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NEW DEVELOPMENTS IN FIXED INCOME INVESTMENTS

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This session will cover new "fixed" income investments and new ramifications of traditional investments suitable for pension and savings funds. Discussions will include investments such as:

- Mortgage-backed securities
- Discount bonds
- "Junk" bonds
- Convertible issues
- Various forms of Guaranteed Income contracts
- Equity fund with guaranteed yield

MR. YUAN CHANG: It's been no secret that the fixed income market has been extremely volatile of late. Come to think of it, the calmness of 1983 was really the calm before the storm. This volatility really started back in the '70s, aided and abetted by deregulation in the banking field; so that the banks have the so-called level playing field, and in this kind of environment, the great American ingenuity really took off.

You know there was the day when fixed income securities were just pieces of paper that said you lend somebody some money and you're going to get it back, and for that you get a compensation. Now this compensation couldn't be very high either. In fact, the only place that you found it was high is the same place where if you didn't pay back, they'd break your legs.

Then came the idea that principal is paid back on a predetermined schedule for a long period of time. Believe it or not, the form of today's mortgages had not always existed. Now what do we have? We package the things and sell them as securities - GNMA's, FNMA's, Sally Mae's, CitiMacs, and whoever else wants to attend the party. In fact it's one place where you can be the life of the party the minute you are conceived.

But that's not all. We now take a security and try to carve it up like an Angus steer. We can sell the principal, we can sell a stream of income, we can sell part of a stream of income, and we can take part of the stream of income and combine it with some principal and sell that. I don't know how true it is; I was told that if you take an earthworm and chop it up into pieces, every part will remain alive.

I also want to call to your attention to another phenomenon: a blurring of the lines between fixed income securities and equities. The fixed income investment used to be the haven for widows and orphans, and equities a place not for the faint heart. Now a simple preferred stock is really an equity-based fixed income investment, sort of a wolf in sheep's clothing. But the volatility has changed the sheep into the image, if not the substance, of a

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wolf anyway. So equities begin to appear in the form of fixed income through guarantees, and you'll see an example of that today. Convertibles, junk bonds, etc., really require a lot more of the analysis that's appropriate for equities than it is for fixed income instruments.

Let me also mention futures, options, options on futures, and maybe someday futures on options. While this is not a session designed to go into these instruments, they are, of course, being used in conjunction with fixed investment income. After you hear all the speakers, I'd like you to keep one thing in perspective: remember that all these devices, interesting as they are, are all designed to seek lower risk or enhanced yield. That is the basic purpose.

MR. JOSEPH MACAULAY: New developments in fixed income investments are more recent uses of some old strategies. They have become popular now because of the current level of interest rates. The main point I'll be addressing is a way of reducing either the cost of a pension plan to a plan sponsor, or increasing the certainty of a moderate cost level. None of these processes guarantees the lowest total cost over a long run, but they remove variability. Many plan sponsors want to remove as much variability as they can. These strategies could dramatically reduce the cost if that is what the plan sponsor wants to do. This is probably the usual reason most plan sponsors get involved.

Most of the strategies involve making a guaranteed or more assured provision for the retired life liabilities. Some of the strategies also can make reasonable provision for active lives. I'm not addressing the situation of a plan sponsor terminating a pension plan and using single purchase annuities to obtain a reversion; that's a special case. After providing a guarantee for retired life liabilities, the plan's actuary can exclude the liabilities and the assets underlying them. This should produce a one-time gain for the difference between what he was carrying the liability at and what it would cost to buy it.

The normal approach of an ongoing plan would be to buy single premium annuities for at least a significant group, if not all, of the retireds, and possibly the terminated vesteds. They'd purchase the annuities from a life company and take the guarantee away from the sponsor. In the normal approach, the insurance company assumes all administrative functions, and there is really no further contact between the plan sponsor and the retirees concerning retirement benefits. A secondary effect is that under current interpretation, the participants would no longer be retired participants on Form 5500, and Pension Benefit Guarantee Corporation (PBGC) premiums for these retireds are no longer required.

Now buying the single purchase annuities involves a significant number of simple steps which can evolve into complex processes. First you have to assemble complete data on your retired personnel: all birthdates, sex data, options, forms, etc., have to be made available. For some plans this is a significant task because their actuary has previously been making some assumptions. For the retirees it shouldn't be too difficult because you're already drawing checks. This is done as of a specific date and normally

produced in machine-readable format if it's a large group. You also have to put together a complete specification package showing the exact meaning of the options and everything that the insurers would need to use to bid on this. Usually you would have a consultant handle the work because it really can become complex. Then you put together the package with a bid letter, send it to the insurance companies you're going to ask to bid on your business, and tell them whom to call with questions - and they'll get questions.

One caution: some plan sponsors are not going to be comfortable working with certain companies for a variety of reasons. For different people this level of comfort is at different places on the spectrum. Some people might only be comfortable working with the ten or fifteen largest companies. Some plans are big enough where only the very large companies will want to do business with them. An important thing is don't waste your time asking an insurance company to bid on your business that you would not be willing to give your business. You're wasting their time, your time, and your consultant's time.

Now you've sent in your material and you've given the insurance company time to respond, normally almost a month to make the bid. Usually the bid would be for taking over payments three or four months after that or some other convenient date like the upcoming January 1st, for tax reasons. Frequently it's a two-round bidding situation: all of the companies send in their bids and you screen, let's say, the five carriers that you're really willing to go with for a second round. If it's a large case, most of the bids are now done on the basis that they are good for not more than one day and frequently less. You have a short meeting time in which you're going to accept the bids, you pick the insurer and then you start the process of transferring the money and real data. There's usually a period of a few months where the insurance company and you have an agreement to adjust for minor changes (e.g., dates of birth). (On the ones the Hancock has sold, we've run for as much as a year before all of the little problems are cleared up.)

This produces a large and easy-to-determine drop in liabilities for the pension plan.

The next option is cash flow matching or dedication. This is popular for very large plans. One reason is that frequently they want to keep in touch with their employees. Another is they may want to retain the option for unwinding the deal at some point. Finally, they may have other reasons for not wanting to turn over everything to the insurance companies.

The general arrangement is to purchase a portfolio of bonds which will produce cash flows to either exactly match or closely match the projected cash flows of the retirees. In some instances it includes a projection of what you would expect to happen for the active lives. You'll usually produce a match for at least ten years and frequently 20 years. The reason why this process is popular is it produces most, if not all, of the savings of a single purchase annuity. It allows future flexibility because you can make a change. If you decide to change your investment philosophy once you've bought single purchase annuities, you're locked in; here you have an opportunity later to rededicate. You can also change your philosophy on what you want to do for bond quality, etc., and possibly take money out.

In order to make it work, the first thing you need is to have your consultant generate a projection of cash flow, including both payouts and anticipated receipts, if any, for at least the next ten or 20 years. The cash flow is then provided to a number of investment bankers, brokers, etc. Some insurance companies' investment arms can also bid on this. They will then try to match a group of bond investments, strips, special investments, or any type that you've agreed to accept. They will try to match it exactly to your specifications. The way they do it is by running a computer model, overnight usually; and at the opening of business in the morning, they will come out with a bid. Usually these can be firm bids and as long as you're willing to accept them by the opening of the bond market, the deal can be made.

You may also have to give them other information in addition to the cash flow. For example, you have to give them limitations on the type of investments, if you have any. For example, some plans for political and other reasons don't want to have anything to do with investments in South Africa or Northern Ireland. There may also be comfort restrictions, such as single A or better bonds at issuance. So you have to give those restrictions.

Now the real test of the capability of this system is the size of the universe of the bonds that the people doing the calculation for you have - the larger the universe of bonds, the better chance they're going to have to have the winning bid. Many of the larger investment bankers have thousands of bonds, all of which have been priced and run into their model. For a large simulation these models can take quite a few hours to run, but it's simply computer time and that's one of the cheapest items these days, especially on an overnight basis.

This is total cash flow matching or dedication.

There are a couple of other approaches. You can go straight toward immunization or duration matching. This involves matching the investment time horizons of the assets of your portfolio with the duration of the liabilities, so that the value of the portfolio will not change as interest rates move up or down. This only holds for small parallel shifts of the yield curve. When yield curve shifts are large, the portfolio experiences a profit or loss depending on the dispersion, or convexity, of the portfolio. Finally, the portfolio must be continually rebalanced to maintain the chosen time horizon.

