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Enhancing  
Life Insurance  
Regulatory  
Regimes in  
**ASIA**

Applying the actuarial control cycle  
to life insurance and pension products

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# Applying the actuarial control cycle to life insurance and pension products

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## Introduction

This afternoon, I wish to present one approach to understanding the risks involved in managing or regulating life insurance or pension business.

It is known as the actuarial control cycle. In this presentation I will explain the actuarial control cycle as it applies to life insurance and indicate how this approach can be applied to understand the risks involved. In turn, this will highlight various concerns from the regulator's perspective.

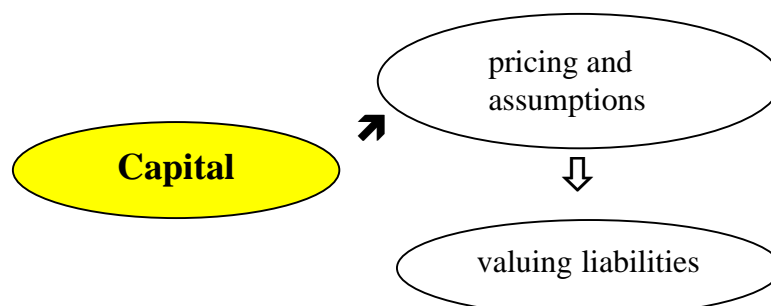
## The actuarial control cycle

Let us begin where most people start to think of insurance; that is, in the pricing of the product.

Of course, the pricing of any product goes beyond the costs of future liabilities and should also take into account the desired return on shareholders' funds, as well as other features of the current marketplace.

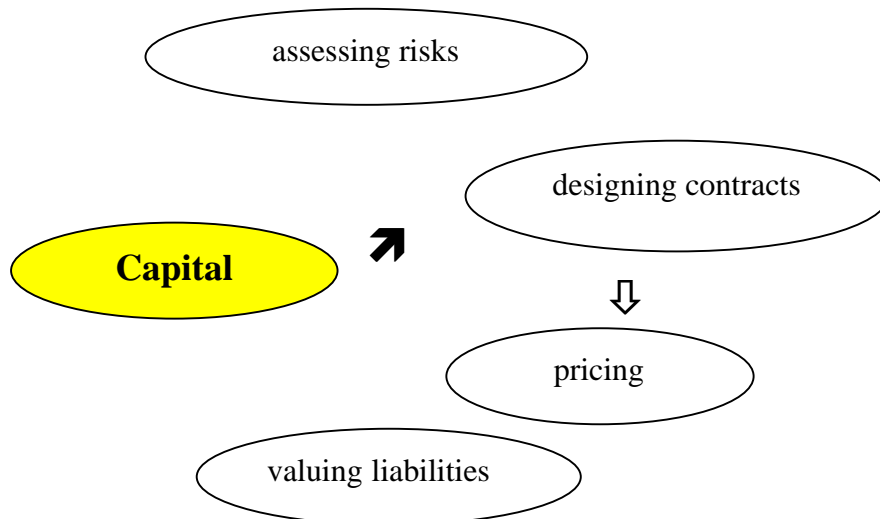
Having established a price and sold some of the product, the company is then concerned with setting aside an appropriate level of reserves for the future benefits. In many cases, these reserves will require additional capital. However, any additional capital does not come without a cost.

The need for a return on any capital invested means that the allocation of capital is an important part in both pricing our products and valuing our future liabilities. This could be demonstrated as follows:

