

# The Great MOCE Debate

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**M**OCE is an abbreviation of “margin over current estimate.” The great MOCE debate is over whether the measurement of insurance contract liabilities for financial reporting purposes should include a MOCE and, if so, how that MOCE should be calculated. This debate has occurred in many contexts in recent years as the accounting treatment of insurance has been evolving. One current context is in connection with ICS 2.0, the international capital standard that the International Association of Insurance Supervisors (IAIS) is developing.

In this article, I argue that a MOCE should be included in the estimate of insurance liabilities for accounting purposes and that the cost of capital should be the basis of the MOCE. The major alternatives are that either MOCE should not be included or that it should be calculated using what is called a “prudence” approach, based on a probability level or conditional tail expectation (CTE).

The first section of this article explains how the cost-of-capital concept is fundamental to the financial framework of the insurance business. It is at the very root of the insurance business model.

The second section focuses on financial reporting, arguing that if measurement of earnings is to be consistent with the business model, then the cost of capital should play a role in that measurement.

Where financial reporting is concerned, there are historical precedents and practical considerations to consider. Those are addressed at the end of this article, where it is shown that the cost-of-capital concept for MOCE explains some important

historical precedents, provides a consistent approach to many issues under current debate, and that practical considerations involved with its application can be easily addressed.

## FINANCIAL FOUNDATIONS OF THE INSURANCE BUSINESS

Insurance is by nature a risk-management business. An insurance company must maintain capital to draw upon in the event of adverse claims experience. Insurers try to grow and diversify in order to reduce the likelihood and magnitude of adverse experience, but that possibility cannot be eliminated. So, insurers must have capital and must have investors to supply that capital and allow it to be put at risk. Investors expect a return higher than the risk-free rate on the capital they provide. The extra return, or risk premium, is the cost of capital. It is the product of the amount of capital required and the size of the risk return spread that investors demand. The cost of capital is recovered by charging the customers more than the expected cost of claims and related expenses. To attract capital from investors, insurers charge premiums that include a profit margin that at least covers the cost of capital.

An insurance company must be able to attract and retain capital from investors to remain viable. Therefore, the cost of capital is a required cost of doing business. Viewing it as a cost may seem to be at odds with the accounting treatment where the cost of capital is part of what is presented as profit or earnings. Nevertheless, in this article, I will take the conceptual view that the cost of capital is a required cost of doing business because it is a fundamental part of the economic business model for insurance.

## THE ACCOUNTING FRAMEWORK AND MEASUREMENT OF EARNINGS

An accounting framework is used to report an insurer’s financial condition, including net earnings and the amount of capital held. Premiums and investment returns are the main income items, while claims and expenses are the main disbursements. The balance sheet includes mainly invested assets on one side, while the other side must be divided between liabilities and capital.

Liabilities arise because premiums are normally paid before claims are paid. In the interim between premium payment and claim payment, there is a liability for the future payment of the claim. The question at hand is what should be included in the liability. Certainly, future claim payments should be included. Most actuaries agree that future policy-related expenses should be included. I suggest that the cost of capital should be included, since it is a required cost of doing business. Let’s examine why this makes sense, focusing on the emergence of earnings with an accounting framework.



If the premium for a new insurance contract is paid at the end of a reporting period, any excess of the premium payment over the liability that is set up is recognized as income immediately. In later periods, any excess of the liability released over the claims and expenses incurred is recognized as income in that period. Therefore, the contents of the liability determine the timing of income recognition. (I ignore investment income here for simplicity—more on that later.) If the liability includes only expected future claims and expenses, then expected future earnings are zero. Any margin included in the liability represents an expected amount of future earnings that have been deferred. Following this logic, **the purpose of having a margin in the liability is to defer the recognition of earnings.** This is especially important in the case of insurance contracts that span several reporting periods, that is, long-term contracts.

