

RECORD OF SOCIETY OF ACTUARIES

1992 VOL. 18 NO. 3

EVALUATING ADEQUACY OF CAPITAL

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Recorder: GREGORY D. JACOBS

- NAIC risk-based capital proposals
- Rating agency techniques
- Valuation actuary views

MR. GREGORY D. JACOBS: Cande Olsen is an FSA with New York Life, and she's the operating director of the NAIC advisory group on risk-based capital. She will speak from a regulatory perspective, mainly focusing on the newly proposed risk-based capital (RBC) formula. David Wells is a chartered financial analyst (CFA) and a vice president in the Financial Institutions Group at Fitch Investor Services. He's going to bring a kind of quasi-regulatory perspective, and that's from the rating agencies. Frank Irish is an FSA who is a senior vice president and corporate actuary at John Hancock. His perspective is going to be from our profession, the actuarial profession. Frank will talk about the valuation actuary, actuarial issues regarding adequacy of capital, and evaluating capital levels.

[Ms. Olsen's discussion of the NAIC risk-based capital formula reflects the status of the formula at the time of the presentation. The formula is likely to have experienced some changes by the time of publication.]

MS. CANDE OLSEN: Well, as Greg said, I'm going to be speaking about NAIC risk-based capital. These standards are in a proposed form right now. This proposal was made to the NAIC in December 1991 and is currently in the process of being tested. I'm going to assume that most of you are not familiar with risk-based capital, so I'm going to be speaking on a fairly elementary level. I apologize to those people who know a lot about NAIC risk-based capital and are here because they want to know a lot more. I will be talking about how NAIC risk-based capital came about, how the factors in the formula were derived, and how the formula is expected to be used. I will also discuss the status of the process and some of the next steps.

First, let's talk about current capital standards. Currently, the required capital is a flat dollar amount that varies from state to state. This is the minimum capital that any company needs to have to do business in the state. This is really a meaningless standard for a mature company, since it's the same amount required regardless of whether a company is small or large. For example, the minimum capital for a company as large as New York Life, which is my company, is only \$300,000. So, it became clear, after awhile, that we needed a more realistic standard for companies.

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In 1990, the NAIC met with people from the insurance industry to discuss this problem and decided that the best approach to measure financial strength is by a risk-based capital formula. This would be a formula specifically designed for regulatory use that would reflect the size of the company and would reflect the risk profile of each insurer's business operation. This approach would help insurance departments to better allocate resources and to focus their attention on the weak companies, and it would give regulators authority to take earlier and more effective action with respect to companies on the edge of instability.

The NAIC put together a working group of regulators to research this problem, and the first thing the working group did was appoint an advisory group of industry people to come up with a risk-based capital formula. This industry group was composed mostly of actuaries. The first charge to the industry group was to develop a risk-based capital formula for all life insurance companies that would distinguish between weakly capitalized companies and other companies. This would not be used to rank or rate companies, just to point out which companies were weakly capitalized. Second, they were asked to address the technical issues when coming up with a formula; that is, the size of a company, product mix, asset mix, etc. Finally, they were asked to develop a model law and regulation that would define the guidelines for regulatory review and/or action based on the level of a company's risk-based capital ratio, or the trend in its ratio.

In order to do this, we developed a process and some guidelines. The NAIC wanted us to use annual statement information as much as possible. We also decided to follow current statutory accounting practices. The formula structure that we agreed on was more in the line of a traditional risk-based capital formula that has a C-1 risk, a C-2 risk, a C-3 risk, and a C-4 risk. This is the kind of formula that is currently used by Moody's to develop an initial look at a company. The New York Insurance Department has an experimental risk-based capital formula. The state of Minnesota also asked companies to file under a risk-based capital formula. This traditional format looks like this: It takes an asset or a liability item from the annual statement that represents the exposure to each type of risk, and then a factor is applied to that type of risk exposure. For instance, the risk exposure for junk bonds would be the asset value of the junk bond portfolio. Then a risk-based capital factor would be applied to that asset amount to come up with the surplus, or risk-based capital, needed to protect the company against the risk of loss for that particular type of asset. The risk-based capital for each of the different assets and products is added up in order to come up with total risk-based capital for a company.

To develop this formula, we used both stochastic and Delphic processes. The stochastic method uses statistical modeling to come up with the factors. Where there was not industry data available, we used a Delphic method. This involves going to the experts to ask for their help in coming up with a factor based on limited data or no data for a particular type of asset or insurance risk. In coming up with these factors, we kept in mind that the purpose of the formula we were developing was to distinguish weakly capitalized companies from other companies and not to rank or rate companies. I'll probably say that a few more times during my presentation.

As I mentioned, there are four different types of risks. The first risk is asset depreciation, which we also call the C-1 risk. This is the risk associated with any losses

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related to assets. Then there's the insurance pricing risk, or the C-2 risk, which is the risk of adverse mortality and morbidity experience, both for the fluctuation in claims exposure and also for catastrophic claims not included in the pricing. The third type of risk is the interest rate risk, or the C-3 risk. This is the risk associated with losses resulting from swings in interest rates. The last risk is business risk, or the C-4 risk. I will go over some of the highlights of our formula relative to these different types of risks and how we came up with some of our factors. The first category is asset depreciation C-1 risk.

The bond factors were based on cash-flow modeling using a Monte Carlo technique. For bonds, where we had the most industry data, we did the most sophisticated modeling. We used historical default rates for each of the six mandatory securities valuation reserve (MSVR) categories for bonds that show up in the annual statement, soon to be called asset valuation reserve (AVR) categories. We did 2,000 trials for each bond in a modeled portfolio, and for each trial, a surplus was developed by coming up with a present value of the cash flows resulting from default. We set our risk-based capital factor equal to the surplus needed to cover the risk in 92% of the trials, or a 92% confidence limit.

The bond size factor is a new type of factor that we introduced in our formula. We don't know of any other formula that has a factor like this, and it reflects additional modeling for different sizes of portfolios. The risk increases as the size of our portfolio decreases. That's the basis of this factor.

We also have factors for the different types of mortgages. The mortgage factor for the biggest class of mortgages, that is, commercial mortgages in good standing, is between a category two and a category three bond, of the six bond categories I mentioned before. This factor is also experience-adjusted. Since a quality rating system is not yet available for mortgages, like the quality rating system for bonds, we developed a basic factor for each type of mortgage and then applied this experience adjustment factor. The basic factor for commercial mortgages, for instance, was based on a 25-company survey and on models of several life insurance companies. The experience adjustment factor is a two-year average of the company's mortgage delinquency experience, divided by a two-year average of the industry experience. This ratio is applied to the basic mortgage factor to yield a final mortgage factor for that company. This experience adjustment factor is also subject to a minimum and maximum.

For unaffiliated common stock, we developed a factor that covers the greatest losses over a two-year period. This is based on a well-diversified stock portfolio and Standard and Poor's (S&P) 500 stock averages for the years 1960-90. We used monthly data and determined the greatest percentage decrease in any two-year period. In 95% of those measurements, the decrease was 30% or less, so we chose a 30% factor. We would need more than a 30% factor in only 5% of those measurements.

For affiliated common stock, we derived our factor in a different way. We decided to base the factor on the risk-based capital of the subsidiary. One of the advantages of this approach is that it discourages making an investment in a subsidiary, or the parent, based only on risk-based capital results.

Another factor in our formula is a concentration factor that reflects the additional risk of high concentrations in single exposures. This is something very new, and we don't know of any other risk-based capital formula that has a concentration factor. But we were concerned about concentration and diversity of risk. This factor basically doubles the risk-based capital of the 10 largest asset name exposures.

There are other types of assets, two of the important categories being real estate and Schedule BA assets. For these assets and others, we came up with factors that were consistent with the risk involved, comparing the risk of these assets to the risk of some of the other assets on which we did more sophisticated modeling.

We have gotten, since we distributed this formula, many comments. Some people just ask questions, and some of them suggest ways to improve our formula. Most of the questions on assets had to do with the consistency between the different asset categories. People wondered why we came up with a particular factor or why certain factors were higher or lower than others. Here's an example of one question that was asked: Why does a category six bond, the lowest noninvestment-grade bond, which is carried at market value, have a higher factor than a category five bond, which is carried at book value? The writer felt that since category six was already written down to reflect the higher risk, it probably shouldn't have a higher factor. Our answer: Although category six bonds reflect a loss of value on default by being marked to market, they are still risky assets subject to additional fluctuations in asset value, similar to common stock. This is what our studies showed, so that's why we recommend the same factor, 30%, that we use for common stock.

The next category is insurance pricing, or C-2 risk. Here, the morbidity factors were based on various models that determine the minimum amount of surplus needed to protect against the worst-case scenarios for each type of coverage. We had many different types of coverage in this category, some of which were not shown separately in the annual statement. But even though we couldn't get this information directly from the annual statement, we felt that it was important to use a different factor for each type of coverage, since there is a wide variety of risk and because of the different distributions of types of coverages in different companies. This factor is developed to be applied to earned premium and Exhibit 9 claim reserves. It's a two-tiered formula that reflects the decreased risk of a larger in-force block. That means the factors for the second tier are lower than the factors for the first tier, so that the overall factor for a larger company with a larger block of a certain type of health coverage is going to be a smaller overall average factor.