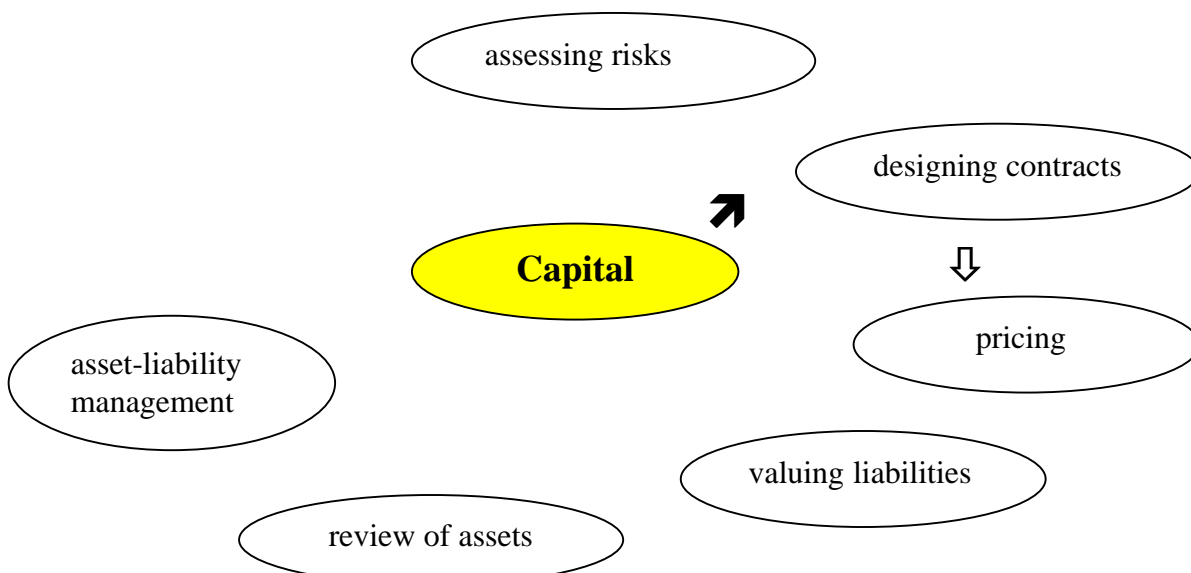


However, we have really talked about steps 2 and 3 without step 1. That is, before we can value any potential or present liabilities, we must understand the contract and all its features. This means that we need to be careful in designing the features of our contracts, with particular care being given to any guarantees or options.

Now, when we are involved in designing policies, we come to an appreciation of the risks involved. These risks can be very wide ranging, including adverse selection and the possible negative impact of certain social, economic, political or natural events. In some cases, accepting these risks will mean that there is a need for extra capital to support the business. The cycle is then expanded to become:



However, insurance business is not restricted to selling products and valuing liabilities. The investment of the premiums represents an important part of the business. Hence, we need to assess the assets held by the funds and recognise that more risky investment approaches should require a higher level of capital backing. In addition, we must consider the suitability of these assets, given the liabilities. This is known as asset-liability management. If there is a significant mismatching between the assets and liabilities, an extra risk is present and more capital is required. The previous diagram can now be expanded as follows:



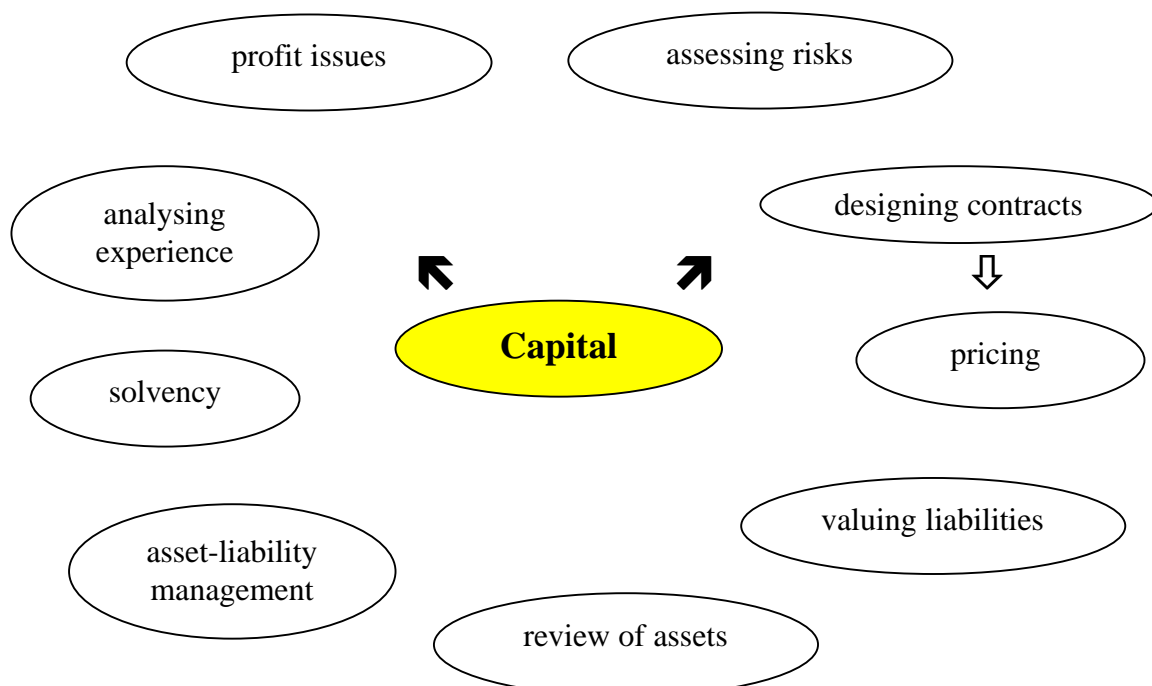
Having considered both the assets and the liabilities, the short and longer term solvency positions of the company need to be assessed. That is, we are concerned with both the short term solvency of the fund as well as the long term financial position, assuming an ongoing business horizon.

