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FINANCIAL FUTURES AND OPTIONS

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Recorder: FRANK J. LONGO

1. Objectives suggesting the use of financial futures and options

   - Cash flow management
   - Investment optimization

2. Strategies

   - Distinctions between futures and options
   - Distinctions between fixed income and equity contracts
   - Applications and expected results
   - Limitations/Risks
   - Procedures

3. Other considerations

   - Administrative
   - Legal

MR. ALAN W. SIBIGTROTH: Let me begin the discussion today by summarizing an example that illustrates the options risk associated with many of the insurance products sold today. Options/futures investment principles have merit for asset accumulation products as most products offer features quite similar to financial options. I will illustrate the option composition of a book value surrender feature, with a 5% surrender charge, and a bailout feature. The risk and reward opportunity associated with the policy feature can be related to the corresponding risk and reward opportunity of put option contracts found in the secondary markets.

The first step in this process is to illustrate a gain and loss graph of the risk for the policy feature as the underlying security, which in this case is an intermediate term bond, changes in value. The surrender feature, which in this example is a 5% surrender charge, has many similarities to a put option. The bailout feature is similar to an option spread. That is, to buy a call option at a lower price and sell a call option for the same duration at a higher price. The exercise that follows will be to put together different types of option contracts to represent the risk and reward curve associated with the policy feature. A fully hedged policy will be to try to construct a composite curve for both the policy feature exposure and the option value that produces a relatively level loss line. That is, the loss is relatively constant across the entire spectrum of movement in the underlying security.

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Once this composite has been made, the valuation of policy features in terms of option values can be developed accordingly. First, each option is priced using secondary market prices or other theoretical valuation models that are appropriate. Secondly, a hierarchy of election patterns is constructed that represents the opportunity to elect various groups of these different options. From this hierarchy, a judgment is made as to the blended value of the policy feature cost from the associated options. This option price can then be added to financial projections either as a charge against first year earnings or as a reduction in the spread margin associated with the portfolio.

The first graph will illustrate the risk and reward opportunity associated with the composition of a surrender privilege and a bailout feature. In this case, the surrender privilege is an annuity contract with a surrender charge of 5%. The bailout feature waives a surrender charge if the renewal guarantee is less than 100 basis points below the current guarantee. As you can see, the company sustains a loss at the point where market values fall below 95%, where the surrender charge has been exhausted. Once bond values fall below 95%, the company begins to sustain a loss. On the other hand, as the portfolio rises above 100%, if the policyholders surrender, they will forfeit a 5% surrender charge, leaving the company with a 5% gain. However, this only occurs up until the value of the bonds rises to the point where the bailout feature is imposed, at which time policyholders can surrender their contracts with no surrender charge.

I should mention that I have excluded any additional capital gains that might be received. This is for two reasons. First of all, policyholders hold the right to surrender this contract and there is less likelihood that they would surrender the policy in light of a declining interest rate climate. Thus, the company would not receive these capital gains except on those people that decided to surrender their contracts. Additionally, companies for the most part welcome the opportunity to receive capital gains and would not be willing to give up capital gain opportunity as part of the pricing.

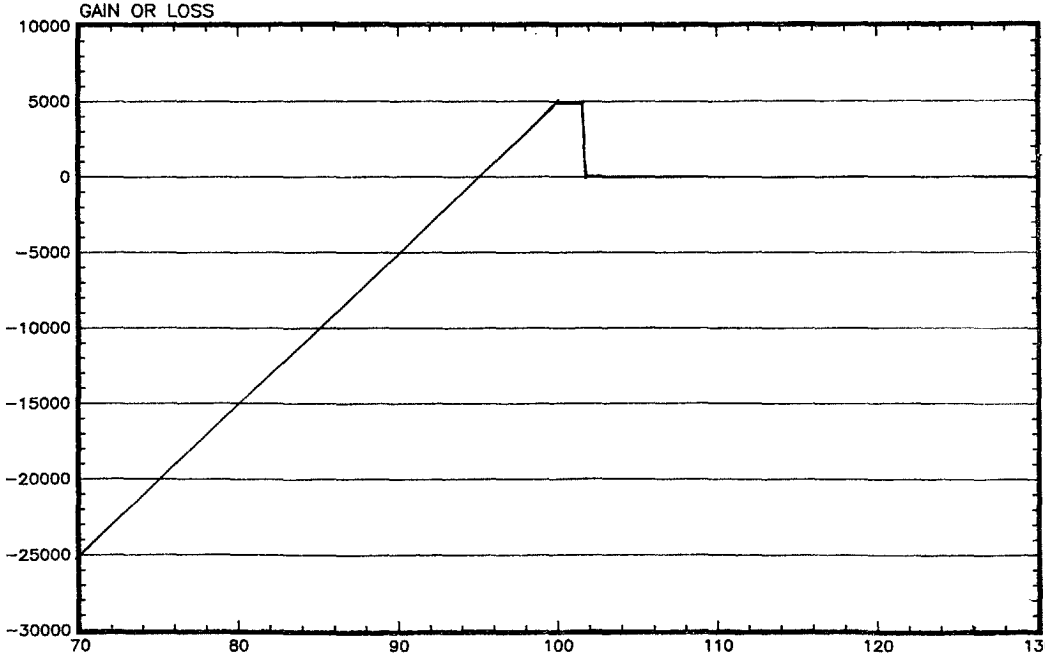
The second graph illustrates the investment strategy that we will try to pattern from this policy feature to offset the risk. As you can see, the graph is merely the inverse or mirror image of the graph we saw in Graph 1. The sum of these two graphs would produce no net gain or loss at any point along the curve, in a sense, saying that the company has no risk whatsoever from capital moves relative to their annuity portfolio. Obviously, this is an ideal situation.

Graph 3 illustrates the proposed put/hedge strategy recommended for this particular situation. A put contract is a vehicle which offers the buyer of the contract the opportunity to make money as the underlying issue declines for a statement premium, which would be lost if the underlying security fails to fall below the strike price or the point at which the put starts picking up intrinsic value. In this case, as the example illustrates, the put contract starts picking up intrinsic value below 95% of par. As you might have noted, I have simply downshifted the put contract from the loss opportunity associated with the policy feature. Why did I do this? You will note that the company has no gain or loss as par values rise above 101.5%. Yet they have substantial loss opportunity as par values fall below 95%. The thrust of the exercise was to identify

