

## **Indexation and Tilted Funds**

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### **Summary**

Indexation is an investment strategy under which a portfolio is designed to perform in line with a representative market index.

In recent years indexation has become widely used by institutional investors worldwide.

This paper outlines the background against which indexation has developed. It then goes on to describe the three main methodologies for index portfolio construction, namely replication, stratified sampling and optimised sampling.

The paper considers some of the problems that may be caused by the widespread use of indexation. It concludes by describing the way in which techniques developed for indexation can be utilised to tilt portfolios in favour of a desired characteristic and gives a view of where the use of these techniques will lead in the future.

### **Résumé**

#### **Indexation et Fonds Infléchis**

L'indexation est une stratégie d'investissement selon laquelle un portefeuille est conçu pour obtenir des résultats alignés sur un index de marché représentatif.

Au cours des dernières années, l'indexation a été énormément utilisée par les investisseurs institutionnels du monde entier.

Cet article souligne dans quel contexte l'indexation s'est développée. Puis il décrit les trois principales méthodologies pour la construction d'un portefeuille indexé, à savoir la reproduction, le sondage stratifié et le sondage optimisé.

L'article étudie certains problèmes qui peuvent être causés par l'utilisation généralisée de l'indexation. Il conclut en décrivant la façon dont les techniques mises au point pour l'indexation peuvent être utilisées pour infléchir les portefeuilles en faveur d'une caractéristique désirée et donne un point de vue sur les conséquences futures de l'utilisation de ces techniques.

## 1. Introduction

Indexation is an investment strategy under which a portfolio is designed to produce performance in line with a representative market index.

A tilted fund is a portfolio which has similar characteristics to an index but which is systematically tilted away from the index in relation to one or more characteristics. The intention is that the "tilt" should produce systematic outperformance without interference from other undesired influences.

Indexation has grown very rapidly in the US and in the UK. It has become a popular investment method for pension funds and other institutional portfolios. It has also been marketed to retail investors in the UK through a number of authorised unit trusts.

The purpose of this paper is to outline the main aspects of indexation and tilted funds in order to provide an introduction to the subject for actuaries and other financial professionals.

The paper explains the main factors behind the growth of indexation in the UK. It then outlines the methods which can be used to construct index portfolios and highlights various problem areas. It concludes by describing tilted portfolios and gives a view of the future of these investment strategies.

Indexation can be used in many different investment areas eg equities, bonds etc. We have confined our attention to the use of the strategy in the UK equity market.

## 2. Background

Actuarial involvement in index construction in the UK dates back to 1929. The stimulus was a paper ("The Statistical Groundwork of Investment Policy" - C M Douglas TFA Vol 12) which highlighted the need for reliable index series (price and yield) as background to investment policy formulation.

The index which was designed to satisfy the requirements of that paper, the Actuaries Index, was calculated monthly by the Actuarial Tuition Service staff, and the format and principles of index construction remained broadly unchanged for over 30 years.

The original index was constrained by difficulties of data collection and calculation. By the early 1960s the availability of electronic calculation facilities had removed these constraints. It became possible at that time to develop a broad ranging market index which was capitalisation weighted

and which covered the bulk of the UK equity market. This index, the FT-Actuaries All Share Index, was introduced in 1962 and was fully explained in Haycocks and Plymen's paper, "The Design, Application and Future Development of the Financial Times-Actuaries Index" (JIA 90), submitted to the Institute of Actuaries in 1964.

That paper again discusses the use of index numbers in formulating investment policy but also contains fascinating sections on "Portfolio Performance" and "Investment Analysis by Computer". The Portfolio Performance section suggests that "The existence of a reliable "standard portfolio" introduces a new and stimulating discipline into investment management".

The next major actuarial paper on the index was Short and Brumwell's paper on the "Composition of the FT-Actuaries Share Indices" (Students Society Journal Vol 21) which was discussed by the Students Society in November 1973. That paper includes a substantial section on portfolio performance measurement.

Despite the insights that these actuarial papers provided, and the extensive discussions on the use of the index in establishing investment policy and monitoring performance, nowhere was it envisaged that the index itself would drive stock selection policy.

Nevertheless, over the last 15 years, increasing numbers of equity portfolios have been established which have the objective of performing in line with the FT-Actuaries All Share Index.