Part of these solvency investigations requires an analysis of the experience of the company and a comparison of this actual experience with the pricing assumptions. This monitoring of past experience is an integral component of any ongoing work.

Another important aspect of the investigation is to analyse the profit (or surplus) made by the company. This can be very helpful in providing a much better understanding of the business.

In addition to this analysis, the distribution of profit can raise important issues of equity between various stakeholders, such as policyholders and shareholders. For instance, the distribution of bonuses in life insurance business can have a significant effect on the capital position of the company and its ability to accept future risks. Of course, it can also affect the return received by the shareholders.

This comprehensive study of the experience and the capital position often means that the risks accepted, policy designs and/or the pricing structures need to be reviewed. This highlights the fact that we must always be ready to respond to changing experience and circumstances, as indicated by the total cycle.



You will note that capital sits in the **centre** of the cycle. The provision and allocation of capital are critical in the operations of life insurance business and are affected by every aspect of the company's operations.

## The role of the regulator

Before applying the control cycle to the regulator's perspective, let me briefly dwell on the role of the regulator.

There are likely to be several goals of the regulator, depending on the country and the maturity of its financial services industries. However, it can be suggested that the goals will include:

- *A very high level of security for policyholders.* That is, there is a very high probability that all valid claims will be paid. Note, I am not saying 100% probability because that is unreasonable. However, a very high level of security will mean that there is an appropriate level of capital backing the business.
- *A stable regulatory environment.* Companies operating long term life insurance business do not want frequent or unpredictable changes. The regulatory environment needs to be sufficiently robust to withstand economic or other shocks that are within reasonable bounds of probability. However, it should not try and predict every conceivable change.
- *A regulatory environment where both shareholders and policyholders can expect to earn a reasonable return.* The level of capital required by the regulator should not be so excessive that shareholders cannot expect to earn a reasonable return on their capital. An ability to earn a reasonable return will also encourage innovation and competition in the industry.

These goals lead to some characteristics that should be evident within a regulatory framework. These include:

- *A prospective approach.* The regulator should be looking forward and not concentrating on the past.
- *Some flexibility.* Whilst it is important to develop a stable and robust regulatory environment, it must also be accepted that we cannot predict every future scenario. That is, we cannot expect the legislation to cover all possible circumstances. Hence, in some circumstances, there is a need for some flexibility.
- *A preventative strategy.* We should endeavour to prevent problems from occurring rather than just trying to fix them after the event. This means that we need some method of "early warning triggers". However, this must also lead to consultations with the company concerned rather than a heavy handed approach.
- *A "big picture" approach.* We should ensure that we consider the company as a whole and that we do not concentrate on parts of the company's operations (such as pricing) without looking at the total picture.

In considering these desirable characteristics, it is recognised that the regulator needs to be aware of all the risks involved in the industry so that the appropriate prudential rules, standards or practices can be developed. The actuarial control cycle can be used to highlight the presence of these risks.

## Understanding the risks

Therefore, let us use the components of the control cycle to identify some of the risks involved in the life insurance business. Of course, I should add that this approach can be applied to other industries and is not just useful for life insurance.

Assessment of risks: A company may not fully appreciate all the risks involved in a particular product. These risks could include changes in consumer behaviour, adverse selection, increased longevity, a new taxation or regulation regime or even a Court decision. We must recognise that not all risks can be assessed in advance or that extra capital is the only answer. For example, a level of reinsurance can be part of the risk management process.