GRAPH 1

PROFIT AND LOSS GRAPH AS OF MAY 29 1984
EXPOSURE FROM SURRENDER AND BAILOUT FEATURE

POLICY FEATURE

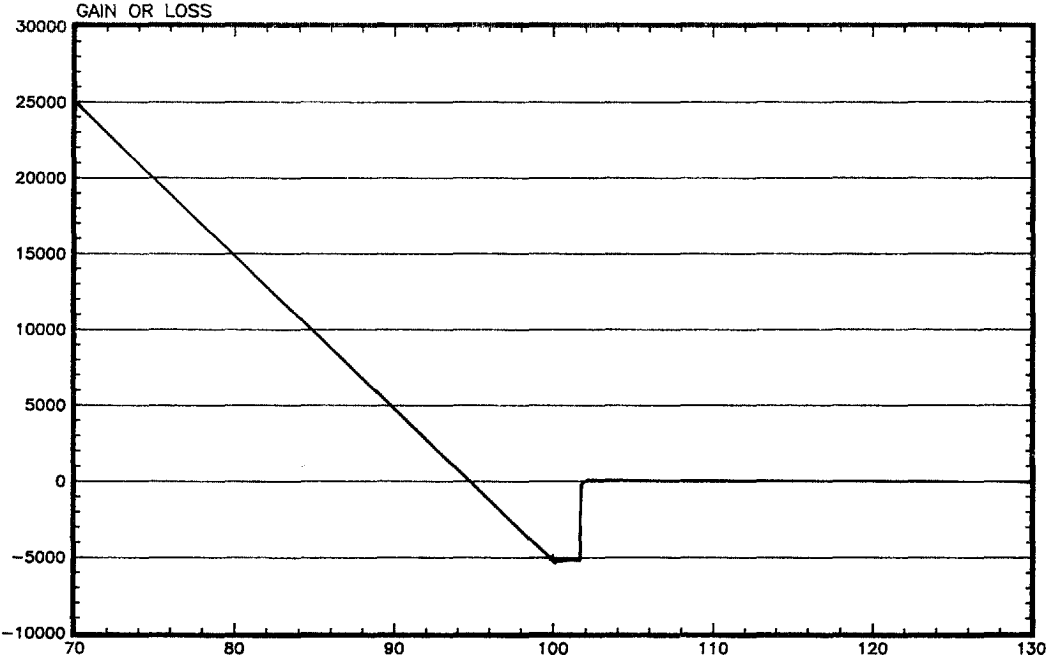


PORTFOLIO MARKET VALUE --- 100 PAR VALUE
ASSUMES SURRENDER WHILE SURRENDER CHARGE IS 5%

GRAPH 2

PROFIT AND LOSS GRAPH AS OF MAY 29 1984
INVESTMENT STRATEGY FOR POLICY FEATURE

POLICY FEATURE



PORTFOLIO MARKET VALUE -- 100 PAR VALUE

5% SURRENDER CHARGE AND BAILOUT FEATURE

GRAPH 3

PROFIT AND LOSS GRAPH AS OF MAY 29 1984

INVESTMENT STRATEGY AND PUT HEDGE

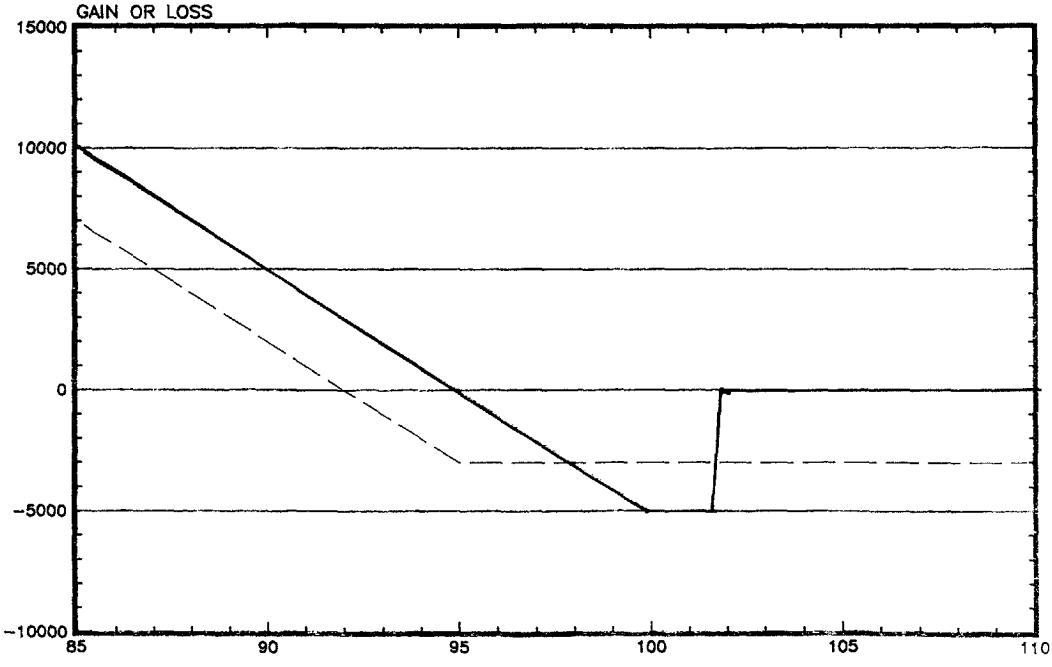


ILLUSTRATION OF THE SURRENDER FEATURE
INVESTMENT STRATEGY AND THE PROPOSED PUT HEDGE

an option contract that would impose relatively equal losses as prices either rise or fall. You will note that the put contract shows a loss for high bond prices of three points, that is to say, a premium of $3 is required versus a gain of $0 on the policy feature benefit, above 101.5% and below 95%. The put feature is also at every point three points below the price of the policy feature. Consequently, the company will absorb a loss of three points below 95% and three points above 101.5%. Within the interval from 95% to 101.5%, they will have somewhat different results over a small area.

Moving on to Graph 4, I show again the risk associated with the policy feature as a solid line and the put contract which is suggested for purchase as the dashed line. The dotted dashed line represents the composite of both the put hedge and the policy feature risk. As you can see, this line shows a loss of 3% of principal below 95% and 3% of principal above 101.5%, with a more favorable result between 95% and 101.5%. But the important point to note is that the company has offset a potentially unlimited risk exposure relative to the put risk for another risk and reward opportunity which imposes option prices as of Friday, May 25, 1984.

You should be aware of many distinctions between the curve shown here which is normalized to 100% of par and the Treasury Bond options that could be purchased. For example, many companies would invest in Industrial Bonds as opposed to Treasury instruments, although this is less true today, given the small spread between Industrial and Government debt. Further, note that the Treasury Bonds contracts are twenty year bond instruments instead of five to ten year intermediate term bonds more appropriately purchased by companies offering these annuity contracts. The cash price for a twenty year bond, which is relative to an 8% coupon, is roughly 60.3 rather than 100% of par, so appropriate adjustment would have to be made to move the cash equity associated with the bond contract to the principal value within a portfolio. For example, at today's levels you would have to purchase roughly 1.4 as many Treasury Bond options as you would have in the way of cash instruments. The corresponding strike price of 95% relative to a 60 cash price would be 57.3, not 58, which is the strike price offered in the secondary market. The period assumed in this example is 900 days, two and one-half years, considerably longer than the six and one-half months available as a long-term Treasury Bond option today. The six and one-half month December 58 Treasury Bond put contract could be bought for 1.56 relative to a principal value of 60.3, which is 2.59% of principal.

A risk free interest rate on money of 12% was assumed. The implied volatility for a twenty year Treasury Bond contract is about 14% today. The volatility would be correspondingly less to those shorter term contracts relative to principal values. For this example, I have assumed a 10% volatility corresponding to the shorter maturity. This is a comparatively high value as compared to the 3% charge that I assumed for two and one-half years. However, this is largely due to the lower volatility associated with the investment risk assumed for the annuity portfolio vis-a-vis the longer term Treasury Bond option.

I hope this has given you a flavor of one way of looking at the option risk associated with insurance contracts today and a very simplistic view of the type of investment strategy that might be deployed against such a contract.

GRAPH 4

PROFIT AND LOSS GRAPH AS OF MAY 29 1984
PUT HEDGE AND COMPOSITE RISK POSITION

POLICY FEATURE PUT HEDGE COMPOSITE RISK

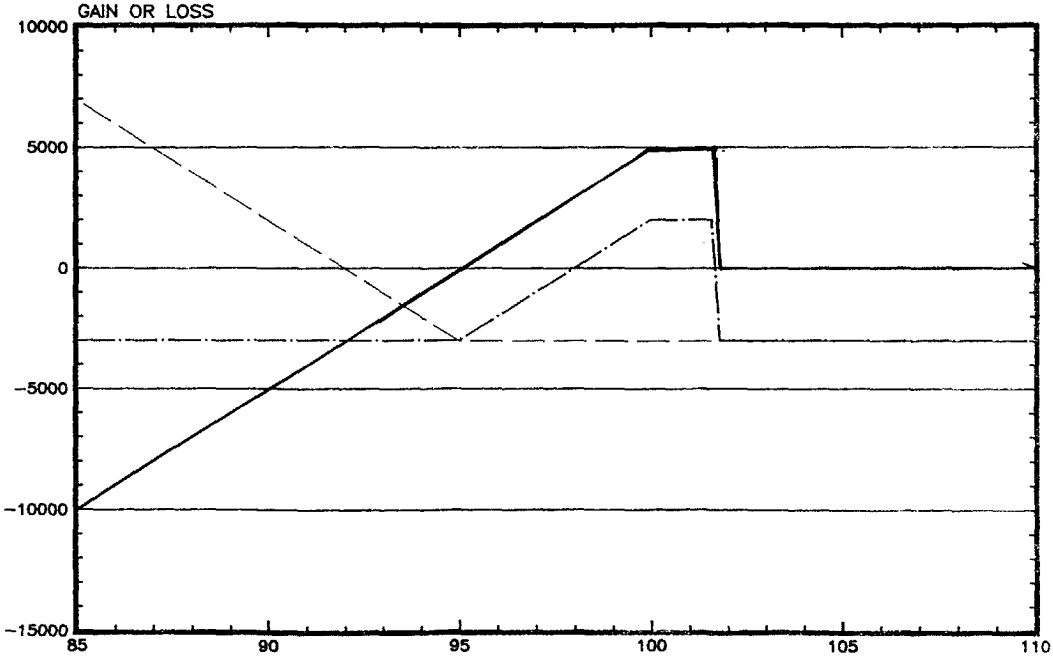


ILLUSTRATION OF THE POLICY FEATURE RISK, THE PROPOSED PUT HEDGE AND THE COMPOSITE OF BOTH POSITIONS

MR. JOHN D. RAITHEL: Today I will discuss options and futures, the differences between them, the differences between fixed income options and stock options, and the differences between fixed income and equity futures. Then I would like to go into various strategies using these instruments, some of the applications, some of the expected results, and the risk inherent in the strategies.