Another approach is called combination matching. This does a tight match for the first five or ten years, and duration matching thereafter. There's a number of reasons why this would be useful. One is that locking in the cash flows beyond five years sort of ties the hands of the plan sponsors for what they might want to do with regard to benefit increases or other things of this type. It's also a very expensive process to exactly match payments that are not necessarily exact. Combination matching is easier to buy for. It's usually cheaper than full dedication because you're duration matching beyond five or ten years. It is not necessarily as cheap as pure immunization; however, it does work better if you are not totally sure of your plans. It also gives you a few years versus duration matching to avoid rededicating, but you can wait and you can rededicate at that point.

The certainty is less and it's a less strong fit. The whole concern you have if you're trying to save money is convincing your enrolled actuary (the hat I'm wearing at the moment) that this is good enough to allow it to be considered as good as a single purchase annuity, so you can exclude both sides. If the actuary is convinced that the package is close enough, that will work. Otherwise, you need to go to changing the interest assumptions of the pension plan, which is not as good or as thorough a way of reducing costs.

A third approach is to buy a guaranteed stream from an insurance company that would do the same thing as a dedicated stream. This puts the plan sponsor on the risk for variations in the stream, and puts the insurance company on the interest risk. A major advantage of this might be that in the current GIC pricing environment, this might be cheaper than the dedicated stream. Disadvantages? Well, it isn't a dedicated portfolio, and you have the insurance company contract restrictions on how you get out of it. It doesn't have great liquidity. It does allow you an advantage over single purchase annuities. If you want to retain some control in writing the checks, it seems silly to have to buy and take all of the expenses of single purchase annuities if you're still doing the checks and other administrative functions.

What can happen if we do a single purchase? We'll assume for the moment that a single purchase or a dedication would have approximately the same cost; there'll be variations, but let's assume approximately the same cost.

You have a retired life liability, GAM '71 at 7-1/2% at $10 million (Exhibit I). You go out and you get bids; a single purchase annuity happens to be priced at 13-1/2%, GAM '71 set back a couple of years; that costs you $7,823,000, or $2,175,000 less than what you're carrying the liability on your books. We're assuming entry age normal funding method for convenience. (Frozen initial liability works a little bit differently, but not a lot.) You buy the annuities, your assets go down by the $7,823,000, your liabilities go down by the $10 million. Your unfunded, therefore, drops from $6,800,000 to $4,600,000; your normal cost stays the same. I took a 20-year amortization of the difference. There's a gain of $200,000. (Actually, you have to take a 15-year amortization of the unfunded difference, but I was looking at where you would save.)

Now if your actuary can be convinced on a dedication that it has the same impact, the results would be the same.

Now for another option. Same pension plan. I'd call this unit credit, but the official word is accrued benefit cost method (Exhibit II)(some of these present values are not normally shown in a single statement). You basically do the same thing; you have a large gain, but now your unfunded has gone negative. Full funding limitation says you have a zero cost, so that's a possible impact. This would be one way to get a zero, if that's what you want. You have the right to go from entry age normal, if you want, to unit credit. And you could therefore generate a zero cost.

Exhibit III pulls both methods together. The total cost on the current EAN is $981,000. You can save $200,000 - this is an annual cost right now - or you could convert to unit credit and at least temporarily have a zero cost for this year and a cost of about $300,000 for next year. (This is what you'd have from an IRS requirement, possibly.)

However, one must assume that your company is big enough to be regulated by the SEC. The accountants aren't totally quiet. Basically you have to have a cost level for comparability, according to the accountants. The generally accepted accounting principle statements are all on old APB-8. You could have some problems if suddenly you tried to make this change and you hadn't consulted your outside auditors. If you have been in the habit of expensing on your financials exactly what you've put into the pension plan, this approach will probably cause you some problems with the outside auditors. They're going to want to amortize that gain. You'd have to amortize that gain over somewhere between ten and thirty years. You could have a situation where if you were on unit credit, you'd have a full funding limitation by making the move. You couldn't deduct anything, but you would have to expense on your financial statements that were used for SEC and publications as if you had made some expense; and then you'd have a liability for an expense that had not yet been paid. So, don't just go running off; you've got to make sure to set up everything well with your accountants beforehand.

One last topic I have is other uses for guaranteed interest contracts. The life insurance company guaranteed interest contract has a number of advantages, and some disadvantages, for defined benefit pension plans. The major advantage is you can get the equivalent of a zero coupon bond at an interest rate that is probably higher than a CAT or a TIGR or any other zero coupon bonds you can buy. Since you don't have a tax situation, you can use zero coupon bonds.

It gives you a high rate of interest that's guaranteed - your actuary can use it to raise your overall interest rate. The insurance company stands behind the guarantee and gives you an advantage against default if you're really worried about it. In this current interest market the rate you can get is usually at least 50 basis points beyond a zero, and could be more than that depending on the day-to-day competitiveness of the marketplace. It would give you an assured interest rate for a significant period, and many plans have found this desirable at least for a portion of their portfolio.

Disadvantages? If you do this instead of buying a zero coupon bond in the market, you're locked into the insurance contract. There are provisions in some of them for asking out before maturity. However, the provisions are not necessarily the ones you'd prefer. Another problem is you're in the fixed income area: since you've bought something moderately long, you are therefore taking an interest rate risk.

All of these things are really not new. We saw immunization and dedication being done in the early '80's. We saw single purchase annuities being used occasionally. The major differences today are that single purchase annuity rates have now gotten in the same neighborhood as GIC rates. So people sometimes make use of single purchase annuities where they weren't financially feasible before. You've also found the insurance companies are very competitive, and computer systems have improved so that the bankers can do very close projections and matches.

Basically, the world has changed slightly. It's now more efficient; it can be done better. That's why these strategies are becoming more popular.

Depending on how you believe the election is going to come out if you listened to our speaker this morning, sometime after Mondale gets elected you might want to immunize your portfolio since the bond market is supposed to go boom about that point. Or if you think Reagan is going to get re-elected, you probably should do it before the Fall, because you may think rates have peaked. Interest rates are now approaching the highest levels they've been on long-term investments, and this is a time when many people decide to make use of the fixed income investments.

MR. MARTIN RUBY: The purpose of my talk is to present some of the current developments in the fixed income field that are applicable to pension funds and insurance company group pension and other products.

This is not a very easy task because of the explosion of investment ideas that has occurred over the last few years. I am sure that even as I speak there is some clever young institutional bond manager deep in the bowels of a Salomon Brothers or Goldman Sachs who is cooking up a new idea that will cause some of my comments to be obsolete by next week!

However, recognizing this risk, I am still brave enough to talk about four developments that I think are representative of the changes occurring in the fixed income field. As Yuan mentioned, my company does not operate in New York; and as a result some of these techniques perhaps could not be used by New York companies unless they were in a separate account. But other states are taking a different view of the conservatism provided by some of these hedging techniques, particularly with financial futures, and do allow them.

The four items I will be discussing are financial futures, junk bonds, stripped Treasuries, and a unique short-term strategy using covered call options. I will touch on not just how these investments can be used directly, but how they can be applied to produce some highly innovative insurance company products aimed at the pension and savings market. My focus will be more on the investments rather than actuarial implications of the investments. It's important for actuaries to be more comfortable with these concepts.

The first investment area is financial futures. The one I will be focusing on is the Treasury bond futures contract, since this is the most useful contract in hedging long-term bonds.

First, what is a futures contract? A futures contract is a firm commitment to make or take delivery of a standardized amount of a commodity (in this case a financial instrument). Long-term U. S. Treasury bond futures are futures contracts calling for delivery of long-term bonds issued by the U. S. Treasury. Futures contracts in U. S. Government debt are not obligations of the U. S. Treasury.

Some of the highlights of the U. S. Treasury bond futures contract include (Exhibit IV):

- The basic trading unit is a $100,000 par value Treasury Bond.

- The standard deliverable contract is a Treasury bond of at least 15 years' maturity, and it trades at a coupon of 8% or an equivalent. There are actually conversion factors to convert other coupons to the standard 8% coupon deliverable contract.

- They're quoted as a percentage of par. So a $100 par contract would be trading in that case at 94 and 1/32nd.

- The contracts are traded on the Chicago Board of Trade and are allowed to fluctuate 2 points either way every day and a minimum fluctuation per bid is 1/32nd of a point.

- What makes futures so useful for hedging is that to buy or sell a contract, say $59,000 based on the current level of interest rates, you only have to put up $2,000 of interest margin. Each day each contract is marked to market, and if you've made money during the day because of the way interest rates have gone, that's added to your margin account. If you've lost money, you have to add that amount to the margin account if it falls below $1,500. But the real key is that the cost of that is minimal compared to the size of the contract you can command.

