

RECORD, Volume 23, No. 3*

Washington Annual Meeting
October 26–29, 1997

Session 141PD Current Investment Topics

Track: Investment
Key words: Investments, Risk-Based Capital

Moderator: STEPHEN D. REDDY
Panelists: MARK W. GRIFFIN
ANNA HANSEN†
DAVID POWER‡
Recorder: STEPHEN D. REDDY

Summary: Expert panelists discuss current developments and investment trends in the insurance industry. Discussion topics include: catastrophe bonds (CAT), collateralized bond obligations (CBOs), securitization developments, and asset allocation trends.

Mr. Stephen D. Reddy: I think we have a good session here, so I think you're in for some good material. Basically, we have a couple of representatives from investment banks here, and one from a rating agency.

We'd like to cover some of the developments in the investment arena as it affects insurance companies; namely equity on notes, CBOs, and CAT bonds, which have received a lot of attention. We will address issues and get a rating agency perspective on those and other structured products. Toward the end, we will have time for questions so we can focus on any particular investment related topics you'd like to talk about that we didn't happen to cover in the presentations themselves.

Mark Griffin is a member of the insurance product group at Goldman Sachs. He recently returned to New York from a five-year stint in London, where he headed

*Copyright © 1998, Society of Actuaries

†Ms. Hansen, not a member of the sponsoring organizations, is Vice President of Morgan Stanley in New York, NY.

‡Mr. Power, not a member of the sponsoring organizations, is Vice President and Senior Analyst of Moody's Investor Service in New York, NY.

the European Pension and Insurance Strategy Group. Mark's work on investments is included in the Society's exam syllabus and most actuarial publications in the U.S. and the U.K., as well as other financial publications such as *The Journal* and *Portfolio Management*.

Anna Hansen is a vice president at Morgan Stanley. Anna works in the equity structured product group area, primarily marketing equity products to insurance companies. She will focus on equity notes and development in that area.

David Power is a vice president and senior analyst at Moody's Investor Service, working in the structure derivatives and fund group at Moody's in New York. David will give us some of the rating agency perspectives on some of these newer more interesting products that we'll be touching on today.

Again, I'm Steve Reddy. I work at Morgan Stanley in New York as well in the Insurance Strategies Group, talking to insurance companies about investment strategy and staying on top of current developments in the investment area as they affect insurance companies. I'm sure we'll have time at the end for several questions.

Anna is going to go first. Unfortunately, she needs to leave before the end of the session, so we will take questions on her material as soon as she has presented it. We then will go forward and save the rest of the questions for the end. Again, we'll broaden it out and address any particular topics you want to cover that are investment related as time permits.

Ms. Anna Hansen: As Steve said, I just want to spend a few minutes talking about what I'm calling capital efficient equity exposures for insurance companies, which basically translates to equity-linked notes (ELNs).

I want to focus briefly on what an equity-linked note (ELN) is and the history of ELNs over the last few years because they have only been in existence since the late 1980s. At that time, they were invented mostly for insurance companies because there was a regulatory arbitrage that existed then and which exists now.

If an insurance company goes in to buy cash equities, the risk-based capital (RBC) reserve is 30%. If an insurance company purchases a bond that typically has a zero coupon or a very low coupon, but the return is linked to some equity exposure and it's an investment grade bond, that RBC is 0.3%. The evolution of ELNs is driven by that differential in the RBC. That is why insurance companies have purchased this product.

Starting in the late 1980s, somebody thought of putting these things together and people began to buy them. At that time, the regulation was not particularly addressed. People believed that if the bond was linked to an equity-linked exposure and principally protected, the NAIC would treat it as a bond. They did so for a long time without actually coming out and saying that is how they treated them.

In September 1995, they actually did clarify that as long as one of these bonds has 100% principal protection it will be treated as debt, and you will get the efficient capital treatment. If you were marketing to insurance companies in 1995, you did see many insurance companies step up their purchase of ELNs with new insurance companies coming forward to buy these products.

The tax treatment and the accounting treatment also went through a number of iterations during the seven or eight years that these things have been outstanding, but recently both of those issues have been resolved and clarified. In June 1996, the IRS released what is called the contingent payment debt instrument regulations, which essentially clarified the tax treatment of ELNs. We'll get into that later. What that basically says is that you will be accruing and paying tax on a phantom basis on these instruments.

In the past, it has been anything from bifurcating the instrument to waiting until you actually get the payment at maturity and then paying the tax. The way it is now, you will be paying on a current basis. That has caused people to figure out how to structure around that so that you don't have to pay tax on something that you're not actually receiving.

The accounting treatment was also clarified in November 1996 with an Emerging Issue Task Force (EITF). It was 96-12. That treatment is called the retrospective yield method, which was meant to mimic the tax treatment where you're actually recording and accruing income as you go. Unfortunately, that has been thrown into question with the FASB exposure on derivatives, so we don't know exactly what its fate will be. But, in the meantime, there is a specific methodology to follow.

What we've seen in the last couple of years is that many insurance companies who previously passed on this product for either accounting or tax reasons, or simply that it wasn't clarified by the NAIC, have come back and said, "We'd like to look at this; we'd like to purchase this." And just this year, we've seen a number of new programs come out with insurance companies.

One thing that also drives the decision is the fact that the market keeps going up. Despite this week's movement on Monday, the primary reason, I believe, that

insurance companies want to even look at this product is because the market keeps going up. They see that insurance companies who hold equity are outperforming, so many of them feel that they missed the boat on this one. The idea behind an equity-linked note, besides the fact that you have favorable RBC, is that you're principally protected. In the event that the market closes lower than where you initially bought the note, you will still receive 100% of your principal.

What are the characteristics, or what goes into an ELN? In other words, what does it look like? I just want to mention that there has been an explosion of different ways to get this type of exposure. By this exposure, I mean equity with principal protection. Historically, it has been a debt instrument of an issuer, say a U.S. or a European corporation, that issues a bond generally off their Medium Term Note (MTN) shelf. It would not necessarily be listed, but it would be a public debt product.

In the last few years, there has been the frequent use of grantor trust to get the same type of exposure but to have more flexibility as far as the issuer going into the secondary market and purchasing something in the secondary basis, as opposed to going out and having somebody issue it for them. I'll talk about that in a minute. The security type has been a typical debt instrument of some issuers. It typically has been investment grade, so that has meant an NAIC one rating.

