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Session 10OF
Managing Credit Risk in the Changing Market Environment

Track: Financial Reporting

Moderator: JOHN O. NIGH
Panelists: HANK PRYBYLSKI†
JOEL S. SALOMON

Summary: Presenters cover the outlook for credit defaults over the next 12 months and approaches used to price the debt market (e.g., Merton's 1973 paper and subsequent developments). Attendees leave with an understanding of how the capital markets value debt issuance and knowledge of future trends in default risk.

MR. JOHN NIGH: I'm a principal with Tillinghast in its New York office responsible for the Americas' mergers and acquisition practice. I've been with Tillinghast for almost 17 years in various capacities. Up until two years ago, I was running Latin America and decided to make the move to New York and am enjoying that experience.

This is an open forum, and the speakers have indicated that they would prefer that you ask questions as they occur to you.

Our two speakers today are Joel Salomon and Hank Prybylski. Joel is the deputy head of the credit risk management department of Swiss Re Financial Services, one of three business groups in Swiss Re. Joel is responsible for managing a team of credit analysts which provide transaction support for U.S. corporate and global life and non-life insurance transactions in financial services, life and health and property and casualty business groups, which have credit risk components.

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†Mr. Hank Prybylski, not a member of the sponsoring organizations, is a partner at Ernst & Young in New York.

Note: The chart(s) referred to in the text can be found at the end of the manuscript.

Joel has developed the FSY credit information network, which is used to elaborate and communicate watchlists and establish a common coordinated credit risk exposure management strategy for financial services. He also is responsible for analyzing and assigning ratings to insurance companies worldwide for Swiss Re. Before joining Swiss Re, Joel was an analyst at Moody's Investor Services. He was responsible for about 20 life and health insurers in the United States.

Hank Prybylski come to us from Ernst & Young's risk management advisory practice, having served with them now for more than 16 years. He works with financial institutions, which he defines as banks, insurance companies and broker dealers, on developing processes for managing financial risks, including credit risk, and on developing economic capital. His clients include Citigroup, Morgan Stanley, Excel Capital and Ace.

We're going to have Hank start today. His presentation will review what's happened in the credit markets and he'll give his view of the future. He'll discuss common areas that financial institutions are working on to manage credit risks and he's going to look at it from an overall industry perspective. Joel's presentation will dig into what one institution is doing. He'll discuss how Swiss Re is organized, what its roles and responsibilities are and how it evaluates companies from a credit risk perspective. He'll also look at how Moody's ratings in particular have moved in the past few years and discuss some of the causes for why they have moved and how they might be different from what we've seen in the past.

MR. HANK PRYBYLSKI: Joel and I are going to cover our topic at two levels. These are my views and opinions and may not reflect the views of Ernst & Young LLP. We'll discuss where, in serving the industry, we see insurance companies developing their credit practices. Given the big bankruptcies of Enron and WorldCom, there have been numerous surprises in insurance portfolios across their different assets or underwritings, be it in their investment portfolios, in their surety bonds or in their directors' and officers' (D&O) policies. Companies have an awareness now that they need to move forward in how they manage their credit risk.

Because of this and the experiences of some of the financial guarantee companies around collateralized debt obligations (CDOs) and credit default swap (CDS) exposures, we're seeing an extreme focus in the insurance industry, and most of our risk management work these days has been particularly focused on the insurance industry, as opposed to two or three years ago where it was more of a traditional bank or broker/dealer environment. I'm going to try to go through where we see insurance company focus and what some of the hot spots are that people are having trouble with. Joel will then drill them down.

One of the things that we've been working with insurance companies on and have had a number of meetings about is developing an awareness of how large the exposures are for a typical insurance company. When you look at the portfolio,

especially the investment portfolio, there are several areas where credit exposures emanate to the extent that you have a large amount of corporate bonds, but there are more concentrated exposures in the industry.

Ceded reinsurance is a major focus area right now. How do you diversify and price away from that exposure? Concerning the financial guarantee, CDS business, which was a major focus area for a number of insurance companies, surety bonds and direct credit coverage, how are those exposures being aggregated across the books?

Some of the less traditional credit exposures, but certainly ones that emanate, are large deductible plans and retrospective premium plans. Another area we've been seeing a lot of people focus on is the more secondary exposures. How do we aggregate exposures in D&O policies and e-mail policies, so that when we look at an overall exposure to an entity across the firm we have that perspective? We have found that you really sit down with an insurance company and pull those numbers together, we're talking about a much more concentrated credit exposure on a material size compared with what I would consider a large banking organization. The gap exits when you look at the banking practices and how they manage credit compared to insurance companies. We're seeing a movement toward bank-like credit risk management practices in the insurance industry.

To paint the picture of how we got to where we are today, Chart 1 illustrates two points that I don't think are new to anyone. In 2001-2002 there was an incredible spike with record volumes of both numbers of default and dollar values of default not seen in what I would call the benign 1990s or 1980s, and not even seen in the recession period of 1991. Effectively, the glut of corporate debt was unloaded back into the distressed bond market, and that certainly ran through the investment portfolios of the insurance companies.

Certainly, 2003 is not running at the levels of exposure, but taking the recent wave of refinancings in the energy industry into consideration, it has eased some industry concerns. However, there is some concern when you talk to credit officers as to whether we are in double dip. Although people may get comfortable now that the pace has slowed down, they are not ready to release the credit cycle.
Our current place in the environment makes people focus more on recovery rates and for the macro conditions. Chart 2 is a little dated, but when I talk about loss-given defaults (LGDs), there's not a lot of information. This chart portrays historical average recovery rates for different seniorities of corporate debt instruments, and from each year, working from the left, working down in seniority, you see a fairly consistent pattern. And, as you would expect, the senior secureds receive for the highest level of recovery on average relative to the subordinated, and what is borne out in the latest credit cycle and the latest credit events is that it's almost been exacerbated.

If you look at the recovery rates on senior facilities in the past year or two, they have held consistent to where you would see that long-term average, in the 60 or 65 percent range, which is where I'd start if I had to put a benchmark for a senior-unsecured or senior-secured debt defaults. The subordinated, the loans and the lesser priorities are the ones that are taking the brunt of the default exposures. We're starting to see that, as the advances of the banks in credit pricing and risk-based pricing are starting to bear out, there needs to be greater emphasis on not just aggregating your exposures but on having an awareness of what type of facility you own in that structure. We'll talk about where we see LGD analysis. I think that LGD analysis and recovery analysis in the investment portfolio is an area where the insurance industry is leading some of its bank counterparts.

Another thing that is going to be particularly interesting in the credit environment is what the implications of the CDS market upon recovery rates are. Now that there's a fairly robust CDS market with much more active hedging going on, there's been a change in the behavior of the traditional workout scenario. Are we going to see people who are hedged, who previously would have been willing to work out the facility and take it through the traditional bankruptcy process, be less concerned about that? Will they be more concerned with wanting to get out of their swap? Will they be more concerned about the credit rating of their swap counter party, which may create some adverse behavior? That's a major concern with the workout institutions of the banks. If anything, that's going to create more volatility in recovery rate experience because you'll see less of a traditional restructuring process.

