
2002 Valuation Actuary Symposium
September 19–20, 2002
Lake Buena Vista, Florida

Session 43PD
Risk-Based Capital

Panelists: James F. Reiskytl
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Summary: This panel discussion provides an overview of the current risk-based-capital (RBC) requirements for life insurers, as well as insight into topical issues and potential changes to RBC. Topics include recent changes to risk-based capital (RBC), proposed changes to the RBC, and the role of stochastic testing, reinsurance and off shore solutions.

MR. ALASTAIR G. LONGLEY-COOK: We are not going to spend time on all existing formulas. We assume that you can look that up. We are not going to cover the liquidity-risk issue either.

I am a former Aetna corporate actuary, currently with Tillinghast-Towers Perrin, where I focus on enterprise-risk management and capital-management issues. I also chair the Academy's Life Capital Adequacy subcommittee, which makes recommendations to the NAIC Task Force on Risk-Based Capital Standards. We are currently working on the topic that we are going to be talking about, which is the proposed standard for variable products with guarantees.

Jim Reiskytl will present the other changes that have been put into place recently, particularly with regard to codification on some of the deferred tax asset (DTA) and deferred tax liability (DTL) issues. He is currently vice president of Tax and Financial Planning at Northwestern

Mutual. Many of us know him for his tireless work for the Academy and the Society on many committees, and most particularly his involvement on the aforementioned risk-based capital committees. He is also chair of the Academy's Solvency and Risk Management Task Force.

James Dallas is a senior consultant for Tillinghast-Towers Perrin. He was formerly a senior vice president with Reinsurance Group of America (RGA), where he specialized in development of capital-motivated reinsurance transactions. He is also vice chairperson of the reinsurance section of the Council and co-author of the RGA life-insurance products and finance textbook used in Society courses five and eight. So he is clearly a well-qualified expert to talk about the implications of these new RBC standards for reinsurance solutions.

MR. JAMES F. REISKYTL: I will highlight three changes that have occurred in risk-based capital. The first is C-3 interest-rate risk, which is known as Phase I. The second is common stock changes, and the third is deferred-tax recognition. Why am I doing this? To make you aware of it. Unfortunately, there are many errors being made in risk-based capital filings right now. People are just having difficulty filling out the RBC diskette. For example, one of the RBC questions is: "What are your five biggest common stock holdings?" Companies have all kinds of common stock, yet they were entering zeros for their top 5! I do not know if you, as actuaries, are involved with your RBC filings, but the reason we want to highlight this is that if you are not involved, you might want to at least find out what your people are doing. If we can improve the accuracy, we are going to have better results. Finally, I hope to give you a little understanding of what's going on behind these changes. Hopefully, as a result you will not miss them and simply fill it in like last year's version.

With that background, let's move to the changes: C-3 Phase I (or the first version of improving the measurement of interest-rate risk) has expanded cash-flow requirements for some companies. These requirements are built on what you are doing as valuation actuaries for interest-sensitive lines—annuities and single-premium life. We tried to do this in a practical way. We did not make everybody do it; we only wanted the companies that might be weakly capitalized do it. So there is a test to decide if you have to do this additional work. Fewer than 50 companies actually had to do the work in 2000 and 2001. There are a number of scenarios that they must run to determine their RBC required amount. Even if not required, you might find these tests valuable for your internal surplus needs.

This new risk-based capital requirement is actually based on the weighted average of a number of probability points. Not to be overlooked, interest-sensitive assets are also tested as part of this new refinement to the risk-based capital formula.

Three major changes were made in the area of common stock. We will keep the same pretax RBC factor of 30%, but adjust it for a weighted-average beta. Beta reflects the experience of your portfolio, weighted by each stock's fluctuations, relative to that of the S&P index. The resulting common stock factor has a minimum of 22.5% and a maximum of 45%, and is intended to give a better risk measure. The nonpublic common stocks use a beta of one. Beta is designed to measure the up-and-down movements of the market—things that you simply cannot diversify away that will occur. Hence, it seemed appropriate to adjust the common stock factor for beta. For those of you who work for life companies that have an asset valuation reserve, you are likely already calculating beta. The same definitions used for beta in the asset valuation reserve are now used for risk-based capital.

Now, we have taken care of the piece you cannot diversify. The next step is to improve the measure if you are not diversified by adding a common stock asset-concentration factor. Up to this point, the asset-concentration factor has excluded common stock. Now common stock is included, but in a separate factor. That's designed to pick up the risk that your company might have only one or two common stocks. Obviously, if you have only one or two, you do not have the benefit of diversification; hence, you should have a higher risk factor. We have increased the factor by 50%. Where did the 50% come from? Simply put, the general thinking is that about one-third of the variance in the common-stock values arise from general market movement, so the other two-thirds (or the square root of three, 1.7), is the risk you are trying to measure. Of course, we assume that you have at least two stocks or three stocks, so 50% seemed reasonable.

Another point is you have to do this concentration factor on a consolidated basis. So you look through investment subsidiaries or other insurance companies and combine the holdings into one measure. Do we include every common stock? No. We leave out mutual funds (they are already diversified, so there is no need to include them) and other investments like federal-home-loan bank stock, which has a very, very low risk.

