Abstract
This paper summarises how the life industry’s approach to capital allocation is changing and sets out a capital allocation framework based on economic value. The paper then goes on to discuss the internal measurement of value. This is illustrated with a case study drawn from the experience of Standard Life in implementing a capital management framework, including a consideration of how performance can be measured. The paper concludes with a discussion of the benefits and challenges of implementing a capital allocation framework.

Key Words
capital allocation; case study; cost of capital; economic capital; economic value; hurdle rates; performance measurement; risk-based capital.
CONTENTS

1. Introduction – the changing approach to capital allocation
2. Capital allocation framework based on economic value
3. Managing value creation
4. Case study – capital management in practice
5. Embedding the Capital Allocation Framework into Standard Life
1. INTRODUCTION – THE CHANGING APPROACH TO CAPITAL ALLOCATION

Industry developments
The Financial Services Authority (FSA) - the UK Regulator – has introduced a revised approach to the determination of solvency capital within the UK life insurance industry. Life companies are now required to undertake an Internal Capital Assessment (ICA); that is, a solvency calculation using a risk based approach that more accurately reflects the risk profile of the business. As this is a recent development, many UK companies have yet to fully embed risk-based capital into the management of their businesses (eg into product pricing or strategic decision making).

Most of the large European and US insurance and reinsurance groups have been developing and implementing risk-based capital management frameworks over the last few years and have rolled these out globally across all business units, although it is likely that the extent to which the concepts are truly embedded in the businesses will vary from company to company.

As a result of these changes, companies are rethinking their approach to capital allocation, no longer just taking into account regulatory capital, but also risk-based capital.

Industry trends
In part, the FSA’s thinking has been driven by developments in the banking sector where Basel I, and particularly Basel II, have required banks to adopt a risk-based approach to managing their business; in part too, by the emerging requirements of Solvency II for the insurance industry.

During the 1990s, there was a trend of the large industrial groups implementing so-called “economic value” frameworks. However, the challenges of applying these frameworks to long-term business resulted, in the past, in few life companies attempting to adopt them. With the widespread acceptance of embedded value reporting these approaches are now being increasingly considered within the life insurance industry.

Shareholder value creation
The economic value frameworks being introduced by some companies seek to reward shareholders based on the value of their investment in the company.

Shareholder value in a life company, as reflected by its market capitalisation, comprises three main elements:

- Net asset value
- Present value of in-force business (PVIF)
- Goodwill or franchise value (value of future new business)

The primary financial objective of a company should be to maximise the value of the company to its shareholders over the long-term;

Should a company fail to generate a satisfactory rate of return, shareholders will be inclined to sell their shares and reinvest in other opportunities. The resulting fall in the share price would continue until such time as the expected return on the share investment equalled the
shareholders’ required rate of return. In today’s competitive environment, it is vital that a company manages to exceed the required return if it is to survive and prosper.

When looking at the company on the basis of its economic (rather than accounting) value, economic profit should be used as a profit measure and it should recognise the cost of capital employed in the business by incorporating an explicit charge for it. Thus, only when economic profit is positive are managers exceeding the opportunity cost of the capital they are utilising.

There have been numerous studies on economic profit over the past decade and it has been adopted by a number of major groups for strategic decision-making and performance measurement. The principal advantages of basing decision-making on economic profit are:

- Economic profit is conceptually aligned to shareholder value creation. It allows a decision-making framework where performance can be assessed relative to the return expectations of shareholders after allowing for the level of risk taken on.
- Economic profit creates a transparent, level playing field between business units. Essentially, profits are charged with a cost of capital, that reflects the risk profile of the business and this focuses management on the efficient utilisation of capital to earn profits.
- By aligning management behaviours with economic profit, companies are able to overcome the difficulties of managing to a number of (potentially inconsistent) financial goals.

2. CAPITAL ALLOCATION FRAMEWORK BASED ON ECONOMIC VALUE

Objectives
The objectives of a capital allocation framework are to allocate capital to each business unit in a way that:

- Reflects the nature and level of risks in the business;
- Allows performance to be analysed according to the different value creation functions;
- Aligns management actions to long-term value creation.

In addition, it also needs to take account of the level of regulatory capital required in the business.

While based on sound principles, the capital allocation framework should not be overly complex, neither in terms of the theory nor the implementation approach for the business. The focus should be on developing a pragmatic approach that facilitates strategic decision-making and engenders the right management behaviours.

To avoid having to prepare results on a multiplicity of financial reporting methods, it is also important is to implement an approach that is aligned with future (expected) developments in financial reporting such as IFRS and market-consistent embedded values, as well as Solvency II.
Regulatory versus economic balance sheet

The following diagram sets out the differences between the regulatory balance sheet of a life company and the economic balance sheet based on liabilities valued at market value. The latter is the platform on which capital management and allocation framework is based. For simplicity, it has been assumed that the Group is all-equity financed.

Figure 1

**Market value of assets**

The market value of traded assets is readily available; for others (e.g., strategic holdings, mortgages, loans etc), appropriate market-consistent estimates will need to be made.

**Economic capital resources**

The market capitalisation of a company represents its economic value. It is helpful to separate out that part of economic value that represents the market’s expectations for future economic profit, sometimes called the economic franchise value. If this is excluded, the resulting amount is the economic value of in-force business of the company, sometimes called economic capital resources.

There is a close relationship between the economic capital resources and market-consistent embedded value (MCEV), and sometimes the terms are used interchangeably.

Economic franchise value cannot be determined directly, but is derived by deducting the economic capital resources from the market capitalisation of the company. Economic capital resources are calculated as the difference between the market value of assets and the market value of liabilities and frictional costs.

