

# RECORD OF SOCIETY OF ACTUARIES 1993 VOL. 19 NO. 1A

## RISK-BASED CAPITAL

Moderator: DARRELL D. KNAPP  
Panelists: KARL MADRECKI  
              JAMES N. ROBERTS  
Recorder:  DARRELL D. KNAPP

- NAIC activities
- Blue Cross/Blue Shield Association activities

MR. DARRELL D. KNAPP: Our panel for this session includes Karl Madrecki, who is with the Blue Cross/Blue Shield Association and Jim Roberts, who is with Ernst & Young. Karl is going to provide basic background on the Blues' initiatives and how they intertwine with the model bill on risk-based capital that the NAIC has proposed. Jim is currently assisting an insurance department and is trying to develop a risk-based capital formula specifically for health carriers. He is going to discuss risk-based capital primarily as it applies to managed care organizations and in particular, HMOs. He will also discuss a risk-driver approach to defining surplus needs. Our third panelist was to have been Cindy Miller, who regrets that she can't be here. She is with Associated Insurance Company, Inc. and has allowed me to present some of her reactions and her company's reactions to risk-based capital.

As an introduction, let's examine what's driving all of the interest on risk-based capital. Right now the concern for solvency, not only of insurance companies but of all financial services entities, seems to be at an all-time high. The public's faith in general in financial services has been significantly eroded, and that has created a huge regulatory interest.

In particular, one of the drivers of the regulatory interest is the fear that the savings & loan crisis will become an insurance company crisis. In all of the press that we read on a daily basis, a few references are still being made that the insurance companies will make the savings & loan crisis look like a minor inconvenience.

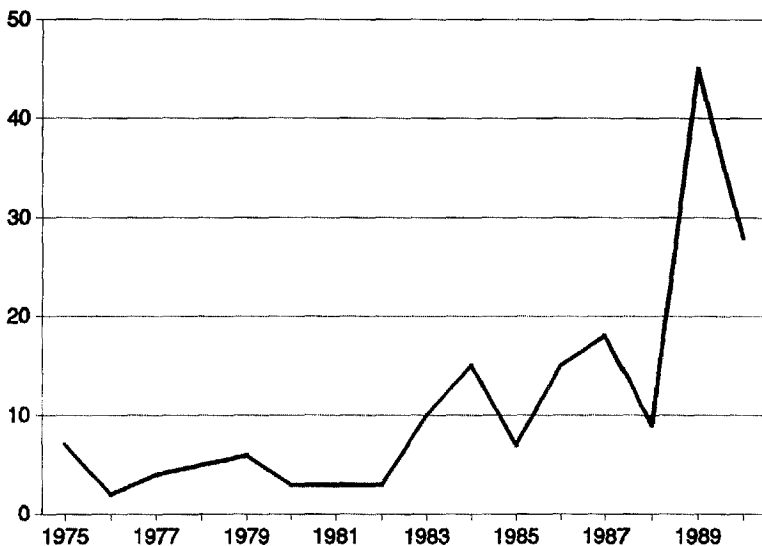
The next big driver that we see is the concern over federal regulation. Representative Dingell is again proposing a repeal of McCarran-Ferguson, leaving state regulators fighting for both a personally felt view of states' rights as well as personal employment opportunities.

The third driver is that we've had several major insurance company insolvencies in the last few years, namely Executive Life and Mutual Benefit. Several other large companies seem to be on the ropes. I think that everyone is willing to accept the small-company insolvencies, but I think the big-insurer insolvencies have created a large concern.

We also have the growing number of insurance company insolvencies. Chart 1 is taken from a Government Accounting Office (GAO) paper on insurance company insolvency. It shows the number of life and health company insolvencies for 1975-1990. The report was a couple of years old, but 1991 was clearly off the chart, with more than 60 insolvencies. The number in 1992 has come back down to

somewhere around the 1989 level. As you can see, there has been a significant increase in the number of insolvencies in the last few years.

CHART 1  
Number of Insolvencies



Also in this report was the major line of coverage for the companies in the year prior to insolvency. Over 60% of the companies have as a major line either group accident and health or other accident and health. It's not strictly a problem with valuation of long-term liabilities. It's not strictly an annuity problem. There's a significant number of insolvencies that are actually in the accident and health business. We need to have some attention paid to that.

Now that we have the regulators' interest, they've done several things to react. First, they came up with the appointed-actuary concept, which states that all of the actuaries signing the certification to an annual statement must be appointed by the company and have personal liability with respect to the certification. Second, more and more states are requiring an audit of the statutory financial statements. Years ago, the statutory blanks basically were not audited by an independent firm.

The third reaction has been to add cash-flow testing and asset attestation. This is a less important issue for health insurance companies, because most of our liabilities are on such a short-duration basis. Occasionally, however, we see an organization where cash-flow testing is a real issue. The fourth reaction, the topic of our discussion, is adding emphasis to risk-based capital, including the model bill on risk-based capital.

