

EXAMINATIONS

April 1999

Subject 401 — UK Fellowship Investment

Paper Two

EXAMINERS' REPORT

This exam comprised two questions to be answered over three hours. Despite this, there was evidence that candidates were running out of time. Question 2 was particularly poorly answered, and will have contributed to candidates' time problems because of solutions which were particularly poorly structured. Comments on individual questions appear at the end of each solution.

1 Fixed benchmarks

- they have a solid basis of a long term asset allocation policy
- have a propensity to re-balance towards value - forces selling of rising markets and buying of falling markets; this is advantageous if the markets are rising or falling on sentiment rather than as a result of underlying economic trends. However, this may prove to be a disadvantage where there is a longer term trend, e.g. the long term decline of the Japanese market, or the sustained advance in the US market.

Capitalisation weighted benchmarks based on market size.

- Will be affected both by breadth of markets and also by stock prices levels.
- They will automatically capture new developments in markets — e.g. technology developments or transfers from public to private enterprise such as mass privatisations.
- Their weakness is that they re-inforce trends in markets so that if prices rise through sentiment rather than by fundamentals, they will encourage buying that sentiment and selling stocks falling through adverse sentiment.

GDP weighted benchmarks

- This will grant greater economic exposure in a portfolio to countries which have poor stockmarket representation relative to the size of their economies (and vice versa)
- There may be little correlation between a country or regional GDP and its investible securities.
- With globalisation of companies, the country of quotation may not be relevant to the weight applied.
- The securities bought may not reflect the underlying regional GDP.

All of the above have advantages and disadvantages — there is no absolutely correct answer.

Report to the Board of Trustees of XYZ Pension Scheme

This report covers the activities of the overseas equity component of the pension scheme, and the investment arrangements in place to manage that element of the fund. The management is shared among 4 investment managers and a tactical asset allocation manager, whose activities are described below.

The fund operates with a fixed benchmark which places 27% in US equities, 27% in European ex UK equities, 20% in Japanese equities and 20% in Far Eastern equities, with the balance 6% left in cash with the TAA manager to cover margin positions. When the arrangement was established, the part of the scheme allocated to overseas equities was split in these proportions among four regional managers, with each manager given a performance benchmark of the relative FT / S&P index denominated in local currency. All regional portfolios are unhedged.

Rebalancing to the Benchmark

The fund benchmark is re-balanced on a calendar quarterly basis, i.e. as a consequence of market movements over the quarter, the proportion of assets in, for example, US equities may have risen above 27% and that in Japanese equities below 20%. By redistributing the portions of the benchmark above and below their agreed weights back to their initial values, the total index is “re-balanced” each quarter. The amount of assets managed by each regional manager may have moved similarly over the quarter. However, no additional allocation of funds has taken place in the three years since the fund was established. As a consequence of market movements over this period, and in particular of rising markets in Europe and the US and falling markets in Japan and the Far East, the result has been a substantial increase in the amount of assets managed in the former regions and a decline in the amount of assets managed in the latter regions by the dedicated regional managers.

In order to overcome this imbalance with these amounts and the scheme's fixed benchmark, the tactical asset allocation manager conducts a quarterly re-balancing of assets. He conducts this exercise by the use of derivative overlays. Essentially he will conduct the following process to achieve this:

At each quarter end, he will obtain from each regional manager the value of assets managed by that manager. He will then calculate the proportion of assets managed by each manager. He then buys or sells future positions in each of the regions in order to redistribute the asset proportions back to the fixed benchmark weights. For example, if the value of assets managed by the US regional manager is 30% of the combined total, then he will sell US equity futures equivalent to 3% of the combined total value to rebalance the US equity proportionate weight back to 27%. He also needs to examine the currency position and hedge the US\$ currency back to a 27% weighting. He will conduct this exercise for each region in turn. The first time this exercise was conducted, the TAA manager had no existing futures positions to take into account. At the time when the second re-balancing and each subsequent re-balancing occurred, the TAA manager had to take into account his own “re-

balancing" open futures positions as well as the values of the regional managers' directly held securities, in order to determine the futures positions which he will maintain over the next quarterly period.

Since the TAA manager is also tasked with outperforming by means of tactical asset allocation, he will also maintain a trading account of short and long future positions. It is important that the TAA manager can separately account for re-balancing and trading positions, so that he can correctly ascribe dealing activity to the appropriate decision. These trading and re-balancing accounts may only be internal book accounts, so that he can net off trades and only physically deal on movements in the net positions.