The purpose of the liability margin can be distinguished from the purpose of holding capital. **The purpose of capital is to provide a very high likelihood that all obligations will be met when experience is worse than expected.**

If one accepts that the purpose of liability margins is to govern earnings emergence, what then should be the expected pattern of earnings recognition for long-term insurance contracts? I suggest that not all earnings should be recognized immediately; some earnings should be deferred. Further, I suggest that the earnings deferral should be consistent with the financial foundations of the business model and therefore based on an estimate of the cost of capital. Other concepts also lead to this idea. The concept of release from risk, combined with the idea that the cost of capital represents the market price of risk, lead directly to this approach. Earnings equal to the market price of risk should not be expected to be reported until the end of a period when the insurance coverage is provided and the company is released from the risk. If the cost of capital is the market price of the risk, then the earnings deferral and the reserve margin should be based on the cost of capital.

Note that this framework allows any expected earnings in excess of the cost of capital to be recognized immediately upon issue of a new contract. The immediate recognition of any “excess” earnings is a separate topic and will not be addressed further here.

Some actuaries argue that the purpose of having a margin in the liability is to provide a safety margin, that is, to provide a more than 50 percent likelihood that the reserve will be adequate to fund future obligations. Of course, any kind of margin will accomplish that, so a cost-of-capital margin could be accepted under that view. But some actuaries extend that concept and confuse the purpose of liability margins with the purpose of capital. They suggest that the safety margin in the liability should be measured in probability terms because its purpose is

not to defer earnings but to provide a high likelihood that all obligations will be met. With that alternate purpose in mind, they suggest that the margin in reserves should be based on the statistical distribution of possible outcomes, such as an 80 percent likelihood or 70 percent CTE level. The level they choose is arbitrary and therefore widely debated. When the margin in reserves is based on this view, the expected pattern of emergence of earnings is very different. It tends to be back-ended and loses all connection with the cost of capital and the business model.

The difference can be striking. The charts below show mortality margins and the pattern of margin release over time for a simple 20-year term life insurance contract. The margins under each approach were calibrated so that they would be approximately equal for a mature block of such business.

Figure 1 shows the size of the margin by number of years to policy expiry. Note that for a short-term contract (or a long-term contract nearing its expiry), the cost of capital margin is dramatically smaller than the percentile margin. The difference for short-term contracts can easily be a factor of five or more. On the other hand, for long-term contracts far from expiry, the cost-of-capital margin is substantially larger than the percentile margin. The patterns cross at very roughly 10 years to expiry.

This durational comparison of margins tends to hold in general; it is not unique to term life insurance, although the exact patterns do vary by type of contract.

Figure 1  
Reserve Margins by Years to Expiry

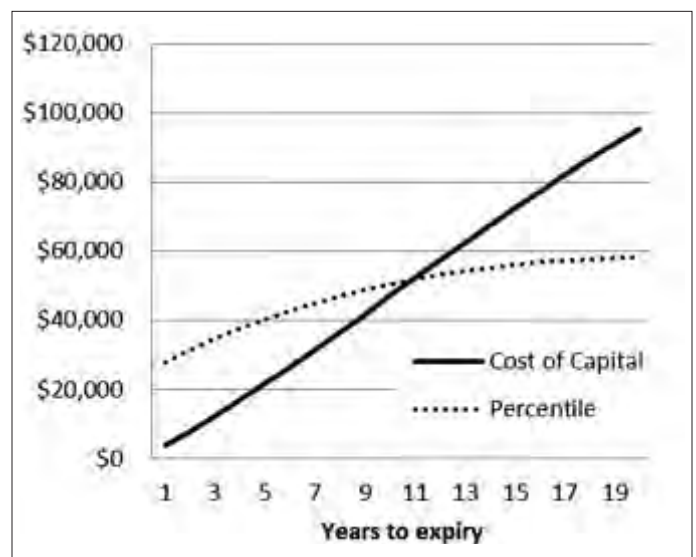
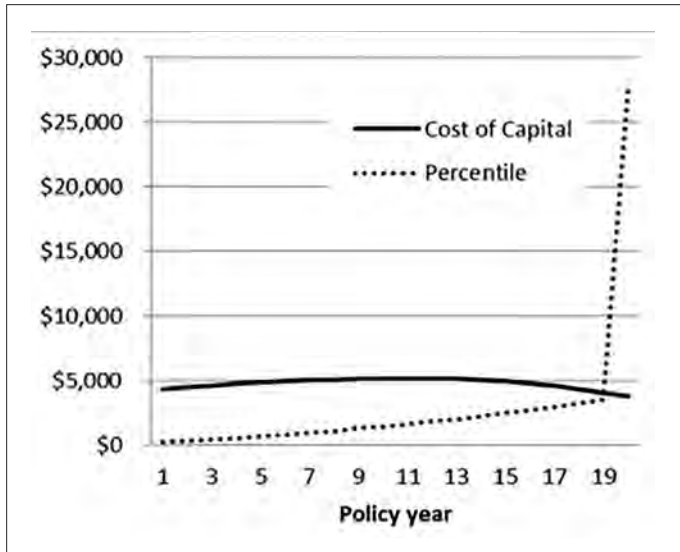