I have a few analogies as to why risk-based capital is needed. One is an investment analogy. Let's say you have an investment of \$10,000. At the end of the investing time period, you have a 75% chance that you're going to get a 100% return on the

## RISK-BASED CAPITAL

investment and a 25% chance that you'll lose your entire investment. Part of the investment vehicle requires that you have to keep reinvesting \$10,000 at the successive time periods. If you scrape up your \$10,000, put all your assets together, and invest it all, you have approximately a probability of one-third of losing your entire investment. This failure rate would probably be unacceptable for any entity in a financial services industry. But, if instead of just putting together \$10,000, you're able to acquire \$50,000 of capital and then invest the \$10,000 at a time, your probability of ruin goes down to below 3 in 100, due to your initial capital level. If you're even more adept at raising capital and acquire \$100,000, your probability of ruin decreases to below 1 in 500,000. You have the same investment, but your probability of ruin varies quite a bit just because of the initial capital level.

The second analogy is that when I was in college, I had a friend who liked to play pool for money. He was a much better pool player than I was. He kept harping on me to go play pool with him. I had always put him off until one Saturday afternoon when we were sitting around and didn't really have anything to do. I didn't have any reason to get out of it and told him we'd play pool, but there were going to be three basic ground rules. The first ground rule was that the winner had to buy the beer and pay for the pool. The second ground rule was that the loser could always play for double or nothing. The third ground rule was that there would be no settling up until the end of the night. The third ground rule was very important, because it gave me an unlimited capital supply.

We headed down to the bar and played pool. After four games, he had won \$80 and was feeling fairly good about the whole situation. After ten games, when he was up by \$5,120, he was getting really excited about the winnings, but he was a little bit concerned about my ability to pay. After 15 games, he was up by \$163,840. I think he began to figure out what was happening. After the 19th game, when we were playing for \$1,310,720, he had run out of money from paying for the beer and the previous pool games. He sank two balls on the break, hit in the eight ball, and lost the game. I happily paid for the glass of beer and that game of pool, and we called it a night.

The two situations demonstrate a relatively important concept. In one situation, you had almost a guaranteed probability of success in terms of your investment, with a 75% probability of significant return. But, if you didn't have enough capital, you had a one-third chance of total failure. In the other situation, there was realistically no probability of success, but given the ground rules, which gave you unlimited capital, there was basically a zero probability of ruin.

Next we want to discuss the NAIC life and health risk-based capital model act. It has two basic components. First, it defines the formula for calculating risk-based capital. Second, it delineates points of regulatory interaction. It basically has four different events. A plan-level event happens at 100% of risk-based capital, requiring the company to submit its plans to the regulators. This is the first level of regulatory oversight. The second level, an action-level event, occurs if the capital falls below 75% of risk-based capital. At that point, the company not only has to submit a plan, but also has to take corrective action as specified by the state. The third level is an authorized-control-level event. If the company's capital drops below 50% of the formula, the regulatory body has the authority to take control of the company.

Finally, if the risk capital drops below 35% of the risk-based capital, a mandatory-control-level event, the regulator is essentially required to take control. The authorized control level gives the regulators a period in which they can use some judgment as to whether to take control.

Currently the life and health risk-based capital model law is deemed completed by the NAIC. Four states, as of the last update that I have, have either adopted or have pending legislation on the model bill. Other states are expected to adopt it, especially if it becomes part of the accreditation requirement for the different state regulatory entities.

A drafting note to the model bill that is of particular interest to health insurers essentially says that the committee did not express an opinion or did not look at whether the capital formula was applicable to organizations, including HMOs, dental service organizations, health service organizations, and Blue Cross/Blue Shield plans. Furthermore, the drafting note says that the states may wish to consider the application of the act to these entities. The model bill is nonspecific, but yet recognizes that there may be some need to do something.

On the property/casualty side, the NAIC is also looking at a risk-based capital formula. It expects to release its initial formula in June 1993 for public exposure. The working group has indicated that Blue plans that are licensed as property/casualty companies will not necessarily be subject to the model bill for a property/casualty company.

MR. KARL MADRECKI: Blue Cross Blue Shield plans are licensees of the Blue Cross and Blue Shield Association, which is an association of independent Blue Cross and Blue Shield plans. I will not be speaking from the perspective of any one specific plan.

I will be commenting on risk-based capital generally and will then focus on medical insurance risk components. I believe the considerations apply to commercial insurers, Blue Cross and Blue Shield plans, other hospital and medical service corporations, HMOs, and all other risk-takers, including self-insured entities and providers that are guaranteeing benefits.

Anyone guaranteeing or promising benefits should have the financial wherewithal to absorb deviations from expected. Insurers are required to manage the risks and to retain and manage appropriate surplus for contingency reserves.

Considerable effort has been directed at identifying insurers in jeopardy and in sufficient time to take corrective action. For insurance regulators and other interested parties, the effort has involved identification of a potential problem, gaining access to the company and to information, and then having an ability to do something about the situation.

#### **RISK-BASED CAPITAL**

A new addition to the jeopardy identification and intervention arsenal of the regulator is risk-based capital. I will reference the NAIC life risk-based capital model standards, because they are much further along at the present time. Even though Blue Cross and Blue Shield plans are presumably excluded, one has to admit that the NAIC does

## RISK-BASED CAPITAL

form the standard against which everything is being judged right now. It will be very difficult to deviate from the work that's been done.

