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Fair Value Accounting

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Moderator: ROBERT M. BEUERLEIN
Panelists: LUKE N. GIRARD
              DOUGLAS W. JOHNSON†
              GEORGE E. SILOS
Recorder: KEVIN WILLIAM ROPER

Summary: With the adoption of Statement of Accounting Standard No. 115, the fair valuation for certain classes of assets in GAAP financial statements was required. Given the one-sided nature of this statement, an on-going concern has been the question of the fair value of liabilities.

Mr. Robert M. Beuerlein: Our all star panel includes Doug Johnson who is a partner with Ernst & Young. He's not an actuary, but he's an accountant, so he'll have a great deal to contribute. He is going to be giving us a FASB update of what's going on these days with regard to fair value accounting. We also have George Silos from New York Life. To end the presentation, Luke Girard from Lincoln Investment Management, Inc., will talk to us about the valuation of insurance liabilities.

Mr. Douglas W. Johnson: Actually, my topic is very simple. The reason it's simple is that not a whole lot has happened since *FAS 115* was put into effect on January 1, 1994. I'm going to cover a few of the items that have occurred, and then I'll discuss a new exposure draft on hedge accounting and derivatives. Again, I don't want to claim I'm an expert on that because I'm not, but we'll touch a little bit on that and see how that impacts on *FAS 115.* I want to spend just a little bit of time revisiting

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history. I want to do this for a particular reason, and I'm going to tell you the punch line before I get to it. One of the things you'll see is that the whole issue of market-value accounting is a bank issue, not an insurance company issue. However, the insurance industry is clearly caught up in it.

It started with some serious discussion back in 1974 when the American Institute of Certified Public Accounts (AICPA) pushed to have market-value accounting for banks on their financial assets. The reason for that was, as you may remember, in 1974 a large number of the banks were under water in their portfolios and there were a large number of problems. The conclusion was that the best way to resolve it would be to have fair value accounting for certain financial assets. The chairperson of the Federal Reserve was adamantly opposed to that. Basically the chairperson said it would cause violent swings in equity, and would be the demise of the banking industry. He effectively quashed it, and it stayed down until about 1987 when it was resurrected again by the AICPA, again driven by banks and the issue that bank portfolios were under water.

The pressure in 1987 ultimately resulted in *FAS 105* which came out in 1990. *FAS 105* was now geared toward financial institutions which happened to include insurance companies. It was a disclosure issue, but the idea was to at least disclose in a company's financial statements, the market value and cost basis of financial assets, and various exposures that could arise. It also broadened a number of other disclosures that have ultimately continued to be there.

In 1990, the real pressure came from the Securities and Exchange Commission (SEC). The SEC actually called for market-value accounting for financial assets for banks. They wanted that done, pushed, and completed. That pressure caused the AICPA to issue a Standard of Practice (SOP) called *SOP 90-11*. Again, it expanded much of the disclosures relating to financial instruments and it was primarily related to banks, insurance companies, and other financial institutions. The FASB also got in the act at that point in time and developed *FAS 107* which was a much broader disclosure. The other thing which was occurring in the FASB, and still continues to occur in the FASB, is a belief that all companies should have the same set of rules and the same set of financial statements. They shouldn't look any different. *FAS 107*, even though it really started with the a banking inference, was brought into other financial institutions. It was applicable to all companies, no matter what industry the company happened to be in. Now, clearly, most of the financial assets and items that you could estimate fair value on were issues relating to banks and insurance companies, not manufacturers and others. But, it is applicable to everybody.

At the same time, the FASB agreed to put the market-value accounting issue on their agenda; which they did. That resulted in what we're talking about, *FAS 115.* It came out in 1993 and became effective January 1, 1994. So, the point I wanted to make is that all of this started with the banking industry. The insurance industry became caught up in it for a variety of reasons.

Now, what's new? The key is nothing significant. There really has not been a lot of significant activity at the FASB over the last couple of years. The FASB, and this is an accountant speaking, of course, is totally stumped with how to mark liabilities to market. You, as actuaries, have all kinds of good solutions for that. The accountants do not. As you will also see in a couple of comments I'll make on the exposure draft on hedge derivative accounting, that thought process also pervades into that exposure draft as well. FASB cannot figure out how to do it. As far as they are concerned, they don't know any reasonable solution.

The other thing that's come out over the last several years is that the held-to-maturity classification is strictly adhered to. That was part of the issue of the open window last year to allow companies to make a one time shift from held-to-maturity into available for sale. The reason was that most people thought, perhaps, there would be a window, or at least some flexibility in the held-to-maturity securities that were sold. That did not meet the very strict guidelines and criteria. If any of those securities are sold, even one, it can possibly taint your entire held-to-maturity portfolio. That came through very clearly. The other thing that has come through, and again, this is in the exposure draft on hedge accounting, but the FASB believes that fair-value accounting is the best accounting approach for financial assets. That is a belief they hold, whether we agree with it or don't agree with it.

The last item I have relates to comprehensive income. That is another new item that is getting a lot of play, and will through the next several years. It is nothing more than once you mark everything to fair value in the financial statements and then you take the changes from year to year like we do right now with *FAS 115*, those changes go directly to equity. The difference is, comprehensive income is a euphemism for equity. The change would show up on the face of your income statement. It would be like an above the line, below the line kind of issue. If you're a public company you would also see earnings per share calculated on a comprehensive income basis.

I want to share with you just a couple of thoughts because I thought you would probably enjoy this. Ernst & Young did a survey of financial statement users on *FAS 115*, basically trying to understand if this thing is useful to you or not useful. I have to explain what the questions are. The first question is: In your opinion has *FAS 115* improved financial reporting? Optional responses were Strongly Agree, Agree,

Disagree, Strongly Disagree, and No Opinion. The answer to this question was that nobody strongly agreed. There were about 33% who agreed, and then 67% that say they didn't really agree. The responses went all the way from Disagree to Strongly Disagree to No Opinion. This is not too surprising.

The second question was: Do the changes in equity caused by fluctuations and fair values of debt securities due to interest rates, provide a meaningful view of the company's financial position? I think we all argued prior to *FAS 115* coming out, that it did not. Again, 33% agree, nobody strongly agrees, and 67% disagree. This time it's a little bit more skewed toward the Strongly Disagree. Again, let me go back and say these were not insurance companies we polled here. These were users. These were broker dealers, investment bankers, security analysts, and rating agencies, not the insurance industry. There were some other questions that I chose not to list. I thought, actually, there were a number of them that were most interesting, but I thought that you would find a large number of these somewhere in the right direction. I think, unless I miss my guess completely, this audience probably completely agrees with these comments.

