

EXAMINATIONS

September 1998

Subject E — Investment and Asset Management

Paper One

EXAMINERS' REPORT

Comments

This paper was generally well answered by candidates.

However, in Question 11, there was a general difficulty in calculating the index levels.

In question 14, very few candidates realised that an oil company's revenues were directly related to the oil price, so that debt servicing based on the oil price would be a particularly good fit for the company.

- 1** Expect a good solution to list both Domestic Issues (Debentures, Unsecured Loans, Bulldogs, Local Authority Bonds and Preference Shares) and Eurosterling Bonds. Also PIBS and similar issues might be mentioned. Extra mark for mentioning floating rate issues (e.g. FRN's) as well as fixed rate issues.

The factors influencing margins will be related to security (relating to credit quality of issuer and type of issue e.g. debentures offer more security than ULS, asset cover (where appropriate), income cover, prior ranking debt, term, features of trust deed particularly further borrowing powers) and marketability (largely related to size of issue). Extra mark for a reference to cyclical economic conditions in general, particularly for unsecured issues.

- 2** Matching (of fixed monetary liabilities) is the selection of assets with cash flows which coincide with liability outgo exactly. Immunisation is an attempt to select investments which respond similarly to changes in interest rates. The conditions for immunisation are that the values are the same, the durations are the same and the convexity of assets exceeds that of liabilities. Limitations include the fact that it is not always possible to obtain investments of the appropriate duration to match liabilities, that much of the theory relating to immunisation relates to fixed monetary liabilities whereas real liabilities (or a mixture of real and nominal) are much more common, continuous rebalancing of portfolios is strictly required and you might not actually know when certain cash flows will occur.

- 3** Two methods could be as follows but other answers acceptable if fully argued. Firstly, the discounting of future income approach could be used (e.g. fixed income up to conversion and projected dividends thereafter - student to give formula). Secondly, a stochastic simulation method might be used specifying a distribution of possible growth rates which it might be argued enables a better assessment of the conversion option.

Assumptions for dividend growth and discounting rates should be consistent but dividend growth is difficult to assess at the individual stock level and one investor's view may differ from another investor. This is the principal reason for calculated values differing from market values.

- 4 Convertible - mixture of equity and bond characteristics depending on whether conversion is close/likely. Higher income, differing response to interest rates and dividend growth expectations etc. Lower marketability and security (vs. most loan stocks). Dependence on share performance. Might expect some mention of fact that the investor may also hold the equity which can influence perceptions somewhat.

Warrant - Longer term than most options. Often issued as a sweetener for a new issue. Have potential implications for equity holders since exercise increases share capital. More complicated valuation method (since exercise can affect share price and frequently very long terms involved). Sometimes available for companies where options cannot be purchased. However Warrants are always calls. Frequently deeply out of the money. High gearing. No income.

- 5 (i) 3 for 1 script \Rightarrow price of $\pounds 10/4 = 250\text{p}$

1 for 3 rights at 50p

New price = 200p

(ii)

- Take up the shares by paying the money requested.
- Sell the rights nil paid in the market.
- Take up part and sell the balance.
- Do nothing and let the rights lapse. If when the rights expire they are worth something the company will sell the rights nil paid and remit the proceeds to the investor.

- 6 (i) The consumer group contains manufacturers of consumer non-durables and so quite defensive, e.g. food manufacturers (Unilever, Cadbury-Schweppes) or pharmaceuticals (Smithkline, Zeneca).

Features:

- Becoming more capital intensive e.g. R&D commitments of Pharmaceuticals.
- Brand names increasing in importance (e.g. S&N, Cadbury-Schweppes)
- Increasingly international — overall trend of global brands.
- Gearing higher than average.
- Profit margins lower (with the obvious exception of the Pharmaceuticals) e.g. Food manufacturers, Brewers.

(ii) General industrials contrasts:

- Much more cyclical volatile profits e.g. Building materials, Housebuilders.

- Margins higher e.g. Engineers.
- Lower gearing.
- Dependent on investment spending and government spending.

7 (i)

- Expectations of real interest rates and inflation.
- Perception in the market of the riskiness of equities.
- Real level of growth in the economy.
- Supply/demand balance in the market — new issues and institutional cash flow.
- Expectations of future corporate profits and dividends.
- Politics.
- Currency effects.
- Other equity markets.
- Taxation.