The main reasons for this substantial growth in indexation are the perceived benefits that index portfolios offer to institutional investors, which are as follows:-

i ***Performance***

The general observation is that the average manager tends to underperform representative market indices. Whilst this assertion depends to an extent on the period of observation, there is little evidence to show the average manager consistently outperforming such indices.

Historically, therefore, a portfolio offering index results would have produced above average performance.

It must be emphasised that this is a highly contentious point. To an extent the statistics vary depending on the way in which expenses of investing new money are treated. In addition using this argument to justify an indexation strategy rests on the assumption that it is indeed possible for an index portfolio to produce index performance.

## ii **Costs**

One major possible reason for the apparent underperformance is transaction cost.

Ignoring transaction costs, it is reasonable to expect the average manager to perform in line with a representative market index. The impact of dealing costs reduces this average performance.

For an index fund to perform successfully it must minimise its costs. Index funds therefore deal infrequently and operate passively.

Index funds deal on an informationless basis and have developed dealing methods which minimise trading costs, such as package (or program) trading.

Finally indexation is a volume business. Direct charges for indexation are usually lower than those for other investment strategies.

## iii **Volatility**

Indexation is a defensive investment method. Since an index fund is designed to perform in line with a benchmark index, it is extremely unlikely to underperform (or outperform) that index.

It should be emphasised that indexation is a method of stock selection, which does not address the problem of asset allocation. Index funds are therefore used as part of an overall portfolio, with some form of asset allocation process also being required.

We have indicated that indexation is an investment strategy which is pursued by substantial numbers of institutional investors. There is evidence to support this belief but we ourselves have attempted to gain greater insights into the use of indexation through a questionnaire sent to UK life offices and major pension funds.

We intend to publish the results of the survey as a supplement to this paper.

### 3. Indexation Techniques

Since their introduction in the early 1970's indexed funds have been managed using a variety of methods.

#### *Objectives*

The various indexation methods have two objectives; to match the index performance as closely as possible and to keep the running costs of the portfolio to a minimum. In the terminology often used in this area these are referred to as reducing tracking error and minimizing slippage respectively.

#### *History*

When indexing was first offered as a product to US Pension Fund sponsors in the early 1970's, the method used for tracking the index was full replication ie the portfolios contained all the stocks included in the indices, in exact index weights. However, the reduction in terms of running costs achieved by holding less than the full index portfolio, especially for small funds, meant that by the late 1970's (when use of indexing was becoming widespread), most offerers of index fund products used some form of partial replication, most commonly stratified sampling. The initial applications of stratified sampling split the index into industry sectors and excluded holdings in each sector below a certain size. Over a period, more sophisticated methods were introduced which attempted to take account of other discriminants of stock performance such as company size. As more factors were taken into account, a subjective and often ad hoc trade-off between them became necessary. Portfolio optimisation techniques based on multiple factor models attempted to introduce a scientific approach to the fitting of a large number of factors. Optimisation techniques also attempted to determine, for each level of portfolio establishment cost, the portfolio that would track the index most closely. In this way optimisation techniques attempted to bring both portfolio selection and the associated transaction costs within a scientific framework.

Optimisation techniques were developed from the portfolio selection models first suggested by Markowitz. The original Markowitz model required, for typical portfolios, estimates of a very large number of stock variances and covariances (ie around 230,000 estimates for the All Share Index). It was not until the model was simplified by Sharpe along lines originally suggested by Markowitz that it was possible to use it in practical applications. The simplifying feature was to assume that there was only one common factor significant in determining relative price performance which was a feature of more than one stock; exposure to general market movements. The so-called single index model considerably eased computational problems but fell open to charges of oversimplification. As a

consequence a number of multi-factor models were suggested in the 1960's. However it was not until the mid 1970's with further increases in computing power that multi-factor models were fully developed, and it was some years after that before they became widely used as a tool for index fund management.

The broad classifications of indexation techniques are full replication, stratified sampling and optimisation. Each of these methods is considered separately below:-

### 3.1 *Full Replication*

#### *Principles*

The portfolio is invested in all the shares of the index in the same proportion as that used in the index formulation.

