

# **MONITORING THE EFFECTIVENESS OF ASSET ALLOCATION DECISIONS**

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## **Keywords**

ALM, asset allocation, financial modelling, life insurance, monitoring, pensions.

## **Abstract**

In this paper we describe the main approaches to asset allocation decisions in the life and pension industries, discuss the issues regarding measuring the effectiveness of asset allocation advice, and suggest possible ways in which the effectiveness of asset allocation can be monitored. Although we briefly consider the applications of finance theory to asset allocation, we specifically focus on current practice (a fund-centric viewpoint). We do not take a stance on whether or not the current fund-centric viewpoint is best practice, but rather outline how advice within that context might be improved.

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## **1. Introduction**

*“It is difficult to persuade trustees to spend more on advice if they have no means of assessing its effectiveness.”*

*Paul Myners quoted in Financial News, 12 March 2002.*

1.1 In the 2000 Budget the Chancellor of the Exchequer set up the Myners review (“Institutional Investment in the United Kingdom: A Review”). The review was given a wide remit, but with a primary focus on private equity investment by UK pension funds. The subsequent report was available in time for the March 2001 Budget. Its findings included:

- The investment consultancy industry was too concentrated, and there was a potential lack of breadth amongst practitioners.
- Employers did not devote sufficient managerial resources to pensions.
- Many trustees were in denial regarding investment decisions.
- A lack of explicit goals and objectives between relevant parties had created a ‘herding’ mentality and sub-optimal investment decisions.
- There was a lack of new ideas and challenges to current practice within the industry.
- There was a mismatch between where resource/cost was deployed and where it could have the greatest impact, in particular asset allocation and manager selection.
- There is a risk that reliance on quantitative asset-liability modelling creates a bias in favour of asset classes with long time series and that those without long time series cannot be modelled and risk being ignored.

1.2 Whilst there may be some scope here for divergence of opinion, most actuaries would welcome the resulting increased focus on strategic asset allocation and the advice that actuaries give on this subject. However, little work has been done to date to analyse the quality of this advice. This paper seeks to redress the balance. Whilst the main focus of the paper is inevitably strategic asset allocation for pension funds (where the trustees are legally responsible for investment strategy), most of what is covered applies equally well to life funds (where the board of directors of the life office are legally responsible).

1.3 One of the reasons for focussing on asset allocation is apparent from a study of, for example, Brinson et al. (1991). This paper quantifies the factors which contribute to the variation in returns between different funds as follows: asset allocation 91.5%, security selection 4.6%, market timing 1.8%, and other 2.1%. Asset allocation is clearly key to the performance of funds. It is also worth noting that an ever increasing number of pension funds have adopted fund-specific benchmarks in recent years (up to around 60% of funds monitored by CAPS in 2001 from less than 10% a decade earlier), rather than simply comparing performance with that achieved by other funds.

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- 1.4 However, it is important to recognise that strategic asset allocation is not simply aiming to maximise returns in isolation from the liabilities or even to maximise the asset/liability ratio. Because of the probabilistic nature of the subject, it is not possible simply to look at the outturn for the fund and compare this with what it would have been with different asset allocations. Instead, it is necessary to focus on what exactly asset allocation is trying to achieve and how clearly defined the process is.
- 1.5 The remainder of the paper is structured as follows:
- Section 2 contains an overview of the asset allocation process for a typical fund.
  - Section 3 concentrates on the financial objectives behind asset allocation.
  - Section 4 considers the variety of methods used for recommending appropriate asset allocations.
  - Section 5 discusses what criteria might be used to assess the quality of asset allocation advice.
  - Section 6 extends this to a discussion of how to monitor the effectiveness of such advice.
  - Section 7 summarises the conclusions of the working party.

### 2. Overview of Asset Allocation Process

*“Some P&D research on asset liability modelling showed how little engagement trustees have in that process. They do not sit down and really understand what the asset liability modelling process involves and do not impose their own questions and perspectives on the process. I want to see trustees more actively involved.”*

*Paul Myners quoted in Professional Pensions, 13 December 2001.*

2.1 The overall process of asset allocation can be broken down into the following stages:

- (a) *Trigger* – a decision is made to review the current asset allocation, perhaps following a particular event.
- (b) *Objective setting and analysis* – someone (often the consulting actuary for a pension fund) analyses the implications of alternative strategies, perhaps using asset liability modelling (ALM).
- (c) *Decision* – the results of the analysis are presented to the decision-making body and a decision on the preferred alternative is made.
- (d) *Implementation* – the chosen asset allocation strategy is implemented.
- (e) *Monitoring* – the ongoing position of the fund is monitored to ensure the asset allocation position remains appropriate.

Each of these stages is considered in more detail below.

#### ***Trigger***

2.2 There may be a variety of reasons for initiating a review of asset allocation, either as part of a regular process or in response to a particular event. Whilst the details may vary between pension and life funds, there are generally parallels between the two categories. Possible triggers are listed below.

