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DAC in A Volatile Equity Return World

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Panelists: Richard Browne
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Summary: The panel discusses common methodologies for dealing with this volatility including stochastic DAC, mean reversion for long-term returns and weighted average or approaches.

MR. NOVIAN JUNUS: I'm with Milliman in the Seattle office. I'm going to introduce two speakers later on.

I have tried to catalog the various deferred acquisition cost (DAC) amortization methodologies values I know of: mean reversion, estimated gross profit (EGP)/K factor grading, stochastic DAC and various other methods. We've done a few surveys of companies and how they've developed the DAC amortization methodologies. The ones that we will be presenting here will be the mean reversion and the stochastic DAC methods. There are some other methods that can be somewhat self-explanatory, including the last one, which is basically following the original DAC schedule no matter what happens.

Our presenters are Jevaraj Vadiveloo, who is going to present on stochastic DAC, and we have Richard Browne from KPMG. He's going to go over mean reversion. I'm the moderator, as I've said, and I'm going to present a few items to start thinking about.

What I'm going to show you are basically four slides of returns. Chart 1 is the monthly return for the S&P 500. As you can see, it's quite volatile. But you haven't seen anything yet. Chart 2 is NASDAQ, which is even worse. By the way, they are the same scale, so you can compare one to the other.

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

Taking a look at Russell 2000 (Chart 3), there is the same sort of volatility. Something happened in 1987—I guess that's the crash that happened in October 1987. Chart 4 shows the investment-grade bond. Look at how volatile it is back in the early 1980s; that's because of the inflation era in 1979-'80. After that it toned down. Remember this is total return, so that's why you see monthly returns like this. They're not interest rates or bonds.

You notice that they are volatile. Let's take a look at trying to determine what the mean should be. In Chart 5, the top of the table shows the returns and the volatility from 1970 to 2003. In fact, if you invested in investment grade bond funds, look at what kind of return you got. It's a good one. It's even equivalent to the S&P 500 but with less volatility. That's interesting.

If you look at 1994 through 1999, you see a different picture. The return from 2000 and 2003 is also a different picture. Volatility basically stays relatively constant for the S&P 500; it ranges from 14 percent to 19 percent for a different period. I guess you can say it's volatile, period, but the returns are going to be relatively different depending on when you start. That's food for thought.

MR. JEYARAJ VADIVELOO: I see a lot of familiar faces. In fact, many of the people in the room were around when we first came up with the stochastic DAC methodology. It was a business reaction when I was with Aetna Financial Services. Basically we were reacting to, as Novian pointed out, the volatility in equity returns, which were directly impacting Aetna Financial Services at that time in our GAAP earnings. We had two choices: one was to do what we used to call forward locking, which meant that you kept the future equity return assumptions a constant and recognized whatever happened in the current year, kept the future equity returns constant and calculated your unlocked DAC. That caused a maximum volatility in your earnings. We weren't prepared to do that, nor were most companies, but most companies, including us, kept doing what we used to call "ad hoc procedures." Most ad hoc procedures meant that, when you had a market correction, you assumed that the future was going to be significantly better and vice versa. That was a way to (and I hate to use the word) manage GAAP earnings, but effectively that's what companies were doing.

The problem was that around the time we came up with this methodology, there were some new rulings from the SEC with some strict guidelines on materiality. Plus, it was getting difficult for me at that point in time to face the auditors and keep explaining to them that things were going to get much better or things were going to get much worse. That story got a little bit stale after a while. We felt that we had to come up with something that had almost conflicting requirements. We wanted to address the volatility issue and yet strictly conform to FAS-97 and these SEC guidelines. That was a challenge.

Before I get into the details of the stochastic DAC unlocking process, let me do a review of DAC unlocking, which I'm sure all of you are familiar with. At issue, you

set up this DAC asset, which is your acquisition cost. It could be a first-year phenomenon, or you could have future renewal costs that you are deferring. You set up this equation where you solve for what we call the amortization rate. Some companies call it the "K factor." Basically the equation that satisfies your DAC at issue is your key factor times the present value (PV) of future margins. Usually at issue, when you make this calculation, is you have some kind of a level constant equity return assumption. Most companies will do it by issue year and by plan of insurance, so you have several amortization rates.

You do a DAC roll-forward process, which looks at DAC at the beginning of the year or the beginning of the period. You add the interest on the DAC, add any new deferrals, subtract your DAC amortization and get your ending DAC. The DAC amortization here is going to be the amortization ratio for the period times the actual margins earned. That's the start of the problem.

FAS-97 forces you to periodically do this unlocking process. The unlocking process involves recalibration of your DAC, and you do that by going back to your DAC at issue and solving for a new K factor or amortization rate. This time the equation will be: PV of your DAC equals this new amortization rate times the PV of your historical and your future margins. Once you solve for this new amortization rate, you create this unlocked DAC. You can do it either retrospectively or prospectively. The prospective DAC is calculated where your new DAC or your unlocked DAC is your new amortization rate times the PV of future margins. What we define as a DAC catch-up is the difference between this unlocked DAC and that roll-forward DAC. If your unlocked DAC is larger than your roll-forward DAC, you have a positive catch-up, which is a contribution to your DAC earnings. The reverse is if the unlocked DAC is less than your roll-forward DAC.

As I mentioned at the start, most companies (at least at the time that we came up with the stochastic DAC methodology) used a single set of future assumptions on equity returns to project the future margins—a deterministic approach. That caused major swings in your catch-up and, hence, your resulting GAAP earnings. We talked of several techniques—some ad hoc, some a little bit more structured—but the end result of all these techniques was to try to reduce some of the volatility that was happening. Again, based on this, we decided that we wanted to come up with something that was less arbitrary, yet conformed to FAS-97, and also helped us to handle this volatility issue.