A big difference between options and futures is the extent of the obligation. If you buy an option, the cost of the option is all the money you can lose. If you buy a future, on the other hand, your losses are theoretically unlimited and, if you're short and the market goes up, you will have a loss on this position which could mount and mount. This is similar to being short a call on an individual stock, but in those cases you are usually covered and as the stock goes up, the option goes up and the gain in the stock more than offsets the loss on the option. Normally, when you use futures you are also hedged; therefore when the bond market goes up, the future goes up and there is a loss on the short sale. However, when the markets go down and you're short the option, you are only going to get the premium. Whereas, if you're short the future, you will get a lot more than the option premium because the future will track the underlying asset fairly well.

Another big difference between options and futures is what you do to maintain the position. When you have a stock option outstanding for institutional accounts, it's a covered option and there is really nothing you have to do to maintain the position. If you're exercised on the option, you can buy the stock in the open marketplace, but you really don't have to do anything else about the option. If you buy an option, you don't have to do anything else about that either. You just wait and make a decision to sell, but that's all there is to it.

A futures contract works differently. First of all, you have to open a futures account with a brokerage house. Then you have to deposit the escrow money into that account that is required by the exchanges. For example, for a stock index future, if you are a bona fide hedger as opposed to a personal speculator, the hedging margin at this time for the S&P 500 futures is $3,000 a contract. That's what you have to put up with the broker. You can, if you buy multiple contracts, use this money and have it invested in treasury bills. But it is not used to buy anything. It is just a good faith deposit so that you will live up to the terms of the obligation. Each day you will either make or lose money. If you lose money, you have to wire-transfer money into the brokerage house in an amount equal to the loss. This is called mark-to-the-market. If you make money, you can pull the money out. There is money constantly going back and forth. This is an important consideration as far as the logistics of how the two positions operate. In options, you don't have to do anything more; whereas in futures you have to mark-to-market.

Another big difference between the two is taxes. At this time, if you buy an option it's taxed at short-term rates because its holding period is less than a year. If you sell a call option and are exercised, the option proceeds are added to the sale proceeds of the stock. Some basis is always adjusted by the amount of the option premium, depending upon whether you're long or short an option or whether a put and call is involved. However, it's a short-term gain or loss if you actually buy and sell the option.

Futures are a lot different. In 1981 a tax rule was enacted dealing with futures. According to this rule, there is no holding period for financial futures. In other words, it doesn't matter how long you have the position outstanding as far as tax treatment is concerned. Sixty percent of the gain or loss is long-term, 40% is short-term. You can buy it in the morning and sell it in the afternoon and you have 60% long-term and 40% short-term.

Another tax implication for futures that is different from options and different from anything else, really, is that everything is marked-to-the-market at the end of the year for tax purposes. This means that every futures position outstanding is assumed to have been sold or covered at the last trading day of the year, and you will pay taxes on the 60-40 basis on whatever that price was. Your new cost for the succeeding year is the closing price of the current year.

Now let me discuss the differences between fixed income and equity options. Stock options are offered on something like 370 individual stocks. They are also offered on stock market indices. There is an option on the S&P 500 which doesn't trade very much. The big successful index option is the S&P 100, and that has a lot of trading volume. The difference between the two types of options is that stock options trade on three month cycles. There's the January, April, July, October cycle, February, May, August and so on. The stock index options, like the S&P 100, trade for the next three months. They used to trade every three months, but there was no market in the later two. All of the volume was in the first expiration month so the distant months were dropped and there are now the next three trading months.

Fixed income options are offered on some physicals but, like the S&P 500 stock options, there is very little volume. The big volume in the fixed income options is on options on the U.S. treasury bond futures. If you want to trade in the options market on the fixed income side, you almost have to deal in these fixed income options.

Now let's discuss the differences between fixed income and equity futures. They trade on the same months - March, June, September, and December. But the big difference between stock index futures and fixed income futures is that stock index futures settle in cash while fixed income futures do not.

There are three main stock index futures. There's the S&P 500, which has the largest volume. There's the New York Composite Future, which is traded on the NYFE, and there's also the Value Line Index, which is traded on the Kansas City Board of Trade. For each one of these indices, the equivalent stock value of those indices is equal to $500 times the price of the future. With the S&P around $150, each contract represents approximately $75,000 worth of stock.

While stock index futures settle in cash, fixed income futures actually settle in the instruments, and this is where the term "the cheapest to deliver" comes in. Adjustments are made to equate actual bonds to the theoretical asset that underlies the future. For example, the most heavily traded fixed income future is the U.S. treasury bond future, which is a hypothetical 8% coupon 30-year government bond. But there is

no such thing. Therefore, if you are actually exercised on the future, price adjustments are made for what you actually buy.

I would like to discuss some individual stock strategies. One that is probably the easiest to understand and the safest, if you will, is what are commonly called conversions. Conversions involve the purchase of a stock and a put and the sale of a call. When you sell a call, you are selling away the upside. When you buy a put, you're protecting yourself on the downside. Thus, your profit or loss is equal to the relationship between the prices for which you buy and sell the stock and options, the exercise price of the options, and, of course, the dividend. The goal of conversions is to compete with money market returns. You can monitor conversions real time. Computer systems exist that will monitor the bid and ask spreads of the stock, the call and the put at any time, and that will calculate an annualized rate of return. You used to be able to do a lot better in conversions than you can now. The reason is that the market is now more efficient.

Theoretically, these transactions have little or no risk. So, therefore, theoretically, the rates of return should be equal to the risk-free rate. But every once in a while something gets out of line and you can put on a conversion and lock in a good rate. It's somewhat of a riskless transaction because if the stock's at 20 and you buy it at 20 and then you sell the call for 2 and you buy the put for 1 you net a point no matter what happens, plus the dividend. If the stock goes to 25, you're exercised on the short call. That's how you get rid of the stock and the put expires worthless. If the stock goes down to 15, you exercise the put, (you sell the stock through the exercise of the put) and the call expires worthless. A potential problem comes if the stock is right around 20 and it's the last day before expiration. You don't know what to do. You don't know if you're going to be exercised on the call and because of that you cannot put in an order to exercise the put. What usually happens is that you have to wait to see if you get exercised on the call. If not, you hope that the stock market doesn't open significantly lower. If it does, you will not get the return that you thought you had locked in on the conversion. But outside of this risk, conversions are a very effective strategy. Its big application is for corporate money and not for pension fund money because of the tax implications. You're transferring income that normally would be interest earnings into capital gains items. You can offset a capital loss with this capital gain. By the way, if you're a corporation you do not get the 85% dividend received deduction because you're long the put.

The second strategy is dividend capture. It is just like a conversion except you're not long the put. You do get the 85% dividend received deduction if the stock is not more than 20% in the money. If it is, then you don't get the DRD. Now, that is not a formal IRS ruling, but that seems to be what people have accepted and it hasn't been challenged yet. If you buy a put, the holding period on the stock is suspended. That is an IRS ruling. There has not been a ruling that if you buy a put you don't get the dividend received. It's the opinion of our counsel that you do not get it. There are some other counsels who, I know, will say you do get it. I believe it is safe to say that most say you won't. We don't want to tell people that they will get it, have them take it, and then have to have penalties and things of that sort. Also, with dividend capture you don't have the put, so there really is no question, although

again there is no ruling on the 20% in-the-money rule. If it's less than 20% in the money, the feeling in the industry is that there will be no problem.

Because you're not using money to purchase a put with dividend capture, you have a higher expected return, especially on an after-tax basis. The biggest application of dividend capture is for corporate money. The objective is to compete with after-tax returns, and generally, the after-tax returns are double those of money markets. The risk, and this does occur periodically, is that the stock goes down and you don't have enough protection. The analysis that's made on your expected return always assumes that the stock's going to close above the exercise price. Well, if it doesn't, if there is a bad announcement or something like that, and the stock opens down six or seven points, then you are going to have a loss. If corporations use dividend capture, they have to have a contingency plan for such an adverse move. The best thing to do when the stock goes down to the exercise price is to cover everything immediately.