The attractive part about this is you don't have management fees you would have if you got into a fund that was being actively managed. As I said, it can be either private or public. The equity exposure, the coupon, the currency exposure, and the maturity are all items that are flexible. And by that I mean negotiable. The equity exposure that you choose can be an index, it can be a single stock, a basket of single stocks, or a basket of indices. It can be foreign or domestic. If it is foreign, you have some input into whether your currency is hedged or unhedged.

There are different coupon structures. You can have a current pay coupon, a minimum return, or a zero coupon. The maturity is five years, seven years, or ten years. That's also flexible, but the common thing about the maturity is that it is 100% principal protected, and that's what drives the NAIC to give the good RBC treatment. All these components typically go into an issuer who disperses to the investor a note, which has these characteristics.

I just want to say a word about the initial price. By that, I mean the initial participation. When you put one of these notes together, what will vary or inform you of pricing is the participation level. For instance, if you have a 7-year, ELN that's linked to the Standard & Poor's (S&P) 500 and a zero coupon, what

percentage of the price appreciation in the S&P are you going to receive at maturity? Is that going to be 100%? 90%? Or 120%?

The things that go into that are the credit quality of the issuer, the maturity of the note, the coupon level, the factors that affect the actual underlying equity itself (which would be the volatility in the market), the dividend yield in that index or that stock, and interest rates in the market in general. For instance, if you have a high credit quality, say, a triple A quality rating versus a single A, the issuer of the triple A security would produce for you a lower participation than the single A because that issuer is going to be, in effect, funding at a lower level. The maturity of the note, if that's longer, will affect the coupon that you're giving up on the traditional note. That will result in a higher participation.

I did want to go through what are some typical structures. There are three popular structures in ELNs. The first one is the result of a European-style option. What you have is a zero coupon bond wedded with an equity option. Imagine that the present value of a zero coupon bond, for example, is five years assuming that interest rates are 6.5%. The present value is about \$73. If a zero matures at \$100, the present value is \$73. That leaves you about \$27 to spend on an option. That zero will mature as to \$100, and the equity option will pay off if the equity is above where you first purchased it. The minimum that you would get in that case is \$100. The additional is dependent on the market.

The next structure, which is very popular, is a minimum-yield-to-maturity structure. In this case, I've shown a 1% per annum that equates to a note maturing after 5 years at \$105.1. It's still a zero coupon, but the implied phantom yield is 1% per year, which means that your present value is about \$77, leaving you with \$23 to spend on the option. If all things were equal and you were looking in the S&P 500, for instance, you would have a lower participation than you would on the previous structure. But the minimum yield to maturity structure guarantees a higher minimum return.

The third structure that I wanted to look at is what we call an average payout structure, and that results from an Asian style option. In this case, you still have the zero coupon bond, but it's wedded with an Asian option, which means you have a certain number of points of averaging for your final value. Let's return to the S&P 500. Instead of taking one point in the future—which would be five years in this example—you would take the average of the level of the S&P in year four and five, and that would be your final value.

This has been a very popular structure for two reasons. One, it reduces the cost of the option, which gives you a higher participation. Second, it mitigates the risk on

one day in the future five or seven years from now. This structure mitigates the risk of having a downturn on one day. We see structures that are averaging as little as the last 20 trading days in a structure and as great as the last 3 years, depending on the time.

As I said, many trust structures have been coming out, and a trust structure basically embeds the ELNs economics into a grantor trust. What results is economically the same thing for the most part, but the accounting and the tax treatment are slightly different. I just wanted to go through those differences.

When I say that the economics are primarily the same, the option cost should be the same, but what may be different is the cost or the implied cost of the issuer. The reason for that is with a grantor trust, you can go out into the secondary market, pick up a bond, and put it into a trust. That saves you from going to the issuer directly and negotiating the bond that they will issue. Generally, there's a premium for going to an issuer and asking them to issue something for you specifically. Going into the secondary market sometimes results in a higher participation.

The structure is usually a public U.S. MTN. We went through the tax. The statutory treatment is treated as debt by the NAIC as long as there's 100% principal protection. It follows the retrospective yield method until, again, there's something further from the FASB. One component that goes into these things, just on the documentation side, is that you have to disclose what you're doing as far as the equity. With a public MTN in the U.S., that is going to be the most onerous disclosure on the index or the stock. That compares to a lesser standard for a private placement, which is what a grantor trust is.

In the ELN, the credit is fully to the note issuer and liquidity is there. I would say that there are five dealers on the street that would make a market in this, Morgan Stanley being one of them. The point about saying that it's not a liquid secondary market is you can't punch up an issue on Bloomberg and expect to see the latest quote. They just don't trade that often. The comparison here is the grantor trust structure, which is privately placed under 144A. The tax is bifurcated; meaning that you would account for the bond that resides in the grantor trust as you would any normal bond. If it's a zero coupon, you would just accrete the Original Issue Discount (OID).

For the option you would recognize capital gain or loss at maturity as opposed to income on the ELN structure. For regulatory purposes, they're treated the same. For GAAP accounting purposes, again, you split up and treat the bond separately from the way that you treat the option. The bond would follow the normal choice

of classification, whether hold to maturity or available for sale or trading. In the option, you would recognize mark-to-market changes during the life. The indexed disclosure is just a lesser standard for something that's not public nor registered with the SEC, so in certain cases it's somewhat easier to do private placement as opposed to public. The credit is split up as well. You would have credited exposure to the bond issuer on the bond component and to the dealer who put the transaction together. In this example, it's Morgan Stanley on the option component. The liquidity is nearly the same for both the grantor trust structure and the ELN. That is a basic overview.

Mr. Reddy: Since 1995, when the NAIC clarified principal protection as being sort of a governing principal for equity notes being treated as debt, have you seen a clear increase in use by insurance companies? Or at least interest by insurance companies in using them?

Ms. Hansen: Yes. I think that over the last year or year and a half there has been a clear increase in inquiries from insurance companies regarding this product. There's a long lead time, as everybody knows, as far as working an idea through an insurance company. Of the probably seven or eight insurance companies that have inquired about this, only one actually came to market. But I would say that in the next six months to a year the rest of them should come to market and start to buy these things.

