REPORT OF THE BOARD OF EXAMINERS ON THE EXAMINATIONS HELD IN

April 2002

Subject 401 — UK Fellowship Investment

Paper Two

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The examiners are mindful that a number of interpretations may be drawn from the syllabus and Core Reading. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable.

The report does not attempt to offer a specimen solution for each question — that is, a solution that a well prepared candidate might have produced in the time allowed. For most questions substantially more detail is given than would normally be necessary to obtain a clear pass. There can also be valid alternatives which would gain equal marks.

K Forman
Chairman of the Board of Examiners

25 June 2002

EXAMINERS' COMMENTS

General Observations: There appeared to be some evidence that candidates found the questions different to what they had expected. This applied in particular to Q2, perhaps because of the detailed nature of the question.

Question 1

(i) We were disappointed that many candidates could not prepare the methodology required or carry out the necessary calculations. Most marks were awarded for method not answers and marks were awarded for appropriate commentaries on the answers obtained rather than the correct ones.

(ii) Reasonably well answered.

(iii) Few seem to have read the recent addition to core reading and picked out the essential features.

(iv) Reasonable answers.

(v) Reasonable answers.

(vi) Many obvious points were missed.

(vii) Answers were weak in the main with to little thought being given to what was needed.

(viii) Answers were weak in the main with to little thought being given to what was needed

Question 2

(i) Candidates either knew this or did not. In a number of cases where they did not, there was evidence that this impacted attempts at (ii) and (iii). A number could express the formulae but not make appropriate comments.

(ii) Both parts badly answered as candidates did not take the information and explain what was going on.

(iii) Some candidates scored well but many failed to discuss the issues of the strategy and wrote down basic facts without tying them in to the strategy. Few covered the various return scenarios.

1 Solution

(i) (a) Formulae for columns

A	B	C	D	E	F	G	(C–B)*(E–E[Total])	(F–E)*C	(D–B)*(E–E[Total])	(G–E)*D

(b)

YEAR 2

Asset Class	*B'mark Alloc.*	*Manager A Actual Alloc.*	*Manager B Actual Alloc.*	*B'mark Return*	*Manager A Actual Return*	*Manager B Actual Return*	*Calculations*			
							Manager A Asset Class Selection	*Manager A Stock Selection*	*Manager B Asset Class Selection*	*Manager B Stock Selection*
UK Eq	55.9%	57.2%	54.7%	10.6	10.9	10.7	0.0	0.2	0.0	0.1
O/S Eq	22.8%	22.6%	14.4%	37.8	38.4	17.5	0.0	0.1	–2.1	–2.9
ILG	0.8%	1.0%	2.2%	4.5	6.8	0.0	0.0	0.0	–0.1	–0.1
UKB	8.0%	7.3%	5.5%	0.4	–0.1	1.1	0.1	0.0	0.3	0.0
O/S B	7.3%	7.3%	16.4%	–2.6	–6.1	–1.7	0.0	–0.3	–1.4	0.1
Cash	5.2%	4.6%	6.8%	5.0	5.0	5.0	0.0	0.0	–0.1	0.0
Total	100.0%	100.0%	100.0%	13.0	12.9	7.7	0.0	0.0	–3.4	–2.8

Comments on Results:

- Manager A takes very little risk in choosing asset classes.
- Similarly, manager A's stock selection is not particularly aggressive.
- Manager B is far more willing to take risk in choosing assets. In particular, their decision to be heavily underweight in overseas equities (at the expense of O/SB) in year 2 caused problems.
- Manager B's stock selection in overseas equities was very poor
- Unallocated error in analysis of B needs to be considered. It may have been due to timing of asset allocation or trading activity

(ii) (a) Investment style can be used to help categorise investment managers. A manager style can, unless catered for in any analysis, mask their true abilities.

Similarly, appointing high quality managers of an inappropriate style can bring unacceptable risk into a set of investment manager arrangements.

A manager's adherence to a style critical to their appointment can be crucial to control the portfolio risk and, in particular, the diversification benefits gained by appointing a manager of a complimentary style.

The common style definitions for managers are:

- Active vs passive management
- Value vs growth
- Small vs mid vs large cap etc.