MR. DALE S. HAGSTROM: Did you say that conversions were better for corporations or for pension plans?

MR. RAITHEL: They're better for corporations as opposed to pension plans because you have the tax benefits. Both conversions and dividend capture are better for corporate money. Pension plans used to do them in a bigger way than they do now. The reason why it's been cut back is that the good positions just aren't out there any more. We have some pension plans for which we do conversions now. You can do it for pension plans but the rate that you have to get for corporate money is substantially lower (because of the tax implications) than it is for pension fund money. You can accept a lower rate going in. Because corporations are using conversions, the rates have been driven down. Therefore, it's less advantageous for pension fund money.

Regarding the point on capital losses for corporations: if you have a capital loss, you don't have any way to offset that loss and you want to offset it, you can take money that is normally invested in cash equivalents and do either a conversion or a dividend capture program. Now, you can offset your tax loss. Thus, if you have no other way to offset that loss, you can use the gain from conversions to offset it, and therefore not effectively pay any tax on the conversion profits that you otherwise would have had to pay, had you actually had the money invested in money markets.

The number one application of individual stock options for institutions is covered call writing. The objective is to provide incremental income and the expectation that you'll hear is anywhere from 2% to 8% per year. People went out and touted this and said it's a free lunch. Those were also the people who said that there is no way in the world that it could ever rain in New York City for four straight days. But they were wrong on that and they were wrong on the rain. Clients have a tendency to not look at the stock and option combined, but to look at them separately. The feeling that many people have is that there's no point in engaging in options activities if they can't make money in options per se.

What happens in a covered call writing program? Most of the time, on a month by month, you will make some money, simply because options sell for

a premium. The only way you lose at maturity is if the stock goes up by more than the premium for which you sold the call. Most of the time that does not happen. The stock market either goes up a little bit or goes down or stays level and you make money. But the point is that when you make money you make a little bit of money. But when you lose money, you lose so big, you just can't believe what you can lose and how fast you can lose it. For the period from August 1982 to June 1983, believe me, you could have wiped out five or six years of profits in a covered call option writing program. You had similar periods in 1975 and 1976. The only way a program like this can have, in my opinion, long-term success, and there are a lot of people in the options industry that won't agree with this statement, is to be a market timer and avoid those periods of time, which have been typically the first six to eight months following a major bear market bottom. If you have a covered call writing program during that period of time, I can guarantee you that you're going to lose money. It's not a question of will those periods occur again. The only question is when, and you have to avoid them.

The worst thing you can do in a covered call writing program is to write a call and if it goes up, write more at the next higher strike price. You write enough to have a zero cash flow. The theory is that eventually the stock comes down and you get all your money back. That's a Martingale approach, and all that particular strategy will prove is that the market has more money than you do and that stocks can go up a lot farther than you ever thought.

Let's discuss call buying. The typical program is a 90-10. This is where you take 90% of your money and put it in money markets, and with 10% you go out and buy calls. There are some academic studies on this strategy which show that overall it's a better investment vehicle than the stock market itself. But the only reason is that there were a few periods, two periods in the study over a 15 year period, where the returns were just phenomenal and more than made up for the losses. In fact, there was one six month period where the return on the entire portfolio, including the 90% money invested in fixed income, was 87%. You have to be there for those periods to be successful.

Put strategies basically have the same pros and cons as call strategies. When you sell puts, most of the time you make money. But the market will go down very fast and then you lose. It's the same story as the call strategy where you actually have to be a market timer or be able to have individual stock selection capabilities. If you're that good at individual stock selection, you really don't need options.

Let me talk a minute about options on indices. Essentially, the S&P 100's are the only options that have liquidity. But there is a problem with them for institutional money. The big volume is always in the nearby month. If you're buying a protective put, you have to constantly roll it. You have the problem of always paying out the put premium since you cannot buy a long-term option. The longest option that you can buy is three months. If you tried to buy a three month option, there would be no volume to put it on in size. The S&P 100 options are great for an individual if he thinks the market is going to go down 20 points in the next three days. But for institutional money, it really isn't the thing to use. The best thing to use to create hedges are stock index futures.

The biggest use of equity futures, which I think will be utilized in the next three to five years, will be as an asset allocation tool. A pension asset manager can effectively alter his asset allocation. He can increase stocks, decrease bonds, or any combination thereof. He will not have to go through the process of firing a manager or telling someone to sell out part of his portfolio because he is going to move out of stocks. Futures track the underlying indices extremely well. If you wanted to increase bonds and decrease equities, you would sell stock market futures, buy bond futures or things of that sort. Or, if you want to get out of the stock market, but it's going to take two months to get rid of a manager, you can sell futures and then gradually unload the stocks.

Another big usage is in portfolio management itself. Many portfolio managers manage $100 million and want to be represented in everything. They feel that they have to be represented in the chemicals because of their weight in the index, and they don't want to be under-represented. But they don't like any chemical companies and there are about five or six other industries they don't like either. One possibility is to buy futures and then buy the stocks in the companies that they do like. This is a big use of futures.

If a portfolio manager wants to raise cash very quickly and he's afraid that if he sells a lot of his stock, he's really going to suffer because the market's going down, then he can sell futures. He will not have the market impact doing this like he would with individual stocks. In my opinion, the big use of futures in the future will be either in asset allocation or as a portfolio management tool, although I don't think you have too much of that going on right now.

Another big usage will be in asset substitution. At this time, this is primarily for index fund oriented money. It doesn't have to be, but that's what it's turned out to be. In asset substitution one switches between stocks and futures, depending upon which is more attractive. If the futures are more attractive than the stocks, you can enhance your return and actually outperform the index. That's the objective. In my example I'll use the S&P 500 futures. They move with the S&P. In fact, on the settlement date, which is the third Friday of the month, everyone with an outstanding position is settled out at the closing price of the S&P 500 on that day and your account is either credited or debited with that amount. You know that on the maturity date it's going to be equal to the price of the S&P 500.

In analyzing the attractiveness of the futures you consider the price of the S&P 500 today, the price at which the futures are trading today, interest rates, and the dividends to be received on the stocks. Therefore, since you know the price of the future and the price of the index, you know the spread. Suppose the index is at 160 and the future is at 162, and it's a June future. You know that between now and the third Friday in June on a relative basis to the S&P you're going to lose 2 points if you're in the futures. Also, if you're in the futures you're not going to get the dividends on the stocks because you don't own them. The big plus for the futures is that for $75,000 or $80,000 worth of stock, you only have to put up $3,000 at a brokerage house and that money can earn treasury bill rates. In addition, the rest of the money, the other $70-75,000, is invested in money markets. Depending upon all these relationships, you can determine whether or not it's advantageous to be

in stocks or to be in futures. We manage accounts that do this, right now about $160 million. We shift back and forth between futures and stocks, depending upon which is more attractive.

We do the analysis based upon the factors that I mentioned. Of course, there are also transaction costs involved and that is a big consideration when you're buying and selling $30-40 million worth of stock in a very short period of time. You have commissions on the stocks to consider as part of your expenses. From a practical standpoint, what actually occurs is that if we are in futures and contemplating going into stocks because the futures are overvalued, the tickets will be all at the various windows on the Exchange. For a $50 million account we will do it usually in two different lumps, so to speak. When we give a go ahead, it usually takes around five minutes to get everything done for every $25 million. Then we see if the relationships are still there and we do another $25 million until we get everything done.

The expected return on this strategy is between 150 and 200 basis points better than the S&P each and every year. And, needless to say, if someone had been able to do that for the last ten years he would have ranked very high in the Becker universe. We have been doing this for eight months and our accounts at this time are about 130 basis points ahead of the S&P after eight months. That's right in line with our expectations.

Now, what's happened with futures is similar to what happened in the options market. The options market started in 1973. Initially, the options were tremendously overvalued. When stock index futures started trading, everybody expected them to be overvalued too. What happened was that they were tremendously undervalued for a year and a half. For the first 15 months, there were institutions that had asset substitution programs and got 550 and 600 basis points better than the S&P. Now, those relationships aren't there anymore, but we think that conservatively you can get the 150 to 250 incremental return after all expenses.

MR. SIBIGTROTH: I wonder if it would be possible for you to go through an example to illustrate what the value of the cost of carrying the futures position would be vis-a-vis the dividend yield on the portfolio to give some flavor for what type of spread you have to have between the cash and futures market before this becomes attractive.