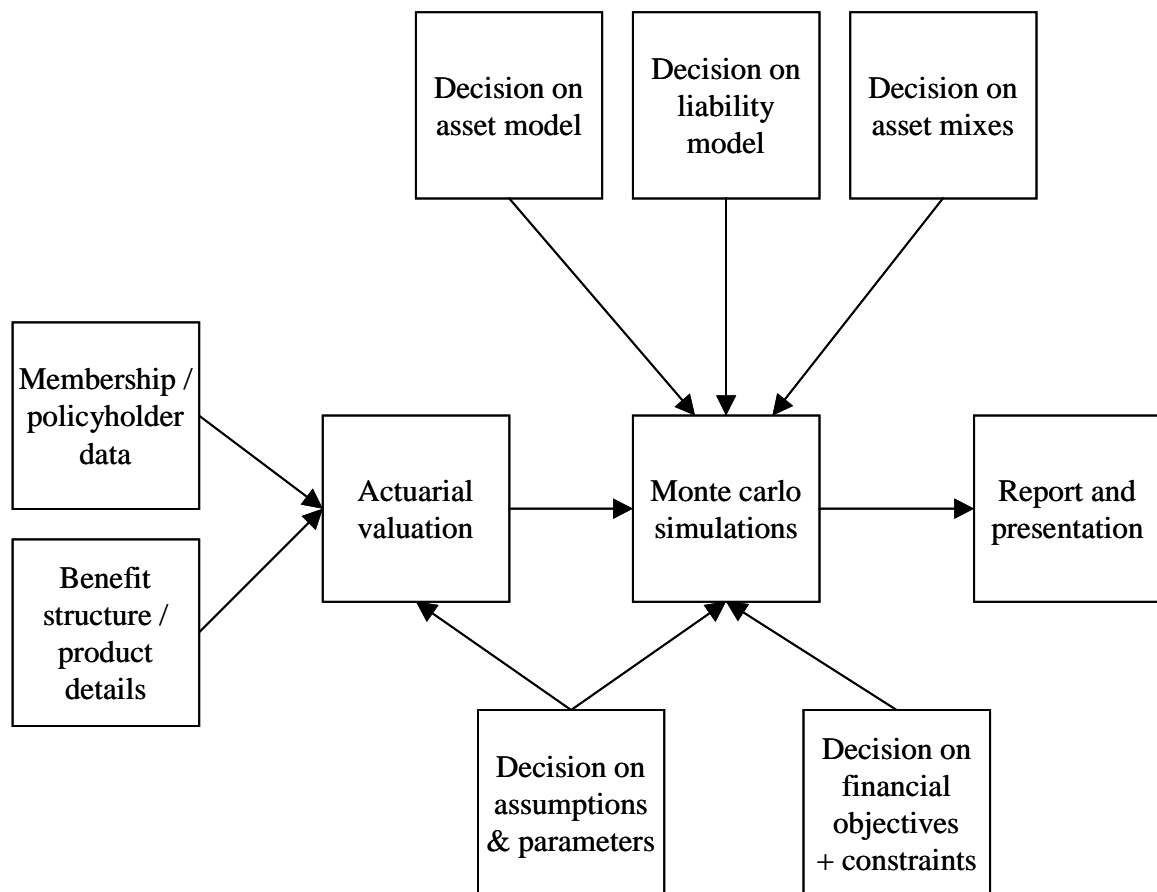
- (a) *Legislation* – accounting or other rule changes may change the nature or perception of the risks in the fund, prompting a review of strategy (perhaps FRS17 for pension funds or Fair Value accounting for life funds).
- (b) *Economic conditions* – changes to the economic environment and/or investment conditions may prompt a review.
- (c) *Liability profile* – there may be changes to the liability profile. For example, if a pension scheme's active membership reduces in size and it becomes mostly pensioners the trustees and company may feel that this can now be accurately matched by an appropriate bond portfolio and wish to reduce the overall level of risk within the fund. Alternatively, the mix of business sold by a life office might change, necessitating a review of investment strategy.
- (d) *Solvency* – if a life fund's solvency level or pension scheme's funding level improves significantly, it may be felt that this represents a larger cushion against bad investment experience allowing the fund to invest more heavily in volatile assets.
- (e) *Risk tolerance* – the risk tolerance of a life office board or pension fund trustees may change, leading to a desire to alter the risk profile of the fund. For example, for a pension

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fund corporate action or changes in trading environment may significantly alter the ability of the sponsoring employer to support the scheme.

### *Objective setting and analysis*

- 2.3 The starting point for the asset allocation process is to set suitable financial objectives for the pension scheme or life insurer. There is discussion on financial objective setting in section 3 of the paper. The critical point is that financial objectives must be determined before the number crunching and analysis commences. The financial objectives drive the asset allocation and not the other way round.
- 2.4 An asset liability model is a tool to model likely future developments of a pension scheme or life office, and is therefore a powerful aid in investigating the implications of different asset allocations. It is a complex tool, taking many inputs and often utilising Monte Carlo techniques. An overview of the ALM process is illustrated in the diagram below.



- 2.5 Subsequent sections of this paper discuss the current practice for making decisions regarding asset and liability models, asset mixes and assumptions and parameters. What is important in relation to the effectiveness of asset allocation advice is to ascertain which party is really making the decisions. Is it those with ultimate responsibility or is it their advisors?

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### ***Decision***

- 2.6 The first stage of the decision-making part of the process is to present the results to the client (the decision-makers). It is worth clarifying the identity of the client. For a pension fund, this may be the trustees or an investment sub-committee. The company will sometimes also take advice, although the investment strategy remains the responsibility of the trustees. The Myners-preferred approach is to use, where appropriate, an investment sub-committee, preferably with some employer representation. For a life office, it will normally be the board, although again there may be an investment committee that carries out the bulk of the investment work.
- 2.7 The presentation of results will generally involve providing a written report giving a suggested shortlist of portfolios using agreed risk and reward measures. The shortlist may be derived by the advisor working in isolation, or after an initial report considering a wider range of strategies ranging from 'cashflow matching' to more conventional mismatched strategies. The shortlisted portfolios will typically represent practical asset mixes and may not necessarily lie directly on an 'efficient frontier' or be optimised in any sense. The fact that the consultant has so much involvement in developing the shortlist of portfolios implies a certain amount of influence over the final asset allocation. The extent to which the consultant influences the initial level of mismatching varies across clients and advisors. However, the consultant usually does have significant involvement in 'fine tuning' the shortlist of portfolios within a given strategic risk-return band.
- 2.8 The next stage is for the client to request any additional calculations. These may involve looking at additional asset mixes, different risk/reward measures or some form of sensitivity testing. Once the results of this work have been presented to the client, then the client is in a position to make a final decision on the asset allocation.

### ***Implementation***

- 2.9 The line between making and implementing the decision is often blurred. The decision will generally extend no further than a decision on the mix between the asset classes. Indeed, it may not even determine a split within some asset groupings (for example, there may be an allocation to overseas equities, but no decision as to the allocation to individual regions or sectors). Decisions that are likely to be excluded at this time are those on outperformance targets, the mix between active and passive management, the number of managers to be appointed (including any mixture of management styles) and the use of tactical asset allocation.
- 2.10 The revised asset allocation may trigger a review of investment manager, particularly if the new allocation involves new asset classes. If it is already decided that an existing manager will be used, then this might influence the implementation of decisions. For example, if the decision is taken to invest in corporate bonds and the incumbent manager only offers a long-dated corporate bond fund, then the exact choice of asset class has already been made for the client. However, the decision to restrict the choice of investments to those offered by the incumbent manager or managers would rarely be appropriate. One possible exception might be where changing managers immediately would result in heavy cancellation penalties - for example, if the existing investment were some type of guaranteed return insurance product.