**Market value of liabilities**

Since a market value is not available for the liabilities, a market-consistent approach needs to be adopted. There are two broad types of methodology for performing a market-consistent
valuation of liabilities: (a) constructing a replicating portfolio of assets (or using an equivalent closed-form valuation approach); and (b) using a stochastic cash flow projection model to carry out a risk-neutral valuation (the market-consistent value of future cash flows should be determined by discounting at risk-free rates). Alternative methodologies, such as real-world models with state price deflators, binomial trees and related models, could also be used. In addition, a market value margin should potentially be added in respect of unhedgeable risks.

The market-consistent approach for valuing liabilities is likely to have significant implications for credit spread-supported business (e.g. annuities). Any business priced on the basis of yield-uplifts obtained from matching corporate bonds would be less profitable, or even loss-making, when valued on a market-consistent basis since the spreads over risk free are deemed to cover the additional risk of investing in corporate bonds. The extent of this would depend on the allowance, if any, that is deemed appropriate to be made for the liquidity premium (as compensation for lack of liquidity).

**Frictional costs**

Shareholders should allow for frictional costs when valuing a company.

Frictional costs represent costs that shareholders incur by not directly investing in the underlying assets. They comprise costs associated with the misalignment of manager and shareholder interests (agency costs); costs associated with financial distress (e.g. loss of goodwill, increased regulatory and legal costs, capital raising costs); costs associated with the illiquidity of shareholder investments as a result of regulatory restrictions; and the cost of double taxation (i.e. the investor suffers tax on investments both at the company level and again when profits are distributed).

Frictional costs are not unique to insurance companies. However, costs such as agency costs and financial distress costs are more significant when compared to industrial sector companies as a result of the greater opacity in financial reporting and the considerable regulatory restrictions on the capital invested.

**Determination of economic capital resources**

To determine the economic capital resources directly, the market value of liabilities and frictional costs need to be deducted from the market value of assets. However, the economic capital resources can also be derived indirectly since they are equivalent to the market-consistent embedded value.

In the absence of a market-consistent embedded value, a European Embedded Value (EEV) could be used as a starting point to derive the economic capital resources. Although EEVs make allowance for the time value of options and guarantees, they may be based on economic assumptions which are not market consistent. The “real-world” economic assumptions used combined with the flat risk-discount rate and implicit allowances for the cost of capital may result in significant differences. The extent of the adjustments required to be made to the EEV depends on the methodology and assumptions adopted for calculating the EEV.

EEV calculations only apply to life businesses. Other important business units in the group, such as a bank or an investment company, are not subject to embedded values, but could be included using analogous methodologies. Any differences in approach between the various business units, would have potential implications for consistency between business units and should be investigated.
Capital Allocation and Performance Measurement - a Case Study
David King (Ernst & Young) & Kenneth McGaughey (Standard Life)

Capital tiering
Not all of the economic capital resources are equally at risk; economic capital resources can be viewed as comprising different capital tiers representing a hierarchy in terms of the extent to which each is at risk. In addition, there is a hierarchy in respect of the liquidity of the capital, with regulatory capital, for example, being less liquid than surplus capital.

The various tiers of economic capital resources identified separately in Figure 1 for purposes of the proposed economic capital framework are set out below:

<table>
<thead>
<tr>
<th>Tier</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Capital</td>
<td>The market value of assets to support both regulatory reserves and capital required by the Regulator in order for the company to continue to trade, less the market value of liabilities.</td>
</tr>
<tr>
<td>Risk-Based Capital (RBC)</td>
<td>Excess of the market value of assets over the market value of liabilities required to ensure (economic) solvency at a given confidence level over a specified time horizon.</td>
</tr>
<tr>
<td></td>
<td>For life companies, Solvency II will encourage the development of internal risk-based capital models and the embedding thereof in a capital allocation framework. For other business units, a consistent approach should be adopted to ensure a level playing field. However, differences may exist between models used for external solvency reporting and a company’s internal RBC calculations, primarily because of differences in the level of confidence of the projections and the methodology used, particularly around diversification.</td>
</tr>
<tr>
<td></td>
<td>Group-level RBC under a capital allocation framework may be less than the RBC under the Insurance Groups Directive even if the same confidence level and consistent approach is used because of allowance for inter-company diversification benefits.</td>
</tr>
<tr>
<td>Respectability Capital</td>
<td>The amount of economic capital resources held, if any, in excess of the higher between regulatory capital and risk-based capital in order to meet external perceptions, for example, rating agency requirements for the desired credit rating.</td>
</tr>
<tr>
<td>Excess Capital</td>
<td>The amount of economic capital resources held surplus to the above requirements. In part, it serves as working capital for the company’s new business plans.</td>
</tr>
</tbody>
</table>

Cost of Capital
Capital tiering
All capital is at risk to some extent, and shareholders will require a return for putting their capital at risk. However, it is important to understand and measure the interaction and the balance between the different tiers of capital rather than to consider the entire amount of capital as being “risk bearing”. A rational investor should demand a lower rate of return for...
an investment in a business unit where a lower proportion of capital is risk bearing, or where a similar proportion is risk bearing but a higher proportion is deemed liquid. 

In a simplistic way, suppliers of risk-based capital might be considered to require a return more akin to a geared equity-type return, while providers of the other layers would require a lower return that depends upon the relative security of each tier of capital. 

The calculation of the cost of capital and its allocation to different business units is of fundamental importance to the operation of such a capital allocation framework. If the cost of capital is not determined in a transparent and consistent manner, correctly reflecting the risk profile of each business unit, then performance measurement and capital allocation decisions will be distorted and some business units could potentially be wrongly rewarded at the expense of others. 

It is also important that the overall cost of capital for the group is calculated to be consistent with the expectations of the market. A framework that is theoretically sound but not market-consistent may lead to incorrect management decisions if these are taken solely on the basis of economic value creation as determined by the framework. This does not mean, however, that such a framework would not add value, since it may still significantly improve the ability to make decisions on a comparable basis between alternative options. 