Almost every single one of the respondents, when they wrote in, said that you can't put assets to market without putting liability to market. I'm sure that's not news to you. I liked a response which said this was as currently structured, an accounting stupidity. But anyway, the bottom line on the survey was that the users of financial statements also recognized the limited information in using *FAS 115.* Most of them tend to take those adjustments out when they analyze financial statements. So, they're back to square one. Most of them also would prefer those items as disclosure items, not items to be actually in the balance sheet or income statement.

There are only three issues that have surfaced since this came out in 1994. The first is backward tracing. This is a deferred-tax issue. It comes not from *FAS 115* but from what is in *FAS 109* on deferred taxes. All it's really saying is that if you have an unrealized loss in your portfolio and you set up a deferred tax asset to offset that unrealized loss, the reverse of the deferred liability on the unrealized gain, you may decide to put a valuation allowance against it. Often times this happens because under accounting you can recognize losses but not gains.

When you go the other way, you have deferred tax assets and your question is, can you realize it if you don't have some capital loss carry backs? You may not be able to use it. Most companies put up 100% valuation allowance on that. When they do that and if you come up a year later and you change that valuation allowance because you believe you have capitalized gains to offset that against, that's a change in judgment. That change will run through your income statement, regardless of the fact that it really got there originally directly through equity. If the change is simply

due to the change in market values or securities, then you're OK. It will go back through equity.

For foreign denominated investments, the only new issue is that you don't have to try to split out between what's a foreign currency exchange gain or loss and what's a security gain or loss. You can just lump them all together, security gains or losses.

Desecuritizations is saying that if you do go through a desecuritization and if your securitized asset was a held to maturity asset, it is not a sale. Therefore it does not taint your held-to-maturity portfolio.

Let's talk about derivative-hedge accounting. One thing that you should be aware of is that there really is no direct effect on *FAS 115* related to derivative hedge accounting. So, my comments, will be brief because I don't know a lot about it. There are some major changes, and that's really what I want to point out to you. All derivatives will be put at fair value whether they're on balance sheet or off balance sheet. They will be placed on the balance sheet. The change in the fair value from year to year will go through either the income statement as we know it, or through comprehensive income, which as I said is a euphemism for equity at this point. There will be no deferral of gains or losses on derivatives going forward.

There will end up being four categories that a derivative will fall into. It's either a hedge or not a hedge. If it's a hedge there are three possibilities. It may be a fair-value hedge and that's going to be a hedge of the fair value of existing assets, liabilities, or firm commitments. It is a cash-flow hedge if it's a forecast of transactions. A lot of interest rate swaps will fall into that category. The last category is a foreign currency hedge. That's the clearest one. There are all of the derivatives. You'll see why that makes a difference in a minute.

If it is a fair-value hedge, the change in the fair values from year to year will go into the regular income space. You will be able to offset that by the change in the hedged asset or liability to the extent that it matches or to the extent that it doesn't match. If it's too short, the differential will just fall through income. If it's more, let's say if it's a *FAS 115* available for sale asset, then that difference would go into equity as it normally would have. But, it will be the same effect as it is now, which is true as long as your hedged asset or liability moves in the opposite direction and moves in equal amounts. Cash flow hedges will be taken into comprehensive income, or in other words, directly to equity. The changes in those will go directly to equity until the date that the expected transaction was to take place. At that date, the entire amount goes into income, period. The last category is derivatives that don't qualify, including derivatives that are used to hedge a held-to-maturity security

and they are derivatives that would hedge an insurance liability that is defined by *FAS 60, FAS 97*, and *FAS 113.*

There are some other ways the asset managers can figure out how to hedge something different to get the same result. If you're currently hedging the held-to-maturity security for interest rate risks, you're going to have to figure out how to hedge the liability side of the balance sheet. Presuming that it's a guaranteed investment contract (GIC) or some financial liability that is not an insurance liability, you'll be able to get hedge accounting. Otherwise, when derivatives fall into this category, the fair value changes in those derivatives hit your income statement.

I think you'll see a derivative final statement in 1997. That's what FASB is intending to do. They are on track regardless of the objections, and there are a lot of objections to the exposure draft. I believe they will get one out in 1997. You'll see FASB continuing to move forward on the belief that fair-value accounting is best for financial assets/liabilities. I think you'll also see more on this comprehensive income proposal. That, in effect, will mean whether it goes through equity or not, it will show up on, what we will call, the face of your income statement. The last item I think you'll see continues complexity. I don't believe there is any let up in the amount of complexity that we'll see over the next number of years in this whole area.

Mr. George E. Silos: I will discuss how the current GAAP framework might impact any possible fair-value accounting methodology. I will then give a very brief overview of some of these methods, including graphical examples of how some of these proposed fair-value accounting methods will impact GAAP equity and the contribution to GAAP equity. *FAS 115* accounting, for certain debt, and equity securities, was issued in May 1993. The definition of debt securities includes treasury securities, corporate bonds, and collateralized mortgage obligation (CMOs). It excludes assets such as commercial real estate loans and policy loans, unless these assets have been securitized.

There are three categories of debt securities: held-to-maturity security, trading securities, and available for sale securities. *FAS 115* includes the definition of held-to-maturity securities and trading securities. Available for sale securities is the catch-all for anything that is not in the held for maturity or trading category. The held-to-maturity category is restricted. Only securities where there is a positive intent and ability to hold these securities to maturity can be classified as held to maturity. These securities are held at amortized costs, there are no unrealized holding gains or losses that develop on them.

The next category is the trading securities. These securities are held principally for the purpose of selling them in the near term. Unrealized holding gains and losses develop on the trading securities and they are reflected directly in earnings.

The available for sale category is the catch-all for everything that is not either held to maturity or trading. Unrealized holding gains or losses develop on these securities, but they are not reflected on earnings, instead they go below the line in a separate component of shareholders equity. When classifying a security there is often a two step process to determine if the security is held to maturity or not. If it's not a held to maturity, the security is in the available for sale of trading category. Any security that might be sold due to changes in market interest rates, pre-payment risks, or liquidity needs cannot be in the held to maturity category. Even the available for sale category is a little restricted.