Next I'll describe some simplified examples of how futures actually work. Below is an example of a long hedge:

THE LONG HEDGE

Cash Market	Futures Market
April 1	**April 1**
Wants to take advantage of today's higher yield level on 20-year 8-1/4% Treasury bonds at 68-14	Buys 10 September bond futures contracts at 68-10
July 2	**July 2**
Buys $1 million of 20-year 8-1/4% Treasury bonds at 82-13 (yielding 10.14)	Sells 10 September bond futures contracts at 80-07
Loss: $139,687.50	**Gain: $119,062.50**

In this example, on the left is a cash market, and on the right is a futures market. You're now at April 1. Let's say that you are a bond manager and you're holding some Treasury bonds. In this case you think that interest rates are going to go down. Let's say you're managing a pension fund and you have been told by your client that you'll be getting $1 million in July. If I had that money right now, I could lock it up in high-term yields. But I don't have the money right now, so what could I do?

What you can do is on April 1, go on the right-hand column and buy ten September bond futures at 68 10/32. July 2nd comes around and you now receive your million dollars and invest it in Treasury bonds. Interest rates have fallen, so at that time a Treasury bond will cost you 82 13/32. So the Treasury bond price has gone up by $139,000 over that few months' period. Because you were in the futures contract, which again only cost a small fraction to purchase, you were able to retain that higher yield by making a profit by selling out the futures contract on July 2nd. So you've used the gain in the futures market to offset the price rise that occurred in the cash market.

Below is an example of a short hedge:

THE SHORT HEDGE

Cash Market	**Futures Market**
October 1	**October 1**
Holds $1 million 20-year 8-3/4% Treasury bonds priced at 94-26 (yield 9.25%)	Sells 10 Treasury bond futures contracts at 86-28
October 31	**October 31**
Prices for bonds fall to 86-16 (yield 10.29%)	Buys 10 U.S. Treasury bond futures at 79-26
Loss: $83,125.00	**Gain: $70,625.00**

Now with the short hedge, you sell rather than buy the futures contract. In this one, let's say on October 1 you hold $1 million of par value Treasury bonds, currently priced at 94 26/32. You think that interest rates are going to go up. You don't want to go through the expense and trouble of selling off all your bonds, but you don't want to subject this long-term portfolio to the possibility of capital losses. What you could do is go out in the bond futures market and sell ten Treasury bond futures that are then selling at 86 28/32. Sure enough, a month later interest rates do rise; your bonds that you're holding in your portfolio now are only worth 86 16/32, resulting in a loss of $83,000; but you've shorted the futures, which means you can buy back now what you sold before, and you have a gain there of $70,000, offsetting most of the loss that occurred on your cash portfolio. Thus, a use for the short hedge is a way for a pension fund manager to protect the value of his long-term Treasury bonds from rising interest rates.

An example of a cross-hedge is:

THE CROSS HEDGE

Cash Market	**Futures Market**
January 2	**January 2**
Holds $5 million high-grade corporate bonds with a market value of $3,673,437.50 (a price of 73-15 per bond)	Sells 50 U.S. Treasury bond contracts at 81-20
March 14	**March 14**
Value of bonds declines to $3,220,312.50 (a price of 64-13 per bond) **Loss: $453,125.00**	Buys 50 U.S. Treasury bond contracts at 69-20 **Gain: $600,000.00**

In this example, what you're holding is not Treasury bonds, but a mixture of industrial or utility bonds. This is very typical of any insurance company portfolio. Here the bond manager is looking at $5 million of par value bonds which in the market are now worth 73 15/32 per bond. And again the premise here is that the bond trader feels very strongly that interest rates are about to go up. In order to protect his portfolio, he would sell, or short, 50 U. S. Treasury bond futures contracts which are at 81 20/32. Sure enough, as this is a perfect world here, a few months later he calls it right again. This bond portfolio lost $450,000 of market value, but now he can buy it back as Treasury bond futures at a cheaper price than what he sold them for. This more than offsets that loss with a gain of $600,000.

In addition, a short hedge combined with long-term bonds can provide an attractive investment strategy to develop the so-called liquid GIC's which have indexed interest rates and provide very favorable withdrawal rights at book value.

These are simplified examples of how financial futures can be used. In real life, there are a number of risks which must be considered before plunging into this market. One thing that futures are not is a sure-fired, management-free way to remove risks from an investment portfolio. In fact, my company has found them to be a very management-intensive type of investment which requires daily attention.

In general, some of the risks and costs associated with financial futures spreads are:

- Basis Risk - both cash vs. futures and quality spreads.
- Variation Margin - the gain or loss caused by the contract being marked to market each day.

- Hedging Inefficiencies - managed by the Hedge Ratio.
- Convergence

Now think about what you have when you buy a futures contract. What you have is the right, or actually the obligation, to take delivery of Treasury bonds at some future date. However, during the period you're holding that contract, the futures contract may not move precisely the way the cash instrument does. And in fact, if it doesn't move precisely the same way, there may be some inefficiency there. The top part of Exhibit V shows fluctuations in 14% Treasury bonds over a several months' period, and the middle line shows comparable moves in the Treasury bond futures contract. The last, smaller line at the very bottom shows the spread between the cash yield and futures yield over a period of time. As you can see, it fluctuated between a low and a high of over 250 basis points. So there is a considerable risk here that has to be considered.

The next kind of risk is what I call a quality risk; and this is an even more pronounced and probably more common risk. Most portfolios that you're trying to hedge with Treasury bond futures will probably be in something other than Treasury bonds. What I've done here (Exhibit VI) is track the yields on long-term single A industrials to Treasuries to show how that yield spread can change over time; and currently that yield spread is around 100 basis points. In 1982 it reached as high as 250 basis points. So there you run the risk that the cash instrument you hold, let's say industrial bonds, can move one way because of the relative spread difference, and the Treasury bond future can move the opposite way. So you're not only not hedging, but you're actually making it even worse than if you had done nothing at all. This just points up the need to constantly monitor yield spreads and be alert to required portfolio adjustments when yield spreads change.

An example of this occurred a few months ago when spreads between Treasuries and utilities were at a very low level. My company has a fair amount of utility bonds that are hedged with Treasury bond futures. It was feared that as the yield relation returned to its more normal relationship, utility rates would go up faster than Treasury rates. Thus, we would lose more on the value of our bond portfolio than we would make on being short in Treasury bond futures. As a result we shifted a portion of the portfolio into industrials where the yield relationship was better. This enabled us to avoid substantial market value losses which we would otherwise have incurred.

Exhibit VII demonstrates some of the inefficiency of hedging and the need to control this by varying the hedge ratio.

If you look at the top example, an unweighted hedge, here we hold $1 million worth of Treasury bonds at par value, and we simply sell ten Treasury bond futures contracts. Because the proportions were not adjusted right, even though the par values were equal, the market values aren't; in fact, the hedge is not very efficient. In this example the loss in the cash instrument is $128,000; the gain is only $108,000, for a net loss of $20,000.

In the second example, at the bottom, instead of ten Treasury bond futures contracts, you sell twelve. In other words, you line up the market value rather than the par value of the contracts. It turns out to be almost a breakeven situation.

Again, the hedge ratio - that ratio of how much of your portfolio do you hedge - is a tool you can use and must constantly vary, depending on all factors I've mentioned to make sure that your hedge is working properly.

The two graphs in Exhibit VIII illustrate the concept of convergence. It is at first a difficult concept to understand, but it is also the costliest aspect of using futures.

Futures contracts do not normally trade at cash for a variety of reasons, one of the major ones being convergence. Convergence can be thought of as the cost to carry the cash instrument as an alternative to buying the futures contract.

For example, say the yield curve is positive as in the top graph. Then the futures contract will tend to trade at a discount to cash because the next best investment is to borrow cash at a short-term rate and buy long-term Treasury bonds. This would result in a "profit" based on the difference between long- and short-term rates. Accordingly, buyers of the futures contract will tend to bid down the price until it can roughly equate to this next-best alternative.

However, as the futures contract approaches delivery date, the contract will converge toward the cash price of Treasury bonds, since those are the deliverable instruments. This means that even if interest rates don't change, the price of the futures contract will increase as it approaches its delivery date.