Mortality factors were based on cash-flow modeling by using a Monte Carlo technique to provide for the excess of actual claims over expected claims. The process we used to come up with this factor is similar to the process we used to come up with cash-flow modeling the bond factors that I described before. We developed this factor to be applied to the net amount at risk. Here we have a four-tiered formula that reflects the decreased risk of a larger in-force block. That is, the factors are lower for each successive tier of net amount at risk.

Finally, we have a premium stabilization reserve offset for group life and health insurance. Since premium stabilization reserves decrease a company's risk, we felt that an offset of 50% of this reserve would be appropriate. How did we come up

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with the 50%? Well, the 50% represents an approximation to the premium stabilization reserves that would have been deducted if we did the risk-based capital calculation on a contract-by-contract basis; that is, if we calculated risk-based capital for each contract and then deducted the premium stabilization reserve up to the amount of the risk-based capital, and no more than that. We felt 50% would be a good approximation.

We also got questions on C-2. An example of a question was, why use net amount at risk as the basis for calculating C-2 mortality risk? Expected claims actually provide the best theoretical basis for this risk. The net amount at risk is available from the annual statement. We had come up with our ratios first, by using expected claims; then because they weren't available in the annual statement, we translated the expected claims factors to what they would be if they were applied to net amount at risk. This translation reflects the average distribution by age, etc.

The third category is C-3 risk, or the interest rate risk. Here we divided products into low-, medium-, and high-risk categories and developed factors that would be applied to reserves. The impact of interest rate changes is greatest on policies where the guarantees are most in favor of the policyholder and where the policyholder is most likely to be responsive to interest rates. Therefore, we categorized these different products by their withdrawal provisions to assign them to low-, medium-, and high-risk categories. The low-risk factor was based on a simple model where we assumed a certain asset/liability mismatch and also assumed a certain swing in interest rates. For the medium- and high-risk categories we determined factors by measuring the additional risk for more discretionary withdrawal provisions. Finally, we added a 50% loading to the factors where there was no unqualified actuarial opinion because changes in interest rates represent a greater potential risk to those companies whose managements are not able to make an unqualified actuarial opinion.

We also got a lot of questions on C-3. Here's an example of a question: Shouldn't a company with a satisfactory actuarial opinion, under Regulation 126, have a favorable risk-based capital ratio? Answer: A company can have adequate reserves under Regulation 126 and still be weakly capitalized. Regulation 126 deals with reserve adequacy, not surplus adequacy. It's entirely possible for a company to pass all or most of the seven scenarios required in the cash-flow testing and still be weakly capitalized. The focus of risk-based capital is to survive a near-term catastrophe. The focus of reserve adequacy is to mature obligations over the long term.

The last category is the business risk, or C-4 risk. This risk was difficult to quantify, in a general way, for all companies. We studied many of the different types of business risks that companies are exposed to. We rejected most of the ideas we had as being impractical to implement or just not applicable to all companies, and we came up with just one type of business risk. We added a risk charge for guaranty fund assessment, based on the premiums subject to guaranty fund assessments. We felt that we could do this rather simply, and that it was a risk that all companies faced.

This is how we came up with the factors for all the different types of risks. How did we come up with risk-based capital? Risk-based capital, or RBC, is equal to the total risk-based capital with an adjustment for covariance. Adjustment for covariance is

not necessarily used in all risk-based capital formulas, but we felt that catastrophic risks do not usually occur at the same time. Actually, the covariance adjustment is statistically equivalent to assuming that the C-1 risk and the C-3 risk, asset depreciation and interest rate risk, occur or could occur at the same time; whereas the C-2 risk, the insurance risk, is random with respect to the others. What does the covariance adjustment look like? It's:

$$C4 + \sqrt{(C1 + C3)^2 + (C2)^2}$$

Now, I didn't come up with this covariance adjustment, but my understanding is that it is the standard mathematical or statistical way to reflect covariance.

Now that we have the risk-based capital, we need the total adjusted capital to compare it to. We didn't use just surplus; we used adjusted surplus. That's equal to surplus, plus AVR, plus one-half the dividend liability, which is a cushion against adverse experience, plus any voluntary investment reserves that the company has set up. The idea here is that you have a risk-based capital standard, and you want to compare that standard for any particular company to its total adjusted capital. In doing this we come up with a risk-based capital ratio that is equal to the total adjusted capital divided by the risk-based capital. Any company that has total adjusted capital less than the risk-based capital will be below 100% and would require special regulatory attention. We've also recommended that any company that hasn't gone below 100% yet, but is trending towards below 100%, also requires regulatory attention.

One of the things I said before is that we're really concerned about companies, and possibly the press, using our risk-based capital ratios to rate or rank companies. The formula was really not developed that way, and not intended to be used for that. The formula was supposed to be used to determine the companies that are weakly capitalized. We are concerned with having a formula that has a ratio that would be very easy for people to rank companies. So, we're now leaning toward a new recommendation, a new way to look at risk-based capital, and that is a risk-based capital margin. The risk-based capital margin is equal to the total adjusted capital minus the risk-based capital. It's more like a pass-fail test. Is your margin positive or negative? Are you weakly capitalized or not? That's something that we're in the process of working on right now. During the rest of this presentation, I'll still be talking about risk-based capital ratios, since that's how we did our original testing. We will be drawing up a model law and developing an annual statement schedule based on the concept of margins.

How's this formula going to be used? Well, we've suggested certain levels of regulatory action. We've set up three levels: A, B, and C. The A level would be if a company falls below 100%, or in the example before, if its margin turns negative. Here, the company would be required to submit a confidential business plan to its state of domicile. This plan would present actions to remedy the company's deficient capital situation over a period of years. The B level would be some percentage lower than 100%, which hasn't yet been determined. We're still waiting for final testing results. Or, if you look at the marginal approach, the negative margin would be somewhat more here. This would require a detailed, confidential investigation that would be done by the regulator of the state of domicile, probably by using outside

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resources to determine the necessary corrective action for this company. The difference between level B and level A is that in level B, the regulator is taking a larger role and the onus is on the regulator; the onus is on the company in level A. The final level would be C, which would be a minimum level that is a much lower percentage of the original risk-based capital, or a much more negative margin. Here the company would be placed into conservatorship pursuant to the state's rehabilitation and liquidation statutes. This minimum level would actually be the larger of the risk-based capital minimum level and the dollar minimum level. For some very, very small companies, the dollar minimum level that is currently in effect might be larger. Of course, this would vary from state to state.

When we were putting together this formula, there were many issues that we were concerned with. The first concern was "simple" versus "complex." We wanted to develop a formula that was as simple as possible, so it could be easily applied and easily understood, yet sufficiently detailed to distinguish weakly capitalized companies from all others, and to be able to address all the varied types of companies. There are 2,400 companies licensed to do business in the U.S., and they do different types of business, sell different types of products, and have different types of assets. Also, public relations and formula abuse was a big concern to us. Some type of summary of risk-based capital results will go in the annual statement. We're not sure what types yet, but we are concerned that people will potentially misuse these results or that the press will potentially misuse these results. The results are not to be used for ranking or rating. The raters do a much better job in rating, and you'll see later how this process works. It's a much more in-depth process, and they do a better job in rating the companies. So, to discourage ranking and rating, we are going to follow the marginal approach, as I mentioned before.

When we made our presentation to the NAIC in December, we needed to do some testing to see, in a very general way, how the formula results would look, so we did preliminary testing. For preliminary testing, we used 1990 publicly available annual statement data. A precise calculation could not be done at that time because not all the information required in the formula is available publicly. For instance, we didn't have the 10 largest name exposures, so we just ignored that factor. For other factors, we made certain assumptions or certain approximations. Mostly, we worked with the 674 largest companies, those companies with assets of \$50 million and above, which represent over 99% of total industry assets. Our preliminary results showed that 12% of the companies had total adjusted capital less than 100% of their risk-based capital. How did these companies come out by size? That's something people always want to know. I divided those companies with assets of \$50 million and above into four categories as shown in Table 1: Companies with assets of \$5 billion and above, \$1.5 billion to \$5 billion, \$250 million to \$1.5 billion, and \$50 million to \$250 million. The second column shows the number of companies that fell below 100% in each of those categories, and the last column shows the percentage of those companies that fell below 100%. You can see that for all groups except the large company group, they were all around 12%, which was the average. For the largest companies, the percentage of companies that fell below 100% was only 6%. We don't really feel that this is statistically significant yet, because that only represents three companies. We also feel that once we do the final testing, and we see the effect of the concentration factor, that several more companies may fall into this group.

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TABLE 1
Companies Below 100%

Company Size	Number	Percentage
\$5 billion and above	3	6.1%
\$1.5 billion to \$5 billion	10	13.0
\$250 million to \$1.5 billion	27	11.0
\$50 million to \$250 million	43	14.2
All companies above \$50 million	83	12.3

Another thing we can see is the average risk-based capital ratio. In Table 2, I've divided the companies into the same four categories. The second column shows the number of companies in each of those categories, and the last column shows the average risk-based capital ratio. You can see that, overall, for companies of \$50 million and above, the risk-based capital ratio is 177%. This shows, under our formula, that the insurance industry is very well capitalized. You can also see, as you look at the different sizes of categories, that the smaller companies appear to be better capitalized than the larger companies.