Mr. Reddy: What about the different types of equity exposure that can get wrapped up in these things? Have you seen more moving away from, perhaps, the earlier S&P 500-type options and a shift toward foreign indices or things of that sort?

Ms. Hansen: As far as the types of exposure, in the beginning of this product it was almost exclusively S&P 500 exposure; that being the most liquid U.S. market that there is as far as embedding options into notes. In recent years though, we have seen insurance companies purchasing EFA-type exposures and even some that have purchased emerging markets with Latin America and Southeast Asia. I think, by far, the biggest exposure is still in the U.S. market.

From the Floor: How does this thing work with securitization? You have the outside for providing the equity option. If you want to securitize some of your current assets, does the trust work? Does the ELN (ELN) work?

Ms. Hansen: In other words, if you currently hold cash equities and you want to principally protect those and put them into a trust?

From the Floor: That's right.

Ms. Hansen: There has been some work done on that subject. I think that it's unclear as to whether or not you can simply take cash equities that you own, dump them into a trust and principally protect them, and come out with something that has a better RBC treatment. I'm not sure that it has been resolved. Do you know, Steve, if that's been resolved? I know there's been much work done around that question, but I don't think there's any particular resolution as far as the NAIC is concerned.

From the Floor: I thought that Morgan had a live application into the Standard Valuation Office (SVO).

Ms. Hansen: I'm not aware of that.

Mr. Reddy: It was my understanding in terms of taking assets off the balance sheet that, for statutory purposes, the NAIC position is that the new trust structures do come on the balance sheet, and the regional assets come off the balance sheet. But they do have to be rated by the SVO. It is subject to getting a rating, which means having something in the trust that can give it a favorable rating, such as treasury zeroes, to provide principal protection.

Obviously, the more aggressive you get in coming up with creating a note that might have a positive coupon, for example, the harder it may be to get a favorable rating.

From the Floor: Did you hear anything about *FAS 125* and the return of the assets? Is that a sale at termination of maturity of the note?

Mr. Reddy: No, I don't believe there's a sale for GAAP purposes if you're just repackaging existing assets into a security that you don't sell any portion of.

From the Floor: I was thinking about the special purpose equity corporation rules under *FAS 125* where the special purpose corporation could not do equity sales or purchases. With the termination at maturity, can the actual stocks come back?

Mr. Reddy: Oh, I'm sorry. It's the maturity of the certificates themselves. Can the stocks come back? As far as I know.

Ms. Hansen: Yes. Again, this is a cutting-edge arena because there are many different ways that you can go about doing what you're trying to say. I think part of what you're trying to say is if you put cash into a grantor trust and you principally protect it, can you then take those stocks back and not sell them at the maturity of that trust? That is an unclear area. Do you put them in there as a forward sale?

And if you do it that way, do you then cash-settle that forward sale as opposed to physically settle and deliver those stocks, which would clearly be a sale at that time?

Again, there are many different ways to think about this and to structure it. If you take the forward sale type of structure and you have a band of 20% risk, today it would not be considered a sale. But you would have to choose not to physically settle those at maturity. We think that may work. But I'm not certain that you can simply take those stocks, put them into a grantor trust, throw a bond in there, and then take the stocks back five years later and say nothing happened—all I did was get good RBC treatment. I'm not certain that works. But again, there's a lot of investigation going on around this whole issue, and it has not really been clarified.

Mr. Reddy: Yes, I think you're bound to see more activity in this area and, presumably, we will have more clarification as regulators scrutinize these types of instruments more closely.

Mr. Peter Hepokoski: Anna, when you were talking about the disclosure requirements, I think you characterized the disclosure of the equity element as being burdensome. I would expect it would have been fairly straightforward to define this, and I wonder if you could elaborate?

Ms. Hansen: For the U.S. market, disclosure is very simple. There's a publisher for the S&P. All the components of that index are fully disclosed and readily available to just about anyone.

For other emerging markets, such as Southeast Asia or Latin America, it's more difficult to get your hands on exactly what the components are, and how they deal with market disruption events, how they put stocks in, or how they take stocks out. The point is that if you are buying a U.S. MTN that's registered with the SEC, the disclosure has to be accurate, up-to-date, and complete. If you're doing a private placement that doesn't go through SEC registration, it's up to the underwriter or the issuer how much they feel comfortable with, so it's just a lesser standard of disclosure.

From the Floor: If I understand your ELN correctly, it's similar to a bond plus an option. Why can't an insurance company go ahead and do it themselves that way rather than going to ELNs? There must be some advantages and disadvantages in going through an investment banker to do that. What would they be?

Ms. Hansen: The regulatory treatment is more certain if you actually buy a bond as opposed to an ELN. As I said, an MTN from an issuer where the return is linked to

an equity market or a grantor trust package containing their bond and the option. The investor can't make decisions about those during the in life. It's a static investment. You put it in there and it matures at a certain time. That is considered debt by the NAIC.

If an insurance company buys a bond and an option and puts them together somewhere in their organization, that is not considered a bond. It doesn't get the debt treatment. You would have a bond plus an equity option where the equity option would have disadvantaged RBC treatment.

From the Floor: Two easy questions, I think. What's the typical maturity on one of these things? How long can they run with numerous structured settlements?

Second, you talked about the GAAP accounting treatment, and that is getting settled. What's the statutory treatment? What's the statement value they make you put down each year and the annual income?