**Compensation Required by Shareholders**

The cost of equity capital consists of two main components:

1. **Base cost of equity capital**

   This is compensation that shareholders require for risks to which their investment is exposed and that cannot be diversified away by holding a well-diversified portfolio of investments. 

   A number of tools exist in the market for estimating the base cost of equity. The Capital Asset Pricing Model (CAPM) is one such tool that is commonly used in company valuations. It involves using a top-down approach for estimating the systematic (market) risk included in the company relative to the market and calculating the return required (in addition to the risk-free rate) by shareholders in the firm, based on the market equity risk premium and the relative exposure to systematic risk. Note that the CAPM model would not include an adequate allowance for Frictional Costs. 

   As an alternative and complementary calculation, a bottom-up approach could be adopted to solve for the base cost of equity capital. This would involve calculating the expected returns under a real-world projection of the MCEV. Such a method has advantages when carrying out unit or product line comparisons, but are harder to communicate to the market and to tie back to the market expectations for the group. In practice, we would suggest that a top-down and a bottom-up method should 

---

1 That is, a portfolio consisting of shares in firms that are exposed to different types of non-market risks that can be considered independent of each other. The larger the number of these independent risks, the smaller the aggregate non-market risk for the portfolio. 

2 This is measured by estimating a Beta parameter. The Beta parameter equals the covariance of the value of the firm with the market, divided by the variance of the market.
simultaneously be considered. In this paper, however, we are focusing on a top-down approach.

(2) Compensation for Frictional Costs.

In addition to the base cost of equity capital, compensation is required for frictional costs, including double taxation, liquidity costs, agency costs, and financial distress costs.

The quantification of frictional costs is not straightforward and it is recommended that, initially, a pragmatic, simplified approach be adopted. In the longer term, as market-consistent embedded value methodologies continue to be enhanced, practical approaches for estimating these costs could be further developed.

3. MANAGING VALUE CREATION

Value creation in insurance
At the highest level, the activities of an insurance company can be conceived of as comprising two distinct elements:

- **Insurance**: underwriting insurance and administering risks.
- **Investment**: investing policyholder premiums until the benefit payments are due.

From this perspective, an insurance company creates value for its shareholders by:

- Underwriting insurance business on terms that cover the claim payments associated with the risks taken on, together with the administration costs associated with maintaining the contracts.
  
  The overall complexity of insurance products, and the difficulty for policyholders in comparing one product with another, attenuate competitive pressures and lead to a market that is relatively inefficient. This permits insurance companies to generate economic profits.

- Achieving a return on investment activities that exceeds the return required on the capital backing it.

By separating the business into these two elements, the investment decisions are kept distinct from the underwriting decisions.

Performance by function
Within this high level subdivision between insurance and investment activities, performance can be analysed further. This should be done in a way that focuses management actions on the areas of the business where it believes it can generate the largest increase in shareholder value, for example:

- Value of new business;
- Expense reduction;
- Investment performance.
For the purposes of the capital allocation framework, the capital allocated to each business unit should be aligned with the way the company wishes to manage its business and should reflect risks within that unit’s control.

**General approach**

The overall approach could analyse performance into, for example, the following areas:

- **New business**

  One of the key items of external financial reporting is the value of new business written over the period and it is important that this is given appropriate focus in the Framework. On a market value basis, all of the profit associated with new business emerges at the point of sale, with the exception of:
  - Frictional costs which should be provisioned for when the policy is written
  - Any market value margins added to the best estimate (non-financial/unhedgeable) assumptions to adjust the value of the liabilities onto a basis that reflects what third parties might be prepared to pay for them. They cause a holding back of “expected” profits for future periods.

- **Administration of existing business**

  If actual experience were the same as expected, the economic profit emerging over the period should be zero \(^3\) conceptually (unless allowance for market value margins has been made).

  The business challenge for the function administering existing business is to beat the best estimate experience. Clearly expenses are one of the areas where management has a very direct influence on the outcome.

  Since the function administering the business has no influence over the investment decisions, it would be inappropriate to judge its performance on investment results. In order to remove investment returns from its performance, it is necessary to credit the administration function with investment returns on a portfolio of assets that match its cash flows. This portfolio is called a replicating portfolio.

- **Investment performance**

  Rather than investing in the replicating portfolio, the company will of course invest its assets to try to maximise its return for shareholders or to achieve the best return for policyholders. This will require additional capital to support the market and credit risks taken on. The actual investment decisions taken by the company can be split into those relating to the proportion to be invested in each sector (e.g. UK equity, foreign equity, property, gilts, corporate bonds, etc) and the choice of investments within each sector.

  - **Strategic asset allocation**

    The split by sector is termed “strategic asset allocation”.

    The performance of the strategic asset allocation is determined by comparing the total return assuming the assets are invested in the benchmark index for each sector against the returns had they been invested in the replicating portfolio.

---

\(^3\) Where non-linearity exists in the liabilities or assets, actual performance can never equal expected because of the time value decay.
The responsibility for strategic asset allocation lies within the legal entity and is the responsibility of that entity’s Board.

- Tactical asset allocation

  The choice of investments within each sector is termed “tactical asset allocation”.

  The performance of tactical asset allocation is assessed by measuring the actual returns achieved on the invested assets against the benchmark indices decided by the strategic asset allocation function.

The responsibility for tactical asset allocation performance will typically lie with the investment management firm within the guidelines set out in the investment mandates.