What else have we done? We separated C-1 into two components. We used to have one C-1 component, but now we have two: C-1 common stock and C-1 other. So we now have two factors. Equation 1 shows what it looks like when you combine the terms. We have assumed an independence of the common-stock risk from both the interest-rate C-1 risk and the other C-1 risks. The remaining risks are measured as they were by the RBC formula. The C-1 common stock category includes affiliated common stock, Schedule BA partnerships and preferred stock of insurance affiliates. I am particularly pleased that this change brings the three RBC formulas—the life formula, the health formula, and the property-and-casualty formula—into greater consistency. So you no longer have to move your common stock to one of your other companies to get better RBC treatment.

$$\text{RBC} = C_o + (C-4)_a + \sqrt{\{(C-1)_o + (C-3)_a\}^2 + (C-1)_{cs}^2 + (C-2)^2 + \dots}$$

[Equation 1]

The topic of deferred taxes is the third area that I am going to briefly discuss. There are very significant changes made to recognize the deferred-tax effect on both total adjusted capital and risk-based capital. Remember, these are the two things that are compared to decide if you might be weakly capitalized company. So how did we change total adjusted capital? We now recognize deferred-tax assets and deferred-tax liabilities. I hope everybody understands what deferred-tax assets and liabilities are. Simply defined, you have a statutory accounting system, and you have a tax system. Take the difference, if any and multiply by 35%. If it is something that you will be able to deduct for taxes in the future, that is a deferred tax asset. If it is something that you would have to pay in the future, such as a common stock gain; it is a deferred-tax liability. Hence, you have deferred-tax assets and liabilities. All three RBC formulas recognize the DTAs and DTLs in total-adjusted capital.

You might ask, “Are they real, and can I pay bills with them?” That is one of the issues that is still being addressed at the RBC level. They reported on this at the last meeting. Of course, for RBC purposes, what you are looking for is not whether the asset is valuable, but how much do the recognized deferred tax amounts vary? I think we will find that it will not vary a lot, but school is not out yet on that one. It will be monitored and adjusted, if necessary.

Now, let us look at the other side of the equation. What about risk-based capital? We have separated all of the RBC components into either taxable income or taxable capital gains components. Why was that done? The regulators were trying to prepare for possible future changes. They said, “Let’s construct the formula in such a way that if tax rates change or capital-gains treatment changes, we can modify it without going back and reconstructing the whole formula.” So we developed a formula, and have broken it into taxable income pieces, capital gains pieces (even though, as you know at the moment, the tax rate for the two of them is the same) and then we apply an appropriate tax factor. So we have a pretax number, we multiply it by tax, subtract the tax and get an after-tax result. C-2, C-3 and C-4, which are the pricing risk, the interest-rate risk, and other contingency risk, were all taxable income items, and the C-1 asset default or credit forms were capital gains items.

What about C-1 fixed-income default risks? In the original developmental work, we reflected taxes, but obviously not deferred taxes. So we had to change the tax assumptions to recognize deferred taxes. The original work assumed that when you have a credit default loss, for example, on a fixed-income investment, that you would not recognize it for taxes for a year, and then you would recognize half of the loss. The process is very scientific—the correct answer is somewhere between zero and 100. We recognized half. That laid the basis for the next step—how to recognize deferred taxes. With deferred taxes, we now have 100% tax recognition right? No. If you are familiar with codification, you know they did not provide full recognition of deferred taxes. They set up a set of rules to determine how much will be recognized. The rules for recognition are as follows: tax deductions must be recognizable in the next year, or be able to be carried back against taxes actually paid during past three years and be consistent with the character of the taxes that were paid, etc. Due to these constraints, 30-40% of the deferred tax assets for the industry were not recognized in 2001. So being very actuarial and very scientific, we concluded that since 100% is right for full tax recognition, and we have assumed 50% recognition in the current RBC factors, we would split the difference and assume 75% recognition of taxes in the new factors. It was very carefully determined. We also eliminated the one-year delay in tax recognition. What’s amazing to me is the one-year delay had almost the same effect on the resulting factors as going from 50% to 75% assumed tax recognition. The impact of timing is very powerful. Timing is always important, but I did not realize that it was this important.

We assumed full tax recognition for equities. Why full recognition? Why 75% on fixed-income investments and 100% on equities? For real estate, we already had full recognition because book value accounting does not recognize unrealized gains—so this was not a change. As to common stock, presumably you would never invest in a common stock with about 1% dividends unless you had a very high expected return on the unrealized gain piece or the equity return. Hence, it is a little hard to imagine losses in the market on individual stocks in any one year that would exceed the aggregate unrealized gains of your total common stock portfolio. Hence 100% recognition of deferred taxes was assumed in the RBC common stock factor.

So we developed the new factors using the new tax assumptions. We used the new assumptions, but we did not change anything else. That is, we did not go back to try to redo the underlying fixed-income default experience assumptions. In the process, it was found that there were some areas in which improvements could be made and they were.

At times some people have questioned the continued value of the asset valuation reserve (AVR). One of the many compelling reasons to do so is our research shows that without an asset valuation reserve, or a similar process, the fixed-income C-1 RBC factors would double! Does that strike you as being logical or reasonable? I think so. Let me explain why. If you don't set the risk premium paid as part of the investment return on any investment aside to pay default claims when they occur, the RBC factors will be higher. For example, on a class-three bond, you are paid extra yield over that of Treasuries. The company does not pay extra yield because it likes you. It pays extra yield because it is a riskier company. There is a risk that they will not be able to pay. Under the GAAP accounting system, this extra money goes right through to the gain if there are no actual losses in that year since you do not set it aside in an AVR. Once in a while, you will get losses, and those may be greater or less than that year's risk premiums, so there is no regularity to GAAP results. It would be like selling term insurance and letting all the term premium go right through to the gain from operations each year unless you paid a claim. There are no reserves for future death claims. Obviously we do not do that. Yet without an AVR for fixed-income assets, this is exactly what is being done—it seems a bit unusual.