MR. RAITHEL: I mentioned conversions before as a strategy for stock options. Well, there is a comparable type strategy that can also be done using futures which relates to your question. Basically, you buy the S&P 500 stocks and then short a future against them. You lock in a return because the future moves up and down with the index. You're going to get the dividends on the stocks and the premium of the future over the index and you can figure out what the annualized return is. This return is called the return-to-the-hedged portfolio. Generally, the return to the hedged portfolio is about 16-17%. But when your transaction costs come in and you have round trip commissions on the stocks, that will knock the return to the hedged portfolio down to the 12% area. It's 12% or 13% in today's market and is usually competitive with money market rates. Generally, in order for the switch to be made, the return to the hedged portfolio would have to be 20-22% with no transaction costs included. And then for undervaluation, to switch back from stocks into futures, the return to the hedged portfolio would have to be in the area of 9% to

10%. You have to monitor this very closely. We have orders in all the time because sometimes there's just a little window that lasts for 20 minutes and then the relationships are gone. These are the kinds of annualized returns to the hedged portfolios we look for in order to implement the switches back and forth between stocks and futures.

MR. SIBIGTROTH: What are the difficulties imposed by trying to move out of a portfolio based on a widely held group of securities on the S&P 500 which is a broad based index?

MR. RAITHEL: The biggest problem is that you will start to affect the market, especially if you're going to unload stocks in a very short period of time. What happens is that all the stocks you're selling are in the S&P in just the right amounts. You might have read some articles recently that over a 20 minute period of time the stock market was down 12 points or up very sharply. The chances are very high when that happens that somebody's doing a switch.

The last thing I want to talk about is portfolio insurance. This is the methodology used to effectively create a synthetic option, any option, long or short, put or call. You can do this by systematically adjusting your exposure to the asset, and being long or short the asset, depending upon what option you want to replicate.

The type of synthetic option that is created when you do this is different from other options. You have a lot of flexibility. Number one, there is no fixed maturity. The maturity of the option is dependent upon market volatility and not on time.

Number two, you can make the maturity of the option be anything you want. You can also make the strike price anything you want. You create a synthetic option by systematically, in a pre-determined way, adjusting your cash and asset mix. The particular type of option that is replicated is generally a long put on a portfolio. The asset plus a long put is equal to a long call. You can use this portfolio insurance with any particular type of liquid asset. You don't have to use futures. You can use it on the asset itself as long as it's liquid and can use it for stocks, or bonds or foreign currencies. But if you do it at all, you almost have to use futures because of the advantages associated with them. With programs of this sort you have to be able to make quick adjustments in your cash/asset mix. Sometimes you'll change the cash/asset mix from 40% to 65%, and it has to be done right away. Well, to try to do that with the asset itself is difficult, to say the least. But you can effectively do it with futures very quickly.

Just to give you an idea of expected results, we had some stock accounts start January 1 and they are about 470 basis points ahead of the S&P. They are using the S&P as the underlying asset. We had another client start May 1 using fixed income futures and through yesterday, this account was up 30 basis points for the month, using portfolio insurance vs. -2.62% for the Lehman Govt./Corp. Index.

MR. SIBIGTROTH: The taxation of futures and options contracts is quite complex. We have the 40-60 relationship between short and long-term gains on unrealized future transactions. We have ordinary income taxation relative to options on equities or cash options. I was wondering if

you might overview the taxation of options and future contracts, and in particular, comment on the likely tax treatment for options on cash vehicles like equity contracts, vis-a-vis options on futures. Through options on futures, for example, will they receive the tax treatment relative to futures or will they receive the tax treatment relative to the options on equities?

MR. RAITHEL: These are just my opinions. To briefly review the tax implications on options, at this time, all options transactions are short-term capital gains or losses.

Futures are taxed by the 60-40 rule which is that all gains and losses are 60% long-term and 40% short-term, despite the holding period. There are thoughts that options on futures, especially the options on the treasury bond futures, should be taxed the same way and not taxed the way that options are taxed now. What will be done on that, I really don't know. There are pros and cons, I guess, to making it the same as the underlying vehicle. If you actually exercise the option, then you have tax implications there whether you cover the option or exercise it, and then cover the futures. You have tax situations which are different depending on whatever you do. You could have a tax arbitrage if they continue to be taxed differently. If you actually exercise an option, then your option premium is incorporated in various ways into either the sales proceeds or the purchase price.

MR. CHARLES G. MCNALLY: The only thing I would add to that is my understanding that the proposed legislation on the taxation of options on futures to make them like taxation of futures didn't extend to any of the index options such as the CBOE 100s. My understanding was that those were to really look very much like ordinary equity options because of their cash settlement aspect. So they would again be simply all treated as short-term capital gains. But I don't think that has actually been passed.

MR. RAITHEL: No, I don't think so. There's another technicality on the stock index futures and I don't think this has been resolved either. When you trade futures it's the 60-40, but if you actually settle up on the last day in cash, my understanding of the regulation is that you will get the 60-40 treatment if the future is an actual commodity position like wheat or soybeans. But because the stock index futures settle in cash, there's some thinking that if you actually go through and take the cash settlement then you're not entitled to the 60-40 at all because cash is not a bona fide commodity.

MR. RICK KOYIOL*: I think the question on the cash settlement was probably resolved by the Technical Corrections Act in 1982 where they included cash settlement contracts as falling under the 60-40 rule. On the question of taxation of options on futures, we've been talking to the Service informally quite a bit over the last few weeks, and the feeling we get from them is that the option buyer is more likely to fall under the 60-40 rule because of a sentence in Section 1234 that says that the option will have the same tax treatment as the underlying asset would in the hands of the taxpayer. For the option seller, we get the indication

*Mr. Koyiol, not a member of the Society, is Manager, Touche Ross & Co.

that that will, for the time being, result in short-term capital gain or loss until the new tax bill is passed, which will make options on futures fall under a mark to market situation which could create some interesting situations for a call buyer where he has unrealized gains for which he has received no cash but the new tax bill will require him to mark to market and pay taxes on that unrealized gain even though he doesn't have the cash in hand. But for the time being, the Service, at least informally, is telling us that options fall under Section 1234 and the committee reports on the new tax bill seem to indicate that there was no intent originally to include options on futures under Section 1256. The only way we can get options to fall under Section 1256 is if the option buyer has the rule under Section 1234 that the option will follow the underlying asset. So it's only the option buyer, we think, that falls under the 60-40 rule. The option seller, for the time being, is pure short-term gain or loss.

MR. SIBIGTROTH: Thank you very much. That was very helpful. Is everyone familiar with the mark to market rule relative to futures taxation? Everybody's aware of it? Okay.

MR. LOU NATHAN: I've heard from time to time the comment made that, let's say, a put option can be bought to adjust the duration of the asset portfolio. How would that work mathematically?

MR. MCNALLY: That's kind of a fairly deep question. And I guess that it's one that I'll be touching on, generally speaking, in the talk that I'll be giving. My understanding is that the objective that you're talking about is to establish in a fixed income portfolio a risk exposure which is equivalent to just being long a call.

Basically, it would work very much like the strategy that John mentioned of really allocating the mix of assets between, say, cash and bonds in a fractional way according to the changes in the level of interest rates so that as interest rates go higher, the mix of assets gets much more into cash and as interest rates get lower, the mix of assets tends to go more towards the longer maturity bonds. The idea is that you're trying to do this within a small enough window that you're not just entirely getting long at each bottom in yields and you're not getting entirely invested short every time you've got the yields at the very highest levels. You're trying to do this in such a way that you catch at least a fair amount of each upward move in price by being pretty much fully invested by the time that happens, or alternatively, so that you're catching (or avoiding) most of the upward moves in yields by having already gotten pretty much fully invested in cash by the time the big spike in interest rates has come.

MR. NATHAN: Are you talking about actually being invested in cash or is using that as a means to have a formula that would give you the appropriate result if you were using an option?

MR. MCNALLY: Well, basically, either way. It can be done by actually liquidating part of the portfolio and investing it short-term or by doing the equivalent, which is by adjusting the duration of the portfolio in effect down to duration of a cash equivalent by selling long-term treasury futures.

MR. SIBIGTROTH: You know, that point came up the other day and when you go over your comments you might clarify how that is not moving you into a position of missing the interest rate play, if you will, by being in cash when the market hits its peak and being in bonds when it hits its low. I'm not sure I understand that. Maybe you can clarify it.

