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The Cost of Capital—Everything an Actuary Needs to Know

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Summary: This panel covers the determination and use of the cost of capital for both stock and mutual companies. Topics covered include:

- *How to measure the cost of capital*
- *Use of cost of capital in choosing among options or setting an enterprise's direction*
- *Should different costs of capital be used for different purposes?*
- *Options for financing and the effect on cost*
- *Maximizing return by proper mix of options*
- *Example of an acquisition*
- *Appropriate amount of capital*
- *International perspective*

Mr. Michael V. Eckman: Francis de Regnaucourt works for Ernst and Young. He's a senior consulting actuary in the New York office. He has six years of experience in a bond rating agency, is a Chartered Financial Analyst, a Fellow of the CIA, and a self-described retired Canadian and actuary.

I am the appointed actuary with ReliaStar Financial Corporation in Minneapolis. I have some experience in product pricing, valuation, and acquisitions. I will be focusing on the use and measurement of cost of capital in a stock life insurance and holding company.

First, I will give my working definition of the cost of capital. Cost of capital is the burden a product, strategy, or enterprise must bear in order to hold required capital sufficient for risks assumed. Alternatively, I consider it the additional income a product, strategy, or enterprise must earn in order to bring the ROI up to the level required by investors.

As I will illustrate, this cost or burden can be expressed in many ways in the various tests and procedures we perform to determine the profitability of a product, strategy, or enterprise. Often, the cost of capital will be expressed in the form of an interest rate. I have used a hypothetical balance sheet to calculate the cost of capital for an enterprise (Table 1). The cost of capital is the weighted average of the after-tax interest rates for debt and, in my example, Tier One Preferred Shares (TOPrS) and the cost of common equity. The debt, TOPrS, and equity make up the required capital that support the enterprise. If the products that the company issues do not at least earn enough profit to offset this cost, value will be destroyed.

TABLE 1
CALCULATION OF COST TO CAPITAL FROM THE BALANCE SHEET

| Weighted Cost of Capital | | | |
|---------------------------------|---------------|---------------|------------------------|
| | Amount | Weight | Cost of Capital |
| Long-Term Debt | 600 | 21% | 4.1% |
| TOPrS | 300 | 10 | 5.2 |
| Common Equity (excl FAS 115) | 2,000 | 69 | 12.0 |
| Total Long-Term Capital | 2,900 | 100 | 9.7 |

The interest rates for debt and TOPrS can be determined from the terms of the indebtedness. For the equity, however, there is no such simple source as the terms of indebtedness. For this item, an additional calculation and some judgment are required.

Table 2 shows a calculation of the cost of equity using the Capital Asset Pricing Model (CAPM) approach. In this approach, the cost of equity is the risk-free rate plus a multiple of the difference between the long-term equity return expectation and the risk-free rate. The multiple is called Beta and represents the relative volatility of the enterprise to the long-term market return. In this example, Beta is assumed to be 1.2. We expect the enterprise's return to be 20% more volatile than the market as a whole. This calculation produces the 12% cost I used in the previous table. Of course, there is some judgment in the determination of the long-term equity return. Would a reasonable number now be in the high teens or even 20% because of the returns in the market over the last few years?

TABLE 2
CALCULATION OF COST OF CAPITAL
FROM THE BALANCE SHEET

| Cost of Equity (CAPM) | |
|------------------------------|------|
| Risk-Free Rate | 4.4% |
| Long-Term S&P Equity Returns | 10.7 |
| Risk Premium | 6.4 |
| Beta | 1.2 |
| Cost of Equity (CAPM) | 12.0 |

An alternative calculation for the cost of equity uses the enterprise's dividend rate and dividend growth rate (Table 3). In this calculation, the dividend projected for

next year is divided by a stock price to produce a dividend rate. This dividend rate is added to the growth rate to produce the cost of equity. The logic is that the shareholders will expect the dividend and growth rate of the underlying stock to total 11.98%.