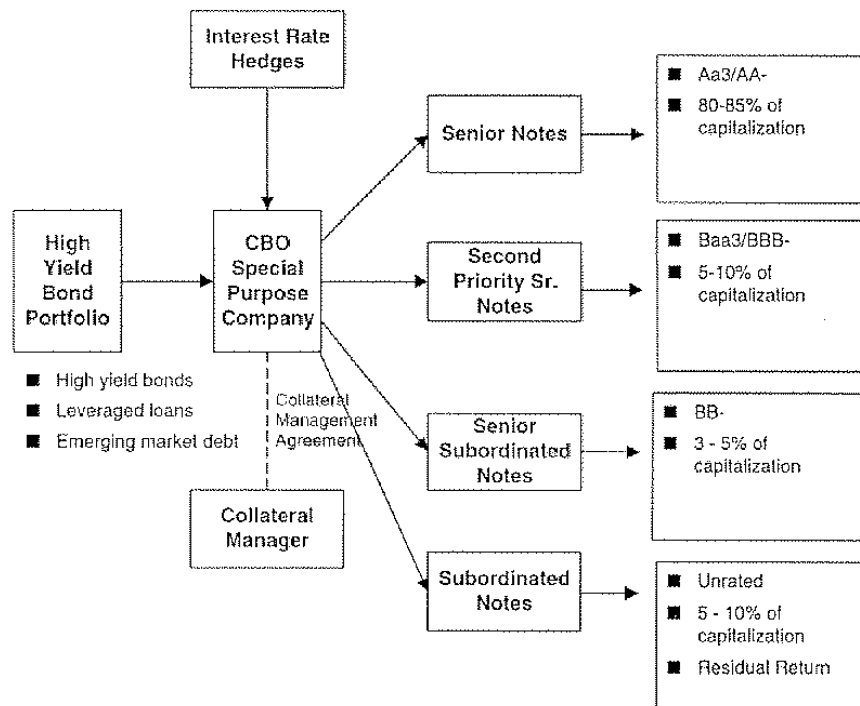
Ms. Hansen: On the statutory side, it's treated like any other bond so it's just carried at cost. Typical maturity has been five to seven years. But recently, I would say, in the last 9 months, there have been transactions that have come out as long as 30 years. There are, however, probably only two or three dealers who can put that structure together, so it's not as widespread as a five- to even ten-year structure.

Mr. Reddy: Mark Griffin is going to speak next and address both CBOs and CAT bonds, and what's going on in those arenas.

Mr. Mark W. Griffin: CBOs, to my mind, are really nothing more than the world's oldest profession at work again. Before we get too deep into that, I will remind you that many butchers feel that they are the world's oldest profession. This is really nothing more than walking in the supermarket and observing that you can buy a whole chicken or the different pieces of the chicken. And, in fact, if you buy all the pieces, you'll notice that the price is higher than buying the whole chicken. But, at the same time, the butcher who cuts up the chicken has the risk that he won't sell two legs for every breast, and so forth.

The CBO is actually a group of higher yielding bonds that are tranching for credit. Chart 1 shows a sample CBO structure. This is rating agency intensive business, so I know that David will have some more guidance on how these are done and how they tend to work later on. Basically you take a high-yield bond portfolio that goes into something called the CBO special purpose company, which issues different types of notes. They, as I said, are tranching with respect to credit risk.

CHART 1
SAMPLE CBO STRUCTURE



There are different types of situations that are possible. In Chart 1 we show four different types of notes running from a double A rated at the top of the page to unrated at the bottom. If you imagine that the high-yield bond portfolio is 100 high-yield bonds in equal proportion and if the bottom piece is 5% of the capitalization, then the bottom piece will take the first 5% of the defaults.

The next piece is double B minus. It takes the next 3–5%, depending on the definition, as you move up the page. That’s how you get the credit protection. If you’re buying the double A at the top of the page, then you have more credit protection than if you were holding the original high yield bond portfolio.

Among other things to understand about the structure, there’s typically a collateral manager who’s in charge of managing the different bonds that are within the CBO. There may be interest rate hedges involved in the CBO just to get the term and maturity structure of the CBO to be fairly consistent between the different issues that you want to put in. It would be very convenient if all the issues you wanted to put in had exactly the same maturity, but that’s not always the case, or that’s too limiting in terms of building the CBO.

The insurance companies tend to be both buyers and issuers. That sounds odd, but there are actually good reasons to be both. First, the desire for yield is always there, now more than ever for insurance companies. Comparing insurance companies in pension funds to other investing sectors of the market, their tolerance for illiquidity is higher than the general money manager; therefore, there's a natural attraction from insurance companies to structures like the CBOs.

Regarding outsourcing on a leveraged basis, we started to see the trend of insurance companies hiring external managers for high-yield debt or emerging markets debt—things that they don't particularly specialize in. This is another way to do the same thing because, in a sense, you are hiring this collateral manager. He's going to manage the bonds within the CBO. There's a good analogy between that and simply hiring that manager to manage a portfolio of high-yield debt.

It also provides diversification and professional management for a small absolute investment, meaning that if you don't want to buy \$200 million of high-yield debt, this is a way to buy \$10 or \$20 million and get a diversified basket. You've diversified your risk without buying pieces of the different bonds that are out there.

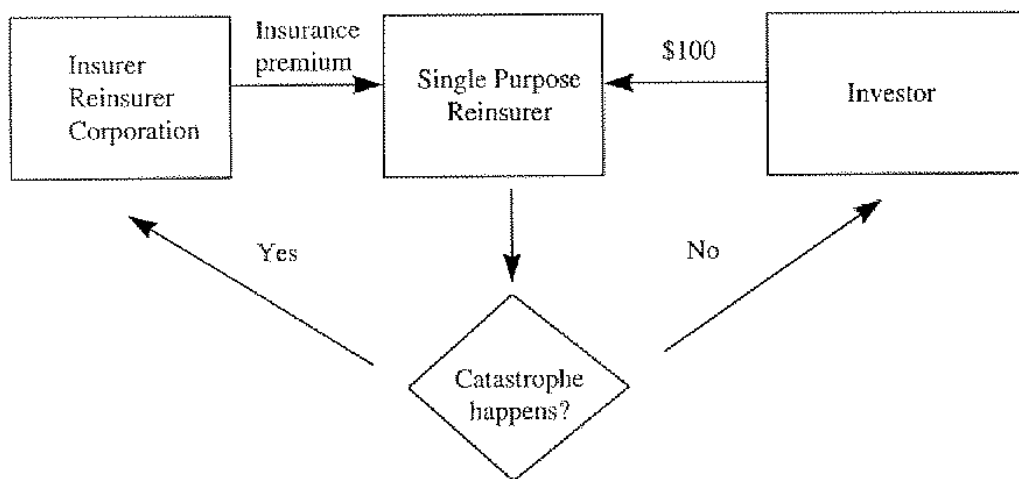
Insurers are also issuers from time to time. I notice that in David's presentation he has a list of some of the CBOs, and there are some insurance companies who have been issuers who are on that list. The prime motivator is to simply collect the management fee because the collateral manager will collect a fee based on the total amount of bonds in the structure.