MR. PETER H. MOELLER: I have a commission question. If you buy, say, a call option on the CBOE 100 index and let's say the strike price is 155 at the time of expiry, and let's say that the index is at 157, is the commission based on $157 transaction or $2 transaction since you're $2 in the money?

MR. RAITHEL: Well, the selling price would be $2 at maturity and so it would be based upon $2.

MR. MOELLER: So it's different from a stock. In other words, if you exercise the option you would pay commission on the full stock, but on the index you only pay to the extent you're in the index money.

MR. RAITHEL: Right.

MR. SIBIGTROTH: Thank you very much, John, for that presentation. At this point, I'd like to turn the floor to Charlie who will discuss strategies relative to interest rate contracts.

MR. MCNALLY: What I'll be talking about is strategies using financial futures and options specifically in a risk offset capacity for a portfolio. The theme is really going to be duration. I'm glad that that word came up earlier because duration is the primary tool used to measure interest rate risk in a fixed income portfolio and at Goldman Sachs in working with hedgers, using financial futures and options, it's been really the bread and butter tool we use in measuring the risk and implementing a strategy.

Before I get directly into that, I'd just like to mention the mix of participants we see in the financial futures. Many of you know this, I'm sure, but currently the treasury bond futures are probably the most liquid financial instrument traded anywhere in the country, maybe anywhere in the world. The trading volume in the treasury bond futures has recently been running at upwards of 150,000 contracts a day, sometimes 200,000 contracts a day. This is an instrument which has a $100,000 par amount, so we're talking some rather impressive volume in that. And liquidity is extremely good there. Participation comes from the local traders on the exchange floors and also from the primary dealers in government bonds and in other sectors of the bond market. Probably 75% of the volume comes from those two groups. The balance of the volume comes from institutional hedgers, which would include fiduciaries such as ERISA pension funds, both internally managed and outside managers, mutual funds, endowment funds, bank trust departments, other institutional hedgers including mortgage bankers, savings and loans, commercial banks and there has even been some insurance company participation in this. Then the balance of the volume comes from the individual speculators in the market who I think count for a rather small part of this market. I'm trying to characterize the market volume this way to give you an idea that the interest rate futures by and large are very much of a professionals' market in that the institutions, although they're in there in a

substantial way now, do not participate in nearly as big a way as they do in many of the other markets, which is why we expect that the growth of participation from the likes of insurance companies potentially is quite big. It can be quite an important tool for them. And most of that group is still to come.

I'm sure most of you are familiar with the concept of duration, which has long been used as a measure of a fixed income portfolio's risk. The question I'm going to try to deal with is, in integrating financial futures into a fixed income portfolio management, how to extend the concept of duration to financial futures. The problem here is that duration is a concept that's based on measuring an instrument which has a known cash flow, and a future is not an instrument with a cash flow. In fact, a future does not represent ownership of something. A future is strictly a price transfer instrument. And the only cash flow you can talk about associated with a future is the initial margin, which John referred to earlier, which is just simply a performance bond, and the daily transfer of variation margin. So, there is no known cash flow associated with a future and yet we need to somehow adapt this concept of duration to a future. But I'd like to hit a few preliminaries on this before going too deeply into the duration idea.

For today, I want to focus attention on the long-term treasury bond futures and also the treasury note futures. They are both traded at the Chicago Board of Trade. My comments are really oriented towards a fixed income portfolio risk, and the bulk of the risk of such a portfolio does come from the longer maturities. There are also two other longer term type futures available, both based on GNMAs. One is the original interest rate futures contract, which is the GNMA CDR future. The other one is a rather new future based on delivery of either GNMA I, as the original GNMAs are known, or GNMA IIs, and that contract is really quite new and has not traded in terribly big volume so far and has not even gone through a full delivery yet. Deliveries at the end of June will be the first deliveries and that will probably determine the fate of that contract. The problem with the old GNMA CDR contract is that because of the way the delivery system works in the contract, it has not followed the cash GNMA market terribly reliably. The volume of trade in that contract is off considerably and it just isn't considered to be a good hedging vehicle because of all those problems. And I'll say right now we steer people away from using that GNMA CDR contract for risk offset.

The other active liquid interest rate futures are in the short end. We have three contracts traded on the International Monetary Market Division of the Chicago Merchantile Exchange. Those are based on three month treasury bills, three month domestic certificates of deposit, and three month Eurodollar deposits. Those have their purpose in many hedging programs, but they're not quite so important for today's discussion. So, I'll leave them just with that mention.

As for the contract specifications for the two long-term treasury contracts, they're both $100,000 face amount contracts. They both are nominally specified in terms of an 8% coupon instrument that gets delivered. They both are market basket contracts in the sense that there are many different instruments that are actually eligible to deliver versus a short position in these futures. For the long-term treasury bond future, the requirement is that it be an instrument with a minimum

of 15 years to first redemption, which means 15 years to the first call date if the bond is a callable treasury, or to maturity if it's not a callable. And currently, there are about 20 different issues that are all eligible for delivery against the bond futures. So there's really quite a selection of candidates to be delivered.

In the treasury note futures, the maturity window is between 6-1/2 and 10 years remaining to maturity at the time of delivery. One other requirement is that the delivered instrument must have originally been issued as a treasury note, which means that the original maturity had to have been 10 years or less. In fact, these contracts tend to price off of the longer maturity instruments of each deliverable basket. For the 10 year treasury note futures, we tend to see a close correspondence with the most recent treasury 10 year issue. And for the treasury bond futures, we tend to see close correspondence with, let's say, a group of the longer 30 year treasury bonds.

One thing I should mention is that, while the delivery mechanism is very important in understanding the economics of these contracts, in fact most contracts are terminated not in delivery but in offset through taking an opposite position in the same contract at some other point in time. So that a short does not need to plan on buying those treasury bonds to make delivery but rather can buy back that contract and offset the position. Similarly, a long can sell that position later on and the obligation is offset.

Let's get back to the delivery requirements, which are important to understand the economics. For somebody who does go through delivery on futures, there is a price adjustment made for the fact that for the most part 8% treasury bonds and notes don't exist nowadays. Those 8% nominal contract specifications were drawn up back in 1977 for the bond futures when 8% wasn't really so far off the market in terms of treasury bond yields for those days. At any rate, the active liquid part of the treasury market is in coupons considerably higher than that. And to pay fairer value for the fact that there is a greater value to a higher coupon, a delivery factor is used. It is multiplied by the futures price at the time of delivery to, in the case of the high coupon, adjust upward the actual cash value to be paid for the bond in going through the delivery. And this delivery factor is really the only way that an 8% coupon figures into the economics of one of these futures contracts. No other place does 8% figure in there. And the 8% is only figured into the mathematics of how this delivery factor is calculated. It's meant to approximate an adjustment to give any one of deliverable issues about the same yield at the time of the delivery. It's quite approximate, though. This is by no means a true yield maintenance contract.

One question we have to deal with in doing any kind of analysis on the treasury bond or treasury note futures is how should these things price? Normally, with a new kind of fixed income instrument we look at the yield of similar instruments in the market, to get an idea of what kind of yield they should be pricing at now, and then translate that yield into a price. Unfortunately, if you use just some sort of a typical 8% 20 year bond calculation, that gives you an answer in the case of treasury bond futures that can be off the mark by several points. Really the pricing model we need to keep in mind for pricing the treasury bond or treasury note futures is the fact that the main marginal effect on treasury bond

futures pricing comes from arbitrageurs who are willing to either buy cash treasuries and sell futures, or short cash treasuries and buy futures any time when relationships seem to get too much out of line.

This is very much akin to what John referred to with the changing in and out of a stock portfolio, an S&P type portfolio, buying the futures when the futures seem to be cheap to the index, or buying the stocks themselves when the futures seem to be overpriced and switching back and forth. Analogous operations take place in a somewhat more leveraged fashion in the stock and the bond futures and in fact, all in all, it helps to make the bond futures and the note futures extremely liquid and extremely efficiently priced. There was a time when arbitrage could yield the kind of 130 basis point type of incremental returns that John has referred to, back when the contracts were still very new. But it is a considerably more mature market now and efficient market theory seems to have taken over: we just don't see those kinds of gross returns anymore. In fact, I'm told that arbitrageurs now tend to work for spreads as small as one or two thirty-seconds on that trade. So it's clear that most of the slack in the pricing of these futures has already been arbitraged out. This is good for hedgers because it means that there's going to be an excellent price corresponce between the treasury bond futures and the actual treasury bond market.