TABLE 3
CALCULATION OF COST OF CAPITAL
FROM THE BALANCE SHEET

| Cost of Equity (Constant Growth) | |
|---|---------|
| Dividend Rate | \$0.90 |
| 1 + Growth Rate | 1.10 |
| Dividend (t+1) | .99 |
| 3-Month Avg Stock Price | \$50.00 |
| Subtotal | 1.98 % |
| Growth Rate | 10.00 % |
| Cost of Equity (Constant Growth) | 11.98 % |

A refinement of the constant growth method is to calculate the cost of new equity. The calculation is the same with the added fact that if you issue new equity at, for example, \$50 per share, you will receive something less than \$50 because of the flotation cost. The shareholder will require the same return on his or her \$50 even though he or she may receive only \$47 after flotation cost. The return required on new equity in this example may grow to 12.08%.

In a perfect world (that is, no tax) there is no difference between the cost of debt and equity. Ours is not a perfect world. The tax laws favor debt, as the cost of debt is a deductible expense. As we saw in the calculation of cost of capital from the balance sheet, debt apparently costs less than equity. To the extent an enterprise can use debt instead of equity to finance its operations, it can take advantage of leverage. That is, for a given amount of earnings, the return on shareholder equity will be higher than if the enterprise was funded 100% with equity. As debt increases, I believe that investors should require a higher return. By requiring a higher return, they would bring the cost of debt closer to the cost of equity. I will talk more on this point later.

When to use the cost of debt or equity is a question of how far down leverage should be pushed. As noted above, using leverage would enable an enterprise or product to have lower earnings and provide the same return. We should ask what does the market require? What are peer companies and competitors offering? In the end, I believe that the cost of equity should probably be used for judging any proposals.

One way to use the cost of capital as calculated above is as the hurdle rate. The hurdle rate is the rate at which an investor is indifferent to making a further investment. It can also be considered the opportunity cost and the return at which a company treads water. The hurdle rate can be different from the performance target, where the performance target represents the profit objective of the

enterprise. The enterprise in my first example that had a cost of capital of 12% would view an investment returning 12% with some indifference. At 12%, it would at least be the case that equity would not be destroyed. The performance target, however, might be 14%, so that value is actually created.

Another way to approach the cost of capital is to determine the amount of capital that is required to support a product. My company considers two required capital formulas. Our internal formula is tailored to our company and its perception of risks. We have separate C-1, C-2, C-3, and C-4 factors that vary by product. The external formulas are tailored to ease of calculation and general applicability. We recognize that despite our analysis and faith in our internal formula, we have to hold required capital that is specified by the external rating agencies and regulatory authorities. Therefore, we use our internal formula multiplied by a rating adjustment factor to bring the total capital up to the externally required level. In effect, the external formula determines the total amount of required capital and the internal formula is used to allocate it by product. We recognize the shortcomings of this approach.

The external requirements and rating adjustment factor, like the one that we use, may cause an enterprise to pass up an appropriate opportunity. An enterprise may feel that based on its internal formula, a certain level of capital is required for a product and see that the profit on the product is sufficient to produce an adequate return at that level of capital. If the required capital is increased to the level specified by the external requirements, the return decreases and the actions to increase the profits of the product may make it less desirable in the marketplace.

The external requirements and rating adjustment factor, like the one that we use, may cause dissension in an enterprise as one business unit bears part of the cost of capital of another business unit. For example, if the rating adjustment factor to ensure an A+ rating is 1.3, every business unit's required capital would be 130% of the internal formula. The business unit that, for one reason or another, does not need the A+ rating will object to the additional burden. One solution is to vary the rating adjustment factor by business unit with the largest burden being carried by those units desiring the high rating.

Once an enterprise establishes its performance target (which may or may not be its hurdle rate) and its level of required capital, it is ready to calculate the return on the various options under consideration. The process is a standard pricing procedure in which we set assumptions, calculate the required capital, project profits and distributable earnings, and calculate the ROI or the internal rate of return (IRR). We can then compare the result to the performance measure and the results of other options and make a decision as to where to invest our surplus.