Many asset managers, not insurance companies, like to do this because it increases their assets under management. If they're putting together a CBO that's \$200 or \$300 million, then that's shown as assets under management for that asset manager, which is very important in the way that many asset managers are compared to one another. Also, for insurance companies, it would leverage the credit skills of the insurance company to the extent that the insurance company will tend to have credit analysts who may be quite good at high-yield emerging markets that are in the CBO. If you don't want to increase that particular type of asset on your balance sheet, this is a way to leverage that expertise effectively to externally market the insurance company's credit skills. That is the very simple version of CBOs.

The type of things going into these CBOs initially were more what we call high-yield bonds, or what you may think of as junk bonds. We've also, as this has evolved, started to see more leverage loans, emerging market debt, and even in the last couple of months, catastrophe bonds, which we'll talk about in a couple of minutes. The issuance of these has taken off, again, in the last couple of years and we expect that to continue.

Before I move on to insurance-linked securities or CAT bonds, are there any questions on CBOs? Chart 2 is a schematic diagram of an insurance-linked security. These are sometimes called catastrophe bonds, active GOD bonds, or volcano bonds. There are many names for them, but the basic structure is that you have on the left-hand side an insurer, a reinsurer, or a corporation that would normally buy some type of insurance program. Rather than paying that insurance premium to an insurance company, you're simply paying that premium to the single purpose reinsurer, which is basically a trust to hold these assets.

CHART 2
INSURANCE-LINKED SECURITY STRUCTURE



The single purpose reinsurer takes in the insurance premium from the party on the left, receives the \$100 from the investor on the right, and then pays that amount back to either the investor or the insurer, reinsurer, or corporation based on the occurrence or nonoccurrence of some identified catastrophe. Even in the small number of deals that have occurred so far, we've seen a different number of catastrophes that this has been used for.

The most popular example is the big-hurricane-hits-Miami scenario, and the subsequent losses. Obviously, you can have more sophisticated payout patterns based on the amount of the catastrophe or the timing, but the basic idea is that both the investor and the person or entity trying to buy protection put their money into the single purpose reinsurer. Whoever gets the proceeds is dependent on whether or not this catastrophe occurs.

One of the real criteria of this type of security is that the catastrophe itself has to be an event where the insurance premium that someone would pay to protect against the event, divided by the probability of the event itself, has to be a high enough

multiple to interest the investor. Given our actuarial training, we expect those to be almost equal. There are still large pockets of the market where that is a fairly high multiple. What you pay for a very small risk is actually a significant multiple of the probability of that risk. That's the type of situation that's most applicable here.

The catastrophe definition can be on an indemnity basis. If it's an insurance company, it can be based on the insurance company's actual losses. The trigger might be that the company's total loss is more than x billion dollars, causing a payback to the insurance company under the catastrophe bond.

Alternatively, you could have what we call an index or a parametric trigger. All that means is that you have some sort of index. The best example is in the U.S. There are Pharmaceutical Card System (PCS) indices of industry losses in different areas over different periods of time. You can base the trigger on those indices. If industry losses in Florida from a single event are greater than \$20 billion, that causes a payback to the insurance company under the catastrophe bond, for example.

You can have a parametric trigger where the trigger on the bond is based on the Richter scale reading of an earthquake, the number of ships that sink in a year, the number of planes that crash in a year, or the number of people killed. It can get kind of gruesome. But anything that you can count can be included as a trigger event under these types of securities. There are a handful of these things out there. People like ourselves are working day and night to increase the number, but it is a new market where there really isn't a clear template yet in terms of how these things will work.

What is the rationale behind this market? It is motivated, I think, by the large number of insured losses, for instance, in the 1989–95 time frame where you had North Ridge, Hurricane Andrew in Florida, and some other catastrophes that were very large by historic standards. The insured losses from those events, which, by themselves, were over a billion dollars, were roughly \$36 billion compared to the property/casualty (P&C) industry surplus of \$232 billion. You can see how those events themselves took a big bite out of that surplus level.

We also throw in the size of the capital markets; although that clearly varies day by day. Obviously, the extremely large insured losses are really just a blip in terms of overall capital market performance. The general macro idea here is to be able to spread those losses over a much greater exposure than just P&C industry surplus. I think that is the idea of securitization.

The advantages to an insurer or reinsurer, or even to a corporation, of securitizing relative to traditional reinsurance is that they have no credit concerns with respect

to the reinsurance company. The investor has posted the \$100, so the money is there. They don't have to worry that the same large event is going to have a negative impact on the reinsurer's ability to pay. The capacity is potentially unlimited.

Some of the participants have done this strategically in the hopes of bringing the capital markets in not to get better pricing now but to assure that the capital markets will be there if there is a big event. Then it will be easier to see where additional capacity may come from if there's a big bite taken out of the surplus level of the P&C and reinsurance industry.

Why are insurance linked securities attractive to investors? Clearly, this would never work if there weren't investors to buy these things. The returns have been viewed by investors to date as being quite attractive because these have been done in sectors of the reinsurance market where there is typically a low-frequency, high-severity risk because that tends to be the type of risk that in reinsurance terms you need to pay a considerable multiple of what the risk is actually worth.

Let's take something that by all the best modeling in the world looks like a 1% probability. If you take that to the reinsurance industry, you will have to pay, 3-5% to reinsure that type of risk. Again, that's the type of multiple the reinsurance industry will charge, but that multiple is attractive to investors because it tends to be higher than the comparable multiple for bond credit risk where you look historically at, say, double B default rates of roughly 1%. Spreads on double B bonds before a couple of days ago were in the magnitude of 2%; maybe they're 3% now. Here you have a security that for the same expectation of loss you're getting 4% or 5%; something well north of that. On that basis, risk versus return, they look attractive relative to the bond market. The other obvious attraction of these is that historically insurance risk has been uncorrelated with other asset classes.