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- 2.11 Manager agreements will need to be drafted, agreed and signed. The same will need to be done for the statement of investment principles to reflect the new asset allocation, which will need to be circulated to the investment managers.
- 2.12 Physically changing the asset allocation can also be done several ways and the exact method is often determined by the size of the fund. For a small pension scheme, the change in allocation will often be effected by selling part of one asset class and buying another with the proceeds. For larger schemes, *in specie* transfer will be an option, where one manager may be willing to accept individual securities from another. For more complex changes, a transition manager may be appointed to co-ordinate the changes and control costs. In any case, it is important to try to ascertain all the costs incurred in a transition, including 'hidden' costs such as market impact and opportunity costs.
- 2.13 There are also differences of opinion as to whether it is better to change an asset allocation immediately to the new benchmark or to stagger the change over a period of time, perhaps months. An argument for the former is that once a strategic asset allocation has been agreed, investing in any other manner is incurring unmodelled strategic risk. It also makes performance measurement easier, in that the benchmark changes on a particular date rather than over a period of time. However, some believe that the latter approach (sometimes called 'pound cost averaging') is useful because it is claimed that it can reduce the risk of switching funds from an asset class that is potentially undervalued to one that is potentially overvalued. It can also be argued on a 'behavioural finance' basis that switching the funds over a long period of time mitigates any potential 'regret' on the part of the decision-makers. The more cynical might note that incremental transitions make performance measurement more difficult and hence any regret is less apparent to the decision-maker.

### ***Monitoring***

- 2.14 There are several types of monitoring that need to be considered with respect to asset allocation. One type is the monitoring of asset allocations relative to the strategic benchmark and another is the ongoing appropriateness of the strategic benchmark itself. Sources of information about the former type of monitoring could be the fund managers themselves, independent measurers and/or custodians.
- 2.15 In single-mandate funds, the fund manager needs to demonstrate clear adherence to rebalancing guidelines specified in the mandate. This clearly requires guidelines to have been set, and set consistently with the desired asset allocation. Furthermore, if the strategic position is a dynamic one, this information needs to be conveyed to the manager. In most cases, if monitoring is undertaken regularly, the magnitude of deviations will be small and the manager can rebalance the portfolio as required.
- 2.16 In multiple-manager arrangements the monitoring is slightly more complex. Possible sources of deviation from the strategy include not only the usual differential performance of the different asset classes being measured by the managers, but also the fact that the aggregation of tactical positions within each portfolio may lead to significant deviations at a total fund level.
- 2.17 Monitoring is also required not only to establish that asset allocation splits are being maintained, but also that splits across managers (as determined when structuring the fund) are being maintained. The changes needed to maintain both dimensions of the allocation (across



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managers and across asset classes) can be non-trivial and possibly expensive in complicated arrangements.

- 2.18 Various possibilities exist for doing this. In funds with strong net cashflows (in or out), the direction of cashflows can be used. Other alternatives include the use of a tactical asset allocation overlay manager who monitors aggregate positions frequently and uses futures or other derivatives to 'complete' the fund and bring the asset allocation back into line with strategy.
- 2.19 Some sort of monitoring that the strategy remains appropriate is less likely to be carried out. This is mainly because the complexity of the process in the setting of investment strategy means it is only reviewed periodically (often following an actuarial valuation or following significant changes in the circumstances of the fund). This complexity, by definition, means that a relatively simple way of monitoring strategy appropriateness is unlikely to be found. What is common, and becoming increasingly so, is to monitor the impact of investment strategy on the funding or solvency level of the fund. This can be achieved by comparing the performance of a passive portfolio of assets invested as per the investment strategy to the performance of a 'hedge' portfolio. By a hedge portfolio, we mean a portfolio that most closely replicates the economic value of the liability. In most cases (particularly for defined benefit pension liabilities, non-profit life insurance and general insurance business) this will consist of a portfolio of bonds (fixed and/or index-linked) of suitable duration. The performance of the hedge portfolio is a proxy for the way the liabilities are changing (ignoring changes in demographics and injections/withdrawals of capital). Comparing this performance to the performance of the investment strategy shows the impact the investment strategy is having on the position of the fund in each period of measurement (if the comparison is also made with actual performance then the impact of active management and/or deviations from strategy due to rebalancing policy or tactical asset allocation can also be assessed). Whilst this gives no indication whether or not a strategy remains appropriate, it provides information on the 'success' of a particular strategy (if we define success as adding value over the hedge portfolio) and can also act as a trigger for a full review of strategy.
- 2.20 Dramatic under- or out-performance of the strategic benchmark relative to the liabilities could have a significant enough effect on the solvency of a fund to affect the appropriateness of the asset allocation. The interpretation of what constitutes dramatic will depend on the financial objectives. As an example, in April 2002, the BP Amoco UK pension scheme disclosed a 96% funding level, as opposed to 120% the previous year, but the company decided that no change to the investment strategy (about three-quarters of the fund in equities) was necessary.
- 2.21 Other possibilities for measures against which to judge the success of a strategy might be:
- The previous benchmark.
  - The average asset allocation of similar funds/companies.
  - Some legislative measure such as the MFR matching asset allocation.
  - A convenient proxy for the hedged portfolio – for example a long-dated corporate bond index.

The above measures will of course only be appropriate in quite specific circumstances when they have been built into the objectives of the strategy. Apart from the MFR measure, which can have a real economic impact, the other measures will only be rough guides to success.

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- 2.22 Consideration should also be given to the performance to be measured. The purpose of the change in asset allocation may have been to reduce risk, in which case a measure of risk needs to be considered as well as outperformance relative to the benchmark. The choice of risk measure can present difficulties, as it should relate back to the reason for choosing the particular asset allocation strategy. If, for example, the strategy was chosen so as to limit the probability of a particular event to 10% over the next ten years, then we would need to wait several thousand years before we could estimate with any confidence whether the modelling was in fact accurate. This speaks volumes for picking appropriate risk measures that are useful to the client, as opposed to using statistics to illustrate some concepts (which is in itself an important function of any advice).
- 2.23 An alternative approach, which may allow the accuracy of the modelling to be judged over a shorter timeframe, would be to examine the reduction in risk relative to an alternative asset allocation. If the new strategy implied a halving in the level of risk for the company, then we could measure the standard deviation of returns relative to the hedged portfolio of both the new asset allocation and the previous asset allocation. Standard deviation could be measured quarterly or monthly and hence we could judge over a 3 to 5 year time frame whether the new asset allocation did halve the level of risk the company faced.