TABLE 2
Average RBC Ratio

Company Size	Number of Companies	Average RBC Ratio
\$5 billion and above	49	1.53
\$1.5 billion to \$5 billion	77	1.92
\$250 million to \$1.5 billion	245	2.21
\$50 million to \$250 million	303	2.56
All companies above \$50 million	674	1.77

Also, another thing of interest is that, for the larger companies, the C-1 risk dominates. On average, about 80% of total risk-based capital would be C-1 risk. Whereas for the smaller companies, in this case the \$50 million to \$250 million dollar companies, the C-1 risk and the C-2 risk are about equal, and the sum of those two risks is the largest percentage of the total.

What are our next steps? Our formula was presented to the NAIC in December 1991, and it was published by the ACLI at that time. The next step, and what we've been working on since that time, is detailed testing. In April, the NAIC sent a request to all companies licensed to do business in the U.S. to submit data for 1990 and 1991 so that risk-based capital ratios could be calculated for all companies at that time. That data was due by the first week in June. From the analysis of that data and the comments that we received from companies, we may make changes to the formula, and we will finalize our recommendation for the formula. With respect to the A, B, and C levels, we'll come up with the percentage that would trigger those different types of actions. We'll draft a model regulation, a model law, and we'll draft an annual statement schedule. We expect to have that done by September. We hope the NAIC will accept the schedule, the model law, the formula, and the trigger points in September for exposure so that the formal exposure period would begin at that time. After a three-month exposure period, we would expect that the NAIC

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would adopt the formula and the law in December for implementation in the 1993 annual statement blank. The states will then, we would hope, adopt the model law quickly, to achieve or maintain accreditation, as this will be one of the model laws that will be required for accreditation.

Since the life insurance world and the investment world, of which it is a part, are dynamic and ever changing, you really can't have a static risk-based capital formula. Therefore, we have recommended that there be a formal oversight and review mechanism to constantly be looking at the formula and determining if it needs changes and recommending those changes. Our committee feels that, properly maintained, a risk-based capital formula is a very, very good tool for regulators and will help to contribute to effective solvency regulation in the years to come.

MR. JACOBS: Our next speaker is David Wells, and he brings a quasi-regulatory sort of perspective. Since David is not an actuary, I think he deserves a little bit more of an introduction. He's a vice president in the financial institutions group of Fitch Investor Services in charge of property, casualty, life, and mortgage insurance company rating services. Fitch is one of the oldest, independently owned rating agencies of fixed income securities in the United States. Prior to joining Fitch, David was vice president and senior securities analyst, specializing in insurance companies, with Merrill Lynch Capital Markets and E.F. Hutton. He has an MBA from Columbia University, a bachelor of science degree in economics and statistics from New York University, and he's a chartered financial analyst.

MR. DAVID P. WELLS: The output of rating agencies and the role they've played has gained much importance, and this isn't necessarily because we provide infallible ratings. It's because the risk presented by certain investments and products that the industry sells have finally converged, requiring many policyholders and investors to ask more questions and develop a heightened sense of interest in the financial security of the companies they deal with. Since the opinions of a rating agency can substantially affect both the buyers and sellers of insurance products, it's important for the agencies to let you know how they develop their ratings and what methodologies they use.

Before I begin, I want to quote something from an annual report for Bankers Trust Corporation, the large money center commercial bank. The theme of the annual report is risk. It summarizes six axioms about risk that it follows. I thought it was interesting because I think it applies to insurance companies as well. They are: "Risk isn't always where you expect it to be," "Not taking risk may be the biggest risk of all," "Risk surrounds almost everything worth having," "Hide from risk and you hide from its rewards," "Every time money travels, risk travels with it," and "Risk, you have to look at it even if you don't want to." I think those are interesting and important points for management of insurance companies today.

I will discuss how we determine ratings overall. It is a qualitative and judgment-oriented process. Then I'll discuss what's unique about rating life insurance companies: major areas of analysis, how they're measured, other external factors involved in rating insurance companies, and evaluating capital adequacy. Finally I will close with some thoughts about how we might improve the process of evaluating capital adequacy. Clearly, there is no formula for determining ratings, as you probably have

discovered if you've worked with a rating agency in the past. It's just not that simple. In fact, the actual rating decision in the end is a committee decision. After all, the numbers have been looked at, management has been interviewed, all the issues have been discussed, and whatever models have been considered. Be it risk-based capital or other models, the actual final rating is voted on by a committee of rating officers. That fact is key because it's an important decision for the company, and one or two individuals may tend to develop prejudices about certain opinions or certain companies. It's important to temper those opinions with a committee decision.

I mentioned that ratings are important for life insurance companies, and I want to dwell on this for a little while, because they are so important. First of all, I think life insurance companies are one of the most difficult financial services companies to analyze, particularly when it comes to evaluating capital adequacy. First, their liabilities aren't always easy to understand, or, at least, to predict the behavior of. Second, their true asset quality, at times, can be difficult to track. These considerations have resulted from changes in both the types of investments companies buy and the products they sell. I would contrast this with banks, where I think tracking asset quality by the analyst, the regulator, and even the company itself is more thorough. Bank regulators look at real estate loans and other assets more closely, more carefully, and more frequently. I also think their liabilities are more straightforward.

At the same time, ratings are important to insurance companies. This stems from the frequent observation that the quality of the product insurance companies sell is only as good as the rating. Particularly in the last year and a half, pricing and other service factors may be an issue, but your product is only as good as the company is strong. Compare this to a sneaker company that could have its debt ratings downgraded to BBB or lower and still make a good sneaker. Also, ratings are important, because when the financial press sometimes distorts certain issues, it's hard to differentiate among different companies and the quality of those companies. I think that's where ratings are meant to come in.

When we determine a rating, the eight major areas of analysis are: (1) management, (2) industry conditions, (3) corporate organization and structure, (4) operations, (5) profitability, (6) liquidity, (7) asset quality, and (8) capital adequacy. Corporate organization and structure refers to how the company is run, whether it's a mutual or a stock, how it's organized, what its subsidiaries are, and so on. Included in operations are lines of business, expense structure, distribution, and other income statement issues. Profitability has to do with how profitable a company is overall. Capital adequacy is frequently the vortex of many issues on this list. We look at asset quality and liquidity and other issues relative to capital adequacy, and incorporate them into our evaluation of capital adequacy.

Specifically, the framework for measuring capital adequacy should not come as a surprise. These are the four general risk areas we look at when evaluating capital adequacy. First is asset quality. Next is business risk, not C-4 risk, but really pricing risk, as was mentioned earlier; how companies price their products and what risk they take relative to those prices. Third, the liquidity position of an insurance company is increasingly important to its rating. Last is the hard-to-quantify business risk, or the

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price of misadventure. This is important because it's not only the hardest to predict, but capital is such a hard item to earn and build, and it can be lost so quickly. There are many cases where companies have built up very strong capital over the years, only to lose it in one or two quarters. I think Warren Buffett, when talking about how easily capital can be lost, referring to Noah and the ark said, "What matters is building arks, not predicting rain." So, I think what's important is protecting capital, not only building it.

We use four common ratios to measure capital adequacy on a very simple basis. We look at liabilities to surplus, assets to surplus, and premiums to surplus. We do use and look at risk-based capital ratios, or margins. The exact measure or ratio used may vary by line of business. For example, premiums to surplus will largely apply to accident health coverages. Also, precise ratios for each rating category are not set. The numbers should, however, fall into an acceptable range, depending on the products the company writes. For example, a liabilities-to-surplus ratio of 30:1 would probably be acceptable for an annuity writer if it were well matched and had high asset quality. But all things being equal, a ratio of 20:1 for that same company would probably result in a higher rating.

Fitch doesn't yet utilize a proprietary risk-based capital model. We will review a company's own models, when available, and obviously we'll look at the NAIC's version when that's available. Risk-based capital models are helpful for basic comparative purposes among companies; for instance, the NAIC's model for evaluating minimum capital. For rating purposes, if the C-1, C-2, or C-3 risk becomes an important issue in the rating process, it's typically an overwhelming issue. It is apparent that using a risk-based capital model is probably not entirely necessary. Also, risk-based capital models are only as accurate as the input. The input can be accurate if you're looking at bond default rates over a very long period of time, but things do change. One company that had some very sophisticated models once told me that it usually gets to the bottom line fairly closely in its forecast, but all the line items are vastly different from expectations. "We earn what we say we're going to earn, and we have the capital that we say we're going to have. When you look at the composition of how we got there, it's usually entirely different." So, that's just one caveat when looking at pure ratios.

Measurement of capital can involve several adjustments, as we just heard in the NAIC case. Any reserves carried as liabilities are added back into capital, including the new AVR and interest maintenance reserve (IMR) accounts. Voluntary reserves will be included as well, but GAAP reserves will not. This frequently happens at large stock companies, where their holding companies have taken some large reserves for asset problems, and the reserve has been held at the parent company. That's not the same as hard capital at the insurance company. It has other subsidiaries that can afford to fund those reserves and ultimately downstream capital; the reserves shouldn't be added back into the subsidiaries capital.