It seems very logical that if you have an asset valuation reserve or similar process for which you're setting this risk premium aside, year by year, when claims occur, you're going to be less "in the money" since you will have a reserve to pay part of the claim, and therefore the RBC factor will be lower, than if you don't have a process that sets money aside. Of course, that is what the AVR does.

No AVR doubles the RBC factors because no risk premiums have been set aside to help cover future default losses when they occur. The biggest RBC factor change is for high-yield investments. They have the same factor as equities. We used to call these investments junk, but that's a nasty adjective.

What about the other changes? C-2, C-3 and C-4 RBC components already have full tax recognition. So those factors did not change except for those of health insurance. The vast majority of weakly capitalized companies happen to be health companies or health enterprises. In many cases, they are also non-taxpayers, and hence, we use a zero-tax factor for the health risk benefits, except for disability insurance (DI) and long-term care which are usually sold by other insurers.

Since taxes reflect your own company's circumstances, how can this test work? RBC is a first stage test. The regulators were also given an additional tool—a sensitivity test. For this test, we run all the numbers pretax; for both total adjusted capital and risk-based capital. You really notice the impact of the different treatment of subsidiaries. As long as your company is above the regulatory control or action level with or without the sensitivity test, who will spend time reviewing what you are doing? As your company moves into that sensitive area, the regulator can actually deal with the tax specifics of your company—your tax-sharing agreements, your ability to have carrybacks, carry forwards, and all the details that you need to accurately assess your company's taxes. The results are known for the range of no tax to 75% recognized taxes. Hence, the regulators have a tool to assess each company differently, if they wish to do so, based on these two results.

MR. LONGLEY-COOK: Most valuation actuaries and appointed actuaries spend a lot of time on modeling, and evaluation of the company through asset-adequacy analysis and other means. Risk-based capital has been, up to now, fairly formulaic—and by formulaic I mean is you look up the factor based on what category of bond you have, and you put it in. Maybe you have never even filled out the regulatory form. Somebody in your company does it. Maybe you are aware of it and maybe it gets factored into some of your calculations, but you are not intimately involved in it. That is changing because the world is changing. What the NAIC realized some years ago was that if they're going to stay abreast of these changes—new products, new risks, new asset strategies—those look-it-up-in-the-table and plug-in-the-number approaches just aren't going to work. You are seeing the same kinds of initiatives and developments internationally. Canada just introduced capital requirements for their segregated funds, which are basically the variable annuities and GICs, as we know them, that require stochastic modeling and give credit for hedges, etc. If the actuary can prove that the company has an effective risk-management program and that they're doing it effectively, the effect of that hedging (up to 50%) is taken into account in the modeling.

Even though C-3 Phase II is still just a proposal, the anticipated effective date for this is December 2004, and the proposal was originally made a little over a year ago. It has been updated and the final proposal is expected to be made at the December 2002 NAIC meeting. If you are going to be ready to do this, you really ought to start now. So I am glad you are here. I hope that you also will take word back to your companies about what is happening here.

Tillinghast-Towers Perrin recently did a survey of CFOs on risk management and capital management. One of the questions was, "Are you aware of what's going on in RBC and some of the proposals around equity risks?" The vast majority of the CFOs were not aware. Of those who were aware, none had done any modeling. So clearly, you might want to take some of that awareness back to your own CFOs. So with that as introduction, let us talk about what C-3 Phase II is all about.

C-3 phase I, was introduced a couple of years ago for the first time. It is modeling of assets and liabilities on a company-specific basis, but they were deterministic scenarios. You run 50 (or 12

if you do not want to do 50). In fact, only about 48 companies ended up having to do it. There is discussion in the NAIC Life/Health Actuarial Task Force about removing that exemption so that all companies would have to do at least two scenarios. Surely you can do two and set the requirements based on that. The original work that went into the exemption rules assumed that the mismatch was one-eighth of a year. So the sensitivity test, which basically takes the impact and multiplies it by eight, was looking at whether you were mismatched one year. The question asked of the Academy recently was, “Is that an appropriate assumption?” Our answer was no. There may well be companies out there with serious mismatches, and that is not going to capture them. So that is being discussed. So keep an eye on C-3 Phase I because there may end up being a requirement at least to do two scenarios. Then, if you do not like the answer, do the 50.

C-3 Phase II is the expansion of that concept to variable products with guarantees, excluding index guarantees. (That’s Phase III, I guess.) So we are talking about guaranteed minimum death benefits (GMDBs), guaranteed minimum income benefits (GMIBs), guaranteed minimum accumulation benefits (GMABs). The Life Capital Adequacy Subcommittee now addresses these issues. This decision was made back in March and reiterated, if you will, in June. Let us go through it briefly.

In Phase I, the interest-rate generator was predetermined. It is on the website, and you basically just run it. It is a spreadsheet model, and it was used to develop 50 worst-case scenarios, so it makes sense to use those in your modeling. The C-III subgroup realized, early on, that the NAIC regulators should not be prescribing the equity-scenario generator. There are too many different kinds out there. It is evolving every day. So rather than say that you must use a particular equity-return generator, the proposal says that you can use whatever generator you want, but you have to validate it to a certain standard of percentiles in the tail. You have to prove that your generator has “fat enough” tails. If you are just using lognormal, it is not going to produce tails that are fat enough. That is where we are concerned. So the proposal contains percentiles that you must validate your model to. Once you have done that, you can then go on and use it to model your own funds. So that is different from Phase I. We are talking about roughly 1,000 scenarios to 10,000 scenarios (not 50). Again, we’re using your model or a model that you have purchased.