One of the things that has been revolutionary is an increase in more sources of default information on a forward-looking basis. When I think about the conversations we were having with insurance companies two or three years ago, and when we were doing due diligence on an insurance company that wanted to wrap or provide a second loss protection on a structured CDO, the information value of how those products or assets were being rated was principally an historical basis. A lot of what I'm going to focus on today is, as people are looking at credits, there's a movement away from external ratings as the primary drivers of information.

In the CDS market, our experience is that people are now actively using CDS prices as an indicator of probability default and breaking that back down into their credit models.

Chart 3 is Morgan Stanley's index of an average of investment grade swaps. There are two things going on. We're looking at the liquidity crunch for CDS prices, which could be caused by the demand for CDOs being placed. It also reflects people's concerns about probabilities of default, and if you use default swaps as a true forward-looking indicator, what can we glean out of this? Over the past year, around the fall-winter period, there's a heightened awareness for default and concern across industries—this has 50 names, so it's a diversified portfolio—and

then a slow ramping down. If you were looking at those names, this would be an excellent point of information value from an underwriting perspective.

This is an area where, as people look at credit infrastructure for more information, we'll see more and more transparency. There are some accounting rules, Emerging Issues Task Force (EITF) 02-03, which really get to mark-to-market practices for unobservable products. It may dry up some liquidity, particularly on the structured side, because there'll be some limitations on what profits you can book. It may also create some transparency that the credit risk groups will be able to work into their own analyses.

That's a little bit of the environment, about which I have two things to say: the first is that it appears to be getting better, but getting better from an absolutely horrible condition, and it could slide right back. Second, be focused on what piece of a facility you have in your investment portfolio, as there still are a large number of events that could change expected value significantly.

You then may ask, "If that's the environment that I'm in, what do I need to do to fix that? What are some of the common problems that Joel would have been facing at Swiss Re as he was putting his organization together to address these issues? Where do people need to spend their time?"

I discussed the heavy reliance on external ratings. It's easy to get information and it's easy to do the math. They give you all the information. It's harder to be more forward-looking and to address some more volatility. What do I do if it changes? You need to support that with more equity-based prices.

One of the other concerns we see is that credit risk limits are not risk-based. In that sense, we see a lot of organizations that'll be going through a process of pulling together their exposures across their different lines of business, be it financial products, life or property and casualty (P&C), and pulling those together and asking what their exposure is to XYZ Company.

We find that there's not a consistent view from a risk perspective. People have notional limits, and when I think about notional limits, that would be comparing a D&O policy limit to a corporate or surety bond. They're all going to have different exposure profiles when you actually get down to, if things go bad, how much they're going to lose. Although having notional limits is better than having nothing aggregated, they need to pull that together on a quantitative framework.

Secondly, a problem exists, and this is probably the primary problem from a risk-based perspective, in that there are no single-name exposures pulled together, and the common word we use in talking about the credit officers is that they have the "dial-pad" approach, the dial-pad being the phone pad. If you see a bankruptcy event or a concern, how do you get that information to your business unit? That needs to move from a dial-pad to a forward-looking perspective—more of a pushing

out. For example, the default swap prices just spiked on ABC Company. How much exposure do we have? How do we get out of that? The biggest problem we hear on exiting is that the investment portfolio is the area of greatest liquidity. They're the ones who have to liquidate the name. You want to try to get out of that exposure before it hits your investment portfolio.

A third major problem is a deteriorating credit not identified on a timely basis. There is not enough forward-looking information and not enough perspective. We commonly find that when we ask insurance companies what their workout strategy is, whether they have a defined exit profile, whether they sold at a certain position or how they pull that information together to work it out as a credit, is deteriorating. It's not commonly defined, and it needs to be discussed more.

I've done a lot of structuring work in the area of CDOs, which some companies have and others have too many of. The credit derivative business is a huge source for premiums, and if you look at the spreads that can be earned relative to a traditional investment portfolio, the return profiles are there. The institutions that have seen problems were not using forward-looking models and were not really understanding their single-name exposure across multiple CDOs and had unknown concentration exposures.

When you get into how to model a CDO and how to model a structured product, getting down to the building blocks of a double-waterfall approach and getting down to the building blocks of a truly transparent single-name exposure across multiple CDOs are all difficult, but important requirements. You're seeing some advances in the rating agencies on that. Ratings of CDOs are not as sophisticated as you would need to do to price them, but there probably are some opportunities for improvement.

If those are some of the common challenges, where do we think people are striving, and how would you suggest people approach that? We look at managing credit risk along a continuum, and you can't go from A to D immediately. There's a fairly logical step-wise process. My experience is that most insurance companies are somewhere between the first and second bubbles. They have individual transaction management. They've pushed out limits. They've pushed out exposures to individual names and pushed them down to the businesses.

There's a chief credit officer who may approve transactions but may not have the whole picture, and they are striving to get to more of a portfolio management approach where there's active concentration analysis, more dynamic ratings review, and more of an early warning system. I think that's probably leading class for an insurance company right now, and probably somewhat standard class for a banking organization of equivalent exposure size.

Where do we see people going and what are the opportunities for improvement? I said there's an individual portfolio management where perhaps the individual is the

individual exposure and the portfolio is taking that individual exposure across all your businesses. The next leap of faith is saying, "Now I know my individuals across my portfolio. How do I look at them as an overall portfolio? How do I look at the marginal contribution from a concentration, or maybe from an industry perspective? How do I look at portfolio level pricing? How do I look at how I net that?" That's the movement forward. When people say portfolio management of credit exposures, which I think is what their goal is, there are two avenues. Do you manage the information from a reporting perspective and figure out how you then act on it, or do you manage the information as an actual portfolio?

Financial organizations are asking why credit exposure can't be transfer-priced and centrally managed like an asset/liability modeling (ALM) exposure. Why can't we strip out the credit risk from our residual products and manage it in a central portfolio and hold that in one group? You look at how ALM is stripped out of numerous products in a banking sense, and this is even starting to go on in a P&C sense. Why don't we move that to one portfolio and have our experts of credit risk managing that portfolio, deciding how to price it, deciding how to lay it off and giving them the tools? Getting there is a way off. We need more liquidity in the securitization market. We need more liquidity in the CDS market. I think that's the aspirational directive.

Critical to getting there, what are the real building blocks from a credit analysis perspective? I talked about a couple things. I talked about the need to be forward-looking, the need for risk-based pricing and the need to have exposure information. To do that, you need to know who's going to default. In the industry, there are four ways for modeling default risk, four general models. I'm not going to recommend one or the other. In my view, you want to be a data junkie. You want to get as much data as you can on how people are viewing this because it's a difficult process. People should not have a one-sided view of the world, and that's where they get arbitraged.

There's the structural model class, better known as the Merton model, such as KMV. What is the probability of default based on the firm's asset value falling below the level of the firm's liabilities? How do we structurally model the debt as an option and come out with a probability of default? That is where we see the most movement and the greatest traction right now.