Figure 2 shows the pattern of margin release by policy year. Since margin release represents the expected future earnings, this is the pattern of expected future earnings by policy year. Under the cost-of-capital approach, this pattern is nearly level, because the amount released each year is the cost of capital. Under the percentile approach, the earnings release is back-ended to a significant degree.

Figure 2  
Margin Release by Policy Year



### HISTORICAL PRECEDENTS AND RECENT DEVELOPMENTS RELATING TO MOCE

The cost-of-capital approach to MOCE explains many things. It helps explain why historical differences in accounting for short- versus long-term contracts developed. It also provides answers to many questions, and solutions to a number of issues that have arisen during the recent evolution of accounting for insurance contracts both in the United States and internationally. The subsections below provide a sampling of places where the cost-of-capital approach to MOCE provides insight.

#### Historical Accounting Methods and Short- vs. Long-Term Contracts

Regulatory accounting for life insurance has traditionally included significant margins in the reserve liability. Regulatory accounting for short-term property/casualty (P/C) contracts has not, and there is resistance from P/C insurers to adding margins. Why this difference?

The cost-of-capital framework for margins provides two good answers: One is the size of the margin, and the other is the degree to which the liability margin affects capital requirements.

The size of the margin was discussed previously, but here's a numerical example. Consider a P/C company with capital equal to 30 percent of liabilities and a cost of capital rate of 5 percent. Assuming an average one-year contract duration, the cost-of-capital margin would be about  $30\% \times 5\% = 1.5\%$  of liabilities. That's pretty insignificant next to the uncertainty in claims estimates. On the other hand, consider a life insurance company with contracts whose average lifetime is at least 20 years, with capital equal to 15 percent of liabilities and a cost of capital rate of 5 percent. The cost of capital would be  $15\% \times 5\% = 0.75\%$  of liabilities per year, present valued over 20 years. The 20-year annuity factor may be about 12, putting the margin at  $0.75\% \times 12 = 9.0\%$  of liabilities. Relative to liabilities, that's six times as large as for P/C and clearly NOT insignificant. So, we see that a cost-of-capital margin would be insignificant for short-term contracts and significant for long-term contracts, and that may partly explain why accounting has developed with different treatment for the two kinds of business.

The other reason is the interaction between liability margins and capital. Are liability margins part of capital or part of the liability? Capital requirements are generally based on the size of potential losses over a defined period of time at a defined percentile. Since liability margins are released over time, the amount of margin released during the defined time period is an expected profit that shifts the distribution of potential losses during that time period. In effect, that part of the margin is an offset to the capital requirement. For short-term contracts, the entire margin is released during that time period, so the entire margin is essentially capital. For long-term contracts, it depends on the time period. When the defined time period is short (as in Solvency II), then only a small fraction of the margin is released during that period, so most of the margin represents a liability, not capital.

The IAIS is considering a MOCE in developing its proposed international capital standard, but there is debate over whether it should be considered an offset to capital. As described above, the cost-of-capital framework provides a clear conceptual answer to this issue. It also explains why P/C insurers generally argue that the MOCE is part of capital, while life insurers tend to argue that it is part of the liability. The truth varies by company.