Subsidiaries of the insurance company are excluded, as with the NAIC case, at the risk-based capital level and not at any more than 100%. Although I'll have to say that if a subsidiary of an insurance company had risk-based capital of 300% or 400%, though we would typically only take out the 100% level, it might cause us to take a closer look at that subsidiary if we were rating it. Why would you want

300% or 400% of your capital in a subsidiary, particularly when it's so scarce these days? Why not just upstream it to the parent insurance company? Perhaps there's something that the company knows about measuring risk and carrying capital forth that we don't know.

Policy loans are also typically excluded from liabilities, in the liabilities-to-surplus ratio. We also might make specific value adjustments for certain assets. If the particular asset account was disproportionately large, and we could get a better handle on the market value or the potential realizable value, or the risk of that asset, we might make a specific adjustment as opposed to using just a published number. Also, analysts frequently mention quality of earnings when they talk about measuring a company's earnings. There are a number of accounting treatments that can represent the strength of a company in a number of different ways. I think this applies to surplus as well. If the insurance company has surplus relief, certain off-balance sheet contingencies, or certain alternative financing mechanisms, these frequently should be viewed as temporary capital, not permanent capital. Adjustments might be made when evaluating the company's capital if those existed.

Though the capital amount of the insurance company, and how adequate that is, is first and foremost in providing a rating, the holding company of an insurance company can frequently provide both real and perceived changes to capital adequacy. At its weakest, a holding company or parent can improve the perception of an insurance company's capital adequacy, particularly when the holding company is a long-term owner and has demonstrated a commitment to the insurance company. The 1970s and 1980s were replete with cases of financial services companies and industrial companies wanting to diversify and get into the financial services business or insurance business, only to have not too happy endings and get out of that business with substantial losses after a period of time. Sometimes a holding company can provide explicit support to the subsidiaries, and that would be included in measurement of its capital adequacy. This is frequently done with property and casualty companies that pool risks, and with some mortgage insurance companies where a strong parent can make a capital commitment. This can result in applying the rating of the parent to the subsidiary.

One more issue on holding companies, the double leverage issue, can affect perceived capital adequacy. Double leverage is a term that comes from rating agencies analyzing banks, which are also regulated financial institutions. It's not uncommon for a holding company in the banking industry to borrow funds and downstream those funds to the subsidiary as equity. The bank subsidiary, in turn, borrows on the greater equity base; hence the term, double leverage. This practice is typically important for public bondholders because of regulatory constraints on what dividends can be paid out of either banks or insurance companies. When bondholder's debt is serviced from those dividends, a high double-leverage ratio will immediately send a signal that says, "Will the insurance company or bank be able to upstream adequate dividends to service parent company debt?" That will affect the debt rating.

However, if an insurance company is a subsidiary of a highly leveraged parent, all things being equal, it's going to be called on to send dividends up to the parent company to support that debt more frequently and in larger amounts. That will affect the perceived long-term capital adequacy of the insurer. There will be less of a

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margin for earning and retaining capital. More of the capital will be paid out to the parent company. Double leverage can be incorporated in measuring capital adequacy of an insurance company, and therefore perhaps its rating.

Regulatory forces, to a degree, also help set standards and approaches that rating agencies may use to review capital adequacy. Bond limits, or more specifically, the change made a year or so ago in the nomenclature of bond ratings – as well as the development of the AVR, RBC, and improving disclosure requirements – all help insurance companies to measure, track, and manage risks to capital. In some cases, the new regulations require the insurance company to address and quantify issues they may not have done if they weren't required to do so. This helps the rating agency at least begin to approach the job of evaluating certain capital risks, since the company has already compiled some of the data and has begun to face some of the facts that need to be faced in the rating process.

I have some additional viewpoints on ratings and capital. As I mentioned earlier, some of the ratios we look at, including RBC, while not alone critical rating components, do provide good references for comparisons among companies. We do not rate on a curve. When looking at ratios and numbers, we also look at trends. I think those are very important, not necessarily to extrapolate to the future, but to look at management's record at managing capital adequacy and managing capital. Related to this, we look at the capital management culture of an insurance company. This is a hard quality to describe, yet after meeting with key managers in the financial or capital area over a period of time, it's actually possible to obtain a sense of how the company approaches its capital decisions, how it views and manages risks, and how well it can maintain consistency in the capital formation process. Adequate capital begins with management's ability to accurately measure risks. This type of evaluation also comes from reviewing how an insurer has reacted to mistakes and misadventures in the past, which I think is important. As I mentioned, it's important to protect capital, since it can be difficult to build over time, but can disappear so quickly.

Last, we also look beyond more traditional, static measures of capital adequacy. We look at the insurance company's record of operating profitability as a backdrop to those ratios. One topic for a presentation on managing capital adequacy lists as a source of capital is: "earn it." I think that's extremely important. A profitable insurance company, long-term, will give us greater comfort if it's going to have adequate capital than one that hasn't been profitable over the long term, but may look good at a point in time.

Finally, I'd like to address a couple of rating-agency-specific issues. Risk capital is intended, as I understand for the NAIC basis, to quantify a minimum level of capital. Ratings, if they were largely derived from a risk-based capital formula, should look at a target or optimal level. This process would become more complicated, because a scale would have to be developed to correlate risk-based capital ratios to ratings. That's why, when evaluating an insurance company, we try to evaluate its own risk-based capital model, even though it'll result in, theoretically, 100% ratios whether it's an AAA or BBB company, because that's its target. At least it'll be more sensitive to the risks.

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Also, rating agencies have limited resources and time when it comes to evaluating capital adequacy and assigning a ratio. I like to put the challenge of assigning a rating in these terms: First, evaluate the asset quality of an insurance company, trying to foretell how adequate its reserves are and what the actual default and recovery ratios would be on all of its invested assets. Second, evaluate the liability structure of the company, looking at all the risks, including underwriting risk, for potentially a large number of product lines. Also, look at how well the insurance company manages its asset-liability relationships. Third, evaluate the operating characteristics of the carrier: how profitable it is, its distributions systems, expense structure, business plan, and so on. Last, review some of the qualitative issues like breadth and depth of management, how well they know their business and how well they do their job – their strategic plans, their acquisition and divestiture plans, and the quality and impact on the insurance company. Then incorporate all of this information into a single rating, and publicly provide that rating and opinion on the company to thousands of investors and policyholders who are going to make billions of dollars of investment decisions based on it. And do all this for \$15,000. I think very few consulting actuaries would accept that assignment.

Having just given the general and brief overview of how we look at capital adequacy and how we try to rate an insurance company, I think certain things can still stand a lot of improvement. For example, it's hard to imagine that only a year ago insurance companies still provided ratings in their portfolio using prehistoric terms like "yes" or "no." I think the same thing is about to happen for real estate and other investment assets and also for other disclosure and financial measurements.

The obvious backdrop to spur a change in rating agency and other analytical methodology is the events of 1991, of which I think we are all brutally aware. The sequence begins with emergence or discovery of bad assets, leads to public fears, then illiquidity, followed by regulatory intervention and ultimately the risk of policyholder losses. Note that I say "discovery" of poor asset quality. In some cases, it was actual deterioration in certain investment markets that caused the rating to decline or the problems to develop. In other cases, it was actually just the mere discovery or realization of already existing poor asset quality that was just not discovered earlier. That's why, perhaps, an effort should be made to look closer at asset quality, as well as to better understand the relationships between assets and liabilities when trying to determine the financial strength of the insurance company, including how adequate its capital position is.

I'll discuss three areas – real estate, bonds, and asset-liability management – all of which are very important when it comes to evaluating the adequacy of capital of an insurance company. I think, relative to the capital risks that real estate investments present, little is done to review commercial mortgage quality. This is more or less the current approach, the due diligence that rating agencies perform when evaluating the asset quality risk for insurance companies in their mortgage portfolios. The overall portfolio is reviewed based on a description of property types and locations. It may include such items as loan-to-value ratios and debt service coverage ratios, although I doubt these numbers are always very current. As part of the review, the status of portfolio is provided in terms of delinquencies, watched properties and foreclosures. Next, some review is typically done of qualitative issues, such as the underwriting guidelines that are in place and how they are changing; how the company may have

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tightened up its grading system, if it has one; and what type of management experience the professionals have in that department. All this information is reviewed, and certain general assumptions relating to the quality and performance of that portfolio are made by the rating agency. The assumptions are based on the outlook for certain markets and are tempered by the agency's qualitative conclusions.

This, perhaps, is what's needed in reviewing the true asset quality of real estate investments. I think the agency should go beyond what a company tells it about credit fundamentals of the portfolio and essentially second-guess the insurance company. For example, if an insurance company owns an AA-rated bond, it's easy for the rating agency and the insurance company to both confirm this fact. When the company provides its average loan-to-value ratio, or debt service coverage ratio for its mortgages, I'm not that sure that they always know what the current number is. Probably the right way is to take a representative sample of the mortgage investments, focusing on the biggest and the most troublesome ones, and potentially the most troublesome loans. Look very closely at that sample, and examine items such as rent rolls, the project's cash flow, borrower strength, and current market data. Make your own assumptions about how those investments are going to perform over time, including defaults and recovery values. Grade and categorize those mortgage investments, and then extrapolate the results to the entire portfolio.