#### *Practical Application*

For the broadly based investment indices such as the FT-Actuaries All Share Index none of the current practitioners in the UK advocate a strict application of the full replication principle. Usually the initial fund is set up to replicate the index (or virtually so), but cashflows into and out of the fund are dealt with using stratified sampling techniques. Where possible, and almost always on setting up a fund, transactions are made simultaneously by reference to either closing prices or prices at a specified time during the day. By dealing in this way, and by putting the deals out to competitive tender, transaction costs are reduced. In normal circumstances dealing is limited to once a month, and reflects dividend income, small cashflows, minor corporate actions and changes to the index. More significant changes are dealt with immediately. Some practitioners advocate the use of index futures and other index derivatives for the investment of small cashflows. Once the exposure via futures reaches a trigger percentage of the fund, the futures are sold and the exposure to the market is obtained through direct stock holdings.

#### *Advantages*

A main attraction of the method is its simplicity. If it is followed correctly there is little that can adversely affect the results obtained.

Once the initial portfolio has been set up turnover in the portfolio should be limited, unless there are large cashflows into or out of the fund. There is also likely to be only a small requirement for time spent managing the portfolio.

As holdings are related to market capitalisation the size of stock purchases is likely to be linked to stock liquidity, thus reducing transaction expenses.

Prior to allowance for running costs, full replication produces the most accurate tracking of the index of the methods available.

### *Disadvantages*

When running cost are taken into account, the full replication method does not always achieve index performance. In part this is due to difficulties associated with index formulation, but also because index performance calculations usually ignore transaction and other costs.

Although turnover may be limited the number of transactions is likely to be higher than for other methods. This may be mitigated to some extent if stratified sampling is used for cashflows into and out of the fund.

The high number of holdings and transactions may make the method expensive to run for small funds. Even for large funds the very large number of small holdings may be a needless expense in comparison with the extra accuracy obtained.

The large number of holdings may lead to increased trading and accounting problems, especially when establishing the portfolio, and the initial cost of setting up the indexed portfolio is likely to be higher than for other methods.

The method is inflexible and cannot be used as part of more active fund management techniques such as tilted funds.

## **3.2 Stratified Sampling**

### *Principles*

Various factors are chosen such as industry group, company size, beta, etc which may reasonably be expected to explain relative price performance over the following period. Using these factors the index is split down into various cells, and a stratified sample is taken from these cells such that the portfolio obtained matches the index with respect to the factors chosen.

### *Practical Application*

In practice a number of ad hoc adjustments are made to the process with the aim of obtaining a more accurate tracking of the index.

The most common is the use of back-testing, where the performance of the chosen portfolio is tracked against the index over the period leading up to the

current date. The relative performance of the overall portfolio and often individual industry sectors are checked against the corresponding index, and adjustments are made if required. Checks for randomness of relative performance can also be made at the same time.

Further adjustments are sometimes made by selecting further factors on a subjective basis which are thought to be currently relevant. For example overseas exposure could be matched at a time of expected exchange rate volatility, while at the same time retaining a close match with regard to the other chosen factors.

As with full replication the use of index futures and other index related products is often advocated, and package trading techniques are used. Cashflows into and out of the fund are used to rebalance the fund where possible in an attempt to reduce turnover.

#### *Advantages*

The numbers of holdings and transactions are lower in comparison with full replication. The method remains relatively straightforward and it is possible to make ad hoc adjustments fairly simply as required.

The method allows tilting of funds towards one or more factors which are expected to give rise to outperformance while having a neutral exposure to other chosen factors. The management time requirements of the fund are limited with rebalancing being required normally only semi-annually. The method can be used where there are restrictions on stock holdings, say for corporate or ethical reasons.

#### *Disadvantages*

The choice of discrimination factors is relatively subjective and the number of factors that can be allowed for is limited.

The backtesting of the portfolios means that the method relies in part on the past being a reliable guide to the future. This leaves the approach vulnerable to the emergence of new discriminating factors. As compared with full replication the tracking error of the index is likely to be larger. The turnover is also likely to be greater especially if the factors chosen in the stratified sampling are changed.

In order to obtain an appropriate exposure to small capitalisation stock without proliferating the portfolio it will be necessary to take large holdings in a few such companies. This is likely to increase transaction costs and stock specific risks.

The relative performance of stocks may cause the portfolio to drift away from the index leading to a requirement for higher turnover.



### 3.3 Optimised Sampling

#### *Principles*

Using a statistical analysis of historic share price performance those share attributes which have historically explained a significant proportion of relative share price performance are selected. Assuming these factors are the only discriminators of performance common to more than one share, a formula is determined which allows the expected variance of any portfolio against the index to be estimated.