When you discuss the stochastic DAC principle, there are almost two languages that you have to use. When you're dealing with the auditors, you have to be extremely careful that you don't talk of a range of possible estimates and don't talk of managing earnings. These are words you can't use. What do you do? It's almost like a contradiction when you do a stochastic method. You're coming up with a range of future estimates. The way I like to view it is it's a methodology for justifying whether a set of future assumptions is plausible. It recognizes the fact that no one can predict with certainty future equity return assumptions, yet there's

supposed to be an acceptable range of future equity return assumptions that would be reasonable. Outside that range, it would not be reasonable. The criterion used to determine what was reasonable was a statistical criterion. We basically established confidence bounds, and if we fell outside the range either direction, it led us into certain decisions.

One of the assumptions we made in this stochastic DAC methodology was we assumed that future equity returns had no bearing on what happened in the past. We used the efficient market hypothesis. We did the random generation of equity returns. We did an independent assumption.

What's the methodology? I'm going to explain it this way, but you can possibly explain it in another way. Hopefully I'll get to two ways of looking at it. One way of looking at it is to solve for a set of future equity return assumptions such that the unlocked DAC that results equals your roll-forward DAC. Now you step back and ask whether the set of future equity return assumptions is appropriate. To do that, you have this statistical test. To perform this test, we randomly generated future equity return assumptions and used this independent assumption that I talked about. For each projection of future equity return assumptions, we calculated the new amortization rate and the DAC that would resolve, so you end up with an empirical distribution of possible DAC balances. You formed your empirical confidence band. If your roll-forward DAC fell within the confidence band, you did nothing. If it fell outside, you had to make certain decisions.

When we generated future equity return scenarios, we had to make an assumption on a long-term mean and volatility. It was similar to some of the numbers that Novian put up. We formed basically a confidence band around the mean. It doesn't necessarily have to be a symmetric band. In fact, when I talk of some of the implementation issues, I'll mention how it doesn't have to be symmetrical for some situations.

What are the catch-up rules? As I said, if your roll-forward DAC falls within the confidence band, that means your roll-forward DAC is appropriate for you to hold, no catch-up results, and your amortization rate doesn't change. In a way when I started off saying you solve for your equity return assumption such that it equals your roll-forward DAC, you really don't have to do that. Once you generate this distribution of DAC balances, there's sort of a one-to-one relationship; if your roll-forward DAC falls within the confidence band, that means the equity return assumption that generated a roll-forward DAC is plausible. We make that sort of link.

What happens if it falls outside the corridor? Let's look at a case where it falls below the lower bound. That means that one of your equity return assumptions you needed to assume to make your unlocked DAC equal to your current roll-forward DAC was somewhat implausible. It was maybe too conservative. You move your DAC balance to the lower corridor, and the difference between your lower corridor

and your current unlocked DAC is your DAC catch-up. You can solve for the equity return assumption such that your unlocked DAC equals the lower band. The opposite happens when you fall on the right-hand side of the corridor. That means your assumptions are too liberal to justify holding your current DAC balance, and you move it down to the upper limit. That's the basic methodology.

I think some of the implementation issues are probably even more important than the methodology. From a company's point of view, two issues that we deal with are convincing your auditor and convincing your management. Both are very important because it's a new methodology and it's easy for this to be some kind of black box that's hard to communicate, particularly to management. What are some of the things you can do to make it easy to overcome these two barriers? Any type of equity return random generator has to be somewhat logical. When we were at Aetna Financial Services, we used a normal random variable with a certain mean and a certain standard deviation. You can use a lognormal. You can use other methods, but the key thing is to use a methodology that captures the volatility because that's what you're trying to do here.

Should you model every fund separately? With assumptions you can do that, but that would be a fair amount of work. We looked at an overall distribution of our funds and came up with an overall long-term mean and a long-term volatility parameter. It was easier to manage and certainly easier to explain.
The corridor bounds are probably one of the hardest decisions to make because there's no magical answer. I mentioned at the start that it doesn't necessarily have to be symmetrical. When you have a lot of embedded options like guaranteed minimum death benefits (GMDBs), by necessity it's going to be an asymmetric type of confidence band. Use 80 percent or 90 percent.It should be around the mean, or on the median. Personally this is my advice: From a company's perspective, before you make a decision on either the confidence bands or the volatility parameters, you have to model your business. Do a lot of what-if analysis, find out what you're comfortable with and then try to sell it to your auditors. That's the only way to do it because one of the disciplines in the stochastic DAC methodologies is once you make the decision you're not going to change it. If you form an 80 percent confidence band, you can't switch it mid-stream to a 90 percent confidence band to avoid catch-ups or adjustments. Again, there's no simple answer other than modeling your own business and seeing what's appropriate.

Again, I'm speaking from my own experience when I had to convince three auditors. It was KPMG when I was with Aetna Financial Services, and then when we became part of ING, it was Ernst & Young. When I joined Deloitte, it was Deloitte. Price Waterhouse I think is the only one I haven't talked to.

We had an outside vendor system to do our GAAP projections. Our auditors were comfortable with this outside vendor system. What we wanted to avoid was switching to some kind of model and completely disregarding our outside vendor system. We compromised by using our mean valuation system to do what we called

a baseline projection of our future margins. To do the baseline projection, we used what I call a full unlocking principle. We used a long-term average and projected the margins, and then we collected the key pieces of information from these valuation systems—fund balances, margins and so on. Next we ran maybe 500 projected equity return scenarios. On an Excel model, we did the adjustments to the future margins. It was almost like a compromise. We had this complicated Excel model, but we built it off this baseline projection. That was the way we did it. Everyone can use his own methods. Finally, communicating it to management and auditors is something you cannot overemphasize.

Novian wanted us to talk a little bit about how this relates to some of the new issues for the Standards of Practice (SOP). At one level, this goes well with the new SOP because the SOP also suggests the use of a stochastic methodology to calculate reserves. This is stochastic, and the SOP talks of consistency in assumptions in methodology with your DAC amortization. Again, on the surface this seems to be appropriate.