The first two classes of models, the ones I'll call market-based models later in the presentation, are reduced-form models. The third class is also known as the Jarrow Turnbull pricing model and asset models, which is also known as implying defaults from market prices of CDSs. How do you come up with the risk-neutral default probabilities from market prices? If in the end we think the market is smarter than all of us, why don't we let the market tell us when it's going to default? This is the same theory as structural, but more direct.

Last are historical averages. I'm obviously biased against relying exclusively on ratings. They tend to be a little static but do provide, if nothing more, a framework, a linchpin or a source of information that cannot be ignored.

Finally, and this is probably more of an issue in a banking environment where we see less private form-type exposures in an insurance company sense, are statistical models. How do you spread a company's financial ratios and apply them?

Just drilling down a little bit deeper on each of these processes, the structural model really has its foundations in Merton's approach, and it's taken since 1976 to become this popular. In a default, liabilities exceed the value of its assets—that's a simple idea. The bondholders or note holders get the company if the assets can't pay the debt off. In that sense, equity is not really linear asset owned.
Because the asset values are not truly observable, and if you wanted to figure out what the probability of default is, you need a way of implying back the asset values. In this sense, Merton came up with a novel approach of treating the firm as an option and being able to predict and price the distribution of asset values using equity prices.

KMV and Risk Metrics have institutionalized this process and produced the probability of default metrics using equity prices and financial statements and their view to distance default of asset values and asset-value volatilities. The output of this process is taking the equity price information, which works best for a public firm, and implying back the default probability default. However, it does not tell you the recovery rate on those different levels of debt. It's just going to tell you how much that debt's going to default.

The other issue that you're going to find with these types of approaches is that you're going to see significant amounts of volatility as the equity markets react. I understand that accounting firms may even consider such tools as part of their client analysis.

The second approach, which we're seeing the greatest traction around, is generally reduced-form models and implying risk-neutral default probabilities that occur at default swap prices. Again, if you know what someone is willing to pay you for a CDS price, if you have an estimate on London interbank offered rates (LIBOR), if you have a view on liquidity and if you have a view on recovery rates, you can estimate the probability of default that's going to be implied. Increasing, and particularly in synthetic CDOs, this is almost standard practice, and we're seeing risk-neutral default probability as the key input parameters into the pricing.

The big challenge with using CDO prices is that part of their price is based on credit risk, and part is based on liquidity. I think it's almost akin to a volatility skewing issue. How do you treat liquidity adjustments to pull back to a probability of default? You need a true probability of default for a more structured CDO. That is more of an art than a science. As I mentioned, EITF 02-03 may create some more

correlation hedges and more pricing around that, but increasingly, we're seeing people assuming risk-neutral default probabilities into their risk models to reanalyze structures from a risk perspective.

Chart 4 is an interesting analysis that we looked at for our company, and this is a real portfolio. It's a good illustration, and I think if you did this for your exposures, you'd make a lot of headway and have some light bulbs go off. The horizontal axis is obviously ratings. We're using ratings and what the historical average is of a five-year probability of default, fitted the speed of the curve, and those are the yellow lines. The blue dots represent actual rated facilities, and what we're comparing in a structural model sense is what the market says the five-year probability of default for that instrument is versus what the rating agencies say?

If you look at the eight percent number, which would be most akin to a BB, BB-, all of what you have rated at the eight percent line above the A's and the investment grade of categories, the market is telling you there's been significant deterioration or concern in those credits. What people will do is use this type of analysis as an early warning signal. There could be obvious reasons for this, such as equity volatility or CDS pricing liquidity, but what you'd want to do is focus on all the ones at the top of the individual lines and ask what is going on in these prices. What is going on in these names that we're not aware of? If you're not doing this, and you're pricing off the historicals from a structured and a credit underwriting perspective, your concern is going to be adverse selection on each of those blue dots that are at the high end of the ranges.

FROM THE FLOOR: Are you comparing real world historical probabilities with risk-neutral probabilities here?

MR. PRYBYLSKI: Yes. That is the average AA over five-year historical, and I'm comparing that on a five-year basis, so there's accumulated default probability implied by a risk-neutral sense. It's a little bit apples-and-oranges, and you have to believe that the rating agencies are continually trying to rate to their historical averages. You could have some through-the-cycle volatility here. The idea is to catch the top end of the curve.

A lot of banking organizations will use this type of analysis to validate their own internal rating processes, whereas in this sense, I've used a rating agency curve. You could easily use your own internal analysis.

FROM THE FLOOR: I'm missing the point here, but are you saying that you're looking at the companies that fell higher up on the list in terms of what the market-based cost would be? Now, are the blue dots supposed to represent the whole universe of issuers? It seems like what we get is the result that their market's pricing at a much higher probability of default than what historically would be, which is only natural because people aren't going to want to take on the risk without being compensated, right? We're more concerned with the relative position

of the dots, or you're assuming that half of A-level issuers are going to be above a six percent cumulative default rate when the historicals are on half of a percent.

MR. PRYBYLSKI: Right. Are half of those A's really at this point in time liquidity-adjusted? Are they really behaving more like Bs or BBs? This portfolio is obviously migrated and distressed. It's somewhat exaggerated.

FROM THE FLOOR: Right.

MR. PRYBYLSKI: Right now this could be a KMV or more than 10%probability. We think that's more like a single B. The question is, why is it telling us that? It could be this shortage of liquidity in the default swap name. It could be aberrant equity volatility. The point of the matter is it's worthy of investigation.
I mentioned LGDs, and this conversation has gone classically how the market treats the two key factors of risk. I spent a lot of time on probability of default, and not a lot of time on LGDs, and really when you do a lot of analysis, this is as critical as the probability of default structure, and there's more information for probability of default. It's the least understood parameter.

I'm not sure if you're familiar with Basel Capital Accord and what's going on from a banking environment, but Basel requirements from an advanced internal ratings-based approach will certainly push. We're aware of major studies right now going on at the big banks on coming up with more sophisticated LGD models. There also are some early-stage models on a vendor basis that I think are limited by the data. The major problem in LGD is that the benign economic conditions of the 1990s have not allowed enough data to make conclusions on strong correlations and strong regressions or to determine the key factors.

The vision, and we've been working on this with some of the investment portfolio managers, is that if you go back to the Merton model, the assets have volatility, and debt is just like a waterfall. Shouldn't we be able to model a company in a waterfall-like structure like you would model a synthetic CDO? If you get that concept, what you quickly realize is that the structure of the debt, the structure of the assets and the volatility of the assets play directly into the recovery rates.

One critical measure from a portfolio perspective is if you're assuming somewhat generalized static measures from a pricing standpoint, your critical assumption from a modeling standpoint would be the volatility of that measure. The key factors from a multifactor pricing model that we see people working on are not just obviously exposure type. But, what is the collateral? What is the risk rating? Risk rating at inception seems to have a high predictive ability with recovery-rate at the end. What are the underlying asset types?