### 3. Financial Objectives

*“What I am saying is that trustees should be more professional and business-like in their behaviours. They should sit down and ask themselves:*

- *What are we doing?*
- *What really are our objectives?*
- *What are our goals?*
- *How do we manage our resources and those who advise us in an efficient way to achieve our objectives?”*

*Paul Myners quoted in Professional Pensions, 13 December 2001.*

- 3.1 Being clear about the objectives of asset allocation is fundamental to the success of the exercise. The objectives will normally revolve around achieving an appropriate balance between investment return and investment risk for the fund. For example, this might be expressed as maximising return subject to an acceptable level of risk taking into account the nature of the liabilities which the fund is intended to meet.
- 3.2 A common and powerful tool to help achieve these objectives, especially if risk is measured as the probability of particular outcomes, is traditional asset liability modelling. More recently ALM including the use of deflators for valuation purposes has started to be used for particular purposes (for example, see Chapman et al. (2001)). Below we consider in more detail why pension schemes and life insurers may use ALM.

#### ***Why do pension schemes undertake an asset liability study?***

- 3.3 The reasons for pension schemes undertaking an AL study are many and varied, although they mostly revolve around the issue of understanding and quantifying investment risk within the scheme with the aim of translating the risk/return trade-off into more meaningful financial objectives. This can either be from the point of view of the trustees wanting to gain a clearer understanding of security for members or the company wishing to understand and control its obligations with regard to contributions. These risks can normally be categorised into:
- (a) *Security* – What is the likelihood and possible size of any deficit, be this on an MFR, buy-out, closed funds or ongoing funding basis? What is the breakdown of potential losses between various causes such as poor returns, mortality improvements, early retirements, staff turnover being lower than expected, unexpected inflation?
  - (b) *Contributions* – What level and variability of contributions might the company and members expect?
  - (c) *Benefits* – If discretionary benefits are a possibility then what level and variability might be expected?
  - (d) *Accounting measures* – What P&L and balance sheet variability can be expected and how is this affected by different accounting standards?
  - (e) *Apportionment* – What is the degree to which risk is apportioned between different stakeholders (for example, pension scheme beneficiaries, stockholders, advisors, regulators, Inland Revenue and the state)?

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- 3.4 Once the trustees and company have understood the degree of risk they are running they will often want to use an AL study to assist in amending or setting a strategic asset allocation. They are essentially answering the question – "To what degrees can the level and variability of security, contributions, benefits and accounting measures be changed by altering the scheme's asset allocation?" The broad risk of equities versus bonds is normally the most important risk to understand and alter. However, AL studies can also be useful in developing an understanding of the impact of alternative assets, the split between domestic and overseas equities and the split between various bond categories as well as the duration of the bond portfolio.
- 3.5 It may not always be possible to achieve an appropriate outcome through amending the strategic asset allocation alone. A study may therefore go on to assist in amending or setting scheme benefit design. The study would help in determining what impact scheme design can have on security, contributions, benefits and accounting measures. For instance, if the company moves to a DC and DB hybrid, in order to share risk with the employees, what range of benefits might be expected?
- 3.6 Clearly the pace of funding will have an impact on security and there can also be an interaction between the funding policy and the investment strategy. Therefore, the trustees and company may also wish to understand the consequences of alternative funding strategies.
- 3.7 Over time, economic and investment conditions will change and hence may alter the risk profile of the fund. For example the significant reduction in index-linked and fixed interest bond yields over the last few years will have had a significant impact on scheme security as measured on a buy-out basis. The significant growth in the sterling non-gilt bond market opens up new opportunities for investment but also new risks to be understood. One could therefore use AL studies to understand the consequences of changes in the economic or investment environment.
- 3.8 AL studies may be used to assist in setting up a new scheme, for instance either a new scheme with no assets or liabilities and just future contributions to be invested or a transfer of liabilities and assets from a corporate take-over. The new group of trustees and employer will want to take advice on how to invest the transferred assets and/or future contributions.
- 3.9 Even within a DC only arrangement AL studies may be useful, for example to help the members understand the level of risk they are taking and choose an appropriate investment strategy and/or contribution level. This advice can be either to the trustees to help develop appropriate default strategies or given directly to individual members.
- 3.10 Finally, once the investment strategy has been put in place AL studies may be of further use to assist in setting appropriate manager structure arrangements, as described in Urwin et al. (2001).

### ***How do life insurers use asset liability modelling?***

- 3.11 The primary use of ALM in life offices involves measurement of risks and returns, from both shareholder and policyholder perspective. ALM is most commonly applied to with-profits funds (including traditional with-profits, unitised structures and new designs based on the transparent with-profits initiative). Other popular areas for ALM studies include annuity

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books, and some remaining books of non-participating savings contracts which have guarantees (for example guaranteed annuity rates).

- 3.12 The commonest use of outputs for risk analysis is to examine the probability of some adverse event, such as the invocation of guarantees, the depletion of the estate of a with-profits fund, or the failure to meet required statutory solvency margins. Investigations may extend to the effectiveness of possible hedging instruments.
- 3.13 ALM may also be employed to measure expected returns, such as mean flows to policyholders or shareholders from a particular fund. The results would typically be similar to the results of a deterministic projection, except for the impact of guarantees.
- 3.14 Much is talked about the use of efficient frontier analysis for selecting investment mix. The idea is to select an asset portfolio which minimises the risk (as measured, for example, by one of the adverse probabilities mentioned above) for a given level of expected returns. However, this methodology has turned out to be highly sensitive to input assumptions (for example relative risk premiums on different assets). Liability structures often have only a negligible effect. The asset liability efficient frontier is seldom used in practice, although risk-return scatterplots are occasionally used to illustrate various candidate strategies.
- 3.15 The risk and return methods have a number of well-rehearsed advantages and disadvantages. The insight given from a stochastic view can be substantial; potential disasters can be averted when they are foreseeable rather than inevitable. Potential weaknesses include the difficulty of incorporating any operational type risks (for example, it is unlikely that anybody's ALM exercises anticipated mis-selling compensation or the consequences of dividend tax changes).
- 3.16 Although not directly linked to strategic asset allocation, a further limitation of the risk-return methodology is the lack of a robust link to present values. It is, of course, possible to discount stochastically generated mean cashflows. However, experience from traded options suggests that appropriate discount rates could cover a broad range, from large and negative to very large and positive.
- 3.17 In the same way that alternative benefit structures may be examined for pension funds, asset allocation advice for life funds may be tied up with proposed changes to bonus smoothing strategies for with-profits policies.

