

**RECORD OF SOCIETY OF ACTUARIES
1994 VOL. 20 NO. 3B**

**ASSET/LIABILITY MATCHING FROM AN
EXPERIENCED CONSULTANT'S VIEWPOINT**

Moderator: GORDON L. GOULD
Panelist: LAURENCE B. SIEGEL*
Recorder: GORDON L. GOULD

This session will provide an overview of the state-of-the-art asset/liability matching techniques for pension plans. We will also discuss the application of the techniques to stabilize *FAS 87* expense, protect plan surplus against economic fluctuations, and manage the nonparallel yield-curve shift.

MR. GORDON L. GOULD: I'm going to discuss some technical issues, and then I'm going to turn it over to Larry. He's going to look at assets and liabilities from an economic perspective, focusing on the total finances of a corporation, rather than the narrow perspective of pension liabilities.

Let's talk a little bit about stabilizing accounting cost. We'll start off with a couple of easy points. Obviously, some built-in smoothing exists just by applying the different provisions of *FAS 87*—approaches like not amortizing gains and losses outside of a corridor, using a market-related value of assets, and so on. Somewhat more subtle is keeping the spread between the discount rate, salary scales, and medical inflation trend constant so that you don't get whipped around just because the yield curve is bouncing all over the place. Perhaps a slightly more subtle technique would be to use a market-related value of assets, smoothing only the equities, and to carry the bonds at market value. The bond portion of your portfolio will tend to track the accumulated benefit obligation/projected benefit obligation (ABO/PBO) as you adjust for changing yield-curve conditions, whereas the equities won't bounce around as much. This technique has been in existence almost since the day that the statement came out. Out of curiosity, how many of your plan sponsors use this type of method? Just a few. I'm surprised that we don't see this a little more often. I think it's reasonably intuitive.

The next topic is protecting pension plan surplus. There's much focus on short-term measures, such as ABO, and I think it's important to educate plan sponsors to understand what the cost of short-term thinking is. When we talk about protecting surplus, what are we talking about? Are we talking about protecting surplus on an ABO basis, perhaps to avoid hits to equity, or is it to keep a certain level of termination liability protected? Is this a useful strategy? I would argue that, by and large, it's not, although I'm not suggesting we can ignore short-term considerations entirely. For example, a plan sponsor with an unexpected, large equity hit would probably be very upset if we hadn't provided some warning ahead of time. Termination surplus is available for the most part.

One concept for protecting surplus on an ABO basis is called *dollar-duration matching*. Instead of looking at the duration of the liabilities and setting the duration of your

*Mr. Siegel, not a member of the sponsoring organizations, is Managing Director of Ibbotson Associates in Chicago, IL.

assets equal to that, you take into account the extent to which you have surplus. For example, with a fair value of assets of \$1,300, an ABO of \$1,000, and an ABO duration of 15, you'd actually need to use a shorter duration on your asset portfolio to match it, because the surplus is going to move on a magnified basis compared to the ABO.

A couple of comments on this. First, this only works in textbooks. Durations are exact only for infinitesimal changes in interest rates. They assume parallel movements of yield curves and the like, and in practice, there's more subtlety than just matching this duration. Another comment. This would really require all long bond instruments. On a duration of 11.5 roughly equivalent to a 30-year Treasury coupon bond; contrary to what many people intuitively think, equity durations are, in fact, very short. They're not long in duration as you might think. A dividend stream that runs into perpetuity must have a 45-year duration? Not so. Obviously, levels of dividends do move with price inflation, causing equity durations to be very low. In fact, some people would argue that they're virtually zero. I'd like to leave you with the question, is using the ABO the right measure of surplus?

If you want to hedge active liabilities, it would be better to use instruments that react economically in the way that active liabilities (such as real estate, equities and index bonds) react. There are no index bonds for the U.S. and using U.K. or Canadian indexed bonds carries currency risk.