I do want to touch on what I consider some fundamental differences between the SOP and the stochastic DAC methodology. In the SOP, the corresponding ratio to the amortization rate is the benefit ratio. That's the ratio of the PV of excess payments to the PV of expected assessments. Both the numerator and denominator are impacted by the volatility of the market. On the other hand, the K factor, or the amortization rate, is just a ratio of the PV of deferrals to the PV of your future margins. Largely your denominator is affected by stochastic equity returns. In a sense, there's far more volatility embedded in the SOP than in stochastic DAC unlocking. It means that you don't have to necessarily use the same assumptions or even the same number of scenarios when you're doing SOP analysis versus DAC analysis.

The other point is that companies that have adopted the stochastic DAC methodology have carried it all the way through in terms of unlocking. Companies that have started with the SOP have been fairly preoccupied with coming up with an opening benefit and reserve. Issues of how you unlock your benefit ratio, at least for some of the clients we have dealt with, still haven't been completely finalized. I'm sure that will have room for future discussion.

MR. RICHARD H. BROWNE: I'm going to cover the mean reversion technique as a method of addressing volatility. What I'm going to do is first give an overview of DAC in a FAS-97 environment. I'll talk a little bit about unlocking and true-ups and what the sources of volatility are in FAS-97 DAC amortization in an equity environment. Primarily I want to go over this to make sure that we're using the same terminology when we discuss this. It's clear what I mean by some of the terms I'm using.

I'm going to give a simple example of mean reversion as a technique just to go through the mechanics for those of you who may not have been working on it on a

day-to-day basis. I'm going to also try to share with you some of the different variations of mean reversion techniques that I've seen at some of my clients in the past couple of years. Then I want to talk a little bit about challenges to mean reversion. There's been a lot of criticism of it, and I'd just like to make sure everyone is aware of some of the criticisms of the technique and how it fits in with required GAAP methodologies. As Jay did, I also want to touch briefly on the relationship of mean reversion when you get into SOP 03-1 calculations.

Before I do that, I'm curious to know how many people here have variable annuities or other FAS-97 equity-based products that are using a mean reversion technique? My experience is that's common practice right now, and most companies are using some variation of it. How many people are using stochastic? It looks like few, if any. That's also consistent with my experience. A lot of companies may be thinking about stochastic approaches or going to them but have not yet implemented anything like that.

I have some comments on DAC in a FAS-97 environment. As Jay pointed out, DAC is amortized in proportion to EGPs. For variable products, mortality and expense (M&E) charges are probably the key driver of gross profits. Anything that is going to cause fund amounts to change is going to cause M&E charges to change, and that's usually the major source of volatility. Other components of EGPs are surrender charges and expenses and mortality charges over and above the account balance. Because EGPs are projected from issue date and periodically adjusted for both actual experience and for any changes in anticipated assumptions, that whole process of adjusting introduces volatility.

The terminology I want to use is fairly common. I usually use the term "true-up" to mean retrospective unlocking, or the process of substituting actual margins and actual deferrals year by year in place of projected as time moves on. This also would include reprojecting future amortization streams using updated in force. Each year you have lapses; you have a new in force; and even without changing any assumptions, you're going to get an impact on your future EGPs. That's the true-up. Prospective unlocking or just unlocking is a term where I mean revision of future assumptions, and how changing the future anticipated experience will also change your DAC amortization and introduce volatility.

The DAC roll-forward that Jay talked about I've pulled out here. The DAC true-up and unlocking are sometimes shown as part of the amortization, but I wanted to point out that often when you go through a process where in a particular period you have big swings in the market, where it's going to hit is in a true-up, and unlocking that has to go on to reflect changes either in anticipated experience or historic. That's a point in the roll-forward where you see the impact of the unlocking.

You sometimes hear that DAC is sensitive to adjustments to the market because you get a double hit to earnings. For example, when the market declines, when funds decline, your actual M&E charges will decline in that period because you have

a lesser base on which to collect the M&E charges. That's a hit to earnings. You also get a hit because the amount of funds declines, and, therefore, you have less of a base on what you're going to earn gross profits on in the future. Your future EGPs go down. Because of the nature of FAS-97 amortization, as a level percentage of EGPs over the life of the contract, you get a hit to earnings from that aspect, too. There is a double hit when you get a market decline.

On the opposite side when the market goes up, you get that magnified double contribution to earnings. There are some who feel that this double hit to earnings or double contribution to earnings is really an oversensitivity, and I think that's probably the primary reason that techniques like mean reversions and stochastic DAC have come into use.

I'm going through the mechanics of a simple example of a mean reversion calculation. It's a single deposit on a variable annuity of $1 million with a $50,000 acquisition cost. M&E charges are 1.5 percent. I'm assuming 10 percent long-term net growth. That's net of M&E and the anticipated growth assumption at the issue of the contract. I have assumed withdrawal rates of 2 percent the first year graded to 10 percent in year five and later. There are no bells and whistles; it's just a simple contract. Chart 6shows the account balance, the estimated growth profits, which are in this case expense margins, and the M&E charges. It shows how they develop and a DAC amortization scheduled based on that. The discount rate that the DAC amortization is based on is equal to the net assumed growth rate of 10 percent. The resulting pretax GAAP profits also are shown.

Chart 7 shows what happens if the market drops by 20 percent. Let's say everything the first four years was the same as we assumed at issue, but the market drops by 20 percent in the fifth year. As you can see you get a large hit to earnings because of the true-up and unlocking. Part of that results from the EGPs dropping substantially after the fifth year, because you have a smaller base on which you're earning your margins. You get a fairly severe hit to earnings when the market drops by 20 percent.

Now what I want to do is take a simple mean reversion approach and show how that affects these earnings when the market drops. Mean reversion is a mechanism to adjust the prospective growth rate to achieve targeted accumulative average market return over the life of the contracts. The specific details vary significantly by company. Generally there's a look-back period and a look-forward period, and you come up with a rate in the look-forward period that will bring you back to your long-term growth rate on an average basis taking into account the actual experience in the look-back period.