Taking transaction costs into account a formula for calculating the cost of revising an existing portfolio to any other portfolio may also be set out. Using quadratic optimisation techniques, once a specification of a trade-off between transaction costs and expected tracking error is made, an optimal portfolio can be determined.

#### *Practical Application*

In practice instead of specifying an expected tracking error transaction cost trade-off, the minimum transaction cost of reducing the existing tracking error to various levels may be calculated. A decision is then made on the basis of the trade-off as indicated by the optimisation program. The historic experience is often weighted so that the most recent experience is given a greater importance in estimates of future tracking error.

#### *Advantages*

On the basis of historic data, optimisation provides an objective basis by which indexation can be followed. If the assumptions underlying the method are correct then optimisation will provide a precise system by which the tracking error can be balanced against slippage. In this way it may be considered preferable to the approximate method used by stratified sampling practitioners. Optimisation methods can be easily adapted to facilitate active management procedures such as tilting.

#### *Disadvantages*

Many of the assumptions underlying optimisation are debatable. In particular the following may be invalid:-

- (i) That all of the discriminating factors common to more than one share have been specified.
- (ii) That the historic importance of the various factors is a reliable guide to their expected future importance.

- (iii) The usual assumption that factors affect performance in a linear fashion
- (iv) That the cost of portfolio revisions can be considered individually with no reference to the likely future cost of further portfolio revisions that may become necessary, for example, because of changes in the factors themselves.

New share issues may be difficult to accommodate under the method due to lack of historic data. As the determination of the optimal portfolio is complex, errors in the results are difficult to detect. The complexity also makes the method difficult to adapt quickly if the assumptions are thought to be unrealistic due to market developments.

#### *Main Differences Between Methods*

The main differences between the methods are brought out by a comparison of full replication with optimisation, since stratified sampling is intermediate between the other two methods. Optimisation attempts to solve the indexation problem objectively, but requires a number of assumptions which are questionable. At the other extreme full replication provides a method by which accurate tracking of the index prior to running costs is almost guaranteed. It may however involve a number of unjustifiable costs especially in setting up the index fund.

#### *Choice of Method*

The main considerations in choosing which method to use for indexation are:-

- (i) The size of the fund and hence the impact of holding and transaction costs.
- (ii) The index being tracked and in particular the number of stocks in the index.

The proportion of stock variability against the index explained by stock specific events.

The expected number of changes to the index.

The number of stocks with relatively small capitalisations.

The relative spreads of the different stocks in the index.

The existence of stocks in which investment is prohibited.

- (iii) **Transaction, holding and turnover costs.** These include both external costs such as commission, market spread, and bank transaction and holding charges, and internal costs such as deal processing, reporting and accounting costs.

Internal costs will be affected by the arrangements for deal processing and reporting while external costs will be affected by the ability to negotiate special terms for package trades etc.

The initial set up costs will be a further factor and will depend in part on the existing structure of the fund.

Other cost factors will depend on whether the funds are managed internally and if so the costs of databases, software and the expertise required.

Some offset to these costs may be obtained by stock lending.

- (iv) **The performance objectives of the fund and whether small discrepancies in performance relative to the index are important.**

Partial replication practitioners argue that reductions in operating costs are more important than random error caused by imprecise index tracking, while those advocating full replication suggest that sampling techniques leave the portfolios open to systematic tracking errors due to flaws in the assumptions made.

If the fund is a small part of larger fund than the effect of small tracking errors may be insignificant.

- (v) **The likely size of cashflows into and out of the fund.** Large cashflows into and out of a fund will tend to increase the attractions of partial replication.

There is no clear cut choice between the methods. Although some factors can be quantified it is still necessary to make a judgement on the precise method used. The larger the fund and the smaller the size of cashflows into and out of the fund the greater are the advantages of full replication and vice versa.

## 4. Problem Areas

### 4.1 *Index Return Definition and Index Construction*

The FT-Actuaries All Share Index is an index of capital values. An historic dividend yield is also shown. In addition an ex-dividend adjustment is calculated which measures the dividends becoming due on shares going ex-dividend. The ex-dividend adjustment starts each calendar year at zero and increases throughout the year.