This is very similar to the way rating agencies rate commercial mortgage-backed bonds. They take a sample and determine what the losses will be and how much subordination is needed for a given rating level. Incidentally, in the very tough commercial real estate market we've been experiencing, I understand that the ratings of these commercial mortgage-backed bonds have performed very well and haven't been lowered. That's largely because of the level of due diligence that was performed.

Also, I think rating agencies probably could do a little more work in terms of reviewing the underwriter's servicing skills, including such areas as the success they've had in prior workouts -- how many workouts have gone back into the default category, how quick they are to foreclose, and what the quality of the delinquency prevention procedures are at the company.

This type of information provides a picture of the insurance company's investing culture. I talked about capital management culture before, but I think assessing an investing culture is also very helpful, because many of the liabilities on the balance sheet of an insurance company are going to outlive the assets. This means that assets will turn over during the life of that liability, and you want to know what standards they have and how good they are at reinvesting their funds. Finally, and most importantly, this should be done by real estate experts. Too often it's done by insurance analysts who know a little bit about real estate, having looked just at insurance companies. Most rating agencies have real estate analysts who do nothing but evaluate commercial real estate, and I think it would be helpful to have them included in the process. Incidentally, we just published a commercial mortgage default study that outlines the methodology we use for rating commercial mortgage-backed securities, and it does include some analyses of life insurance company experience. This information was too recent to include, but if you write or call me, or give me your card, I'll be happy to give you a copy later.

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With respect to bonds, although I don't think the changes should be as dramatic, I think some improvement should be made in the way we look at bond quality. Currently, the overall portfolios are reviewed; ratings, defaults, industry and issuer concentrations are examined; and market values and the like are considered. Then the information may be developed into some default of potential capital charge models.

What I think should be done, perhaps looking closer at bonds, is what we call a recovery analysis on the lower-rated credits. We call it a Fitch recovery indicator, performed by our high-yield bond analysts. The analysis could be applied to larger holdings of the insurance company's lower-rated bonds or to bonds with quickly deteriorating credit trends. These are typically NAIC-rated category five and six bonds. For fixed-income securities, a recovery analysis first values the total issuing company, allocates that value to different creditor groups, taking into account precedents set by previous bankruptcy reorganizations, considers potential creditor negotiations, and appropriately discounts that future value to the current date. It assigns a more analytically thoughtful, presumably more stable, and hopefully more accurate, estimate of a low-quality bond's true worth. Today we typically rely on a market value, which can be very misleading beyond the bond's true credit fundamentals. In a recovery analysis, the final value decided could actually be higher or lower than the market value. In fact, by taking this longer-term, measured view of a bond's value, some insurers might benefit from a higher actual portfolio value, not a lower one.

I understand the NAIC is considering language that would allow private opinions on low-rated NAIC category six bonds that would supersede the market value. When Cande was speaking earlier about the capital charges on NAIC category six bonds, if a carrying value came out higher on a low-rated six, it would result in a larger capital requirement, because you'd apply that fixed charge to a larger value. The offset is the fact that the company would be allowed to carry the asset at a higher value, which would result in a higher risk-based capital level or ratio.

I think an agency should also, in some of these low-rated bonds, look closer at covenant structure, notably private placements, which reflect the extent of negotiation that goes on between borrowers and lenders, and typically results in a higher-quality credit. For some low-grade private placements, when viewed by the policyholder and general public, the ratings may actually belie the rights and remedies to the insurance company to preserve its investment and forego a monetary default.

The next consideration is a new risk that I think some insurance companies are presented with – interest rate risk, or prepayment risk from a very popular investment, collateralized mortgage obligations (CMOs). CMOs should be looked at closely by rating agencies because some of these investments could, under certain interest rate scenarios, actually produce negative returns. They tend to be very high credit-rated investments, AAA, because they have government guarantees or subordinated tranches. If the insurance company invests in an interest-only (IO) CMO, it could result in the insurer not getting back its full investment value. There are certain ways of hedging portfolios so that these types of risk can offset each other. That's why it's important not to look at only the number of IOs, but to look at how the insurance company managed its portfolio and hedges these risks with other CMOs, thereby

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offsetting the prepayment or cash-flow risk. Similarly, as was suggested in the real estate area, this should be done by bond experts and not by insurance analysts just using bond ratings.

The last consideration is liabilities. For the most part, the methodology currently employed by rating agencies includes a review of the insurance company's product design and pricing. It includes more traditional risk-based products, like health and life insurance, as well as interest-sensitive products. We might also look at the carrier's Regulation 126 results, if that calculation is done, although the number of scenarios can be too limited and some of the asset assumptions might be too liberal. Some review is also done of the insurance company's asset-liability management systems, including the type of models they may use, if any; the way they test their products; and how well the actuarial or product design departments are integrated with the investment departments.

I'll tell you what I think might be needed to evaluate the liability structure of a life insurance company. Ideally, rating agencies should develop a relative framework for assessing the potential risks from insufficient management of capital, including risks that may not only come to capital but to profits and liquidity. The way to achieve this is a simplified actuarial modeling system where major product groups, not only the interest-sensitive ones modeled on the Regulation 126, but also traditional insurance risk products that can present risk, are modeled. The information would also presumably include the more accurate asset quality and default and recovery information received from the earlier asset review. A large number of random scenarios could be run on the model, incorporating changes in variables that you would expect, such as interest rates, loss ratios, and lapse rates. Additionally, if certain risks to capital appeared notably higher, predetermined tests could be run to see how high a certain variable had to get to achieve a threshold or stress level of that particular measure, be it capital or liquidity or profitability.

This is a radical change in the way rating agencies evaluate capital adequacy that I'm sure might worry a lot of companies, because the results might be misinterpreted or misrepresented. It's clear that agencies need better tools to evaluate capital adequacy. The output is not meant to be a precise measure of capital risk. It's meant to be an order of magnitude of the capital adequacy or degree of confidence that a rating agency can have in its rating. For example, a risk-based capital ratio is not supposed to be used for rating. If one company had a 200% ratio and another company had 100% ratio, you would have an order of magnitude that indicated that the risks were relatively different in both cases.

Similarly, in this type of analysis, if you ran 150 scenarios and one company generated negative capital in 10 of those scenarios, and another company generated negative capital in 30 of those scenarios, while it's not a precise measure, it at least gives you an order of magnitude that the risks for one company could be substantially higher than the risks for the other company. This was done recently when we looked at a mortgage insurance company. When you evaluate the capital risk, or capital adequacy of a mortgage insurance company, it is relatively easy to model its liability portfolio. You have information on the types of mortgages that are insured, what their loan-to-value ratios were, what the properties were, whether it was a fixed-income loan or a variable-rate loan, and all the risks. You model it against a relatively

simple asset structure of high-quality assets to determine what, in a severe depression, could be the capital losses of that insurance company. You can gear your rating around that. I think that some of this methodology should be used for life insurance companies as well.

Anyone who has participated in rating agency reviews over the last five years should have noticed that they've become more sophisticated in the way agencies look at insurance companies. In fact, early on, I understand a lot of life insurance analysts at rating agencies perhaps had backgrounds in other areas, like analyzing banks or other financial institutions, and weren't even insurance analysts. I think that as the industry changes, the methodology and techniques that rating agencies use should also change to produce more precise ratings.

MR. JACOBS: Frank Irish is senior vice president and corporate actuary at John Hancock. He will bring capital adequacy-type discussion issues to the forefront from our professional perspective, that is being a valuation actuary or appointed actuary.

MR. FRANK S. IRISH: Valuation actuaries can see many parallels between their own work and risk-based capital, as far as both methods and goals are concerned. In both cases, the goal is to create a financial structure that will survive adverse circumstances. The methods involve projections of experience under adverse circumstances. Techniques such as scenario testing and stochastic methods are common ground between us, as is the ultimate aim of seeing to it that promises to the customer are kept through insuring that the money will be there to meet the obligations. Perhaps we could better say that there should be a strong likelihood that the money will be there, not a certainty, for there is no certainty for the valuation actuary. Actuarial reserves are designed to do this job with a certain degree of conservatism, and risk-based capital is designed to add a layer of conservatism to that. It can happen, from time to time, that actuarial reserves may not be adequate to mature the obligations because of unexpectedly bad experience. The reserves and surplus together should be adequate in all but the most outrageous and farfetched of circumstances.

This raises the frequently asked question of whether it makes sense to look at reserves and surplus together as a unit when judging the soundness of a company's operation. In other words, should a company that has very strong surplus be allowed to hold weak reserves? Should a company with very strong reserves be allowed to hold less surplus? It's my impression that the consensus answer to these questions is no, and that's my answer, too. As a matter of fact, when the idea of speaking to you was first broached to me, it was put in terms of speaking about the impact of risk-based capital on the valuation actuary. My immediate reaction was that there is no impact of risk-based capital on the valuation actuary. The two should be independent. So, that's what I will talk about.

