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**THE ACTUARY'S ROLE
IN DETERMINING PENSION FUND
INVESTMENT STRATEGY**

by

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1. INTRODUCTION

1.1 Increasingly pension funds in the U.K. are considering the adoption of an investment strategy geared towards the particular circumstances of the fund and its sponsoring company. Whilst funds adopting this approach are currently in a minority, their number is growing rapidly.

1.2 The major reason for the move towards customized investment strategies has undoubtedly been the acceptance amongst corporate financial management of the importance which pension fund assets play in company finances.

The initial impetus for the growth in importance of these assets came undoubtedly from the growth in "contribution holidays". These heightened the awareness of financial executives that pension funds can have an impact on company finances and do influence the profit and loss account.

This awareness has been further increased by the introduction of accounting standards on accounting for the cost of pension funds. Whilst the U.K. standard (SSAP 24) has less direct impact on investment strategy than the comparable standard in the USA (FAS 87), it has nevertheless highlighted the fact that pension fund costs can and do influence profits.

1.3 The rapid change in financial conditions in October 1987 has also prompted pension funds to reassess the "risk" which they are undertaking with their investment policies. This begs the question of how one should define "risk"; this issue is addressed later in the paper.

- 1.4 The growing attention being paid to the most appropriate investment strategy for a pension fund to follow has led to considerable opportunities for actuaries to assist their clients in outlining the impact of different investment strategies and devising the most appropriate strategy for their own circumstances. This is not a novel role for the profession; it is, for example, a role which they have fulfilled in life offices for numerous decades.

Over the years, actuaries have been advising their pension fund clients on investment matters, particularly in the last 10 years or so in the evaluation and interpretation of investment performance statistics. Clients are now seeking a more structured and detailed level of advice and this has in turn resulted in debate on the extent of the role which actuaries should be playing.

- 1.5 This paper reviews the current involvement of the profession in defining pension fund investment strategy and the current techniques being employed.

Other papers have outlined in detail the theoretical aspects of the methodologies currently being employed. In this paper, I have attempted to outline some of the practical issues currently facing actuaries in this field of activity.

2. ROLE OF THE ACTUARY

2.1 Before going on to consider the current methodologies being employed, it is worthwhile considering, in the first instance, the role which the profession should have in advising its clients on investment strategy.

2.2 I have heard criticism from more than an isolated number of investment managers of the involvement of actuaries in investment issues. Criticism has varied from the rational ("you do not have the in depth knowledge of the investment markets") to the commercially jealous ("it's all just another way of increasing your fee income").

Whilst these criticisms, inter alia, all have a degree of truth (some to a greater extent than others) I nevertheless believe that there is a strong, legitimate and increasing role for actuaries to play in this field.

2.3 Much of the work to date has involved reviewing past investment performance in the context of the so called "league tables". This has always struck me as putting the cart before the horse in that little thought seems to have been applied in actually identifying whether or not the performance yardsticks being applied are really valid.

Contrary to accepted business practice, companies have expended much of their energy in this area reviewing the return on a substantial portion of their assets (that is, the resources devoted to the pension fund) without a clear 'Business Plan' having been pre-determined.

2.4 Consequently, I think that there is a role to be played in advising companies on the long term implications of different investment strategies for their pension funds given the nature of the pension fund's liabilities, the relationship between the fund's assets and its liabilities, and the sponsoring company's attitude to the future resources which it is prepared to allocate to the pension fund.

Such a role demands an understanding of the fund's liabilities, the long term returns and fluctuations in capital markets and the impact that these factors will have on the cost of the benefits being provided. Given that as a profession, our role is to provide long term financial projections, it is difficult, in my opinion, to come to any conclusion other than that the profession is ideally suited to assist in devising the long term strategy of a pension fund.

- 2.5 I stress the use of the term "long term strategy" in the previous paragraph. Different factors emerge when one considers the short term impact of altering the asset mix from that underlying the long term strategy to take advantage of short term movements in markets (or 'tactical asset allocation').

In this respect, further distinctions need to be made, I suggest, between the use of quantitative methods to identify departures from a long term strategy and the use of qualitative methods.

- 2.6 I see nothing inconsistent with the involvement of actuaries in the use of purely quantitative methods involving statistical relationships between different markets. This is an area to which actuaries are ideally suited.