Re-balancing Issues

In general terms, this process is relatively efficient. Dealing in futures is relatively inexpensive, whereas conducting a similar exercise by means of directly held assets would result in the following problems:

- the cost of selling securities in an "overweight" region and buying securities in an "underweight" region
- the synchronisation of the selling and buying activities between the two regions to ensure continuity of exposure to markets
- difference over settlement periods between regions
- transfers of cash between regions to enable settlement
- obliging the regional managers to trade (buy or sell) securities to a timetable

However, over the three year period, this re-balancing through the use of futures has given rise to a number of issues.

The regional managers are employed because of their specific skill in managing assets within their region. As a result of market movements over the last three years, the managers each now manage a significantly different proportion of the assets from their starting proportions. In the Far East and Japan, the regional managers manage significantly less than the proportion of assets they began with, while in Europe and the US the managers manage significantly more than amounts originally received. The balance of assets are held in futures positions of the managers. In the Far East, futures positions are not available which accurately represent the underlying country stockmarkets. However, the main problem is that a major portion of Japanese and Far Eastern assets are held within an "index" future position — i.e. this portion of the assets is not being managed actively — the regional managers are not being wholly employed and the value of active management is being lost. In the overweight regions, the managers manage more than their benchmark weight and are paid active fees on this excess, while a re-balancing index future position is offsetting this excess.

It is for this reason that we advocate the undertaking of a physical re-balancing of the future positions back to underlying assets, i.e. short future positions should be closed with a corresponding selling of underlying stock,

and long future positions should be closed with a corresponding buying of underlying stock.

Conducting the Futures to Physical Switch

Issues are:

- ensuring synchronisation (even by time of day) between trading in futures by the TAA manager and corresponding trading by the regional manager
- ensuring that cash is available to cover security settlement. It should be possible to sell securities in the markets which are physically overweight to release cash, which will be available to settle physical stock purchases in markets which are short of these physical assets
- security purchases and sales should be conducted by program trades to ensure low cost of dealing and efficient timing of trading activity
- it is important to know the up to date asset values of each regional manager's portfolio at the time of the trades; it may be possible to use a portfolio valuation taken the previous day and track its movement over the period up to the time of trading
- it is important to ensure that all of the managers are aware of the strict timetable of activity and the precise value of deals which they will undertake
- the regional managers should have checked the market liquidity available in the stocks in which they deal
- the regional managers are measured against a performance benchmark. Their performance measurement should take into account the large cash flow related to this switch
- etc

It would appear that some candidates had never encountered fixed benchmarks before. Most were able to differentiate between the benchmarks, but showed little understanding of how managers manage a portfolio relative to its benchmark, however defined. Although candidates were able to describe the existing quarterly rebalancing process, few identified clearly the rebalancing issues, and even fewer could produce a satisfactory plan for conducting the physical asset switch, which related to the practical problems involved, e.g. the need to synchronise the operation between the regional managers so that the settlement proceeds in one region could be used to finance purchases in another.

- 2** The three fund managers will experience different levels of taxation on income and on capital gains.

The charity fund pays no capital gains tax and receives the tax credit on dividends; the tax credit is being reduced to zero over five years, it has been assumed that the reduction is on a straight line basis.

The authorised investment trust pays no capital gains tax and receives all dividends net of tax.

The life fund pays tax on capital gains, typically 25% and receives dividends net of tax.

Throughout the answer it has been assumed that all investments are sold after 5 years.

As the beta of the ordinary share is one and it is expected that the stock market will rise at 10% p.a. assume that the stock price will also rise at 10% p.a.

It has also been assumed that the dividends will continue to increase at 8% p.a. and that the next dividend is due in one years time.

It is also assumed that the coupons on the convertible and preference shares have just been paid and are paid annually.

Ordinary Shares.

The present value of the dividend stream in the hands of the investment trust and the life fund is:

$$\begin{aligned} &= 12 \times (1.08/1.07) + (1.08/1.07)^2 + (1.08/1.07)^3 + (1.08/1.07)^4 + (1.08/1.07)^5 \\ &= 61.70\text{p per share} \end{aligned}$$

The present value of the dividend stream in the hands of the charity fund is:

$$\begin{aligned} &= 12 \times (1.08/1.07)/0.9 + (1.08/1.07)^2/0.92 + (1.08/1.07)^3/0.94 + (1.08/1.07)^4/0.96 + (1.08/1.07)^5/0.98 \\ &= 65.68\text{p per share} \end{aligned}$$

The present value of the final capital amount in the hands of the charity fund and the investment trust is:

$$\begin{aligned} &= 425 \times (1.1)^5 / (1.07)^5 \\ &= 684.47 / (1.07)^5 \\ &= 488.02\text{p per share} \end{aligned}$$