In a negative yield curve situation, the exact opposite happens. Here, you buy the futures contract at a premium, and it will tend to go downward toward the cash price as the delivery date approaches. In the top example, the 100 on the top left is the cash price, and depending on the delivery date of the futures contract, you're paying to buy that contract at more and more of a discount. If you want to buy a futures contract deliverable in March, you pay 98; in June, 96; and so forth. But if interest rates don't change between now and then, the value of your futures contract will go up until it reaches the 100, where it's deliverable.

Now you'll probably say, "Why is this so bad since I'll make an automatic profit on my futures contract?" Well, that's not necessarily true. Suppose you're using the futures contract as a hedge against your long-term portfolio, which means that what you've done is short the futures contract. In that case, let's say you're selling a futures contract in March at 98, and interest rates don't change. You're going to have to buy it back at 100. So you'll lose money on that hedge, even though no interest rates changed.

Of course the way to guard against that is by varying the hedge ratio; and, if you're using this to price an insurance company product, for example, you can price in the cost of this convergence.

Well, let's go from the world of the futures to the world of junk. Junk bonds, that is.

In an effort to clean up the image of junk bonds, I am proposing a revised spelling which gives the term a certain amount of class. Investment houses and serious investors who have a greater need to impress clients have been using the term "high-yield bonds" instead.

What is a junk bond? The best definition I've seen is that they are issues which tend to trade more on their name or credit characteristics than on the general level of interest rates. Narrowly defined, they include all issues below investment grade (i.e., those rated Bal or lower by Moody's or BB+ or lower by Standard & Poor's).

Over the last eight years over 200 industrial and finance companies issued almost $20 billion of high-yield debt. Added to this are the large number of investment-grade issues which have dropped into this category because their ratings were lowered (a good example is nuclear utilities).

The basic premise behind investing in junk bonds is that they offer a substantial margin over yields of higher-rated securities without proportionately more risk. This basically boils down to a question of credit ratings versus fundamentals. A prime example of this is Chrysler bonds. When the company was teetering on bankruptcy, the bonds obviously traded at a very low level. Just as an equity portfolio manager examines the fundamentals of a company, the bond manager in this situation may have felt that Chrysler was going to pull through and was handsomely rewarded when Chrysler bonds were eventually upgraded.

A few studies have been done measuring the performance of junk bonds, even though the definition of what constitutes junk bonds makes this difficult. Basically, the studies look at what percentage of debt that eventually defaults and adds in missed interest payments.

The investment firm of Drexel, Burnham, Lambert, which is the principal player in this market, looked at the percentage of high-yield debt that resulted in bankruptcy and missed interest payments. During the period 1977-1982, this reduced yield annually by an average of less than 60 basis points. This is remarkable considering: (i) the severe recession we went through at that time; and (ii) the attractive yield spread between junk and investment-grade bonds which, during that period, ranged as high as 450 basis points or higher. So if you knew how to choose the right junk bonds, you were giving up on the average 60 basis points in default and missed interest payments, but you were getting an additional 450 basis points on extra spread.

One of the nice things about junk bonds is the possibility of "instant upgrades." This occurs when a higher-rated company acquires a lower-rated one. The bonds of the acquired company suddenly take on a new status that is not related to interest rate movements. Even when the acquiring company is not assuming the debt, these issues tend to trade higher if the acquiring company is investment grade.

A final word of advice in seeking good junk bond issues is to ask your equity portfolio manager. Many times an equity manager will be investing

in a certain stock and discover that the debt securities of the company are below investment grade. If the fundamentals are good enough to invest in common stock, then certainly one can justify investing in the company's debt.

Finally, Exhibit IX compares high-yield bonds' new issues spreads versus Treasury bonds to that of investment-grade bonds versus Treasuries during the 1983-1984 period. As you can see, the spread between junk and investment-grade bonds got as high as 450 basis points last June. This level of yield spread can support a lot of defaults until the overall yield on junk bonds would fall below investment-grade bonds.

My next topic is stripped Treasuries. These securities have grown in volume and popularity in the last few years, and I predict that investors will find new and varied uses as time goes on. These are representative of the whole category of zero coupon bonds.

Merrill Lynch started the big move into stripped Treasuries by introducing TIGR's or Treasury Investment Growth Receipts a few years ago. Other investment houses have followed with their versions and continued the feline-oriented acronyms. CATS and COUGARS are now on the market.

The idea is very simple. Merrill Lynch (for example) buys a large block of Treasury bonds and separates each coupon payment, as well as the coupon's principal amount due at maturity. A receipt is issued to the investor evidencing his purchase of a particular coupon in that series. Investment houses make a market in these instruments to maintain investor liquidity. You can thus pick your maturity and not have to worry about reinvestment in between.

The IRS does require that imputed interest be included as income on these investments and thus their use has mainly been in the tax-exempt area such as pension funds and IRA's.

One example of how these can be used is to immunize a bond portfolio backing a defined benefit pension plan. This is typically done when a company wants to lower its pension contribution. The actuary for the plan projects the fairly predictable retired life run-out and the investment manager locks in a yield on assets covering this liability by matching stripped Treasury maturities to the cash flow needs of the plan. This in turn allows the actuary to value the retired life liability using a higher interest rate and thus lowers cost.

A recent idea has been discussed which would have an insurance company internally strip bonds (not just Treasuries) by having various products use different portions of the bonds' flow of funds. This can result in some very attractive pricing assumptions, which in turn result in very competitive quotes.

The last strategy I'll discuss will not at first glance appear to be a fixed income strategy. This is the writing of covered call options on common stock. What I hope to show is that in a properly-managed program this can be used to improve short-term investment results without taking on an undue amount of risk.

Now a call is a type of option where the owner has the right (but not obligation) to buy a certain stock at a stated price during a stated period of time. The premise is that in the right kind of market one can purchase blue chip common stock, write calls against these and out-perform the short-term market because of the premium received from the call option.

Let's first look at some assumptions and I'll explain how this works.

Let's say that a money manager purchases 100 shares of AB Corporation at $50 per share in September. At the same time he writes an option against that portfolio. In other words, he sells off the right to some other investor to buy from him the AB stock he just bought and that option is sold for $6-1/2. It gives the holder of that option the right to buy that stock from him between now and November at $45 per share. Finally, assume AB Corporation pays $.50 per share quarterly dividend.

First of all, what happens if you hold the stock for three months and the option is exercised? (Exhibit X.) In this case you receive as income a dividend of $50; you've gotten your option premium (which is after commissions); and you've also received the difference between the purchase and exercise price. Remember here you bought the stock at $50 and you were forced to sell at $45. So you lost $5 per share plus commissions - this comes to $515. You netted $160 from that transaction. What you had invested was the purchase price of the stock plus commissions less the premium you received when you sold the option. And if you annualize that, you get a 15.4% return.

Now what happens if the option is exercised before the dividend is paid? (Exhibit XI.) Here I've assumed that rather than three months, it's exercised in the first one-and-a-half months. Again, while you don't get your dividend, you still get your option premium; and you still have to subtract off the difference between what you purchased the stock at and what you were forced to sell it at. So your net income from that transaction is $110; you still have the same investment, and thus your annualized yield is now 21.9%.

The last example assumes the option is not exercised. (Exhibit XII.) In this example I've assumed the stock dropped from $50 to $43. Here I get my dividend; I get my option premium; but now I want to sell out my stock and get out of this deal. I've lost $7 per share plus commissions. So I've lost $55 on the transaction, I have over $4,300 invested, and I've thus had an annualized loss at 4.9%.

The key to this entire strategy, using it as an alternative to short-term investments, is to pick a relationship between the premium paid on the option and the allowable amount a stock could drop, and still come out with a return more than short-term rates at that time. By doing this and doing it in the right market, we think (at least my company thinks) it's possible to increase the overall yield on our short-term portfolio without taking an undue amount of additional risk.

In conclusion, I think that all these strategies are now being used in various degrees by a number of financial institutions, insurance companies, money managers, banks, and so forth. And I think they're necessary in order to give a competitive edge in today's marketplace because if other

institutions are doing this and your company's not, your products and your investment performance may suffer as a result.

MR. RALPH TATE: I am indeed something of a fish out of water, neither an actuary nor a fixed income type. What I'm going to be talking about is going to seem like, I fear, a very strange sort of hybrid. What it is precisely is a product with a guaranteed minimum result, but a volatile nonguaranteeable potential result. At the Aetna, we have taken to calling it GEM - Guaranteed Equity Management. Generically it's called Dynamic Hedging or Dynamic Asset Allocation.

I am going to talk a little bit about dynamic hedging's theoretical background, discuss what that theory means through looking at some simulations, and finally talk about some applications that I believe are particularly interesting at this point in time, given the current market environment.