The total return on the index has been calculated differently by the different performance measurement organisations. One method was to divide the historic yield by 12 and invest this in the index at the beginning of each month. In a period of rising dividends this usually understated the return. Another method was to use the ex-dividend adjustment as a measure of the dividends received in each month. This method may very slightly overstate returns in a period of rising markets as dividends are only actually received about six weeks or so (on average) after shares go ex-dividend whereas the ex-dividend adjustment is increased on shares going ex-dividend.

The latter method is now most often used though an adjustment may be made to allow for the time of receipt of dividends.

Unmarketable securities, new issues and some corporate actions often present problems for index funds in that it can be difficult for the index funds to precisely follow the index. The index funds, and institutional investors generally, may have difficulty in acquiring sufficient shares in companies where large blocks of shares are held by other investors. Also they may have difficulty in obtaining sufficient shares at the issue price in new issues (where the stock may go into the index at the issue price) when other groups of investors (for example private investors or the government) take a significant interest in the issue.

However a primary purpose of a market capitalisation weighted index is to represent the experience of all investors and not just that of institutional investors or index funds. The latter groups' performance is, in any case, monitored by private surveys. The results of these surveys can currently be compared to indices to provide an indication of whether or not the survey universe did well compared to investors generally.

This all-encompassing quality of indices is clearly valuable but nevertheless changes have occasionally been made to procedure for the FT-Actuaries All Share Index. For example new issues have sometimes been included in the index at the first day's trading closing price so possibly making it easier for index funds to obtain their weighting at the price at which a new issue enters the index. Pressures to change the construction of the index to accommodate other problematic areas for index funds and institutional investors generally, such as unmarketable securities, have been resisted.

## 4.2 *Market Inefficiency*

An obvious potential problem is that lack of turnover in a stockmarket, due to large blocks of shares being untraded and held passively by index funds, means that prices will not change when they otherwise would.

However, it is not obvious that any particular level of turnover is necessary for prices to change. It merely requires more buyers than sellers, or vice versa, or the perception by market makers that such is the case. The same price changes will take place as otherwise but on reduced levels of turnover.

A more important issue related to reduced turnover is the consequent reduced revenues accruing to the securities industry. This may lead to a reduction in the resources available for research and analysis of companies and for market-making unless securities firms are in a position to be long-run loss makers. All this has been counterbalanced in the UK by an increased quantum of research undertaken within fund management organisations and a perception that much of the resources previously available were not used effectively.

Nevertheless there is still a great reliance amongst active managers on stockbroker research for information on the largest companies. At the same time, there is theoretically a level of turnover at which even research on these companies would be an unprofitable activity for stockbrokers.

Indexation is likely to lead to reduced efficiency in the market pricing mechanism. For example if 35% of the market was indexed, the owners of a private company could sell 35% of their own shareholding to the index funds at literally any price. This would happen as long as the company's market capitalisation (itself a function of price) made it important enough in the index. The index funds would then have to buy, between them, 35% of the issued capital of the company. In these circumstances the price need bear no relation to the underlying value or size of the company. This effect would obviously be further exaggerated if only, say, 30% of the company was floated and 35% of the market was held by index funds.

It is not obvious precisely how active investors can take advantage of index funds in a truly systematic way. Indeed the existence of index funds may, in a sense, make it more difficult for active managers to outperform the index.

This is because the index continues to represent an aggregation of the experience of all investors. So the aggregate experience of all non index funds will also be close to the index. The less successful active investment managers will tend to lose clients, either to index funds or to the more successful active managers. Thus the more successful active managers who previously may have been likely to beat the index will only have themselves to compete with and their aggregate experience will deteriorate, approaching that of the index.

An anomaly may arise in the area of companies too small to be in the index and amongst those stocks moving in and out of the index. A company currently needs to attain a market capitalization in the region of £60m to gain entry to the index. If an increasing proportion of the market is indexed this may reduce the pool of funds available for investment in the shares of companies too small for the index. Shares in this category may therefore be underpriced and whilst they would be likely to remain underpriced they should, other things being equal, also have a higher dividend yield. The higher yield would ensure outperformance to holders of these shares. Holders of these shares should also benefit from more than their fair share of takeover activity if these shares were genuinely underpriced.

Shares moving in and out of the index should outperform and underperform respectively as index funds adjust their holdings. However in the UK, where most index funds are constructed using sampling methods, the movement of a small company from outside the index to inside the index does not appear to produce a significant immediate reaction from index funds. On the other hand there seems to be a more noticeable effect whereby index funds sell holdings in companies which leave the index.