As Darrell mentioned, under the currently adopted NAIC formula and model, at 100% of capital or at 125% with the downward trend, you have to submit a remedial-action plan. A remedial-action plan includes identifying reasons and conditions, proposing corrective actions, providing a five-year financial projection, identifying key assumptions and their sensitivities, and identifying both the qualities and problems with the business. This is no simple task.

If risk-based capital continues to decline or the regulator rejects the plan, the initiatives required shift between the company and the regulator, obviously, with increased intensity.

At the regulatory-action level, 75% of risk-based capital, the company is required to submit to examination and/or analysis and submit another action plan. The commissioner may issue an order of corrective action. For Executive Life, this might have been limited exposure to junk bonds. It could mean ceasing to write new business.

By the time you get to the 35% level in the current model, the commissioner shall place the company under regulatory control. Now in development of all this, it was recognized that this would require a number of statutory changes. Clearly the risk-based capital model affords regulatory agencies a significant monitoring and intervention tool that they didn't have before. The ultimate application is also to quantify or define minimum statutory reserve requirements.

### APPROPRIATE SURPLUS

Risk-based capital, although a useful monitoring tool, is not designed to establish an appropriate level of surplus. If risk-based capital is too high, then a regulator could unnecessarily become too involved in a company's business. If risk-based capital is too low, then someone might view risk-based capital as being indicative of some appropriate level of surplus, when in fact, it has deficiencies for this purpose.

For the sake of illustration, let's assume that an appropriate surplus level might be something like 175-200% of risk-based capital. I don't want to suggest that setting appropriate surplus for your company is as simple as factoring up the risk-based capital. Obviously, subject to regulatory concerns, appropriate capital is management's prerogative incorporating a number of considerations. I'm going to use the words *appropriate capital*, *target capital* or *optimum capital* somewhat interchangeably here to distinguish them from risk-based capital, which is a monitoring threshold, and try to set these two items in perspective relative to each other.

One of the considerations in setting appropriate capital in a company would be a consideration if your insured risks are subject to down cycles. If they are, then more surplus is needed going into a down cycle than going up. The excess of appropriate surplus over risk-based capital provides a margin before attracting regulatory attention. Management's calculation of appropriate surplus may involve determination of where the insurer is in its risk cycle and a target level of capital, as well; something you want to get back to.

## RECORD, VOLUME 19

Just for a moment I want to contrast this with property and casualty insurance, which has a predominance of catastrophes. It is also subject to underwriting cycles as we know them in the medical business. So it has a double problem when addressing capital requirements.

From another perspective, the risk-based capital calculation is limited to financial information that is readily available and reasonably simple to obtain. The obvious choice is the blank. Appropriate and target surplus will be based on additional factors. A company will develop its target capital based (1) on its knowledge or feeling about the conservatism in its assets, or in its asset valuation and its liability valuation; (2) in its methods of accounting or the way it applies accounting; (3) on its assessment of its insured financial arrangements; (4) on its reinsurance strategies; and (5) on its rating bases. Medical insurers will also specifically consider the provider arrangements and the rating margins.

We all can imagine two companies with similar surplus ratios, where one company would be our preference because of our suspicion or trust in it. That company is always so conservative, has reserved for everything, etc. Overall, "surplus," as we know it, is not apparent from the balance sheet. In any event, what management chooses to incorporate in developing its target appropriate level of capital is at their discretion. Risk-based capital was not intended to incorporate development needs that management may feel is necessary for future direction.

Appropriate capital should not be a function of profit levels available in the marketplace or are otherwise restricted to satisfy desired returns on equity, unless the company can bring the risks in line with the supportable or allowable levels of surplus.

Let's take some examples from medical. If this business has a 10% premium growth trend, and 20% of premium is considered an appropriate surplus, then a company starting with 20% surplus needs to realize an overall gain equivalent to 1.8% of premium from the underwriting gains and from all investment sources, simply to maintain the relative surplus level. Greater overall gains are needed following a depletion of surplus to get back to the target.

With the same 10% growth trend, if profit retained is limited somehow to 1%, then at most, an 11% surplus-to-premium ratio can be sustained. This does not mean 11% is the right number. The insurer must then alter its risk arrangement to where the 11% surplus is appropriate.

As another example, let's suppose that we can factor the insurance risk factors, the C-2 risk factor for medical, by a factor of 2 and say that that's appropriate surplus. For group medical, the C-2 insurance risk factor is 15% of the first \$50 million of premium and 7% of the excess premium, if appropriate. Targeted capital on a doubling-up basis would be 14-30% of the total premium.

Now consider the financial arrangements being converted to a minimum-premium-stop-loss-type coverage. Let's suppose that the minimum-premium-stop-loss is 20% of the original premium. Then risk-based capital becomes 25% of 20% or 4% of the original premium equivalent. If appropriate capital is taken to be two times this, we have 8%. Obviously, this is easier to maintain in terms of the overall profit needed

## RISK-BASED CAPITAL

and certainly could enhance return-on-equity levels. To be appropriate, the insurer is assumed to have altered the risk-attachment point in that repackaging process.

Actually, for the diversified life companies that were targeted in life risk-based capital development, I believe that the majority of group medical business was already converted to minimum premium and stop-loss coverages and that the risk factors were not set to discourage a fully insured product over a stop-loss product. The risk factor differences could, however, affect the carrier that was proportionately more fully insured in its portfolio.

