR. STEIN: As to internal or publicly reported numbers, I think it is fair to say we have had a lot of discussion on that. Our comments were, I think, clearly focussed on internal reporting for management purposes only. Methodologies and the practices that we talked about primarily were designed to achieve internal financial management objectives as opposed to external reporting criteria and requirements. That is, we aren't trying to define necessarily GAAP for mutual companies, literally. Right now GAAP for mutual companies is statutory. In a very technical sense, that is what it is. And we are not really trying to suggest that one of these is what the mutual industry ought to report for a publicly reported GAAP basis. It gets kind of confusing, and it is almost more technical than meaningful. But the objectives were to define the overriding management concerns of the mutual industry and then devise a financial reporting system that provided information to support that and allow you to evaluate your success. It isn't necessarily GAAP, and it isn't necessarily true that whatever we have talked about or whatever Dick has illustrated will be GAAP for mutuals if and when the FASB ever decides to move ahead on that project.

MR. STENSON: We should also underscore Arnold's earlier comment here that the neither task force nor the subcommittees have had a final or even an interim report on this subject.

MR. DICKE: We are not trying to report for the committee. As for recommendations, the committee's discussions were focused not so much on recommending a single method but rather on figuring out a criterion that might be applied to various methods to see whether or not they produce reasonable results. We are not actually recommending the level return method so much as saying that the producing of not more or less level returns on equity is a criterion for a good management reporting model.

MR. WARNOCK: Now I have one additional comment and one question. Bob enumerated several difficulties with GAAP accounting companies for stock companies and I thought that was very refreshing. Specifically, you said that the

fundamental economics of the business are not reflected in stock company GAAP and that stock company GAAP is not fully consistent with return on equity type pricing methods that are widely used in the industry. I submit that if we modify stock company GAAP methodology sufficiently to solve these problems, then we don't have GAAP at all. Now my question is to Joe Dunn, and it is in regard to the level return on equity method. Is the level return on equity method substantially equivalent to what we call value added?

MR. DUNN: The formulas that you use are virtually identical. The difference between the two methods is how you choose the assumptions. The level return on equity method tends to lock in assumptions at issue, and you determine the balancing item as the return on equity, Anderson's J. The value added method tends to be closer to an actuarial valuation. You set down and determine what the J should be, what the return on equity should be, what the other experience assumptions should be, and you prospectively value the future profits that you are projecting to produce the value of the business at that point. That would be closer to taking the market value of the business at every point in time. It is conceivable with the value added method, for instance, that you will produce a profit at issue if your assumptions work out that way. Of course you could produce a loss also.

MR. STEIN: We have talked clearly about capital and return on equity as a primary to the system considered here. I think that often leads to the adoption of things that are more like stock company GAAP.

There is a need for reliable, credible information, the ability to compare to the stock insurance industry, to answer analyst questions, financial communities questions, the rating agencies, and so on. Many, many other criteria push for something that is more understandable, in a non-technical sense. More readily identifiable as an accepted methodology within the financial community. As a result, in practice when we talk about ROE and methods that theoretically and on paper, in the math and so on produced level ROEs, I think in practice all these other competing reasons for doing financial reporting in a more sophisticated manner for mutuals leads into something more like stock company GAAP that might have appeared here from what we have said.

MR. RICHARD S. ROBERTSON: I'm impressed with the work of the committee. One thing that surprised me from what we have seen here, in fact disturbed me very much, is how poorly the return on equity, as a level percentage of premium, appears in this work. That would suggest that traditional GAAP isn't doing a very good job if one accepts the premise that level return on equity is an appropriate standard as I do. It seems to me there are a couple of things that would modify the results that you put forth here. One is that we don't really use level of premiums as our standard. We use something that is probably closer to what is labeled the deposit method, or level return of premium with modest conservatism in the assumptions. Another thing is that return on equity is necessarily completely dependent on the definition of equity. And you define it as basically 5% of cash values, or the initial equity above the cash value. Whereas I think we would put some components of equity that relate to mortality risk inforce or some other measures. And I guess I would like the benefit of the committees experience. If you made these adjustments, would you come up with a conclusion that traditional stock GAAP comes a lot closer to meeting your test than this work might suggest.

MR. STENSON: We did one set where we used 103% of cash values and 30% of expected mortality. That might not be enough of a difference from the other one for your view. In testing that, the general results and pattern of them seem to be relatively similar.

MR. ROBERTSON: Yes, because you are using select mortality.

MR. STENSON: The other thing that we did not do in any of these methods, because they are par policies with dividends, is have the additional element for adverse deviations which you would put in a stock calculation as I understand it, at least on the fixed guaranteed premium product.

MR. DICKE: The one labeled composite here actually had moderate margins, as was mentioned, in three of the factors. Many of us thought that this method was closest to stock GAAP.

MR. ROBERTSON: I'll make the additional observation that if you pull
what the FASB is trying to do to Universal Life, it is going to look just awful
in this study. It is going to jump all over the place.

MR. STEIN: I suspect it will give us more arguments to say that what they are
suggesting doesn't make any sense. In practice, Dick, I agree with the implied
suggestion you are making that stock like GAAP is a manageable tool to use for
financial management in a stock company. It is relatively clear that generally
speaking, stock companies are using GAAP or very modest modifications of GAAP
to accomplish the same financial management objectives, that is, measure return
on capital. Composite, with the margins for adverse deviation fits with GAAP
for stock companies very well, and in fact that has been one of the problems
with Universal Life in talking with the FASB. Every time a traditional GAAP
method is illustrated to FASB or shown in comparison to composite, it is
suggested that no adverse deviations need to be provided for in the accounting
system. That isn't true and in practice GAAP for stock companies in a guaran-
teed cost environment much more approximates the composite method as shown here
than does the level percentage of premium. When you get into a Universal Life
and a par product, where it is not guaranteed, there are theoretical reasons
why you would have no margins for adverse deviation. In practice, we have
found that mutual companies and stock companies alike, when they adopt a
reporting system like this, put in margins for adverse deviation that accom-
plish the levelization of return on equity measures. The difference is between
the level ROE methodology, meaning the mechanics and the formulas, and
traditional GAAP meaning percentage of premium oriented. The differences
between those two are relatively slight. The change in the ROE as you drift
down through the years of a traditional GAAP methodology are relatively modest
which you can levelize with margins for adverse deviation. I would not want to
conclude that stock like GAAP, as it currently is defined, is inappropriate for
a financial management system for either stocks or mutuals. I would conclude
that it is a manageable mechanism we use, and it has all the support and
credibility and reliability that is needed to be able to evaluate and discuss
results with the board, for example.

MR. WALTER SHUR: In the opening remarks, it was indicated that what a mutual
company is really doing is managing capital. That is kind of the bedrock upon

which most of the rest of this flows. I think there were a couple of
instances, one where a 105% of statutory reserve was used in one of the early
models. I think in Dick's model it was 105% of the cash value. There never
was any discussion as to what is capital. As one question, I would ask, what
is the capital of a mutual company? One might argue that the capital of a
mutual company is its statutory surplus. If that is a correct interpretation,
then that might suggest that statutory accounting is a pretty useful tool,
because it's the only accounting method that shows exactly what happens to the
company's capital. I think Dick made the point that the statutory accounting
method was the only one out of line with all the others. I might make the
comment that all of the other methods were out of line with the statutory
accounting method, which is the only one that shows what happens to the com-
pany's capital. If you think about looking at a new product, it would seem
that one of the most important things to know about that new product is, just
how does it use capital? When does it use capital? When does it return capital?
Statutory accounting is what gives you that picture. If you use other kinds of
accounting, do you mask the incidence of the use and production of capital?

MR. STENSON: "Everybody is out of step but my John," as the woman said when
watching the soldiers go by. I think, as to the basic assumption underlying
this, capital is statutory surplus, in the sense that what were trying to do
with the return on equity model is to show how much of that statutory surplus
is used by the policy. The basic capitalization level of some amount above
statutory reserve, I think, is basically honing in on the statutory reserve in
that sense in establishing the amount of capital the contract needs. I think
it would follow that the total for the company would be the statutory surplus.
I guess it depends on how you want to look at it. When you look at the stat-
utory method, you see the drain each year, but you don't see any impact of the
relative long term effect. Whereas the return from equity approach indicates
how much is being charged for the use of that capital. When you look inside
the technique and see the capital flows, you are getting how much the policy is
using and how much it is repaying over the years.

MR. DUNN: The primary purpose of GAAP, at least in my view, is if you allocate
the resources to those activities that produce the highest short term return,
as reported by GAAP, you should hopefully be making efficient allocation of

resources in the long run. It doesn't always work out that way, but I think
that should be a goal with GAAP reporting. It is clear that isn't the case with
statutory, if you use statutory reporting.

You would never issue another policy if you were allocating resources that way.
You would sit on the money and let it accumulate surplus. The purposes of
GAAP are different, and for the purposes of GAAP, the capital or equity has to
be defined differently than statutory. Otherwise you get these results that
make its use as an aid in allocation of resources impossible.