Spreads and prices of recently issued securities can be quite volatile in the days and weeks right after a security is issued. A trader who has purchased a recently issued security may be tempted, sometimes with good reason, to sell if that trader was not able to purchase the desired volume that the trader wanted, or if the spreads have changed significantly in the days or weeks since the security was issued. If the trader buys, and then quickly sells one of these securities, watch out. The trader risks the reclassification of a whole category of similar securities into the trading category, which means that not only would that insurance company's GAAP equity be possibly quite volatile, but also it's GAAP earnings could be quite volatile.

When the FASB issued *FAS 115*, it did not ignore the fact that the standard was one sided, and that it marked some assets to market without marking liabilities to market. Appendix 8 of *FAS 115* provides background information and the basis for conclusions within *FAS 115.* Paragraphs 49 and 56 of this Appendix specifically address financial liabilities. Paragraph 49 notes that some financial institutions manage their interest rate risk by coordinating their holdings of financial assets and financial liabilities. This fact suggests that in order for financial statements to present a more accurate view of an enterprises exposure to risk, some liabilities should be reported at fair value if some investments are required to be reported at fair value.

Paragraph 56 notes that FASB believes it would be preferable to permit certain related liabilities to be reported at fair value if all investments and debt securities were required to report at fair value. However, all securities are not required to be held at fair value, for example, commercial real estate loans, policy loans, and held-to-maturity debt securities.

Paragraph 51 of the Standard notes that no proposals permitting certain related liabilities to be held at fair value were workable and not unacceptably complex or permissive. The paragraph also notes that difficulties arose in trying to identify which liability should be considered as related to the debt securities being reported at fair value.

These problems were mentioned in *FAS 115* Appendix A, paragraph 51, when *FAS 115* was issued in May 1993. The same problems were reiterated in December 1995 by Bob Wilkins who is the FASB project manager responsible for *FAS 115.* At that time, he addressed a conference on the fair value of insurance liabilities held at New York University. He asked two significant questions. The first question began with "how" and the second question began with "which." The first question was, How should the fair value of such liabilities be determined? Now, at that conference several papers were presented. These papers did not primarily focus on the current GAAP framework, however, they did attempt to answer the "how" question. The second question was "which." Which liability should be marked at fair value? Which liability should be considered as related to the debt securities being reported at fair value?

Most of the research to date has focused on the "how." For example, the AAA fair value of liabilities task force paper discusses several different possible fair value accounting methods. The primary focus of that paper, though, is more on "how" than on "which" liabilities should be marked at fair value. A related question. In paragraph 53 of *FAS 115*, the Board also noted that there was no consensus as to whether the fair value of an insurer's liabilities depends on what assets it holds, or is independent of the composition of its assets.

A similar question was also brought up by Bob Wilkins at that December 1995 NYU Fair Value Insurance Liabilities Conference. That related question is, Should the credit quality of the issuing financial institution have an impact on the fair value of a liability? The Board also noted that there was no consensus as to whether the cash surrender value should be a minimum level for the fair value of liabilities. Under present accounting, there is no cash-surrender value floor to *FAS 60* type life insurance liabilities. If a floor is introduced, I wonder if it would apply to the benefit reserve or to the net GAAP liability, that is to the net GAAP reserve less the deferred policy acquisition costs.

The FASB position on marking the liabilities to fair value can be summed up on paragraph 56 of Appendix A, which states that the Board believes it would be preferable to permit certain related liabilities to be reported at fair value, if all investments and debt securities were required to be reported at fair value. With this statement, the Board is saying *FAS 115* does not broadly expand the use of fair value when reporting securities. By that the Board was saying that before *FAS 115*,

noninsurance companies valued nonmarketable equity securities at cost. But marketable equity securities were held at the lower of cost or market.

Unrealized gains are included in income for current marketable equity securities, but not for noncurrent marketable equity securities. For insurance companies before *FAS 115,* fixed income investment portfolios were carried at amortized cost with market value disclosed. Equities in fixed-income trading portfolios were carried at market with historical cost disclosed. Now, the point is that both the pre- and post-*FAS 115* systems were mixed cost and market systems. For that reason, the Board felt that statement does not broadly expand the use of fair value in reporting securities. Consequently, and this is in connection with paragraph 56, the Board believes it is not essential to address the valuation of liabilities in this statement.

Now that we've covered what the Board itself thought about marking liabilities to market, let's take a look at what the current industry position is, and then how FASBs future actions could impact fair-value accounting.

In September 1995, the ACLI Board reviewed work that the ACLI task force on market-value accounting had done through it's liability working group. The Board felt that FASB should be advised that while the ACLI remains very concerned about the one sided nature of *FAS 115,* it was unable to suggest a method for valuing liabilities at this time. No consensus is formed in the industry about one particular method that should be used for marking liabilities to fair value. The ACLI Board felt that members of the working group on liabilities could be permitted to seek public comment on the methods for fair-valuing liabilities that the group identified, with the understanding that this would be done in the name of the individual and not the ACLI.

Also, no further analysis is going to be done through the ACLI in modeling any of the methods identified by the working group. In fact, the working group was discharged. However, a number of ACLI members expressed concern that, notwithstanding the relative lack of harm caused by *FAS 115* since it's adoption, a spike in interest rates could potentially be extremely troubling for our business.

If a system to account for liabilities at market value were to be incorporated into the GAAP framework, I wonder if that system would account for each of the different types of financial liabilities in a consistent manner? If so, then market-value accounting would be different from the current system where different liabilities are accounted for differently. For example, bank and thrift liabilities are not accounted for in the same manner as most insurance company liabilities. Even insurance company liabilities are not accounted for in a uniform manner. Sometimes premium is revenue, sometimes it isn't. Sometimes there's a deferred policy

acquisition cost (DAC), sometimes there is not. When there is a DAC for policy acquisition costs, it may be amortized in proportion to investment income, premiums, or gross profits, depending on the product. Sometimes the benefit reserve is an account value. Sometimes it is a net premium reserve or the present value of future benefits. When the reserve is the present value of future benefits, sometimes the interest rate used to calculate the present value is locked in and sometimes it isn't. Sometimes there's a cash value floor to the benefit reserve and sometimes there isn't. While investment contract fair values are shown in the notes to the financial statements, there is no such requirement for insurance contracts. These inconsistencies may be carried over into any market-value accounting system. If so, no single fair-value method will work for each different kind of liability. If these inconsistencies are not carried forward, then not only will the new system result in fair values, it would also bring about, perhaps, more radical results of accounting for all types of financial liabilities in the same way.