### 4. Methods Used

*“Asset Liability Modelling is a technique to aid advice on a scheme's asset allocation depending ultimately on the liability profile of the scheme (reflecting the maturity) and the degree of surplus against various definitions of liabilities (long term, MFR and solvency). It can be used to provide guidance on the optimal asset allocation for a particular funding level, given the particular degree of risk or long term cost the scheme sponsor wishes to adopt.”*

*Response to the Myners Review of Institutional Investment for HM Treasury, on behalf of the Faculty and Institute of Actuaries, July 2000.*

- 4.1 When the asset allocation decision-making process uses ALM, an important decision is which asset model to use. The asset model must be appropriate for the purpose and consistent with the liability model – there is little extra insight to be gained from performing ALM with a state-of-the-art asset model on one side of the equation and a basic liability model on the other. Depending on the purpose of the ALM exercise the results may show great or little sensitivity to the choice of asset model.
- 4.2 Asset models are typically defined as either ‘economic’ (when they are formulated according to economic and financial economic theory and then calibrated to data) or ‘statistical’ (when they are formulated to a statistical best fit, without any reference to economic and financial economic theory). In practice, most models fall somewhere between the two extremes, for example Wilkie (1986, 1995), possibly the best known stochastic asset model, is driven by statistical best fit but is modified to stay in line with elements of economic theory. Lee & Wilkie (2000) provide a summary of the main published models used by actuaries in the UK.
- 4.3 Large actuarial consulting firms and insurance companies typically use either one of these published models (often with amendments and/or additions) or their own proprietary model. The models usually cover, at a minimum, domestic equities and bonds and sometimes cash, but can extend to several asset classes, including regional equity, property, government and non-government bonds and even alternative asset classes. The factor which ‘links’ the asset and liability models is most commonly price inflation, but again a number of variables are used such as economic growth and wages.
- 4.4 An important distinction to make between models is whether or not they describe an efficient market. Unfortunately for the practitioner, the efficient market hypothesis (EMH) is of no assistance when developing an efficient market model because the EMH merely proposes that asset prices reflect available information and are thus best estimates of their intrinsic value i.e. it does not specify how information is mapped to prices. Smith (2001) addresses this issue when evaluating stochastic asset models, and concludes that models (more correctly the markets they describe) cannot simply be described as either efficient or inefficient, but rather that when they are compared to each other, they can be either ‘more efficient’ or ‘less efficient’ than each other.
- 4.5 Some authors, such as Thomson et al. (1995), have argued that in most practical applications, the actual model used does not matter. Others, such as Smith (1996) and Lang (1998) argue that “different models can produce different results” (Lang (1998) p. 27). We can expect similar models to give similar results, but it is unlikely that models that differ in significant

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ways will give similar results. For this reason, the choice of model is an important but often contentious decision. Huber (1997) specifies four criteria for the evaluation of models (consistency with prior economic theory, goodness-of-fit, parsimony and parameter constancy over time) which are a useful starting point for choosing between models.

- 4.6 Whereas the choice of an asset model is an area where there is perhaps little consensus in the actuarial profession, the modelling of liabilities is far less controversial. In practice, because many of the demographic factors affecting liabilities (such as mortality) have virtually no correlation to investment markets, they are normally treated as deterministic in projections and only those liability items that are linked in some way to investment markets (like price or wage inflation and discount rates) are allowed to vary stochastically.
- 4.7 However, some strategic asset allocations can make the stochastic fluctuations of the underlying demographics significantly more important than the investment risk. In these cases, the decision-makers need to be aware that a new source of risk relative to expectations will have become more important (even though the absolute level of demographic uncertainty is unlikely to change with strategy).
- 4.8 The calibration of the model, which could more generally fall under the description of setting assumptions, is also another potentially controversial area. Again, several approaches can be taken to calibrating the model. The two main approaches can best be described as ‘historical’ and ‘current market conditions’, and again a combination of the two is sometimes used. Although there may be many parameters that need to be estimated to calibrate the model, these can be summarised in expected returns, variances and covariances of the asset classes being modelled. To be simplistic, if the expected return on bonds equals the average return on bonds over the last  $x$  years, the model is calibrated to history, whereas if it equals the current bond yield, it is calibrated to current market conditions. This is an oversimplification because some items, e.g. variance and covariance, might be calibrated to history and expectations to current market conditions.
- 4.9 Also, certain parameters, most notably the prospective equity risk premium, cannot be inferred from current market conditions. For these parameters, calibration is inevitably subjective, even when history is used, because the parameters will vary depending on the index and time period used. These subjective assumptions are set in a number of ways, including ‘expert’ consensus, and often with reference to economic theory and historic data. Apart from getting the decision-makers’ buy-in to the choice of model, their buy-in to these subjective assumptions is crucial, and sensitivity analysis to these assumptions is often helpful in this process.
- 4.10 The output from traditional ALM studies may take a number of forms. In many cases, it will start with an efficient frontier which is used to provide the ‘candidate’ asset mixes and to consider the efficiency of the existing strategic benchmark. Funnels of doubt are also used to show the expected outcomes and variability of outcomes under various investment strategies. A variety of parameters are considered for ‘risk’ and ‘return’ in ALM studies. Expected funding or solvency levels, contributions or bonus rates are often targeted, with the corresponding risk sometimes being the distribution of such variables, the probability of breaching some critical level, or some more involved statistic such as expected shortfall.

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- 4.11 Some recent work (for example Exley et al. (1997), Chapman et al. (2001)) has questioned whether asset allocation decisions for pension funds should be made on the basis of these types of output, suggesting that models could be better used to compare the effect of different asset allocations on the division of risk between various stakeholders. Nevertheless the authors believe that it remains the case today that these are the most common measures used.