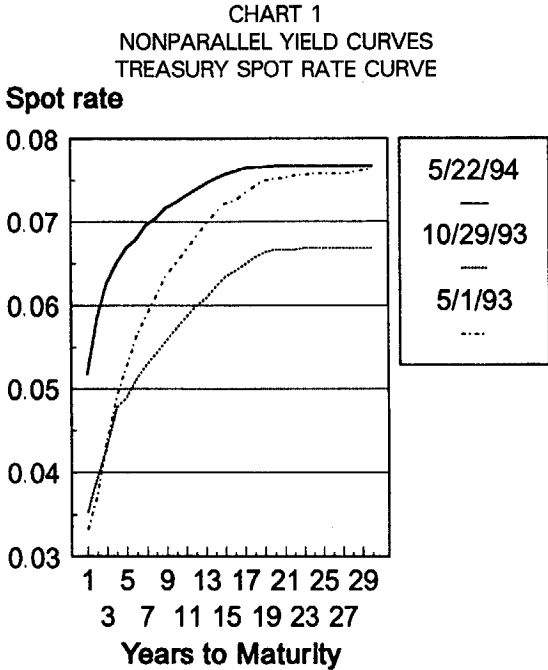
This leads us into one of the issues that I raised about dollar-duration matching, which is the yield curve and how it moves. Chart 1 is an actual representation of the spot yield curve as of three points in time. I was a little bit lazy. I happened to have these three floating around in a diskette somewhere so I plugged them in. I really wanted these to be one year ago, six months ago, and today. They're a fairly accurate picture.

The spot rate curve is what the zero coupon bond yield is for each of these maturities. This picture is more important to look at than what *The Wall Street Journal* publishes as the Treasury yield curve. It is the yield to maturity on coupon bonds of a 1- to 30-year duration, which is most important because when you're discounting a sequence of cash flows in the future, each cash flow would be discounted at the spot yield rates. The May 1, 1993 yield curve is very steeply increasing. The one-year T-bill was down in the low threes and the 30-year T-bond wasn't quite 7%, but the zero coupons were pushing around 7.5%. When the yield curve is that steep, the bond market is predicting a substantial increase in inflation over the next several years and only one of two things can happen. Either we're going to get that inflation, in which case the short end of the curve is going to come up, or we're not going to get that inflation and the long end of the curve is going to come down; the bond market pushed the long yields back down.

It's obviously much more complicated than that and supply and demand is what ultimately moves these around. For FAS purposes, the short end of the curve affects retirees because all of the benefit payments are concentrated in these first 10-15 years, and it's the long end that affects actives. A long coupon bond really doesn't work all that well because it really has an intermediate-type duration. Its duration is longer than that which affects retirees, but it's shorter than that which affects active

ASSET/LIABILITY MATCHING—EXPERIENCED CONSULTANT’S VIEWPOINT

employees. Derivatives didn’t perform the way they were expected to in the first quarter of 1994.



I took these yield curves and played them out against the projected cash flow for a single retiree who is 70 years old and a single active employee who is 50 years old. (See Table 1.) I calculated, using the yield curves, what the reserve would have been per \$1 of accrued benefit. You can see what happened in that first move. The short end of the curve really didn’t come down much. In fact, the very short end really didn’t move at all. The intermediate yields did come down some and overall the retired liability went up by a little over 4%. However, the long end of the curve did come down substantially in that six-month period and an active PBO increased by about 17%; it was a very substantial move.

The next move was a parallel upward yield curve movement, which is why the retirees jumped back 9% and the actives jumped back about 20%, which is roughly in line with their relative durations. If you thought the retired duration was about seven and the active duration was about 16, the magnitude of this yield curve movement would produce these results.

I think the message here is explaining this to plan sponsors. I know I’m supposed to be telling you how to manage the nonparallel yield curve shift, but I honestly don’t know how to manage one. I’m not sure anybody really does. The dynamics are very complicated. The instruments for managing this type of movement are somewhat nonliquid and not all that well understood. Things like mortgage-backed

RECORD, VOLUME 20

securities, inverse floaters, and principal-only and interest-only strips are very dangerous instruments to be working with in a long-term environment like this.