### **PREDOMINANTLY MONOLINE HEALTH CARRIERS**

Developing life risk-based capital was a major effort for the NAIC task force and for its industry advisory group. The focus was on life risks and testing on diversified life companies. Refinements in the accident and health insurance risk factors will not produce a material percentage change in the risk-based capital levels for these companies, because the asset and interest rate risks are paramount there.

For a predominantly monoline health carrier, however, the C-2 insurance risk factor becomes paramount, approximating 70% of risk-based capital. Under these circumstances, you would expect a reasonable relationship between the risk-based capital C-2 factors and "appropriate surplus." This relationship should not be too high or too low, but a balance. These are things that we've been working on at the Association in looking at these relationships.

The plans, as I've already noted, are licensees of the Blue Cross and Blue Shield Association. There are membership capital requirements that the Association applies, based on internally developed risk mix-adjusted capital formulas. These requirements are used in the licensing process and are not intended to dictate to plans how they should run their business. As we have evolved with that particular formula, we have noted a number of observations and some differences between our experiences and what we see in the risk-based capital formula.

It's been our observation that the premium volume levels in the fully insured group and individual medical insurance risk factors are not that distinguishable. The individual formula for risk-based capital is 25% of the first \$25 million and 15% of the excess. Group is 15% of the first \$50 million and 7% of the excess. This lack of distinction may be possibly due to the length of time plans have been in business or their focused attention being monoline companies.

In several areas, plan individual and group business has not displayed the difference between the individual and group C-2 risk factors. So relatively speaking, both the volume adjustments and the differences between individual and group have not been that apparent. The risk differences we have perceived have much to do with the ability to incur and notice a change in trends and experience and the ability to alter rates and implement rate changes.

We apply a number of risk-transfer overlays. For group business, we segregate fully insured business, based on the degree of risk assumed by the group. At one end of the spectrum is cost plus business, where the claim risk is minimized. At the other

end is fully insured. In the middle has been the pronounced tendency, as groups get larger, to transfer the risk to the group by using 115% or 120% attachment points.

We also utilize a managed-care overlay, which operates to reduce the insurance risk. This is another risk-transfer overlay that goes along with transferring the risk or sharing the risk with the providers. The spectrum ranges in increments between fee for service to global budgeting. This overlay enables us to apply our formula and to evaluate HMOs in the same vein as insurers.

The C-3 interest risk structure does not seem applicable to our business. This is more a matter of appropriateness in the structure of our balance sheet than in magnitude.

### HEALTH REFORM

As we go forward for health insurers, we're looking at a number of undefined risks on the horizon in the way of health reform. In the initial stages of reform, we already see pressure to minimize rates and prices to offer the lowest-cost health care to the maximum number of people. This will be done to encourage companies to provide effective management and also to utilize funding limitations to prevent providers from seeking additional reimbursement. In this process, solvency of whoever is guaranteeing the benefits is assumed, but not addressed at this point.

The word *competition* is used often in reform. Without knowing where health care delivery financing will go, the more capital you have initially, the more you can price aggressively in the current market. You can afford to take more risks. Competitive pricing increases the risk of adverse deviation. Even if losses don't develop, relative profit reductions could evolve. With lower profits, and given the relationship between profit and supportable surplus, you would only be able to support lower relative levels of surplus than you originally started with. We all recognize that reform risks are not the same as the underwriting cycle risk, and we are exploring new dimensions as we go forward.

MR. KNAPP: First, I ought to give you an overview on Associated Insurance Companies, Inc., because it's a unique corporate structure. It's a conglomeration of companies whose parent is licensed as a property and casualty company. It includes the Blue Cross/Blue Shield of Indiana plan and significant other participants in the health insurance market through a number of Anthem companies, including Anthem of Indiana, Anthem of Texas, and Anthem of California.

This multiple-company approach provides several unique challenges regarding risk-based capital. One of which is whether you look at adequate capital and surplus at each of the subsidiary companies or whether you roll it all up into the parent. In addition, a number of the Anthem Companies have subsidiary HMOs.

Broadly, AICI had two main comments about the NAIC risk-based formula. First, it's a static model that's applied to all companies. It prefers a method of developing surplus factors by performing an annual or semiannual study, starting from the current block of business and projecting forward over a reasonably foreseeable future, such as 20 years. Then a range of scenarios would be developed with lapses, new business, morbidity, defaults, etc., all being tested at various levels. Surplus factors would be developed that meet the required confidence intervals for solvency as a



## RISK-BASED CAPITAL

result of these tests. Although that's a great idea, it's not really practical, because AICI, or very few other health insurers, have the resources or ability to perform that sort of analysis on a regular basis to the satisfaction of a number of different state insurance regulators that may be interested in the organization.

The second general comment is a recognition that the formula develops a minimum surplus level, not necessarily an appropriate surplus level. We as actuaries need to make sure that in our own corporate boardrooms, as well as externally to the public, we are able to explain the difference between those two. In addition, we need to continue to emphasize that spending surplus down to the NAIC level will indeed endanger both that company's future and the future of the industry in total. If we all spend down to 100%, we probably will be inadequately capitalized.