MR. STEIN: I don't think we are suggesting that the reporting system changes
your bedrock analysis of the economics of the product. What we are trying to
suggest is that some alternate system of financial reporting provides more
readily accessible information, more easily understood and more easily ex-
plained information, which is consistent with the comments that you made
concerning the use of the capital in the products and so forth. All that we
are trying to suggest here is that, as Dick says, statutory may, if you had a
single block of business, allow you to measure that instant in time when you
invested the capital. Thereafter, it gives you no ability to evaluate how well
you are doing vis a vis the return on the capital that's required to continue
to stay in business. We are suggesting that if, and I think you agree,
management of capital is essential for the mutual organization, then a report-
ing system that tries to first measure the amount of initial capital investment
in a block of business and secondarily measure the level of unrecovered
investment and correspondingly measure the return on those investments. A
reporting system that does all that, on it's surface, is much better than a
system like statutory, that forces you to spend ungodly amounts of time and
efforts trying to understand just what the heck is going on there. So we are
suggesting that an alternate system more easily and more readily is consistent
with the primary objectives of capital management. You get, in the end, the
same conclusions. It provides, however, an easier access to management infor-
mation with respect to the use of the capital to the organization.

MR. DICKE: Although you have received many answers here, let me add one more
thing. If you notice, the internal reporting systems we have considered are
entirely embedded in the statutory system. The overriding purpose is managing

statutory capital. The return on equity method is a system in which the year
to year return on equity is the same as that statutory internal rate of return.

MR. R. STEPHEN RADCLIFFE: All of your tests, I know, are illustrative, but did
you choose pretax return for simplicity, or is there another reason?

MR. STENSON: Yes, we chose pretax return for simplicity. As I understand the
traditional accounting methodologies, one would set up a liability for deferred
tax basically as a balancing item. We probably should look at how that might
work. Probably the theory would begin to fall apart a little bit in terms of
its nicety when you have taxes as a balancing item which leads to a conclusion
that perhaps you should put taxes right into some of these formulations which
would produce presumably different patterns but an entirely different
theoretical approach. On the other hand I don't think that would jive with
accounting methodology.

MR. STEIN: If we are using pretax should we be using something higher
than 15% as the internal rate of return?

MR. DICKE: Very interesting question. I wouldn't necessarily think so. I
would think that would be a pretax number. But you may feel it should be
higher than that.

MR. DUNN: The primary affect here, the part we are worrying about is the
incidence of profits reported and we just picked 15% as a number we had seen
that was used before. Even if you have a product with a substantially higher
return, the results wouldn't necessarily change too much in terms of the
incidence of profits and the relative position of the various methods. You just
have a larger absolute profit and that's about all.

MR. STENSON: We did take the same product and cut the dividends to make it
produce 20%, and the relative pattern was not that different. Another comment
on the taxes. Bear in mind that it's basically a return on the investment in
the contract and much of the expenses that are in the contract on the book will
be deductible on your tax return as well.

MR. STEIN: Except for the surplus tax in a mutual company. It was clearly a simplifying assumption to use pre-tax rates, however, in my mind and I suspect in everybody's thinking here, if you extend it to include taxes we aren't suggesting that anything changes in terms of what the standards ought to be. The return on equity method still remains the standard. It simply is an after tax calculation in the cash flows that Dick illustrated, in one of the exhibits. One of the cash flows would simply be the taxes related to the writing of that business. If you were to do the level return on equity methodology and actually implemented it, which some mutual companies actually have, notably the Provident, it includes projected gains, tax benefits and costs in the calculations, and thereby achieves in theory (if actual equals assumed) level ROEs after tax. That clearly conflicts with GAAP because it buries a discounted tax provision in the liability. However, that is one of the things that I believe, as a result of a fair amount of practice in this area, is a manageable thing with currently defined deferred tax accounting for the Life Insurance Industry. On this rate of return, as Joe said, we are clearly not trying to establish goals for mutual companies. I think, in practice, we have found that after tax ROEs over the last several years for many mutual companies tend more to approximate net investment earnings rates currently available, or after tax net investment earnings rates currently available, than the 15% level. This isn't meant to establish a target rate for mutual companies nor for stock companies, but rather to illustrate the incidence of earnings.

MR. DICKE: There are two things that ought to be said. The return on equity of a mutual company is very different from the ROE of a stock company. Insofar as there is any payment to policyholders of a mutual equivalent to stockholder dividends, it is deducted out before the return on equity is calculated. In other words, the mutual company ROE is a rate of retained earnings. This being the case, in order to set a target rate, one must look at the company's pro-jected growth rate over the long term. Furthermore, a mutual company is presumably not attempting to maximize a rate of return but rather to minimize the cost of insurance to it's policyholders over the long run. That being the case, the ROE cannot really be a measure of performance. You really should be aiming at some target which is determined to be correct for your company: i.e.

tied to a reasonable growth rate and fair, in sense of intergenerational
equity. We didn't go into any of those considerations. We just chose a number.

MR. FRANK S. IRISH: I could summarize much of what has gone on as a discussion
of various methods, and you succeeded in proving that the choice between them
is not terribly important, numerically speaking, which is gratifying, but this
points out the fact that there are other issues involved with your principles
which you have established that are numerically important and have to be
addressed by your committee. I'll name just a couple of these because they are
irritating and irksome to me personally. As I tried to apply GAAP in a mutual
company, one of them is the refusal of the accountants to admit all issue
expenses as deferrable. I think, if I apply the principles that I hear --
mainly that GAAP is for the purpose of seeing whether we are managing capital
well -- we should be deferring all issue expenses. I think this should become
an issue between mutual companies and the accounting profession that should be
dealt with, and I've expressed my position on it and I would like to hear
yours. I think the other issue which can be of great numerical and analytical
significance is the unlocking of assumptions. Again, I will simply express my
position that unlocking is a very useful and a very appropriate device for a
mutual company to use.

MR. STEIN: First, on the restrictions that GAAP puts on deferrable expenses.
I guess it might be best to say that the committee certainly sympathizes
strongly with the problem, and some stock companies try to come to grips with
that with some adjustments outside of the formal publicly reported numbers. As
a practical matter, I guess from what I've heard and seen in terms of dis-
cussion of whether that would be left in a stock like GAAP environment, which
then might be carried over to a mutual companies, is not going to happen. The
current discussion on Universal Life accounting was preceded by discussions of
single premium deferred annuity accounting. There was much discussion at that
time, during the last two or three years, I guess it started in the middle of
1984, if my memory is right. The Institute committees that I was on and the
Task Forces that I participated in addressed whether or not they should lift
that restriction, and there was very little sympathy from the Institute for
that and very little sympathy from the FASB. I don't think, in a literal

sense, that's going to be changed. It will have to be dealt with in the mechanics and perhaps adjustments to publicly reported numbers.

With respect to unlocking, I think there is an awful lot of sympathy for that as well. I agree that unlocking in a non-guaranteed product environment is correct, is consistent with stock like GAAP. I think the pronouncements that we will see coming out of FASB with respect to Universal Life and some other issues being dealt with will directly or indirectly permit or encourage or allow, whatever the words might be, unlocking on non-guaranteed products. I think unlocking and locking in and all that is primarily a problem with semantics. There are a whole bunch of practical reasons why lock in was provided for stock life companies. The theory is that locking in the reserve system and the reported results was consistent with the guaranteed nature of the pricing. You locked in the pricing so you locked in the accounting. If everything worked out right, then profits reported equal expected profits. On a non-guaranteed cost product, meaning either indeterminate premium, traditional par or Universal Life, I think unlocking becomes a semantic problem more than anything else. The theory is, the reported results should be consistent with the pricing. You lock in, in any event, the relationship between pricing and financial results. I think the acceptability of unlocking in a stock company environment for Universal Life and the acceptability of unlocking in non-guaranteed premium products will result in acceptable unlocking in a par environment. So I don't think that is a problem.

MR. STENSON: I think that it ought not to be something that is viewed as a required practice with the par contract. Particularly since there is a lot of offset in the management of the dividend scale.

APPENDIX A

SLIDE 1

OVERVIEW OF METHODS

1.      LEVEL RETURN ON EQUITY

2.      LEVEL PERCENTAGE OF PREMIUM

3.      RELEASE FROM RISK METHODS

            a.  FULL RELEASE FROM RISK

            b.  COMPOSITE

            c.  SOURCE OF EARNINGS

4.      DEPOSIT

5.      METHODS BASED ON DIVIDEND CHARGES

SLIDE 2

LEVEL RETURN ON EQUITY METHOD

1.  REQUIRED ASSETS MUST FIRST BE DETERMINED. FOR INSTANCE, REQUIRED ASSETS MIGHT BE 105% OF THE STATUTORY RESERVE.

2.  THE REQUIRED ASSETS DETERMINE THE CAPITAL FLOWS TO AND FROM THE PRODUCT.

3.  THE LEVEL RETURN ON EQUITY IS THE INTERNAL RATE OF RETURN OF THE CAPITAL FLOWS.

4.  THE LEVEL RETURN ON EQUITY RESERVE IS DETERMINED BY THE REQUIREMENT THAT THE RETURN ON EQUITY EACH YEAR EQUALS THE LEVEL ROE DETERMINED IN STEP 3.

