

REPORT OF THE BOARD OF EXAMINERS ON THE EXAMINATIONS HELD IN

April 2002

Subject 301 — Investment and Asset Management

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' COMMENT

While the overall pass rate was in line with previous years; many more might have passed if focused on the question that was asked. Many candidates instead answered the question they thought should be asked or just wrote all they knew on a particular subject without reference to any question either real or imaginary. These approaches generally do not yield many marks while candidates reduce the time they have to answer other questions.

As in previous years the examiners were disappointed in the candidates ability to apply bookwork or to exercise any degree of judgement.

There was also a tendency assume that whenever an institution was mentioned examiners automatically meant a life company was involved and the discussion soon centred around free assets and the like. This is an examination in investment and asset management and therefore an institutional shareholder could be a pension fund, an investment trust, an OEIC, a unit trust, a private client manager, a general fund or a life company.

Question 1 was bookwork and should have provided well-prepared candidates with six marks however many candidates had trouble pinning down the definition of a certificate of deposit.

Question 2, again this was bookwork and was generally answered well.

Question 3 was, in the main answered well.

The answers to **Question 4** varied considerably, few candidates pointed to the fact that in part (i) the sales figure did not measure profitability. While in part (ii) the basis of the answer was given in the question and yet many candidates failed to produce a satisfactory answer. Part (iii) was reasonably well answered.

Most candidates gained a few marks on **Question 5** however a number of candidates spent some time discussing the liabilities without paying due attention to the assets and the returns and risks associated with them.

Candidates who read **Question 6** and thought about their answer before starting on the calculations were well rewarded in that they made the right assumption regarding cash flows, namely that they were received at the end of the period. Those candidates who assumed that cash flows were received mid way through the period had trouble calculating the time-weighted return and usually changed their assumption in order to perform the calculation. While these candidates did not lose marks it did mean that they had more calculations to perform.

In general most candidates produced figures that were not far from the correct solutions, candidates were not penalised for making arithmetic mistakes providing the underlying formulae were correct.

Parts (ii), (iii) & (iv) of question 6 were very poorly answered, if candidates had made mistakes in part (i) and had made reasonable comments in parts (ii) and (iv) then they could

receive full marks for those sections. In general the comments made demonstrated a poor grasp of what the figures that been calculated actually meant.

In part (iii), some candidates calculated total returns or in some cases capital returns, many candidates failed to appreciate that the yield figure on the domestic share index was an annual yield.

Many candidates failed to read **Question 7** and therefore produced unfocused answers. This usually involved looking at the question from the prospective of a participant in the futures exchange rather than the futures exchange itself. These answers scored a few marks usually for mentioning initial and variation margins.

Part (ii) was poorly answered.

Question 8 was bookwork and most candidates received full marks or near full marks.

Question 9 demonstrated the either candidates don't read the question or that they do but fail to grasp the significance of the facts given in the question.

Many candidates saw no contradiction in mentioning that sufficient properties may not be purchased in order to provide a diversified property portfolio. At the same time they assumed that the full \$500m is invested in property thereby assuming the investment manager would not want overall diversification between the various asset classes.

Candidates seem to lack any sense of what constitutes a large fund or a small fund and to what extent liquidity would play a part in allowing a switch into property to take place.

What is basically the application of bookwork was not answered well.

Question 10 produced the poorest answers despite the examiners exercising a significant degree of flexibility where candidates had chosen a different interpretation in answering part (ii). Candidates confused the word parameters for factors however the examiners gave credit for a well-constructed discussion of the factors rather than the parameters.

In general candidates seemed at a loss to use what knowledge they possessed to provide an adequate answer.

In **Question 11** parts (i) and (ii) were answered well with the answers to part (iii) being more variable.

- 1**
- (a) A calculation made for loans issued by companies.
The capital cover is the number of times that the assets of the company (excluding intangibles and after notionally paying current liabilities) cover the amount of the loan (including prior ranking loans).
 - (b) A certificate issued by a bank...
...showing that a stated sum of money has been deposited for a specified time at a specified rate of interest.
Certificates of deposit can be traded (i.e. sold) by the original depositor
 - (c) A measure of a stock's volatility relative to movements in the whole market.
Usually defined as the covariance of the return on the stock with the return on the market, divided by the variance of the market return.
 - (d) The risk of the individual share relative to the overall market which cannot be eliminated by diversification.
It is measured by the Beta factor.
A share with a Beta greater than 1 is said to be aggressive i.e. the share is expected to do better than the market when prices rise.
Conversely, a share with a Beta less than 1 is a defensive stock, i.e. its price will be expected to fall by less than the market when prices fall.
- 2**
- (i) In the classical system company profits are taxed twice.
Once in the hands of the company and once in the hands of the investor.
The investor may pay both income tax and capital gains tax.
The tax rates paid on income and capital gains may be different.