#### 4.3 *Corporate Governance*

Index funds have no interest in the relative performance of the different stocks in the index. They are therefore entirely passive owners of companies and have no obvious incentive to promote the development of any of the companies whose shares they own. They typically exert no pressure for management to act in shareholders' interests. In contentious matters, for example contested takeovers or the appointment of directors, index funds are likely to either abstain or support existing management. They do not generally vote half their holding each way which action would leave the matter to be decided by the active investors. If they were to vote half their holding each way then at least matters requiring only a majority vote could be effectively decided by the active investors.

The above factors taken together may in the extreme lead to companies in an index being run for the benefit of their management and employees rather than for (apparently disinterested) shareholders. At worst index funds may be accused of being irresponsible owners of productive assets. A two tier market could develop where companies not in the index are run for the benefit of shareholders whereas companies in the index may feel less constrained by shareholder pressure because of the passive nature of part of their shareholder base.

Some index funds in the UK may, occasionally, attempt to make decisions on corporate actions as if they were interested in the outcome. This can arise through being caught up in the general decision making machinery of an

investment management organisation and also through a desire to deflect criticism. However the motivation of index funds when making such decisions seems only tenuously related to their economic role as owners of companies. The results of decisions on corporate actions matter a great deal and it would clearly be unsatisfactory for these decisions to be taken by people with no identifiable interest in their successful outcome.

A means will have to be found to ensure index funds are responsible stewards of capital.

## 5. Tilted Funds

### *Rationale*

The aim of a tilted fund is to achieve a higher exposure to a factor (or set of factors) thought likely to produce outperformance in a portfolio of stocks (or conversely lower exposure to 'negative' factors) relative to a given index, while holding other attributes of the portfolio at index level. This can be achieved by using stratified sampling or optimisation.

### *Practical Application*

If stratified sampling is used, the selection of companies is adjusted so that the portfolio has the required increase in exposure to the selected attributes. The 'risk' involved in this can be measured by examining the change in the historic tracking error and by the degree of loosening of fit in other attributes.

Using optimisation, the additional expected return associated with a particular factor or factors is input with the optimiser indicating for various expected tracking errors the maximum available excess return after allowance for transaction costs.

### *Tilted Funds in Action*

The initial introduction of tilted funds followed fairly swiftly on the heels of index funds in the United States. The earliest funds had a single bias, normally toward high yield stocks. We have been unable to obtain any concrete data on the performance of these early funds, but do not believe the results to be particularly startling one way or the other. Although sceptical of the value of "backtests" for various reasons, the authors have run model UK equity portfolios in real time to test the efficacy of different portfolio tilts.

Two model portfolios have been run over a 2 year period, one with a low gearing tilt, the other with a high foreign earnings tilt. The portfolios' exposure to other factors has been kept neutral relative to the market. The tilts within these portfolios have persisted over time and there has been no need to rebalance them.

### *Tilted Funds*

The future of tilted funds looks to be inextricably linked with the future of computerised stock screening and analysis techniques, the fusion of which could lead to some form of expert system for active management. The competitive nature of the market will mean however that such systems will need to be continuously developed if they are to provide the outperformance that they will doubtless claim. Indeed as commented above, this blurring of the edges is likely to pose some interesting practical questions. Should a fund which holds all 'index attributes' at index values except for one or two which are held away from index but are not subsequently varied (except on a long time scale) be classed as actively or passively managed? What if instead of long term variation, a much shorter period is used? As the use of computer based techniques in fund management grows, there could emerge an important battle for fees in this territory between index managers keen to widen their portfolio of products from one side and active managers keen to do the same from the other. However, it is worth noting that such funds have been very slow to take off in the United States.

### *Towards Understanding?*

Perhaps a more likely development will be a better understanding by pension fund trustees (and life assurance fund managers too) of the risk profiles of their funds. The more rigorous approach encouraged by the techniques based in indexation and tilting may encourage funds to base their investment strategy round an index core with active tilted funds aiming to produce a degree of outperformance. It may be that the performance of these funds is no better than the traditional 'three wise men' (for wise men read balanced managers) approach; but at least trustees will have a clear picture of the way in which performance was achieved and the risk accepted to achieve it.