Design of contract: The design of any contract requires consideration of a number of factors. Major flaws in the contract design can occur leaving the company open to selection against it by policyholders or a higher than expected number of claims. On occasions, the design and pricing of a contract needs to be consistent with the planned marketing of the policy.

Pricing: The pricing of any insurance product requires a number of assumptions about future claim rates, investment earnings rates, expenses, taxes etc. It is always possible that there could be a major error in pricing due to the use of incorrect assumptions or the omission of some key assumptions.

Valuing liabilities: The valuation of future liabilities and the establishment of appropriate reserves is a fundamental component of any life insurance business. It is critical that all liabilities are valued and that an appropriate set of assumptions be used. Errors can occur with some policies being omitted or through the use of past assumptions that are no longer relevant.

Review of assets: It is likely that there will be a range of investments. Each asset will have a probability of default or loss and some will be more risky than others. Different investment strategies should lead to different capital requirements.

Asset-liability management: Many life insurance and pension products are long term liabilities over several years and possibly decades. However, the term of the assets backing these liabilities is often much shorter. This mismatch of assets and liabilities can represent a major risk, especially if it is assumed that the current earning rates will be maintained.

Solvency: It is important that when considering the solvency of the business, we compare assets and liabilities on a similar basis. If this is not done, the conclusions may be incorrect. In addition, solvency should be concerned with both the immediate financial position of the company and a longer term perspective.

Experience: The experience of the company will almost always be different from that assumed in the pricing calculations. The company must have a method to monitor their own experience and feed this experience back into revised pricing and valuation

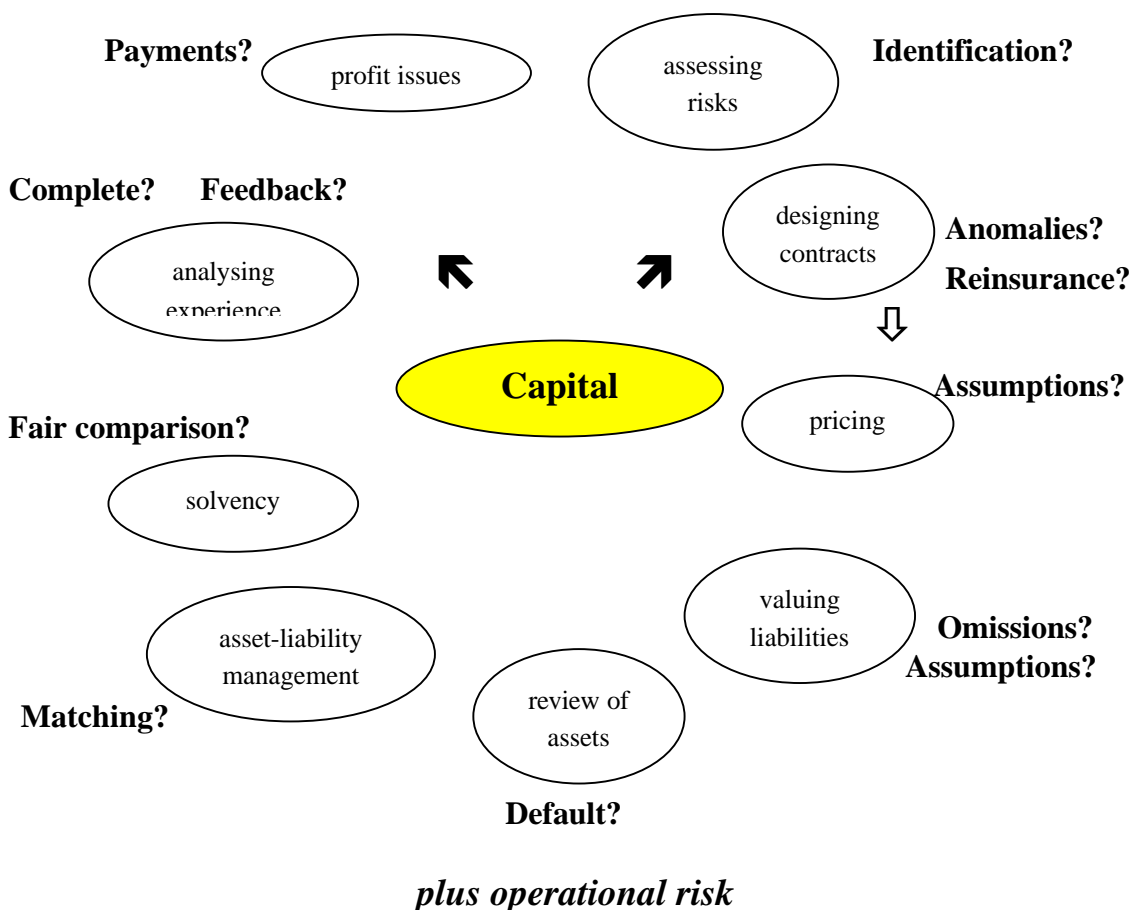
assumptions. If this does not occur, there is a significant risk that the company will not be adopting a realistic position.