(b) The analysis would focus on the equity holdings and make use of the following data:

- Company market capitalisation (percentage of index)
- Dividend yield
- Price to book ratio
- Expected earnings
- Earnings growth
- Gearing

The analysis would check the statistical evidence per stock to ensure that a stated style is being pursued for the portfolio as a whole. It would also be important to assess the extent of the style being pursued.

A reasonable history of the statistics should be considered to ensure that the manager's conviction to a style remained consistent over time.

Compare performance with adjusted indices if considering active management style:

- If size bias, compare with relevant parts of indices.
- If value/growth style, compare with relevant style adjusted indices.

(iii) The definition and discussion in this part of the question is drawn from "The Concept of Investment Efficiency and its Applications to Investment Management Structure" — Hodgson, Breban, Ford, Streatfield, Urwin.

Information ratio = active return ÷ active risk

Active return = fund return – benchmark return

Active risk = standard deviation of active return

Both investment managers have underperformed. Manager A has lost less per unit of risk. Both managers will have a low ranking. These are not particularly impressive statistics — we would prefer a manager with a high positive information ratio.

Note that five years is a reasonable timeframe for consideration but the analysis is not ideal for assessing which managers will produce and maintain high information ratios going forward.

Information ratio should not be used in isolation.

(iv) Active fund management is a people business. To assess this side as well as statistical data on each manager's record, more information on the fund management companies will be required. This will need to be prepared based on research into the investment managers.

- Details on company
  - size and nature of operation
  - ownership details
  - assets under management
  - clients lost and gained
  - fee structure
  - key focus of activity

- People
  - details of key staff (background, track record etc.)
  - number of people in each area of operation
  - remuneration structure
  - comments on other procedures for attracting and retaining quality staff

- Process issues
  - research capabilities (and external sources or research)
  - stock selection procedures
  - asset allocation procedures
  - risk controls
  - back office and client service qualities

(v) Both manager have underperformed their benchmark. This will have led to a reduction in funding.

More significantly will be the underperformance of the benchmark relative to the increase in the value of the liabilities.

The key to this will be the likely linkage of the liabilities to a combination of UK fixed and index-linked bonds which have performed more strongly than the mix of assets held.

(vi) (a) The Trustees' objectives are well formulated. The fundamental responsibility to the members is central with sensible account taken of the need to keep the costs under control.

An additional issue to factor in to the discussion would be an idea of the ability of the company to absorb an increase in cost.

Also, an idea of the possibility of securing benefit improvements if decisions taken worked in the Trustees' favour would be useful.

Possible impact of FRS 17 on investment strategy

(b)

- Allocation to equities and bonds.
- Types of equities and types of bonds to be held.
- The possibility of currency hedging and alternative asset classes which may be appropriate.
- Acceptance by both the company and the Trustees of the suitability of the investment strategy with the funding plans.

(c) Various investment strategies could be "tested" by modelling techniques.

This would help establish the Trustees to meet their objectives and help to assess the down and upside risk of not meeting the objectives.

Scenario modelling would help to identify the problem conditions for various investment strategies. The scenarios used could be based on discussions with the Trustees and the company.

Stochastic modelling can be used to ask more direct "what if" questions given the random nature of the modelling variables.

More explicit investment objectives could be formulated to help the Trustees in their crucial task of managing the investment arrangements.

Depending on the sophistication of the model, all the decisions referred to in part (b) would be aided by some form of modelling.

(d) The lack of correlation between the assets held and those driving the value of the liabilities is likely to be the key area of focus.

A move towards UK fixed and index-linked bonds would reduce the future volatility of funding levels and contribution rates.

The types of bond (fixed vs index-linked, sovereign vs non-sovereign) will depend on the precise nature of the liabilities and the Trustees' attitude to risk.

Any mis-match that remained would be more clearly understood and consistent with the objectives selected.

(vii) See Hodgson, Breban, Ford, Streatfield and Urwin.

- Active vs passive management — preferably an analysis by asset class.
- Multi-asset vs specialist management — could a range of "best in class" managers be sensibly used. Would a manager of managers be better?
- Whether active style management required — focus on value/growth or small/large cap for any part of the mandates established.
- Segregated vs pooled — potentially driven by the size of mandates established.
- Cost analyses of the various investment management structures — both transition expenses and ongoing management costs should be scrutinised.

(viii) With the investment strategy, management structure and investment managers in place, the following issues should be considered.