Anyway, the price model that we put together for pricing treasury bond and treasury note futures has to do with first, identifying what is the issue that is currently cheapest to deliver. For example, I mentioned that there is a close price correspondence between the current 10 year treasury, which is now 13-1/4 of 94, and the treasury note futures. In the treasury bond futures, there are a few issues that seem to be competing for that cheapest to deliver distinction at the same time, so it's not quite so clear which one in any given moment will qualify.

But the basic idea of the pricing model is to identify cheapest delivery, calculate how much net carry there would be between now and the time of delivery (by which you just offset the coupon income over that period of time against the cost of financing the position), and then finally adjust the results by the delivery factors and you come up with a theoretical value for where the future should price. You won't be exactly 100% on the mark based on that, because there's also a certain amount of extra value to the future that comes from being short the future because of the "wild card" delivery option. And that leads to the possibility of a certain amount of games that can be played with switching issues, making delivery at different times of the month and so there's a certain, let's say, put option value that's implied into both of these futures which causes typically a three or four thirty-second perceived cheapness in the futures price relative to a theoretical evaluation of the sort I just described. But the pricing model I've described is extremely good for modeling purposes because it gives us an extremely good handle on how the movements of the bond futures will be related to the movement of the treasury market.

I want to focus for a second on this question of cost of carry because I mentioned that the arbitrageurs influence this relationship to help keep things in line. One implication of this is that when short-term interest rates go up, and if longer term yields remain constant, it tends to slightly push up the price of treasury bond or treasury note futures,

simply to correspond to the fact that an arbitrageur who would be buying cash bonds and selling futures would have to pay more for financing and therefore has to sell the futures at a correspondingly higher price in order to break even on the transaction. Similarly, when financing rates go down, it causes, assuming all the other things are equal, bond futures or note futures prices to go down.

But one other thing comes out of this which has to do not with arbitrageurs, but with this idea of efficient markets, which is that shortening of portfolio duration by selling treasury bond or treasury note futures has the effect of not only placing you risk-wise on a shorter duration part of the yield curve, but also yield-wise puts you on a shorter duration part of the yield curve. And the idea is that the convergence that necessarily takes place between the futures market and the cash market as you approach delivery will cause the overall realized yield of such a shortened duration portfolio, to come out more like a shorter duration kind of yield. So I guess in contrast with the still fairly new, fairly inefficient stock index futures, we find that there's no free lunch available in the interest rate futures markets now.

Occasionally, there are situations where what we call basis factors distort the relationships, where there is basis risk that could go in favor or against a hedge position, and sometimes those represent opportunities. But I think that it is important to be aware of the risk of those basis slippages, and aware of how factors will affect that risk and whether it will tend to push it more in your favor or against you. I don't think that you should necessarily expect to systematically make money on those basis shifts. I think, rather, that what financial futures markets give you is liquidity, in the sense of very good, very tight spread between the bid price and the offer price at any given time. It's typically good for very large volume transactions, and tremendous anonymity is available in these markets where you can move tremendous size without the market really noticing that XYZ Company is dumping a position of hundreds of millions of dollars of bonds.

And that's really a tremendous advantage to using futures because it allows you to move quickly, to change the structure of the portfolio before the market gets away from you and then to eventually unwind that actual portfolio by, say, selling off some corporates, buying back the futures, selling off some more corporates, or whatevers, passthrough, perhaps, buying back more futures, over time and doing it on a relative value basis rather than having to hit any bid in sight just to get rid of some bonds before the market tanks some more. And I emphasize that, with the more volatile markets that we had during the period of October 1979 to the fall of 1982, and then again the recent volatility since sometime this winter, considerations like those can make a tremendous difference in the overall return realized in a portfolio. There are other applications and things like dedicated portfolios or duration portfolios, where again the the very low transaction costs speak favorably of using futures for the more frequent adjustments as opposed to having to do a complete portfolio turnover, which can be costly. It's been our experience of actually turning over hedge positions where it's literally in the thousands of contracts, and just to give you an idea, 1,000 futures contracts amounts to, roughly speaking, a face amount of about $100 million in long-term bonds. And we've had multi-thousand positions put on in a day or over a course of a few days, without the futures market

really knowing that there's something unusual going on. Or at least maybe realizing that yes, Goldman Sachs seems to be a seller of bonds today without really noticing that there's an unusual size going on there. And I think that anonymity, that ability to lay off the big position without clobbering the market is really the main benefit that the futures markets have to offer.

Let me get back to the duration idea. You're probably familiar with the technical definition of duration as being a present value-weighted average of the amount of time left to all the payments that you'll be getting from a given bond. That is to say, if you take a look at a bond, and its cash flow consists of a number of coupons out to maturity and a balloon at the end, there's a scale of amounts of time to each of those payments. We're trying to figure out some kind of average amount of time for the entire stream of those payments, where the weights we are using are the present values of each one of those payments. So duration is very much of a time concept.

Of course, that kind of calculation is closely related to the actual calculation of price from yield where all we're really doing is summing up all the present values of those coupons and the principal -- and that's our price. In fact, this time sense of duration can be converted to a price sensitivity concept of duration, price sensitivity with respect to yield. It's very closely related and in fact, numerically, a very close number. In this form it represents a measure of the price risk of a security per dollar value of the security. And it's also a very close, very simple connection to a couple of other measures of price risk. For example, the yield value of a 32nd in price, or the similar idea of the price value of one basis point change in yield. All three of these measures represent equally good ways of measuring the price risk of a fixed income portfolio.

The question is, how do we apply this to a future, given that a future has no cash flow? What we do is relate that again to this idea of which bond, of the deliverable issues available, currently is the cheapest to deliver, and what's the duration of that bond. Further, we relate the duration of the cheapest deliverable bond to the future by way of simply dividing by its delivery factor. And that way you've got a good measure of the price sensitivity of the future with respect to any given incremental change in the yields of the treasury sector.

This has been the tool we've used, really to great success, in getting a true risk offset. Of course, we're not doing a 100% risk offset, there's always some basis risk left over. But what we're doing is we're getting a good handle on the systematic price risk of the portfolio that comes from changes in the overall level of interest rates, such as changes in, say, treasury bond yields, which we use as the best barometer of the overall market level. It puts our customers into the business of being spread traders, because they're trading yield spread relationships.

For example, let's examine corporate bond yields versus treasury bond yields. Take somebody who is buying a new issue corporate because, due to the skittish market, it has to be offered at a fairly attractive yield just to get the issue completely sold. That represents some kind of an underwriting spread, a bit of excess value of that new issue, which tends to be taken out in the course of the next few days or weeks after the

issue is offered. Well, that kind of underwriting spread, at times, can be profitably taken out by way of selling a duration-matched number of treasury bond futures. That puts you in a position of being long a corporate bond yield, and short a treasury bond yield and if you're correct on your assessment that this new issue really does represent some extra underwriting value which in turn gets reduced over the secondary market trading of the issue, then that position can be unwound some time later with that underwriting spread realized as sort of an arbitrage profit. And that's a business which works particularly well in skittish markets where there are new issues coming in. But it especially works when there is a pretty good supply of new corporate issues. Well, we have to see the new supply of corporate issues before that'll be a really good game to play. But it illustrates the point that the duration match use of futures to offset risk really only offsets the systematic risk of the market and puts you in the position of trying to determine where there are the best values to be realized on the market, what's the relative value of, say, a given AAA corporate or a given Baa corporate, or whatever, versus the value of the treasury sector right now.

I want to mention one thing which occasionally surprises people. This duration-match method usually results in a greater number of futures, measured in terms of face amount, used to hedge a given position in cash bonds than the face amount of bonds that you're actually hedging. In part this is due to the fact that an 8% coupon bond, in terms of which the future is nominally specified, is in some sense a smaller sized instrument. It was mentioned by John that currently treasury bond futures are priced on the order of 60 right now, that is to say 60% of par value, which is another way of saying that a treasury bond future is, in some sense, a smaller instrument than a current coupon treasury bond or a current coupon corporate bond is. But, again, it puts us in a position of focusing on where a portfolio manager can typically give the best value added, which is in determining the relative value relationships of different sectors and allowing the speed of adjusting a portfolio without necessarily completely blowing away the market for the bonds that he owns in the process of doing the adjustment.