5.  EXPERIENCE ASSUMPTIONS ARE CONSISTENT WITH THOSE USED IN SETTING THE DIVIDEND SCALE.

6.  THIS METHOD PRODUCES REASONABLE RESULTS ON BOTH LEVEL AND SINGLE PREMIUM PRODUCTS.

7.  THIS METHOD ASSUMES THAT PRIMARY SERVICE THE COMPANY PERFORMS IS THE PROVISION OF CAPITAL.

PANEL DISCUSSION

SLIDE 3


LEVEL PERCENTAGE OF PREMIUM METHOD


1.   PREMIUMS ARE REPORTED AS REVENUE WHEN DUE.


2.   EXPERIENCE ASSUMPTIONS ARE CONSISTENT WITH THOSE USED
     IN SETTING DIVIDEND SCALE.


3.   PROFITS EMERGE AS A LEVEL PERCENT OF PREMIUM IF ACTUAL
     EXPERIENCE EQUALS EXPECTED.


4.   ON SINGLE PREMIUM PRODUCTS, SUBSTANTIAL PROFITS EMERGE
     AT ISSUE.


5.   THERE IS NO CLEAR RELATIONSHIP BETWEEN SERVICE
     PERFORMED AND RECOGNITION OF REVENUE.

SLIDE 4

RELEASE FROM RISK METHODS

1.  THE BENEFIT RESERVE IS DETERMINED USING EXPERIENCE ASSUMPTIONS WHICH ARE MORE CONSERVATIVE THAN DIVIDEND ASSUMPTIONS.

2.  SOME OR ALL OF THE EXPECTED PROFIT EMERGES AS THESE MARGINS ARE RELEASED.

3.  INTEREST RATE MARGINS CAN BE ASSOCIATED WITH THE INVESTMENT MANAGEMENT SERVICE AND MORTALITY RATE MARGINS WITH THE MORTALITY POOLING SERVICE.

4.  SEVERAL VARIATIONS

    a.  FULL RELEASE FROM RISK (aka THE PROSPECTIVE DEPOSIT METHOD)

    b.  COMPOSITE (aka BALANCE METHOD)

    c.  EQUITABLE'S SOURCE OF EARNINGS APPROACH

PANEL DISCUSSION

SLIDE 5

COMPOSITE METHOD

1.   SOME MARGINS ARE ADDED TO THE EXPERIENCE ASSUMPTIONS,
     BUT THE BALANCE OF THE PROFIT EMERGES AS A LEVEL
     PERCENT OF PREMIUM.

2.   THIS METHOD IS CLOSE TO GAAP AS DEFINED IN THE AUDIT
     GUIDE FOR STOCK COMPANIES.

3.   THERE IS NO CLEAR CUT CANDIDATE FOR SERVICE PERFORMED.

SLIDE 6

SOURCE OF EARNINGS

1.  THIS METHOD WAS ORIGINALLY PROPOSED BY THE EQUITABLE.

2.  BENEFIT RESERVE IS SET EQUAL TO THE NET LEVEL PREMIUM
    RESERVE BASED ON THE POLICY GUARANTEES.

3.  REVENUE IS THE INCOME BEFORE DEFERRABLE ACQUISITION
    EXPENSE BUT AFTER DIVIDENDS AND A CHARGE FOR BENEFIT
    RESERVES INCREASES.

4.  DEFERRABLE ACQUISITION EXPENSES ARE AMORTIZED IN
    PROPORTION TO THE EXPECTED REVENUE STREAM.

5.  A MODIFICATION IS SOMETIMES MADE TO THE FIRST YEAR
    REVENUE STREAM TO REDUCE THE REVENUE REPORTED IN
    THE FIRST YEAR, EITHER BY MAKING A CHARGE FOR A
    HYPOTHETICAL FIRST YEAR DIVIDEND OR BY ELIMINATING
    THE GAIN ON WITHDRAWALS.

SLIDE 7


DEPOSIT METHOD


1.  THIS METHOD USES THE POLICY CASH VALUE, OR THE CASH
    VALUE PLUS TERMINAL DIVIDEND AS THE BENEFIT RESERVE.


2.  THE METHOD WORKS BEST WHEN ONE USES THE FORMULA DERIVED
    CASH VALUE BEFORE ANY RESTRICTION THAT THE CASH VALUE IS
    NON-NEGATIVE.


3.  IN THE USUAL VARIATION, REVENUE IS DEFINED AS INCOME
    WITH A CHARGE FOR THE INCREASE IN BENEFIT RESERVES AND
    THE ONLY CHARGE FOR ACQUISITION EXPENSE BEING THE CASH
    VALUE EXPENSE ALLOWANCE.


4.  DEFERRABLE ACQUISITION EXPENSES IN EXCESS OF THE CASH
    VALUE EXPENSE ALLOWANCE ARE AMORTIZED IN PROPORTION TO
    REVENUE.


5.  THERE IS NO CLEAR CANDIDATE FOR SERVICE PERFORMED.

APPENDIX B

TABLE 1

15% Internal Rate of Return Model
Analysis of Total Cash Flows

| Year | (1)<br>Required<br>Assets<br>Beginning<br>of Year | (2)<br><br><br>Insurance<br>Cash Flows | (3)<br><br>Investment<br>Income on<br>(1)+(2) | (4)<br>Total<br>Cash Flow<br>from Oper.<br>(2)+(3) | (5)<br><br>Capital<br>Flows<br>End of Yr. | (6)<br><br>End of<br>Yr. Assets<br>(1)+(4)+(5) |
|---|---|---|---|---|---|---|
| 0 | | | | | 593,584 | 593,584 |
| 1 | 593,584 | -505,797 | 13,960 | -491,837 | 0 | 101,747 |
| 2 | 101,747 | 798,171 | 141,141 | 939,312 | 0 | 1,041,058 |
| 3 | 1,041,058 | 553,139 | 239,828 | 792,968 | -44,348 | 1,789,678 |
| 4 | 1,789,678 | 335,604 | 311,362 | 646,966 | -102,558 | 2,334,086 |
| 5 | 2,334,086 | 194,270 | 364,752 | 559,022 | -116,168 | 2,776,940 |
| 6 | 2,776,940 | 57,153 | 404,291 | 461,445 | -88,978 | 3,149,406 |
| 7 | 3,149,406 | -17,474 | 439,951 | 422,477 | -128,774 | 3,443,109 |
| 8 | 3,443,109 | -103,413 | 465,912 | 362,499 | -111,341 | 3,694,266 |
| 9 | 3,694,266 | -168,392 | 488,104 | 319,712 | -127,863 | 3,886,115 |
| 10 | 3,886,115 | -216,237 | 504,406 | 288,168 | -140,919 | 4,033,364 |
| 11 | 4,033,364 | -245,823 | 516,371 | 270,548 | -178,456 | 4,125,456 |
| 12 | 4,125,456 | -287,764 | 522,705 | 234,941 | -186,007 | 4,174,389 |
| 13 | 4,174,389 | -323,573 | 524,402 | 200,830 | -170,372 | 4,204,847 |
| 14 | 4,204,847 | -356,794 | 524,280 | 167,487 | -172,007 | 4,200,326 |
| 15 | 4,200,326 | -383,186 | 520,417 | 137,231 | -155,995 | 4,181,563 |
| 16 | 4,181,563 | -403,551 | 515,173 | 111,623 | -157,625 | 4,135,560 |
| 17 | 4,135,560 | -422,123 | 507,041 | 84,918 | -154,274 | 4,066,205 |
| 18 | 4,066,205 | -434,371 | 496,446 | 62,074 | -139,040 | 3,989,239 |
| 19 | 3,989,239 | -441,559 | 485,178 | 43,619 | -139,107 | 3,893,751 |
| 20 | 3,893,751 | -443,295 | 471,966 | 28,671 | -139,498 | 3,782,924 |
| 21 | 3,782,924 | -434,621 | 457,160 | 22,539 | -173,747 | 3,631,717 |
| 22 | 3,631,717 | -422,948 | 437,871 | 14,924 | -171,634 | 3,475,006 |
| 23 | 3,475,006 | -409,762 | 418,095 | 8,333 | -169,099 | 3,314,240 |
| 24 | 3,314,240 | -396,129 | 397,985 | 1,856 | -165,369 | 3,150,727 |
| 25 | 3,150,727 | -382,169 | 377,682 | -4,487 | -160,559 | 2,985,681 |
| 26 | 2,985,681 | -369,381 | 357,316 | -12,065 | -153,494 | 2,820,122 |
| 27 | 2,820,122 | -356,601 | 336,994 | -19,607 | -150,710 | 2,649,806 |
| 28 | 2,649,806 | -344,714 | 316,225 | -28,489 | -139,463 | 2,481,854 |
| 29 | 2,481,854 | -333,131 | 295,817 | -37,313 | -127,696 | 2,316,845 |
| 30 | 2,316,845 | -2,497,482 | 275,831 | -2,221,651 | -95,184 | |

Dividends are 100% of original.
Required Assets are 105% of Statutory Reserves.