My first example is an acquisition (Table 4). I first look at the target as is and then add the impact of additional sales, expense savings, and other actions. In order to determine if the target meets or exceeds our performance measure, I will calculate the actuarial appraisal value of the target at various discount rates. The cost of capital in my example is presented as the required capital at acquisition less the

present value of the change in required capital and less after-tax interest earned on required capital.

**TABLE 4
ACQUISITION EXAMPLE**

| | Present Value AFIT | | | |
|--|--------------------|-------|-------|-------|
| | 8% | 10% | 12% | 14% |
| Existing Business (in millions) | | | | |
| Value Before Cost of Capital | \$190 | \$175 | \$165 | \$155 |
| Cost of Capital | (20) | (30) | (35) | (40) |
| Value After Cost of Capital | 170 | 145 | 130 | 115 |
| New Business | | | | |
| Value Before Cost of Capital | 125 | 80 | 50 | 30 |
| Cost of Capital | (40) | (45) | (50) | (55) |
| Value After Cost of Capital | 85 | 35 | 0 | (25) |
| Expense Savings | 12 | 10 | 9 | 8 |
| Total | 267 | 190 | 139 | 98 |

Assume that we are considering a \$150 million purchase price for this target. Based on the value of existing surplus in the target and the value of exiting business, the ROI would be about 9.6%. Note that the present value of the target after federal income tax is \$145 million at 10% and \$170 million at 8%. The cost of capital at 10% is \$30 million. This means that the amount of required capital at acquisition less the present value at 10% of the projected change in required capital and the projected after-tax interest earned on required capital is \$30 million.

Now assume that we can use target to increase the sales of our own products, and we can finance additional sales of a target's products. The results show that the new business returns 12%. The present value of the new business after cost of capital is zero at the 12% discount rate. Finally, we identify expense savings after transition costs that further increase the value of the target.

Based on these assumptions and the resulting calculations, the return on the \$150 million is now about 11.6%. If the 11.6% meets or exceeds our performance measure, we can decide to proceed with the acquisition. If the result falls short of the performance measure, we will have to consider additional changes that will increase the value of target.

My next example is the pricing of a new product (Table 5). I will calculate the ROI based on distributable earnings. Required capital is a factor in the calculation of distributable earnings as distributable earnings are the after-tax statutory book profits plus the after-tax investment income on required capital plus required capital returned (less required capital consumed). Normally, the product will consume capital in its early years and return it in its later years. If the ROI meets or exceeds our performance measure, we can choose to proceed.

TABLE 5
NEW BUSINESS PRICING

| Deterministic Results: | Expense Levels | | |
|------------------------|----------------|---------|--------|
| | Marginal | Pricing | Actual |
| ROI | 13.20% | 11.76% | 9.84% |
| Break-Even Year | 3 | 3 | 3 |
| FY Strain/FY Prem | 4.55% | 4.74% | 4.96% |
| Stochastic Median ROI | | 10.92 | |

I consider results for this single premium deferred annuity based on both deterministic and stochastic interest rate scenarios. In addition, I consider three expense assumptions. Our pricing expenses in the example are lower than the actual expenses. Even though the product shows an 11.76% ROI, management should not expect to see this high of a result immediately. If we could issue the product allocating it only marginal expenses, the return would be higher. The stochastic mean ROI reminds us that the actual results will vary from the deterministic results because of the interest rates varying from the deterministic assumption. I also show two other measures: break-even year and first-year strain to first-year premium to show that the product will be consuming surplus for a period of time after issue.

In the pricing process, we can use sensitivity tests to determine what a change in assumption or contract characteristic would have on the ROI. For example, an additional 1% commission may cost (that is decrease the ROI) by 20 basis points. We can use this information in the product development process to determine the trade-off between product and assumption changes and profitability.

One interesting question is, what is the cost of investing surplus in equities in order to seed separate accounts to be used for the enterprise's own variable products? If we are able to collect the mortality and expense (M&E) charges from the variable product and also collect the mutual fund management fees, we will have a more profitable package. Until the new mutual funds reach critical mass, however, we will have to use some of our own surplus to seed them. What should we charge the new product for this seed money?