TABLE 1
RESERVE PER \$1 ACCRUED BENEFIT

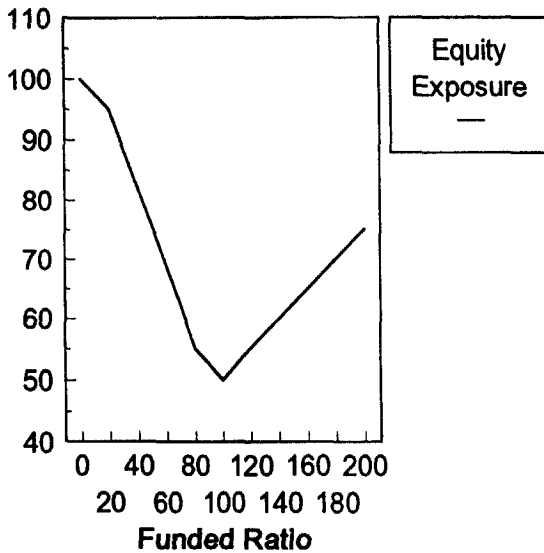
	5/1/93 Curve	11/1/93 Curve	5/22/94 Curve
Retiree	8.601	8.969	8.201
% increase		4.300	(4.700)
Active (PBO)	7.095	8.286	6.885
% increase		16.800	(2.900)

Cash-balance plans are more complicated than you might think. A cash-balance plan that has a floating interest rate will behave somewhat like a mortgage-backed security because interest rate increases tend to push liabilities up and vice versa. So if you're thinking about using something like intermediate-term bonds for defeasing the risk on a cash-balance plan you might want to think that over again, because if interest rates increase a great deal, your intermediate bond portfolio is going to get clobbered. What's going to happen to the liability of the cash-balance plan? It's going to go up because interest rates are increasing, and therefore, the future growth of the account balances is increasing. So the duration for a cash-balance liability is very low, possibly even negative depending on what your interest credit is, how the yield curve moves, etc. So it's something to be very careful about when making recommendations for a cash-balance plan.

How would you adjust your equity allocations based on your funded ratio? We can't look at this and say, "60/40 is the right equity allocation," or "look at things on a very long-term basis and be more aggressive." Your funded ratio probably does matter, particularly when you have to take into account short-term factors of equity hits and the annual expense. Let's look at three different scenarios. Let's say we have a very low-funded ratio, 20% or 30% funded hypothetically speaking. In that situation why wouldn't you just go for broke? What's the downside? You're 20% funded and you go down to 10% funded. So what? You're in a horrible position. You have little to lose and everything to gain. If you have a very high ratio, you can make a similar argument in the reverse that you've got a lot of cushion. You can be aggressive, and therefore, you have enough cushion to survive disappointments in the market, downturns, etc. On the other hand, if you're around 100% funded, and I haven't said on what basis, that's when you probably have to be the most careful because you're flirting in and out of potential equity hits. Shareholders look at this and say, "We want a strong, fully funded plan." The employee population likes to see some security, so at that point, you might want to be a little more cautious.

If you took a shot at graphing how equity allocation might vary with the funded ratio, it might look like Chart 2. Now bear in mind that this is not a theory or a well-researched idea. This is a discussion point. Very low-funded ratios go up to 100% in equities. Maybe even above 100% using leverage, futures, etc. It would come down to maybe a 50% equity allocation when you were right around the full-funding level and then turn back up.

CHART 2
EQUITY ALLOCATION VERSUS FUNDED RATIO
Equity Allocation



FROM THE FLOOR: Can you comment on what you would do when plans are waiting to be terminated. They’re frozen. They actually need to terminate.

MR. GOULD: If a plan is waiting to terminate, it would need exactly enough assets. In that case, I would try to immunize the cash flow as closely as I could or I would go into the futures market and try to synthetically immunize the change in interest rates without implementing an immunized portfolio. I would prefer to go pure immunized on cash flow because I think in the futures market surprises can happen.