What is dynamic hedging or dynamic asset allocation? Most simply, it's a mechanical asset management technique that sets a mix of risk-free and equity or other volatile risky assets and rebalances that mix over time as the values change to accomplish certain minimum results. I need to emphasize here that it is neither market timing predictive sorts of processes or, if not predictive, at least probability based processes. It is a mathematical technique that is purely reactive.

The theory behind dynamic hedging really has its base in the work done by Fischer Black and Myron Scholes and others in the '70's. In 1981 in the Financial Analysts Journal, Mark Rubenstein and Hayne Leland of the University of California at Berkely wrote an article, the basic thrust of which was that it is possible to replicate the return patterns of an option either a put or a call option, through a mixture of stocks and cash if you allow yourself to revise the mix over time and in reaction to changes in values. Basically the point is that there is a replicating portfolio strategy that allows you to create synthetically any option, either an option that exists (traded on the Chicago Board of Exchange) or any option that you can imagine. The fact that this works, and is in fact of some practical value, is attested to daily by the activities of market makers on the CBOE and other options exchanges. (I had a gentleman tell me that it was the only piece of academic investment work that he knew that was the basis of personal fortunes.)

What we are going to focus on here is the put option, the ability to create synthetically a put on an instrument. As was noted before, a call is the right, but not the obligation, to buy, and a put is the right, but not the obligation, to sell an instrument at a price at a point in time. And since risk is such a focus on everything that we do in the investment business, puts intuitively have an enormous amount of interest as an instrument for managing portfolios.

The first graph (Exhibit XIII) obviously is the put return diagram, the returns for a put exercisable 10% below the current price of an instrument. The dotted line is the return line for that instrument. Obviously if you owned such a put and the instrument, your return, if the value of the instrument declined 10% or more, would be that -10%. Because at that point you would exercise the put sell the instrument down 10%, and be done.

On the upside you would participate fully; that is, you would not exercise the put, and hence would move up parallel to the underlying instrument's return, missing only the amount of premium you had paid to purchase the put.

One thing this does do is give you some interesting changes in the way probability returns get distributed (Exhibit XIV). Here, we show the probability distribution of a put at zero; that is, a no downside at current price put. What happens here is that the probabilities associated with loss of an instrument all pile up at the zero line. And above the zero line, where the put would not be exercised, the probabilities swap on a one-for-one basis with the probabilities associated with the normal curve that we've been almost hard-wired to believe exists for all investment instruments.

The interesting thing here is we now have to throw out a lot of the vocabulary we've learned about risk because of the skewness of this distribution; standard normal no longer tells us anything of much interest about risk. There is a standard deviation of this distribution, but we're no longer quite as interested as we were when it was a normal distribution.

Since puts exist on the public exchanges, why should we worry about this at all, or why should we think about creating them synthetically? One example I've already mentioned is that perhaps the puts on the options on the publicly traded exchanges may be mispriced. More importantly, if we recognize that we may not be talking about a single instrument, but instead can be talking about a portfolio, and a put on a portfolio, our interest ought to be a good deal higher. Again, we're talking about a mix of riskless instruments and a portfolio of risky instruments put together to create a synthetic put - a guaranteed minimum price, a stop-out, to eliminate the portfolio downside. And the elimination of that portfolio downside is at least worth another look.

How much experience have we with this? Well, real time experience is limited to a couple of years of operation, though enough to say that it does work as nearly as so short a period can prove it. What I've brought here is an example based on some simulation work that we've done (Exhibit XV). This uses the S&P 500, an index fund, the second column from the right, as the active or volatile portfolio and one-year bills as the passive or reserve portfolio. What we've done here is chained a series of one-year no downside return of capital or zero minimum hedges. The far right column shows that the hedge worked as promised - the minimum was not violated. Detail would show that the way the hedge actually works is that as markets move down, you find yourself selling stocks and moving more and more into a reserve portfolio. In 1975 when the S&P was up 37+%, this hedge portfolio would have been up 25%.

Two quick points to make on this: One, these simulations are valid. They include what I think to be excessively conservative transaction cost estimates. Second, if you'll note at the very bottom, over this ten-year period, the hedge portfolio annualized return of 10.9% exceeded the annualized return of the S&P of 10.6%. That I think is clearly an anomalous result; the hedge should have a lower return than the active portfolio over time. You ought to be paid for the risk involved for owning equities.

One question that often arises at this point is, well if it's a lower return, why bother to own it? If pension funds are, in fact, 100% invested in equities, they've shown a tolerance for that risk, and this probably is not a product that makes any sense for them. But to the extent that pension funds are trying to diversify away risk - hedge out volatility - what we are asserting here is that there is a better way to do it.

This is simply a picture of that set of results put in motion (Exhibit XVI). The graph shows annual Treasury bill return, S&P return, and the hedged portfolio return. This is a slightly longer period (15 years), but again you can see the results: capturing most of the upside and limiting downside, as promised.

There are static hedges that accomplish this. That is, you can put in place static hedges of various sorts that will limit the downside in a similar, or at least comparable, fashion. The key clearly is the upside capture; having controlled risk, how much return can you garner. Again, our claim is that the dynamic asset allocation is more precise; that is, you don't have to talk in terms of no more than a 5% or 10% probability of downside, you can talk about a zero chance. And in most realistic situations, there is a better upside capture.

I should talk a little bit about applications. It's easy, I think, to break them into two generic kinds. One would be short-term, and we would be talking about annual guarantees. In this case, we're talking about savings accounts, perhaps, or capital accounts with extremely low tolerance for loss or for downside risk. Economists might consider it a plan with a purely skewed utility function for risk.

The chart (Exhibit XVII) speaks to what we can talk about in terms of trade-off of guarantee versus capture. I would focus on the top two lines, that is, the guarantee level and the initial asset mix. There are a whole range of assumptions that are behind this; the most important, the determining ones are the so-called reserve returns - in this case the Treasury bills. You can get a feel that there is a fairly direct, almost linear trade-off between how much you give up in terms of the guarantee level and how much participation on the upside you ought to expect.

Considering longer-term multiple-year guarantees, we have a similar trade-off. The longer the guarantee, the better upside capture you have at any level of guarantee. We might be able to go in and guarantee something like the actuarial rate and give continued good upside exposure. It turns out in the current environment that the existence of extraordinarily high bond rates gives you an enormous amount of pulling power to reach the guarantee. So that, for example, with this program we could theoretically, make an 8% five-year guarantee, and begin the program 70% to 75% invested in the equity markets.

A subsidiary example is that the entire guarantee package is invested in marketable securities, and the guarantee can be terminated at any point in time. That is, if we had a major rally in the bond market and a concurrent major rally in the stock market, so that the 8% guarantee after a year-and-a-half looked pretty easy, it would be fairly straightforward for the sponsor involved to terminate the guarantee and start over at a new higher level based on the existing market values.

The upside is what matters. The point to make is that the upside is specifiable, with almost complete precision once you know what the active return will be. It is not prespecifiable in the way the downside is, but it is determinable and fairly clearly specifiable.

The conclusions we reached are that this is, we think, an important new way to deal with risks in a more precise way, and a way that allows you to optimize exposure to the higher returns that we hope will continue to be available in the equity market. Most importantly, what we have brought to the package is that we are now willing to guarantee that it works. The guarantee is a full insurance company guarantee. We think that there is the potential both to handle special situations - one-year guarantees or guarantees of a portion of a pension portfolio - and as a broad portfolio management asset allocation tool for managing the entire mix of marketable assets for a plan sponsor.

MR. RON LEVIN: Your dynamic asset allocation strategy, if I understand it, is based on balancing a risky asset with a riskless asset. If your guarantee is over a one-year period, the appropriate riskless asset would be some short-term money instrument. If your guarantee is, say, over a five-year period, what do you use as a riskless asset?

MR. TATE: A stripped government.

MR. LEVIN: And you trade in and out of that government according to your asset model?

MR. TATE: Yes. It turns out that the bill is the perfect model for it and the CAT, TIGR, or whatever has all of the immunized characteristics you require.

MR. LEVIN: Could you use an immunized portfolio also?

MR. TATE: You could, certainly there's no theoretical reason not to. We have tried to keep it simple, so it focused on the simpler discount instruments. As to effect on expected return, it should add at the margin.

MR. RICHARD SEGA: Ralph, if I read it correctly, it seems that the dynamic hedging approach takes an incremental return for a lower-than-expected additional risk. Given that the markets are a zero-sum game, and for every good trade I do somebody took the other side, where does your incremental return come from?