What I want to touch on last is portfolio risk. At the end of the day, how do we pull this all together, and what are we trying to accomplish? Portfolio modeling is really the measure in the change if value in the portfolio value due to defaults and

migrations. It's your classic credit value at risk, but, more importantly, what's the marginal risk contribution? The key factor in this analysis is correlation. How do you correlate the default parameters? We now have looked at how we model the asset values, but how do we then model those asset values in a consistent structure?

This is a critical pricing component of a synthetic CDO. Most typically, people are using direct asset correlations as opposed to the Bernoulli or default correlations. You have your own assumptions. You use pairwise, which are rating agency-driven assumptions, in the intra-industry and nothing across industry. They are most typically captured in a time-to-default scenario from a simulation perspective.

MR. JOEL SALOMON: I'm a managing director in Swiss Re's financial services credit risk management division and the deputy head of the credit risk management unit. Most of you know Swiss Re as a life and health reinsurance company in the United States and, in fact, as the largest life and health reinsurance company in the world. I know Swiss Re as the third-largest Swiss bank because of the amount of credit exposure we take.

First, I'll give you an overview of Swiss Re and the financial services business group because credit risk management is located within the financial services business group, and that's where more than 95 percent of the exposure of credit risk within Swiss Re emanates from. I'll get into how we're organized and what the roles and responsibilities are for credit risk management at Swiss Re. We'll also discuss how we go about assessing a counter party that we have credit exposure to. We'll go through both a counter party analysis and the transaction analysis, and then we'll get into some of the details of the analytical process. Then I'd like to discuss how managing credit risk has changed over the past couple years given the difficult environment that we're currently operating in, and that will be shown in some of the credit trends you'll see. I'll show some historical Moody's default rates, some downgrade statistics and some upgrade statistics from Standard & Poors (S&P).

Here is a quick overview of Swiss Re to give you a perspective on credit risk management of financial services: There are three major business groups—property and casualty (P&C) reinsurance, life and health reinsurance and financial services. Within financial services, which is where I'd like to focus, there are four product units—asset management, advisory and capital markets, credit and risk solutions.

As Hank already alluded to, there are a large number of different types of credit exposure an insurance company takes. Within asset management, there's the direct credit exposure coming from corporate bonds. There are, within Swiss Re at least, a large number of what we call contingent credit exposures where you need one event to occur and then the default for the company to lose money. Those contingent credit risks come, for example, within advisory and capital markets, the financial products area, where we enter into swap transactions.

I'll quickly explain CDSs for those of you who are not familiar with them. For example, Swiss Re may buy protection on IBM, the reference entity, from a counter party, perhaps J.P. Morgan Chase. We buy $5 million of protection on IBM. We have contingent credit exposure to J.P. Morgan Chase. If IBM were to fail, we're looking for $5 million from J.P. Morgan Chase. If they're not around, we lose $5 million, even though we bought protection on IBM. On the other hand, if we sold protection, and J.P. Morgan Chase is buying from us, we have direct exposure to IBM. If IBM were to fail, we would be out $5 million and have to pay that to J.P. Morgan Chase. There are many examples where we have both direct and contingent credit exposures.

Within credit solutions, Hank alluded to credit insurance. The surety bonds have been in the press over the past year with the Enron default and the litigation with J.P. Morgan Chase. We've reinsured many insurance companies that provide surety bonds, and many of those cases are construction companies financing construction projects, so a large amount of our credit exposure book is construction companies and retail companies because we're the largest credit and surety reinsurer in the world. Concerning our financial guarantee business, we reinsure financial guarantors, so we look to the underlying within those financial guarantee transactions. They may be, again, construction companies or retail. It can be any type of counter party that we may have contingent risk to.

Within the capital markets-based transactions and credit solutions, we've talked about the collateralized loan obligations (CLOs). Swiss Re does have about $30 billion notional in CLO exposure. Most of that's in the high super-senior layers. If you're not very familiar with those structures, there is generally a large amount of subordination below which we would need defaults to occur for Swiss Re to be exposed. Even though it's about $30 billion notional, the actual direct credit exposure is much smaller than that.

Within risk solutions, most of you are familiar with surplus relief transactions for life insurance companies. That's where we provide financing to insurance companies, so we would take on credit risk there. Being the second-largest property and casualty reinsurer, a large amount of credit exposure is coming from Finite Re business. There's a large spectrum of products that create credit exposure within Swiss Re.

I'd like to get into Swiss Re's credit risk management or, first of all, start off with the guiding principles. As already mentioned, the financial services business group maintains the responsibility and the accountability for the underwriting and the management and the reporting of credit risk within Swiss Re group. That responsibility is specifically with the CEO of financial services but delegated down to the chief risk officer and credit risk management.

We're organized is globally. We're located in New York and Zurich, close to the business groups. A reason why we're located within financial services is we want to

be close to the transactions that go on in the different product units. Each analyst is a specialist in a particular sector, focused on that sector. We don't have generalists covering all corporates, but we have individuals covering the auto sector, support of suppliers, construction, retail and life insurance companies.

We are mandated to provide an independent objective view of credit risk booked within financial services. As I said before, 95%of the exposure comes within financial services, but there is a small percentage, three percent or so, that comes from the different business groups, life and health and property and casualty, where we have a service agreement. The other two percent come from retrocession.

I want to quickly go through what the responsibilities are for credit risk management, and they start out with identifying the credit risk within a transaction. Most of you probably are thinking that's simple, but when you have these highly complex structured finance transactions, just identifying where the credit exposure is coming from can be complex. Once you identify the credit exposure, you need to calculate the exposure.

As Hank alluded to, the first important point is, what's the worst-case scenario? What's the maximum loss you could have in this transaction? We calculate that, which generally is simple. On corporate bond, it's the whole exposure, but if you have highly contingent exposures, it can be looking at running various scenarios to determine what the 99th percentile or so is and then calculating, based on that contingency factor, what the estimated credit exposure today is. We have a quantitative analyst in the group who works closely with the transaction team and the credit analyst to come up with those amounts.

The main part of the job, though, is the credit risk assessment and the obligor/sector monitoring. When a transaction comes into Swiss Re, a deal team is formed, and the credit risk management department is placed on the deal team. Our main part of the job is to do exactly what a Moody's or S&P does. We assign an internal Swiss Re rating to a counter party, and, just like S&P and Moody's, we'll go through a fundamental credit analysis using both qualitative and quantitative factors to come up with a rating on that company.

One big difference, though, is we're defining a credit limit for the counter party, and Hank got it right—the limit is based on the worst-case scenario. If you're assigning a limit based on an estimated credit exposure, that estimated amount could become the worst-case scenario in a CLO structure if that subordination goes away. We want to better understand what the worst-case scenario is. Our chief financial officer wants to know what the worst case is. What would we have to fund in a worst-case scenario? That's where the credit limit is set.

The next step, once a transaction closes, is to monitor those companies. Depending on the credit quality and on the amount of exposure, we would look at that counter

party either quarterly, semiannually or annually. The ones that are more critical or the higher exposures are looked at more frequently.