One, must, however question the desirability of actuarial consultants becoming involved in tactical asset allocation for their clients based on qualitative methods involving fundamental analysis of stock markets.

Leaving aside the commercial dangers inherent in such a step, one must question the extent of the resources available within consulting firms and whether these resources really are sufficient.

2.7 In any event, whatever the methodology implied, the involvement of actuarial consultants in tactical asset allocation must, to some extent, create a conflict of interest between the actuarial adviser and the investment adviser. In turn, this would question the objectivity of the actuarial advisers in assisting their clients selecting investment management structures and investment management firms.

In short, if the actuarial firm provides tactical asset allocation services, it is difficult to see it recommending balanced fund management to its clients.

2.8 Similar criticisms could of course be levied at actuarial involvement in defining long term strategy but, in these circumstances, the criticisms have, to my mind, less weight. The majority of investment firms have preferred strategic approaches and, as such, cannot provide objective advice on long term strategy.

In any event, the liability-led nature of the advice on long term strategy creates a clear division of responsibilities which minimises, if not eliminates, conflict of interest.

2.9 In summary, the recent expansion in the services provided by actuarial firms to encompass advice on long term investment strategy for pension funds has extended their investment related services to the boundary beyond which conflicts of interest between actuaries and investment managers are likely to arise. It will be interesting to review this issue in several years to see whether these conflicts have been addressed and resolved. I personally doubt whether they will and that any further expansion in actuarial services towards providing advice on tactical asset allocation is ill-advised.

3. DETERMINING INVESTMENT OBJECTIVES

- 3.1 In attempting to devise the most appropriate investment strategy, it is necessary to have a clear indication of the objectives required of the investment policy. In practice, few pension funds in the U.K. have clearly defined investment objectives.
- 3.2 A requirement by the Financial Services Act for investment management agreements to state the client's investment objectives has led to a continuation of the usual cliches; for example "maximise return within acceptable levels of risk" - this returns us to how "risk" should be defined.
- 3.3 The one area where pension funds do have clearly defined investment objectives is in the area of performance relative to that of other pension funds. There is, in this regard, an overwhelming desire to appear in the upper quartile of returns irrespective of whether such an objective is appropriate given the nature of the fund's liabilities and other factors influencing investment objectives. It can be strongly argued that such a system encourages fund managers to look over their shoulders at what the competition is doing rather than adopt the most appropriate investment policy for their client.

In this scenario, the definition of "risk" becomes the investment manager's commercial risk of doing something different from the average fund manager rather than the degree of "risk" inherent in the investment policy followed, in terms of investment return and the consequent impact on the security of benefits and variability of contributions.

- 3.4 It strikes me that there is a general agreement that the system requires qualification if not an overhaul. That is not to say that a particular pension fund should be disinterested in the performance of other funds but rather that such comparisons should be included in objectives where it is appropriate to do so rather than as a matter of course or as the only yardstick by which performance is judged.

Nevertheless, the present system continues by and large unchanged. Those investment firms who appear in the upper quartile are happy to advertise this fact and consequently obtain new funds for management whilst those who languish in the bottom quartile bemoan the iniquity of the system. As firms move from the top of the league tables to the bottom (and vice-versa) views are changed.

Consultants, it must be said, also perpetuate the so-called tyranny of the league tables largely, I think, in the absence of feasible alternatives.

- 3.5 A similar situation arises in the debate on 'short-termism'. Investment firms are happy to quote short term performance statistics when they are beneficial and thus an aid to obtaining new clients but, should short term performance statistics be adverse, virtue is made of a necessity and long term performance statistics are preferred.

Similarly industrialists who criticise the fund management industry for 'selling out' to predators will also criticise their own pension fund investment manager for underperformance arising from a failure to invest in companies solely on the basis that they are likely to be acquired.

- 3.6 It is naive to imagine that the assortment of vicious circles outlined above will be easily solved.

However, one step in the right direction would be if investment objectives were based on a company's business expectations for its pension fund. This is by no means a novel suggestion (particularly in the U.S. where it is applied across a wide range of funds) but it is one which has only recently come into prominence in the U.K. where investment objectives have largely been determined in ignorance of their inter-relationship with the company's business objectives for the pension fund.

In this way, the objective of the pension fund's investment strategy can be directly related to the achievement of the company's strategic business objective for its pension fund (for ease of reference, the strategic business objective for the pension is subsequently referred to as 'the Business Objective').