Here's a simple example to see what I'm talking about. The long-term growth rate is 10 percent. It's a look-back four years and a look-back five years, so my total mean reversion period is 10 years. I'm assuming for the first four years I get that anticipated 10 percent. The market drops 20 percent. You solve for the rate that in

years six to 10 will bring you back to overall over the whole period a 10 percent earnings rate. In this particular case, using the formula $(1.1)^{10} = (1.10)^4$ x 0.80 x $(1.145)^5$, this turns out to be 14.5 percent. The assumption that is used in your DAC calculation at the end of the fifth year for that valuation is an interest rate of 14.5 percent for the next five years and then 10 percent thereafter.

Using this example, I've now recalculated the DAC using the revised interest rate. You can see the true-up and locking, which were about minus six something are now only minus four something. You don't get a hit to earnings in the fifth year; you get a much smaller profit level. It dampens the effect. Overall, you're going to get down to the same place because the DAC has to amortize to zero, so the earnings in future periods are adjusted as well.

Chart 8 shows the amount of DAC amortization in the simple example with mean reversion and without mean reversion. You can see that where you have large DAC amortization in the fifth year, it's dampened. Chart 9 shows the comparison of profits for the simple example with mean reversion and without mean reversion. Profits are improved in the fifth year.

I want to talk a little bit about the parameters that go into the mean reversion calculation, some of the variations I've seen in companies in doing this approach and maybe some of the considerations companies have made in trying to decide what their mean reversion formulas look like. The long-term growth rate is basically a company's best estimate assumption over what the markets are going to do in the long term. I'd say most companies seem to be around 8 percent to 10 percent, and that's probably an assumption that is usually not changed often. In fact, I don't think I've seen any of my clients in the past two years change their long-term growth rate assumption. There's a look-back period and a look-forward period, as I mentioned. The look-back period is the period in which you're looking at recent experience, and the look-forward period is the period in which you're determining a rate that will revert you back to the long-term growth rate. Very common are things like look-back four, look-forward five; look-back three, look-forward three is also fairly common.

A company can use the entire amortization period so that it looks from the inception all the way to the current valuation date and smoothes that over the remaining amortization period. There are also some short ones. There is some variation in practice. One variation in the approach is to fix the period in this year-to-year progression and say, "I'm going to look-back three, look-forward five, and I'm going to roll that forward each year." When I do the next year I look-back three, so I lose one portion of history and get some new history in there on which I'm reverting.

A second point is to fix an anchor point and say, "I'm going to start in the year 2003, and when I do 2004 I'll only have a look-back period of one year and then maybe have a look-forward period of three or four years." Then the next year I'm

going to keep that anchor point , look at two years history and then use that same three or four years going forward. That's another approach I've seen.

Almost everyone who is doing mean reversion has put a cap on the rate to revert, that is the rate that you can get out there. I think when the market really dropped, and people were coming up with rates for the next three or four years of 25 percent growth or higher, their auditors might have been looking at them and asking, "Do you really think that's possible?" I think there's been pressure to put caps on that to say, "This technique maybe works okay, but within bounds." I think that is what they are saying with caps. Probably the most common caps I've seen are 10 percent growth rate caps. I haven't seen many caps higher than 15 percent.

FROM THE FLOOR: Do you see floors also?

MR. BROWNE: Yes, usually I see floors. Usually they're symmetric around the long-term growth rate.

FROM THE FLOOR: In addition to the cap, would it be frowned upon to maybe increase the number of look-forward years?

MR. BROWNE: I am aware of companies that do adjust the forward period. For example, you might have a three-year period with a cap of 15 percent, but if when you calculate it you're getting 16 percent for the three-year period, you might extend it to a four or a five, or extend it as far as is necessary to bring you back down to your reasonable cap. Yes, I have seen that approach used.

I'd like to go through some of the challenges or criticisms that you often hear with regard to mean reversion. A few years ago, when the market had experienced some large drops, you heard a lot more challenges especially from analysts and so forth. You don't hear as many criticisms now, I think, because things have settled down for some months. People also are recognizing that this method is essentially becoming common practice. I want to go through some of these.

The first challenge is that the mean reversion method doesn't trigger write-downs when warranted. Many people would say that there are situations when the market drops. That loss of profit is real, and somehow the mean reversion technique is not truly reflecting the condition of the company. When you use a mean reversion technique, you get sometimes near-term market assumptions that might not appear realistic. Is 15 percent over the next four years a realistic interest rate? FAS-97 requires that your assumption be a best estimate. It comes down to what the nature of a best estimate Is. Is a mean reversion approach consistent with a required long-term best estimate assumption that is required by FAS-97? You hear arguments on both sides of that. I think most companies who use mean reversion need to be able to answer to their auditors to say, "Yes, we believe this is a reasonable approach that is consistent with the best estimate requirements of FAS-97."

Some people say solving for an assumption isn't really GAAP. Assumption is supposed to be what you believe is going to happen. You can't solve for it in terms of just simple equations. Of course, you can if solving does give you a result that's consistent with long-term expectations, but just a formula approach has a lot of danger sometimes. There's also this smoothing of earnings. Clearly it's dampening the effects of volatility. Is smoothing earnings too much under what should be allowed under GAAP accounting? Because of all of these reasons, does this bring the quality of earnings into question when we're looking at companies' statements? There are a lot of people who have raised these questions. I think it's clear that companies that are using mean reversion need to be aware that some of those concerns are out there.

When you are performing recoverability on DAC, do you still use a mean reversion technique in looking at your future earnings to see if your DAC is recoverable? I've heard arguments on both sides of that, too. I'm not going to express any opinion on these challenges, but I think these are questions that are important to consider.

Again, Novian wanted us to comment on how these techniques might integrate with SOP. The SOP requires a reserve calculation based on multiple scenarios; often stochastic is used. The SOP requires that assumptions for DAC amortization and the SOP be consistent. The question is does this mean that mean reversion must be used in the scenarios for the SOP reserve if it's used for DAC? For those of you who were in the GAAP issue session this morning, it was mentioned that there are a few companies that, when they go through their stochastic scenarios, are imposing mean reversion parameters on their stochastic scenarios that they develop. To be consistent, I would say that most that I have seen are not. Most are taking the interpretation that the requirement for consistent assumptions means that the long-term assumed growth rates ought to in some way be consistent. There's usually some sort of reversion underlying stochastic generation formulas and techniques, and that ought to be consistent with what the long-term growth rate for DAC amortization ought to be. It seems to be the interpretation that I've seen in practice most of the time.