(ii) Look at reverse yield gap and yield ratio

Reverse yield gap i.e. bond yield (BY) – dividend yield (DY)
= Inflation Risk Premium (IRP) – Equity Risk Premium (ERP)
+ Real Dividend Growth

Look at in absolute terms and relative to historical norm
Use expectations of real interest rates, inflation and dividend growth
(looking at corporate profit outlook) to see if equities appear cheap or dear.

Yield ratio, i.e. BY/DY may also be of use

Not intuitively so useful as yield gap, but a measure used in the marketplace by investors.

Your expectations of each of the factors in (i) (or your expectation of how the market perception of each of them will change) will influence whether or not one asset class appears cheap relative to the other,

e.g.

- higher inflation would generally hit the bond market first
- higher growth in the economy would be expected to lead to higher inflation eventually and hence worry the bond market most
- poor economic growth would hurt corporate profits outlook and hence the equity market. Interest rates may be cut to stimulate growth and the expectation of this will help the bond market
- currency moves can influence both corporate profits and economic growth and hence move the markets relative to each other
- other equity markets especially the US market can directly influence the UK equity market; the same is true of the US and UK bond markets

- supply and demand in each market is very influential. Shareholder friendly activities such as share buybacks can mean dividends are less necessary, and hence a lower dividend yield may be tolerated (or indeed be appropriate) which might make equities appear more expensive
- political changes can influence economic activity and hence move markets. Taxation changes may also accompany political events

8 Factors to consider:

- Why is it only partially let? Is it a new site that is growing and is thus highly likely that it will be fully let or is it becoming less popular with the likelihood that more lets will become available.
- The location of the shopping centre is a key factor in assessing how successful it will be achieving fully-let status and in its quality of tenants.
- Expected return: property is a real asset and both capital values and rental income would be expected to increase in line with inflation in the long term. The price offered for the site would have to take into account the probable future cash flows and make the necessary adjustments to its risk discount rate i.e. for a partially-let site where there are large risks associated with the project we would expect a much higher discount rate to be applied for a site which is highly likely to be fully let in the future.
- Cash flow: typical institutional UK lease 25 year term with rent review every 5 years — income stream is stepped in nature with initial yield depending on property type. In this case cash-flow will be highly dependent on ability to fully let the site — failure to do so may impair ability to step-up rents for existing occupiers at review dates. Again both of these probabilities have to be allowed for in the pricing.
- Cash flow income may be offset by property management costs although this is dependent on type of lease.
- Property is very unmarketable — in this case marketability is practically non-existent and it is highly likely that you will only need to speak to at most two institutions about the sale.
- For pricing it will be very difficult to make comparisons with other sales, thus emphasising the need to factor in all the risks into your assessment.
- Income security dependent on quality of tenant — who are the current tenants, of what quality are they, how long have they been at the site and what are the current terms of their leases?
- Capital values of buildings is volatile although the land itself is always likely to have value — no reference is made to the quality of the building nor how old it is.

- Property susceptible to political risks — are there any political considerations that will prevent you from either buying the shopping centre or will restrict you in your plans to more fully let the site.
- Obsolescence — buildings need modernising or replacing — no reference to how old the shopping centre is and what state of repair it is in.

- 9** (i) Hedging
Speculation
Arbitrage
Portfolio Management

- (ii) Sell £150m worth of exposure UK equity index futures.
Buy £150m worth of exposure to the bond future.

UK equity exposure would need to be reduced partly through the FTSE100 contract and partly through the FTSE Mid 250 contract. Look at the actual split of the portfolio but assuming (since the portfolio is well diversified) roughly an index split we would need to sell:

80% FTSE100, i.e. £120m
20% FTSE250, i.e. £30m

Note: core reading defines 25 as the point size for this contract. But the point size was reduced to 10 in 1998. Both answers are acceptable for marks!

No. of contracts = $\frac{\text{£Xmn}}{25} \times \text{Index level}$
where £X is the amount to be sold

Buy $\frac{\text{£150M}}{50,000} \times \text{Bond future level}$

Check if it is necessary to reduce the no. of contracts because of the length of the future, i.e. by ratio.