Reserves and surplus are each subject to their own set of standards and regulations, and each of these is complex enough so that it would merely be overkill to try to develop some kind of interaction or reciprocal relationship between the two. Risk-based capital assumes, implicitly, that the reserves are adequate, and I suppose you could also say that reserve standards assume that capital is adequate. Perhaps even more important is the concept that readers of a balance sheet have the right to expect that the reserves they see therein meet industrywide standards. They should

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not have to modify their evaluation of the company depending on whether the surplus has been allowed to interact with the reserves. The presentation of balance sheet data makes it very difficult for the reader to make any estimate of whether the reserves are sound. On the other hand, the surplus can be judged quite easily, once we have risk-based capital standards in place. At that point, the public will know what the standard for a company's surplus is, in numerical terms, and whether the company meets that standard. Reserves, however, are based on a much more detailed analysis, an extremely complex set of standards. These standards have to be in force and stand on their own feet.

The new standard valuation law makes it apparent that there is at least a presumption that asset adequacy is a standard applied to reserves only and is unrelated to the kind of surplus that the company may have. It's true that the standard valuation law leaves the development of detailed standards for actuarial reserves very wide open. It may be that during the development of these standards, there will be those who will argue that the level of reserves needed could be a function of how strong the company's surplus is. It's not beyond belief that such a concept could be written into the standards. I think it should be resisted. The development of standards is, of course, in its infancy. By the end of 1992, standards will be published that will help, but they will probably still leave open such questions as, how many scenarios can be failed, or how conservative should the mortality or default assumptions be? Existing documents point us only vaguely in the right direction. For example, in the NAIC accounting practices and procedures manuals, we see the statement that the valuation of both assets and liabilities should be on a conservative basis, with the additional clue that the valuations should be sufficient to survive over an economic cycle. This implies, I suppose, that the reserves should be good enough to stay sound in the face of an economic cycle of a kind typical since World War II. The implication also is that the reserves should be strong enough to produce at least modest positive earnings during every year of a typical economic cycle.

The Tweedie committee that made the original report that led to the standard valuation law relied very heavily on language such as, "A substantially better-than-even chance," in describing the soundness standards that reserves should meet. The committee was also very concerned to make the distinction between reserves and surplus. There are different implied levels of probability for each – moderate deviations on one hand and catastrophic levels on the other hand. Finally, the report of the risk-based capital committee itself makes the same sort of point. The work of the risk-based capital committee assumes that the actuary has set the reserves at an adequate level and that such level is regulated by a separate set of standards. Surplus will then be an additional layer of protection on top of the reserves as they have been set up. Furthermore, the committee repeats the points about not wanting to vary surplus standards in response to the strengths of the underlying reserves. The implication is that reserves themselves must be subject to consistent standards that apply to all.

I also want to discuss a few things that impress me as being parallels between the methods used by the valuation actuary and the methods used to derive the factors for risk-based capital. This is particularly clear cut in the case of bonds, as the text of the report makes clear, through a conscious decision to adopt a cash-flow testing type of approach to the subject. The valuation actuary projects cash flows by using

scenarios or stochastic methods to determine how much reserve has to be set up right now to ensure that there is a certain level of confidence and that those projected cash flows will be positive. The parallels with the derivation of the bond factors are clear. The approach treats default losses as if they were the claims that are to be paid out. There's even a premium assumed in the calculation, similar to what the valuation actuary does when setting up level premium reserves. In this case, it has assumed that the normal level of default is provided for in the basic reserves, and that this extra provision represents a resource, or premium, that is available to meet the actual default losses. Thus, the risk-based capital is there to meet the possibility that losses will fluctuate sporadically. In some scenarios, it will be worse than what is provided for in the basic reserves. In essence, it is appropriate to look at the process as setting up a parallel type of reserve subject to more stringent confidence limits. The methods used also obey another valuation actuary principle (one that's not adequate given its full due by actuaries), and that is that the reserves should be adequate at every interim duration during the projection period and not just at the end of the projection period.

In the case of equities, however, the approach of the committee was to devise factors that would cover the largest loss within a two-year period or at least would have a high probability of covering the largest loss. This is an approach that is more like a contingency reserve than an actuarial reserve. I think it assumes that real estate and stocks are assigned to surplus rather than supporting liabilities, and that the purpose of the risk-based capital factor is to protect surplus against any loss of value that may occur, rather than support particular liabilities. It's an interesting question as to whether equities should be assumed to be held in support of actuarial liabilities, or whether they are held only in support of surplus. It's hard to see how most companies could do cash-flow testing, unless they assume that some of their equity holdings, including common stock, real estate and subsidiaries, are held in support of actuarial liabilities. But as far as I know, the actuarial literature has never tackled this question. From my own experience, I know that it's extremely difficult to try to provide for even minor amounts of equities in the cash-flow testing process. Perhaps this remains one of the many unsolved actuarial problems that lie ahead of us in the field of valuation of liabilities and analysis of capital.

The treatment of equities also brings up the whole subject of book versus market values. Stocks are carried at market value, whereas real estate is carried at the lesser of book and market. This difference should affect our judgment of how much risk is involved in each. It should be recognized that the use of book values reduces fluctuations in surplus and thus reduces risks. This is true, of course, of bonds and mortgages as well, and because of the importance given to recent attempts to change life insurance accounting over to a market-value basis, it is worth pointing out how much difference this would make in everything we are discussing. With market values we would not only need to hold more capital, but our whole approach to product design and investment mix would be changed.

The whole subject of market values versus book values is getting us a little far afield, and I want to return to my main topic, which is the relationship between the valuation actuary and the risk-based capital process. One of the most obvious areas of interaction between the work of the valuation actuary and the actuary who oversees surplus is the area of C-3 risk. The procedures of valuation provide a very great

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protection against C-3 risk, but they do not protect against extraordinary fluctuations in interest rates, nor should they be expected to. The same philosophy applies here as elsewhere. That is, if you are going to set up standards for surplus, you have to think along somewhat the same lines as one does in setting up actuarial reserves. Then set up an extra layer of protection that raises to a very high level the probability of surviving and paying off on promises. That fluctuation in interest rates can exceed the criteria normally used in actuarial reserves is very easy to demonstrate.

For example, in the New York seven scenarios, a 3% drop is considered to be the most abrupt drop in the interest rate in one year. It was only a few years ago, namely 1985, that interest rates dropped 4% in one year. I'm sure we could find even more dramatic examples if we went back further, and, of course, there's a very dramatic and well-known example of what happened in a rising interest rate scenario during the 1980-81 period. Furthermore, actuarial reserves don't even have to pass all of the New York scenarios, nor do they have to pass 95% or even 90% of the scenarios generated by a stochastic procedure. It's very clear that in order to protect against catastrophe, we need an extra layer of assets to protect us against the C-3 risk and to ensure capital adequacy, just as in the C-1 and C-2 risks.

Of course, one of the most interesting things about the committee's approach to C-3 risk is the addition of a provision for higher C-3 risk charges in the cases of actuarial reserves that are not subject to proper asset adequacy analysis. Perhaps if we are fully confident of all the efforts of the profession and the regulators toward requiring the appropriate analyses, and we are confident that those efforts would be successful, we might not need these extra amounts. I think it is fair to say that nobody, not even among us, to say nothing of the regulators and the public, is confident that this will happen. Therefore, it is only reasonable that such a provision should be put in. It is also clear that if the company really doesn't do an asset adequacy analysis and really does not carry out its asset-liability management in the way that it should, then it is incurring risks far greater than those implied in the committee's report; that is, a far greater than 50% increase in the C-3 risk. I guess we have to accept the fact that what is done there is in the nature of a compromise, a set of provisions that will clearly be reexamined and modified as time goes by.

Finally, I'd like to address the MSVR, which is treated in the risk-based capital formula as an offset to the capital requirements. I think this is proper because the MSVR is there and available to absorb the same kind of risks that the C-1 portion of the risk-based capital is meant to handle. I think we can put it in terms of the typical bond or mortgage, which has a provision in its yield for the normal level of defaults, or perhaps slightly more than the normal level. The MSVR represents an additional line of defense against a surge in defaults well above the normal level and, therefore, does the same job that risk-based capital is designed to do. It is worth noting that the MSVR is currently undergoing major changes, and in 1992, it will be transformed into two new reserves known as the AVR and the IMR. These new reserves do a better job than the old MSVR in at least two respects. First, the AVR will be applicable to mortgages and real estate, as well as to bonds and stocks, and, therefore, will cover all securities on which losses can occur. Second, the new concept of the IMR will be designed to capture and amortize into earnings those gains that arise from movements in interest rates, as opposed to the provision for gains and losses that arise from changes in the creditworthiness of the issuer that will be

captured in the AVR. The new reserves are also being designed more explicitly to be like actuarial reserves in terms of the general conservatism of the provisions, as well as in the way in which the reserves release profits gradually into surplus. It is also hoped that the new reserves will be formulated in a manner that is consistent both numerically and philosophically with the efforts in the area of the risk-based capital. Incidentally, you may not be aware of it, but the new AVR and the RBC, as they stand now, have factors that are somewhat inconsistent with each other. This will not be fixed in 1992, but it is to be hoped that progress will be made on this front for application in 1993, at the time when the risk-based capital work becomes effective for the insurance industry.