MR. TATE: I should underline that that's not true. I think some promoters of the notion have argued that there is a free lunch in this. I think a better description of this is that this is a very highly specified lunch, and you get to know a lot more about the bill before the waiter brings it. It is clear to me that over any time you are lowering the expected return of the aggregate by hedging. It is also true that it is path dependent so that in theory and with the simulations, we can see a fifteen-year period of volatile, but not going anywhere, markets where the hedge in fact increases return.

MR. SEGA: Let me ask just one more question. What are the results if your portfolio volatility is greater than you initially anticipated?

MR. TATE: The impact is a marginally negative impact on upside capture. That is to say, there is no risk of the guarantee. The process recognizes that volatility and captures it on the way down. It does mean that for the system to work perfectly for you to really be able to talk about optimal upside capture, you need to have defined precisely what the volatility is ahead of time. But it is a fairly marginal impact, negative, but not important.

EXHIBIT I

ENTRY AGE NORMAL

RESULTS IN THOUSANDS

Possible Savings if Single Purchase

	Current	Single Purchase
PV		At 13.5% (7,823.9)
Actives	$20,000.0	$20,000.0
Retired	10,000.0	0.0
Total	$30,000.0	$20,000.0
Assets	$20,000.0	$12,176.1
Unfunded	6,822.7	4,646.6
Normal Cost	358.5	358.5
20-Year Amortization	622.6	424.0
Total Costs	$981.1	$782.5

EXHIBIT II

ACCRUED BENEFIT COST METHOD

RESULTS IN THOUSANDS

Possible Savings if Single Purchase

	Current	Single Purchase
PV		At 13.5% (7,823.9)
Actives	$20,000.0	$20,000.0
Retired	10,000.0	0.0
Total	$30,000.0	$20,000.0
Assets	$20,000.0	$12,176.1
Unfunded	1,428.5	(747.5)
Normal Cost	585.0	585.0
20-Year Amortization	130.4	(585.0)
Total Costs	$715.4	$ 0.0

EXHIBIT III

USING VARIOUS METHODS

RESULTS IN THOUSANDS

Possible Savings if Single Purchase

PV	Current EAN	Single Purchase EAN	Unit Credit
Actives	$20,000.0	$20,000.0	$20,000.0
Retired	10,000.0	0.0	0.0
Total	$30,000.0	$20,000.0	$20,000.0
Assets	$20,000.0	$12,176.1	$12,176.1
Unfunded	6,822.7	4,646.6	(745.5)
Normal Cost	358.5	358.5	585.0
20-Year Amortization	622.6	424.0	(585.0)
Total Costs	$981.1	$782.5	$0.0

EXHIBIT IV

U. S. TREASURY BOND FUTURES CONTRACT TRADED AT THE CHICAGO BOARD OF TRADE

Basic Trading Unit	U.S. Treasury bonds with $100,000 face value
Deliverable Grade	U.S. Treasury bonds. Maturing at least 15 years from delivery day if not callable; and if callable are not so for at least 15 years from delivery day.
Delivery Method	Federal Reserve book entry wire transfer system. Invoice is adjusted for coupon rates and maturity or call dates.
Price Quotation	Percentage of par, e.g., 94-01 or 94 1/32.
Minimum Fluctuation	1/32 of a point or $31.25 per contract.
Daily Price Limit	64/32 ($2,000 per contract) above and below the previous day's settlement price.
Initial Margin	$2,000 per contract.
Maintenance Margin	$1,500 per contract.
Hedging Margin	$1,500 per contract.
Hours of Trading	8:00 a.m. to 2:00 p.m. (Chicago time).
Ticker Symbol	US

NOTE: Above is as of June, 1980. Margins are subject to change. Margins required by member firms may exceed CBT contract margins. For full details on all specifications, see Chicago Board of Trade Rules and Regulations.

Cash vs. Future Basis Risk

EXHIBIT V

Time Chart of Yield Levels and Spreads

30 Year Treasuries versus New Long A Industrials

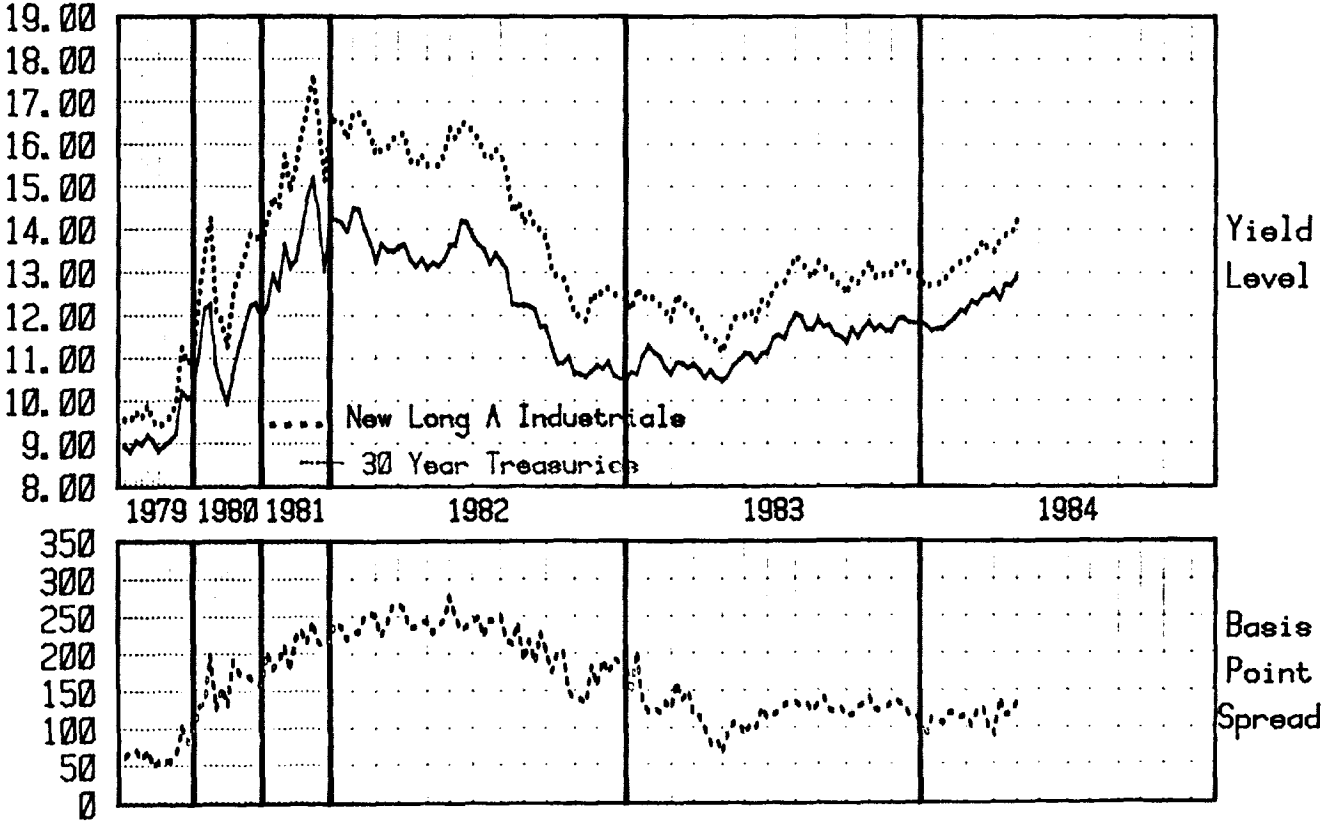


EXHIBIT VI

EXHIBIT VII

Hedging Inefficiency — Hedge Ratio

Unweighted hedge

Cash market	Futures market
May 30	**May 30**
Holds $1 million 10⅜ Treasury bonds at 100-10. Market value: $1,003,125.00	Sells 10 December Treasury bond contracts at 79-23. Market value: $797,187.50
September 30	**September 30**
Sells $1 million 10⅜ Treasury bonds at 87-16. Market value: $875,000.00	Buys 10 December Treasury bond contracts at 68-29. Market value: $689,062.50
Loss: $128,125.00	**Gain: $108,125.00**
Net loss: $20,000.00	

Weighted hedge

Cash market	Futures market
May 30	**May 30**
Holds $1 million 10⅜ Treasury bonds at 100-10. Market value: $1,003,125.00	Sells 12 December Treasury bond contracts at 79-23. Market value: $956,625.00
September 30	**September 30**
Sells $1 million 10⅜ Treasury bonds at 87-16. Market value: $875,000.00	Buys 12 December Treasury bond contracts at 68-29. Market value: $826,875.00
Loss: $128,125.00	**Gain: $129,750.00**
Net gain: $1,625.00	