It also allows the introduction of a meaningful and objective definition of "risk". As mentioned earlier in the paper, "risk" is often used indiscriminately in statements of investment policy or investment objectives. It is, by and large, a catchall phrase meaning all things to all men on which it is often difficult to reach agreement.

By introducing the concept of a Business Objective for the pension fund, the 'risk' inherent in a particular investment strategy can thus be related objectively to the probability of not achieving the stated Business Objective.

3.7 In attempting to identify the pension fund's Business Objective, it is important to stress that the process does not, at this stage, involve any investment decisions. It is a simple statement of how the pension fund is viewed within the company's long term business plan. For example:-

- a) "To provide the current level of benefits at a cost not exceeding X% of payroll".
- b) "To ensure that the contribution of the pension fund towards the profit and loss account over the next 5 years does not reduce below £Y million".
- c) "To introduce desired benefit improvements without any increase in cost".

In passing it should be noted that the expected returns from the capital markets may well be such that achievement of the stated Business Objective is highly unlikely, in which case the Business Objective requires to be restated at a more acceptable level.

3.8 Such an approach can be criticised on the grounds that it views the investment strategy purely from the viewpoint of the company rather than the members of the pension fund. The interests of the members can, and should, be allowed for, typically by including the attainment and continuation of minimum funding ratios within the Business Objectives.

This does, however, also raise the issue of members' expectations from a defined benefit pension fund and, in particular, the extent to which future surpluses should be used to improve benefits. My personal view is that the quantum of benefits provided should be independent of the financial position of the pension fund. In other words, I see no reason why members should receive improved benefits merely because the pension fund is in a healthier financial position than anticipated and my comments in the remainder of this paper are based on this premise.

I suspect that this is not necessarily a universally held opinion and the Business Objectives could of course incorporate any agreement between the Company and the Trustees of the pension fund on the future allocation of surpluses.

Equally, it strikes me that it is not unreasonable for an employer to wish to avoid excessive surpluses being accumulated within the pension fund particularly in view of the legislation on this issue and the consequent possibility of having to improve benefits. The Business Objective may well therefore include not only a minimum but also a maximum funding ratio.

Particular circumstances arise in the case of discretionary increases in pensions payment (whether or not there is pre-funding of these increases) and the Business Objective should reflect the agreed policy on this issue.

- 3.9 It is worthwhile noting that much of the discussion on pension fund investment strategy has, to date, involved the matching of assets to liabilities.

By relating investment strategy to the achievement of the Business Objective, account can also be taken of an equally important issue influencing the acceptable level of 'risk' inherent in the pension fund's investment strategy; that is, the likely range of cost which the employer is prepared to accept and the employer's degree of risk averseness relative to the likely range of cost.

If pension fund contributions represent a high proportion of pre-tax profits, the employer is unlikely to adopt a strategy which carries with it a significant possibility of higher costs. Conversely, if pension fund contributions represent a small proportion of pre-tax profits, the employer may be more likely to adopt an aggressive investment policy which carries with it a reasonable likelihood of higher costs.

- 3.10 In my experience, Company management has found the identification of Business Objectives for the pension fund an instructive exercise. From the actuary's point of view, the setting up of Business Objectives provides a clear and identifiable yardstick against which the effectiveness of the investment strategy can be measured.

In moving on to identify the most appropriate long term investment strategy, use is increasingly being made of modelling techniques applied to both the fund's assets and liabilities and the application of these techniques is described in the following section of the paper.

4. APPLICATION OF MODELLING TECHNIQUES

4.1 Asset modelling techniques were first outlined in the U.S. in 1976 by Ibbotson and Sinquefeld (1). There has been substantial subsequent research. Recent examples in the U.K. are outlined at the end of paper (2).

4.2 Under these simulation models, probability distributions of future inflation rates and returns on different asset classes are produced. They are based on the trend of returns and the fluctuations in returns based on past experiences. Taking account of the correlation between returns from different asset classes, probability distributions for different mixes can, in turn, be produced.

Using these distributions, one can identify the asset mix which is most likely to achieve, over a given period, at least a given level of return. Unless one is seeking to achieve returns at either end of the spectrum of returns, it is likely that a variety of asset mixes will all achieve at least a given level of return within very close levels of probability. In these circumstances, secondary conditions such as minimising the probability of underperforming the given level of return by a certain amount or maximising the probability of outperforming the threshold rate of return by a certain amount will reduce the possible asset mixes which are most likely to achieve the given targets.