Like Phase I, the metric is the same. For each scenario, starting with no statutory surplus, you accumulate the statutory surplus going forward, including estimated statutory reserves, federal income tax, and expenses. You look at the worst surplus in each of the years projected and discount that back. Let's say you run 1,000 scenarios. You would then rank them, and pick the worst one. So for each scenario, you have one number, and that number is the lowest present value of surplus. Then you rank those numbers, and you look to the worst ones.

In Phase I, we used the 95th-percentile result. In Phase II, taking the lead from Canada's Office of the Superintendent of Financial Institutions (OSFI), we are examining conditional tail expectation (CTE) at the 90th-percentile level. So we are suggesting running 1,000 scenarios, looking at the worst 100, and taking the average of those. The reason for that is because when we're dealing with some of these risks that show up in your GMDB, GMIB, GMABs, there are situations in which, at the 95th percentile, you're fine, and there is no required surplus; however, at the 97th percentile, there are huge losses. So you need to capture what is happening out there in the tail. When the CIA recommended this, the OSFI accepted it, but moved 90 up to 95. The Canadian reserve requirements do not have the kinds of flooring problems that we have with the Commissioners Annuity Reserve Valuation Method (CARVM)—for which there's additional conservatism built in. So you have conservatism on conservatism in our area, but not in Canada. So maybe a 95 CTE is comparable to our 90 CTE with reserve flooring. Then you take a look at what assets you need for that, subtract out your reserves, and that is your RBC requirement.

As I mentioned earlier, reinsurance and hedging will be reflected, but again, not entirely. There is basis risk, gap risk and cost risk, and you need to make an adjustment for that.

There are significant issues still to be resolved. Some of them did get resolved in some sense. Let's talk about these. We have calibration requirements for the equity returns. We are still working on them for interest rates. You have to model both for a couple of reasons. If you have GMIBs, then you are concerned about having the equity markets tank at the same time, your interest rates have moved against you, so you cannot cover the interest-rate spread built into the pricing of your guaranteed annuity. So you want to model both, and there are various ways to do that. You can run separate models and link them with covariance, perhaps. You can run an

integrated model that might start with your yield curve, project out, and cascade off of the equity returns with links to the interest rates, with stochastic variables to build in some of the variability. So if you run 1,000 scenarios, you end up with 1,000 vectors that contain, for each duration, both what the equities have done during that period of time and what the interest rates are doing during that period of time. So that would give you the best of all worlds. You have it all in one, and you have it linked. But it's a more complex and a more sophisticated model. So that is one reason for modeling both. The other is, even with GMDBs, you need to discount the results back at an interest rate. In C-3 Phase I, we use the short-term rate for the scenario that was being modeled. So we probably will come out with something along the same lines here or a default, if you are not running interest-rate models to current short-term rates. That is where we are going on that. We still need to finalize the actual model validation numbers. We will get that done.

The second issue here is, as in C-3 Phase I, we had an alternative, simplified approach. Instead of 50 scenarios, you only had to run 12 with higher factors. So we're looking into a "safe harbor," in which you don't run 10,000 scenarios; you only run a certain number and build your RBC requirement off of that. This would be particularly important for companies that do not have large exposures, do not need quite the precision, and can deal with whatever the simplified method produces.

Clearly, when this is exposed and considered for implementation, we expect that there will be some resistance from companies that feel that this is too much work. In C-3 Phase I, that resistance resulted in exemption rules. So only 48 companies ended up having to do it. This time, I do not think that's going to happen. The NAIC is very concerned about these risks and is already expressing concern that the exemptions in Phase I went too far. So the message that we are getting is that this is going to go forward. This is an attempt to deal with that on a preemptive basis. Clearly, this is going to require a fair amount of work to do it correctly. So once again, the time to start looking at measuring the impact and getting ready is now.

Details of regulatory review and approval. We are anticipating that there will be a memorandum. Maybe many of you write an actuarial opinion and memorandum. They are detailed, and they are a lot of work, but they are the documentation of what you did. Maybe the documentation for

RBC does not need to be as long, but there needs to be documentation about what you did, because the approach here is very different. I hope that you appreciate the C-change that's occurring. If this goes forward, what the regulators are saying to the appointed actuary or the "RBC actuary" is that they're responsible for doing this right. We are not going to tell you what model to use, or what assumptions to make. We're going to give you an approach; we're going to give you a metric; we're going to require you to validate your models, but then it's up to you. So it is important for you, if you do this or your RBC actuary does it, to gear up for it, understand it, and document it. Unlike an asset-adequacy analysis, in which you might put up some additional reserves, maybe you do not. Frankly, it does not affect GAAP earnings, it does not affect tax so, in many ways, it does not have a huge impact. In this situation, we are talking about risk-based capital, and that is very important. Consider the situation in which you do the calculations, and you go up to your CFO and say, "Guess what, at the end of the year, when we file this, we're going to be below the threshold for company action by the regulators." Can you imagine the sort of dynamic that goes on there? Or what's less onerous is you are trying to dividend to the parent, and you need approval from the state. They are going to be looking at your RBC ratio. Again, how do you do this? There's the work that goes into it and the modeling capability and the documentation.

Does the scope include variable universal life insurance? At this point, it does not. [Editor's note: This was later changed.] Similar to Phase I, the profit margins in universal life tend to swamp the down sides on the annuity side. I have already talked about credit for hedging. It will be partial, but it will be there. This is one of the situations in which reinsurance solutions come into play. The work so far indicates that the impact of this can be either none or huge, depending upon the extent of the guarantees and the "in the moneyness" of your portfolio of products. We have recent capital market performance that shows that a lot of these portfolios are fairly far in the money now.

Discount rates for accumulating negative surplus. Even if you're not modeling interest rates for GMIBs, the right answer would be to model them so that you know what discount rate to use coming back. Otherwise, you might have to use a default current rate.