The first result of investing the seed money is an increase in required capital (Table 6). I have assumed that we move the capital from a sleepy bond with a low 30-basis-point-required-capital factor to invest in equities with a 36% required capital factor. The other assumptions are shown, including the assumption that the separate account will return 10% before tax while the bond will return 6.5% before tax.

TABLE 6
SEEDING SEPARATE ACCOUNTS

| ASSUMPTIONS | | |
|----------------------|------------------|-------|
| Required AFIT return | | 14.0% |
| Assumed BFIT return | General Account | 6.5 |
| | Separate Account | 10.0 |
| Required Capital | General Account | 0.3 |
| | Separate Account | 36.0 |
| Tax Rate | | 35.0 |

The next calculation tries to estimate the lost opportunity cost expressed as a percentage of the seed money invested (Table 7). We require a 14% return on the seed money invested in the separate account. In addition, we require a 14% return on the additional required capital (the 35.7% equal to the 36% less the 30 basis points already held on the sleepy bond). We assume a 10% before income tax (BFIT) return on the seed money in the mutual fund and a 6.5% BFIT return on the additional required capital. The right-hand column shows the return as a percentage of the seed money. We require a 19% return and expect an 8% return. The difference of 11% has to be made up by the product.

TABLE 7
SEEDING SEPARATE ACCOUNTS

| COST CALCULATION | | | |
|---|---------------------|------------------------|---------------------|
| | Assets as % Seed | After-Tax Return as | Return as % Seed |
| Required on Seed | 100.0% | 14.0% | 14.0% |
| Required on Required Capital | 35.7 | 14.0 | 5.0 |
| Assumed on Seed | 100.0 | 6.5 | 6.5 |
| Assumed on Required Capital | 35.7 | 4.2 | 1.5 |
| Net AFIT Annual Cost as a Percentage of Seed Money | | | 11.0 |

In the end, the new product should be charged somewhere between zero and 11% per year of the seed money, depending upon how available or possible the alternative 14% return is.

There have been questions and criticisms about the use of cost of capital, ROI, IRR, and CAPM in making business decisions, especially decisions whether or not to acquire another company. As I will point out, these questions and criticisms do not prove that these tools are not valid, only that they are not the one and only answer.

CAPM is best suited for constructing a portfolio and not making a single buy/sell decision. Since Beta assumes a portfolio, it is not good for pricing an individual company. For example, the target company might be doing so poorly that its stock performance is unrelated to the market's performance. In that case, the target company's Beta might be very low. A check on Beta would be the premium

of a call option on the target's stock. The more volatile the stock, the higher the premium. In this case, translating the premium into an annual rate would produce a better estimate of the cost of capital.

We have read and heard of managers who state that they would not even consider a proposal that returned less than $x\%$. Should the hurdle rate or performance measure vary with market interest rates? I believe they should, and by fixing on the $x\%$, the managers may be doing their shareholders a disservice. When Aegon purchased Transamerica, it said it was expecting a 9% return on the acquisition. This was below its once proclaimed performance measure of 11%. Since interest rates had fallen and equity values had increased, Aegon was enjoying a lower cost of capital than when it required 11%.

When we look at the effect of discounting values over a long period of time, we can ask whether hurdle rates and performance measures should vary with investment horizons. The purchase of Manhattan Island for \$24 seems like a steal. If, however, you calculate the ROI over 373 years, the rate of return may not be too impressive if we have hurdle rates in the double digits. Likewise, discounting a benefit that will be experienced far in the future at a rate as low as 7% may give a ridiculously low cost. Despite the low cost, we may not want to pay it or make the investment. First, we may feel very uncertain about the distant future and whether the state of the world, much less our business, will be similar to today. Second, we might fear that even if we pay the cost now, someone may plunder the fund along the way. These uncertainties may lead us to using a very low rate, and this would increase the current cost. Choosing the correct discount rate is very difficult, but choosing the assumptions is just as hard. I am reminded of the Dilbert cartoon in which the boss tells Dogbert that "the only way to make decisions is to pull numbers out of the air, call them 'assumptions,' and calculate the net present value. Of course, you have to use the right discount rate, otherwise it's meaningless."