Under the imputation system the investor will receive their distributions after the company has paid some or all of their tax liability on the distribution.
The sum paid by the company to the government is imputed to the investor.
If the investor is not liable to tax they may be able to reclaim some or all of the tax paid.
For some investors there may a further tax liability on the distribution.
 - (ii) The factors to be considered are:

The total rate of tax on an investment and how it is split between income and capital gains.
The timing of the tax payments e.g. whether the tax is deducted at source or has to be paid subsequently.
To what extent losses or gains can be aggregated over different investments and time scales.
The extent to which tax deducted at source can be reclaimed.

3 (i) Step 1

Make a high-level preliminary risk analysis to confirm that the project does not obviously have such a high risk profile that it is not worth analysing further.

A clear risk is that the finance cannot be raised...

The government may decide that the capital required is too great to justify politically.

The commercial financial institutions may doubt the ability of the national sports body to successfully manage the project to a successful conclusion.

(these two marks for these or any other reasonable issue that each of the financial backers might have)

It would be important for the project to understand clearly the positions of these two parties before going further.

Step 2

Hold a brainstorming session of project experts and senior internal and external people who are used to thinking strategically about the long-term.

The aim will be to identify project risks, both likely and unlikely,

...to discuss these risks...

...and their interdependency,...

...to attempt to place a broad initial evaluation on each risk,...

...both for frequency of occurrence...

...and probable consequences if it does occur,...

...and to generate initial mitigation options and discuss them briefly.

Step 3

Carry out a desktop analysis to supplement the results from the brainstorming session,...

...by identifying further risks and mitigation options,...

...using a general risk matrix,...

...researching similar projects undertaken by the sponsor or others in the past (including overseas experiences),...

...and obtaining the considered opinions of experts who are familiar with the details of the project and the outline plans for financing it.

Step 4

Carefully set out all the identified risks in a risk register,...

...with cross references to other risks where there is interdependency.

Step 5

Ensure that upside risks as well as downside risks are covered.

A risk matrix could be used for the above purposes...
...with column headings relating to the cause of risk...
...and the rows relating to the risks in successive stages of the project

- (ii) The major risks are
- (a) finance not available from government
 - (b) planning permission not being granted
 - (c) returns will not be sufficient to attract investors
 - (d) sports body not financially strong enough
 - (e) wrong position
 - (f) cost will be too great

Other risks will also be acceptable as there is no absolutely correct answer to this part.

- 4 (i) The sales figure will represent the value of the sales made by the company in a particular year. The sales figure does not give any information regarding how profitable the company is whereas the enterprise value represents the total value of the company. The value that investors place on a company will be a reflection of the return they expect the company to make. Therefore a company with a high value of sales but low profit margins is likely to have a lower EV compared to a company with the same value of sales but a high profit margin.

The company with the low profit margin may have a higher than expected EV if investors expect the profitability of the company to rise in the near future.

Given both companies are in the same industry the most likely reasons for one having a higher EV to sales ratio than the other are:

- (1) Management ability.
 - (2) A more efficient capital structure.
 - (3) The possibility of a take over bid.
 - (4) size or liquidity – ability to trade the stock
 - (5) change of capital structure over the period
- (ii) Basic earnings per share are calculated after taking into account:
- (1) Interest on loans.
 - (2) Tax on profits.
 - (3) Depreciation of fixed assets.
 - (4) Amortisation of goodwill.

Each of these items can introduce distortions when trying to compare one company with another.

If an investor wishes to make a comparison of companies operating in a global industry, then the tax rate will vary from country to country as will the ideal capital structure. Equally the way accounting rules treat depreciation and amortisation can distort an investors view on the attractiveness of one company compared to that of another.

- (iii) (a) The weighted average cost of capital is defined the aggregate return required by the providers of debt and equity capital, allowing for the effects of tax and the risks borne by the capital providers.
- (b) The WACC of a company is a function of its capital structure, the costs of financing in the debt markets, the tax rate applicable and the company's beta. All these items may change from company to company, even within the same industry.

A company with a high level of debt will have a greater proportion of its WACC based on debt financing than a company with a low level of debt. Equally a company with a high beta will have a greater proportion its WACC based on its cost of equity finance.

- 5** Before we could construct a portfolio for an investor we would need to have some idea of the nature and term of the liabilities of that investor.

This will determine the level of risk that the investor can afford to take in trying to meet the liabilities.

Historically cash has been the asset with the lowest level of risk and return. Where stability of capital values is prerequisite, cash is the appropriate low-risk asset but the price of this low risk is low returns in the longer term relative to equities or bonds.

Where the investor can afford to take a somewhat higher level of risk in meeting the liabilities, bonds may be the appropriate asset class because of its slightly higher risk-return profile.

For investors who are looking for high or real returns and who can take bear the volatility of equities, then an equity portfolio may be appropriate.