## TABLE 2

### 15% Internal Rate of Return Model
### Return on Equity (ROE) Accounting Method

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Year | Total Invested Assets | Net Liability | Equity | Cash Flow from Oper. | Change in Liability | Net Income (4)-(5) | ROE (6)/(3) |
| 0 | 593,584 | | 593,584 | | | | |
| 1 | 101,747 | -580,875 | 682,622 | -491,837 | -580,875 | 89,038 | 15% |
| 2 | 1,041,058 | 256,044 | 785,015 | 939,312 | 836,918 | 102,393 | 15 |
| 3 | 1,789,678 | 931,259 | 858,419 | 792,968 | 675,215 | 117,752 | 15 |
| 4 | 2,334,086 | 1,449,462 | 884,624 | 646,966 | 518,203 | 128,763 | 15 |
| 5 | 2,776,940 | 1,875,790 | 901,150 | 559,022 | 426,328 | 132,694 | 15 |
| 6 | 3,149,406 | 2,202,062 | 947,344 | 461,445 | 326,272 | 135,172 | 15 |
| 7 | 3,443,109 | 2,482,437 | 960,672 | 422,477 | 280,375 | 142,102 | 15 |
| 8 | 3,694,266 | 2,700,835 | 993,431 | 362,499 | 218,398 | 144,101 | 15 |
| 9 | 3,886,115 | 2,871,532 | 1,014,583 | 319,712 | 170,697 | 149,015 | 15 |
| 10 | 4,033,364 | 3,007,513 | 1,025,851 | 288,168 | 135,981 | 152,187 | 15 |
| 11 | 4,125,456 | 3,124,183 | 1,001,272 | 270,548 | 116,670 | 153,878 | 15 |
| 12 | 4,174,389 | 3,208,934 | 965,456 | 234,941 | 84,750 | 150,191 | 15 |
| 13 | 4,204,847 | 3,264,945 | 939,902 | 200,830 | 56,011 | 144,818 | 15 |
| 14 | 4,200,326 | 3,291,447 | 908,880 | 167,487 | 26,502 | 140,985 | 15 |
| 15 | 4,181,563 | 3,292,346 | 889,216 | 137,231 | 899 | 136,332 | 15 |
| 16 | 4,135,560 | 3,270,586 | 864,974 | 111,623 | -21,760 | 133,382 | 15 |
| 17 | 4,066,205 | 3,225,759 | 840,446 | 84,918 | -44,828 | 129,746 | 15 |
| 18 | 3,989,239 | 3,161,766 | 827,473 | 62,074 | -63,993 | 126,067 | 15 |
| 19 | 3,893,751 | 3,081,264 | 812,487 | 43,619 | -80,502 | 124,121 | 15 |
| 20 | 3,782,924 | 2,988,062 | 794,862 | 28,671 | -93,202 | 121,873 | 15 |
| 21 | 3,631,717 | 2,891,372 | 740,345 | 22,539 | -96,690 | 119,229 | 15 |
| 22 | 3,475,006 | 2,795,244 | 679,762 | 14,924 | -96,128 | 111,052 | 15 |
| 23 | 3,314,240 | 2,701,612 | 612,628 | 8,333 | -93,632 | 101,964 | 15 |
| 24 | 3,150,727 | 2,611,574 | 539,153 | 1,856 | -90,038 | 91,894 | 15 |
| 25 | 2,985,681 | 2,526,214 | 459,467 | -4,487 | -85,360 | 80,873 | 15 |
| 26 | 2,820,122 | 2,445,229 | 374,893 | -12,065 | -80,985 | 68,920 | 15 |
| 27 | 2,649,806 | 2,369,389 | 280,417 | -19,607 | -75,840 | 56,234 | 15 |
| 28 | 2,481,854 | 2,298,837 | 183,017 | -28,489 | -70,552 | 42,063 | 15 |
| 29 | 2,316,845 | 2,234,071 | 82,773 | -37,313 | -64,766 | 27,453 | 15 |
| 30 | 0 | 0 | 0 | -2,221,651 | -2,234,071 | 12,420 | 15 |

Dividends are 100% of original.
Required Assets are 105% of Statutory Reserves.

TABLE 3

15% Internal Rate of Return Model
Net Income For Selected Methods (thousands)

| YEAR | LEVEL % OF PREM. | COMPOSITE | FULL RELEASE | SOURCE OF EARNINGS | STATUTORY | RETURN ON EQUITY |
|------|------|------|------|------|------|------|
| 1 | 136 | 111 | 85 | 141 | -492 | 89 |
| 2 | 131 | 112 | 92 | 131 | -71 | 102 |
| 3 | 139 | 125 | 110 | 138 | 66 | 118 |
| 4 | 145 | 134 | 122 | 143 | 118 | 129 |
| 5 | 145 | 136 | 128 | 143 | 129 | 133 |
| 6 | 145 | 138 | 131 | 142 | 100 | 135 |
| 7 | 148 | 143 | 138 | 145 | 137 | 142 |
| 8 | 148 | 144 | 140 | 144 | 119 | 144 |
| 9 | 150 | 148 | 145 | 147 | 133 | 149 |
| 10 | 151 | 150 | 148 | 146 | 145 | 152 |
| 11 | 151 | 150 | 149 | 146 | 181 | 154 |
| 12 | 146 | 146 | 147 | 143 | 187 | 150 |
| 13 | 140 | 141 | 142 | 137 | 171 | 145 |
| 14 | 136 | 138 | 140 | 133 | 172 | 141 |
| 15 | 131 | 133 | 136 | 129 | 155 | 136 |
| 16 | 127 | 130 | 133 | 125 | 156 | 133 |
| 17 | 122 | 126 | 130 | 120 | 152 | 130 |
| 18 | 118 | 122 | 127 | 117 | 137 | 126 |
| 19 | 115 | 120 | 125 | 114 | 136 | 124 |
| 20 | 111 | 117 | 122 | 110 | 136 | 122 |
| 21 | 107 | 113 | 119 | 109 | 169 | 119 |
| 22 | 99 | 105 | 112 | 102 | 167 | 111 |
| 23 | 90 | 97 | 103 | 94 | 164 | 102 |
| 24 | 81 | 88 | 94 | 85 | 161 | 92 |
| 25 | 71 | 78 | 85 | 76 | 156 | 81 |
| 26 | 60 | 67 | 75 | 65 | 149 | 69 |
| 27 | 49 | 56 | 64 | 55 | 146 | 56 |
| 28 | 37 | 45 | 53 | 43 | 135 | 42 |
| 29 | 25 | 33 | 41 | 31 | 123 | 27 |
| 30 | 12 | 21 | 30 | 13 | 28 | 12 |

Dividends are 100% of original.
Full Release from Risk percentage is 7.3088%.
Required Assets are 105% of Statutory Reserves.

TABLE 4

15% Internal Rate of Return Model
GAAP Ratios of NI to ROE NI (100 ratio)

| YEAR | LEVEL % OF PREM. | COMPOSITE | FULL RELEASE | SOURCE OF EARNINGS | STATUTORY | RETURN ON EQUITY |
|---|---|---|---|---|---|---|
| 1 | 153.0% | 124.4% | 95.3% | 158.3% | -552.4% | 100.0% |
| 2 | 128.4 | 109.2 | 89.9 | 128.4 | -69.8 | 100.0 |
| 3 | 118.4 | 106.0 | 93.4 | 117.3 | 56.2 | 100.0 |
| 4 | 112.4 | 103.7 | 94.9 | 111.3 | 92.0 | 100.0 |
| 5 | 109.3 | 102.8 | 96.1 | 107.7 | 97.3 | 100.0 |
| 6 | 107.1 | 102.1 | 97.1 | 104.8 | 73.9 | 100.0 |
| 7 | 104.3 | 100.6 | 96.9 | 101.9 | 96.6 | 100.0 |
| 8 | 102.7 | 100.1 | 97.5 | 100.2 | 82.3 | 100.0 |
| 9 | 100.8 | 99.1 | 97.4 | 98.4 | 89.6 | 100.0 |
| 10 | 99.2 | 98.3 | 97.4 | 95.7 | 95.4 | 100.0 |
| 11 | 97.9 | 97.5 | 97.0 | 94.9 | 117.7 | 100.0 |
| 12 | 97.3 | 97.4 | 97.6 | 95.1 | 124.8 | 100.0 |
| 13 | 97.0 | 97.6 | 98.3 | 94.9 | 118.3 | 100.0 |
| 14 | 96.4 | 97.6 | 99.0 | 94.6 | 121.9 | 100.0 |
| 15 | 95.8 | 97.7 | 99.6 | 94.7 | 114.0 | 100.0 |
| 16 | 95.1 | 97.5 | 99.9 | 94.0 | 117.2 | 100.0 |
| 17 | 95.3 | 97.3 | 100.3 | 92.7 | 117.4 | 100.0 |
| 18 | 93.6 | 97.0 | 100.6 | 92.5 | 108.5 | 100.0 |
| 19 | 92.5 | 96.5 | 100.5 | 91.6 | 109.8 | 100.0 |
| 20 | 91.3 | 95.9 | 100.5 | 90.3 | 111.8 | 100.0 |
| 21 | 90.1 | 95.0 | 100.0 | 91.7 | 142.0 | 100.0 |
| 22 | 89.4 | 94.9 | 100.5 | 91.7 | 150.4 | 100.0 |
| 23 | 88.6 | 95.0 | 101.4 | 91.9 | 161.3 | 100.0 |
| 24 | 88.0 | 95.3 | 102.8 | 92.2 | 174.8 | 100.0 |
| 25 | 87.4 | 96.1 | 104.9 | 93.5 | 192.6 | 100.0 |
| 26 | 86.9 | 97.6 | 108.4 | 94.7 | 215.7 | 100.0 |
| 27 | 86.7 | 100.4 | 114.2 | 97.4 | 259.2 | 100.0 |
| 28 | 87.2 | 106.3 | 125.5 | 101.8 | 319.9 | 100.0 |
| 29 | 89.3 | 119.8 | 150.6 | 112.9 | 447.7 | 100.0 |
| 30 | 99.4 | 169.5 | 240.2 | 104.9 | 223.1 | 100.0 |

Dividends are 100% of original.
Full Release from Risk percentage is 7.3088%.
Required Assets are 105% of Statutory Reserves.