Profit issues: At the end of each year, the company's financial position is assessed and decisions are made in respect of distributing any profit to policyholders and shareholders. Of course, any distribution must also take into account the capital position and needs of the company, both now and in the future.

It is apparent that there are risks to the company's financial position at every step of the control cycle. Each risk needs to be identified and managed by the company. In most cases, an amount of capital is required to protect the company from an adverse outcome.

In addition, there is an extra risk that is even more difficult to quantify. This is operational risk that covers a range of issues ranging from fraud and mismanagement to technology breakdown or negative public relations.

So, using the control cycle to summarise the risks, we have the following:



Clearly there are many risks involved in life insurance business. However we must stress that the risks are not cumulative. We cannot just add them up. For instance, there are certain risks that will offset each other. An obvious example is mortality risk. If our mortality experience is lower than that assumed in our prices, this is a benefit for some life insurance products but it will require extra reserves for our annuity business.

## Possible responses from the regulator

In view of this large number of risks, how should a regulator respond?

One approach is for the regulator to develop a procedure to identify and measure the size of each risk. However, such an approach will be inadequate as not all risks can be easily quantified. That is, there is no procedure or formula that can include all the risks.

An alternative approach, with two parts, is therefore suggested.

The first part is a regular return, identifying the major risks and calculating the amount of capital required. In terms of life insurance, this could include a calculation of the amount of capital needed to support the company related to:

- a) the perceived riskiness of the business written. For instance, where the product is new or there is little data, extra capital would be required;
- b) the valuation assumptions used. Some slightly conservative standard assumptions could be used to calculate a minimum reserve level;
- c) the perceived riskiness of the assets held. For example, assets that are considered to have a higher default probability should require more capital;
- d) the extent to which the assets and liabilities are mismatched. Where significant mismatching is present, more capital is required; and
- e) a reserve related to the level of expenses or new business growth.

However, even if a level of capital is set commensurate with these risks, this level of capital cannot be expected to account for all possible risks. There is a need for a second component.

The use of a “expert” who is familiar with the company’s total business can have considerable advantages. This expert can report, on a confidential basis, to both the Board of Directors and the regulator. This Report can cover a much wider range of risks than is possible under a standard set of formula or calculations. The expert can also play an important role in improving the level of co-operation between the firm and the regulator.

In many countries, this is the role of the Appointed Actuary. For example, in Australia, the Appointed Actuary completes an annual Financial Condition Report which discusses all the matters within the actuarial control cycle, including the distribution of profits and allocation of capital.

However, I also acknowledge that the use of internal “experts” may be difficult in some countries. In these cases, it may be appropriate to move gradually from a higher level of factual reporting in the early years to increasing reliance on the expert in the future.

Indeed, it is fair to note that the prudential regulation of financial services in most countries is continuing to evolve. With the increasing level of integration between banking, life insurance, non-life insurance and pensions in many countries, at the

regulator level and/or within financial conglomerates, we are all facing new challenges. Of course, increased globalisation adds an extra dimension to these challenges.

In conclusion, it must be stressed that any prudential standards will affect the amount and allocation of capital within a company. The standards should also ensure that the amount of capital required:

- is appropriate to the risks accepted;
- provides a good level of security to policyholders;
- but is not excessive such that it thwarts innovation and competition.

It is important to stress that there is not a “correct” answer to the amount of capital needed. The standards will always represent a compromise between the pressures of policyholder security and a return to the shareholders. In addition, the final result will be determined, at least in part, by the social, political, cultural and economic conditions of the particular country.