One argument you might have with this chart is that upside gain doesn’t really do us much good. If I’m 300% funded, is that better than 200% funded? I can’t get the cash back and so on and so forth. I would argue that there is positive value added by that extra surplus. You can offer higher benefits. There’s some other clever things you can do. *It makes you more attractive as a potential takeover.*

The last topic is what I’ll call liability measures. The only message that I want to send people away with is to think about, when advising plan sponsors, what liability measures to be looking at. I know a very common approach is to forecast things like pension expenses, funded status, and cash flow. I know I’ve done that many times, and all of these measures have flaws, particularly the first two. Consider a long-term projection of funded ratio. It has to converge towards 100% because the less assets earn, the more you put in and vice versa. We all know that universal rule of balance where contributions vary inversely with investment earnings. Pension expense projections exhibit many of the same dynamics—higher contributions generate lower expense. Even cash flow has some implications that you want to think about. When

RECORD, VOLUME 20

you get to a zero cash flow is there a benefit to getting even more funded even though it doesn't reduce your cash flow any further?

I would recommend focusing, for the most part, on the cash flows on an open-group basis. This is probably something that we all are doing when performing studies—considering the impact of new entrants and looking at the long-term cash flow that each alternative asset policy would produce. I'd also recommend looking at duration on this basis as well. I think looking at the duration of the ABO is short-sighted because that's not a going-concern measure. That's a point-in-time, bolt-the-doors, and go-out-of-business-at-12-midnight type of measure. And then you would discount these cash flows and try and draw some conclusions based on that.

Before turning over to Larry, remember that there's no explicit link between assets and liabilities. The liabilities are liabilities of the corporation just like any other long-term bond, and the assets are, again, just assets of the corporation just like any others. And while there are economic factors that make some of these behave in similar ways, there's nothing explicit that links these together.

Table 2 is my last proselytism on liability measures. If we looked at how duration differs by liability measure, you'd see on an ABO basis, ignoring future new hires, that you might have a duration of around 12 or 13 years if you had this type of liability profile. We can look at PBO where the duration for actives, ignoring salary changes, is going to be a little longer. It's going to shift up some. If we throw in the liabilities and look at total present values of future benefits and put in future new hires, the duration's going to climb above 20 years where there are no instruments other than long-term zero-coupon bonds that immunize that type of liability. You'd want to do one of two things: either go very, very long on your fixed income or try and get into more equity, real estate, and inflation-responsive investments in order to really properly manage this long-term obligation. I'm going to turn the discussion over to Larry Siegel who's going to walk us through a little different perspective.

TABLE 2
DURATION DIFFERS BY MEASURE
LIABILITY FOCUS AFFECTS ASSET ALLOCATION

	ABO		PBO		PVFB	
	Dollars	Duration	Dollars	Duration	Dollars	Duration
Retirees	50	7.0	50	7.0	50	7.0
Current actives	60	17.0	105	20.0	175	22.0
Future hires	0		0		50	30.0
Weighted	110	12.5	155	15.8	275	20.7

MR. LAURENCE B. SIEGEL: Gordon pretty well covered my first topic. I'm going to go through why duration is a relative measure for matching assets and liabilities and what its limitations are. And I'm going to move quickly to an investigation of what happens to the asset mix or the efficient or ideal asset mix as you change the measure of the liability from ABO to PBO to an indexed benefit obligation (IBO) and,

ASSET/LIABILITY MATCHING—EXPERIENCED CONSULTANT’S VIEWPOINT

finally, to a measure that I call economic liability. Then I’m going to spend some time figuring out a good way to model the economic liability and then talk about issues that have to do with bringing together the corporate or plan sponsor’s risk and the risk of the pension plan itself.

The duration concept expressed in every textbook, of course, is an average time that it takes you to get your money back. That’s explicitly exactly right for a bond. If you have a 20-year Treasury coupon bond, and it takes seven years to get half your money back, in present value terms, then the duration is seven years. What does it mean to say an equity has a duration? You can sell it when you want to or you can hold it forever. It doesn’t mature so we have to look at the interest rate sensitivity of an equity and say that must be what we mean by duration. In order to figure out how to calculate the duration of a portfolio whether that’s a portfolio of stocks and bonds or a portfolio of assets and liabilities where some of those assets could be equities, we’ve had to look at the empirical or actual interest rate sensitivity of a typical stock. It turns out that it’s roughly the interest rate sensitivity of a one- to two-year bond. Even though equities with growing dividends have this long tail and, as Gordon said, it could be a 45-year duration if you calculate the cash flows, the bond part of a stock is one or two years. And this will be important to remember when we look at the efficient frontiers of stocks, bonds, cash, and liabilities.