#### More Recent Developments in Insurance Accounting

For long-term contracts, there has been an evolution in recent decades away from formulaic measurement of insurance liabilities and toward the principle-based idea that the liability should be set equal to the value of the assets sufficient to fund the future obligation in terms of its cash flows. The concept of a replicating portfolio has been used to suggest that the value



of an insurance obligation is equal to the value of its replicating portfolio, that is, a portfolio with exactly the same cash flows.

True replicating portfolios rarely exist, but this concept has been used to argue for approaches to setting the discount rate and including margins when taking the present value of future liability cash flows. Arguments are that the discount rate should be less than the total return on risky assets because there is no provision for default in the liability cash flows. And a margin for claims variability should be included because risk aversion is known to affect asset prices.

Let's view this in the framework of setting the liability equal to a current central estimate and a MOCE.

To get the central estimate, we compute the present value of future liability cash flows (with no defaults) using a discount rate. If this is to be a true central estimate, then the discount rate should be a central estimate of the total return (net of defaults) on the assets.

To get the margin for risk in a cost-of-capital framework, we add an implicit cash flow equal to the cost of capital and apply the same discounting. The MOCE is added to the central estimate to obtain the liability.

This conceptual approach differs from the calculation procedure under every one of the recently proposed accounting frameworks (e.g., PBR, IFRS 17, ICS 2.0, Solvency II) in one fundamental way. The discount rate is never allowed to be a central estimate of the asset earnings rate. It is always lower. That means that the amount called the central estimate is not a central estimate; it includes a margin.

Conceptually, the spread between a central estimate of the asset earnings rate and the mandated discount rate represents a margin for investment risk that is present in the assets but not in the liability cash flows. The spread is conceptually equivalent to an estimate of the cost of capital, based on just the part of capital that is attributable to investment risks. In other words, this process mandates inclusion of an implicit cost-of-capital margin for investment risk in the central estimate.

Given that every one of the recently proposed accounting and capital frameworks implicitly includes a cost-of-capital margin for investment risks in the central estimate, it is surprising that there is debate over the conceptual basis of the margin for other risks. Internal consistency suggests using the same cost-of-capital basis for all margins. One can only speculate that debate arises due to a historical difference between actuarial and financial approaches to risk. To many actuaries, risk is characterized by a probability distribution, so that approach is often applied





to claims risks. To persons trained in finance, risk is characterized by a higher expected return, so that approach is applied to investment risks. In fact, both are true, and both are reflected in the cost of capital framework.

### Stochastic Techniques and Liability Valuation

One of the arguments against the cost-of-capital framework for MOCE has been that it requires stochastic-within-stochastic projections for valuation. That may be a conceptually consistent approach, but as a practical matter, cost-of-capital margins can be calculated in a deterministic valuation.

The appropriate place for stochastic modeling is in the determination of capital requirements. Once capital requirements are determined, they can be converted into factor-based approximations. Many insurers routinely do this when developing their own capital targets for management purposes. A cost-of-capital MOCE can be calculated by taking the present value of periodic

cash flows equal to the projected factor-based capital amount multiplied by a cost-of-capital rate. When that is done, there is no need for stochastic valuation; all stochastic analysis can be focused on developing capital requirements.

### CONCLUSION

I am an actuary, and my college degree is in actuarial science. While I work in the insurance business, I consider myself at least partly a scientist and try to follow scientific principles. One of those principles is to have a theory or conceptual framework that I apply consistently. Such a theory must be consistent with and help explain many of the things I observe in the financial environment. Once I accept such a conceptual framework, I use it when explaining my work to nonactuaries. That requires that I do my work in a manner consistent with the conceptual framework.

As discussed in this article, the cost-of-capital conceptual framework explains many things. The recent evolution of financial reporting requirements has opened the possibility of using this framework more directly in the future, but the current state of debate is riddled with competing concepts and conflicting points of view, especially between companies writing short- and long-term contracts. The cost of capital can be a consistent underlying framework. When properly understood, it can explain and resolve the conflicting points of view. I hope this article helps build such understanding. ■



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