Let me say, in summary, that it's possible to see many parallels between risk-based capital and the work of the valuation actuary and to view the two fields of endeavor as using many of the same techniques and having much philosophy in common. If the work of the valuation actuary is viewed as establishing a level of liabilities that has a high probability of being adequate to meet all the obligations of the company, then the work of the risk-based capital formula is to add another layer of protection to that, and that will bring the total soundness of the company to an even higher level. Nonetheless, it is also important to recognize that each of these areas of work also has its own particular standards and measures, that we should not try to let surplus soundness substitute for reserve soundness, or vice versa. One can foresee the possibility of developing two actuarial specialties, one of which is the valuation actuary as we already know it, and the other one is the actuary who deals with the sort of thing we're talking about. It may be that we will call the new breed of actuary the surplus actuary, although I'm not sure I like that title very much. I think I do know one actuary who actually has that title. On the other hand, maybe we can call the new breed of actuary a capital actuary, that one I like.

MR. STEVEN A. SMITH: One subject, I guess, wasn't actually on the program, but it's very much related. We've talked about statutory surplus adequacy, statutory reserve adequacy, and we were talking about valuation actuaries. For those of us who work in a stock company, we also, in effect, have to do an opinion on the adequacy of our GAAP reserves and the deferred acquisition costs that we have on our balance sheets. We do cash-flow testing for assets equal to statutory reserves. But how many of us have done additional cash-flow testing with assets equal to net GAAP reserves? Suppose you do your cash-flow testing for Regulation 126, or whatever, and you throw in 100 random scenarios, and you pass 95 out of 100 with statutory assets, or assets equal to statutory reserves. For many of us, GAAP reserves might be 5% or 10% lower, and maybe 10% get large deferred acquisition costs. Suppose you did 100 random scenarios, and you failed 40, or 60, out of 100, with assets equal to net GAAP reserves. What does that say about the adequacy of your GAAP surplus, or the adequacy of your net GAAP reserves? If anyone on the panel has some thoughts about that, I'd like to hear them.

MR. JACOBS: Our good friend from the Mutual Company is going to answer this question.

MR. IRISH: Mutual companies have GAAP, too.

MR. JACOBS: That's true.

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MR. IRISH: *Your observations are very well taken, Steve. There's no question but that it's important information to management and to investors, and to various outside bodies, as to how sound your GAAP reserves are and exactly what circumstances can make them fail. If you use GAAP reserves in any way to convince any one of your constituencies that you're running your business right, then this is obviously a necessity, and the same kind of analysis that we've been talking about is worthwhile in GAAP reserves. I can't help but point out, however, you know as well as I do, that the level of statistical confidence that we're talking about in GAAP reserves is entirely different. I wouldn't want to say that GAAP reserves are pitched at a 50% level, but it can't be very much more than a 50% level. We hope that statutory reserves will survive over something like, perhaps, 75% or 80% of the probability distribution, and that the total assets of the company will survive in 95-99% eventualities.*

MR. JACOBS: *I guess my only observation is, and it's simply an observation, in my travels, I've not seen a company, nor have I been asked to, nor have my friends at FASB or the SEC suggested that we do cash-flow testing in determining recoverability levels of the deferred acquisition cost (DAC) that's on a company's books. Your line of question is very interesting. I hope nobody from FASB is here who will run back and start putting that in one of its pronouncements. I'm also not aware of the Actuarial Standards Board, in the GAAP standard, having any comments or dialogue regarding testing by using cash-flow levels instead of just a straight interest rate sort of discount.*

MR. ALLAN BRENDER: *With respect to the uses of the risk-based capital formula, some of you may know that we've had a formula of this type in Canada for six or seven years now at least. One of the things that I see happening, and I think it's inevitable, is that people start using the requirements calculated through this formula as required capital for purposes of pricing. You see many people now, when they're trying to figure out, in their pricing, ROE goals and things of that kind, using this formula. It's only intended to be a minimum, but it's the only common formula that is available, and people know how to calculate it easily. I think it's inevitable that these kinds of things come to pass, no matter how much we say that these are minimum formulas and are not necessarily appropriate. It would seem to me, particularly in the U.S. where there is a rate regulation environment, that regulators for a particular piece of business would want to look at the amount of capital invested in that line. And, bingo, you have a number to give them all of a sudden. Even though you don't think it's the appropriate number, they're going to take it, and they're going to use it unless you can find some way of impressing on people that it's not the appropriate number. They'll have a hard time believing that. Finally, when the Canadian Institute looked at this whole question of the formula and the availability of it about seven or eight years ago, we came to the conclusion that the actuary, as a valuation actuary, and now under the new rule, something called the appointed actuary, has to look at surplus and make statements about solvency, and could not rely on the formula. We've introduced one heck of a huge job that the actuary has to go through to lead to surplus assessments and so on, and these formulas, in fact, are not something that you can really take comfort with. They're objective formulas that regulators need for their own purposes, but that's as far as they go.*

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MS. OLSEN: I don't know what there is to say. Thank you very much, for your insight. We're still going to try to keep people from thinking that this is the only formula, and developing their pricing on it, but I don't know what will happen.

MR. IRISH: Well, I have something to say, as usual. The fact is that my company and your company and many others have, for a long period of years, been using something like risk-based capital, only it was their own home-cooked formula, and we had been using it in pricing. Most of the formulas for rate of return in the pricing context that you see have either surplus, target surplus, surplus needs, or risk-based capital in them. I think the questioner is right in saying that there's a danger that an arbitrary formula will get imbedded in these pricing procedures; that may be inappropriate in some cases. It seems to me that the proper solution for a company like mine that has been doing this for 15 years, is to adopt the risk-based capital formula because it is going to have the stamp of authority on it, and then adopt internal modifications in those few cases where it isn't appropriate for detailed decision making within the company. This applies to pricing decisions, investment decisions, project decisions, all sorts of things. I think, in general, we can use the new formulas as a framework.

MS. OLSEN: I think that, even in doing that, there may be a danger in that people think, or companies think, that there is no modification necessary for their formula, or the modification they use is $x\%$ of every factor. So, we'll see.

MR. IRISH: You might be careful of that.

MS. OLSEN: New York Life does not intend to use that formula in managing its surplus, as of right now.

MR. JACOBS: In my travels around, again, I will submit to you that I think Allan's and Frank's point is right on the head, that most companies are throwing out their old risk-based capital formulas and plugging in the NAIC formula in their pricing models. I've warned, as you've heard up here and in the audience, that it may not be the most appropriate. What we're shooting for, if we price under that standard, is a very low hurdle, and there are going to be many more companies other than 12 that are below that threshold if we continue to do that. But, that's just us talking. Another fear that I have, I think was brought up by Allan. I know for a fact that marketing officers of companies are already going to the actuarial area, trying to figure out what their RBC ratios are. Next time *Life Insurance Selling* or *Best's Review* (Life & Health Edition) comes out, in the bottom corner it will, say, "My RBC ratio's this, what's yours?" I don't know how you stop that, but it's inevitable, in my opinion. My friends at the advisory council, I know, are subject to those sorts of comments.

MS. OLSEN: One thing that I might just mention is that we are concerned even with companies using the test results right now. There are agents and other people starting to ask questions about, "What is your current test risk-based capital?" We think that that is totally inappropriate, because we're doing the testing to determine whether changes need to be made to the formula, and it may be totally misleading. At the last meeting of the NAIC, held just earlier this week, the executive committee, or whatever, of commissioners made a resolution that the risk-based capital formula results should not be used for anything at this time, because they could be

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misleading. I don't know where that resolution goes or what happens with it, but they feel that it should not be used for anything right now. After implementation, we don't feel that those results would be appropriate to be used by agents or by companies in their advertising, or anything else. We're in the process of trying to determine how that idea should be incorporated into our model law, or maybe into some other laws having to do with market conduct or unfair trade practices. We'll be working on that over the next couple months.

MR. WILBUR M. BOLTON: I have a couple of questions, I guess primarily for Cande Olsen. One has to do with morbidity reserves, the weighting on that. I seem to recall in the literature running across some kinds of statements that, going from the 1920s to the 1930s, the cost of disability provisions under long-term disability went up by a factor of four at about the same time we were getting very heavy asset default rates. That would suggest, at least as far as disability is concerned, that there is a rather strong correlation with the C-1 risk. The second question is, are there any adjustments to the formula? I did not hear this addressed in your presentation. Let's take the example of a group pension company that has primarily market value termination provisions in its contracts. I would think that it would be entitled to some kind of an adjustment on its risk-based capital, as opposed to a company that's carrying largely book-value guarantees.

MS. OLSEN: With regard to your first question, on the relationship between C-1 and C-2 risk, that was discussed by our advisory group; there could possibly be a relationship between the economy and disability income. But we rejected doing anything about it. I don't know if anybody has any more information on that. I know that it did come up, and we decided it was not enough of a correlation to take that into consideration. Your second question is related to group pension.

MR. BOLTON: Are the factors differentiated between market-value-adjusted liabilities and book-value-adjusted liabilities?

MS. OLSEN: Well, the C-3 factors are different. I'm not sure I understand the question.

MR. BOLTON: The question is with respect to termination. The surrender values on many group pensions are not guaranteed, but are subject to a market-value termination provision. So, in effect, if the employer wants to take a glop of money out, it's adjusted to whatever the market value is. It's like a separate account-type thing. It would seem to me that a company, to the extent that it has that built in, would not need nearly the risk-based capital on the C-1 side as somebody else who is working with book-value guarantees.