How can equity duration be measured? Here are two ways to estimate it. Martin Lebowitz, from Salomon Brothers, created a structure wherein he developed a multiple regression formula involving each different maturity of bond . . . 30 days, 90 days, a year, two, five, etc. The solution that provides the best fit is the duration of a stock market. His solution was 2.19 years and that is the interest rate sensitivity of the stock market. I’m with Ibbotson and Associates and I approached the problem from a different viewpoint. I applied a simple regression formula only to one year Treasury Bills. The beta from that regression, one year, is my estimate of the duration. While these two estimates are different by a ratio of two to one, they both suggest that equity durations are very short.

The conventional framework for using duration to defease the liability is to say if the duration of the asset and the duration of the liabilities are the same, then there’s no interest rate risk. You may get mixed instructions from your company. They may say, well, you have to worry about all of them at the same time. I’m going to suggest an approach that may possibly achieve that.

As Gordon pointed out, the ABO is the most common measure of the size of the liability, yet it has major inadequacies. It doesn’t really take into account the growth of liabilities beyond the active lives. So the PBO is used to do that, but it has inadequacies, too. For example, if benefits are indexed to inflation after retirement or you’re concerned about future hires (and I’ll explain why you should be concerned about it in a minute), then PBOs are also inaccurate. The surplus is assets minus liabilities. Liabilities may be based on all of these measures or none of these measures. They are whatever you think liabilities should be. And in order to conduct the surplus optimization, we measured the ABO for a group of companies and figured out what the mix of stocks, bonds, and cash would be that best defeases the ABO. Then we expanded the definition of liabilities to these other measures that have been

discussed and the asset mix completely changes, so it's vitally important to figure out what the liabilities are that you're trying to defease.

To start the optimization study, we begin without any liabilities at all. We begin simply with what is the efficient frontier of stocks, bonds and cash. Because this uses historical data and bonds didn't do well over the period that was studied, this isn't quite fair. But the long bonds are way down off the efficient frontier, which represents the best possible combination of the three assets. Stocks are at the top and cash is at the bottom. The mixes, because long bonds have a low correlation, help to reduce some of the risk of holding stocks and cash. They are used so you get 18% or 19% in long bonds at certain levels of risk tolerance. Long bonds aren't very desirable, and this is basically a stock and cash strategy. So if you have no liabilities, and you believe in this set of data, then long bonds don't look very good. Then when you bring in the ABO and you hold it short in the optimization model, it has to add up to 100. So let's say you have 140% in stocks, bonds, and cash and -40% in liabilities. That's just the way you set up an optimization problem for an asset/liability portfolio. Long bonds snap back up onto the frontier and cash moves way off it. Cash and Treasury bills have a zero rate in every portfolio. No matter what the risk is you best defease the risk of the ABO by holding mostly long bonds until you get to 120% of the risk of the stock market and then you bring in some equities. So because the ABO is modeled like a long bond, putting that into the optimizer causes the optimizer to say, well, we're short in long bonds, we have to be long in long bonds and then we have no risk.

The surplus optimization answer is mostly long bonds. Now you won't be surprised about what happens when you move away from the ABO. Long bonds begin to look a little less attractive. Why? Well, the PBO contains inflation up to the point of retirement. For somebody who's 20 years old, that's 45 years of inflation and long bonds are not a good hedge against inflation; in fact, they're perfectly awful. So stocks and cash are the assets that might hedge against this inflation. But because the ABO is a large part of the PBO, Treasury bills still aren't used, but the stock market comes in a little earlier and has heavier weights. The long bonds don't start at 100. They start at 92 and fall below 50%. So as you try to defease the PBO, you have an extra stock in bond. The bonds are more or less for the ABO, and the stock is more or less for the active lives.