The charge from the NAIC is, “Thou shalt insure that the company is solvent at each point in your projection, according to statutory accounting,” i.e., at each point, you must calculate your reserve and determine the surplus net of the required reserves. For annuities, that means use CARVM and use the highest present value type of calculation. In situations in which you are using Guideline 34 for GMDBs, you have that additional deterministic adjustment. For VAGLBs, guess what, you have quad-M with another adjustment. The tests that we ran showed that if you floor your reserves using all of that, you end up with results that are relatively high and very volatile. Were there enough assets in the long run? Yes, there were, in most of those cases. So that was an additional requirement that did not seem to be needed, but that was the charge.

During a now historic conference call between the NAIC Risk-Based Capital Working Group and the members of various Academy committees that have been working on these issues, all the C-3 issues recently were laid on the table, along with some other issues around quad M. Quad M was discarded, which was a little disappointing for those working on the committee. But, on the other hand, most of us rejoiced in the conclusion because we were not happy with the way that was all going anyway.

The decision was to look at a reserve standard that is consistent with the RBC standard that we’re talking about for Phase II (i.e., a CTE standard based on stochastic modeling). I do not know whether it is going to be 60% or 65%, but something along those lines. That is the guideline that we are working under at this point. In the meantime, you may have heard that at this year-end for VAGLB reserving, we are going to use a temporary solution of accumulated fees with an asset-adequacy analysis. What the final solution will be to that remains to be seen, but the direction in which this is going is along the lines of where we’re going with RBC C-3 Phase II.

All of that is happening as we speak, and I encourage you to stay tuned to the developments. But again, the trend is toward setting it, based on a stochastic model. I just want to briefly talk about the greater use of stochastic testing. A pattern develops. There is an incentive for greater stochastic testing. We have talked about C-3 Phase II. I mentioned OSFI’s requirement. You may be familiar with some of the other initiatives. Basel Accord II sets standards for capital for

the banks, particularly for operational risks. There is a formula, and you get relief from that formula if you can prove that you are managing your operational risks and they are lower than what the formula would produce. How do you do that? By accumulating data, running models, and justifying your conclusion to the federal regulators. That is a similar initiative.

Internationally—I will just mention a couple of initiatives. The United Kingdom's regulating body, called the Financial Services Authority (FSA), has initiated a process for setting capital based on company-specific models. In addition, we have all read about the efforts of the International Accounting Standards Board (IASB) to introduce fair-value accounting. There is a lot of controversy about how to do that. But I think that it is fair to conclude that if this goes forward, then in order to capture the value of embedded options, you would need to do either stochastic modeling or option pricing. The current factor approach does not do the job. With the greater emphasis on products that are linked to market performance, you have this increased dependency on revenues and risks associated with that performance, requiring this kind of modeling.

The other interesting development is that rating agencies have moved away from their factor-based capital models and are allowing companies to justify a different result, based on their own models, allowing some relief from those factor-based models. That is in the works, but it is moving in that direction. What do companies need to do to prepare for this? They need an infrastructure to make sure that all these risks are being assessed across the board, not just in the back rooms of the actuarial department. It needs to be coordinated so that these risks are part of a central evaluation process involving pricing, investing, financial reporting and risk-management activities. Again, you need to know how to model. I would guess that if I took a poll here, I would find all kinds of modeling capabilities from one end of the spectrum to another—from fairly simplistic spreadsheet models all the way up to integrated economic-scenario generators, and various levels of how that's updated, verified, and validated. But again, if you do not have the modeling capability now to do stochastic modeling with these kinds of risks, then you can see that these proposals are going to be affecting your company fairly rapidly. In order to be ready,

now is the time to start. Do not wait for the regulation to occur. If you can start modeling now, you not only get ready for that, but you also can use the results to look for risks and opportunities to maximize the risk-return relationship for capital utilization.

MR. JAMES W. DALLAS: If you came here thinking that you are going to get all the magic formulas from reinsurers, you are going to be sorely disappointed. But I am hoping to give you some ideas or thoughts to provoke some further discussion when you go back to the office, as you consider the changes to all of these risk-based capital formulas and how reinsurance might be used.

I am going to start with an overview of reinsurance. I think that most of you already know the basics of reinsurance. I will go into an overview of RBC credits in reinsurance contracts, and then I will show some examples, using reinsurance again. Then I will get into off shore uses and some considerations. Before I get into the overview, I want to make a distinction between what I think of as discretionary requirements and regulatory requirements. I like to think that discretionary requirements are what we all, as good actuaries, would set up as prudent reserves or prudent risk-based capital. That's not always the same thing as regulatory requirements, which I think of as those amounts deemed necessary to satisfy regulations and make sure that you have a solvent company. The reason that I make this distinction will become a little clearer as I get into discussion of off shore solutions.

I have a quick overview of reinsurance. There has been a long-standing use for reinsurance to advance profits, with repayment to the reinsurer as the renewal stream of the profits emerge. It sounds simple, right? The reinsurer gives you some capital up front. That capital is provided through the renewal streams, or you give a premium to the reinsurer to cover a certain risk. The reinsurer certainly hopes that those premiums are adequate enough to cover the risks that the reinsurer is covering. At the same time, reinsurance can be an effective way to reduce RBC requirements, both discretionary and regulatory. If you passed the risk on to the reinsurer, you may become comfortable with reducing your discretionary requirements.