The next part of our responsibility is the quantitative analytical methods for credit risk management. I already mentioned our quantitative analyst on the staff. Other responsibilities include establishing credit limit structures and then elaborating on them to the different approval committees, reporting on our credit risk exposures across Swiss Re group and elaborating on our credit policy.

I thought it would be good to quickly go through a graphical explanation of these types of functions (see Chart 5). The first step is the identification. We have the different business groups creating the exposure, and you see some examples of the different types of products that I've already mentioned, such as the trade credit, the surety bonds, the Fin Re and capital markets transaction. Those committed long-term capital securities transactions are similar to catastrophe put options in the property casualty arena, but the type of trigger could be anything besides a catastrophe.

We've developed this product that we trademarked whereby we did a transaction with Michelin, for example, where the trigger was the weighted average fall in the gross domestic product of France and the United States, and if that decline was more than 25%, it would have the ability to put securities to Swiss Re, those securities being senior debt securities. That was the trigger, and then we would have a loss if the trigger occurred and Michelin defaulted.

To continue with the responsibilities, you see the exposure calculation methodology, the largest bar being the worst case, and we look at the netting of potential collateral and the contingency factor to come up with the estimated credit exposure. The probability of default is the main part of the job, and we already talked about some of the quantitative methods. Hank mentioned some of those quantitative methods. We do stress testing and scenario analysis on these probability defaults over the whole portfolio.

Once the transaction has closed, it's added into the portfolio, and we analyze to see how the portfolio can be optimized and if it makes sense to add on additional exposures in certain industries or certain tenors to better optimize the credit risk portfolio.

The next step is to expand that to all the risks, not only credit risk but market risk and the underwriting risk. We ask whether we should be taking more credit risk or less credit risk based on the overall risk landscape for Swiss Re. I want to point out that we do use the structural model, the KMV model. We also use historical averages—Moody's historical default study—in our risk-adjusted capital calculations.

Chart 6 is important for individuals who sometimes get confused between the product, which is a line of business, and a risk category, which clearly for

companies where underwriting a liability risk, credit risk and market risk. We are managing that credit risk. The fact some people get confused that there's credit insurance, surety bonds and financial guarantees. That's a line of business, and we're covering all these types of lines of business or products.

The credit risk management within Swiss Re is comprehensive and perceptive. Credit exposures are coming mainly from those four product units—asset management, financial products, credit and risk solutions. What we have done, and Hank alluded to it also as a challenge for the insurance industry, is to aggregate exposures across all these different product types, and we have a system called Germit—the group credit risk exposure reporting management and information tool. It's a mouthful, but what it does is it aggregates exposures across all these product units.

It has our credit rating in there. It has the organizational structure of the company. It has the exposures, the worst-case scenario and the estimated credit exposure. If the company is on the watch list, it has a huge amount of information, which is aggregated for this particular company within this database. We use this tool to aggregate the exposures across all these product units to see where the peak aggregate exposure is or the worst or lowest credit quality companies.

This information is used in a weekly credit information network meeting. We established this meeting a little over a year ago, and we have individuals on conference call from all the product units mentioned. As some of you know, we own Conning Asset Management. It manages third-party assets. We have the credit analysts on the call who give their opinion. If we're talking about an insurance company or a bank, we have representatives from Fox-Pitt, Kelton, which is our investment banking boutique that covers insurance companies and banks. It's interesting to get a different perspective. They're looking at the upside potential. We're looking the downside risk.

We also have representatives from the other risk-taking areas to give their opinions. Within financial products, we have the CDS traders. It's interesting to get their input on where they see the CDS market trading for a particular company. We have all of these representatives. The point is to put all this information into the meeting so that we can come up with a consensus on the counter party. What is Swiss Re's opinion on this company? Should we buy additional credit risk exposure on this company? Should we sell down or manage down our exposure? Should we hedge the exposure?

The other part of the Germit system is reporting into our monthly credit letter. We have a credit letter that slices and dices credit exposures by product unit, credit quality, maturity or tenor or by various different measures, so that senior management better understands where the critical risks and the concentrations are.

Germit is also used in establishing four watch lists that we have. We have a Prudential list, which is a list determining where we have enough risk exposure to a particular company. The credit quality may be good. It may be AAA or AA, but even with that high credit quality, we might decide we have too much exposure. We have the more critical cases, the stress lists in which we view negative credit migration as likely; the distress list, where there's a high degree of uncertainty about the ongoing viability of a company; and the defaulted list, which WorldCom is on.

The good thing there was that, again, going back to Hank's point, we were proactive in that regard. When we had this meeting established, one of the first companies we talked about in April 2002 was WorldCom, and we were able to recommend and come to a consensus that we should manage down that exposure so that the amount that was held when WorldCom did default in June 2002 was the minimum.

FROM THE FLOOR: How do you decide where to set your credit limits? If you rate something BBB, is it a function of your capital? How do you do that?

MR. SALOMON: It's a difficult process. Currently, it's based on the existing exposure and the transaction that's coming in. We'll set a limit based on the new transaction coming in and on how it's structured, not just the credit quality. We look at the tenor, the existing exposure. How much does this add to the existing exposure? Then we look at the overall seniority. Are we taking on a senior unsecured debt position or are we subordinated in the structure? What types of risk mitigants are in place in this transaction? Do we have a direct exposure? Is it contingent? What risk mitigants, such as financial covenants, have been put in?

Even though you might say it makes sense to have a $200 million limit for BBBs, in fact each BBB exposure could be different based on the underlying transactions that we have for that BBB. We don't set limits by rating category alone, but each limit is based on all the items that I just enumerated.

FROM THE FLOOR: How do you calculate the individual name exposure in structured transactions?

MR. SALOMON: That's a good question. You may have a hundred names in a CDO and $10 million to each of those names, but we have $50 million or $500 million of subordination below. There is a calculation that we do based on a non-proportional allocation to each of the names in the portfolio, assuming that we have exposure to each of the names in the portfolio from the top-down level. We first assume we have direct exposure and then calculate the impact of having the subordination. If it's 10% subordination, what's the probability based on the company?

We have all the names in the CDO and the like based on their ratings. We can then calculate the likelihood that the subordination is eaten away. Say that based on that probability, we have a non-proportional allocation to the individual companies.

But the limits are set based on the notional, the worst case. If there's that $10 million in the portfolio to IBM, we would set our limit based on the $10 million, knowing that if there's 20%subordination, the actual exposure is much less.

FROM THE FLOOR: Is the information that's produced at this point then used to determine the best area to take exposure to a single name, whether it be how you're compensated, an insurance product or a structured type of transaction?

MR. SALOMON: Being an insurance company, there are a lot of other constraints, such as ALM constraints on the corporate bond or asset management portfolio. There is a constraint to match assets and liabilities. There's a huge amount of cash flow coming in, and they need to put it to work. Whereas based on ALM constraints, risk-based capital constraints and all these other tax or regulatory constraints. The decision for the best place to invest is made by looking at individual counter parties, but they may say that credit spreads are currently really tight, and we don't want to take any additional credit risk. We're going to take convexity risk in the mortgage-backed security portfolio.