**Hurdle rates**

The cost of capital calculation set out in the previous section represents the minimum return that the company should be seeking to return on the shareholders’ investment in the company. Rather than being expressed as a weighted return on the economic capital resources of the company, the cost of capital could be re-expressed as a return on a metric used by the company for management purposes, for example, risk-based capital. It then becomes a hurdle rate used in internal decision-making; if the expected return is less than the hurdle rate, the business should not be written. Each business unit will have a different hurdle rate consistent with the cost of capital allocated to each.

Adjustments are required to the hurdle rate in order to allow for strategic factors, for instance, when the group wishes an individual business unit to take a strategic action which is in the interest of the group but not economically profitable for the business unit.

**Short-term cash generation versus long-term value creation**

The profitability of the life products sold cannot be considered only in terms of the revenue consequences in the year of issue – the profitability of any product depends on it remaining in force (or being renewed) for a certain number of years. Thus, to get a complete (and consistent) picture of the value creation anticipated by competing business plans (i.e. competing for capital in the allocation inherent in the business planning cycle), some form of long-term measure should be used.

Under the framework presented, the measure of profits generated is the change in economic capital resources over the year, referred to as “economic operating profit”. The “economic profit”, is derived from the economic operating profits by deducting the cost of capital.

Important, though, the long-term view is, it must also be recognised that shorter-term considerations, such as cash flow and dividend cover, cannot be ignored. The metrics external analysts use and their expectations as to the values to be reported also prove very influential in how a firm is perceived by the market.

To encourage cash generation, hurdle rates set for business units may be adjusted, perhaps by applying a higher liquidity charge to the regulatory capital in order to penalise products that have relatively higher regulatory requirements and which would impact negatively on dividend policy. Alternatively, the group could require that each business unit remits to group cash equivalent to at least its cost of capital; such an approach would of course require special treatment to be given to start-ups or business units in a phase of rapid growth.
4. CASE STUDY – CAPITAL MANAGEMENT IN PRACTICE

Introducing the Group
For the purposes of illustration, we have constructed a hypothetical ‘group’ of financial services companies, consisting of the following business units:

- Life and pensions company
- Bank
- Investment management.

The group structure has been kept as simple as possible, with all three businesses being owned directly by the group holding company.

Although the structure is hypothetical, we have tried to capture some of the key characteristics of the various businesses using our own experience.

Figure 1 Hypothetical Group Structure

Value of the Businesses
In order to ensure that the decisions can be made consistently across the group, it is vital to ensure that the businesses are valued in a consistent manner across the group.

The value added by any business, and the sensitivity of that value to changing conditions, is clearly a function of the future stream of cashflows. Hence, an embedded value approach suggests itself as a measurement tool. Although ‘embedded value’ is not a technique that is widely applied in either the banking or asset management industry, it is conceptually a simple matter to construct a value for both of these businesses. It is perhaps helpful to regard it as a measure of the ‘lifetime value’ expected to be added by current customers.

The total economic resources of the business can then be viewed as the sum of net assets and a value of in-force business.

When using embedded values in this way, it is important to ensure the consistency of assumptions used in valuing the businesses. It is also important to note that the ‘value of in-force’ should ideally be determined using market consistent assumptions and should be
adjusted to allow for other risks. As an alternative to a VIF calculation, the MCEV can be directly calculated as the value of assets minus liabilities and frictionals, for all business units.

Table A: Opening Balance Sheet (Business Units & Consolidated)

<table>
<thead>
<tr>
<th></th>
<th>Life and Pensions</th>
<th>Bank</th>
<th>Investment</th>
<th>Group Centre</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Assets</td>
<td>500</td>
<td>1000</td>
<td>100</td>
<td>400</td>
<td>2000</td>
</tr>
<tr>
<td>Value of In-Force</td>
<td>1500</td>
<td>500</td>
<td>1000</td>
<td>0</td>
<td>3000</td>
</tr>
<tr>
<td>Total Capital Resources</td>
<td>2000</td>
<td>1500</td>
<td>1100</td>
<td>400</td>
<td>5000</td>
</tr>
</tbody>
</table>

Capital Tiering
The capital resources available to the business is only part of the story. It is still necessary to determine what role the capital is playing within the business, and to do this, we need to tier the capital.

For simplicity, we will assume that the capital resources previously identified as being allocated to business units are:

- supporting risk, and therefore constitute ‘risk-based capital’, or,
- required to be held by regulators, and therefore constitute ‘regulatory capital’.

(ie there is no respectability capital, and group holds all excess capital at outset.)

Quantifying Risk Based Capital
Risk-based capital must be quantified. Clearly, this must be undertaken in a manner that is consistent and equitable across all the businesses. It must also be comprehensive, and capable of identifying the key financial risks to which the group is exposed.

Stress tests can be deployed throughout the businesses and used to investigate the behaviour of the capital resources under extreme circumstances.

Assume that there are three key risks for all three classes of business

(1) Market
(2) Mortality
(3) Persistency

Clearly this is a highly simplified view of a much more complex position. In reality these stress tests would be set on the basis of significant statistical analysis of outcomes and a predefined level of confidence.

But, assuming we can specify ‘equivalent strength’ stress tests for each of our three business units, we can then measure risk exposure across the group. It may look something like the following:
Table B: Analysis of Risk Based Capital

<table>
<thead>
<tr>
<th></th>
<th>Life and Pensions</th>
<th>Bank</th>
<th>Investment</th>
<th>Group Centre</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>750</td>
<td>550</td>
<td>450</td>
<td>0</td>
<td>1750</td>
</tr>
<tr>
<td>Mortality</td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>400</td>
</tr>
<tr>
<td>Persistency</td>
<td>200</td>
<td>200</td>
<td>450</td>
<td>0</td>
<td>850</td>
</tr>
<tr>
<td>Gross Risk Based Capital:</td>
<td>1350</td>
<td>750</td>
<td>900</td>
<td>0</td>
<td>3000</td>
</tr>
<tr>
<td>Diversification Benefit:</td>
<td>-900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allocation of Diversification:</td>
<td>-405</td>
<td>-225</td>
<td>-270</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Net Risk Based Capital:</td>
<td>945</td>
<td>525</td>
<td>630</td>
<td>0</td>
<td>2100</td>
</tr>
</tbody>
</table>

In performing this calculation, we are assuming that the working capital within the group corporate centre is held entirely in cash and the corporate centre exposes the Group to no additional risks.