Fair-value methodologies for financial liabilities can be categorized in four different categories. The first method is the discounted cash flow or option-pricing method. The second is the actuarial appraisal method, which backs into the market value of liabilities by saying market value of liabilities equals the market value of the assets, less the value of the combined bundle of asset/liabilities. A third group of methods are mitigation methods. Finally, there are methods that minimally amend the existing accounting framework.

Discounted cash flow or option-pricing methods has been coined as constructive methods in the paper produced by the AAA task force on the fair value of liabilities which was chaired by Jim Holman. These approaches generate cash flows which can vary by stochastically-generated interest-rate scenarios. Then discount these cash flows back at the risk free interest rate for each scenario, plus a spread to reflect risks such as liquidity and the insurance company's credit. If only a single scenario is used to generate and discount these cash flows, an additional spread is added to reflect risk aversion. Alternatively, a fixed spread can be found that when added to the risk free rate gets the present value of future benefits and expenses equal to the present value of considerations.

The second group of methods, the actuarial appraisal methods, are coined as deductive in the same AAA paper which I just mentioned. I suppose they are coined as deductive because of the way market-value liabilities are backed into. The value of the bundle assets/liabilities are subtracted from the value of assets. Life insurance company actuarial appraisals are based on the present value of the net cash flows available to shareholders after adjustment for statutory reserve and required surplus. This appraisal value can be deducted from the value of assets to determine the fair value of liabilities.

The third group of methods are the mitigation methods. Mitigation methods mitigate the volatility caused by included assets at fair value in the balance sheet. These methods do not necessarily calculate the true value of liabilities.

Examples of this approach include incorporating a statutory accounting interest maintenance adjustment, similar to the interest maintenance reserve (IMR). Maybe it will be called the IMR in GAAP. Another example is setting the fair value of liabilities equal to the book value of liabilities multiplied by the ratio of the market value of assets to the book value of assets. These methods begin by assuming that cash-flow testing analysis already shows that the book value of assets is adequate to fund the book value of liabilities. The SEC DAC amortization adjustment is another example of a method that mitigates the volatility caused by *FAS 115.*

Finally, the fourth group of methods are methods that minimally amend existing accounting framework. These methods would begin by identifying which liabilities would be marked at fair value.

One possibility is to just classify liabilities the way assets are classified. Right now we have some assets that are debt securities and within that it's held to maturity or available for sale. This creates something similar that could be done with the liability. Maybe liabilities that the insurance company has no intent to reinsure or sell off could be held to maturity. That probably would be a little too permissive, and in fact, there is some feeling that the current accounting for the assets is already too permissive.
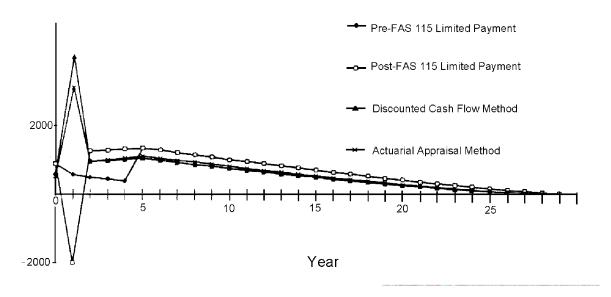
Yet another approach may be identifying which liabilities would be marked to market, and just doing a pro rata adjustment. Maybe a certain ratio of the liabilities would be marked to market and that ratio would equal a weighted average of the asset. Within methods that minimally amend the existing accounting framework, one possibility would be to redefine the term locking in *FAS 60*, as applying to the discount spread over the treasury curve used to discount liability cash flows, rather than having the term "locking" reply to the discount rate itself.

Another possibility that would minimally amend the existing accounting framework would be to give even more mitigating power to the SEC DAC amortization adjustment by allowing the DAC to exceed the accumulated value of deferred acquisition costs.

Chart 1 shows how the *pre-FAS 115* accounting and post-*FAS 115* accounting, and possible constructive and deductive methods would work for some life insurance liabilities. This example is of a single premium immediate annuity (SPIA). In this case, the duration of the annuity is about ten, the duration of the liability is also

about 10. The duration of the asset that's backing this annuity is about five, so the assets are shorter than the liabilities. In this situation if interest rates go up, that's a good thing for the insurance company, a positive development. The line with the darkened diamonds in this chart, represents the accounting that was in place before *FAS 115.* This is an example of contribution to GAAP equity. In the second year we have interest rates popping up from 8–10% here.

CHART 1
SPIA WITH 5-YEAR BOND CONTRIBUTION TO SPIA GAAP EQUITY
INTEREST RATES JUMP FROM 8% TO 10% AT END OF SECOND YEAR

In fact, it only shoots up after the assets mature in the fifth year and then they are reinvested at a higher rate of interest, and then there are more earnings. Under *FAS 115* the contribution to GAAP equity is quite different. That contribution is shown by the line with the white squares and you can see that in the second year when interest rates pop up there's a big decrease in the contribution to GAAP equity because the assets are marked to market.
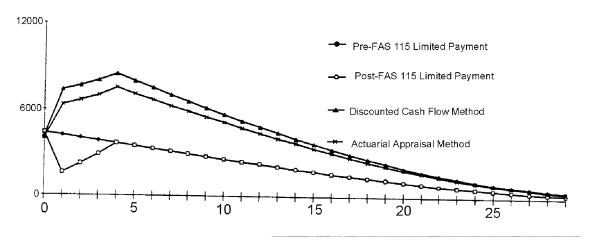
Since interest rates went up, the assets are marked downwards, but there's no change in the liability. It's kind of a perverse situation. The interest rate spike is actually a good thing, but the contribution to GAAP equity is shown as a big negative.

What could happen if either a discounted cash-flow constructive-type methodology was put in place or an actuarial-appraisal method deductive approach was put into place, would be that the true economics would be shown.

The triangle and cross lines show that in the second year there is a big increase to the contribution to GAAP equity. That's because, although the assets are marked downwards, the liabilities are even longer and they're marked even further downwards, and so there is a big increase in the contribution to GAAP equity, which reflects the actual economics of the situation.

Chart 2 relates to the balance sheet. This is the SPIA GAAP equity itself and you can see, once again, there is a big drop in GAAP equity under *FAS 115.*

CHART 2
SPIA WITH 5 YEAR BOND; SPIA GAAP EQUITY
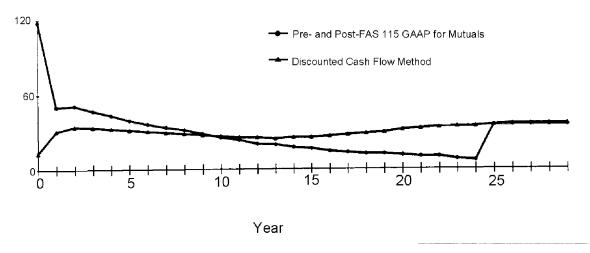INTEREST RATES JUMP FROM 8% TO 10% AT END OF SECOND YEAR

The darkened diamond line shows that it is smooth; that's *pre-FAS 115* accounting. The white square line shows that there is a big drop in GAAP equity under *FAS 115,* and the other lines show that there is a positive increase to GAAP equity.