Volatility of Portfolio/Volatility of FTA Government All Stocks index.

- 10** (i) If a hedge is to be successful then the value of the option must move in line with the value of the underlying assets.

The delta of an option is the derivative of the option price with respect to the underlying asset price, i.e. it measures the rate of change of the value of the option on a small change in the underlying asset.

The number of options required for each unit of the asset is equal to the inverse of the delta. Delta varies by time to expiry, asset price relative to exercise price and the volatility of the underlying security so an absolutely accurate hedge will require adjustment of the no. of contracts held.

- (ii) Consider stock XYZ, whose current share price is 500p.

The following option prices are available to you:

<i>Exercise Price (p)</i>	<i>Call Option</i>	<i>Delta</i>	<i>Put Option</i>	<i>Delta</i>
520	15	0.3	30	0.6

- (a) No. of contracts = $(£6M/5) * \frac{1}{2} * (1/0.6) = 1,000,000$
or 1,000 lots (of 1,000)
- (b) Cost = $1,000,000 \times 0.3 = £300,000$
- (c) It depends on whether the extra income will be paid before the expiry of the options.

If **yes** call option price will fall
put option price will rise

If **no** then no change

- 11 (i) Bookwork

$$I(t) = \sum_i N_{i,t} P_{i,t} / B(t)$$

with

$N_{i,t}$ = number of shares issued for the i th constituent at time t

$P_{i,t}$ = price of the i th constituent at time t

$B(t)$ = base value or divisor at time t

$B(t)$ is obtained from $B(t - 1)$ through the chain-linking process

(ii)

Co.	Start Mkt Capitalisation	Base price	No. of shrs day 0 & 1	Day 1 Price	Day 2 shrs	Day 2 Price
A	30,000	30	1000	33	1000	33
B	30,000	30	1000	36	1500	42
C	40,000	20	2000	30	2000	40
D	20,000	40	500	40	500	40
E	20,000	20	1000	22	1000	24
Total	140,000					
Day 0	numerator	140000	denominator	140.00	Index value	1000.00
Day 1	numerator	171000	denominator	140.00	Index value	1221.43
Day 2	numerator	220000	denominator	154.74	Index value	1421.77

For day 0, using formula in (i) you obtain

$$1000 = 140,000/B(0)$$

so base value is 140 to give index value of 1000

For day 1, $B(1) = B(0)$ and plug in the respective numbers

$$\begin{aligned} I(1) &= 171,000/140 \\ &= 1221.43 \end{aligned}$$

For day 2, base value will need to be adjusted to allow for issue of new shares

$$\begin{aligned} B(2) &= B(1) \text{ multiplied by the ratio of the "new" market cap to the old} \\ &= 140 \times (171,000 + (500 \times 36))/171,000 \\ &= 154.74 \end{aligned}$$

$I(2)$ can then be calculated

$$\begin{aligned} I(2) &= 220,000/154.74 \\ &= 1421.77 \end{aligned}$$

(iii) There are two possible choices.

- (a) Proceed as before ignoring the state holding.
- (b) Only account for 50% of the market capitalisations of companies B and C.

Which is chosen depends on whether you wish the index to represent the market (a), or to represent what an investor could achieve in the market (b), since he can only purchase stock from that which is in free float.

- 12** Information about customers relates to an advisor seeking information about the circumstances and investment objectives of a client which would be relevant to the advice given.

Information for customers relates to making available to a client the information with which he can make a balanced and informed decision.

Both of these principles relate to determining the client's investor needs, ensuring the advisor and the client understand the needs and the client is aware of the desire for compatibility of his requirements and the assets proposed to meet these requirements.

There is an obligation on the advisor to assist the client to interpret his own needs and make his investment decision.

- 13** Both parts bookwork.