I think the correlation is a very good one when you can see what happened in the markets the other day when all the equity markets around the world went down at the same time. Here you have risks that historically have been uncorrelated. People intuitively understand why they should be uncorrelated, so they would generally accept that going forward.

Also, what is interesting from a diversification perspective is that here you can build a portfolio of different risks and continue to drive the volatility of that portfolio of CAT bonds down over time. For example, you may buy one particular bond that is Florida Hurricane. Later on, you might buy a California Earthquake, a Tokyo Earthquake, a Northeast Storm, a New Madrid Earthquake, or a European Wind

Storm. We're dreaming up all kinds of things. As you add more risks, you continue to drive the volatility of the portfolio itself down.

I think that the best analogy is probably the U.S. stock market. If you look at the S&P 500 Index, which is basically the 500 stocks with the largest capitalization in the market, the average volatility of the components of that index is about 30%. Yet when you put 500 of these together, you only get the volatility down to about half of that. So after you have five or ten U.S. equities, the amount of reduction in volatility you get from buying more becomes extremely small, and eventually becomes zero. To the extent that you can add different risks in insurance-linked securities, you can continue to decrease that volatility of the portfolio in addition to the fact that the portfolio itself should be uncorrelated to other portfolios within your balance sheet. That's the generic, overall description of what's going on. As I said, there are particular deals in the market and deals that we and others are working on that tend to be specific. Unfortunately, they're all private placement, so it's hard to describe them in great detail in this forum. But it's starting to happen fairly quickly.

I think what's interesting is that many people on the reinsurance side of the business were very surprised by this because, in terms of their cycle, premiums, if anything, are getting somewhat soft. The reinsurers had always expected that if a securitization like we've seen were to begin, it would begin in a harder market where the premiums that they charge are high relative to what they have done historically; maybe right after a large event like an earthquake or a hurricane.

The CAT deals have taken off in this environment because bond spreads are quite low by historic standards. Equity markets are quite high. Basically, capital market investors are having to look further and harder to figure out where they're going to make incremental return. There are still pockets of the reinsurance industry where you can get a very attractive multiple in terms of what you're getting paid to something's historic risk; therefore, those are attractive to bond investors.

I should probably add that within each of these fields, there is sophisticated professional modeling that's included in the disclosure to investors. The professional modeling firms tend to be widely used within the insurance and reinsurance business for either hurricane or earthquake risk. They will be the experts for one of these deals providing data and analysis on the probabilities of the particular trigger event. Some investors perceive that they don't really know this business as well as reinsurers, so why should they be doing it? I think many who have participated recognize that they have access to the same models through these professional modeling firms that the insurance and reinsurance industry themselves use, so they're not that far behind in terms of their ability to model these risks.

From the Floor: The investors are posting more or less the surplus that's going to be behind the risk in this business. Are the investors posting that surplus?

Mr. Griffin: I wouldn't even say they're posting surplus. They're basically collateralizing the risk as opposed to a reinsurer, who typically is writing an option.

They wouldn't necessarily post collateral. The collateral is there. The maximum amount you can collect is the \$100 that is in the trust already from the investor.

From the Floor: I guess that was my point. When you say collateralize that risk, the risk in question is probably the complete maximum amount that would have to be paid out in a given catastrophe. Is that right?

Mr. Griffin: Right. The amount that they put into the trust within a single purpose reinsurer is the amount at risk and the maximum amount that can be lost.

From the Floor: All that they can pay out.

Mr. Griffin: Yes.

Mr. Reddy: You mentioned the benefit of doing multiple investments from an investor's standpoint, getting the benefit of the lack of correlation and the reduction of volatility of potential results. What do you think it will take to get more of these deals to market so that investors can have multiple investment options and get multiple investments in their portfolio?

Mr. Griffin: We see quite a number of investors who are happy to build their portfolio from the first yield on; therefore, our priority is to bring them different risks until there is a portfolio out there. There is a fairly large group of investors whom we've approached who say, "This is interesting but come back when you have 20 of these things so I can buy a portfolio," which is well and good. But you can also see that when there are 20 of these things out there, their value will go up, so you would expect the spreads to come in to the extent that people can buy a diversified portfolio.

The question is, do you wait till there are 20 and take a reduced spread, or do you start to play when there's a handful of these things, in the hopes that there will not be a catastrophe until the 20 come along, for which you should get spread reward? We would hope to get to the 20 point fairly soon.

Mr. Reddy: What do you think it will take to get to the 20 point? Is it going to take a big catastrophe? Will that make it easier to get a deal done?

Mr. Griffin: I don't know if that will make it easier or harder. If there is a big catastrophe that hits one of the securities, obviously, some of those people are going to lose money and, undoubtedly, lose their appetite going forward. At the same time, we talked about this multiple of spread to risk. There are many investors who we've approached, and the group that tends to fall into this category of waiting for a catastrophe are really hedge funds more than anyone who says this is an attractive multiple. But I'm going to keep my powder dry until the big one does occur. I'm going to invest when that multiple goes from five to one to ten to one. It's always great to say that you're going to buy the market at the bottom. But there are some people who will participate in the market that way.

I have to think that with just a handful of deals out there, a big catastrophe that hits one of the deals is going to be bad for the market. At the same time, understanding the dynamics of the reinsurance and P&C business, if there is a large catastrophe that's not covered by one of these deals, the pricing will harden and none of these securities will be affected. Just through its effect on the reinsurance business, in the P&C business, you expect that multiple to go up and this market to be even more attractive to investors.

Mr. David Power: I will talk about each of the products that both Anna and Mark talked about earlier and talk about how we at Moody's view the credit risk as associated with those products, and how we rate them. We do rate each of those types of products in our structured derivatives group; those being private-linked notes, prioritized bond obligations, and collateralized loan obligations, as well as catastrophe-linked bonds.

The approach we use, alluded to by Mark, is the notion of expected loss, which is a function both of the probability that a default will occur and the loss that will occur in the event of that default. Rather than merely looking at the probability of default, we think it's important from the investor's perspective that recoveries be included in what our ratings mean. We consistently apply this notion of expected loss to all the products that we rate, whether they be plain vanilla corporate bonds that have the full gamut of ratings, or specifically designed structured instruments.