You'll note that I didn't get the exact same answer for the actuarial appraisal and discounted cash flow method, those are the triangle and cross lines. They kind of move together, but they're not exactly the same. In this example the discounted cash-flow method, or option-pricing method, ended up with the lower reserve. That's possibly because it did not take into account the cost of capital, and perhaps Luke will touch on that subject.

Chart 3 is not a single premium immediate annuity, it's a graph of contribution to traditional whole life GAAP equity. In this line there is no change in interest rates. I just let the interest rates be constant for the whole 30 years. The point of this chart is not to show what happens if interest rates move, but just to show that different accounting methodology would give very different results.

CHART 3
TRADITION WHOLE LIFE WITH 10 YEAR BONDS
CONTRIBUTION TO TRADITIONAL WHOLE LIFE GAAP EQUITY
INTEREST RATES CONSTANT AT 8%

Year

The darkened diamond line shows what happens under current accounting for a particular traditional whole life liability, and the triangle line would show what would happen under the discounted cash flow method. You can see that the diamond line front loads the profits, and the triangle line more back loads them.

There are rather complicated reasons for this, but the primary one is that option pricing methods tend to have earnings emerge as a percentage of investment income. In the early years, there isn't much investment income because the reserve is low.
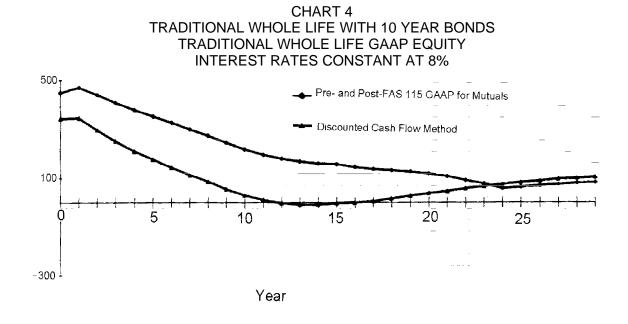
Under current accounting, earnings emerge in proportion to gross profits. There are several sources of earnings besides just the interest margins. There are also expense margins and mortality margins and loadings, and so on.

In any new kind of accounting methodology, we'd have to be careful that even if interest rates don't change, there could be dramatic differences in accounting results.

Chart 4 is the balance sheet as opposed to the change in the balance sheet. Again, it shows that even if interest rates don't change, depending on the methodology you use, you could end up with a very different accounting result.

Another idea I'd like to touch upon now is asymmetric value. If somebody issues a liability and someone else holds it, should those two liabilities be held at the same value on the two different accounting statements? Holders, issuers, underwriters, and potential buyers and sellers place different values on a good. A policyholder

must value a policy above its cash-surrender value, but an insurer may do otherwise. There's talk that insurance companies could hold a liability at less than its cash surrender value.

CHART 4
TRADITIONAL WHOLE LIFE WITH 10 YEAR BONDS
TRADITIONAL WHOLE LIFE GAAP EQUITY
INTEREST RATES CONSTANT AT 8%

I bought a life insurance policy not too long ago and some of my colleagues have told me it's a foolish thing to do, but I did it. I've already sunk several thousand dollars of premium into it, but my cash value is only several hundred. Now, the insurance company may hold that liability at its cash value or something less, but to me it should be worth several thousand. They'll say you shouldn't have bought it. So, there's a bid ask spread there.

We never really know the exact value of anything, there's always a bid ask spread, even treasury securities have a bid ask spread. For insurance company liabilities, maybe the bid ask spread is really huge. Instead of it being just a few basis points, it may be the difference between a few hundred dollars and a few thousand dollars on a cash value. When the market is thick, the equilibrium value or price can be determined readily, but if it's not, the market is not complete, then that liability cannot be replicated easily and we can't really get a value for the liability. We can only get a bound for the value.

Another question that comes up in different methods is, What kind of discount rate to use? Yield curves typically slope upward, but valuation rate curves typically slope downward. Every year around this time New York state sends out a circular letter, and the longer the liability, the lower the valuation interest rate is. The riskier the liability the lower the valuation interest rate is.

That's the opposite of how assets are valued. The longer the asset, usually the higher up on the yield curve it is. The riskier the asset the higher the spread. That's not true in statutory valuation of liabilities. It's not true in GAAP valuation. Under *FAS 60* there's a provision for adverse deviation and an actuary may want to use a lower valuation rate for a long asset or for a riskier asset. The same type of thing is true for pension liabilities. Now, generally the yield curve slopes upward.

The liquidity preference and pure expectation hypothesis do not explain the whole yield curve. That's probably because bond and stock returns are positively correlated. There is an article in the March 1983 *Journal of Finance* by Bruno Selnick, and another article in the May/June 1992 *Financial Analyst Journal* by John W. Peevey, which indicate that bond- stock returns are positively correlated. That could be the reason why the yield curve generally slopes upwards.

There is an element of systemic risk in a long term asset, even if it's risk free in terms of C–1 default risk. It's still risky in terms of C–3 risk and investors want some extra yield because of that. I'm just pointing out that there is a discontinuity between longer, riskier assets generally having higher yields and longer, riskier liabilities, generally being discounted back at lower yields. There are two senses of time. Are spreads constant across the yield curve? No. They are not constant over time either. So the idea of valuing things a constant spread to treasuries may not work because that spread should vary over time in both senses, the yield curve, and time itself.

There's some talk about whether weaker companies should be able to discount their liabilities at higher rates than stronger companies. If so, that implies that the cost of capital for a weaker company is lower than the cost of capital for a stronger company, and that's not what you would think about intuitively. For instance, imagine two companies that both have the same kind of assets, a $10 perpetuity. The market value is $100, it pays $10 each year. The liability is a $9 perpetuity so the distributable earnings are $1 each year.
If a stronger company has a lower cost of capital, when you go through the mathematics you'd find out that the stronger company should actually have a lower liability. I borrowed this concept from Dave Babble of the University of Pennsylvania. Mr. Babble notes that if you have a really risky company, maybe a company that's totally mismatched or not run well in other ways, the more, it moves to the right side of this curve. The more liabilities it issues, the higher its put option, or financial risk value is.