Convergence

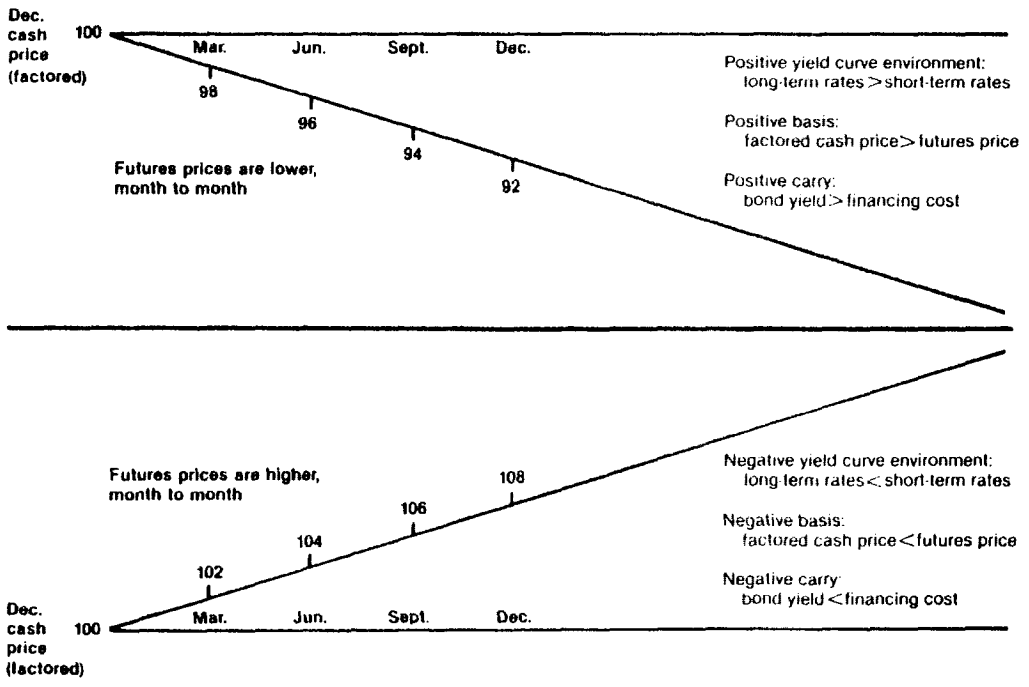
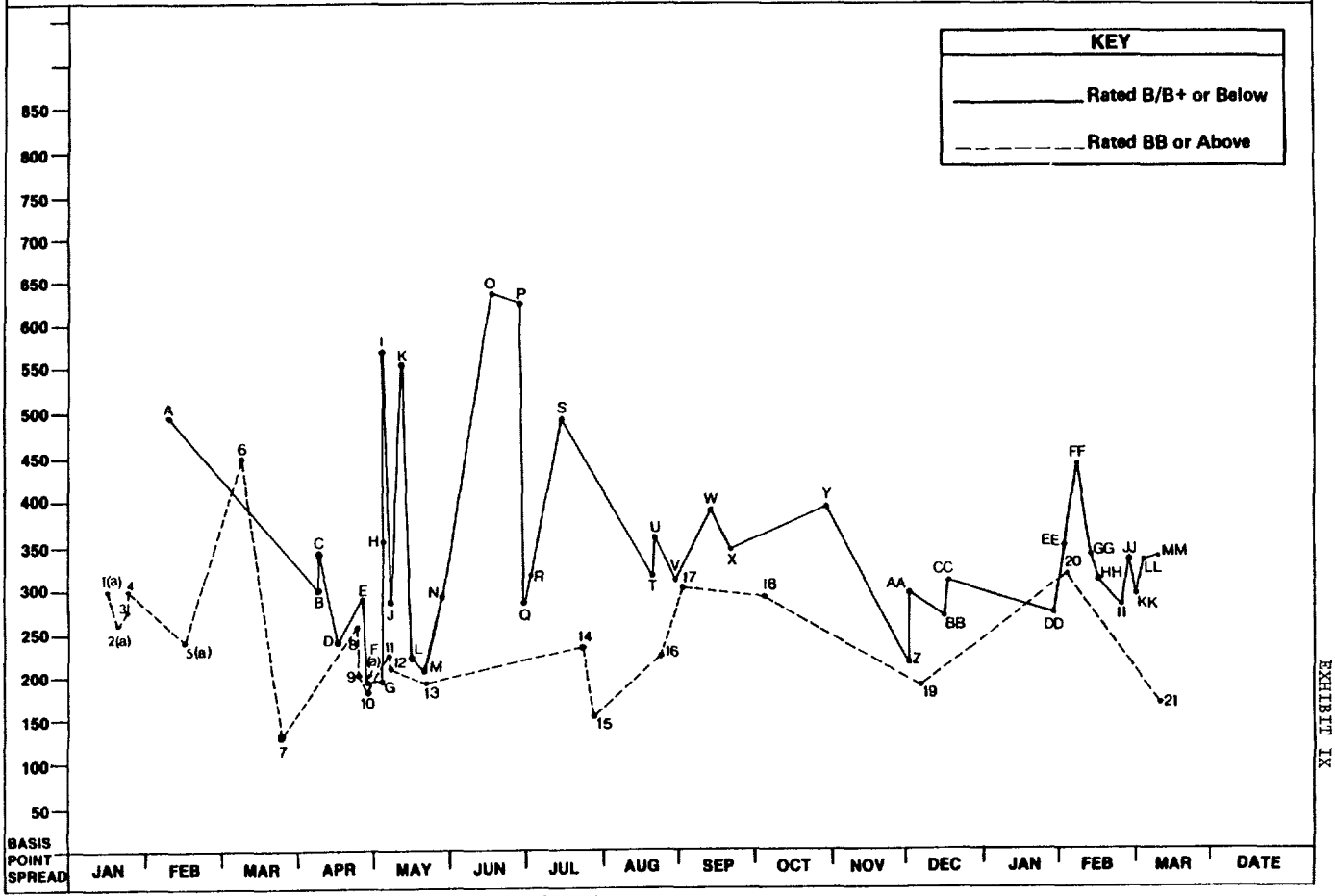


EXHIBIT IX

HIGH - YIELD NEW ISSUE SPREADS vs. U.S. TREASURY BOND YIELDS
1983-1984



(a) OFFERED "AT THE MARKET". YIELD TO MATURITY BASED ON NET PROCEEDS.

Example 1

Option is exercised after dividend is paid

Numerator:	Dividend	$ 50	
	Option premium	625	
	Difference between purchase and exercise price	(515)	
			$ 160
Denominator:	Purchase price of stock	5015	
	less premium	(625)	
			$4390

Annualized return = $(1+{}^{160}/_{4390})^4 = 15.4\%$

EXHIBIT X

Example 2

Option is exercised before dividend is paid

Numerator:	Dividend	$0	
	Option premium	625	
	Difference between purchase and exercise price	(515)	
			$ 110
Denominator:	Purchase price of stock	5015	
	less premium	(625)	
			$4390

Annualized return = $(1+{}^{110}/_{4390})^{8} = 21.9\%$

Example 3

Option is not exercised

Numerator:	Dividend	$ 50	
	Option premium	625	
	Difference between purchase and sell price	(730)	
			$ (55)
Denominator:	Purchase price of stock	5015	
	less premium	$(615)	
			$4390