All of these methods reward the use of debt despite its risks, especially the risk of deflation. Although the use of debt and the resulting leverage may make returns look large, the enterprise is betting on the fact that it will pay back the debt with cheaper dollars. To the extent interest rates remain low, and there is little inflation and possibly deflation, paying back the debt may be more expensive.

The return on capital can be manipulated by share repurchase programs. Currently, companies are buying their own stock in an increasing market environment. As they do, a measure such as earnings per share increases. In fact, the number will increase even if profits do not increase. All that a company needs to do is reduce the denominator. Often, these buybacks are funded by debt. As I argued before, this may just increase the riskiness of the company.

In particular, stock options have encouraged management to initiate buybacks of stock. Just buying the stock makes the options more valuable. Management does not even have to improve the profitability of the company to get a benefit from the options.

In addition to the measures we have discussed, we can use others to validate the conclusions and give us another viewpoint on the acceptability of a proposal.

Present value (PV) profit/PV premium has been used in the past to measure the profitability of traditional insurance products. In the case of a product that has a very low required capital, this measure would help to indicate whether there is any real profit in the product. With a very low capital amount, a product can produce high "return" but little contribution to the bottom line.

Return on assets (ROA) and the PV profit/PV liabilities and required capital are good methods to test the profitability of asset accumulation products. Just how much of the interest spread, M&E charge, or mutual fund fee does fall to the bottom line? The ROI or IRR may look fine, but how much has to be sold to make a difference to the enterprise?

Economic value added has been touted by some and criticized by others. If you read *Fortune* magazine regularly, you may conclude it is the only measure the editors believe in. For all of its virtues, it suffers most from the necessity of keeping yet another set of books (in addition to statutory, GAAP, tax, and possibly management). This set of books is not even given much credence by the outside world.

GAAP earnings and ROE are valuable because they are what most of the outside world uses to measure our success. They definitely have a short-term focus and can lead management to short-term thinking, rash decisions, and even ill-advised acts. On the other hand, if we relied on only the ROI or IRR measures to determine whether or not to make an acquisition, we would probably pass on most. Once all the arithmetic is done, the ROI may appear to be lower than we would like, but the GAAP impact may be positive.

The best I can say is do not use cost of capital alone. Take the reported profits into account as well as profit related to premiums and assets. Even used correctly, cost of capital is just one tool among many.

Jack Welch, the CEO of General Electric, is credited with teaching his subordinates that business presents no easy answers, just a succession of suboptimal solutions that must be worked at, rethought, and worked at again. Cost of capital is just one of those steps in the thinking and working.

Mr. Francis de Regnaucourt: When Mike and I were planning this session, I decided to present in the usual Monty Python tradition something completely different: the DuPont method of equity analysis. Actually, it's not all that different. As I listened to Mike's speech, I noticed that he led into it a number of times. He said you can increase returns by adding more debt. He said margins are the form of profitability.

The DuPont method is a technique used in equity analysis to look at the components of ROE. I am going to focus on ROE only. Those of you who are already with stock companies know the importance of equity, and those of you

who are demutualizing are going to learn its importance quickly. The DuPont analysis concerns itself with ROE, and you'll see how returns on debt play into it as well.

The name DuPont tells you that the technique is geared for an industrial company. Because of this, I am going to ask you to bear with me at least for the first half of the presentation. We're going to talk about some terms that don't make a lot of sense in life insurance. Assets are quite different for an industrial company than for a life insurance company. Also, a different definition of assets applies if you're a retailer and you sell groceries or clothing. The challenge I have, and what I hope to do in the second half, is show you how this can fit into the life insurance industry and the financial services industry in general, and how you can draw some insights from it.

We start with the actual formula which breaks down into five components. The first component segregates the tax rate. The next two components are different kinds of leverage that you can operate in different ways. You operate the levers, to use the euphemism. The final one is profit margin. I think we all agree it makes sense that profit margins have something to say in your ROE. The fourth one is the one that's my challenge, and that's turnover. We're going to talk about turnover a lot, but, for now, consider it sales and growth. That's the closest fit to life insurance that I can give you.