In credit and surety reinsurance, we're the market share leader. The capital returns historically have been good, and the late 1990s, early 2000 and 2001 weren't so good. Now they're starting to get good again, and so looking at returns on capital compared to other areas, we ask whether we should allocate more capital to that business rather than in the structured credit area where maybe the returns aren't as good. You have to allocate. The returns on that capital just aren't that good. There are a lot of other constraints that go into determining where credit risk should be allocated across the different product units.

Let me quickly go through the credit risk analytical process. It includes both a counter party analysis and transaction analysis, and the goal here is to evaluate the counter party's probability of default. That probability of default comes into play by evaluating the business and the financial risks. We look at both quantitative and qualitative information.

For the transaction analysis, we look at how likely the default within the transaction itself is, within the CLO structure and within the transaction. What's the likelihood that we will be exposed? We need to look at the alignment of interest, the credit enhancement, the layering and the due diligence process, and so on a case-by-case analysis, we look at all this information to determine how likely that default probability is. We provide independent support in the decision making process. We reside above the different product units, so it's independent even though we are on the deal teams.

To continue on this high level, the analytical process starts with basic research, counter party analysis and credit scoring tools. We use both quantitative and qualitative analysis ratings, and then the transaction analysis comes in whereby we give our recommendation. That recommendation goes to, depending on the credit

quality of the company, tenor and the existing exposure, a different committee within Swiss Re that would approve the credit limit recommendation.

If we start with the basic research, we require a minimum of three years worth of ordered financial statements and the latest interim results. It was interesting and surprising to me when I came to Swiss Re from Moody's in that many times when we do a reinsurance due diligence on a company, especially on the life insurance and P&C side where we have close relationships with these companies, we'll get a huge amount of information, potentially a lot more than Moody's or S&P would, given that we have teams of people that go out to various offices, such as a claims, underwriting or actuarial office. All this information is synthesized, along with the publicly available information, the GAAP and statutory financial statements and the information from our cedants, for example, on construction and retail, surety and credit insurance.

Unlike what Hank said, I think within Swiss Re there's not a heavy reliance on the public rating agency reports. In fact, generally it's the last step. We go through our analysis, and we come to a conclusion, and then we see what the rating agencies have said.

Hank did mention the market view, the extension of the Merton model, the KMV, estimated default frequency (EDF) and credit monitor. KMV is trying to determine that default frequency, and it's interesting because we found that there's a lot of volatility in the KMV EDFs, and it's important to understand the reason for the EDF's being where it is. You may be looking at the trend, but what we've seen, especially within financial institutions, is that these percentages are much higher than in corporates. For example, we looked at some names that have a two percent probability of default per annum which are equivalent to below-investment grade. U.K. banks had a large number of them at AA-rated, but they have two percent EDFs.

Also we look at bonds and CDS spreads, which again, is just another data point in the overall information gathering that we do. We'll try to determine why the CDS spreads trading at 500 basis points is equivalent to BB, yet we've assigned a AA rating to it. What's going on in the market? Back in October 2001, spreads were extremely wide, and now they've condensed. Have they come in too far? If you look at what the implied rating is on the CDS market back in October 2001 compared to what it is today, you would have said that we should have rated everything BB back then, and now we should rate everything AA.

Our goal is to look long term and determine what the probability of default is over a long period of time because in a lot of these transactions that we enter into, we're exposed for five, seven or 10 years. The goal is to be long term, to try to keep the rating as stable as possible and to be a good indicator not only for the people who are marketing to those companies but also for our own internal capital allocation.

We also get access to bonds and equity research. It's especially handy to have Fox-Pitt, Kelton in the house. We can just drop down and say, "What's your view on Metropolitan Life?" We can converse on individual companies.

I'll quickly go through how managing credit risk has changed. From our point of view, it hasn't. We continue to ask questions, but the difference today is that it's been a little bit more focused. Let's go through some of the reasons why over the past couple of years things have changed. Hank alluded to these past two years. The number of defaults in absolute terms and notional amounts have been records. Defaulted debt per single name has been increasing. Look at Enron and WorldCom.

The number of companies going from investment grade to below-investment grade—those so-called fallen angels—continues to increase. We've seen it in the telecom, the airlines, energy, the conglomerates and in pulp and paper with Georgia Pacific having exposure to asbestos. There's a large transition from high investment grade to default, and the time has shortened dramatically. Even A-rated companies shouldn't be considered default-proof. We've seen some examples of that. The stability of public rating agency ratings has been questioned, and financial markets have been punitive. We've talked about that, how spreads had blown out last October. They have the mentality of fire, aim and shoot.

We've added a few things to our analysis. We look closely now at event risks, accounting irregularities, the asbestos liabilities and litigation risk, especially in the tobacco companies. We're evaluating corporate governance issues. I read recently that Moody's is coming out with its own corporate governance ratings for individual companies. It also is looking closely at how management is governing the company. We look at special-purpose vehicles more closely now, especially to see what the impact would be if they're put back on the balance sheet, and the impact of pension plan funding, especially in those corporations that have large funding deficits such as airlines and autos.

What have we learned? We've continued to focus on the fundamentals. We've added detailed analysis on special-purpose vehicles, corporate governance, the off-balance-sheet derivative exposures and collateral, but at the end of the day, it's fundamental credit analysis. Importantly, we have added these market-based measures, but they should be treated for what they are, which is just figures. The real work is to understand what they're saying, not just to fall into the market spread trap.

Numerous investment-grade corporates have been trading at junk levels since back in October, and the question is, did they imply a much higher probability of default and did a large number of them default? I think the answer is no. Within Swiss Re, we have reduced exposures to some of those riskiest areas such as airlines, the auto sector and some sectors that are particularly prone to recession, such as retail and construction, especially in Germany.

Let me just conclude with some default experience as shown in Chart 7. This default experience is from Moody's for both all corporates and for below-investment-grade companies. You can see over the past year or so that default rates have come down dramatically. This is on a global basis. It appears that the peak of defaults has occurred at 10.6% at year-end 2001, declining to about 8.3%at the end of last year. You would say, based on this graph, that everything's getting better, so things should be fine.

In fact, you need to look at U.S. and non-U.S. default rates. Yes, U.S. default rates have come down, but European default rates have continued to increase (see Chart 8). Our expectation is they'll exceed U.S. default rates this year.

To go through the projection for 2003, in January 2003 it was projecting that default rates would decline about seven percent in 2003 (Chart 9). Moody's also looked at the 90%confidence level, and the default rate for these below-investment-grade bonds would be somewhere between 6.3 and 9.1% at the end of this year.

To look at some of the rating actions that S&P took over the past couple of years, you can see in Chart 10 that the downgrade to upgrade ratio was 4.4-times-to-one in 2002 for life and health insurance companies. I'm sure all of you know the reasons for these downgrades. We've been talking about credit quality. Credit quality has clearly deteriorated because of so many of the factors we've been talking about. We have these fallen angels and the large defaults that impacted earnings and capital.