That is to say for each tenure and each rating level, there is an expected loss associated with a 5-year triple A or a 15-year B-1 bond. Those vary significantly from an expected loss of somewhere on the order of a tenth of a basis point on one-year triple A to 30% or 40% on short-term single B rated bonds. When we look at expected loss of various instruments, we take into account the default rates that we have garnered from Moody's 100 odd years of experience in rating bonds, and the default rates associated with bonds of any particular rating category.

Given the potential correlation of defaults of bonds when you're talking about a pool of bonds being put together as in a CBO, the likelihood that one bond or multiple bonds will or will not default together will affect the analysis of CBO significantly. And then, of course, we take into account recovery rates, which do have a relatively high standard deviation. There's not as much information and reliable data about recovery rates; therefore, we generally take some conservative estimation of what the appropriate recovery rates are for various instruments.

For an example I have referenced credit-link notes, which are not particularly different from the ELNs that Anna described earlier. In the basic structure, you have a grantor trust and it issues a note. Instead of having an equity option, you can have something as simple as an interest rate swap where the bond in your trust pays the fixed rate of interest. The conventional note is put into the trust, and then the trust enters into a swap with the swap counterparty. The swap counterparty agrees to pay everything that the structured note holder is entitled to receive, which is all the principal and interest components on the structured note and all the interest that's to be paid to that credit-linked note holder.

The swap counterparty, in return for agreeing to pay all those amounts to the trust, receives all the payments on the conventional note that the trust holds. From that perspective, all the risk in the transaction is on the swap counterparty. Why would anybody do this? Because the swap counterparty, or somebody else that the swap counterparty is acting for, no longer has the conventional note on their balance sheet.

How do you look at the expected loss in such a transaction? Let's assume that the swap counterparty has a 10% probability of default based on their rating level over the life of the deal, and that our historical data would lead us to believe that in the event that the swap counterparty would default, the holder of the note would receive the recovery of 40 cents on the dollar. Therefore, you have a 90% probability that you'll get \$100 at the end, and a 10% probability that you will get \$40 at the end.

It's a simple move from there to calculate the expected loss, which is the probability of default times the loss upon default, which is \$6. Forty cents on the dollar is closer to the historical mean on corporate balance. We usually use 30 cents on the dollar for CBOs. When I changed it to 40 cents, I forgot to change the resulting calculation.

That's a simple example of how we calculate expected loss. What do we do with that expected loss? If you're going to lose \$6 out of your \$100 and the tenure of the bond is so long, what rating level does that equate to in our standard benchmarks?

In this example it would be the exact same as the swap counterparty's rating, so if the swap counterparty was Baa1 then this credit-linked note would also be rated Baa1 because it would have the identical expected loss as an instrument issued by the swap counterparty.

The notion of expected loss continues through our analysis of CBOs. As Mark described, a CBO is a pool of assets owned by a special purpose vehicle, which then tranches out the losses associated with the pool of junk bonds. The equity piece at the bottom takes the first losses. Sometimes there's a mezzanine piece, and the senior piece is protected at various levels. How do we determine, for the senior piece for example, what the expected loss is that is what is the probability of them losing money and how much will they lose in the various events?

The market for CBOs has increased dramatically from the first one issued in 1988 to this year. I shouldn't be here today because I should be rating the three that are going to close this week! The volume has exploded for a number of reasons. One of the reasons is that the availability of different types of assets to put into a structure like this has expanded as our techniques for looking at them have matured.

The CBO is actually a market arbitrage opportunity—at least it was formed that way. If you take a pool of B-1 bonds that has paid 250 basis points over London Interbank Offered Rate (LIBOR) and you separate that loss among tranches of investors in order to pay a big double A class at the top, you may only have to pay 60 or 70 basis points, and that number keeps going down for the biggest piece of your capital structure, which leaves very attractive returns at the bottom for your equity piece.

The types of assets, as Mark alluded to earlier, that go into the CBOs are expanding from just junk bonds to bank loans and emerging market bonds. We're also seeing synthetic bonds, trade receivables, and even product finance debt being proposed for these structures.

In evaluating the expected loss to the holders of the rated pieces of a CBO, our methodology takes into account the default probability of the assets and the recovery rates. As I said, we usually assume the 30% for U.S. high-yield junk bonds, so when they default the holders of them will recover 30 cents on the dollar. We assume that emerging market bonds will pay even less.

We also assume that when defaults occur, they will occur early. If a B-1 bond survives the first year, it's much more likely to survive the next several years, so we believe that most of the defaults that you would expect to occur will occur early in the transaction. We then take into account the potential correlation in the pool.

We also take into account when the losses might occur in the transaction by looking at all the possible scenarios that could occur with defaults in the pool of CBOs. Remember, a CBO, unlike a mutual fund, may be slightly managed in terms of what assets remain in the CBO, but we insist upon fairly stringent restrictions as to the types of assets that can move in and out and the characteristics and the quality of the assets that have to remain in the structure.

But we look at all the possibilities within those guidelines of when defaults could occur, how they occur, how they are bunched, and the probability of each of those scenarios and the losses associated with them. We then sum them up. We look at the present values and we come up again, almost magically, with an expected loss number. We do look at the present value of the losses, so it does matter when, over the course of the transaction, they occur.

There are a number of structural issues that we look at in CBOs that I don't think we need to address here. I will review a few quickly, such as ramp-up periods. We worry that when the transaction closes, it doesn't close owning a bunch of junk bonds. It takes a while to buy them. We want to make sure that you don't buy the bad ones first and hope that you will get the good ones later because you could get stuck when the market moves. So, we have very tight restrictions on how you become a fully funded pool of assets.

The priority payments are how cash flow moves through the transaction, making sure there are enough bonds in the structure on a principal basis to support all of the rated debt. Make sure there's enough interest coming in. Make sure that interest rate or currency risk is written out of the transaction. Make sure that the players, the collateral manager and the indentured trustee, know what they're doing and will do an adequate job. As I mentioned before, the pool should remain fairly constant, and the market risk should not enter into the transaction. We're only looking at the credit risk of the items in the pool.

There are legal issues here, which are essentially the legal issues that are dealt with in every structured transaction, which I won't address here.