### 5. Criteria for Assessing Quality of Advice

*“To the extent that decisions are not being made in a conscious and well-thought through way, there is a cost because trustees will be making sub-optimal decisions.”*

*Paul Myners quoted in Professional Pensions, 13 December 2001.*

- 5.1 The Myners report has put asset allocation in the spotlight, and therefore the actuarial profession because of its close involvement. The process, who does what, accountability for outcome, etc., will all be subject to much greater scrutiny than before. Therefore it is in the profession's interest to propose methods of measuring the effectiveness of asset allocation advice which are appropriate for all relevant parties.
- 5.2 It is of fundamental importance that all concerned should recognise that the appropriate measure of the quality of advice on strategic asset allocation is not whether or not investment returns turn out to be better after following the advice than they would have been without it. It may possibly be of more relevance to observe on whether or not any outcomes are outside any projected 'funnel of doubt', but even here there may be unexpected circumstances or random outcomes which act as mitigating circumstances.
- 5.3 In practice, there are many factors which will influence 'effectiveness'. One of them is the quality of the actuary's work. The quality of the actuary's work will depend in part on the quality of the tools the actuary uses, so one could break down the ALM process into a number of stages/tools and consider how the quality of each could be assessed. However, we are not proposing a quantitative assessment of each tool; the quality of the whole work is not just the sum of its parts and low quality tools skilfully used may be better than high quality tools clumsily used.
- 5.4 The outcome of asset allocation advice is probabilistic in nature. Therefore measurement of effectiveness should focus on the process rather than the result. Factors which can be considered are:
  1. Were clear objectives set and understood by decision-makers?
  2. Was a full spectrum of stakeholders considered?
  3. Does the advice help the decision-makers decide what to do not just now but also in the future? That is, is there an understanding of how to react to changing events?
  4. What is the process for setting assumptions and for decision-makers to understand their impact?
  5. Has the ALM practitioner demonstrated understanding of the model and its limitations and the ability to convey that understanding to the client or a third party?
  6. Are risks communicated to clients in such a way that they understand the risks of different asset allocations?
  7. Were implementation issues considered and included in the advice?
  8. Do decision-makers have the required qualification/expertise?

We consider each of these factors in more detail in the next section.

### 6. Monitoring Effectiveness

*“It would be good to think that trustees sat down and said: ‘We’ve been quite hard on our fund managers but actually the people who have made the worst decisions over the last 15 years are us, the trustees.’”*

*Paul Myners quoted in Professional Pensions, 13 December 2001.*

6.1 In paragraphs 2.14 to 2.23 we discussed ongoing monitoring of a fund’s asset allocation. In this section we consider how one might examine the effectiveness of the asset allocation process, covering each of the criteria listed in section 5.

#### ***Were clear objectives understood by decision-makers?***

6.2 There is an initial point to make here: is it clear who the decision-makers are? This is a point that the paper has already touched on, but it is important to recognise the source of the impetus for any decision, since this will have a bearing on whether the objectives were understood. For example, some pension fund trustee boards may rely (too?) heavily on their advisors, in which case the advisors are effectively the decision-makers.

6.3 There is also the case where the scheme sponsor will be driving the decision (when the decision is ultimately the trustees’). The sponsor may understand its objectives, but those objectives may not be clear to the trustees. However, as the sponsor will be the one funding the scheme, it is appropriate for them to have some input into the asset allocation decision.

6.4 For example, the Boots Pension Scheme has as its objective “to ensure that the value of scheme assets is always enough to pay all pensions regardless of movements in the financial markets”<sup>1</sup> and took a decision in 2000 to move all of its assets into corporate bonds. This statement alone raises an important point. Although the Boots Pension Scheme took the decision, it was driven primarily by John Ralfe, the head of corporate finance, even though the final decision is the trustees’. Moreover, the decision was coordinated with a programme to buy back some of the corporate shares, recognising the reduced need for risk capital held to protect against adverse fluctuations of the pension scheme’s investments.

6.5 In broad terms, the objective should be to arrive at an appropriate asset allocation. However, do decision-makers understand what makes a particular asset allocation appropriate? Most can get to grips with efficient frontiers, but it is not clear the extent to which risk and reward measures, or rather the options available in this area, and their relevance, are understood.

6.6 It is worth spending some time on the concept of efficient frontiers. Although the basic risk/reward concept is understood, how much are the figures on the axes understood? The vertical axis, which is often expected return, surplus, or something similar, is generally easy to understand. However, the horizontal axis, which will often be in terms of a standard deviation, may not be explained or understood adequately. The fact that a larger number means more risk is easy to get across as a concept, but the meaning of the numbers in terms of (for instance) how frequently underfunding is likely to occur may not be explained or

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<sup>1</sup> Quoted in an article in the Financial Times “Inflation linkage for Boots fund”, 15 April 2002.

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understood. This means that when decision-makers are comparing different portfolios, they may not appreciate the true extent to which they differ in terms of risk.

- 6.7 Part of the problem is that there is no 'right answer'. Apart from the fact that there is a decision to be made as to where on the efficient frontier the 'best' portfolio lies, there is a choice of appropriate risk and return criteria. There is a danger that the consultants will recommend their 'pet' criteria against which the decision-makers will often be in no position to argue.

### ***Was a full spectrum of stakeholders considered?***

- 6.8 There are two aspects to this: first were all stakeholders included in the analysis, and second were all stakeholders represented amongst the decision-makers? For a pension fund, the main stakeholders could include trustees, employer, beneficiaries, investment manager and actuary. Similarly for a life company they would be the company board, shareholders, policyholders and investment manager. Each of these will have a different perspective and priorities.
- 6.9 For a pension fund, trustees are responsible for the final decision on asset allocation and it is their job to balance the priorities of the two main stakeholders of the employer and beneficiaries. The same holds true for the board of a life company balancing the interests of shareholders and policyholders.
- 6.10 Within the group of beneficiaries of a pension fund, the various members (e.g. actives, deferreds and pensioners) may also have different priorities. Younger active members in particular may be more concerned about the future profitability of their employer, and hence their future job prospects, than in security of the pension scheme. Older active members and certainly pensioners and deferreds will be mainly concerned with the security of their current benefits and possibly also with the likelihood of future benefit improvements.
- 6.11 Similarly, different groups of policyholders of a life office may have different interests, even amongst with-profits policyholders. An obvious recent example is Equitable Life, where the interests of policyholders with and without guaranteed annuity rates were fundamentally different.
- 6.12 For a pension scheme, the sponsoring employer will probably want to be able to attract and retain employees with an attractive pension arrangement, but will also be interested in keeping the cost of these arrangements at a competitive level and avoiding unnecessary risks. For a life office, the analogy is with attracting new business and encouraging persistency of existing policyholders.
- 6.13 Investment managers will have some useful insights on the practicality of any arrangement put in place, on transition issues and the issues around timing if any change. In addition the existence or otherwise of managers able to implement types of strategy must be a strong driver in deciding the strategy. Conversely, trends towards different types of strategy will impact the products that managers may decide to offer.
- 6.14 The actuary will be able to advise on issues around funding or capital requirements, accounting considerations, legislative issues, duration of the liabilities, matching characteristics and other risks the pension scheme or life fund may face. The strategy that the scheme adopts will impact on the relative importance of various types of risk that face the

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fund. The advisor will therefore have to make sure that they are able to offer advice on these risks.