The key thing to keep in mind, whether it be an on-shore or off-shore reinsurer, is that any time the reinsurer's view of the risk and/or the cost of its capital is different than your cost of capital or your view of the risk, that creates an opportunity to leverage those differences through a reinsurance agreement. I think that's the basic idea to keep in mind when you're considering reinsurance

Reinsurance, in general, is used to transfer all uncertain risks to the reinsurer. It comes in a variety of forms, yearly renewable term, coinsurance, modified coinsurance, coinsurance with funds withheld, or combinations of the above. You may have heard the term "co-modco" thrown out. Again, I'm not going to get into the details of what makes all of these types different, but there's a variety of tools to reinsurance methods that a reinsurer can use to provide capital or to remove risks from your books.

I'd like to say a little bit about RBC credits in general. With RBC credits, it is a little more obvious that risk-based capital moves to the reinsurer under a coinsurance and a yearly renewable term (YRT) agreement. On the coinsurance, both the assets and the reserves move to the reinsurer. Risk-based-capital formulas are usually a function of assets and reserves or the net amount at risk. If the reinsurer is holding those values—the assets and the reserves—then the reinsurer should be responsible for the risk-based capital. It is obvious under coinsurance or YRT in which the portion of the net amount at risk is transferred to the reinsurer, but it is not always so apparent under modco and funds withheld. The assets and/or the reserves stay on the ceding company's books. Under discretionary tracking of risk-based capital, it may be obvious. Even though I am the ceding company, and I have got the assets and reserves on my books, if I transfer the risk to the reinsurer, then my risk-based-capital requirements should be reduced because the risk has been transferred to the reinsurer. When I set up my discretionary reserves or discretionary risk-based capital, I can take that into account, but it has not always been so under regulatory formulas. It was, I think, in 1999 that the NAIC changed its formulas to recognize risk-based-capital credit explicitly for modco and cofunds withheld. C-3 Phase II specifically mentions that you can take reinsurance into account when you are calculating your risk-based-capital amount. So there is now a movement to allow risk-based-capital credits for all forms of reinsurance.

Next, I wanted to get into some basic examples of different reinsurance designs to overcome additional RBC requirements. The basics are, you enter into an agreement in which the reinsurer assumes some or all of the risks behind the additional inefficient requirement. If the reinsurer, on-shore or off-shore, has a different view of capital or cost of capital, that creates an opportunity to leverage those differences. One simple example that I always throw out is the situation in which the reinsurer, being mainly a mortality-risk reinsurer, may be very C-2 heavy. But the ceding company, being an annuity writer, may be very C-1 and C-3 heavy. This creates an opportunity for reducing the overall risk-based capital between the two companies by entering into a reinsurance transaction where the C-1 and C-3 gets transferred to the reinsurer. Again, you can do it under coinsurance. As of now, you can even do it under modco or cofunds withheld.

Table 1 shows two companies’ risk-based-capital breakdowns. You’ve got the direct-writing company, which may be the annuity writer, and you have the reinsurer, which is probably primarily a mortality-risk reinsurer. You can see that the sum of their risk-based capital components is \$421 million. They’re both the same, but for risk-based capital, after covariance goes down, about 20% of that goes away for the direct writing company, and about 5% goes away for the reinsurer. I have to admit that I probably didn’t use the most up-to-date covariance formulas.

**TABLE 1
Capital Before Reinsurance**

	Direct Writing Co.	Reinsurer	Total
C-1 Risk	\$190,000,000	\$ 10,000,000	\$200,000,000
C-2 Risk	100,000,000	400,000,000	500,000,000
C-3 Risk	130,000,000	10,000,000	140,000,000
C-4 Risk	1,000,000	1,000,000	2,000,000
Sum of Components	421,000,000	421,000,000	842,000,000
RBC after Covariance	336,261,092	401,499,688	737,760,780
Ratio of RBC to Sum	80%	95%	88%

In Table 2, I transfer \$60 million of C-1 risk to the reinsurer and \$40 million of C-3 risk to the reinsurer. You can see that the ratio of RBC to sum goes down. For the direct writer, it goes from 80% down to 76%, and for the reinsurer it goes from 95% down to 80%. This creates an opportunity, because now you have made the relationship between the two companies a little more efficient for the total capital between them. That creates an opportunity to arbitrage that difference. So the cost of capital for the reinsurer—because the reinsurer can “put” a lot of C-1 and C-3 risk and not have it effect its risk-based capital too much—might be cheaper than what the ceding company is having to build into its own internal pricing measurements as a cost of capital.

TABLE 2
Capital After Reinsurance

	Direct Writing Co.	Reinsurer	Total
C-1 Risk	130,000,000	70,000,000	200,000,000
C-2 Risk	100,000,000	400,000,000	500,000,000
C-3 Risk	90,000,000	50,000,000	140,000,000
C-4 Risk	1,000,000	1,000,000	2,000,000
Sum of Components:	321,000,000	521,000,000	842,000,000
RBC after Covariance:	242,660,919	418,612,260	661,273,180
Ratio of RBC to Sum:	76%	80%	79%
vs. Before Reinsurance:	80%	95%	88%

The second example deals with additional requirements caused by the C-3 Phase II issues, or any other additional risk-based-capital requirements that may come along. Here you could, again, enter into a modco or coinsurance transaction. Coinsurance may be difficult for variable products, but you could just strip out the particular risk, thus causing the additional issue. For example, it might be that when you do your testing, you find that the GMDB requirement is making you hold 10% of reserves as risk-based capital, or the GMIB might be causing 5%. What you can do is try to find a reinsurer that will take on that risk. There’s not a lot of capacity in the reinsurance marketplace for some of those features that are being written today. In particular, for GMDB, I do not think there is a lot of capacity right now. There is some reinsurance of GMIB,

and some for the guaranteed account value features, but one of the issues would be trying to find the right capacity. If you could find that capacity, you could take that into account in your scenario testing that you're paying the premium to the reinsurer to cover a piece of the risk.