Tiered Capital Position

We now have sufficient information to put together a balance sheet showing the total capital resources of the business, and the way in which that capital is deployed within the businesses.

Table C Analysis of Economic Capital Requirements

<table>
<thead>
<tr>
<th></th>
<th>Life and Pensions</th>
<th>Bank</th>
<th>Investment</th>
<th>Group Centre</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Resources</td>
<td>2000</td>
<td>1500</td>
<td>1100</td>
<td>400</td>
<td>5000</td>
</tr>
<tr>
<td>Capital Requirements</td>
<td>2000</td>
<td>1500</td>
<td>1100</td>
<td>400</td>
<td>5000</td>
</tr>
<tr>
<td>Excess Capital</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Add'l Regulatory Capital</td>
<td>1055</td>
<td>975</td>
<td>470</td>
<td>0</td>
<td>2500</td>
</tr>
<tr>
<td>Risk-Based Capital</td>
<td>945</td>
<td>525</td>
<td>630</td>
<td>0</td>
<td>2100</td>
</tr>
</tbody>
</table>

Given our assumption that all the capital allocated to the business units is either risk-based or regulatory capital, it is a simple matter to determine the latter as the balancing item. In practice, things are a little more complicated than this, but not much.
Capital Allocation and Performance Measurement - a Case Study
David King (Ernst & Young) & Kenneth McGaughey (Standard Life)

Calculating a Hurdle Rate

Having identified the various tiers of capital, and therefore knowing the relative mix of the capital resource requirements for both the group and the business units, we can derive hurdle rates for each business in two simple steps:

Step (1): Calculate the group’s cost of risk – ie the required return on risk-based capital.

Step (2): Assign the cost of the tiers of capital to each business unit.

Step (1) Calculation of group’s cost of risk

We need to make an assumption about the return required by the shareholder on the total assets of the company. This can be seen as not dissimilar to what could be regarded as an acceptable return on embedded value.

Assume that the total required return on all assets, for the group as a whole is, say, 8%. This could be derived from CAPM by assuming a risk free interest rate of 4.5%, combined with the group’s beta (say, 1.15) and an assumed equity risk premium (say, 3%).

If we then assume, for simplicity, that capital that is not at risk is required to earn only risk free, we can backsolve for the Group’s Cost of Risk. In practice, further adjustment may be required because capital that is not at risk may still have a cost (over and above risk-free) associated resulting from frictional costs.

For simplicity, in this example we have also ignored the fact that CAPM would provide a return that is required on the entire market capitalisation, including the economic franchise value.

Table D: Determining the Group’s Cost of Risk

<table>
<thead>
<tr>
<th>Amount</th>
<th>Rate of Return</th>
<th>Required Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Resources</td>
<td>5000</td>
<td>8.0%</td>
</tr>
<tr>
<td>Risk-Based Capital</td>
<td>2100</td>
<td>12.8%</td>
</tr>
<tr>
<td>Add’l Regulatory Capital</td>
<td>2500</td>
<td>4.5%</td>
</tr>
<tr>
<td>Excess Capital</td>
<td>400</td>
<td>4.5%</td>
</tr>
<tr>
<td>Total</td>
<td>5000</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

Step (2) Assignment of cost of the tiers of capital to each business unit

Knowing the group’s ‘cost of risk’, and the risk-based capital of each of the individual business units, it is a simple matter to determine a ‘hurdle rate’ for each business unit.

By assuming a required return of 12.8% on risk-based capital and 4.5% (ie, the risk free rate) on other classes of capital, then we can estimate the return required to be delivered by each business unit on its available capital as follows:
Table E: Required Return on Capital Tiers

<table>
<thead>
<tr>
<th>Required Return</th>
<th>Life and Pensions</th>
<th>Bank</th>
<th>Investment</th>
<th>Group Centre</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess Capital</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Add'l Regulatory Capital</td>
<td>47</td>
<td>44</td>
<td>21</td>
<td>0</td>
<td>113</td>
</tr>
<tr>
<td>Risk-Based Capital</td>
<td>121</td>
<td>67</td>
<td>81</td>
<td>0</td>
<td>270</td>
</tr>
<tr>
<td>Total Return:</td>
<td>169</td>
<td>111</td>
<td>102</td>
<td>18</td>
<td>400</td>
</tr>
</tbody>
</table>

The hurdle rate is then determined simply by dividing through by each business unit’s capital requirements:

<table>
<thead>
<tr>
<th>Required Return</th>
<th>Life and Pensions</th>
<th>Bank</th>
<th>Investment</th>
<th>Group Centre</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Capital</td>
<td>2000</td>
<td>1500</td>
<td>1100</td>
<td>400</td>
<td>5000</td>
</tr>
<tr>
<td>Hurdle Rate</td>
<td>8.4%</td>
<td>7.4%</td>
<td>9.3%</td>
<td>4.5%</td>
<td>8.0%</td>
</tr>
</tbody>
</table>

Practical Application - the Investment Manager’s Perspective

Let us suppose the investment management business unit is required to deliver a return of 9.3% on all capital employed within the business.