AICI had a few more specifics with regard to C-1 risk, the risk of asset depreciation. It conceded that the NAIC formula generally did a somewhat good job, but felt the factor for nonaffiliated common stock may be a little bit low. This did not seem to be a big concern.

With respect to C-3 risk, the risk of disintermediation due to changing interest rates, the risk-based capital formula prescribed by the NAIC focuses on annuities and deposit funds, which is a moot point for most health insurers. The formula does not reflect the fact that the risk of yield loss increases with bond duration. I'm not exactly sure whether I would put this C-3 risk element into C-3 as a risk of the disintermediation due to interest rate changes or as a C-1 risk. It's a risk associated with asset depreciation: if you have a longer duration bond, you have a greater risk of asset depreciation that isn't reflected in the NAIC formula.

Also with regard to C-3, the NAIC formula has not fully recognized the risk associated with CMOs. Depending on the CMO structure, a large risk of yield and even principal loss can exist. The NAIC is said to assume that the asset-adequacy opinion in the statutory or actuarial certification addresses these areas. They're appropriately included, however, when evaluating surplus. The asset-adequacy testing covers reasonably adverse deviations, but not the level of deviation that should be contemplated under a target surplus formula. Also, in the case of the company's qualifying for a Section-7 exemption, due to size or some other status, the bond duration and collateralized mortgage obligation (CMO) risks are never addressed at all in the basic actuarial opinion.

With respect to the C-4 risk, the general business risk, the formula for health insurance carriers is limited to some small charge to recognize guarantee fund assessments. For AICI, there is a significant expense risk in dealing with the group insurance business, especially as more and more plans are self-funded. In AICI's formula, it carries three months of administrative expenses plus any known pricing shortfalls from its administrative loads that aren't covered by premiums that are charged. It also thinks there ought to be an additional 1% of liabilities to cover anything that's unknown in the liability column.

The real driver for health insurers is the C-2 risk, the risk of pricing or reserve inadequacies. It is very important to have a distinction based on rate approval requirements. The NAIC formula essentially has a set level for individual and a set

level for group, but it doesn't recognize whether you're in a state that requires pre-approval of rates or a file and use state, or a state where you don't even have to file. This is a fairly significant distinction. AICI thought an appropriate number was 25% for all individual business, including Medicare supplement. Medicare supplement under the NAIC formula uses a lower rate. It felt that Medicare supplement was justified due to the piggyback nature of the risk, especially considering that the government and the political process is the primary driver. In addition, Medicare supplement rate increases often are developed well before the Medicare updates are actually known, requiring some projection as to what Medicare may do. Furthermore, Medigap legislation significantly increased the risk by limiting the use of insurance tools that could previously have been used to limit the risk, such as variable rating, underwriting, and plan design.

In both the individual and the group elements in the NAIC formula, there is a volume reduction in the risk-based capital formula. For AICI, which has very intense geographic concentrations in some areas, the volume perhaps increases some risk instead. It raises public attention to any rate actions. This public attention often causes either delays or softening of that required rate action.

It's important to have a distinction among various coverages. The NAIC formula combines all group insurance together, and the AICI formula has split group into with and without reform, has split out the fully insured piece, and has split out the experience-rated portion. The reason for having a higher factor for experience rated is that you have more limited profit opportunity due to the competitive nature of the product. Refund liabilities held for the employers should be offset only on an employer-specific basis, instead of offset in aggregate. Often you will have an employer that will have more refund liability than the required risk for that case based on the premium. That should not result in a negative risk-based capital, because you actually owe the employer that money, and you don't have the opportunity to collect it and apply it to losses from other groups.

A factor for cost plus and ASO reflects both the credit risk that occurs on those products as well as some expense risk. The stop-loss factor that AICI uses is analogous to the factor used in the NAIC formula.

MR. JAMES N. ROBERTS: We're going to continue the discussion in the same vein, focusing on the HMO, an animal that is regulated somewhat differently than either health service corporations, Blue Cross/Blue Shield plans, or commercial life and health insurance companies, even though the nature of the products may or may not be similar. This adds an additional dimension to the problem, without a consistent regulatory environment to apply it in. It presents some unique challenges.

The uses for risk-based capital are really comparable throughout the health insurance industry. We will mention these and then look at them more specifically from the HMO's point of view. Regulatory monitoring is the obvious main use. What should regulators do, and what should they be looking at to determine if the capital level is sufficient? Within an organization, other uses can also be very important and very useful. One is to allocate scarce resources within an organization between different products and enterprises. If there's an analytic process that management has in place to determine how much capital should be available for a given type of business, then

## RISK-BASED CAPITAL

that framework can be used to make decisions on allocating capital or allocating other resources within the organization. A third use would be to measure the results once the capital had been allocated to a given segment of the business. A given benchmark return on that capital can be used in monitoring the success of that enterprise or that piece of the business. The fourth area is more of a pricing exercise. If a given level of capital has been identified, an appropriate level of return falls out. Together with a presumed growth rate, one can determine what the profit or the net income should be for a given product. Another use is, with the reform activities going on at the federal level, to develop solvency standards of Accountable Health Plans. The task groups that are working on this have recognized that this is a need and there are really minimal tools available. This is another potential area for application of risk-based capital.