Now I will get into a discussion of off-shore reinsurance. First, I want to present a brief history of regulatory reserve credits. There's a long-standing history of allowing reserve credits and reinsurance agreements. Historically, most reinsurance agreements were done with on-shore authorized reinsurers. There isn't really a requirement, in most states, that reserves have to be exactly mirrored, but the concept is that if the reinsurer is an authorized reinsurer, then reserve credits are allowed. They're allowed because that reinsurer also has to establish reserves on the same basis as the ceding company, or at least on a very similar manner. So if you do a transaction in which you're taking reserve credits with an authorized reinsurer, in whatever state, then you can reduce your reserves for that amount. Again, there's a long-standing history with that concept.

When you move to taking reserve credits, when you reinsure with an off shore facility, since the off shore facility is not under on-shore regulatory scrutiny, you have to come up with other forms of security so that the ceding company can take a reserve credit. The most common are letters of credit, assets in trust, or a combination of assets in trust. So again, if you go directly to an off shore reinsurer, you have to secure those reserve credits. Some of those issues go away under modco because you don't take reserve credits under a modco transaction. But if you're doing a co-insurance transaction or if part of the transaction is co-insurance, you have to secure the reserve credit.

Regardless of whether you are going to an on shore or off shore reinsurer, if that reinsurer assumes risk, then that reinsurer should establish its own risk-based-capital requirement. I guess that's intuitive for discretionary risk-based-capital requirements, regardless of the form of reinsurer. The reinsurer, having accepted the risk, should establish not only adequate reserves, but also should establish adequate risk-based capital on top of those reserves. When you go to an off shore company, there is a little more flexibility with setting up those discretionary reserves. It's not intuitive, necessarily, under regulatory risk-based capital in certain forms of reinsurance.

(Again, there's explicit regulatory change to the NAIC formula NAC299 for modco and cofunds withheld agreements that allowed regulatory risk-based credits for those certain forms.) If you go directly to an off-shore reinsurer right now, you have to secure the reserve credits through letters of credit or assets in trust. The off shore reinsurer has a little more discretion on risk-based-capital credits. Those risk-based-capital credits also are given right now. There is some discussion about requiring security for the risk-based-capital credits also.

When you use off shore reinsurance, you do have to take into account considerations about securing reserve credits, securing risk-based-capital credits, and how that off shore reinsurer might price those items, which may make it more efficient and give you a better price. You also have, as an option, going to an on shore reinsurer that also may use off shore facilities. Typically, you would go to the on shore reinsurer, they would be an authorized reinsurer, and you wouldn't have to get the letters of credits or the assets in trust. But on-shore facilities use the cost effectiveness of the off shore facility in the price that they give to you as the ceding company.

MR. SCOTT HOUGHTON: I had a question about the concentration factor for equities. If an insurance company has a common-stock investment that really represents seed money for a separate account or a subsidiary account, technically it's one stock because it shares in the trust that holds the separate account assets. In reality, there's a diversified portfolio underneath it. How is that treated in the new concentration factor for equities?

MR. REISKYTL: This is seed money that you put into a separate account?

MR. HOUGHTON: Yes.

MR. REISKYTL: And the seed money was common stock? It was cash, I presume.

MR. HOUGHTON: It would be invested into the trust that holds the separate account assets. So the trust would issue shares to the insurance company. The insurance company would have those shares of stock, which technically look like one stock, but in reality, the money is invested in a diversified portfolio by the trust.

MR. REISKYTL: I believe that you have to be very careful there. You should look through the process. If you look through the investment to the underlying common stock, you'll pick them up in the concentration factor. If you find out that it's a mutual fund, you exempt it, but there is not an exemption for the fact that the separate account is like a mutual fund. It's similar to having an investment company or another insurance company, you could equally argue that the insurance-company affiliate was diversified, but the rules say that you look through the process and you accumulate the concentration in any one stock and apply the factor to it. Obviously this concentration factor is an approximation of the risks. It is an attempt to recognize that you do not always have diversity. In most cases, it is not going to have a big effect, except in the instance that you only own one or two stocks and your separate account seed money. Maybe it's a privately invested separate account that is only invested in one stock. You can see the difficulty or the inaccuracy of not examining it. So the rules are that you should look through it, except for those exceptions I mentioned earlier. These exceptions are mutual funds, investments in the Federal Home Loan Bank, and a few other situations in which it is assumed by other requirements that there is diversity. In effect, the factor—the 30% pretax factor and the 20% factor—assume diversification. I think that it's fairly obvious that the concentration factor is an attempt to find out if your portfolio isn't diversified. Surprisingly, there are a few companies that are not diversified. So that's a long answer to a very short question. The short answer is, look through it.

FROM THE FLOOR: I believe that you warned us that this exemption for C-3 Phase I might go away, and we might have to do two scenarios. When could that happen? I mean, are you warning us that this year-end we might have to do that?

MR. LONGLEY-COOK: I doubt it.

MR. REISKYTL: Not remotely. As an advocate of the exemption test, I personally hope it never goes away, though it is kind of hard to argue against two tests. It really comes down to practicality. I think that there's another fundamental difference, and we are confused about it. Having perfect teeth may be a desirable but expensive choice for many who are content or satisfied with eating with not quite so perfect teeth. We can always strive to refine things to

perfection, but must keep the costs to do so in mind. Clearly, doing cash-flow testing is better than using factors. The reason the exemption is in there is, if the risk were to occur and is not likely to make the company weakly capitalized, we have enough other productive work to do without being required to do a lot of refined calculations that won't change anything. So there will be resistance, at least from me, and perhaps from others, to any change in the exemption test. But time will tell. This work suggests that if we're going to do it anyway, why don't we improve other tests. One of the requests of New York at the time we put in C-3 Phase I was, "Does this work suggest that the current C-3 factors ought to be changed?" That's the background of this effort. Maybe we could do it better. The question is, is doing it better, worth it? That's a practical decision that ultimately will be made by the regulators, as to how much work should be done. There are some, of course, in the industry who would like to drive their factors to zero, and the regulators haven't been too sympathetic to their desires yet.