All being well, group’s minimum expectations of the balance sheet performance of the investment management business can be shown as follows:

Table F: Initial Forecast Balance Sheet – Investment Management

<table>
<thead>
<tr>
<th>Capital Resources</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Assets</td>
<td>100</td>
<td>212</td>
</tr>
<tr>
<td>Value of In Force</td>
<td>1,000</td>
<td>990</td>
</tr>
<tr>
<td>Total</td>
<td>1,100</td>
<td>1,202</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capital Tiers</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add'l Reg Capital:</td>
<td>470</td>
<td>466</td>
</tr>
<tr>
<td>Risk Based Capital:</td>
<td>630</td>
<td>624</td>
</tr>
<tr>
<td>Excess Capital:</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,100</td>
<td>1,202</td>
</tr>
</tbody>
</table>

The excess capital arises primarily as result of a surplus being released from the business over the period in question. For simplicity, we have assumed that this surplus arises on the final day of the 2006 reporting period.

Note that this implies that the investment manager has made an economic operating profit of 102. The cost of capital is 9.3%, and this equates to an amount of 102 when taken as a percentage of the opening available capital. The “economic profit” is therefore zero, and the business plan, if executed successfully, will ensure that the investment manager will break even in economic terms.
Revision of Investment Manager’s Business Plans

Now assume that management is planning for a substantial expansion in the business over the next year.

(For simplicity we will assume that this will not affect the Group’s cost of capital, and we will also assume that the regulatory capital requirements are unchanged.)

They request an additional 100 of capital from Group in order to fund this expansion. They intend to execute their expansion plans immediately and have forecast their capital resources as follows:

Table G: Revised Forecast of Capital Resources

<table>
<thead>
<tr>
<th>Capital Resources</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Assets</td>
<td>100</td>
<td>231</td>
</tr>
<tr>
<td>Investment</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Value of In Force</td>
<td>1,000</td>
<td>1,080</td>
</tr>
<tr>
<td>Total</td>
<td>1,200</td>
<td>1,311</td>
</tr>
</tbody>
</table>

Economic Operating Profit: 111.3

As shown, this gives an expected economic profit of 111.3, and, assuming our cost of equity is 9.3%, this would seem to meet our requirements (since the charge for capital will now be 9.3% of the opening capital of 1,200).

Should we approve these plans?

The simple answer is that we do not have enough information at this stage. We need to take account of the new risks being taken on by the investment manager and hence we need to look at both sides of the economic balance sheet.

Low Risk Scenario

Assume that the manager is planning his expansion by taking on business that is, on average, lower risk than the existing book, or that complements the existing in-force risk profile such that the marginal impact leads to a risk reduction. We would determine this, ideally, by reassessing the risk exposure of the combined business.

After allowing for the new business, and assuming that the new business plans are immediately executed, we might expect the balance sheet to look something like that shown in
Table H.
### Table H: Revised Forecast Capital Requirements – Low Risk

<table>
<thead>
<tr>
<th>Capital Resources</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Assets</td>
<td>109</td>
<td>231</td>
</tr>
<tr>
<td>Value of In Force</td>
<td>1,091</td>
<td>1,080</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,200</td>
<td>1,311</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capital Tiers</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add'l Reg Capital:</td>
<td>547</td>
<td>543</td>
</tr>
<tr>
<td>Risk Based Capital</td>
<td>653</td>
<td>646</td>
</tr>
<tr>
<td>Excess Capital:</td>
<td>-</td>
<td>122</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,200</td>
<td>1,311</td>
</tr>
</tbody>
</table>

Note that, unlike Table G,
Table H shows the position immediately following the acquisition of new business, and the opening position has been adjusted accordingly.

This gives an expected economic operating profit of 111.3. But, because the risk profile of the business has changed, the cost of capital has also changed; under this hypothetical scenario the shift away from risky business will result in a reduction in the cost of capital.

The calculation of the revised cost of capital is shown in Table I.

**Table I: Revised Cost of Capital – Low Risk**

<table>
<thead>
<tr>
<th>Capital Tiers</th>
<th>Capital</th>
<th>Charge</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add'l Reg Capital:</td>
<td>547</td>
<td>4.5%</td>
<td>25</td>
</tr>
<tr>
<td>Risk Based Capital</td>
<td>653</td>
<td>12.8%</td>
<td>84</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,200</td>
<td>9.0%</td>
<td><strong>108.4</strong></td>
</tr>
</tbody>
</table>

This implies a hurdle rate of 9.0%, with a revised capital charge of 108.4. The economic value added by this proposition will be 2.9 (i.e. 111.3-108.4), and the proposal will therefore be preferred to another proposal that would only just meet its hurdle.

Alternatively, flexibility exists to modify the business in light of these findings with charges perhaps being reduced.

**High Risk Scenario**

Now assume that the manager is planning his expansion by taking on business that is, on average, higher risk than the existing book.

The revised capital tiers might appear shown in
Table J.
Table J: Revised Forecast Capital Requirements – High Risk

<table>
<thead>
<tr>
<th>Capital Resources</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Assets</td>
<td>109</td>
<td>231</td>
</tr>
<tr>
<td>Value of In Force</td>
<td>1,091</td>
<td>1,080</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,200</td>
<td>1,311</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capital Tiers</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add'l Reg Capital:</td>
<td>444</td>
<td>441</td>
</tr>
<tr>
<td>Risk Based Capital</td>
<td>756</td>
<td>748</td>
</tr>
<tr>
<td>Excess Capital:</td>
<td>-</td>
<td>122</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,200</td>
<td>1,311</td>
</tr>
</tbody>
</table>

As before, this gives an expected economic operating profit of 111.3. But, because the risk profile of the business has shifted towards a more risky profile, the cost of capital will have risen.

The calculation of the revised cost of capital is shown in Table K.