Now we move to an IBO which assumes that benefits are indexed not only up to the time of retirement where you're trying to figure out the final average pay. You also get a cost-of-living adjustment when you retire. For somebody retiring today, that could be a 45-year tail of inflation for the retired lives. Well, 45 years is many years, but it could be 25. My grandfather retired and lived 45 more years; his actuary was shocked that he died at 103. Now that inflation risk is the main risk of the liabilities, cash comes back because short-term bills are a good inflation hedge. Stocks are tremendously important and long bonds have only a moderate role in defeasing the ABO slice of this giant liability pie.

Now is it realistic to worry about defeasing an IBO? Not really. The cost-of-living adjustment may be moderate and it may be discretionary. It may not be offered, but at least this is an issue on the table for us to discuss. If the indexing to inflation were

ASSET/LIABILITY MATCHING—EXPERIENCED CONSULTANT'S VIEWPOINT

perfect, this would be the type of portfolio you would want to hold. There are more stocks and more cash than long bonds.

Finally, the economic liability isn't even captured by the IBO. It is another level, such as the *future hires*. Gordon talked about *future hires* as if everyone understands why *future hires* belong in the equation. People have asked me, "Why are you concerned about *future hires*. We don't have to hire the people and we can't quite see that liability." There is a cost associated with *future hires* and the present value of that cost is in today's stock price. Investors have figured out you're going to hire those people. They price the stock accordingly so you owe them money. You can avoid that liability, of course, by reversing your decision to make the *future hires*; then, if it was a good decision, our stock price comes back down. If it was a bad decision, you'll watch the stock price rise.

Now let's think about the economic liability in terms of what we need to do to figure out the matching asset type. In the framework that I'm using, you really need to figure out the mean or expected return, standard deviation or risk, and the correlations of the liability with every asset that you could conceivably buy—stocks, bonds, real estate, venture capital, or index bonds. In order to do that we need to determine the type of asset. We need a model that's called the liability asset. What are the characteristics of this asset? One is inflation risk. There's also discount rate risk, which is mainly interest rate risk, but it could be at a real rate. Inflation and real rate risk are somewhat different. Real rate risk isn't very important but it could be important in a peculiar period like the present when real rates are extraordinarily high. Macroeconomic risk is the risk that the liabilities will rise if the company does well or that the stock market will do poorly and the pension will have a poorly funded status or won't have any money because the economy is doing poorly. Finally, there is the risk that the actuarial estimates of the liability are subject to statistical estimation error. That's the final level of risk but we can't really address that. I don't know how.

To get a model of the parsimonious or short model of economic liability, it's really necessary to define the liability as something like a mixture of assets because that's the only framework that makes sense. The bond ladder expresses the fixed nature of the relatively well-known liabilities. The stock market captures the general road in both the economy, which would affect the growth of liabilities to the company's prosperity and the *future hires*. Also, the stock market representing claims through assets in the real economy is an inflation hedge over a very long run. Over the short run, the stock market does poorly when there's inflation, but over the long run, it plays catch up in its inflation hedge.

Finally, an industry index and company stock are part of the liability assets. The industry index, because it supposes the increasing liabilities that are associated with the growth of the industry. Look at the semiconductor industry in the 1970s. You were in that and say, well, what's our main risk? The risk is we're going to have a great deal of liabilities because the industry is going to grow. People are going to start becoming highly paid. We're going to have to pay more to get workers. The skills for workers who are in the semiconductor industry are rare and they're going to become rarer because it takes a few years to develop an expert in something. As a result, we're going to have higher and higher factory costs and then we're going to have to pay these people and index their pensions to these high paychecks.

Regardless of whether your own company is successful, the success of the industry is very important. For obvious reasons, the company's own success is directly related to the growth of liabilities.

There may be some people here from public plans, foundations or endowments. All of these corporate issues are a little bit less relevant and I hope that you get something out of this discussion. For public plans, the equivalent of corporate risk is tax-based risk. I live in Illinois. There are a lot of industries leaving Illinois. It's comparable to a declining industry such as the steel industry. In order to determine for this liability asset, how many bonds are in the bond ladder, how much money is in the stock market and so forth, you have to kind of impressionistically look at each one of these issues. If most of the beneficiaries are retired with Bethlehem Steel, you'll see more bonds. When you're at termination, you just want to pay your bills and you just want to immunize the cash flow and dedicate the cash flows. If you have a young workforce there's more time, more stocks, and more inflation hedges. If the liabilities are nominated in the foreign currency, you're paying pensions to Mexicans. You want to own some of those Mexican stocks. If the industry is expected to do well, you may want to increase the amount of industry exposure in the liability assets to capture the fact that it's going to grow relative to the economy. This is a very long list and you wouldn't really do this detailed a study unless it was very important to get the policy very carefully focused on custom tailoring the asset/liability portfolio to all the respective needs of the company. But this gives you an idea of how a corporate financial manager might think about managing the liability asset so that you can at least understand it.