MR. LONGLEY-COOK: I agree, it's not going to happen right away, but it is on the table, and there is a concern that we're missing some potential blowups among those companies that are exempt. On the other hand, there has been some good analysis of the 48 companies that did do it. None of them flipped into company-action level because of the test. The way in which the testing was done was impressive. I think that helped fuel the movement towards Phase II because there was a greater sense of confidence on the part of the regulators that this kind of modeling could be done correctly and not gamed. But there was some concern. I think that it originated with New York. They wondered if it was missing time bombs because of exemptions? All we said was, "We may or may not. But assuming that they're all okay isn't necessarily valid because it was based on this assumption of one-eighth-of-a-year mismatch, and that's clearly not going to be true in all cases." Whether this goes forward is up to the regulators. It's certainly their initiative. We can't advocate a position on this. It's really a regulatory threshold, so to speak. It's their decision. We can certainly answer questions, which we did, about what the assumptions underlying it were, but the speed with which it moves forward is really up to them. There are those companies that would like the exemptions removed because they would like their RBC reduced because of their good asset/liability management. But as the regulators have pointed out, that's not the purpose of RBC. We are trying to find ticking time bombs, not improve your ratios so that you can brag about it.

MR. REISKYTL: In a small way, it is a credit to the valuation actuaries in this room. You really have to think, “Can you have an investment portfolio that passed your standard for reserves and yet fail the RBC test?” I’m sure you can concoct such a portfolio, but the valuation actuary’s review does in many cases provide some constraints. There are people who have made proposals in the past and said, “What about barbells (investing only short and long)?” But presuming that’s going to show up in your reserve cash-flow testing and resulting requirements already. Clearly, there is a broader requirement to do cash-flow testing and a greater responsibility on the actuary. Envision the circumstances, unlike Phase II which is in equities that can go all over the place, unsubstantiated by any research, just your gut feeling—where you pass the basic reserve testing, and then blow up at the next level for RBC (barring some unusual possible guarantees). My own feeling is that the general interest rate risk is probably not allowing weakly capitalized companies to not be identified unless they offer some of the more exotic guarantees. Maybe the exemption test isn’t picking them up. Everyone’s going to have to do that test for Phase II guarantees on variable annuities because it can blow up on you with equities. If you took a long-term view of First Executive, they were not broke. But they were dead broke at the moment. You have to be very, very careful. At least conceptually, it’s a bit strange that quad M reserves, or something, could be higher than your risk-based capital. Yet, in one sense, it conceivably can do that, because you are looking at different, worse points in time. When you do the worst point in time for CARVM, and you do the worst point in time for RBC, they may not be the same points in time. You also may have this subsequent recovery factor because of stock volatility. I believe that we’re just beginning to have a better understanding of how these risks interact and how they change from year to year. I don’t think that we know at this point what impact a 60 CTE or 65 CTE may do to the final RBC results. We are smarter than we were two months ago, and hopefully we’ll be even smarter before we make our recommendations.

Another question on reinsurance—is this what a lot of demutualized companies have done to lower their RBC? Is the interaction between the various phases a driving force in why there are major reinsurance transactions going on—either dumping the RBC into the ocean or into another part of or type of RBC?

MR. DALLAS: A change to the NAIC formula definitely had a part in playing that. RBC does get moved under pure modco transactions, so it can hang on to the assets, but reduce their risk-based-capital requirements.

MR. REISKYTL: It's obvious that the ceder can reduce it. If it was a mirror, you'd think that the reinsurer would just pick it up. The reinsurer may have a different covariance piece, however. As a result, both sides can win, as your examples indicated.

MR. DALLAS: Right.

FROM THE FLOOR: Everybody is familiar with reserves dropping into the ocean, but surplus-RBC-type requirements do not drop into the ocean, because we're trying to stay in business.

MR. DALLAS: That was the point I was trying to make with discretionary RBC. There should be some risk-based-capital requirements established, whether you're on-shore or off-shore, to take into account that you have the risk.

MR. REISKYTL: Also, I think that there's one other thing that you may want to mention. One of the challenges is that we want to give the actuary a lot of freedom to use any model they want, use any equity or interest rate generator they want, and yet have some control by requiring them to meet certain criteria that we find acceptable. I thought it was rather intriguing. On our last conference call, we got into the concept that you would have to run a particular benefit with a particular set of assumptions to see if your model produced the same answers. I mention this for two reasons. One, it gives you a validation. It lets the regulator know that if you have a standard product-assumption set with beginning economic assumptions, and you use the Tillinghast-Towers Perrin model, or any other model on that basis, the answer is two. Then you run it through your model, and if you come out with 100 or zero, the regulator at least has some clue as to what to question you about. Otherwise, you try to wade through all these results wondering, "How do I know if I can trust the models?" It's an intriguing idea because it does provide some consistency. Practically, however it means that you may have to do some more work.

MR. LONGLEY-COOK: The whole question of how the regulator can become comfortable with this additional responsibility and authority placed on the actuary is very much an area that needs to be fleshed out. I mentioned memorandum or documentation, but you need to be able to convince the regulator somehow that you don't have a black box. Maybe you do it by running some standard asset/liability scenarios.