## TABLE 5

### 15% Internal Rate of Return Model
### Returns on Equity

| YEAR | LEVEL % OF PREM. | COMPOSITE | FULL RELEASE | SOURCE OF EARNINGS | STATUTORY | RETURN ON EQUITY |
|------|------|------|------|------|------|------|
| 1 | 23.0% | 18.7% | 14.3% | 23.7% | -82.9% | 15.0% |
| 2 | 18.0 | 15.9 | 13.6 | 17.9 | -70.2 | 15.0 |
| 3 | 16.2 | 15.3 | 14.3 | 16.0 | 218.2 | 15.0 |
| 4 | 15.1 | 14.9 | 14.6 | 14.9 | 227.2 | 15.0 |
| 5 | 14.5 | 14.7 | 14.9 | 14.3 | 189.9 | 15.0 |
| 6 | 14.1 | 14.6 | 15.1 | 13.8 | 123.4 | 15.0 |
| 7 | 13.7 | 14.3 | 15.2 | 13.4 | 149.7 | 15.0 |
| 8 | 13.4 | 14.3 | 15.3 | 13.2 | 118.3 | 15.0 |
| 9 | 13.2 | 14.2 | 15.3 | 13.0 | 124.0 | 15.0 |
| 10 | 13.0 | 14.1 | 15.4 | 12.7 | 128.3 | 15.0 |
| 11 | 12.9 | 14.0 | 15.4 | 12.7 | 154.2 | 15.0 |
| 12 | 12.8 | 14.0 | 15.5 | 12.8 | 156.0 | 15.0 |
| 13 | 12.7 | 14.1 | 15.8 | 12.8 | 140.9 | 15.0 |
| 14 | 12.7 | 14.1 | 15.9 | 12.8 | 140.3 | 15.0 |
| 15 | 12.6 | 14.2 | 16.1 | 12.9 | 127.1 | 15.0 |
| 16 | 12.5 | 14.2 | 16.2 | 12.8 | 128.3 | 15.0 |
| 17 | 12.5 | 14.2 | 16.3 | 12.7 | 126.4 | 15.0 |
| 18 | 12.4 | 14.2 | 16.4 | 12.8 | 115.5 | 15.0 |
| 19 | 12.4 | 14.2 | 16.4 | 12.8 | 117.3 | 15.0 |
| 20 | 12.3 | 14.1 | 16.4 | 12.7 | 120.2 | 15.0 |
| 21 | 12.3 | 14.1 | 16.3 | 13.1 | 153.7 | 15.0 |
| 22 | 12.3 | 14.2 | 16.5 | 13.2 | 157.9 | 15.0 |
| 23 | 12.3 | 14.3 | 16.8 | 13.4 | 162.4 | 15.0 |
| 24 | 12.3 | 14.5 | 17.2 | 13.6 | 166.4 | 15.0 |
| 25 | 12.3 | 14.7 | 17.7 | 13.9 | 169.7 | 15.0 |
| 26 | 12.4 | 15.2 | 18.5 | 14.2 | 171.0 | 15.0 |
| 27 | 12.5 | 15.8 | 19.8 | 14.7 | 177.4 | 15.0 |
| 28 | 12.7 | 17.0 | 22.2 | 15.5 | 174.4 | 15.0 |
| 29 | 13.2 | 19.5 | 27.3 | 17.3 | 170.0 | 15.0 |
| 30 | 14.9 | 28.4 | 45.7 | 15.9 | 41.1 | 15.0 |

Dividends are 100% of original.
Full Release from Risk percentage is 7.3088%.
Required Assets are 105% of Statutory Reserves.

Returns on Equity
15% growth in years 1 to 50

## TABLE 6

| YEAR | LEVEL % OF PREM | COMPOSITE | FULL RELEASE | SOURCE OF EARNINGS | STATUTORY | RETURN ON EQUITY |
|---|---|---|---|---|---|---|
| 1 | 23.0 | 18.7 | 14.3 | 23.7 | -82.9 | 15.0 |
| 2 | 20.4 | 17.3 | 13.9 | 20.7 | -81.2 | 15.0 |
| 3 | 18.9 | 16.6 | 14.0 | 19.1 | -71.5 | 15.0 |
| 4 | 18.0 | 16.2 | 14.2 | 18.0 | -57.6 | 15.0 |
| 5 | 17.3 | 15.9 | 14.3 | 17.3 | -45.3 | 15.0 |
| 6 | 16.9 | 15.7 | 14.4 | 16.8 | -37.0 | 15.0 |
| 7 | 16.5 | 15.6 | 14.5 | 16.4 | -28.4 | 15.0 |
| 8 | 16.2 | 15.5 | 14.6 | 16.1 | -22.2 | 15.0 |
| 9 | 16.0 | 15.4 | 14.6 | 15.9 | -16.7 | 15.0 |
| 10 | 15.8 | 15.3 | 14.7 | 15.7 | -11.8 | 15.0 |
| 11 | 15.6 | 15.2 | 14.7 | 15.5 | -7.0 | 15.0 |
| 12 | 15.5 | 15.2 | 14.7 | 15.4 | -2.8 | 15.0 |
| 13 | 15.4 | 15.1 | 14.8 | 15.3 | 0.3 | 15.0 |
| 14 | 15.3 | 15.1 | 14.8 | 15.3 | 3.0 | 15.0 |
| 15 | 15.3 | 15.1 | 14.8 | 15.2 | 4.9 | 15.0 |
| 16 | 15.2 | 15.1 | 14.9 | 15.2 | 6.6 | 15.0 |
| 17 | 15.2 | 15.0 | 14.9 | 15.1 | 8.0 | 15.0 |
| 18 | 15.1 | 15.0 | 14.9 | 15.1 | 9.1 | 15.0 |
| 19 | 15.1 | 15.0 | 14.9 | 15.1 | 10.0 | 15.0 |
| 20 | 15.1 | 15.0 | 14.9 | 15.0 | 10.8 | 15.0 |
| 21 | 15.1 | 15.0 | 14.9 | 15.0 | 11.6 | 15.0 |
| 22 | 15.1 | 15.0 | 14.9 | 15.0 | 12.3 | 15.0 |
| 23 | 15.0 | 15.0 | 15.0 | 15.0 | 12.9 | 15.0 |
| 24 | 15.0 | 15.0 | 15.0 | 15.0 | 13.4 | 15.0 |
| 25 | 15.0 | 15.0 | 15.0 | 15.0 | 13.9 | 15.0 |
| 26 | 15.0 | 15.0 | 15.0 | 15.0 | 14.2 | 15.0 |
| 27 | 15.0 | 15.0 | 15.0 | 15.0 | 14.5 | 15.0 |
| 28 | 15.0 | 15.0 | 15.0 | 15.0 | 14.8 | 15.0 |
| 29 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 30 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 31 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 32 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 33 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 34 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 35 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 36 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 37 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 38 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 39 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 40 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 41 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 42 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 43 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 44 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 45 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 46 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 47 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 48 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 49 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| 50 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |

Dividends are 100% of original.
Full Release from Risk percentage is 7.3088%.
Required Assets are 105% of Statutory Reserves.