In examining how much capital is required, we've looked at the NAIC formula. Karl presented some thoughts from the Association's point of view in setting some standards for Blue Cross and Blue Shield plans, and I would like to look at the same basic problem within the HMO industry. The framework for doing the analysis is really to identify the components of risk. What are the risk drivers? For purposes of this discussion, I'm defining risk as variability. What are the things that can produce variation in financial results from those that were anticipated?

There is an inventory of risk drivers. Clearly the type of assets is one of them. That's been fairly well developed at this point, since the NAIC has basically been responsive to situations that have occurred, and asset problems have been the single most visible problem area in the industry.

The types of coverages that are in place also is one of the variables. The types of coverages include the types of funding arrangements discussed earlier.

Our third risk driver, the benefits that are covered, refers to the specific categories of medical services that are covered. Some are more variable than others, and some are more predictable than others. This can affect the amount of capital required.

Fourth, and this is a dimension that applies more to HMOs than to other types of health insurers, is how providers are compensated for delivering care. The fundamental difference between an HMO and another type of health insurer is the nature of the promise that it makes to its customer. For a typical health insurer, the promise is that the participant will be indemnified against the costs of an illness or an accident. The HMO promise is a little different. It's actually a promise of delivery of care as opposed to indemnification against cost. This can be fulfilled in many ways, and that's why the provider contract is an important variant for an HMO. Even though HMOs may be regulated under a special set of statutes and requirements, an HMO may look exactly like an insurance company; it may pay for care on some kind of a fee-for-service or service-by-service basis. Alternatively, it may capitate almost the entire delivery system. About everything in between exists in the current marketplace. The nature of the arrangement very much affects the level of capital required.

The next driver is the type, amount, and level of reinsurance that's being used. An excess-loss reinsurance policy will have significantly different risk considerations than a quota-share policy.

Additional drivers include:

- The competitive environment: Who are the competitors and how do you need to respond to competitive pressure?
- The regulatory environment: What is it like, especially the need to obtain rate approval?
- The management information systems: If something happens to your block of business, how long does it take to find out about it, understand the cause, and take the appropriate actions?
- The quality of management and operations: Is the management team in place looking at the business, watching the right things, making the right responses, understanding enough to be able to identify early signs of problems?
- The breadth of the customer base: Is it all one type of customer (for example, all very large employers from which you get 5% of the population in one small geographical area)? Do you have a mix of group size, different levels of participation and a geographical mix?
- The distribution system: How well controlled is it? Are you selling through a wholly-owned internalized sales force that has no other product to sell, and in which the level of communication and understanding of your products is very high? Or are you using a broad array of brokers, with either minimal experience or inadequate training?
- The basic approach to pricing and underwriting: If all your expenses are capitated, you've defined the cost of your raw materials in advance and then set the price on that basis or, alternatively, you're using utilization and cost history with a trend assumption on either a group-by-group basis or a pooled basis.
- The administrative expense structure: To what extent are your costs fixed so you can rapidly expand or contract expenses in conjunction with your business in force?
- The reserving methods used in setting the liabilities: How accurate or conservative are they?
- Other internal and external factors.

Within a given organization, the things that will affect the risk undertaken can be quite varied and complex. The big question is how to deal with all the variables and complexity.

The AICI model that had factors for different types of business is a formula approach that can be applied consistently. As previously mentioned, a more dynamic approach would be appropriate, if feasible. Those are the two components to the templates for setting a risk-based capital level for a given organization. First of all, set a formula that seems reasonable after going through all the drivers of risk. Second, test it among all kinds of economic and business scenarios to see how well it responds to variations.

Within the HMO industry, the regulatory environment is extremely varied, much more so than with other types of insurers. The amount of capital that is required by statute to establish an HMO in a specific state is usually fairly small. It's usually a fixed amount. The application of a risk-based capital standard has not been applied by regulators yet in the HMO industry. The initial capital can be as low as \$50,000.

## RISK-BASED CAPITAL

There aren't statutory tools to require a larger amount. The amount often stays the same, even if the HMO gets very large. That's one problem area.

The regulation within the life and health insurance industry has been relatively consistent, and many resources have been dedicated to risk-based capital through the NAIC and its ability to draw on technical resources from the insurance industry. The thought process has been relatively refined and sophisticated. For Blue Cross and Blue Shield plans, the Association has been able to devote and call on resources so there's been the ability to apply a high level of technical thinking to the process. It is different in the HMO industry. There is an organization similar to the NAIC, the National Association of HMO Regulators (NAHMOR). NAHMOR does not have the same high level of internal staff available as the NAIC. It's primarily an association of volunteers from regulatory agencies, and their backgrounds are very mixed, including insurance and more general health-care regulators. That presents a potential regulatory problem or at least a unique feature of the HMO industry.

The Federal HMO Act from the early 1970s did develop certain specific standards relating to reinsurance and capital. NAHMOR has taken the position that a federal statute is all that's needed to regulate the capital needs for the HMO industry. As actuaries, we might challenge that conclusion, but that's the current environment in the HMO regulatory area.