The equity markets clearly impacted variable products; not only sales but also guaranteed minimum death benefits. Reserves have taken hits, and on the GAAP side the deferred acquisition cost (DAC) amortization accelerations. Those are some of the reasons for that ratio. It's interesting to look at the P&C side, where it's 120-to-1 in 2002, despite the hard market that they were enjoying in 2002, but they paid for the soft pricing in prior years.

Chart 11 is a graph of the rating trend for S&P, and, as you can see, the trend is down. The average credit rating has declined from AA to A as of the year-end 2002. Ratings are more conservative now.

To conclude what you've heard about credit risk management within Swiss Re, we're organized as a centralized unit to provide independent objective views on individual companies. Our responsibilities include the identification, the assessment, the exposure calculation and reporting, and the assessment includes both counter party and transaction analysis based on the fundamentals. We've now incorporated market metrics into the assessment, but, again, those opinions are volatile and often driven by technical factors, liquidity and supply and demand issues, and we believe they tend to overreact to new information. What we've done is distinguish companies' specific drivers from the generalized market segment. What were the

lessons learned? You need to focus on credit quality, and that's more important than ever.

MR. NIGH: Joel, from the perspective of Swiss Re, you talked about WorldCom and reducing your exposure on WorldCom. How has that affected you? You obviously identify the exposure, but is the investment manager the one who handles that? Is it your role or is it someone else's role? That would be a question specific for you at Swiss Re. Also, Hank, what do you see in the industry?

MR. SALOMON: Within Swiss Re, I mentioned the credit information network. This meeting is to try to come to a consensus view on individual credit. At the end of that meeting, we conclude with a decision to buy, sell or hedge decision on the name, and that recommendation is sent out to senior management within the financial services business group. We talk about some of these critical cases. The recommendation is made. It's up to senior management to implement.

For example, with the WorldCom case, it was clear that significant deterioration was likely, and the decision was made at the senior management level to get out of the corporate bond exposures, with the other exposures, if we weren't able to cancel a transaction, then hedge the exposure using the CDS market. If that's not available, we see if there's any retrocession capacity, if it was exposure through reinsurance. If that's not possible, look at syndication possibility. Once a critical case comes—it could be that we have the Prudential list where we have too much exposure to an individual name, even though the credit quality's still good—we would say, "This is our recommendation," and then senior management would decide how the strategy is implemented.

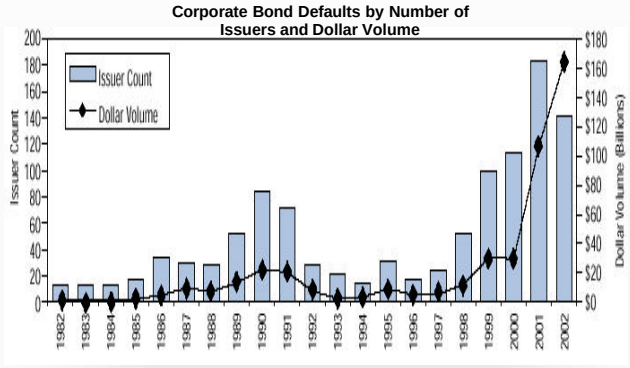
MR. PRYBYLSKI: I think that's pretty consistent with what we're seeing. We are not seeing significant amounts of portfolio activities occurring above the line of businesses in any financial institution, and this is where we are hearing a lot of the investment portfolio people with significant concerns that the extent concentrations do come up. Maybe it's a single name in a CDO that, at the end of the day, the investment portfolio tends to be the most liquid. They're bearing the cost of the deterioration issues.

The question came up about seeing marginal risk-based pricing as people begin to want to write products with individual names where there are concentrations and trying to charge them for that concentration risk up front so that there's a balance. If you want to write names that are going to create concentrations, you've got to get it in your product pricing up front so the most liquid provider doesn't bear the cost of it, but I think that's a trend that needs to be implemented. I think a lot of people are struggling with who will bear the cost of the hedge. Is it the credit group? Is it the line of business? It's at a committee and pushing it down at that level right now.

MR. SALOMON: We have a hedging committee within the credit solutions areas that has a profit and loss (P&L) for hedging, but if we make a decision up at the higher level that says you need to hedge, the question then becomes, who's paying for it, and that hasn't been decided. We're in the process of establishing a group that would have a P&L for hedging above each of the different product units.

Chart 1

Current Credit Environment

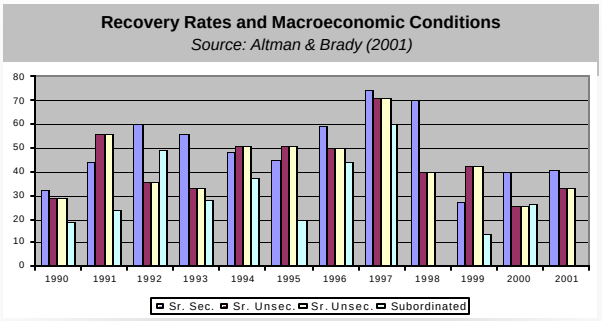


Source: Moody's annual default and recovery study (2/2003)

- Record high number of defaulted issuers on record high dollar amount
- Deteriorating credit quality – Fallen Angels
- Increased individual default size (36 defaults on larger than $1 billion in 2002)
- Default concentration on specific industries (e.g., Telecom)
- Slow economic recovery leading into heightened uncertainty in global financial markets

Chart 2

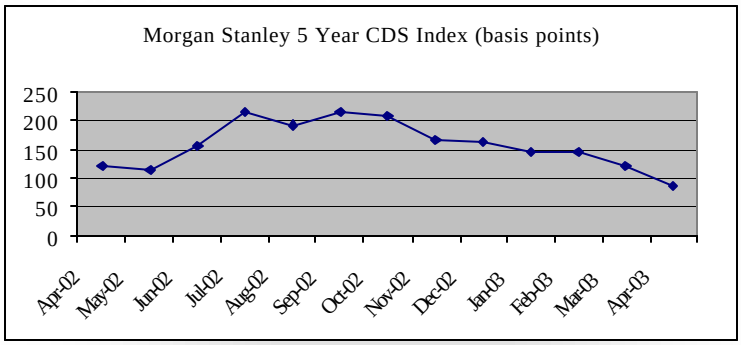
Current Credit Environment



- Seniority continues to be the strongest indicator of recovery potential; subordinated debt holders have suffered the most through this credit cycle
- Combination of record high defaults and weak recoveries have resulted in large credit losses for many investors

Chart 3

Current Credit Environment



(Source: Bloomberg)

- Index of static pool of 50 equally weighted credit default swaps representing broad exposure to the investment grade corporate market
- Provides indication of investment grade credit risk premium and source of over the counter market liquidity for macro portfolio hedges of investment grade risk