Table K: Revised Cost of Capital – High Risk

<table>
<thead>
<tr>
<th>Capital Tiers</th>
<th>Capital</th>
<th>Charge %</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add'l Reg Capital:</td>
<td>444</td>
<td>4.5%</td>
<td>20</td>
</tr>
<tr>
<td>Risk Based Capital</td>
<td>756</td>
<td>12.8%</td>
<td>97</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,200</td>
<td>9.8%</td>
<td>117.0</td>
</tr>
</tbody>
</table>

This implies a hurdle rate of 9.8%, with a revised capital charge of 117. The economic value added by this proposition will be –5.7 (ie. 111.3 – 117), and the proposal should therefore be revised (i.e. charges could be raised, or the plans withdrawn). The proposal should rank behind other proposals that meet their hurdles.

Value added by New Business
It is informative to view the business plan as the interaction between two transactions:

(1) The ongoing ‘in force’ transaction;

(2) A single piece of new business.

Viewed this way, the overall required return for our ‘low risk’ scenario can be deconstructed as shown.

Table L: Required Return on New and In-Force Business

<table>
<thead>
<tr>
<th>Capital Tiers</th>
<th>New Business</th>
<th>Inforce</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add'l Regulatory Capital</td>
<td>77</td>
<td>470</td>
<td>547</td>
</tr>
<tr>
<td>Risk Based Capital</td>
<td>23</td>
<td>630</td>
<td>653</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>1,100</td>
<td>1,200</td>
</tr>
<tr>
<td>Hurdle Rate</td>
<td>6.4%</td>
<td>9.3%</td>
<td>9.0%</td>
</tr>
</tbody>
</table>
In the above calculation we have, for simplicity, allocated all the benefits of diversification between new business and in-force business to the new business marginal cost of capital. Alternative approaches may also be explored in practice.

In essence, provided the inforce can deliver as expected, then it is acceptable for the new business to be priced at substantially less than the initial hurdle rate.

Is it important for the planning process to be able to identify the difference between low risk scenario and the high-risk scenario?

From one perspective, this is absolutely critical. However, in practice, it is probably more important to get the initial hurdle rate correct – relative to the other businesses – and to ensure an effective communication of the methodology.

**Other Considerations**

There are many other factors that need to be considered before coming to a final conclusion. Amongst these are:

- **New Business Charging** – should we expect a premium for new business relative to the required return on inforce? In essence, this amounts to asking whether or not writing new business exposes the Group to additional risk. If, as would seem likely, this is the case, then an additional charge should be made for new business.

  Table I perhaps should have looked more like Table M.

**Table M Required Return on New and Inforce Business**

<table>
<thead>
<tr>
<th>Cost of Capital:</th>
<th>New Business</th>
<th>Inforce</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add'l Regulatory Capital</td>
<td>77</td>
<td>470</td>
<td>547</td>
</tr>
<tr>
<td>Risk Based Capital</td>
<td>23</td>
<td>630</td>
<td>653</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>1,100</strong></td>
<td><strong>-</strong></td>
</tr>
</tbody>
</table>

- **Hurdle Rate**  
  9.4%  9.3%  9.3%

- **Diversification** – The risks to which the Group are exposed are diversified. Diversification arises from many (in cases overlapping) sources:
  - Across policies within risks (including between new business and existing);
  - Across risks;
  - Across product types written by a single business unit;
  - Across business units;
  - Across territories;

  Hence, the risk to the Group of writing a diversified portfolio of risks across a wide range of businesses and territories is substantially lower than might first appear from a sum-of-the-parts type risk assessment.
How do we monitor and assess these benefits. How can they be managed for the benefit of the shareholder? If a diversification results in a benefit for the Group, should this benefit be credited to the business units?

5. EMBEDDING THE CAPITAL ALLOCATION FRAMEWORK INTO STANDARD LIFE

Background
Standard Life has recently taken steps towards implementation of a new capital allocation framework based on economic value. The framework is intended to include policies and procedures for monitoring the amount of capital allocated to the different business units, and to measure the returns on it. The intention is to inform the decision making process and to align management actions with the interests of shareholders.

The framework takes into account the regulatory capital requirements of the business as well as the economic capital (and in particular the risk based capital). It sets out how the performance of the business units can be monitored, in terms of profitability and return on capital measures, allowing also for a system of charging the different business units for the cost of capital allocated.

The planning process requires several different performance metrics be considered as part of the decision-making process. Some of these will be to meet short-term market requirements; others will target long-term goals. The economic measures considered in this framework are aligned to long-term shareholder value creation.

The project is developing, and integrating within the planning process, a capital management and allocation framework under which:

- Capital is allocated (in some cases, notionally) to business units;
- Targets are set for the return on capital or the value added through the use of this capital;
- Actual performance is measured and compared to targets;
- Information is used to inform strategic decisions.

In practical terms, the most significant influence that Group has is the ability to challenge and to require modification of business plans. Since, the ultimate aim of the framework is to promote appropriate behaviours within the business – strategic decisions which result in the maximum value being created for shareholders – we expect the business plans to be increasingly challenged in light of the findings of our ongoing Capital Management project.

While it is necessary that the framework be sufficiently robust to achieve this, a high level of accuracy in every regard is not being sought (nor even necessarily achievable) in practice and the planning process incorporates a certain amount of pragmatism, appropriate to the task in hand.

A key requirement of any capital allocation model is consistency:

- Consistency across businesses when comparing plans (including profit measures, capital requirements and how the projected results compare with the cost of the capital required);
- Consistency with what the market expects in terms of the business performance implied by the relative value (ie market capitalisation) of the company compared to its peers.
Putting Economic Capital at the Heart of the Business

The following is intended to show diagrammatically which aspects of the business the economic capital framework can inform.