- Rebalancing arrangements (including destination of future contributions).
- Transition arrangements to get into new structure — including consideration of transition management.
- Monitoring procedures — structure of manager interview meetings over year.
- Format and frequency of written reporting material from investment manager (similarly, from independent monitoring companies).
- Forward looking plan for systematic review of investment objectives and all aspects of investment arrangements in the future.
- Choice of performance targets and risk controls

2 (i) 301 Core Reading Unit 22 pages 4 & 5. Formulae or words acceptable.

Measures are useful in comparing the risk-adjusted performance of investment managers.

It is particularly useful in comparing the performance of two investment managers that manage different financial assets.

The measures only allow for risk defined in terms of variance of returns and do not allow for downside or actuarial risk.

Which measure is used depends upon whether it is the total portfolio or a subset of the portfolio.

Sharpe and Pre-specified standard deviation for the former, Treynor and Jensen for the latter.

(ii) (a) We would need to examine all the sources of return and the risks being taken by such a manager.

So we would probably need to look at the very minimum at the main risks: credit risk, market risk, the liquidity of the positions, and the exposure of the positions to changes in volatility.

We need to understand what he would do if an option were exercised.

Depending on the trading strategy, other risks may need to be examined too.

A key question is whether the investment manager has experienced the kind of pay-out event or suffered adversely from some of the risks being taken. If he has not, then the ratios are not a reliable guide to risk-adjusted returns.

(b) Writing deep out-of-the-money options increases returns (premiums received) and up until the time the pay-out event occurs risk appears to be low.

This practice produces a high Sharpe ratio (returns are higher & risk as measured by standard deviation of return is low prior to the pay-out event).

Any manager with a short track record and a high Sharpe ratio should be examined very closely.

Before we can rely on the Sharpe ratio of such a manager we would need to understand the trading strategy fully.
The written option premiums provide additional return for the manager –50% more than the risk-free rate — in the months that the options expire worthless.

Investing the option premiums in low-volatility Treasury bills keeps the volatility down.

On average, the return on the index will only exceed 2.5 standard deviations once in every 100 months — less than once in every eight years.

If the return on the index has not exceeded the 2.5 standard deviations while the manager has being pursuing the strategy, his returns will be 1.5 times the risk-free rate and his risk (standard deviation of returns) will not reflect the inherent risk in the strategy. So the Sharpe ratio will be highly misleading.

(iii) In effect the manager is trying to set up a hedged position between the price of the convertible loan stock and the price of the underlying security.

A convertible loan stock could be looked at as a fixed income security and a complex call option with a series of strike prices and exercise dates.

Convertible loan stock therefore has minimum fixed interest value equivalent to its value as a straight bond

The manager is assuming that there is a correlation between moves in the price of the underlying equity security and the convertible loan stock.

If the price of the underlying security rises the manager will make a loss on the short position in the underlying security and make a gain on the convertible loan stock. But getting the exact hedging ratio correct is difficult and this is a major source of risk.

Credit risk: If the credit rating of the issuer falls, the value of its convertible loan stock will fall.

Credit risk: A decline in the credit rating of the issuer may also be accompanied by a fall in the stock price so providing some compensation for the loss in the value of the convertible loan stock.

Buying high-credit quality convertible loan stocks can reduce the credit risk in the portfolio.

In a complex strategy like this, operational risk would need to be examined. In the absence of good risk controls by the manager errors or failure to react quickly to events could lead to large losses.

If bad news hits the equity price, its price may fall sharply but that of the convertible may be only slightly affected depending upon where the price was before the fall relative to the conversion price

Market risk: The value of the convertible loan stock will fall if there is a rise in the interest rate appropriate to the convertible loan stock's maturity.

A general widening of/reduction in the yield spread of corporate bonds over government bonds will reduce/increase the price of the convertible loan stock.

If the manager wishes to sell his convertible bonds is there sufficient liquidity? Who are the natural buyers of convertible bonds at times of crises?

<u>Return potential</u>

The value of an option component of the convertible loan stock increases if the expected volatility of the ordinary share increases.

Assuming that his hedging ratio is correct, the manager will make money if the expected volatility increases. The higher the expected volatility the bigger the chance that the stock will rise above or further above its strike price(s) over the remaining term(s) of the complex call option embedded in the convertible loan stock structure.

As the ordinary share price moves above the conversion strike price, the option price will move up by a greater percentage as the delta effect takes over (assuming that original strategy was delta neutral).