MR. JUNUS: To open it up, I'm going to ask Richard and Jay about the interaction between the SOP and the DAC methodology. I think the way the SOP reserve for GMDBs or guaranteed living benefits (GLBs) needs to be set up is that it should be funded by a percentage of the entire revenue assessments that are available in the product. The extent that your SOP reserves are going to be high is going to drag down the amount of revenue that you have to amortize your DAC. I know that a few companies that I've dealt with have had to deal with that primarily because their GMDB and GLB SOP reserves ended up being really high. Have you encountered that issue with clients?

MR. BROWNE: I'm not sure it really drags down the earnings. It may in the early periods when you're accumulating this return, but the reserve has to eventually go away. I think it's a matter of realigning the slope of your earnings and the incident

year by year, so that you're going to get different distribution of DAC amortization necessarily. Typically I think it slows it a little bit in the earlier years.

MR. STEVEN RYAN TURER: When you stochastically generate the equity or the return of the portfolio, what are you going to do about the discounting for the DAC? Do you still leave that at a fixed rate, or do you change that with the scenarios?

MR. VADIVELOO: When we do that, we use the fixed rate to discount. We stochastically generated the equity returns, but then when we're discounting the future margins we use a fixed rate. We stay consistent that way.

MR. TURER: Isn't the discounting rate inconsistent with the scenarios that you're projecting, or is it in the DAC methodology that when you discount a fixed rate it doesn't matter?

MR. MICHAEL E. DUBOIS: It's my understanding that in setting the interest rate for FAS-97, the rate that's being set for discounting purposes is not necessarily tied to the separate account returns. I believe that it may end up being tied with expected general account returns. Most of the variable annuities have it fixed in general. What Jay has described having a constant discount rate when you have variations in the separate account activity seems to be consistent, at least with what I've seen in the past.

MR. TURER: It seems consistent with when you do the DAC where you do a long-term average, you're also using a long-term average for discounting. When you're switching the equity to be scenario-based, it would seem to be consistent to switch the discount to be scenario-based.

MR. VADIVELOO: I think maybe what you're doing with the mean reversion approach is you're projecting the account values, or the profit stream, based on a mean reverted interest rate return scenario. Your discounting is still going to be using your DAC discount rate. You're not using the mean reverted DAC discount rate, right?

MR. BROWNE: Typically you're using a discount rate. Most companies are using the long-term growth rate as a discount rate and that doesn't change.

MR. VADIVELOO: When you're projecting forward your earnings, that's when you do your mean reverted rate. When you're discounting back, you're still using your long-term return.

MR. ALFRED RAWS: The question I have is at what level do you do the mean reversion? If I have a product line where I've commingled the assets by year of issue, should I have the same mean reversion assumption go forward for each issue year, and in particular, the current year where arguably I have no assets in the past to know what they've done five years back? How in the world do I use that

information? The problem comes with a company that may be selling business currently with a sales inducement in it, so that the current money coming in is being used to pay off the surrenders on all business to keep the portfolio rate that you have alive. You don't have new assets that you're buying with the new money that's coming in. How do you decide how to do that?

MR. BROWNE: If you're going to be using the same rates for different blocks of business depending on when they are issued, you need to be comfortable that the funds that they are investing in have similar characteristics. I'm saying if you have a new block of business that doesn't have any history, but you've also come up with all kinds of new funds that you don't necessarily anticipate to have the same returns, I'm not sure it makes sense to look back to history on funds.

I'm not sure how large an impact or how material that might be. I'm not aware of any companies that are doing much other than one reverted rate for all of their business on the same product type.

MR. RAWS: The response that you're giving started off with saying to look at the mix of the investment choices that are being made. If the current investment choices are substantially different than the investment choices made four or five years ago, that would argue for having a different go-forward rate.

MR. BROWNE: Yes, it could. It's certainly one consideration.

FROM THE FLOOR: It's the same with Ernst & Young. The question is let's assume that we have used 100 scenarios to calculate the DAC. We probably have 1,000 DACs. Which one should I use for financial reporting?

MR. VADIVELOO: When you go through the decision-making process, if your roll-forward DAC falls within the corridor, the low and upper bound, that's what you'll be reporting as your ending DAC. There will be no catch-up. If it falls outside, you go into your upper corridor limit or your lower corridor limit, which will be actual DAC numbers. From a reporting point of view, it's clear—you end up reporting a DAC balance, which could either be your roll-forward DAC, assuming no catch-up, no adjusted return, or it will be one of the lower upper bounds.

FROM THE FLOOR: I see. You set the upper bound and lower bound of the DAC balance at the financial reporting base, and see whether your roll-forward DAC balance is within the boundary. If it is, you report whatever the roll-forward balance is.

MR. VADIVELOO: Exactly.

FROM THE FLOOR: The other question I have is that I remember the FAS-97 saying that the discount rate should be the credit rate. Are they at issue or the

credit rate along the way? I don't quite understand your comment about the long-term growth rate. Am I missing something?

MR. JUNUS: I've used always the fixed account earned rate or credited rate. Usually that's what companies tend to use for discounting. The key thing I've always felt is once you set your discount rate, you keep it fixed. That could be linked to your long-term equity return rate or your credited rate on your general account.

MR. BROWNE: The companies are using their long-term net growth rate, which is their assumed credited rate at issue.

FROM THE FLOOR: Are you talking about the long-term growth rate of the equity or the fixed account?

MR. BROWNE: I was assuming I was only in equity when I said that.

FROM THE FLOOR: When the equity account gives you a negative return, and let's say you are not fixing it at issue, what do you do?

MR. BROWNE: I think most companies are fixing it at issue.