There are currently in the market about \$30 billion of securities that are CBOs and CLOs. Of the CBOs and CLOs that Moody's has rated, none have defaulted, and we continue to monitor all the transactions that we rate on an ongoing basis. We already talked about structural issues and transcend collateral.

As the CBOs have become more popular, as I mentioned earlier, the spreads on the piece have narrowed considerably as the product has become more and more accepted by the investing public.

As this market has grown, it's clear that it is here to stay. We see more and more banks taking loans off their balance sheet and putting them into one of these structures. They believe they're getting regulatory relief from the Federal Reserve and foreign regulators for passing the credit risk of their main business lending on to the capital markets. We're seeing a very strong flurry of activity in those types of transactions.

Unfortunately, each of these transactions, is different. The structure is different. The assets are different. The rules are different. There is no homogeneity. There are similar features throughout the market, but the analysis that we have to undertake is very different in each transaction. We don't see any homogeneity coming into the market anytime soon. It doesn't seem to be affecting the ability of the market to grow, however.

I have, as Mark mentioned earlier, a list of transactions that we rated last year, and this list, if it reflects 1997, would be about twice the size. Finally, I'll talk about what we do when we look at catastrophe bonds, which is, again, the same thing in that we calculate an expected loss and apply that to the benchmark of our expected losses that are associated with all of the Moody's ratings.

We are given the opportunity, unlike most investors in catastrophe bonds, to cross-examine the experts, whose data information and expertise are being employed by the investment bankers and the sponsors of catastrophe-bond transactions about their methodologies, their techniques, their theories, and how they feel about competing theories in their particular area of expertise.

We do not employ experts in seismology or in meteorology to independently review probabilities of massive earthquake or hurricane events. But we do have a limited amount of lay expertise, if there's such a thing, in those areas such that we're able to vet the process by which these experts come up with an experience curve.

The question is, what is the probability of a loss from a certain event exceeding any particular level? We ask these experts what all the variables are that entered into their coming up with this curve, what the variances in those variables are, and how they went about determining what the reasonable range is to assume in using those various variables. We usually require them to come up with something a little more conservative than they had originally come up with depending on our belief as to the conservative nature of how they looked at the various variables.

But once we have a loss experience curve, then it's fairly straightforward to say you have a probability. We know what the loss would be in the event of that probability; voila, we have an expected loss. And that's about it.

From the Floor: Do you know of any products that you use or anything else tied together with the Treasury and placing protection securities? Is there any kind of inflation-indexed funds that can give insurance companies a way of providing products for their users that can hedge against a foreclosure.

Mr. Griffin: The time-based CBOs or CAT bonds?

From the Floor: Yes.

Mr. Griffin: I'm not aware of those being tied together at this point. Those are obviously relatively new securities that may still be coming, but I'm not aware of any combinations of those kinds of structures.

Mr. Power: Most of the principal-protected deals that we see that contain some sort of Treasury security and some other security of the type that Anna was referring to earlier usually use Treasury zeroes because the discount that they save in buying the zeroes can be used to purchase the option. We actually see them now more than anything, from our perspective, in terms of whether they're actually seeking a rating on those types of securities with the equity piece of CBOs, so you have a principal protection that's marrying the two of these products together.

Mr. Reddy: Yes. I was going to mention that I was aware of that as well, and I think that seems to be a trend of companies wanting more principal-protected instruments where the equity piece could be any form of equity—CBO equity being one example. You could have some kind of real estate equity exposure as well in that kind of structure, or some kind of leveraged credit exposure. So there are many possibilities out there in terms of using principal protection to your advantage. Insurance companies seem to be exploring that option with more vigor and enthusiasm these days.

David, just one clarification. You mentioned earlier with respect to B-1 bonds that the risk of default was concentrated in the first year, and then somewhat lessened.

Mr. Power: It's not overly concentrated in the first year. They're still risky after year one, but the marginal default probability in year one is much higher than the marginal default probabilities going forward.

Mr. Reddy: Does that then lead to over time some expected upgrading of some of those securities because they get passed over the hurdle?

Mr. Power: Well, certainly that's true. That is likely. If you have just a B-1 plain vanilla bond and it survives the first year, the odds are that if it survives the first couple of years, it will have improved by then and will likely be upgraded. Our data that build these tables take into account the fact that something was upgraded later down the road.

From the Floor: How many of these new bonds that you are talking about are coming from trash bonds? Are they just a better way to junk bonds?

Mr. Power: I think we did not make a distinction between junk bonds and trash bonds. Basically, in our review of these types of structured instruments, we're leveraging off Moody's fundamental ratings expertise in looking at credit analysis of fundamental names. We believe and I think the market also believes that this is the best fundamental analysis available. If something has a B-3 rating, then it's a B-3 rating. It's a junk bond because it has to pay a high yield, but a B-3 is a B-3 is a B-3.

Mr. Reddy: David, is it fair to say then that in terms of your assigning a given rating to any security, you're looking at trying to estimate the total expected loss whether it comes from coupon or principal?

Mr. Power: That's correct.

Mr. Reddy: Basically the present value of expected loss.

Mr. Power: That's exactly right.

Mr. Reddy: Carrying that further, some of the recent CAT bonds had principal at risk. Presumably, you're just looking at the total at risk and, again, coming up with a present value of expected loss to the investor of the particular security, whether it be coupon or principal.

Mr. Power: That's correct. And actually, we've seen—particularly in the CAT bond area—a wide variety even within issuances of the amount of principal that's protected in various tranches, and the protection of coupon payments even if a trigger event has occurred. Those are all taken into account. It is the total expected loss versus the sort of maximum return that you would expect if everything got paid back as it was promised.

Mr. Reddy: As you're probably aware, the NAIC has, at least for now, decided to categorize CAT bonds risk as debt instruments as long as they can get a rating from a rating agency. That's somewhat of a departure from their overall guideline of principal protection being required.

This is an exception to that as of today. But they're effectively relying on the rating agencies to evaluate the risk and do it in a consistent fashion with the way they approach other securities. It's kind of interesting that they're taking that approach, but it's good for insurance companies as investors to be able to rely on that.

Mr. Power: That's also where the notion of consistently applying the idea of expected loss across the board served us well in being able to rate CAT bonds and to look at this new type of investment consistently with our approaches for other investments.