On the other hand, if you have stronger companies over to the left, companies where you know they're going to pay off their liabilities, the value of the put option that they have; and the put option is the possibility that they may not pay off the

liabilities goes away, but on the other hand, their enterprise value goes up. When we value liability, what should be included in that liability? Should it be, in the middle of the curve is the liquidation value or should it be the liquidation value and the financial risk value? I guess that's what's done now for bonds that a company may issue. The enterprise value is not included in there. Perhaps the enterprise value and the financial risk value should not be included.

Mr. Luke N. Girard: Doug focused on the accounting front and gave us a good overview. George focused on the more practical issues of fair valuing liabilities. I hope to talk more on a conceptual ground, on a theoretical ground as to how to go about doing this.

George talked about seven methods that are being considered to the fair value of liabilities. There are two leading methods. One method is based on the actual appraisal process and the other method is the option pricing method (OPM), or sometimes called discounted cash-flow method. Actuaries like the actuarial appraisal method because, of course, it involves actuarial expertise. It involves the evaluation of contingent events, something that we're all trained to do. It also reflects the economic value of the firm more accurately than any other method. That's important as far as the users of the financial statements are concerned.

On the other hand, the accountants, don't like actuarial appraisals for some very good reasons. One is that the fair value would depend on the level of RBC, and it would also depend on the level of reserves. It would also depend on the type of asset strategy, or the type of assets you would have supporting those liabilities. There's also an objectivity issue, a lot of the assumptions are based on an actuary's judgment, which can be fairly subjective.

The actuarial appraisal method involves three steps. First you determine the free cash flows. Second, you discount those free cash flows at some cost of capital fee. The third step is to deduce the market value of liabilities, or the fair value of liabilities, by subtracting the discounted distributable earnings from the fair value of assets, or market value of assets.

DEDUCING FAIR VALUES:
- STEP 1: $DE_t = I_t - \triangle Rs_{t-1}$
- STEP 2: $DDE = \sum DE_t (1 + c)^{-t}$
- STEP 3: $MVL = MVA - DDE$

Table 1 compares the two methods. The distinguishing feature of the two methods is that in the case of actuarial appraisals, you're discounting free cash flow. In the

case of the option pricing method, you're discounting the actual liability cash flows; a fairly important distinction. The discount rate is also different. In the case of the actuarial appraisal method, the discount rate is risk adjusted. We're not using a risk free rate, we're using a risk adjusted rate. In the case of the option pricing method, we're using the risk free rate, plus a spread.

TABLE 1
ACTUARIAL APPRAISAL METHOD (AAM)
VERSUS OPTION PRICING METHOD (OPM) SUMMARY

ATTRIBUTE	AAM	OPM
Cash Flow	Free Cash Flow	Actual Liability Cash Flow
Discount Rate	Risk-Adjusted	Risk-Free Rate + Spread
Scenarios	Static ⇒ Stochastic	Stochastic
Probability Distribution	True ⇒ Risk-Neutral	Risk-Neutral
Policy Lapsation	Modeled	Modeled
Crediting Strategy	Modeled	Modeled
Operating Expenses	Explicit Assumption	Implicit in the Spread
Income Taxes	Explicit Assumption	Implicit in the Spread
Cost of Capital	Explicit Assumption	Implicit in the Spread

With regard to scenarios, the actuarial profession use to be in a static world, now we've clearly moved into the stochastic world. Some of us may still be doing static valuation, but most of us are using stochastic scenarios. In the case of the option pricing method, the scenarios that are used there are stochastic, generally speaking.

As far as the probability distribution is concerned for these scenarios, the actuarial appraisal method tends to use true scenarios. By true, I mean that these are scenarios that you would expect to actually possibly happen, the true probability distribution. It's not biased in any way, shape, or form by market phenomena. However, I think as a profession we're tending to move, for valuation purposes at least, towards risk neutral valuation, where the probabilities are adjusted for market risk that's priced in the marketplace. Of course, in the option pricing method, it's generally accepted or understood that you use a risk neutral probability distribution. As far as policy lapsation and crediting strategy is concerned, in both cases we just model those strategies, we model policy holder behavior. In that case they are very similar.

In the case of operating expenses, income tax and cost of capital when we're doing the actuarial appraisal method, we're being very explicit in our assumptions. We're

saying these are operating expenses. These are our income taxes, and this is what we're discounting free cash flows at, this is the cost of capital. Whereas in the case of the option pricing method, we do make those assumptions as well, but they are implied. They are implied in the spread that is used to discount the cash flows.

While the two methods look very different, my proposition is that if we are careful in making consistent assumptions, then the two methods will produce exactly the same results. If you notice that the two methods produced different results, that's simply because the assumption setting process may not have been entirely 100% consistent. In mathematical terms, the formula is discounted distributable earnings (DDE) is equal to required surplus, plus one minus the tax rate times the difference between the market value of the assets and the market value of the liabilities, and a tax basis adjustment.

This is the mathematical formulation of what I said in words earlier:

$$DDE^{AAM} = RS^{OPM} + (1-k)(MVA^{OPM} - MVL^{OPM}) + TBA, \text{ where } k \text{ is the tax rate.}$$

The terms in that equation have very specific definitions to insure equivalence between the two methods. In the case of the required surplus (RS), it's the market value of a portfolio of assets that support the RBC requirement, which is equal to the statutory value of the RBC requirement. Simple definition. In the case of the market value of the assets (MVA), it's the market value of the portfolio of assets that support the liabilities, which also has a statutory value equal to the statutory value of liabilities. The tax basis adjustment (TBA) is simply the tax rate times the tax value of that, minus the tax value of liability. Now, the market value of liabilities (MVL) is defined as follows: It's the market cost of purchasing a benchmark-portfolio security where the benchmark replicates a liability cash flow.

I define liability cash flow as including expenses, taxes, and provisions for investment default, and cost of capital. Just a different way of expressing that same definition, is with the discounted value of the liability cash flow at the government yield curve, plus a spread. That spread is the spread of this replicating benchmark with respect to the government yield curve.

Following is another important equation; it's a little bit complicated, but is important. It is the equation for the cost of capital (COC):

$$COC_t = [c/(1-k)-j]RS_{t-1} + (c-l)(MVA_{t-1} - MVL_{t-1}) + [ck/(1-k)](TVA_{t-1}-TVL_{t-1})$$

That equation for the cost of capital is equal to a cost of capital rate times a component of investment capital. RS is a component of the investment capital and MVA minus MVL is a component of investment capital, and so is TVA minus TVL.