FROM THE FLOOR: Yes, I think the fix at issue point makes a lot more sense.

MR. BROWNE: The reason is exactly that situation. It becomes problematic to reflect your actual historic growth rates in your discount rate. That becomes problematic when you have negative growth rates.

FROM THE FLOOR: With respect to the additional liabilities, if you go through 100 scenarios you probably would have 100 different values of the additional liabilities for the GMDB or GLB or whatever that may be. Which one shall we use for your EGP?

MR. VADIVELOO: I don't fully understand. You're going to recognize all your liabilities when you do your projections, so your projected margins will reflect whatever benefits you're offering or risks you're offering. Those are the margins that you'll be using to calculate your DAC balances. Is this to calculate the SOP reserves? The SOP states that you use whatever scenarios you need to use to develop one benefit ratio, and that benefit ratio you apply to your assessments to determine your one reserve.

MR. MICHAEL P. SPARROW: I have a question for Jay about the stochastic DAC. It has to do with the K factor changing or not changing if it stays within a certain distribution. How do you adjust for how that K factor changes when new business is added to the book? It's going to have different characteristics than the in force block.

MR. VADIVELOO: Yes, I think I didn't get into detail on how you do this distribution of DAC balances. This whole test only makes sense in the aggregate. You're not creating confidence bounds by years of issue. You're combining everything together. For each projected equity return scenario—new business, old business—you have to calculate your adjusted returns for each issue year or plan of insurance and calculate your roll-forward DAC. It's all done in aggregate. Does that answer your question?

MR. SPARROW: I understood that it was an aggregate approach. I guess the detail is that every quarter that you revalue this thing, that number is going to change by some fractional amount because of the new business. Are you doing some type of weighted average where you've declined the balance of the existing book, thrown in a weight for the new book and fractionally adjusted the K factor along the way?

MR. VADIVELOO: Yes. Let's say it fell outside the corridor because if everything fell within the corridor, you'd do nothing. If it fell outside, and you have to make an adjustment to one of the corridor limits, you have to then allocate your catch-up positive or negative to your cohorts, which are your GAAP groupings. Anything reasonable and consistent would be an approach you'd use.

MR. STEPHEN J. PRESTON: I have a two-part question. I've sat in on a lot of the presentations about this topic over the years. Particularly on the mean reversion, I've never heard a theoretical justification for it. Has anybody ever attempted to justify it on theoretical grounds? My second question is now that companies have been using primarily mean reversion for the last several years, has anybody done a study as to the impact of the use of that method has, particularly with respect to stock analysts or their reaction to it? I've heard analytical comments from some and maybe more anecdotal that some stock analysts have reached the point now where they look at the method used and just make an adjustment to put everybody on the same page anyway. I'm curious whether anybody has done any kind of studies. To the extent that companies are using different methods, is that all getting ironed out anyway?

MR. VADIVELOO: Effectively being ironed out by the analyst or by the companies themselves?

MR. PRESTON: I was asking more from an analyst's perspective, but it could be from any perspective.

MR. BROWNE: I have not seen any studies of that. I've heard the same sort of anecdotal comments that you're talking about, but I'm not aware of anyone who's attempted to quantify that.

MR. VADIVELOO: The only quantification that I have come across is to justify some rationalization of the long-term mean using some historical analysis. This is similar to what some of the companies are doing with SOP right now. They can

rationalize what scenarios to use and what the long-term mean is and also come up with the caps. Other than that I think that the key point is that for better or worse, you're trying to keep to the long-term best estimate that's presented by the management, so to speak. This is one way to keep it to the long-term best estimate. What mean reversion does is dampen the effect. It is going to catch up with you sometime later on when it is going to dampen the current effect.

MR. DUBOIS: This may be somewhat of a follow up to Steve's question. Looking at the mean reversion question with regard to theoretical foundation, even looking at the stochastic with respect to the corridors, you're coming closer to the way that things act. Setting those corridors and deciding when you go out of corridor you come back to a corridor's edge as opposed to something else seem potentially to have a little questionability as to how this ties back to best estimates. We're discussing two ways of addressing the volatility issue. You mentioned that there may be others. Is it possible that one of the things that nobody is addressing is that FAS-97, with the best estimate on this type of product, encourages volatility?

MR. JUNUS: I think that's a good point that you make that FAS-97, because of the fact that you have to essentially true-up and unlock, anticipates volatility. At the same time, it's also required or asked that the assumptions be management's best-estimate representation.

MR. VADIVELOO: That's a good point because that was a question we struggled with when we first came up with this concept of stochastic DAC. I think we started with the assumption that when you're talking about equity returns, there's a range of plausible assumptions you can make for future equity returns. It's almost acknowledging that equity returns are volatile. If they are volatile, there's no such thing as one set of equity returns. The only question you can ask yourself is whether this assumption is reasonable. If you follow this chain of logic, that's how the stochastic DAC method was built. It wasn't a question of your assumption is right and my assumption is wrong. Is there a set or is there a range of assumptions that we can have using what I call the statistical methodology, which a lot of people are familiar with? In a way I think analysts would be more familiar with whether this is plausible. That's the approach we used. It's how the whole stochastic method built up.

This is in contrast to mean reversion, which is still a deterministic approach ultimately. Maybe the argument on mean reversion is how long would it be reasonable for things to catch up? You are answering a different question. We answered the question I just described.

MR. BROWNE: Quite frankly I don't think there is any theoretical justification for any of the dampening process other than our need to communicate with our bosses, our CFOs and CEOs and justify that our DAC doesn't fluctuate as much as it would otherwise. It's only a matter of time before the analysts get wise to things and understand. My real comment is I think some of the challenges that we have as

actuaries are that we may implement procedures that dampen DAC amortization or the SOP reserve amortization. However, we also have to be comfortable with volatility. We have to be able to communicate that comfort, that volatility is a fact of life—not only volatility in our company's equity price, but also volatility in the prices of other companies' equity that our policyholders are invested in. I think we're in a transition period where we're not that comfortable with volatility. Our management isn't that comfortable with volatility yet in terms of being just a fact of life. The analysts aren't that comfortable with volatility, even though they have to live with it day in and day out. They understand it conceptually, but they still give bonus points for companies who have stable growth in earnings and assets.