Annualized return = $(1 - {}^{55}/_{4390})^4$ = (4.9)%

EXHIBIT XIII

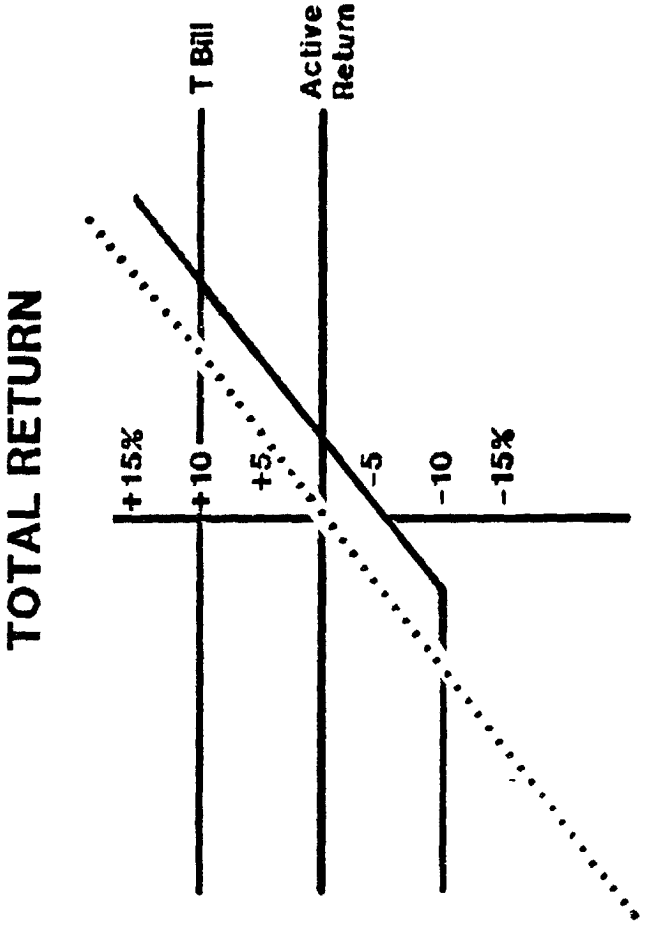


EXHIBIT XIV

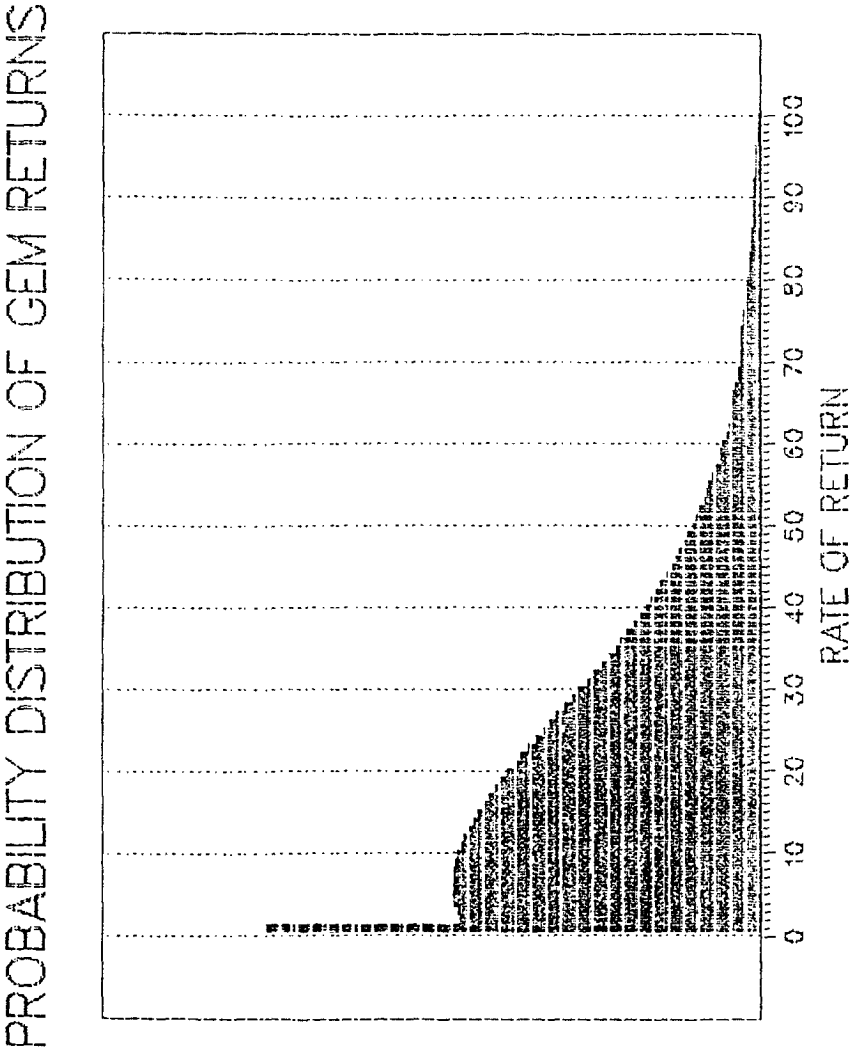

PROBABILITY DISTRIBUTION OF GEM RETURNS
0
10
20
30
40
50
60
70
80
90
100
RATE OF RETURN

EXHIBIT XV

RESULTS OF SIMULATED PORTFOLIOS
ONE YEAR GUARANTEE

(0% Minimum Return)

Year	Salomon Bros. High Grade Corporate Bond Index	Becker Balanced Fund Median	CPI	T-Bills	S&P 500	S&P Gem
1974	(3.1)	(18.4)	12.2	7.3	(26.3)	0.6
1975	14.6	21.7	7.0	7.5	37.1	25.7
1976	18.6	17.9	4.8	6.1	23.8	14.7
1977	1.7	(2.3)	6.8	5.0	(7.2)	3.1
1978	(0.1)	5.0	9.0	7.1	6.5	3.6
1979	(4.2)	11.8	13.3	11.0	18.5	14.3
1980	(2.6)	19.3	12.4	12.9	32.4	25.7
1981	(1.0)	1.7	8.9	13.9	(4.9)	1.2
1982	43.8	23.8	3.9	14.1	21.5	14.2
1983	4.7	15.1	3.8	8.7	22.5	15.2
Cumulative Return	86.1	132.2	119.1	143.6	174.6	181.6
Annualized Return	6.4	8.8	8.2	9.3	10.6	10.9

EXHIBIT XVI

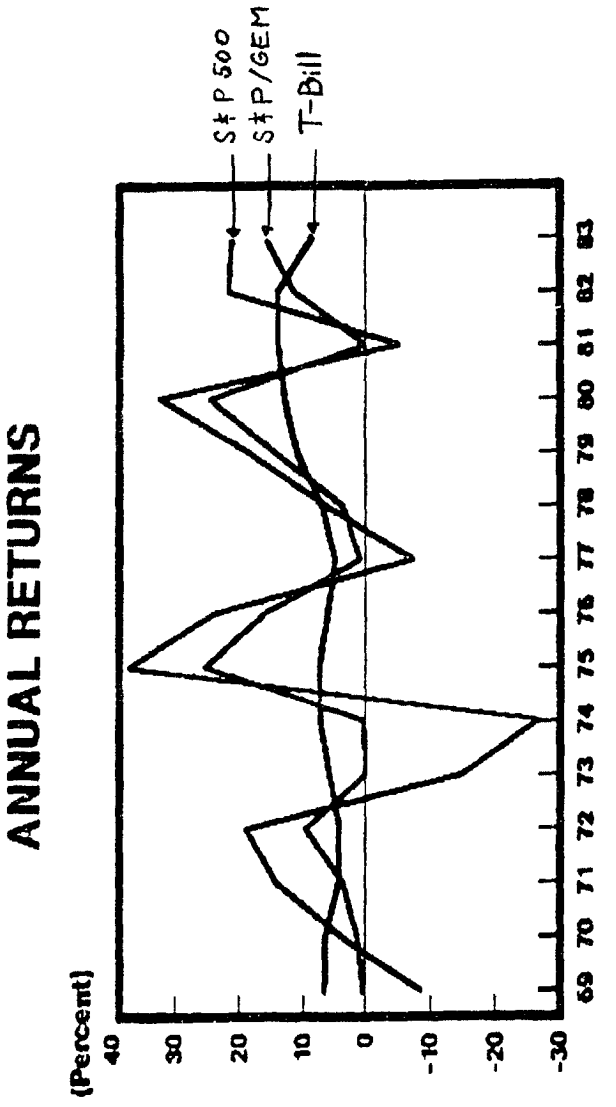

ANNUAL RETURNS
(Percent)
40
30
20
10
0
-10
-20
-30
69 70 71 72 73 74 75 76 77 78 79 80 81 82 83
S&P 500
S&P/GEM
T-Bill

EXHIBIT XVII

GEM TRADE-OFF MATRIX

(One Year Guarantee)

	Guarantee Level			
	-10%	**-5%**	**0%**	**+5%**
Initial Asset Mix	83.0%	72.4%	57.2%	35.6%
Expected Return	16.9%	16.2%	15.1%	13.4%
Expected Return as % of Active Expected Return	93.9%	90.0%	83.9%	74.4%

Assumptions:
Reserve Return 10%
Active Return 18%
Active Portfolio Standard Deviation 20%
Transaction Cost 1% (Round Trip)