- 6.15 It is important that all of these parties are considered and/or consulted at an early stage in the process to gain their initial views and opinions so that the analysis can be properly focused. Thereafter they should be consulted at appropriate stages until the decisions are finally made, so that unnecessary analysis is not undertaken and decisions do not have to be unwound at a late stage in the process.

### ***Does the advice help the decision-makers decide what to do not just now but also in the future?***

- 6.16 Typical advice comes as an initial asset allocation and, in cases where the strategy is not cashflow matching, rebalancing rules. The information that the decision-maker usually has about the strategy is a funnel of doubt: an indication of the average financial position at each point in the future assuming that the strategy is followed, along with an indication of 'good' and 'bad' outcomes. The decision-maker will make a decision based on these distributions of rewards and risks and normally undertakes to review the position at some future time, which is often after a fixed period and normally couched in terms of how the liabilities may have progressed.
- 6.17 In many cases, the strategies considered do not incorporate explicitly the ability of the decision-maker to alter asset allocation at any time based on how the future has unfolded. The 'make up your mind and then hold tight' approach is regarded as 'good' by some because it means that inexperienced investors are then unable to tinker with a so-called 'long-term strategy' based on short-term influences or irrationality.
- 6.18 However, removing the option to change asset allocation removes an important tool. The initial asset allocation is virtually always conditional on the current state of the world and this conditioning is rarely made dynamic in long-term investment advice.
- 6.19 The risks that the decision-maker may have considered when setting the strategy may be absolute in nature; for example, in pension funds, certain funding levels trigger unwanted consequences, perhaps due to regulation (MFR) or something embedded in the scheme rules.
- 6.20 A risk that seemed acceptable at the outset may suddenly become unacceptable before the end of the review period. For example, a pension fund deficit in the accounts of a certain amount may affect the corporate funding arrangements. The sponsor may accept an x% probability of the pension fund producing a deficit of that level and an asset allocation may be constructed with that in mind. However, if funding levels drop significantly immediately after the strategy is implemented, then the probability may have increased above x% and the strategy would no longer be acceptable.
- 6.21 Or alternatively, an opportunity may present itself midway through the review period that the decision-maker may have regarded as golden at the outset. For example, funding levels may have risen to the extent that all future accrual could be immediately funded out of current assets and a matched strategy followed, thereby reducing to very low levels the investment risks to the scheme. Some commentators have suggested that Boots was one of the few 'lucky' schemes to be able to follow exactly this strategy.

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- 6.22 Even if decision-maker and advisor regard explicit dynamic ('automatic') advice as being too complex to specify (because there are too many possible alternatives), advice could contain some analysis of possible trigger points when a review might be needed. Considerable effort is needed to understand and specify trigger points.
- 6.23 The use of contractual arrangements (financial engineering) for implementing changes in strategy can also be considered. These enable the decision-makers to implement dynamic strategies or changes in strategy efficiently and at the right time and can help avoid undesirable 'second-thoughts' brought on by any 'behavioural' factors.

### ***What is the process for setting assumptions?***

- 6.24 Setting assumptions is an important part of the process and, as we noted in 3.14, results are often highly sensitive to input assumptions. Given this importance, the process of setting assumptions should be documented. More importantly, decision-makers need to understand which assumptions are key and what the implications are of using a certain set of assumptions as opposed to an alternative set of assumptions.
- 6.25 We described in 4.8 and 4.9 that several assumptions can be objectively set, but that some (typically key) assumptions must necessarily involve some subjectivity. An approach often used by actuaries is to conduct sensitivity analysis i.e. they repeat the analysis on several sets of assumptions. Whilst sensitivity analysis demonstrates that the impact of assumptions has been assessed, it does not necessarily demonstrate that decision-makers have understood that impact. Sensitivity analysis inevitably increases the quantity of output from the model and it is important therefore that the advisor helps the decision-maker understand the key aspects of the sensitivity analysis. This may mean limited reporting of results under alternative parameterisations in favour of a more qualitative guide.
- 6.26 In order for the assumption setting process to be an effective part of the total process, it is essential that the decision-makers decide on the assumptions to be used i.e. that assumptions are discussed and accepted. The advisor will guide the decision-makers through the process of setting assumptions and in most cases will suggest an initial set of assumptions, but decision-makers need to take responsibility for setting assumptions, just as they take responsibility for setting asset allocation.
- 6.27 The assumption setting process should therefore include a discussion on the assumptions (with reference to some or all of past data, current market yields, and 'expert consensus') before the decision on assumptions is made. Sensitivity analysis can form part of the process. The process should be documented, including reference to whether the decision-maker perceives any of the assumptions chosen as being either 'optimistic' or 'pessimistic', if applicable.

### ***Are the limitations of any model understood?***

- 6.28 The understanding of the model and its limitations will often depend on where an actuary is employed. Many of the larger companies will develop their own stochastic asset models that may be far more complicated than, say, the Wilkie model (Wilkie (1986, 1995)). Also, the equations underlying some of these proprietary models will be closely guarded. This all means that some actuaries will be unable to gain a complete understanding of some of the models. However, how complete an understanding is needed? It could be argued that so long

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as the nature of the model and a broad understanding of the inputs and outputs are known, then this is enough information to allow the actuary to give sensible advice.

- 6.29 The robustness of the analysis with respect to the model chosen will depend significantly on the type of strategy chosen. For example, a strategy designed to hedge all investment risk can be highly sensitive to the model chosen, whereas a strategy that encompasses a significant element of mismatch risk will be less model dependent.
- 6.30 It is important for the actuary to understand the limitations of any asset model, not least that the results of a series of projections depend wholly on the assumptions used – if two asset classes have similar volatilities but different expected returns, then the one with the higher returns is very likely to feature more highly in efficient portfolios.