(i) Define:

1. Inflation risk premium. (IRP)
2. Corporate Bond risk premium. (CBRP)
3. Equity risk premium. (ERP)
4. Property risk premium. (PRP)
5. Risk Free Real Yield (RFRY)
6. Expected Inflation (EI)

then:

1. $\text{BOND GRY} = \text{RFRY} + \text{EI} + \text{IRP} = 3.5 + 3.0 + 0.5 = 7\%$
2. $\text{CBRY} = \text{RFRY} + \text{EI} + \text{IRP} + \text{CBRP} = 3.5 + 3.0 + 0.5 + 1.0 = 8\%$
3. $\text{ERP} = \text{Div Yield} + \text{Div Growth} - \text{RFRY} - \text{EI} = 3.0 + 5.0 - 3.5 - 3.0 = 1.5\%$
4. $\text{PRP} = \text{Prop Yield} + \text{Rental Growth} - \text{RFRY} - \text{EI} = 8.0 + 4.0 - 3.5 - 3.0 = 5.5\%$

RFRY can be taken as the GRY on Index Linked Gilts

IRP quite low implying that investors are relatively unconcerned about the risk of inflation being greater than current expectation.

CBRP includes IRP (of ½% say) and 1% which can be described as due to the marketability risk and the risk of default.

ERP is a little greater than the BRP. It also arises out of need to compensate an investor for the risk of default and lower marketability selective to government bonds, but has an additional amount to account

for the greater volatility of share prices and dividend income.

$$\begin{aligned} \text{(ii) Reverse Yield Gap} &= \text{GRY} - \text{DY} = \text{IRP} - \text{ERP} + \text{Div Growth} \\ &= \text{IRP} - \text{ERP} + \text{EI} + \text{Real Div Growth} \end{aligned}$$

i.e. using the above figures

$$7\% - 3\% = 0.5\% - 1.5\% + 3\% + 2\%$$

14 (i) You are the **company's** adviser.

Would expect earnings of company to be linked to the oil price, so this is a good way for the company to raise finance, since the loan servicing and repayment will be linked to the company's earnings stream.

From the perspective of the purchaser, this should improve the security of meeting payments as they fall due.

Need to determine which oil price (North Sea Brent or West Texas Intermediate) and how to fix the oil price (e.g. on coupon payment date). Oil is priced in US dollars.

However, a company would be expected to borrow money at the cheapest rate it could. It is not clear how the cost of financing the loan by this method would compare with a more conventional method.

Stochastic models of the development of interest rates and oil prices might give some insight, but the price of oil is subject to great volatility.

It is not highly correlated to inflation either, whereas a lender usually positions a view of future inflation as a fairly central parameter in evaluating issue terms of a loan.

This instrument is innovative, and as such is likely to cause lenders to demand a "premium" yield, just in case.

It may however find ready purchasers among corporates who need to hedge against the oil price on a long term basis.

(ii) This would behave rather like an equity, with variable capital and dividends.

However, as explained above, correlation with inflation is not high.

Oil is priced in US\$, so instrument should be priced off US Bonds / equities.

Unlike equities, the “dividend” payable from this loan is likely to be volatile in both directions. This would suggest that the yield should be nearer that of US T Bonds, than index linked.

The initial coupon will reflect the initial oil price and the prospects of oil price inflation in the future.

- 15** An efficient market is one in which stock prices equal their investment value at all times.

There are three forms of efficiency. Assuming markets are semi-strong or strongly efficient, then there should be no opportunity for analysis to add value to decision making. However, this assumption is based on the consensus of investors believing that the current price values all known information. As the opinion of the consensus changes, prices will change to reflect this.

Investors can outperform by chance, by accepting more risk or by use of superior information.

Fundamental analysis is a methodology for evaluating information about companies and the environment they operate within. Some people are better than average at conducting this evaluation and therefore have an understanding of what might cause consensus expectations to change. Also, not all companies are sufficiently analysed for the consensus to have a clear opinion of what might be the “true” price of the companies shares. This provides opportunities for fundamental analysts to achieve excess returns. Managers can demonstrate outperformance over reasonably long periods of time.

Similarly, technical analysis is a specialist area which attempts to apply historical trading patterns to price movements, largely in the shorter term. From that perspective, they are helpful in evaluating how share prices might move to reflect new information.

The fact that both forms of analysis have adherents adds to the information base used by the consensus in arriving at their total judgement of share prices.

For a pension fund, the determination of whether they should passively index track or choose an active strategy will depend on the asset types they include and their confidence in the particular active managers they use.