If you've identified the liability asset on a pension balance sheet and put it where it says pension liabilities (PL), and if you hold an asset with the same characteristics, the same factor exposures, the same stock, bonds, and cash rates, it goes in pension assets and you will have a perfectly balanced asset/liability portfolio. But have you done your job for the employees or the beneficiaries? Have you done your job for the shareholders? This balance sheet would show you have not. The purpose of the company is to make money for the shareholders. The shareholders own all these assets, the corporate project, the pension assets and the shareholders have the responsibilities. They have to pay the employees. The shareholders have to pay the bondholders and the shareholders have to keep something for themselves, earn a fair rate of return on their investment after they stop being shareholders and find another firm to invest in. The employees like to keep their jobs. If the company is exposed to risk through the pension plan, that increases the likelihood of companies having any trouble. So the shareholders' and the employees' interests are usually very closely aligned.

In the case of corporate pension plan management, there's every reason to manage the pension assets in a way that helps the assets to be as large as possible for the pension and the corporate balance sheet combined. The corporate surplus, the net worth, and the equity should be as large as possible. The fact that employees are often paid to a certain extent in company stock with stock option plans, incentive stock options (ISOs) and bonuses related to corporate performance that aren't stocks but they might as well be shows that corporate financial managers really believe in this model of aligning employee and shareholder interest. And I'm supposing that pension assets be managed that way to maximize employee and shareholder return,

ASSET/LIABILITY MATCHING—EXPERIENCED CONSULTANT'S VIEWPOINT

too. What does it mean to do that? It means to glean away a little from building up this liability asset and holding that asset to diversify away some of the risk. Let's say that maximizes corporate equity. Are the assets of the company, plus the assets of the pension plan, minus the economic liabilities of the pension plan, minus the bonds enough? Optimize on the whole company all at once. You get a very different answer than when you optimize on the pension surplus. Why? The risk that the company is going to grow and create a very large liability becomes less important. If the company grows, everybody's happy. If the company does poorly, the pension plan may be underfunded and may not have enough money to make the cash contributions. People were getting laid off. They're getting their pensions early before the capital accumulation in the markets have had time to create any real money for them. The Pension Benefit Guaranty Corporation (PBGC) might have to pay some of the bill and it is not in such great shape. Employees should be very concerned about the asset side of the corporate balance sheet deteriorating. If you're in the steel industry rather than holding company stock, hold assets that do exactly the opposite of what steel company stocks do. Hold more foreign stocks. That's a hedge against being exposed to the risk of doing business in the U.S.

If I worked for GM I would be very worried for three reasons. People are buying just as many cars as they ever have, but Toyota and Volkswagen are starting to wake up and figure out how to build a Saturn cheaply and they're going to put me out of a job. That's without any change in the industry. Just competition within the industry for market share is one level of risk. Now when competition hurts the auto industry, trains and airlines do well. The airline industry is having a wonderful time. I got here for \$58. I can't even drive here for \$58. So reduced demands for cars hurt the auto industry. Now it doesn't matter whether it's Toyota or Volkswagen that is starting to wake up. I may be out of a job no matter what I do as long as my skills are mainly helpful to the car industry. So I'm worried about that risk. Finally, suppose people don't have any money to buy cars or clothes. Suppose there's a depression. I'm worried about that risk, too.

What should I do? I should ask my corporate pension plan manager to get rid of GM stock. Incentive stock options has me overweighted in the stuff anyway and I want to diversify away that risk and so I want to load up on Toyota and Volkswagen or Electronic Data Systems (EDS) stock. Well, that's a risk. You know more about that than I do. What's been going on with the stock?