This is a group of actuaries. We can't go through with a formula like this without going through the algebra. Hopefully, it'll give you some insight into what's meant by the formula. ROE, something you've probably all learned, is the after-tax net income divided by the equity. First thing to do is to remove the taxes from the formula; now you're looking at your pre-tax net income in proportion to equity. You move forward; now we're going to look at the after-tax net income that is not in proportion to equity but in proportion to capital. When you're doing risk-based capital (RBC), it's total capital that you look at. The final factor takes capital divided by equity, one of the forms of leverage we call financial leverage.

You keep moving forward, and restate the ratios to bring in assets. Even though it is a little tougher, I want you to look at the second term, pre-tax net income to assets. Some of you will recognize this from the annuity business as ROA. In fact, we could stop right here and say that the DuPont formula has four factors to it: one that measures ROA, two that measure leverage, and one that measures taxation. When we look at how this fits in life insurance, I'm going to come back to this analogy.

For completeness sake, I'm going to give you the whole formula. First, there is one minus the tax rate. That's pretty easy. You're reflecting how much you paid in taxes. Pre-tax net income to sales is your profit margin. Profit margins mean something different in insurance. If we were selling cars, tables, or, for that matter, petrochemicals, we'd be finished after we had made the sale. We would know how much it'd cost us to produce the goods. We'd know how much we sold them for. Except for the possibility of a couple of lawsuits and some sundry returns, we would know how much money we made. In life insurance, when you make a sale,

you spend some money on commissions, you spend some money on getting the policy on your administrative systems, and you wait to see if and when the profits come in.

A review of the four terms shows that the third term is sales to assets. Now, this is where we're going to have to talk about the industrial concern. If you're DuPont, in particular, or if you're a manufacturer, your assets are your plants. There is maybe a little bit of work in progress, a little bit of raw materials, but by and large it's your plants. In this case, sales to assets are really the throughput of how many sales you can put through for every dollar you invested in plants. If you're a retailer, like a grocery store, your assets are your inventory and your premises, warehouses, and stores. Once again, a part of how efficient you are is what level of sales you can put through with a given number of stores and warehouses. Throughput might be the best word to describe this term. As you can see, it's going to be tough to find an analogy for it within the life insurance industry.

Then look at assets to capital. This is how you invest your capital in business-producing assets. Now, you're a manufacturer again. You have \$100 million of capital. You're not a very big manufacturer. You can play this one of two ways. You can buy \$50 million worth of plants and then keep \$50 million in the bank just sitting there doing nothing. Does that sound familiar? Capital is sitting doing nothing? That's one where you haven't fully or efficiently utilized your capital. If you could be using those plants and turning out profits, you're sort of wasting capital. If, on the other hand, those plants turn out to be total losers, you were probably wise to set aside \$50 million and reinvest them in some plants that might produce more profits in the future. This is what they call operating leverage.

Now we're going to go through the terms one at a time. The first one is *profit margin*. *Financial leverage* can be looked at in a couple of ways. I'll give you a very simple analogy. Has anyone ever bought stock on margin? If you buy stock on margin, you buy \$2,000 worth of securities, you only have to put up \$1,000, and your broker lends you \$1,000. Your capital is \$2,000; you have \$1,000 of debt and \$1,000 of equity. Say your stock makes 20%. Your \$2,000 has become \$2,400. Remember that you invested only \$1,000. You made a \$400 return, which is 40%. You have twice the return you otherwise would have, and, if you notice, your financial leverage and your debt plus equity to your equity of \$1,000 is 2 times. These are just straight multipliers of risk.

If you're making money on your business and you can leverage up further, you'll make much more money with the same amount of investment, but it does go the other way. Rating agencies look at this a great deal. What if your stock loses 20%? You've managed to lose 40% on your cash-on-cash investment. Leverage is, in effect, a multiplier. Leverage is not good. Leverage is not bad. If your business does well, you're going to do better by having leverage. If your business does badly, you're going to do worse by having leverage.