### ***Are risks communicated and understood?***

- 6.31 It is vital that all involved appreciate that the modelling process is only a means to aid understanding of the risks being run in practice. Hence there is a need to translate any risk quantification from the model into real world terms, which may be more qualitative. For example, in the case of a pension fund the range of returns for each alternative asset allocation over the next year is unlikely to be useful to the trustees in determining the most appropriate asset allocation strategy. What may be more useful is for these returns to be translated into statistics that are relevant to the company and trustees, for instance contribution requirements, variability of the FRS17 balance item or the likelihood of MFR failure.
- 6.32 Risks should be expressed relative to the original financial objectives and not just focused on the model outputs. It is also important that the modelling process should not itself unnecessarily limit the scope of the advice given.

### ***Were implementation issues considered?***

- 6.33 It is important for implementation issues to be considered when framing advice. One would expect that advice that stopped at an asset allocation with no indication of the next steps would be deemed poor quality. A legitimate exception would be a circumstance where the decision-makers deliberately restricted the terms of reference of the asset allocation advisor because there is another advisor retained to advise on implementation issues. However, you would still expect some liaison between advisors. Another exception may be if the advisor were providing a second opinion.
- 6.34 The determination of the asset allocation and its implementation are two important components in the overall investment process. But there is the possibility that the two are not aligned, resulting in making investment mistakes which should have been avoided or decision-makers not getting what they expected. The asset allocation advisor should have considered any relevant practical implementation constraints as part of their work, in much the same way as any constraints imposed by the Trust Deed are incorporated into the advice. The advisor could also incorporate the desired implementation structure (e.g. core/satellite arrangement) into their financial modelling.
- 6.35 Implementing a change in asset allocation can be complex. The process should be properly planned with clear responsibilities to deliver what was intended in an efficient manner. From

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an investment perspective it is important that the desired market exposure is maintained and that the new asset allocation is implemented in a timely fashion after the decision is taken.

### ***Do decision-makers have the necessary expertise?***

6.36 The expertise of decision-makers is at the heart of the Myners Report. Indeed it is the first principle for effective decision-making:

*“Decisions should be taken only by persons or organisations with the skills, information and resources necessary to take them effectively. Where trustees elect to take investment decisions, they must have sufficient expertise to be able to evaluate critically any advice they take.”*

*“Trustees should assess whether they have the right set of skills, both individually and collectively, and the right structures and processes to carry out their role effectively.”*

6.37 Asset allocation decisions are complex. No one person can be expected to be an expert on all the inputs to the process. Rather what is important is how the expertise (factual knowledge and experience) which resides with the process participants is synthesised into the decision making.

6.38 There are two dimensions to the expertise of decision-makers. The first relates to how good an individual is at analysing the information and making ‘good’ decisions. This is general and relates to issues like the ability to synthesise information and learn from past mistakes, as well as not being afraid to challenge the status quo.

6.39 The second relates to technical expertise on investment matters. It is completely unreasonable to require decision-makers to be investment experts – it is quite right that they delegate such expertise to advisors. Similarly it would be wrong for there to be a minimum level of expertise amongst decision-makers before asset allocation decisions are made – this would be impractical. But such delegation should not go unchecked – decision-makers should be able to intelligently challenge the advice of their advisors. The extent of delegation should also be ‘appropriate’ – decision-makers should be satisfied that the relevant expertise has formed an input to the process.

6.40 The expertise of decision-makers needs to be assessed at the level of the whole process, including the decision-makers themselves and advisors. A key aspect of this is how the expertise is allocated in the process. This requires the decision-makers to have performed a stock-take of their own expertise and the expertise of their advisors and to identify any gaps. Such an expertise stock-take is part of the documentation mindset which is critical to the ability to measure the effectiveness of asset allocation decisions.

6.41 The actuary is a crucial input of expertise into the asset allocation process. The actuary’s expertise can be assessed in many areas: experience, understanding of economic models, choice of assumptions, qualitative and quantitative understanding of each (and all) asset class(es) etc. Again, it would be wrong to expect the actuary to be an expert in all such areas (though a working knowledge would be expected); rather the actuary would call upon other expertise within their firm.

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- 6.42 The level of expertise of the decision-makers and their involvement in the asset allocation decision should be consistent. Decision-makers should not make decisions in areas in which they do not feel competent. For example, it would be wrong for pension scheme trustees to allocate 5% of assets to private equity because they are seeing big schemes making such a move without first understanding the characteristics of this asset class – they are making an investment decision that may not be appropriate for their scheme even if it is for another one.
- 6.43 The final assessment of the expertise of the decision-makers should focus on their culture of always trying to improve and extend their understanding of the inputs to the investment process.



### **7. Conclusions**

*“Strategic asset allocation decisions should receive a level of attention that fully reflects the contribution they can make towards achieving the fund’s investment objective.”*

*Paul Myners quoted in Financial News, 12 March 2002.*

- 7.1 The Myners Report has put asset allocation very much in the spotlight. The working party has sought to contribute to the public debate on the quality of advice on asset allocation. Here we reiterate the main findings of the paper.
- 7.2 It is vital that all involved in asset allocation understand in advance that the appropriate measure of the quality of advice on strategic asset allocation is not whether or not investment returns turn out to be better after following the advice than they would have been without it. Whatever quantitative assumptions are made for modelling purposes will turn out to be wrong in practice (e.g. future returns, volatilities, etc.).
- 7.3 It is in everybody’s interests that any advice and the methods used to reach the conclusions are understandable and understood. If we are going to be able to monitor the effectiveness of the advice, there may need to be better documentation of what advice was given, what decisions were made and what the reasons were. This may conflict with legal advice which suggests just documenting decisions and not the reasons why, in order to reduce the scope for future litigation.
- 7.4 ALM and asset allocation are blessed with quite a few quantitative tools. To date a lot of the innovation and hard work has gone into improving the capabilities of the tools. Despite this, an area where ALM falls down is when an asset class is ignored because it cannot be easily modelled. The inability to model an asset is not a justification for excluding it from a strategic asset allocation.
- 7.5 The application of the tools is perhaps not as well advanced. For example, as well as showing the overall risks run by a fund, the tools can also be used to apportion risk between stakeholders and develop more dynamic investment strategies.
- 7.6 More hard thinking about what financial issues can be tackled through and are affected by asset allocation might help drive model development (as for example in Chapman et al. (2001)) rather than patching up existing models with the current paradigm. This will lead to new types of strategy.
- 7.7 The moves taken by Boots (and more accurately the press that they received) have broken the mould for pension fund strategies. Even if decision-makers are unwilling to buy into the same logic that legitimises the Boots cashflow matching approach, there is now surely no excuse for strategies to remain so narrow in scope or static.

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