MR. GOULD: GM is contributing a big block of Class E stock, which I guess substantively is not auto industry stock, although GM does control EDS. I just thought it was an interesting contrast that here we are talking about diversifying away certain risks and GM has gone and dumped six billion dollars worth of EDS stock into their pension portfolio and everyone's applauding.

MR. SIEGEL: Well, it beats not having any stock. It's a very undiversified position. The auto industry should receive a low rate in this portfolio. If I'm concerned about a depression, I shouldn't hold a big investment in stock. If I'm concerned about inflation, I shouldn't hold a big weight in bonds.

Well, it's sort of a big picture. Let's think about the whole company. Let's think about the employee's life. You get a very different answer if you think about the

structure of the liability asset. You almost get two completely different answers. Now what can you do? I don't know. Some people suggested that managing the pension plan in a way that might benefit the shareholders is against the law. ERISA imposes an exclusive benefit rule on you. This helps the beneficiaries and it won't hurt the shareholders. Someone could raise the point that it helps the shareholders and won't hurt the beneficiaries. In that case, if that's the position, the corporate-risk approach to pension management could have some legal difficulty. I hope it doesn't, because it's right. But which is more important? That has to be decided on a company-by-company basis. Perhaps your client is a company or you work for the treasury of the company. If you're more concerned that you're going to grow a great deal or do very well, but have a really big pile of liabilities that are going to be harder to defease, then you should focus on the asset/liability part of the equation and hold more assets to the likely liability. If you believe that the main risk is that you're going to do very poorly and that your liabilities aren't going to be all that big, but your assets are going to be very small, then you should focus on the amended balance sheet or corporate-risk side of the equation. And without studying your company on a case-by-case basis, all I can do is say please think about that issue.

MR. GERARD C. MINGIONE: I have a question for both of you because you both mentioned that you think that equity has a very low duration and it matches one- or two-year bonds. Isn't it true that corporate equity doesn't really match the return structure of any bonds at all and that just because we have a closer relationship with the one- and two-year bonds it is, in fact, gross and it's also not very close to 10-, and 20-, and 30-year bonds? Do you think that's an incorrect characterization?

MR. SIEGEL: I think it's exactly right. An equity has almost no relation to any bond. One or two years is the best fit, and it's a very poor test.

MR. GOULD: I would just add to that my personal intuition is that the real duration of equities is more like zero because of the point that you just raised; there's so much random noise going on in the stock market that I don't see the fit as being particularly strong or compelling with any duration of any bond.

MR. SIEGEL: It may depend on the equity. If there's very little leverage in the company, then the equity would be more bond-like. If the equity's a highly leveraged company, then it would have no bond characteristics at all and neither would the bond.

MR. CHARLES E. DEAN, JR.: This question is also directed to both of you. I was very struck with the fact that there are different possible measures of obligation, and that there isn't one that's clearly the best. It's in the eye of the beholder and I think many holders wouldn't even be able to come up with the final clear distinction and evidentially the asset, the optimum asset allocation derived from those different liability measures can differ radically. If you're explaining all this to clients, what level of understanding is there going to be and do they find this whole exercise valuable or do they say I really can't make any decisions from this because everything depends on everything else and there's no firm position to measure it from.

MR. SIEGEL: I think that a presentation to a client has to achieve focus. You have to decide what the client can understand and might think is important and then

ASSET/LIABILITY MATCHING—EXPERIENCED CONSULTANT’S VIEWPOINT

present your answer. If you’re trying to present an answer that’s somewhere between the PBO and the IBO and not worrying too much about future hires, then you should say that and not show the entire range of possibilities because that could paralyze the client. You have to present an answer.

MR. GOULD: The only thing I would add is try to get plan sponsors to focus on which risk they’re most concerned with. If it’s the short-term risk of fluctuations and expense or potential balance sheet implications, then they’re really concerned about an ABO type of measure, irrespective of whether that’s what makes sense. The least we can do is show them that series of implied allocations depending on which measure you’re focusing on and perhaps get the feedback from them as to which risk they really are most concerned with.