MS. OLSEN: There's a lower factor -- a C-3 factor -- though you are talking about C-1. For C-3, we take the reserves as shown in Question 9, Notes to Financial Statements by the different withdrawal categories, and we slot them into the high, medium and low risk. They have different factors, depending on what category they're in. Those contracts are in a category by themselves. We're not doing anything to C-1.

MR. JOHN W. H. TAYLOR: On this question, the first thing I'd like to say is, I think the profession and the industry owes the committees that have been trying to work on the RBC issue a large vote of thanks for a lot of work done, because no matter what formula you develop, there are going to be complaints. I know as a profession we sometimes get worried about the inevitable. I think we've established an RBC, with all of its human errors that may be involved with it, that is basically a new, minimum target surplus, or minimum additional reserve based upon your point of view, because companies are going to want to manage to make sure they never get close to that number. I think, as Frank has talked about, this is a minimum, and every company's going to be trying to target its pricing, etc., to provide either in the mutual terms a contribution to surplus greater than that, or in the stock, a profit in excess of that minimum. I cannot help but see that you almost have to use it, in lieu of your target surplus, as a minimum floor, because the companies are not going to be able to allow that surplus number to fall to that level. I would hope that this issue of changing from a ratio to an absolute dollar excess be really thought through carefully. I understand the risks, but if, as I heard in the presentation, 81% of the RBC requirements for larger companies was involved with the asset risk, it would seem to me the ratios more properly reflect that than absolute dollars. I think I heard support for that, without saying so, from Mr. Wells regarding the way Fitch looked at these numbers. I think we should accept the fact that it is fraught with errors. It has to be, it's a first shot. It's certainly better than the industry has had before, by far, and we are going to have to rely on continually working with it to improve it. I think the public is going to demand a right to those numbers. It's like saying that we can't tell the public about the guaranty associations, yet that's a very important part of how the public decides on buying. We just have to control how those words are, I think, properly phrased.

MS. OLSEN: I just wanted to thank you for your vote of confidence, first of all. Your first comment was that you think that companies that are close to the 100% level will need to manage using that formula. Yes, I agree. Our concern is that, at the 200% level, and there are many companies out there at the 200% level, that's probably not the appropriate way to manage their surplus. Also, in moving from a ratio to a margin, what we're doing is going to be a matter of display. The numbers won't change the method that we're using. We're going to just display a margin in the annual statement rather than a ratio.

MR. TAYLOR: As I say, looking at a number that's primarily an asset number, I guess we need to think through, is the absolute dollar tied more toward the traditional view? The surplus is tied to the random fluctuations of our mortality experience, rather to what need not be a random event, namely, the impact on our assets of economic changes.

MS. OLSEN: Okay. Well, we'll consider that. But I still think that what we're doing is a display to see whether or not a company fails, and once it is over the adequate amount, once it has adequate capital, then it doesn't really matter how much over it is. Also, all the information will be publicly available. There isn't anything that won't be publicly available. It will just be displayed in such a way to encourage people not to think of it as a ratio.

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MR. WALTER S. RUGLAND: I'd like to mention something that David Wells brought up on his major areas of analysis. He said that the areas of analysis in the rating process are management, industry condition, corporate organization and structure, operations, profitability, liquidity, asset quality, and capital adequacy. Last January, the Society's Board of Governors took a position that the process of evaluating a life insurer's financial strength must include an actuarial analysis of its financial status, both currently and under a range of likely future financial conditions. I think this recognized the need for a long-range view of a company's balance sheet, its financial health. In addition to the actuarial involvement in the liability analysis, I'd like David to comment on how actuarial analysis is factored into all these other areas of analysis.

MR. WELLS: I definitely think actuaries should become more involved, particularly on the liability side. There tends to be less of a need on the asset side for actuaries at rating agencies, because traditionally rating agencies have evaluated assets and asset quality. I think we cover the bases fairly well when it comes to bond quality, mortgages, and other asset classes. We're definitely lacking on the actuarial side, and I thought you'd all appreciate that last comment, that the analysis should be done by actuarial experts.

I also wanted to comment regarding the risk-based capital ratio. My understanding is that the NAIC developed it to avoid the absurd numbers like \$300,000 for minimum capital for a large company, and that the ratios shouldn't be used beyond what they're designed for. From an analyst's perspective, I'm looking at the forest and not the trees, and I'm comparing companies. The company that does have a 200% risk-based capital versus one that has 100%, all things being equal, if the methodology's the same, is a lot stronger. Maybe it shouldn't use it to advertise its strength, and maybe it's unfair because it wasn't designed for that, but it's an analytical fact. The alternative is to have publications like *U.S.A. Today* calculate junk bonds to surplus and say a company with 10% is a lot stronger than one with 30%, which is very cursory and is only one issue. I think this is much better.

MR. ROBERT W. FIELD: I have a general question as to how the formula deals with CMOs. Also, how does an actuary, both from a valuation standpoint and a required surplus standpoint, deal with specific types of assets, such as residual CMOs, where it may be very difficult to project cash flow?

MS. OLSEN: We don't specifically deal with CMOs or residual CMOs. I think that in the future, as the annual statement changes and we start to report some of these things separately, our formula will change to reflect that.

MR. IRISH: There is no good answer to your question, I'm afraid, except to say that many people, regulatory and industry people, are well aware of the issue, the difficulties both of measuring CMOs for surplus adequacy and the difficulty of using them in cash-flow testing. Many people are going to try to do something about it.

MR. JAMES F. REISKYTL: I'm also a member of both AVR and risk-based capital efforts. I'd like to really emphasize a point that Cande has been making and clearly the committee wishes to make. I understand people may choose to use this formula as part of their thinking. We'll probably have 80 or 90 letters with suggestions. Many of these, I think the committee believes, have merit, most of which we

probably will not incorporate in the formula. Now, that sounds contradictory, but I'm saying it to make a very fundamental difference in a point. If you're going to look at an individual company and you want to determine the surplus, you would, in fact, make all these refinements. Now, that's not our objective. Our objective is to provide a better means of getting at minimum capital needs. The formula and the analysis have not been done to try to distinguish among adequately capitalized companies. I can't say that often enough. Cande has said it. I'm just trying to reemphasize that there are many, many refinements, some of which are mentioned, regarding what to do about this group here or something else there, and everyone has an opinion. They're all valid. I shouldn't say all, but most of them are valid, and we really would support them if our goal was to produce a target surplus formula. You'd have to do a lot more with C-4. You'd have to do things with growth. You'd have to do things with many, many things that are factors of surplus, which clearly are not part of this formula. We can't emphasize strongly enough that you should use this, and if you're near that minimum, hopefully you will reflect that and be able to improve the situation.

Cande also commented that the industry average is roughly double this amount of money. If the entire industry cut its surplus in half, it would be a very unfortunate, and clearly, unintended result of our efforts. I think, as has been noted, this is a vast improvement. Over \$300,000, or a million dollars, you can invest in anything you want, and you can sell anything you want, are the kind of standards that currently exist. This is what's been improved. We have not attempted to do the other.

I also would note, as long as I'm here, I mentioned to Dave I would hope he would reconsider it, we do not believe that the IMR is part of surplus. It's a liability. I would like the audience to be aware of, at least, the committee's opinion. Finally, I'd like to ask Frank, and you had a very thoughtful presentation, as always, what you would do in situations where the actuary's opinion is qualified, or if the company has failed a number of tests, how should that be reflected in reserve standards as you go into the future? We wrestle first with what probability level should we achieve? How you decide when you should set up additional reserves, and what criteria do you use to do that?

MR. IRISH: I find it very difficult to answer Jim's question. Jim and I have had many conversations about this. I feel that we can do a better job of defining what reserve adequacy really means in terms of statistical precision or some kind of approach that's better defined for the actuary than he now has. How many scenarios can you fail? That's a question that nobody has an answer to. I would like to see something start, perhaps, with saying that our goal is 75% confidence in the reserves. Then work on from there to more specific standards. Nobody seems to be heading in that direction right now.

MR. ROY GOLDMAN: I just wanted to say that I agree with Jim's comments and Cande's comments about the use of the risk-based formulas. I guess each of us can think of items that aren't taken into account, that should be taken into account in evaluating a company. We're a group of actuaries and we're fooling ourselves if we think that whatever we say is going to prevent people from using those numbers in any other way than to linearly order insurance companies. I don't say this to embarrass you at all, Cande, but when you referenced the different sizes of groupings

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of companies, you did say that the smaller companies were better capitalized than the larger companies. I mean, it's just a natural thing to say. When you talk to nontechnical people, marketing people, product developing people, and they want a shorthand way of understanding how much capital is necessary, one of the things you're going to turn to is the NAIC risk-based capital model.

MS. OLSEN: I think the risk is not that some companies are between 200% and 300% and other companies are between 100% and 200%, but that one company says that it's higher ranked than another company, when the difference is three percentage points. We do have some companies that are already concerned about that, and they're putting a lot of pressure on us to change our formula, so that they can more fairly represent their company relative to other companies where the difference is three percentage points. You can never develop a formula if you're going to have constant pressure to change that formula, so companies will be perfectly ranked; they can never be perfectly ranked. That's our big concern.