## TABLE 7
Returns on Equity
15% growth in years 1 to 30 , 30% growth in years 31 to 50

| YEAR | LEVEL % OF PREM | COMPOSITE | FULL RELEASE | SOURCE OF EARNINGS | STATUTORY | RETURN ON EQUITY |
|---|---|---|---|---|---|---|
| 1 | 23.0 | 18.7 | 14.3 | 23.7 | -82.9 | 15.0 |
| 2 | 20.6 | 17.3 | 14.0 | 20.9 | -81.4 | 15.0 |
| 3 | 19.2 | 16.7 | 14.0 | 19.4 | -73.6 | 15.0 |
| 4 | 18.4 | 16.4 | 14.2 | 18.5 | -63.6 | 15.0 |
| 5 | 17.8 | 16.1 | 14.3 | 17.9 | -55.4 | 15.0 |
| 6 | 17.4 | 16.0 | 14.3 | 17.5 | -50.3 | 15.0 |
| 7 | 17.2 | 15.9 | 14.4 | 17.1 | -45.4 | 15.0 |
| 8 | 17.0 | 15.8 | 14.4 | 16.9 | -42.1 | 15.0 |
| 9 | 16.8 | 15.7 | 14.5 | 16.8 | -39.4 | 15.0 |
| 10 | 16.7 | 15.7 | 14.5 | 16.6 | -37.2 | 15.0 |
| 11 | 16.6 | 15.6 | 14.5 | 16.5 | -35.2 | 15.0 |
| 12 | 16.5 | 15.6 | 14.5 | 16.5 | -33.7 | 15.0 |
| 13 | 16.5 | 15.6 | 14.6 | 16.4 | -32.6 | 15.0 |
| 14 | 16.4 | 15.6 | 14.6 | 16.4 | -31.8 | 15.0 |
| 15 | 16.4 | 15.5 | 14.6 | 16.4 | -31.2 | 15.0 |
| 16 | 16.4 | 15.5 | 14.6 | 16.3 | -30.7 | 15.0 |
| 17 | 16.4 | 15.5 | 14.6 | 16.3 | -30.4 | 15.0 |
| 18 | 16.3 | 15.5 | 14.6 | 16.3 | -30.2 | 15.0 |
| 19 | 16.3 | 15.5 | 14.6 | 16.3 | -30.0 | 15.0 |
| 20 | 16.3 | 15.5 | 14.6 | 16.3 | -29.9 | 15.0 |
| 21 | 16.3 | 15.5 | 14.6 | 16.3 | -29.9 | 15.0 |
| 22 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 23 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 24 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 25 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 26 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 27 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 28 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 29 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 30 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 31 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 32 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 33 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 34 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 35 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 36 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 37 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 38 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 39 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 40 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 41 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 42 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 43 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 44 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 45 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 46 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 47 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 48 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 49 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |
| 50 | 16.3 | 15.5 | 14.6 | 16.3 | -29.8 | 15.0 |

Dividends are 100% of original.
Full Release from Risk percentage is 7.3088%.
Required Assets are 105% of Statutory Reserves.

## TABLE 8
Returns on Equity
15% growth in years 1 to 30 , 0% in years 31 to 50

| YEAR | LEVEL %<br>OF PREM | COMPOSITE | FULL<br>RELEASE | SOURCE OF<br>EARNINGS | STATUTORY | RETURN ON<br>EQUITY |
|------|------|------|------|------|------|------|
| 1 | 23.0 | 18.7 | 14.3 | 23.7 | -82.9 | 15.0 |
| 2 | 20.2 | 17.2 | 13.9 | 20.5 | -81.0 | 15.0 |
| 3 | 18.6 | 16.4 | 14.0 | 18.7 | -68.5 | 15.0 |
| 4 | 17.6 | 16.0 | 14.2 | 17.6 | -48.7 | 15.0 |
| 5 | 16.8 | 15.7 | 14.4 | 16.8 | -29.5 | 15.0 |
| 6 | 16.3 | 15.5 | 14.5 | 16.2 | -16.2 | 15.0 |
| 7 | 15.8 | 15.3 | 14.6 | 15.7 | -1.2 | 15.0 |
| 8 | 15.5 | 15.1 | 14.7 | 15.3 | 9.5 | 15.0 |
| 9 | 15.2 | 15.0 | 14.8 | 15.0 | 19.5 | 15.0 |
| 10 | 14.9 | 14.9 | 14.9 | 14.7 | 28.7 | 15.0 |
| 11 | 14.7 | 14.8 | 14.9 | 14.5 | 38.9 | 15.0 |
| 12 | 14.5 | 14.7 | 15.0 | 14.4 | 47.8 | 15.0 |
| 13 | 14.4 | 14.7 | 15.0 | 14.2 | 54.4 | 15.0 |
| 14 | 14.2 | 14.6 | 15.1 | 14.1 | 60.2 | 15.0 |
| 15 | 14.1 | 14.6 | 15.2 | 14.0 | 64.4 | 15.0 |
| 16 | 14.0 | 14.6 | 15.2 | 14.0 | 68.2 | 15.0 |
| 17 | 13.9 | 14.5 | 15.3 | 13.9 | 71.4 | 15.0 |
| 18 | 13.8 | 14.5 | 15.3 | 13.8 | 73.7 | 15.0 |
| 19 | 13.8 | 14.5 | 15.4 | 13.8 | 75.8 | 15.0 |
| 20 | 13.7 | 14.5 | 15.4 | 13.7 | 77.8 | 15.0 |
| 21 | 12.7 | 14.2 | 16.1 | 13.3 | 132.0 | 15.0 |
| 22 | 12.5 | 14.2 | 16.2 | 13.3 | 141.7 | 15.0 |
| 23 | 12.5 | 14.2 | 16.4 | 13.3 | 146.6 | 15.0 |
| 24 | 12.4 | 14.3 | 16.5 | 13.3 | 149.9 | 15.0 |
| 25 | 12.4 | 14.3 | 16.6 | 13.4 | 152.2 | 15.0 |
| 26 | 12.4 | 14.4 | 16.7 | 13.4 | 153.9 | 15.0 |
| 27 | 12.4 | 14.4 | 16.9 | 13.5 | 155.5 | 15.0 |
| 28 | 12.4 | 14.5 | 17.0 | 13.6 | 156.5 | 15.0 |
| 29 | 12.4 | 14.6 | 17.2 | 13.6 | 157.1 | 15.0 |
| 30 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 31 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 32 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 33 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 34 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 35 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 36 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 37 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 38 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 39 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 40 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 41 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 42 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 43 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 44 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 45 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 46 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 47 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 48 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 49 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |
| 50 | 12.5 | 14.7 | 17.3 | 13.6 | 153.3 | 15.0 |

Dividends are 100% of original.
Full Release from Risk percentage is 7.3088%.
Required Assets are 105% of Statutory Reserves. 1458

APPENDIX C


Formulae for GAAP Methods


Prepared for


The Subcommittee on GAAP Issues


of


The Society of Actuaries Task Force


on the Conversion of Mutual Insurance Companies*


by


Joseph L. Dunn


\*   The views expressed in this paper are solely those of the author and are
not necessarily those of the Committee or of the Society of Actuaries.

## Table of Contents

## Definitions in Common to All Methods

## Benefits Guaranteed by the Policy

$DB_t$ — The death benefit per unit for policy year t.

$End_t$ — The endowment benefit per unit payable at duration t.

$GP_t$ — The gross premium per unit payable at duration t.

$CV_t$ — The cash value per unit payable if withdrawal occurs at duration t.

## Dividend Scale Experience

$D_t$ — The annual dividend per unit payable at duration t.

$TD_t$ — The terminal dividend per unit payable during policy year t.

$i_t$ — The interest rate earned during policy year t.

$q_t$ — The death rate during policy year t. Deaths are assumed to occur at the end of the policy year.

$w_t$ — The withdrawal rate during policy year t. Withdrawals are assumed to occur at the end of the policy year.

$P_t$ — The probability of surviving to duration t.

$$P_t = 0 \qquad P_t = P_{t-1} \times (1 - q_{t-1}) \times (1 - w_{t-1})$$

$^d E_t$ — The deferrable acquisition expense per unit in force at duration t.

$^n E_t$ — The non-deferrable acquisition expense per unit in force at duration t.

$^m E_t$ — The maintenance expenses per unit in force at duration t.

$E_t$ — The total expense per unit in force at duration t.

$$E_t = {}^d E_t + {}^n E_t + {}^m E_t$$

$v^t$ — The discount rate for payments at duration t.

$$v^0 = 1$$

$$v^t = v^{t-1} / (1 + i_t)$$

## Cash Flow Formulae

$Ben_t$  The benefit cash flow attributable to policy year t payable at the end of the policy year per unit issued.

$$Ben_t = p_{t-1} \times q_t \times (DB_t + TD_t)$$
$$+ p_{t-1} \times (1 - q_t) \times w_t \times (CV_t + TD_t)$$
$$+ p_{t-1} \times (1 - q_t) \times End_t$$
$$+ p_{t-1} \times (1 - q_t) \times D_t \quad \text{for } t > 0.$$

$^dExp_t$  The deferrable acquisition expense payable at duration t per unit issued.

$$^dExp_t = p_t \times {}^dE_t$$

$^nExp_t$  The non-deferrable acquisition expense payable at duration t per unit issued.

$$^nExp_t = p_t \times {}^nE_t$$

$^mExp_t$  The maintenance expense payable at duration t per unit issued.

$$^mExp_t = p_t \times {}^mE_t$$

$Exp_t$  The total expenses payable at duration t per unit issued.

$$Exp_t = {}^dExp_t + {}^nExp_t + {}^mExp_t$$

$Prem_t$  The premium cash flow payable at duration t per unit issued.

$$Prem_t = p_t \times GP_t$$

$CF^+_t$  The total insurance cash flow attributable to the following policy year payable at duration t per unit issued.

$$CF^+_t = Prem_t - Exp_t$$

$CF^-_t$  The total insurance cash flow attributable to the just ended policy year payable at duration t per unit issued.

$$CF^-_t = -Ben_t$$

## Projected Profits and Return on Equity

$Assets_t$     The required assets at the end of policy year t per unit issued. For instance, this is set equal to 105% of the cash value in the work of the Committee.