The full amount of investment capital is required surplus, your RBC, your embedded value (EV) which is based on a difference between the market value of assets and the market value of liabilities, and tax basis adjustment (TBA). The embedded value I have shown is one minus the tax rate times the market value of assets minus the market value of liabilities. That expression is critical. It's critical to define it this way to show the equivalence of the two methods. This is just another way of summarizing what I just said.

On the left hand side you've got the cost of the investment capital and on the right hand side you've got the cost of that capital expressed as a rate. That first formula, *c* over one minus *k* minus *j* is something I've seen many places, I think some of you may have seen that expression before. The other cost of capital rates are a little different. But, it's the same kind of concept. The definition for *c* is the cost of capitol hurl rate; *j* is the net investment earnings rate on surplus assets, and *l* is the net investment earnings on product assets, and *k* is your tax rate.

I have been using formulas in the static world. In the uncertain stochastic world, the formulas look very similar. The difference is that in a stochastic world you've got a second summation sign that comes into the mathematical equation (Table 2).

TABLE 2
UNCERTAINTY AND INTEREST RATE SENSITIVE CASH FLOW

STATIC WORLD	**UNCERTAIN WORLD**
$DDE = \sum_t DE_t (1 + c)^{-t}$	$DDE = \sum_p q_p \sum_t DE_{p,t}(1+c)^{-t}$
$MVA = \sum_t A_t (1+r_t + \theta^A)^{-t}$	$MVA = \sum_p q_p \sum_t A_{p,t}(1+r_{p,t} +\theta^A)^{-t}$
$MVA = \sum_t L_t (1+r_t + \theta^A)^{-t}$	$MVL = \sum_p q_p \sum_t L_{p,t}(1+r_{p,t} +\theta^A)^{-t}$
$DDE = RS + (1-k)(MVA-MVL) + TBA$	$DDE = RS + (1-k)(MVA-MVL) + TBA$

That second summation sign is to integrate, or to sum, over the scenarios, over the probability space. *p* stands for path, and *q* in the equation stands for the probability of that path occurring. Now, the first equation is the DDE equation. You have the static form and you have the stochastic form. In the case of market value of assets, you have the same thing, the static form and the stochastic form. In the case of the stochastic form, you should note that the asset cash flow depend on path and time in the future, as do the free cash flows in the first equation.

In the market value of liability equation it's the same situation. You have a similar equation there, as well, in the stochastic world. You should note here that the risk free rate here varies with path and time. But the probabilities, Q_p, are the same in all three equations. The probabilities of the path is the same in all three equations. The option adjusted spread (OAS) that is used to discount the assets is different from the OAS that use to discount the liabilities.

The only time they would be the same is if the asset portfolio that existed, that you were valuing, was the replicating portfolio for the liabilities. In that case, the true OAS^A and OAS^L would be the same. Of course, when you go to the stochastic world the decomposition still holds, the DDE still equals *RS* plus *1* minus *a* times *MVA* minus *MVL* plus *TBA*. You have the same thing in the stochastic world; the equation doesn't change. The market value of liabilities definition is still valid in the stochastic world. Discount the value of the liability cash flows on the government yield curve plus the spread where the spread is of the benchmark portfolio relative to that same government yield curve.

What I've been talking about is discounting a set of liability cash flows that is very comprehensive. It includes operating expenses, investment default, taxes, and cost of capital. You can also reformulate the equation for the market value of a liability so that you're discounting just the policy cash flow. When you do it that way you have to adjust your discounting spread. In other words, your spread has to take a hair cut to provide for the things that you don't have in your cash flows.

To do that substitute the sum of policy cash flows and other liability cash flows to be equal to your comprehensive liability cash flows, using the static version of the equation, not the stochastic version. You make that substitution, then you make an assumption. You assume that the ratio of these other cash flows, cost of capital, taxes, and operating expenses over the market value of liabilities is a constant. In other words, it's equal to the required spread. Then define OAS^A for policy cash flows as being equal to OAS^L, comprehensive cash flow, minus this required spread. If you do that you can show that the market value of a liability can also be expressed as discounted policy cash flow. You have to adjust your OAS and you get the same result.

EQUIVALENCE OF AAM AND OPM

Substitute, $PCF_t + ECF_t = L_t$ in the equation: $MVL = \sum L_t (1 + r_t + oas^A)^{-t}$
        PCF = policy cash flows
        ECF = other liability cash flows

Assume: $(ECF_t \div MVL_{t-1})$ = a constant = rs ... the "required spread"
Define: $oas^L = oas^A - rs$

It can be shown that:

$$MVL = \sum L_t \, (1 + r_t + \text{oas}^A)^{-t} = \sum PCF_t \, (1 + r_t + \text{oas}^L)^{-t}$$

I'm going to end my presentation with three different perspectives concerning the valuation of liabilities. My personal favorite is what you've seen all along, that you can express the value of the equity of a firm or the value of equity in a business, as a surplus plus the embedded value plus a tax basis adjustment.

Another way of looking at it, is the Modigliani-Miller version. Modigliani and Miller won the Nobel prize in economics, and they showed that the value of a firm does not depend on it's capital structure if you ignore taxes. They structure the same equation a little differently. If you re-arrange the terms, you get what Modigliani and Miller were doing. That is that the market value of the assets plus required surplus is the value of the assets of the firm. You can break those down into the equity holder's share, which is *DDE* and the policy holder's share, which is *MVL,* and then the remainder is the government's share.

The last perspective, and probably the most relevant perspective for this discussion, is the accounting model. It's the same equation, I'm just reformatting the terms. Here you have the share holder equities, you look over the assets of a firm, *RS* plus *MVA*, minus the liabilities of the firm, then minus a deferred tax liability. What you've seen here is all consistent with finance and accounting models.

Personal Favorite:
       DDE = RS + (1− *k)* (MVA−MVL) + TBA
       Equity = Surplus + Embedded Value + Tax Basis Adjustment

Modigliani-Miller Version:
       MVA + RS = DDE + MVL + *k* [(MVA − TVA) − (MVL − TVL)]
       Assets = Equityholder's Share + Policyholder's Share + Government's Share

Accounting Model:
       DDE = RS + MVA − MVL − *k* [(MVA −TVA) − (MVL −TVL)]
       Shareholder Equity = Assets − Liabilities − Deferred Tax Liability

From the Floor: I think it's a real significant contribution to our understanding about asset/liability management. There's a circularity in the method, which was also in the article that you had for *Risks and Rewards.* I wondered what practical approximations you think are appropriate to deal with the fact that the cost of capital depends on the value of the firm?