We're in this transition period. I don't know if it's going to be five years, 10 years or more, but we all know that volatility is a fact of life, and how we deal with that in terms of communicating with all the parties is a challenge. That's just a comment.

FROM THE FLOOR: I'll ask a little bit different question. The comments people have made are that these GAAP assumptions under FAS-97 with these products have to be best estimates. I'm not sure how senior management understood the process of this before in terms of the assumptions. Now you have the CFO and the CEO having to make certain positive assertions and taking responsibility for overall earnings. Are we having any situations where under Sarbanes-Oxley management is looking at this a little bit more closely than it did in the past? Has anybody had some experiences on this? In essence now they're making the assertion, they're validating the appropriateness of the assumption that these are best estimates. Has anybody had any experience with this?

MR. VADIVELOO: I can speak on behalf of one of the clients Deloitte had, and I know when it adopted the stochastic DAC approach, a lot of dialogue and communication went with the CEO, to make sure that he fully understood what was going on. I didn't personally, but Deloitte spent a lot of time talking with him to make sure he understood it. I believe the CFO and chief actuary were also involved in this whole thing.

MR. BROWNE: I think that's a good point, but I think maybe most companies are just to the point that they're testing their controls for Sarbanes-Oxley and so forth. I'm not sure they are to the point where the testers have addressed that issue yet, but I think it's something that's going to be a concern quickly.

MR. JUNUS: What's interesting is that in the 10-Qs and the 10-Ks, companies explicitly mentioned their assumptions for DAC and their assumptions for what kind of methodology they use to do the DAC amortization. It's out in the open. I'm assuming that the CFOs would have to be comfortable with that to be comfortable with the statements that are going out in 10-Qs and 10-Ks.
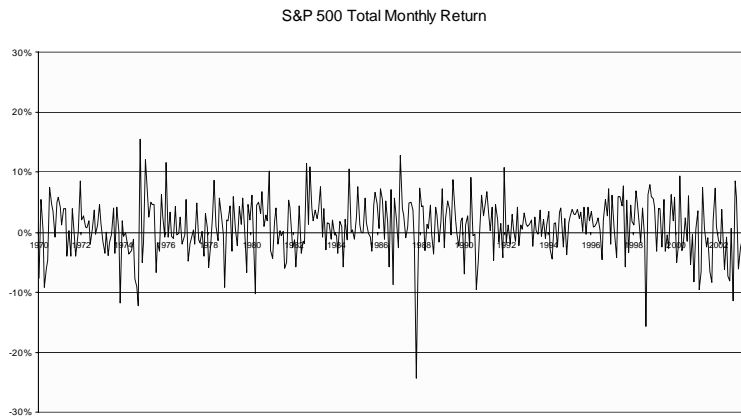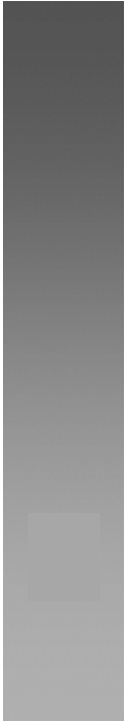
Chart 1

Return and Volatility

S&P 500 Total Monthly Return

Chart 2

Return and Volatility

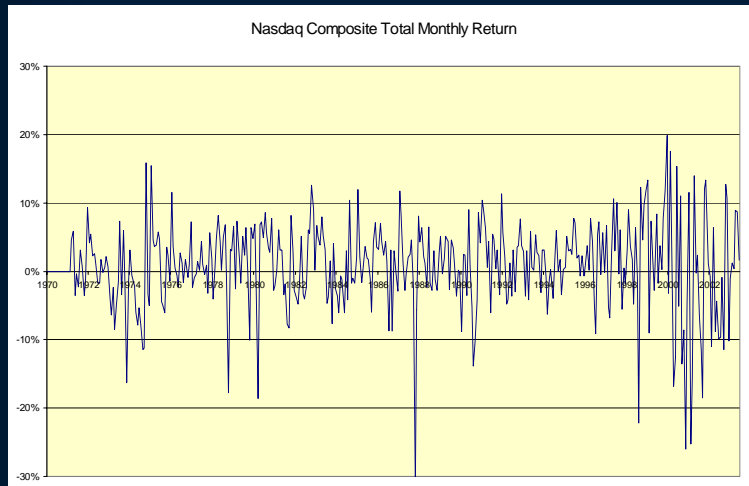Nasdaq Composite Total Monthly Return

Chart 3

Return and Volatility
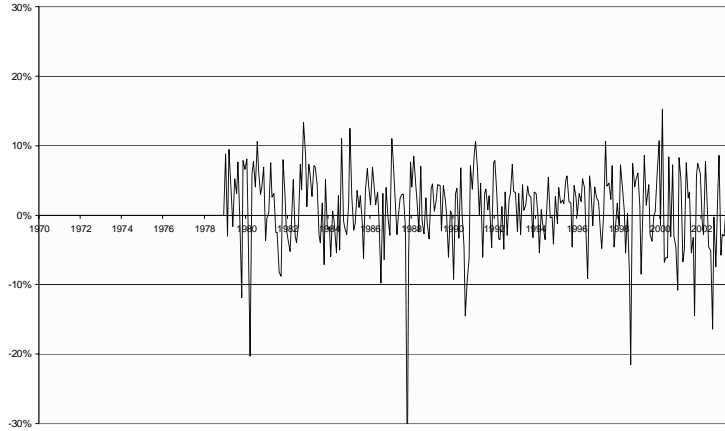
Russell 2000 Total Monthly Return