$Prft_t$     The projected aggregate profit for policy year t.

$$Prft_t = Assets_{t-1} \times i_t$$
$$+ CF^+_{t-1} \times (1 + i_t)$$
$$+ CF^-_t$$
$$+ (p_{t-1} \times V^{Net}_{t-1}) - (p_t \times V^{Net}_t)$$

$Eqty_t$     The total required GAAP equity during policy year t.

$$Eqty_t = Assets_{t-1} - (p_{t-1} \times V^{Net}_{t-1})$$

$ROE_t$     The return on invested equity for policy year t.

$$ROE_t = Prft_t / Eqty_t$$

## Level Return on Invested Equity Method

$j$      The level return on GAAP equity. This rate is determined by the requirement that $pV_t$ determined by the formula below is zero for t past the maturity duration.

$pV_t$      The aggregate net terminal GAAP liability at duration t per unit issued.

$$pV_0 = 0$$

$$pV_t = pV_{t-1} \times (1 + i_t)$$

$$+ CF^+_{t-1} \times (1 + i_t)$$

$$+ CF^-_t$$

$$- (j - i_t) \times (Assets_t - pV_{t-1})$$

$V^{Net}_t$      The net terminal GAAP liability per unit inforce at duration t.

$$V^{Net}_t = pV_t / p_t$$

**Theorem**      If pV is given by the above formulae then

$$pV_{t-1} = Assets_{t-1} - \sum_s CapFlow_s / (1 + j)^{s-t+1}$$

where CapFlow is given by the following formula:

$$CapFlow_t = (Assets_{t-1} + CF^+_{t-1}) \times (1 + i_t)$$

$$+ CF^-_t$$

$$- Assets_t$$

Note:      As defined above this method does not distinguish between deferrable and non-deferrable acquisition expenses. If one substitutes $(CF^+_{t-1} + {}^n Exp_{t-1})$ for $CF^+_{t-1}$ in the above formula for $pV_t$ and solves for j and $V^{Net}_t$, then the nondeferrable acquisition expenses will not be capitalized.

## Level Percentage of Premium Method

$p^{Ben}$     The ratio of the present value of the benefit net premium to the present value of the gross premium.

$$p^{Ben} = \frac{\sum\limits_{t} Ben_t \times v^t}{\sum\limits_{t} GP_t \times v^t}$$

$p^{Def}$     The ratio of the present value of deferrable acquisition expenses to the present value of gross premium.

$$p^{Def} = \frac{\sum\limits_{t} {}^{d}Exp_t \times v^t}{\sum\limits_{t} GP_t \times v^t}$$

$p^{Main}$     The ratio of the present value of maintenance expenses to the present value of gross premium.

$$p^{Main} = \frac{\sum\limits_{t} {}^{m}Exp_t \times v^t}{\sum\limits_{t} GP_t \times v^t}$$

$v^{Ben}_t$     The terminal GAAP benefit reserve per unit inforce at duration t.

$$v^{Ben}_0 = 0$$

$$v^{Ben}_t = (p_{t-1} \times v^{Ben}_{t-1} \times (1 + i_t)$$

$$+ Prem_{t-1} \times p^{Ben} \times (1 + i_t)$$

$$- Ben_t) / p_t$$

$DAC_t$     The terminal GAAP deferred acquisition cost asset per unit inforce at duration t.

$$DAC_0 = 0$$

$$DAC_t = (p_{t-1} \times DAC_{t-1} \times (1 + i_t)$$

$$+ {}^{d}Exp_{t-1} \times (1 + i_t)$$

$$- Prem_{t-1} \times p^{Def} \times (1 + i_t)) / p_t$$

$V^{Main}_t$   The terminal GAAP maintenance expense reserve per unit inforce at duration t.

$$V^{Main}_0 = 0$$

$$V^{Main}_t = (p_{t-1} \times V^{Main}_{t-1} \times (1 + i_t)$$

$$+ \text{Prem}_{t-1} \times p^{Main} \times (1 + i_t)$$

$$- {}^m\text{Exp}_{t-1} \times (1 + i_t)) / p_t$$

$V^{Net}_t$   The net GAAP liability per unit inforce at duration t.

$$V^{Net}_t = V^{Ben}_t + V^{Main}_t - DAC_t$$

## Deposit Approach

### Version 1 - Amortize all Acquisition Expenses

$V^{Ben}_t$      The terminal benefit reserve per unit inforce at duration t.

$$V^{Ben}_t = CV_t + TD^W_t$$

Note: This version comes in two variations itself. In the first variation the cash value used in the above definition is the actual policy cash value, and in the other variation the cash value used is the formula derived value before any restriction that the cash value must be non-negative.

$Rev_t$      The revenue before any charge for acquisition expense.

$$Rev_t = p_{t-1} \times V^{Ben}_{t-1} \times (1 + i_t)$$

$$+ (Prem_{t-1} - {}^mExp_{t-1}) \times (1 + i_t)$$

$$- Ben_t$$

$$- p_t \times V^{Ben}_t$$

$p^{Def}$      The ratio of the present value of the deferrable acquisition expenses to the present value of revenue.

$$p^{Def} = \frac{\sum_t {}^dExp_t \times v^t}{\sum_t Rev_t \times v^t}$$

$DAC_t$      The terminal deferred acquisition cost asset per unit inforce a duration t.

$$DAC_0 = 0$$

$$DAC_t = (p_{t-1} \times DAC_{t-1} \times (1 + i_t)$$

$$+ {}^dExp_{t-1} \times (1 + i_t)$$

$$- Rev_t \times p^{Def}) / p_t$$

$V^{Net}_t$      The net GAAP liability per unit inforce at duration t.

$$V^{Net}_t = V^{Ben}_t - DAC_t$$

**Version 2 –** **Amortize Only Acquisition Expenses in Excess of the Cash Value Expense Allowance**

$V^{Ben}_t$    The terminal benefit reserve per unit inforce at duration t.

$$V^{Ben}_t = CV_t + TD_t$$

where the cash value used in this version must be the formula derived number before any restriction that the cash value be non-negative.

$E^{CV}_0$    The expense allowance used in the calculation of the cash value.

$Rev_t$    The revenue with the only charge for acquisition expense being the cash value expense allowance.

$$Rev_1 = (Prem_0 - {}^mExp_0 - E^{CV}_0) \times (1 + i_t)$$
$$- Ben_1$$
$$- p_1 \times V^{Ben}_1$$

$$Rev_t = p_{t-1} \times V^{Ben}_{t-1} \times (1 + i_t)$$
$$+ (Prem_{t-1} - {}^mExp_{t-1}) \times (1 + i_t)$$
$$- Ben_t$$
$$- p_t \times V^{Ben}_t$$

$_pDef$    The ratio of the present value of the excess deferrable acquisition expenses to the present value of revenue.

$$_pDef = \frac{-E^{CV}_0 + \sum_t {}^dExp_t \times v^t}{\sum_t Rev_t \times v^t}$$

$DAC_t$     The terminal deferred acquisition cost asset per unit inforce at duration t.

$$DAC_0 = 0$$

$$DAC_1 = ((^dExp_0 - E^{CV}_0) \times (1 + i_t)$$
$$- Rev_1 \times P^{Def}) / p_1$$

$$DAC_t = (p_{t-1} \times DAC_{t-1} \times (1 + i_t)$$
$$+ ^dExp_{t-1} \times (1 + i_t)$$
$$- Rev_t \times P^{Def}) / p_t$$

$V^{Net}_t$     The net GAAP liability per unit inforce at duration t.

$$V^{Net}_t = V^{Ben}_t - DAC_t$$

## Release from Risk Methods

### Generalized Release from Risk Model

$PC_t$      The explicit before-tax profit included in the reserve method for policy year t.