We're back to our operating leverage. Maybe I can give you another investment analogy. Now you have \$10,000 to invest. You can be conservative and say I'm going to put \$5,000 in equity and keep \$5,000 in cash because I don't know how

equities are going to do. You can say, "I'm going to go to the hilt and \$10,000 goes straight into the equity fund." With a high-growth, high-risk equity fund, it's the usual choice. If equities do well, you were better to leverage to the hilt and get the maximum benefit from the good returns. This is how operating leverage works.

Turnover is sales to assets. We've already talked about it a little bit. I'm going to give you a couple of analogies that can be done in life insurance when we get to that part. Let's work from the back of the formula. There is your efficiency in producing this business at a low cost. That's really what's reflected by your profit margin. Your turnover is your efficiency in using your business-producing assets and getting as much business out of them as you can. It might be a field force. Your assets might be a field force, home-office overhead, a computer system, or a subsidiary you bought for purposes of selling a different product. Still, moving backwards, your operating leverage is your efficiency in using the capital that you have to get as many business-producing assets as possible. Once again, you could spend it on field forces, on new product development, or on growth. The second term is your efficiency in using your equity and leveraging up to get as much capital as is wise in the circumstances that can then be leveraged into other things. Finally, the first term is your efficiency in keeping the tax man away from the door.

The last two factors, turnover, which refers to sales and growth, and profit margin, really reflect the fundamentals of your financial institution and of your production operation. They reflect your products and your systems—things that probably took a long time to build up. Mike touched on the second two factors, financial leverage and operating leverage. You want to increase financial leverage and buy back some stock. It has nothing to do with you. It has nothing to do with your people. You bring in an investment banker, have him or her buy back some stock to just change the financial leverage.

Operating leverage is a little bit more difficult, but one good acquisition could change it. If you're building plants, you can go out and buy a plant. Taxation is separate from the other factors. I'm probably overestimating the ease of the effort because in life insurance, products and taxation go hand-in-hand. You can go outside and get yourself a tax expert who can change your tax rate, re-file for past years, and change your ROEs after the fact. They range from the most exogenous to your business to the last two, which really are the most intrinsic or inherent to your business. This makes a difference in the weight equity analysts apply to the factors.

My presentation so far has been general: What is the formula and what are its components? Let's see if we can find some ways of fitting this to financial institutions. The first one I consider is a bank, and if you have a pure annuity company you might as well have a bank. It's a different licensing, and you have a different way of selling, but at the end of the day it's the same thing. I've given you a hint of this part of it before when we looked at the four-part formula and said we could have stopped here. Banks measure their raw operating margins as just ROA. It's the margin they make between what they invest at and what they borrow at. It is what they pay their depositors and what they charge to their borrowers. The

other three factors remain unchanged. If you have a pure annuity company, you can probably look at it this way.

What if you had a pure insurance company? By pure insurance I mean a property and casualty (P&C) company, a business where everything is YRT. It would also have a pretty good DuPont formula, except some of the definitions are different. Financial leverage is the same. However, when P&Cs consider operating leverage, they consider premiums to capital. Given a certain amount of capital, how much business can you put through? Three times capital is getting on the high side. One times capital is very unleveraged or very conservative. The rating agencies judge P&Cs using this kind of leverage just as they looked at life companies with their RBC. Of course, from where P&C companies sit, profit margins seem rather nicely defined. It's not even present value of profits to present value of premiums because the business is done on a YRT basis. It's profits to premiums. When you're looking at pure insurance, you have a natural DuPont formula breakup. In real life most of our companies are neither one nor the other. They are a hybrid, like Jack Welch said. There's no easy answer and there are a lot of pretty suboptimal ways to look at this.

Tax and financial leverage are the same if you're looking at an insurance company, an insurance holding company, or an industrial company. One word of caution is that really for most of what I've been looking at, especially the ROAs, we're really talking GAAP methodology. Statutory accounting might be an oxymoron. Statutory has a purpose, and it's to look at solvency for purposes of regulators. Statutory accounting really doesn't fit very well in this analysis. Moreover, if you're going to do like Canadians and put in a lot of provisions for adverse deviation (PADs) up-front and release them over time and manage the earnings, this formula isn't going to work very well. Finally, what do you do for this problem of turnover in life insurance companies? The best suggestion I have for you is to look at companies' growth. How much new premium, given a certain level of assets, can the companies accept?