Chart 4

Return and Volatility

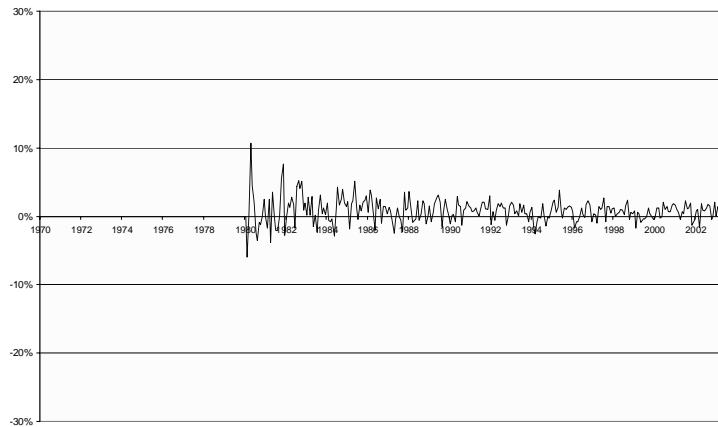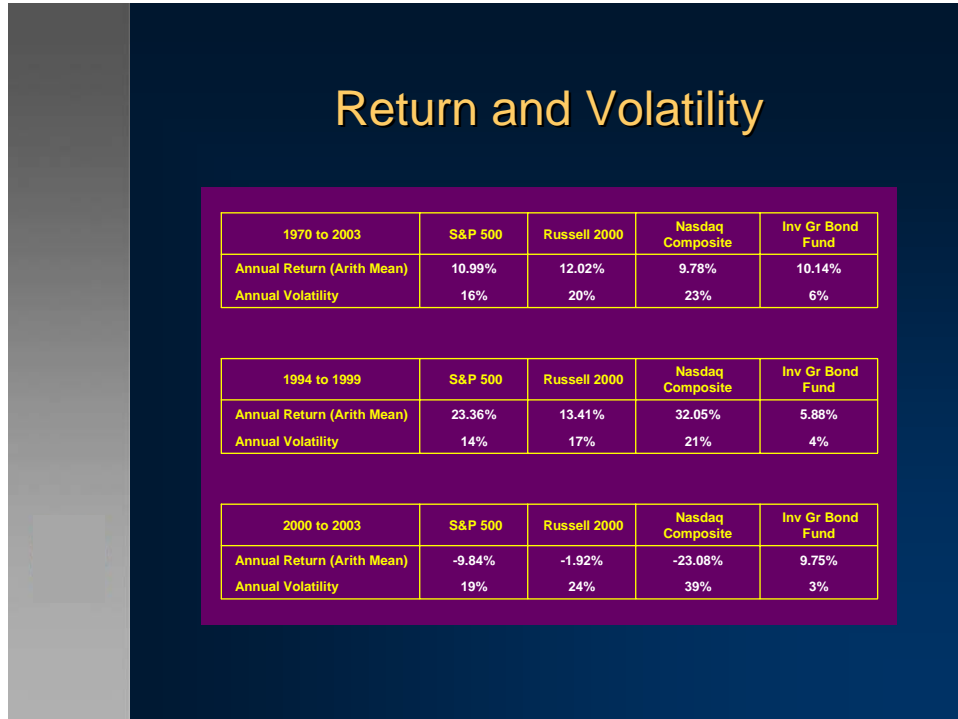### Investment Grade Bond Total Monthly Return

Chart 5

Chart 6

Simple Variable Annuity Example

Projected at Issue

	EOY Account	M&E	Expense Margins	EGP	DAC	Pre-Tax GAAP Profits
1	1,078,000	15,000	(1,000)	14,000	47,877	6,877
2	1,138,368	16,170	(975)	15,195	44,933	7,464
3	1,177,073	17,076	(951)	16,125	41,222	7,920
4	1,191,197	17,656	(927)	16,729	36,832	8,217
5	1,179,285	17,868	(904)	16,964	31,883	8,333
6	1,167,493	17,689	(881)	16,808	26,519	8,256
7	1,155,818	17,512	(859)	16,653	20,698	8,180
8	1,144,259	17,337	(838)	16,500	14,372	8,104
9	1,132,817	17,164	(817)	16,347	7,492	8,030
10	1,121,489	16,992	(796)	16,196	-	7,955

Chart 7

Simple Variable Annuity Example

Mean Reversion Used

	EOY Account	M&E	Expense Margins	EGP	True-up and Unlocking	DAC	Pre-Tax GAAP Profits
1	1,078,000	15,000	(1,000)	14,000		47,877	6,877
2	1,138,368	16,170	(975)	15,195		44,933	7,464
3	1,177,073	17,076	(951)	16,125		41,222	7,920
4	1,191,197	17,656	(927)	16,729		36,832	8,217
5	892,748	12,995	(904)	12,091	(4,400)	28,778	795
6	919,977	13,391	(881)	12,510		24,521	5,375
7	948,036	13,800	(859)	12,941		19,592	5,560
8	976,952	14,221	(838)	13,383		13,918	5,750
9	1,006,749	14,654	(817)	13,838		7,417	5,945
10	996,681	15,101	(796)	14,305		(0)	6,146

Chart 8

Simple Variable Annuity Example

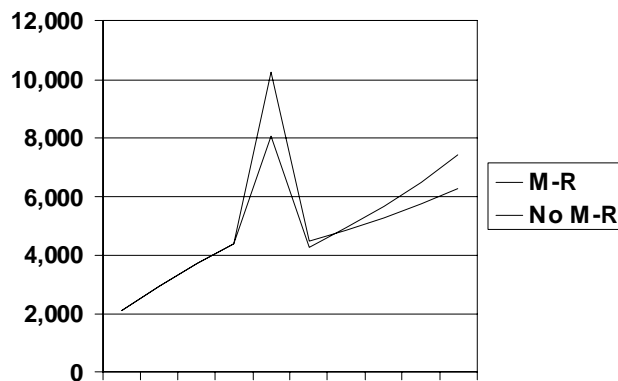## DAC Amortization: With M-R and w/o M-R

Chart 9

Simple Variable Annuity Example

Comparison of Profits: With M-R and w/o M-R