To illustrate how the template of setting risk-based capital might be constructed, the very simple example in Tables 1 and 2 looks at two different HMOs. We developed a very simple two-year projection for HMO A and HMO B. HMO A has all physician fees capitated, and HMO B pays for all physician fees based on a preagreed upon discount from charges. We'll assume that the HMO reimbursement structure for other types of providers is the same and that physician fees represent 50% of the total medical expense. The scenario that is illustrated in this example is that physician fees suddenly go up by 20%. That is a somewhat realistic scenario, construed by hypothesizing that under the current federal budget situation, physician fee reimbursements from Medicare are reduced very significantly, and there is a lot of cost shifting. Physicians respond by raising their customary charges by 20% immediately.

For HMO A, cost increases won't show up immediately in the expense, because the physician fees are fully capitated. They only have to review those on an annual basis. For HMO B, where fee for service is being used, expense goes up in March 1993, but the management does not recognize that immediately. It takes them several months, and then they develop a plan of action. HMO A recognizes the increase three to four months after it has happened in the marketplace, because physicians are all complaining about the capitation level. They claim that they can't survive on that level of payment, but they really can't do anything about it until the contract comes up for renewal on January 1. HMO A has decided to increase its capitations by the 20% level to get them back to a competitive reimbursement level, but it is making it effective January 1994. It knows about it in advance and it can plan for it. It can also plan how it is going to react with its customers in terms of pricing. In this scenario, the decision was that it was going to need a 10% increase in rates, because 50% of its costs had gone up by 20%. It can start phasing it in whenever it wants. HMO A has made the decision to do it in two bites. It decided to put in a 5% rate increase beginning in September 1993 and then 5% for each of the other

RECORD, VOLUME 19

TABLE 1  
HMO A  
Primarily Capitated Arrangements with Providers  
(000's)

Service Month	Jan-93	Feb-93	Mar-93	Apr-93	May-93	Jun-93
Premium	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Benefits:						
Hospital, Physician, Out of Area, Ambulatory	8,500	8,500	8,500	8,500	8,500	8,500
Administrative Expenses	1,300	1,300	1,300	1,300	1,300	1,300
(Assume 13%)	200	200	200	200	200	200
Net Profit/Loss						
Service Month	Jan-94	Feb-94	Mar-94	Apr-94	May-94	Jun-94
Premium	\$10,325	\$10,350	\$10,375	\$10,400	\$10,425	\$10,450
Benefits:						
Hospital, Physician, Out of Area, Ambulatory	9,350	9,350	9,350	9,350	9,350	9,350
Administrative Expenses	1,342	1,346	1,349	1,352	1,355	1,359
(Assume 13%)	(367)	(346)	(324)	(302)	(280)	(259)
Net Profit/Loss						

Service Month	Jul-93	Aug-93	Sep-93	Oct-93	Nov-93	Dec-93	Total-93
Premium	\$10,000	\$10,000	\$10,025	\$10,050	\$10,075	\$10,100	\$120,250
Benefits:							
Hospital, Physician, Out of Area, Ambulatory	8,500	8,500	8,500	8,500	8,500	8,500	102,000
Administrative Expenses	1,300	1,300	1,303	1,307	1,310	1,313	15,633
(Assume 13%)	200	200	222	244	265	287	2,618
Net Profit/Loss							
Service Month	Jul-94	Aug-94	Sep-94	Oct-94	Nov-94	Dec-94	Total-94
Premium	\$10,475	\$10,500	\$10,526	\$10,553	\$10,579	\$10,605	\$125,563
Benefits:							
Hospital, Physician, Out of Area, Ambulatory	9,350	9,350	9,350	9,350	9,350	9,350	112,200
Administrative Expenses	1,362	1,365	1,368	1,372	1,375	1,379	16,323
(Assume 13%)	(237)	(215)	(192)	(169)	(146)	(124)	(2,961)
Net Profit/Loss							

## RISK-BASED CAPITAL

**TABLE 2**  
**HMO B**  
**Primarily Fee-For-Service with Withholds**  
**(000s)**

Service Month	Jan-93	Feb-93	Mar-93	Apr-93	May-93	Jun-93
Premium	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Benefits: Hospital, Physician, Out of Area, Ambulatory	8,500	8,500	9,350	9,350	9,350	9,350
Administrative Expenses (Assume 13%)	1,300	1,300	1,300	1,300	1,300	1,300
Net Profit/Loss	200	200	(650)	(650)	(650)	(650)
Service Month	Jan-94	Feb-94	Mar-94	Apr-94	May-94	Jun-94
Premium	\$10,675	\$10,725	\$10,775	\$10,825	\$10,875	\$10,925
Benefits: Hospital, Physician, Out of Area, Ambulatory	9,350	9,350	9,350	9,350	9,350	9,350
Administrative Expenses (Assume 13%)	1,388	1,394	1,401	1,407	1,414	1,420
Net Profit/Loss	(63)	(19)	24	68	111	155