$V^{GAAP}_t$    The terminal GAAP reserve per unit inforce at duration t which is assumed to satisfy the following relation:

$$PC_t = (V^{GAAP}_{t-1} + P^{GAAP}_{t-1} - E^{GAAP}_{t-1}) \times (1 + i^{GAAP}_t)$$

$$- q^{GAAP}_t \times (DB_t + TD_t)$$

$$- w^{GAAP}_t \times (CV_t + TD_t) \times (1 - q^{GAAP}_t)$$

$$- D^{GAAP}_t \times (1 - q^{GAAP}_t)$$

$$- End_t \times (1 - q^{GAAP}_t)$$

$$- V^{GAAP}_t \times (1 - q^{GAAP}_t) \times (1 - w^{GAAP}_t)$$

$I_VGAAP_t$   The initial GAAP reserve consistent with $V^{GAAP}$ above.

$$I_VGAAP_t = V^{GAAP}_t + P^{GAAP}_t - E^{GAAP}_t$$

### Earning by Source

$Prft^0_t$    The profit resulting from the explicit profit charge.

$$Prft^0_t = p_{t-1} \times PC_t$$

$Prft^i_t$    The profit from interest for policy year t per unit of insurance issued.

$$Prft^i_t = p_{t-1} \times (i_t - i^{GAAP}_t) \times I_VGAAP_{t-1}$$

$Prft^q_t$    The profit from mortality for policy year t per unit of insurance issued.

$$Prft^q_t = p_{t-1} \times (q^{GAAP}_t - q_t)$$

$$\times ((DB_t + TD_t)$$

$$- D^{GAAP}_t - End_t$$

$$- w^{GAAP}_t \times (CV_t + TD_t)$$

$$- (1 - w^{GAAP}_t) \times V^{GAAP}_t)$$

$Prft^P_t$   The profit from premium for policy year t per unit of insurance issued.

$$Prft^P_t = p_{t-1} \times (GP_{t-1} - P^{GAAP}_{t-1}) \times (1 + i_t)$$

$Prft^E_t$   The profit from expenses for policy year t per unit of insurance issued.

$$Prft^E_t = p_{t-1} \times (E^{GAAP}_{t-1} - E_{t-1}) \times (1 + i_t)$$

$Prft^W_t$   The profit from withdrawals for policy year t per unit of insurance issued.

$$Prft^W_t = p_{t-1} \times (1 - q_t) \times (w^{GAAP}_t - w_t)$$
$$\times (CV_t + TD_t - V^{GAAP}_t)$$

$Prft^D_t$   The profit from dividends for policy year t per unit of insurance issued.

$$Prft^D_t = p_{t-1} \times (D^{GAAP}_t - D_t) \times (1 - q_t)$$

**Theorem** The total profit is given by the following formula:

$$Prft_t = (Eqty_t \times i_t) + Prft^0_t + Prft^i_t + Prft^q_t$$
$$+ Prft^P_t + Prft^E_t + Prft^W_t + Prft^D_t$$

## Present Values

$Prft^0$   The present value of the explicit profit charges per unit issued.

$$Prft^0 = \sum_t Prft^0_t \times v^t$$

The definitions of $Prft^i$, $Prft^q$, $Prft^P$, $Prft^E$, $Prft^W$, and $Prft^D$ are similar.

**Methods Without a Separate DAC -- Three factor version**

$V^{Net}_t$     The terminal net GAAP liability per unit inforce at duration t. This reserve will be identified with $V^{GAAP}_t$ in the above formula for earnings by source.

di     The difference between $i_t$ and $i^{GAAP}_t$. Thus

$$i^{GAAP}_t = i_t - di$$

kq     The ratio of $q^{GAAP}_t$ to $q_t$.

$$q^{GAAP}_t = kq \times q_t$$

$p^{Net}$     The ratio of $p^{GAAP}_t$ to $GP_t$

$$p^{GAAP}_t = p^{Net} \times GP_t$$

The remaining GAAP assumptions are defined as follows:

$$PC_t \quad = 0$$

$$w^{GAAP}_t = w_t$$

$$E^{GAAP}_t = E_t$$

$$D^{GAAP}_t = D_t$$

di, kq, and $p^{Net}$ are determined so as to yield the desired values $Prft^1$, $Prft^q$, and $Prft^P$.


Note:     The above procedure does not distinguish between deferrable and non-deferrable acquisition expenses. If one uses $(E_t - {}^n E_t)$ in place of $E_t$ in the above formulae then the nondeferrable acquisition expenses will not be capitalized.

## Methods With a Separate DAC -- Three Factor Version

$V^{GAAP}_t$  The terminal benefit and maintenance expense reserve per unit inforce at duration t.

di    The difference between $i_t$ and $i^{GAAP}_t$. Thus

$$i^{GAAP}_t = i_t - di$$

kq    The ratio of $q^{GAAP}_t$ to $q_t$.

$$q^{GAAP}_t = kq \times q_t$$

$P^{Ben}$    The ratio of $P^{GAAP}_t$ to $GP_t$.

$$P^{GAAP}_t = P^{Ben} \times GP_t$$

The remaining GAAP assumptions are defined as follows:

$$PC_t = 0$$

$$W^{GAAP}_t = W_t$$

$$E^{GAAP}_t = {}^m E_t$$

$$D^{GAAP}_t = D_t$$

di, kq, and $P^{Ben}$ are determined so as to yield the desired values $Prft^i$, $Prft^q$, and $Prft^P$.

$Rev_t$    The revenue before any charge for acquisition expenses for policy year t per unit issued.

$$Rev_t = Prft^i_t + Prft^q_t + Prft^P_t$$

$P^{Def}$    The ratio of the present value of the deferrable acquisition expense to the present value of revenue.

$$P^{Def} = \frac{\sum_t {}^d Exp_t \times v^t}{\sum_t Rev_t \times v^t}$$

$DAC_t$    The terminal deferred acquisition cost asset per unit inforce at duration t.

$$DAC_0 = 0$$

$$DAC_t = (p_{t-1} \times DAC_{t-1} \times (1 + i_t)$$

$$- Rev_t \times p^{Exp}$$

$$+ {}^d Exp_{t-1} \times (1 + i_t)) / p_t$$

$V^{Net}{}_t$    The net GAAP liability per unit inforce at duration t.

$$V^{Net}{}_t = V^{GAAP}{}_t - DAC_t$$

**Methods with a Separate DAC -- Equitable's Source of Earnings Approach**

$V^{Ben}_t$    The terminal benefit reserve per unit inforce at duration t. Under Equitable's approach this reserve is defined as the net level premium reserve calculated using the interest rates and mortality rates guaranteed in the policy. Thus if $V^{Ben}_t$ is identified with $V^{GAAP}_t$ in the above earnings by source formulae we must have the following:

$$i^{GAAP}_t = i^{guar}_t$$

$$q^{GAAP}_t = q^{guar}_t$$

$$P^{GAAP}_t = \text{net level premium based on } i^{guar}_t \text{ and } q^{guar}_t.$$

$$PC_t = 0$$

$$w^{GAAP}_t = 0$$

$$E^{GAAP}_t = 0$$

$$D^{GAAP}_t = 0$$

$Rev_t$    The revenue before any charge for acquisition expense for policy year t per unit issued.

$$Rev_t = Prft^i_t + Prft^q_t + Prft^P_t + Prft^W_t + Prft^D_t$$
$$- {}^mE_{t-1} \times (1 + i_t)$$

$P^{Exp}$    The ratio of the present value of the deferrable acquisition expense to the present value of revenue.

$$P^{Exp} = \frac{\sum_t {}^dExp_t \times v^t}{\sum_t Rev_t \times v^t}$$

$DAC_t$      The terminal deferred acquisition cost asset per unit inforce at duration t.

$$DAC_0 = 0$$

$$DAC_t = (p_{t-1} \times DAC_{t-1} \times (1 + i_t)$$
$$- Rev_t \times p^{Exp}$$
$$+ {}^d Exp_{t-1} \times (1 + i_t)) / p_t$$

$V^{Net}_t$      The net GAAP liability per unit inforce at duration t.

$$V^{Net}_t = V^{Ben}_t - DAC_t$$

Note:      The unmodified version of the Source of Earnings approach produces substantial revenue in the first year. Therefore two modifications have been proposed. One under which the gains on withdrawal are eliminated from revenue in the first year, and a second under which an approximation to a first year dividend is used to reduce revenue in the first year.

## Dividend Fund Method

$F_t$      The target dividend fund per unit inforce at duration t.

$PC_t$      The profit charge deducted at duration t from the annual dividend.

$D_t$      The annual dividend per unit inforce for policy year t.

$$
\begin{aligned}
D_t = \ & (F_{t-1} \times (1 + i_t) \\
& + GP_{t-1} \times (1 + i_t) \\
& - q_t \times (DB_t + TD_t) \\
& - E_{t-1} \times (1 + i_t) \\
& - w_t \times (CV_t + TD_t) \times (1 - q_t) \\
& - End_t \times (1 - q_t) \\
& - PC_t \\
& - F_t \times (1 - q_t) \times (1 - w_t)) \ / \ (i - q_t)
\end{aligned}
$$

$V^{Net}_t$      The terminal net GAAP liability per unit inforce at duration t.

$$V^{Net}_t = F_t$$

**Theorem**      Under the above definitions for $D_t$ and $V^{Net}_t$ the profit for policy year t obeys the following equation.

$$Prft_t = (Eqty_t \times i_t) + (p_{t-1} \times PC_t)$$

**Theorem**  (The Metropolitan Fund System - almost).  Assume that $TD_t$ obeys the following equation:

$$F_t \quad = \quad TD_t + CV_t$$

and that the dividend is defined as above, then the dividend is independent of the withdrawal rate:

$$
\begin{aligned}
D_t \quad = \quad & (F_{t-1} \times (1 + i_t) \\
& + GP_{t-1} \times (1 + i_t) \\
& - q_t \times (DB_t + TD_t - F_t) \\
& - E_{t-1} \times (1 + i_t) \\
& - End_t \times (1 - q_t) \\
& - PC_t \\
& - F_t) \, / \, (1 - q_t)
\end{aligned}
$$