The present value of the final capital amount in the hands of the life fund is:

$$\begin{aligned} &= ((425 \times (1.1)^5 - 425) \times 0.77 + 425) / (1.07)^5 \\ &= 624.79 / (1.07)^5 \\ &= 445.47\text{p per share} \end{aligned}$$

Therefore the present value of holding one ordinary share for the three funds is as follows:

	Income	Capital	Total
Investment Trust	61.70p	488.02p	549.72p
Charity Fund	65.68p	488.02p	553.70p
Life Fund	61.70p	445.47p	507.17p

Preference Share

The present value of the dividend stream in the hands of the investment trust and the life fund is:

$$= 6 \cdot a_5 @ 7\%$$

$$= 24.60p \text{ per share}$$

The present value of the dividend stream in the hands of the charity fund is:

$$= 6 \cdot (1/1.07)/0.9 + (1/1.07)^2/0.92 + (1/1.07)^3/0.94 + (1/1.07)^4/0.96 + (1/1.07)^5/0.98$$

$$= 26.27p \text{ per share}$$

The present value of the final capital amount in the hands of the charity fund and the investment trust is:

$$= 100 \cdot V^5$$

$$= 71.30p \text{ per share}$$

The present value of the final capital amount in the hands of the life fund is:

$$= ((100-75) \cdot 0.75 + 75) \cdot V^5$$

$$= 66.84 p \text{ per share}$$

Therefore the present value of holding one preference share for the three funds is as follows:

	Income	Capital	Total
Investment Trust	24.60p	71.30p	95.90p
Charity Fund	26.27p	71.30p	97.57p
Life Fund	24.60p	66.84p	91.44p

Convertible Share

The yield on the convertible is always higher than that on the ordinary shares, however the conversion terms are such that it makes sense to convert before final expiry.

Value of ordinary shares at conversion date is:

$$\begin{aligned} &= 425 \times (1.1)^5 \\ &= 684.47p \end{aligned}$$

This compares to the redemption proceeds from the convertible of 500p.

Therefore the convertible will be converted after the last coupon is paid.

The present value of the dividend stream in the hands of the investment trust is

$$\begin{aligned} &\left(1 - \frac{30}{100}\right) \times 28 a_5 @ 7\% \\ &= 0.7 \times 28 \times 4.1 \\ &= 80.36 \end{aligned}$$

The present value of the dividend stream in the hands of the life fund is

$$\begin{aligned} &\left(1 - \frac{20}{100}\right) \times 28 a_5 @ 7\% \\ &= 0.8 \times 28 \times 4.1 \\ &= 91.84 \end{aligned}$$

The present value of the dividend stream in the hands of the charity is

$$\begin{aligned} &= 28 a_5 @ 7\% \\ &= 114.8 \end{aligned}$$

The present value of the final capital amount in the hands of the charity fund and the investment trust is:

$$\begin{aligned} &= 684.47 \times V^5 \\ &= 488.02p \text{ per share} \end{aligned}$$

The present value of the final capital amount in the hands of the life fund is:

$$\begin{aligned} &= ((425 \times (1.1)^5 - 470) \times 0.77 + 470) \times V^5 \\ &= 452.85 p \text{ per share} \end{aligned}$$

Therefore the present value of holding one convertible share for the three funds is as follows:

	Income	Capital	Total
Investment Trust	80.36p	488.02p	568.38p
Charity Fund	114.8p	488.02p	602.82p
Life Fund	91.84p	452.85p	544.69p

In order to ascertain which investment is preferred for each fund the figures need to be adjusted to take account of the differing purchase prices.

Therefore assume one pound is invested in each investment.

Therefore the total present values become

	Ord Share	Pref Share	Convertible
Investment Trust	549.72/4.25	95.90/0.75	568.38/4.70
Charity Fund	553.70/4.25	97.57/0.75	602.82/4.70
Life Fund	507.17/4.25	91.44/0.75	544.69/4.70

This becomes:

	Ord Share	Pref Share	Convertible
Investment Trust	129.35	127.87	120.93
Charity Fund	130.28	130.09	128.25
Life Fund	119.33	121.92	115.89

Therefore the charity fund would purchase the ordinary share, the investment trust the ordinary share and the life fund would purchase the preference share.

There were two approaches adopted. The cashflow solution given above and a solution based on relative yields. Marks were awarded for either solution. Many candidates failed to use the information supplied in the question. In particular, several candidates tried to assess the relative attraction based on suitability to investor need, although the question stated that each of the investments was deemed suitable for each investor. There were 9 calculations involved with a good degree of overlap. There were no complete calculations, but marks were awarded (liberally) when a correct approach was adopted (e.g. identifying that different tax rates applied even if the rates applied were not entirely accurate).