Finally, you might ask, "This is all very well and good, but what do you do with this?" I'll tell you what equity analysts do with it. There are no particular set patterns on how they want to see the breakdown, but they can compare companies. You have two companies, A and B. A has a good ROE, and B has a rather poor ROE. A and B pay the same tax rates and have the same operating leverage. You analyze the companies and find out that A just has a great deal more financial leverage than B. If B would just be smart enough to buy back some shares and get its leverage up, it could show the same type of return. You could use the method to identify a management opportunity. You buy the company, oust the management, get somebody in there that gets better leverage, and raise your ROEs. Alternatively, you may find that B is right in line with industry averages, barely hanging onto its AA3 rating, whereas company A is leveraged to the hilt and about to go down like a house of cards. Then you've learned something about company A by looking into the analysis, although at first blush it could have looked rather attractive by a straight ROE analysis. I would say the biggest use of the DuPont analysis by equity analysts is actually to look at differences between

companies, to look at the factors that are inherent to the business, and to identify those companies that can be easily fixed.

The DuPont Analysis does identify what the components of ROE are. For somebody who hasn't looked at this before, it can be useful information to help them understand their own businesses. Finally, if you have an action in mind, a purchase of a new business, a change in the capital structure (I bet your investment bankers are always in there suggesting that to you) you can see fairly quickly which of the factors is affected by it and what effect it has.

That was a very elementary introduction to the DuPont formula, but I suggest to you that looking at this will give you a bit more insight into how the production of capital goes on in your companies.

Mr. Peter L. Hutchings: I have what is part question and part comment on the first presentation. Let's look specifically at the charge for tying up money in a seed money situation. It's interesting. If you step back from the details, before the seed money was required, the company had its assets in bonds earning 6.5% before-tax. The business unit then forced the company against its will perhaps to reinvest in assets earning 10% before tax, and, because of this, the business unit was then forced to pay a penalty based on the calculations we have before us. You would think that they should have been rewarded. What brought this about? The straightforward approach to these problems takes a little pinch of statutory accounting and mixes it in with more modern thinking and produces unusual results like this. In this case, you can see from the exhibit where that pinch comes from. It comes from assuming that a bond portfolio, which is valued at book and might have illiquid private placements, only needs zero-point-something percent of capital. On the other hand, a common stock portfolio, which can be sold in a matter of days, needs 30-something percent. In effect, in this anomalous outcome, the business unit is pulling the insurer by the nose into improving its return by 350 basis points. Then it gets hit for it because of mixing in the leftover statutory accounting that sits under RBC and the more modern thinking that we're all trying to bring to bear. It may be that the RBC produces plausible results in the aggregate for the typical insurance company, but if we assume that the components of required capital are reliable, then we can produce results of this sort. When you step back from the worksheet it is a little bit backwards, at least in my view. That's seven parts comment and one part question, but I offer it up in the interest of not letting this wonderful session end early.

Mr. Eckman: I too was surprised at the results. A possible solution would be to try to give the business unit some kind of credit, so to speak, for increasing the return, if, in fact, it does increase. That 10% is assumed to come with some risk.

I mentioned our target surplus formula and our efforts to make it fit two requirements: internally what we felt the real risk was and externally what we knew was going to be required. Have other companies faced that issue and come up with any different solutions?

Mr. de Regnaucourt: The solutions I have seen are not much different. In a very heavily regulated industry, people look very much at what the regulator wants, and that's RBC. In one where ratings have a lot to do with sales, or at least companies believe it does, they tend to look very much at the rating agency formulas. The rating agencies don't all have the same formulas, and the regulatory formula is different again, which really causes some confusion. Most companies have been able, the way Mike has described, to set what they consider the right benchmark for themselves.