You need to project all the cash flows forward to determine the value of the firm anyway, so there is a bit of a circularity there. I guess the cost of capital in the

second period depends on the embedded value in the first period. If you think there are any practical approximations that are useful in applying this approach I would be interested.

Mr. Girard: There is a circularity in the formulation that I showed. That's correct. There is no circularity in the regular DDE discounting of free cash flows. If you want to overcome the circularity what you have to do is press your calculate button on your spread sheet five or six times, and eventually get there fairly quickly.

From a practical standpoint you would estimate the ratio of cost of capital to the market value of liabilities. You'd make an estimate much as you do for target profit, for example. You estimate it as 25 basis points, or 75 basis points, and that's how you would apply the method in practice. Who knows what the accounting basis is going to be in the future, anyway?

Statutory accounting defines your RBC requirement, it defines your statutory reserves, and those are moving targets. So, to think that we know precisely now, we don't. I guess using an approximation probably is OK.

From the Floor: I'd like to point out that there were some comments made that there are some inconsistencies between the valuation of liabilities in the block and the valuation of assets, in terms of the discounting. My argument is that there are no consistencies if you reflect the sign of the cash flows in terms of positive cash flows coming into the firm versus negative cash flows going out of the firm.

Another way to look at it is to separate the discounting process from the risk adjustment process. We all know that positive cash flow should be reduced if it's uncertain. Negative cash flow should be reduced, that is, made more negative. If you split the discounting process from the risk adjustment process, some of these things fall out and become simpler.
Unfortunately, we're moving into a trap where we're saying we need to conform to the investment community view of risk adjustment process. In reality, we don't need to conform to that. We need to reflect that in terms of understanding the relationship of valuing assets, which tend to have always positive cash flows coming into the firm, for insurance companies.

When valuing liabilities, we need to separate the two, and identify the fact that insurance contracts have some positive cash flows and some negative cash flows. We also need to reflect the fact, or be able to explain the fact, that we have pieces of cash flows that can come from different things; policy holders, the insurance companies, our equity share holders, and the government, and they can be positive and negative cash flows. We all know that the sum of the pieces have to equal the

whole. We have a very complex instrument here and we need to separate the discounting process from the risk adjustment process.

Mr. Silos: Yes, I would agree with you, and I'm glad you pointed that out. My question to you would be, do you think that, for GAAP purposes, long liabilities that are risky should be discounted at high rates or low rates?

From the Floor: I guess the only thing that's been written on that to date is the Potkin Paper, in terms of positive cash flow and negative cash flows, but again, it's not that we have an answer to that, but we do understand the problem and we have a package of assets/liability sets of cash flows that go in both directions. We also have uncertainty outside the interest rate environment, which we need to bring in, in terms of our initial discussion.

For instance, long-term liabilities on accident and health, where the investment side is less of an issue and the uncertainty in terms of the claim cash flow, is a giant uncertainty. Much more uncertain than the asset risk. So, we need to bring that into our discussions so we don't lose sight of the fact that we have a lot of uncertainty on the liability cash flows, as well.

Mr. Johnson: I'd like to add a comment on the discounting of positive or negative cash flows. I agree with the questioner that said that we need to have a consistent methodology for both positive cash flows and negative cash flows, and I think the actuarial appraisal method does that.

Mr. Girard: The actuarial appraisal method basically presumes that we have positive statutory profits going forward. If at any point in time we have a negative profit, or DDE, then the discounting process is incorrect. However, it's only incorrect in terms of that particular year's negative DDE.

If the positive DDEs dominate, the whole cash flows were fine in terms of the present value, but the discounting of a particular negative one, in terms of a constant cash flow that's greater than the risk free rate is just wrong. If the positive numbers dominate the set of cash flows then total of the present value may not be too far off.

From the Floor: I guess my answer to the other question is that if you have negative distributable earnings maybe you don't have distributable earnings down the road. Therefore, you haven't defined distributable earnings correctly in the first place. If your original set of distributable earnings is flawed, I guess you just revise it. Then the process works.

The other point I wanted to make was on risk adjustment. In the world of finance, at least from what I know about it, the way you adjust for risk is you always adjust the probabilities in the adverse direction. That's called a risk neutral evaluation.

When you introduce an OAS you're kind of moving away somewhat from risk neutral evaluation because you're charging for risk, you're reflecting for risk in a slightly different approach. If you accept that you have an OAS in your discounting formula, you are really patching up a problem with the evaluation process that you have in the first place. It's just a practical expediency.

From the Floor: I want to know what would be your suggested number of paths that people should use in the calculations. Second, are these paths suppose to be after all this probability would eliminate any arbitrage profits?

Mr. Girard: There are two questions there. How many paths do you use for the valuation? That really depends on the problem. For example, if you're valuing a liability that has a lot of deep out of the money optionality, I think you need more paths for that because you have to capture those scenarios that are deep out of the money. If you wanted a number, perhaps for a block of single premium deferred annuity business, I think you might be able to get away with 50 or 100 paths. Really the answer varies, and it also depends on how much accuracy you want.

Are the probabilities arbitrage free? My opinion is that you have to use arbitrage free probabilities. The reason why you have to use arbitrage free probabilities is because that's what the market says. When you do fair value you have to find a willing buyer and a willing seller. That's the market which defines those probabilities. You have to use those probabilities if you're doing a fair valuation. You shouldn't use true probabilities, even though they look more realistic. They don't reflect how the market is pricing for risk.

Mr. Johnson: In your scenario projection where you say you should be arbitrage free, does that imply that the scenario should constrain the total return of the stock market to be the same as that of the risk-free rate? Do those assumptions extend to all of the equity markets, as well?

Mr. Girard: Yes, I think they do. Outline paths and then the assign probabilities to your paths apply to all markets. You could do that to cut down on the number of paths. Yes, it is a difficult problem. Let's just hope the computers can keep up with the demands of the work we have to do.

One good thing about focusing on calculating the fair value of the liability using the option pricing methods, is that you don't have to worry about the asset side. Unless

the assets somehow define your liability cash flows. If you're using a portfolio crediting strategy, for example, your assets are in essence defining your liability cash flows. In that sense you've got to mull the whole ball of wax together. That involves a great deal of computational time.