4.3 The simplest application of these models in identifying investment strategy can be achieved as follows.

4.3.1 Compare the current assets and liabilities and solve for the return(s) necessary to achieve the Business Objective.

4.3.2 Identify the asset mix most likely to achieve the return(s) necessary to achieve the Business Objective.

4.3.3 It is necessary to project the cash flow to and from the pension fund over, say, the next 10 years to identify whether or not assets will have to be sold to provide benefits. If this is the case, it may be appropriate to set up a liquidity reserve to pay benefits since it is likely that there is a high probability that the return from the liquidity reserve will, in the short to medium term, exceed that from the long term investment strategy asset mix.

There may be difficulty in carrying out too accurate a cash flow analysis particularly given the uncertainty of, for example, future early retirement programmes and payment of transfer values. However, the existence of investment income and the cessation of contribution holidays has, in my experience, generally resulted in positive cash flows in the majority of pension funds with which I have been involved.

4.3.4 The nature of the liabilities should be investigated to identify those which are fixed in monetary terms and those which are influenced by inflation. To date it has been assumed that the majority of the liabilities are influenced by inflation and, as such, 'real' rates of return will have been used in the asset model. If there is a substantial element of fixed liabilities, it is desirable to compare the range of nominal rates of return resulting from the long term asset mix with the returns available from a suitably matching fixed interest portfolio to identify the risks involved in moving away from the matched position.

Special circumstances arise in the case of pensions in payment. These are often nominally fixed in monetary terms (albeit that the monetary amount may increase by a fixed percentage each year) but, in reality, there is often the objective to increase the payment in line with, or in direct relation to, price inflation. Clearly, the approach adopted should depend on the particular circumstances of the case.

It may be appropriate to determine the appropriate asset mix assuming, firstly, that pensions are fixed in nature and, secondly, that they will be increased in line with inflation. Subsequent discussions should then be held with Trustees and/or the Employer to identify the policy on pension increases and hence the investment policy to be adopted.

4.3.5 These procedures could be followed, say, every 3 years as part of the regular actuarial valuation to identify whether any significant change in the long term asset mix is necessary or not.

4.4 This methodology is, however, open to some criticism.

Whilst the asset mix identified by the asset modelling procedure will be the appropriate investment strategy to achieve the Business Objective in the long term the distribution of returns from the asset mix over short to medium term periods (say up to 10 years) may result in the Business Objective not being achieved over this timescale.

Moreover, the emergence of cost over the lifetime of the pension fund will depend on the valuation basis employed. To the extent that the valuation basis uses a more stringent return assumption than that anticipated by the asset mix identified by the asset modelling procedure, contributions will initially be higher than anticipated and thus the Business Objective is unlikely to be achieved.

In many cases, the methodology outlined above will, in my view, give a reasonable approximation to the most appropriate investment strategy required by a particular pension fund. However, it does not allow fully for the interaction between investment results and valuation basis (or bases). Nevertheless, for many funds, it is a cost effective means of defining investment strategy.

4.5 This criticism can be answered by modelling probability distributions of both the assets and liabilities incorporating consistent projections of future inflation.

In this way probability distributions of factors influenced by both assets and liabilities (such as funding ratios, contribution rates etc) can be constructed.

The technique permits the impact of different investment policies and different valuation bases to be assessed. For example, the likelihood of a particular asset mix resulting in the emergence of a statutory excessive surplus can be assessed using the prescribed basis for such calculations whilst the impact on the ongoing contribution rate can be assessed using a different basis.

By comparing the results of these models, one can identify which asset mix is most likely to achieve the Business Objectives and is thus the most appropriate investment strategy for the pension scheme.

Just as importantly, one can clearly identify the likely impact of changing the various factors involved such as asset mix and/or valuation basis and the consequent effect these changes have on the likely achievement of the Business Objective. In this way a clear insight is obtained on the degree of 'risk' involved in pursuing a particular investment strategy.

- 4.6 In practice, particularly where the Business Objective relates to several factors, a particular asset mix may be appropriate to achieve one aspect of the Business Objective but inappropriate to achieve another. In these circumstances, some prioritisation of the various constituents of the Business Objective may be necessary. Clearly, an acceptable level of benefit security should be given priority.