Service Month	Jul-93	Aug-93	Sep-93	Oct-93	Nov-93	Dec-93	Total-93
Premium	\$10,025	\$10,050	\$10,075	\$10,125	\$10,175	\$10,225	\$120,675
Benefits: Hospital, Physician, Out of Area, Ambulatory	9,350	9,350	9,350	9,350	9,350	9,350	110,500
Administrative Expenses (Assume 13%)	1,303	1,307	1,310	1,316	1,323	1,329	15,688
Net Profit/Loss	(628)	(607)	(585)	(541)	(498)	(454)	(5,513)
Service Month	Jul-94	Aug-94	Sep-94	Oct-94	Nov-94	Dec-94	Total-94
Premium	\$10,951	\$10,978	\$11,004	\$11,004	\$11,004	\$11,000	\$130,740
Benefits: Hospital, Physician, Out of Area, Ambulatory	9,350	9,350	9,350	9,350	9,350	9,350	112,200
Administrative Expenses (Assume 13%)	1,424	1,427	1,430	1,430	1,430	1,430	16,996
Net Profit/Loss	178	200	223	223	223	220	1,544

RECORD, VOLUME 19

months. The model assumes 45% of the business renews January 1. In year 1, it makes a little bit more than its planned profit level because it starts to build in the premium increases before it really needs them. After raising its capitation rates, the premium increases turn out to be inadequate on a short-term basis. In this illustration, it makes \$2.6 million in year 1 and loses \$2.9 million in year 2. The point in time where it needs maximum capital is where it starts losing money. If you measure the total amount of loss from the point where it starts losing money until it starts recovering, it needed \$3.3 million of capital.

HMO B observes the increase in costs suddenly in March 1993, because it pays 80% of customary charges. If customary charges go up, its expenses go up, too. It is locked into whatever charge level the physicians want to make. It takes them several months to identify the problem and respond. When they do respond, they do so somewhat tentatively at first. They implement a 5% premium increase in July, August, and September. Then as more and more data is observed, they get more and more convinced that the problem is bigger, and 10% increases are put in starting in October and then continuing until the whole block has been increased. Under that hypothesis, HMO B loses \$5.5 million in year 1, because expenses increase before it can get a chance to respond with its rates. It makes \$1.5 million in year 2. Over the two-year period, it loses about \$4 million, as opposed to only slightly worse than breaking even for HMO A. It has a consecutive loss of \$6 million as opposed to \$3.2 million. This illustrates that if you pay providers differently, you may have totally different capital needs.

Table 3 illustrates the point that was made earlier. Once you've set a given risk-based capital standard, your growth rate will show how much addition to that surplus you need each year to maintain that level.

TABLE 3  
Examples 1 and 2

Example 1	Year 1	Year 2
Members	20,000	20,000
Premium per Member per Month	\$100	\$115
Total Premium	\$24,000,000	\$27,600,000
RBC	\$2,400,000	\$2,760,000
Company needs to earn 1.5% of premium to maintain adequate surplus level.		
Example 2	Year 1	Year 2
Members	20,000	30,000
Premium per Member per Month	\$100	\$115
Total Premium	\$24,000,000	\$41,400,000
RBC	\$2,400,000	\$4,140,000
Company needs to earn 7.25% of premium (\$1,740,000) to maintain adequate surplus level or find another source of capital.		



## RISK-BASED CAPITAL

The first example shows that if membership stays flat, 20,000 members in year 1, 20,000 members in year 2, and there's an increase in premium because the medical expense per member per month goes up by 15%, the company would really need to earn 1.5% of premium to maintain its level of capital. In the second example, membership increases by 50%, from 20,000 to 30,000 members, with the same 15% trend rate. The company, to maintain the same level of surplus, 10% of premium, would need to earn 7.25% of premium. This phenomenon, illustrated here for the HMO industry, really applies throughout.

MR. THOMAS D. SNOOK: Maybe we should think about the appropriateness of using percentage-of-premium measures for risk-based capital. We've always used premium as a measure of how much business is in force, but it raises a problem because of medical cost inflation and premium inflation. The scenarios you showed were growth scenarios; the number of members grew as did the per-member, per-month numbers. But you can construct the scenario where you have a stable block of business in force, your premium is only growing for inflation, you're making money, and you still have declining risk-based capital ratios. If you project that out over a period of time, you can find where, although right now you think you're in good shape, you could be in trouble in the future. Combine that with things like the underwriting cycle, and you could have a position where you can be in trouble fairly quick.

MR. KNAPP: The NAIC has come a long way from the state of the art in industry ten years ago, which would have been to define your total risk-requirement needs in terms of a percentage of premium, ignoring all of the other features, such as types of assets. This was also the way the Blue Cross and Blue Shield Association was trying to look at plans a period of time ago. I'm not sure how we handle the risk as medical inflation increases. The question seems to be that if you're paying more for medical services, have your risks gone up? In many situations, your risk has gone up somewhat in conjunction with your premiums.

MR. SNOOK: All the dollars suddenly got bigger.

MR. MADRECKI: Maybe from a couple of different perspectives. The first issue is that of proportionate deviation. With managed care, can we lower the proportionate percentage of deviation, which would translate into smaller relative surplus needs? There are also questions as to whether some of the misses that have occurred in the past will repeat themselves in the future. That remains to be seen. I also understand that in some circles in risk-based capital, there are theories that the amount of new business that you have is a different way of measuring your risk, hypothesizing that new business is riskier than old business. That one will be debated for some time.