Figure 2: Economic Capital at the Heart of the Business

Planning Process

The role of capital management within planning and strategy is fundamental. This has been alluded to previously. The planning process represents Group’s first opportunity to challenge and critique the plans of the business units and to exert an influence on those plans.

The key stages of the cycle are as follows:

1. Group calibrates to the market by establishing a required return that it believes is consistent with expectations of shareholders.
2. Using an assessment of risk exposure of each of the business, Group determines the hurdle rates for each of the business units, and issues indicative profit targets.
3. Business Units submit their draft business plans to Group.
4. Group aggregates the draft Business Unit business plans.
5. Group reviews the business plans both on an aggregated and unit-by-unit basis in order to assess whether the proposals (amongst other things) meet requirements in respect of hurdle rate and capital usage.
6. Group negotiates with Business Units on their draft business plans and request modifications if necessary.

7. Business Units submit revised business plans for approval

8. Group approves plans and allocates capital to Business Units where required

**Pricing**

The main part of this presentation has focussed on deriving hurdle rates for business units. However, it should be apparent that this is not the end of the story.

The economic capital approach has a great deal to offer to the pricing process in terms of establishing, for example, the ‘correct’ amount of capital to allocate to a policy. In principle, there is no reason why the capital tiering approach described above cannot be applied to individual contracts, although clearly there are many practical difficulties in doing this.

Of course, from the Group’s perspective, the hurdle rate established at the planning stage is set for business units as a whole, and in principle at least, Group are arguably ambivalent about how this hurdle is achieved. Clearly though, from the business units’ perspective, understanding the nature of their risks, and the principles underlying the development of the hurdle rates can add substantial value to the process of determining how the hurdles are met in practice.

Finally, consider the nature of diversification benefits from the pricing perspective. The risks of a unit of new business can be assessed in isolation, or they can be measured by recognising that the new business fits within a large diversified portfolio. If seen in isolation, the associated capital, and hence the charge for that capital is likely to be much larger than if the business were to be viewed as part of the portfolio. This gives rise to some questions:

- How much credit should be given to the new business for diversification? Can new business be effectively priced using ‘marginal’ capital requirements?
- What is the impact on the in-force book of doing so? ie of allocating diversification benefits to specific lines of new business?
- Are there any wider implications? What about internal and external reporting?

**External Reporting and Embedded Values**

There are a number of areas linked to Reporting that are needed to be considered during the implementation of the Capital Allocation Framework. We will primarily focus on embedded Values.

Whilst a comprehensive EEV methodology has been rolled out across the life insurance business units, it is important to recognise that the calculation of consistent values of in-force is an important part of the capital management process for all business units.

Hence, it is important that these values can be determined for each business, and that the risk exposure of the each business unit can be measured in a consistent manner.

For external reporting purposes, clearly only those organisations writing ‘covered business’ are required to report embedded values.
It is a fundamental requirement of the EEV principles that “the risk margin should reflect any risk associated with the emergence of distributable earnings that is not allowed for elsewhere in the valuation”. Unsurprisingly, analysts have increasingly sought justification for the risk margin ultimately used within the embedded value calculation.

The existence of a strong capital and risk management function has much to offer the external reporting process in this respect. The capital management process will provide data not only on the appropriate level of required capital, but also on the appropriate risk discount rate to use to discount earnings.

There is a very clear relationship between the goals of the capital management program in assessing the appropriate charge for risk to define internal performance targets, and the goals of the EEV principles in establishing a discount rate appropriate to the risks associated with earnings streams.

Again, many similar considerations arise in respect of diversification benefits:

- If it is intended to use different risk discount rates for different territories or product groups, how are diversification benefits to be credited?
- How would a ‘marginally costed’ unit of new business appear under the EEV reporting requirements?

More controversially, should we allow for diversification from ‘non-covered’ business? It would seem contrary to the EEV principles to do so, however it is equally true that in a large diversified Group, decisions to invest will only be made in light of their impact on the whole Group.

6. CONCLUDING REMARKS: BENEFITS AND CHALLENGES OF IMPLEMENTING A CAPITAL ALLOCATION FRAMEWORK

General

During the course of Standard Life’s implementation of a Capital Allocation Framework, a lot was learned about the benefits and challenges of doing so. In these concluding remarks, we seek to draw out the main benefits and challenges.

Benefits

The overriding benefit of the Framework is that it enables the sources of profit to be analysed to identify the key economic drivers of the business. This knowledge can then be used to:

- Assess at a strategic level, which businesses a Group wishes to invest in and grow, and those it would be better to exit from.
- Assess at a business unit level, management’s plans and the effectiveness of its product and distribution initiatives.
- Direct the allocation of the group’s limited capital resources towards those business units where the best returns can be achieved.
- Measure the relative performance of different business units (eg life insurance, investment management, banking) using a consistent methodology.
Align management behaviour with the economic value drivers of the business, and hence with shareholder interests.

Encourage those risk management and mitigation actions that are most effective at increasing the value to shareholders.

**Challenges**

As with any major initiative there will be a number of challenges to its successful implementation. From our experience, the following are some of the key challenges:

- The establishment of an integrated risk and capital management framework that sets the group’s risk appetite in a way that is consistent with the economic capital required to support the risks, and which defines risk policies and procedures that manage and monitor the adherence to the risk appetite.

- Generation of management information that aligns management behaviour with shareholder value creation and which facilitates actions by business units that mitigate risks in a way that reduces economic capital requirements cost effectively.

- Internal communication of the Framework that obtains the understanding and buy-in of the Board and senior management, reconciles the metrics to existing financial reporting, and explains the key economic profit drivers of the business.

- External communication of the Framework to analysts so that consistent messages are given to the market in respect of the group’s various financial reporting frameworks, and that increased transparency in the alignment of management actions behind shareholder value can lead to potentially lower agency costs being attributed to the group.