5. IMPACT ON MONITORING INVESTMENT PERFORMANCE

- 5.1 The move of pension funds towards investment strategies geared towards their own circumstances has implications for the monitoring of investment performance. Some of the statistics produced previously become irrelevant whereas others become more important than previously.
- 5.2 The acceptance by a pension fund of a long term asset mix suggests that the basic yardstick against which performance should be judged is the performance of a passive portfolio invested in line with the long term asset mix and achieving Index returns in each market, rather than the performance of the 'average pension fund'.
- 5.3 Greater attention will be paid to the value added arising from tactical divergencies from the strategic long term asset mix. It is arguable whether different procedures should be followed depending on whether a specialist tactical asset allocator is being used or whether a balanced fund manager is being used who, in effect, provides both tactical asset allocation and specialist management in the markets in which the fund is invested.

Where a specialist tactical asset allocator is used, it is clear that index returns should be used as the basis for market returns, in assessing the value added from tactical asset allocation, since the market returns from the specialist managers investing in the markets cannot be second guessed by the tactical asset allocator. Where a balanced fund manager is used, it is debatable whether market returns should be represented by index returns or by the actual returns achieved on the grounds that the balanced manager should be aware of the returns which they are likely to achieve in the various markets.

- 5.4 The added value arising from stock selection within markets will continue to be calculated as previously but, in view of the growth of index funds, index returns, rather than average returns, are likely to become the basic yardstick of performance for each fund's total assets invested within a market.

The move towards specialist managers together with the increasing differentiation of investment style between investment organisations will result in a particular manager's results within a market being compared, in the short term, with the average return from managers with a similar style (e.g. growth, value) rather than with average market returns or index returns. However, over the medium term (say 4 - 5 years) each manager's returns will be compared with that of the relevant index.

- 5.5 In conclusion, the move towards customized investment strategies allied with the move towards specialist investment managers and index funds is likely to result in investment managers having far more clearly defined roles than at present. This will, in turn, lead to more detailed performance monitoring against each manager's own performance yardsticks in place of, or additional to, the more general monitoring currently in operation.

6. DEFINED CONTRIBUTION PENSION FUNDS

6.1 All of the issues considered in the paper so far have referred to defined benefit pension funds. Similar concepts can be applied to defined contribution funds although it is less likely that the actuary will have a direct input to the investment strategy of such funds since increasingly they are being operated on an individual rather than a group basis. In these circumstances, a general indication of the appropriate investment strategy applicable to individuals of different ages and with different degrees of risk averseness will probably be more appropriate than specific recommendations.

Clearly, regard should be paid to the financial sophistication of the individuals concerned and the nature and amount of the other assets held by the individual. "Know your client"!

6.2 As mentioned above, similar principles apply to defined contribution funds as to defined benefit funds but there are two obvious areas of major differences in the application of the principles. First, we are dealing with funds where there is a higher likelihood of negative cash flow than with defined benefit schemes; indeed, with individual funds, there is certainty of negative cash flow at some stage in the future. Second, there is likely to be more concern about negative absolute rates of return over relatively short time periods.

6.3 In general, this leads either to investment strategies varying over an individual's lifetime according to the outstanding duration to retirement or to a long term asset mix which may be too conservative during the early years of an employee's career and too aggressive in the later years. To my mind, the former approach is to be preferred.

7. CONCLUSIONS

- 7.1 Pension funds in the U.K. are now seeking to define more clearly than previously the investment strategy relevant to the fund's own circumstances and that of its sponsoring employer.

This creates a natural role for actuaries to play in assisting their pension fund clients to determine the most appropriate long term asset mix and the limits within which the short term asset mix may vary.

The long term asset mix should have regard not only to the nature of the fund's liabilities but also to the sponsoring employer's Business Objective for the pension fund.

- 7.2 There should be a clear division of responsibility between actuaries, who should advise on the 'neutral' long term asset mix, and investment managers, who should advise on short term divergencies from the long term asset mix.

I would not be in favour of actuaries extending their services to the extent of advising on the short term divergencies from the long term asset mix.

8. ACKNOWLEDGEMENTS

8.1 Few of the concepts expressed in this paper are novel. I would like to thank my colleagues and others who have contributed over the years to my thoughts on these issues.

Finally, all views expressed in this paper are personal and do not necessarily represent the views of my employer.

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