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Chart 4

Credit Risk Modeling Practices – Market Based vs. Historical Averages

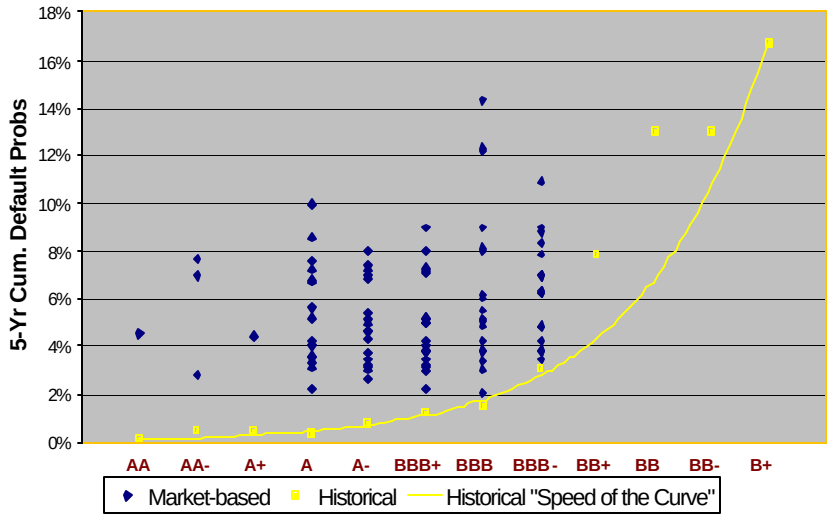

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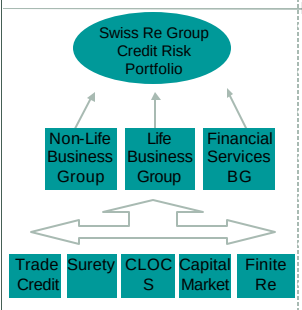
Chart 5

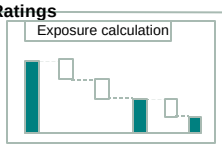
Credit Risk Management Functionality

Credit Risk Identification

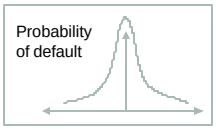


- Credit risks from:
  - all group companies
  - all products
  - all lines of business

Credit Risk Exposure Calculation & Credit Ratings



- Methods to calculate
  - Commitments to extend
  - Outstanding exposures



- Credit Risk Rating methods
- Associated default probabilities

Quantitative Analytical Methods

- Portfolio/Transactional
  - Development
  - Implementation
  - Maintenance

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Chart 6

Scope of Credit Risk Management

- The scope of the credit risk category necessitates a common approach to measurement, assessment and decision-making processes.
- This common approach to the risk category takes precedence over all product related issues.

MAJOR PRODUCTS/ LINES OF BUSINESS	RISK CATEGORIES LIABILITY	CREDIT	MARKET
CORPORATE BOND INVESTMENTS			
EXTERNAL RETROCESSION			
CREDIT/SURETY/FINANCIAL GUARANTEES			
STRUCTURED FINITE, CONTINGENT LIQUIDITY			
LIFE SURPLUS RELIEF, FINITE, ETC.			

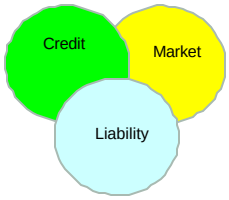

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Chart 7

Moody's Historical Default Experience

Trailing 12-month issuer weighted Default Rates

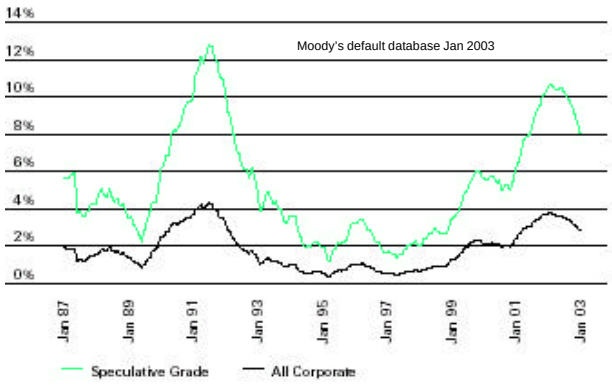

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Chart 8

Moody's Historical Default Experience

Trailing 12-month issuer weighted Default Rates

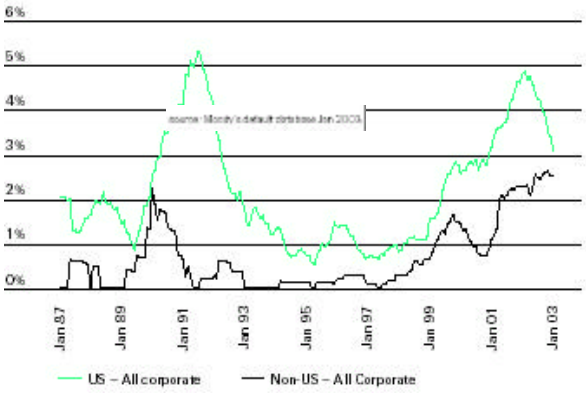

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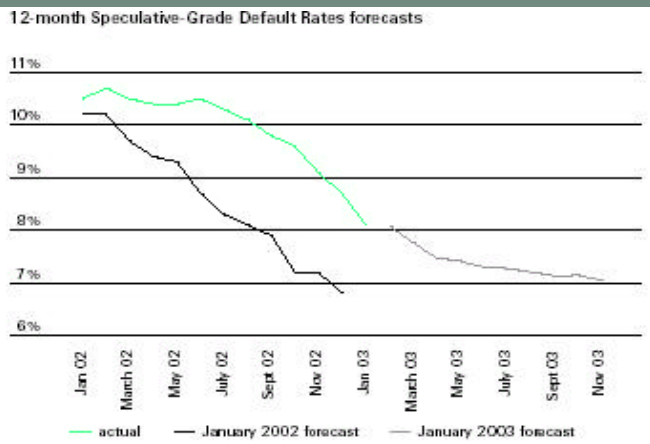
Chart 9

Moody's Historical Default Experience



source: Moody's Monthly Default Reports Jan 2002 – Jan 2003

Chart 10

2001-2002 S&P Rating Actions on North American Insurers

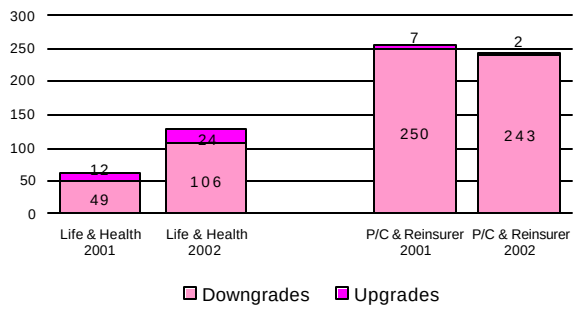


Chart 11

S&P Insurance Ratings Distribution

Rating Distribution for North American Insurance Companies by Group 2000-2002