I'd like to make a few comments regarding the interest rate options markets. There are really several interest rate options markets that have been started since October 1982. The active one, which John mentioned, is the options on the treasury bond futures. They've had liquidity steadily increasing in that market, trading volume has gotten up to an average of about 15-20,000, often in excess of 20,000, contracts a day traded. So we're talking in excess of $2 billion face amount of securities underlying these options that are trading per day. And that market is undoubtedly the liquid interest rate options market. The markets on the CBOE for long-term treasury bond options and on the AMEX for 10 year treasury note options have never really developed this kind of liquidity. Until they do, we'll continue to steer our customers more towards the liquid options on bond futures.

They trade on a three month type of expiration cycle, but one hitch in that is that, for example, the options on the June bond futures actually expired about a week and a half ago. So the expiration date is not actually during the month associated with the bond future, but typically at least a week before. The longest maturity option that is traded would be a nine month option. Right now we've got options trading on September

bond futures, December bond futures and March 1985 bond futures. The greatest liquidity, of course, is in the September options, which will expire on August 24 and liquidity hasn't really developed much in the March options as yet, since they've only been trading for about a week.

Volatility of the market is the main determinant of value of these interest rate options. It really is fairly essential, in valuing these options, to have some kind of options pricing model available. It turns out that there is a modification to our old friend the Black-Scholes model for equity options. This modification makes the Black-Scholes model appropriate for options on futures and it tends to work extremely well. But there are other option models around which also work very well, simply because options on futures are a very simple kind of structure to analyze, really a simpler structure than options on equities or options on actual bonds, because there is no question of dividend, there's no question of a cash flow associated with the underlying instrument, that has to be accounted for in the valuation.

Anyway, the contingent risk aspect of an option, that is to say, the ability to establish a position with a limited downside risk, is what distinguishes options from futures, and the cost of establishing that contingent protection is what's represented by what's known as the time value of an option. Which is simply any value in the option premium which is not represented by intrinsic value. In other words, any value above and beyond that value which could be realized right now by exercising the option against, say, an offsetting position in the future itself. So this idea of time value really represents a measure of the risk of how rapidly the market can move or really how volatile the market will be.

In using any option pricing model, you need to plug in sort of a magic parameter, an unknowable parameter, I should say, which represents an estimate of the volatility of the market. This can be estimated from the recent price history or can be inferred from current market prices of the options themselves to make a statement about what value the options market puts on the volatility of, say, the bond market. And that's known as implied volatility, or implied standard deviation, as both terms seem to be used interchangeably. And that's actually, I think, the most important thing to keep in mind in evaluating whether it makes sense to be a buyer of options in, say, establishing a given hedge, or perhaps a seller of options, or perhaps forgetting about options and doing the same thing that you would be doing but using the futures market completely. Because at times the options on futures will be pricing an extremely high level of volatility. Right now we're pricing in excess of 14% annualized volatility which is as high as the options on bond futures have priced anytime in 1984. It was only briefly in 1983 that we saw higher volatility than that priced into the options. Whereas at other times, particularly February of this year, we've seen volatility of about half that amount and we actually got down to about 7.2% implied annual volatility back a couple of times in February of this year. And at times like that I think that it's obviously a question of the volatility currently priced into the options versus the outlook for volatility in the bond market.

But when options are cheap by that valuation, you should be a buyer of options to implement a given strategy and when options are expensive, you should be a seller of options to take in some kind of incremental income.

Some more sophisticated strategies, of course, involve things like just plain buying or selling volatility as a trade unto itself where you might be a systematic seller of both puts and calls to try to create a market neutral position which will over time lose value and gain money for the person who sold those options. But that's getting a little far afield from the hedge application, which is what I'd really like to focus on. I mentioned the volatility and the impact of volatility on the option evaluation because it's the most important issue above and beyond the normal basis risk kinds of evaluation, that is to say the spread evaluation, that goes into using or evaluating the risk of using options instead of futures for the implementation of a hedge.

There are some good examples around, which Alan mentioned in his opening remarks, of insurance companies who are very much in the business of contingent risk and can use options as a way of hedging some of those contingent risks. Certainly we've helped a number of people to analyze situations like that and I think that the analysis holds up and makes sense. But the main value that the analysis has is in providing some kind of measure of the value the market puts on this kind of a contingent risk to help make intelligent decisions about the value of this contingent risk that you're building into a contract, as opposed to just giving it away as part of a way of getting the business. So with that I say that even if an extremely active options trading program is not anticipated as part of an insurance company's investment activities, being involved in the options market, especially the interest rate options market, has a value just in terms of understanding the value of the contingent claim risks that the insurance company is getting into.

MR. DWIGHT K. BARTLETT, III: I just want to check my understanding about what you can do under present New York law and regulations using these kinds of instruments. My understanding is that, first of all, the Department says you can use these kinds of instruments only to hedge up to 2% of your portfolio and, secondly, you can use them only for the purposes of dealing with the risks associated with future settlement dates on securities transactions. You cannot use them to hedge the risk associated with disintermediation. That seems to be a very limited use of these kinds of instruments and I wonder what's going on to convince the New York Department that this is much too restrictive a use of these kinds of instruments.

MR. MCNALLY: I wish I could tell you that there was a lot going on to work on amending these regulations. Your understanding of the 2% restriction corresponds perfectly with mine and also the risk of forward dated transactions corresponds with my understanding of those restrictions. There is a further restriction that apparently put option transactions are not allowed, although call option transactions are. This is not really a barrier because the same protection of a put can be arranged by use of a synthetic call. But I think that really the way things stand right now is that a typical response is that insurance companies are interpreting the regulations as issued by the Insurance Commissioner's office in the most liberal way they can to try to get some experience going, to try to get a successful track record going, in the limited uses that they can be made in a life insurance company and based on those successful experiences in risk offset, to try to get the rules liberalized at some point in the future.

MR. SIBIGTROTH: In speaking with Terry Lennon and Steve Malek at the Department, my understanding is that that 2% is based on the face value of the contracts, which is not really the actual cash value of the instruments that you would be offsetting the risk associated with. The actual cash value would be something on the order of 60% of that, so you're down to about 1.2% of the assets, which is even less. Also the Insurance Department regulations appear to preclude the use of index options on equities or stock index contracts for the moment. I do feel that while the regulation is rather restrictive, there is an interest by the Insurance Department to understand other applications that would be beneficial to the insurance industry, and they do encourage those companies that would like to pursue a course that is somewhat beyond the present regulation to make that position known to them and I think they would be willing to accommodate it up to a point. Part of the problem with the restriction on put contracts, as I understand it, is there was a preclusion or a restriction in the statute that did not allow them to make that available at the present time. I think they are sensitive to these problems and are willing to entertain other approaches. Their concern for the moment is to limit the risk associated with companies that will try to be a little bit too aggressive initially and move into arenas that pose undue risk to their own insurance policyholders.

MR. DONALD E.C. FISCHER: Can a five-year treasury with an interest rate future be used to essentially produce a synthetic three-year treasury? The second part of my question would be, if I could do that successfully, can I do the same thing with mortgages?

MR. MCNALLY: In answer to both the questions of trying to, say, from a five year bond create the equivalent of a three year bond by using futures, or with a five year commercial mortgage, trying to create the equivalent of a three year commercial mortgage, I'd say that the answer is yes, futures can be used that way to the extent that the basis is consistent during the time the hedge is in effect, that will in fact give you the net price risk of a three year instrument in either case. But in looking at the wisdom of each of those trades, the important thing to keep in mind is, what kind of a basis risk would you be dealing with? In the case of a five year treasury versus a long-term treasury bond future or a ten year treasury note future, you're primarily dealing with a yield curve risk, the extent to which five year yields may go up even with long-term treasury yields remaining constant, you may have created the effective duration, to overall market yields, of only a three year instrument. But the performance may do worse than that, or better than that, because of the slippage in the yield relationships. There's another factor we add on to that, looking at something like a commercial mortgage, because there is a less perfect correspondence between behavior of an instrument such as a commercial mortgage to the extent that a good secondary market even exists for commercial mortgage and treasury bonds. I think the concept is very sound and I can speak from experience of having customers use futures for that kind of application of adjusting the duration of an instrument, not necessarily to just plain reducing it to zero, but reducing it to a set value. And it's the kind of analysis that we work up for people. I think that kind of question is really the core for any kind of large scale use of futures in a fixed income portfolio. In other words, look at the portfolio, get a handle on how big the risk is of that portfolio now, decide where you'd like that risk to be, and then sell or buy the number of futures that you need to get yourself at that place, at that duration.