Benchmark or peer group comparison.

- 6 (i) Contributions and investment income all occur on last day of each quarter. The index returns need to be calculated on a similar basis using the yield at the end of each quarter.

Time weighted return

<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	
(1.54)	11.67	6.48	(5.50)	10.64

Money weighted return

The quarterly returns are the same but the annual return is derived from

$$2,400(1+i) + 37(1+i)^{3/4} + 20(1+i)^{1/2} + 125(1+i)^{1/4} = 2,835$$

(1.54)	11.67	6.48	(5.50)	10.25
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Index time weighted return

$$R(t) = ((I(t) * (1 + Y(t)/4)) / I(t-1) - 1) * 100$$

where $R(t)$ = total return for period t

$I(t)$ = index value at time t

$Y(t)$ = yield on index at time t

7.68	11.53	1.84	(5.86)	15.14
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- (ii) Money and time-weighted are same for each quarter because of assumption but annual is different and reflects time of cash flow v market movements.

Both under perform the index by a considerable amount

The first quarter is the period accounting for all the under performance

There is strong out performance in Q3

Given the difference in income, capital return for the fund have been very poor

(iii)	<i>Period</i>	<i>Fund Income</i>	<i>Index Income</i>	
	Q1	35	18.6	[2,400*1,069/1,000*0.029/4]
	Q2	40	18.6	
	Q3	40	17.8	
	Q4	45	19.6	
	Total	160	74.6	

- (iv) As can be seen the fund was invested in stocks that yielded over twice the average for the index.
It is likely that high yield stocks under performed in the year in question as overall the fund under performed the index by a considerable margin.
The fund manager may have a yield requirement. If this is the case then perhaps a different index should be used to monitor performance.

- 7**
- (i) The exchange protects its credit exposure to participants in the futures market in several different ways.

Trades can only be cleared by members of the exchange with clearing status. Clearing status involves authorisation, having certain minimum capital and operational standards.

Institutional investors, corporates and individuals who wish to effect futures transactions must have their trades cleared by members of the exchange with clearing status.

Clearing members of the exchange must pass on at least the initial margin requirement and the variation margin calls to their clients. They can of course pass on higher margin requirements.

The exchange imposes initial margin requirements on clearing firms (and hence their clients) as part of the procedure of entering into a futures contract.

Typically, the initial margin requirement would provide the exchange with sufficient capital (usually with 99.5% certainty) to weather an adverse price movement in the futures contract in the event that the client/clearing member defaulted.

The credit exposure of the client/clearing member to the exchange varies with the value of the futures contract. For example, where the client has a short futures contract on the FTSE 100 index and the index rises the client's exposure to the exchange via the clearing member increases.

Variation margin is also required where the initial margin falls below a threshold specific to the contract. This provides collateral movement from the client to the exchange that varies with credit exposure of the client/clearing member to the exchange.

Price movement limits allow the exchange to suspend trading in a contract if its price moves up or down by more than set limits. Such limits allow the exchange to limit its credit exposure to clearing members/clients in the event of sudden moves in the price of the futures contract.

The margin requirements for speculators may be different to those for hedgers as speculators may not have the underlying asset to deliver.

Exchanges usually reserve the right to increase the margin requirements if they deem it fit. This was one of the problems that a well-known company in the oil futures market (Metallgesellschaft) suffered.

Close contract if margin not produced.

- (ii) In the OTC markets, there is generally¹ no central counterparty that acts as the buyer to every seller and the seller to every buyer. Hence the credit risk of the counterparty must be assessed both initially and on an ongoing basis.

Settlement of OTC contracts tends to take place at the expiry of the contract so significant credit exposures can build up for the counterparties.

In addition, because of the nature of forward contracts they can swing from being an asset on a balance sheet to being a liability. So there can be significant and sudden swings in credit risk.

Some participants in the OTC market call for collateral posting to the party with the credit exposure to reduce credit risk.

¹ Note that some swaps contracts have a central counterparty for all trades e.g. certain swaps cleared with the London Clearing House (LCH).

- 8** (i) These indices are calculated on a weighted arithmetic average market capitalisation basis with weights reflecting free float in bands.
- (ii) Any 6 of the 8 points listed in Unit 12, ¶ 2 on page 4.

- 9** (i) Prime commercial property comes in large unit sizes.

With a portfolio of \$500m, even if the manager wishes to invest as much as 10% of the portfolio in commercial property, this amounts to only \$50m.

It is unlikely that the fund would get a diversified portfolio of direct property covering shops, offices and industrial properties across different geographical areas of the country for \$50m.

The manager would need to hire in or outsource the property investment portfolio to a manager with property investment management skills. This will add to the lead-time in getting the portfolio set up.

There is also a considerable lead time in finding commercial properties suitable for institutional portfolios, negotiating terms and effecting the legal conveyance of the property to the institutional investor.

The commercial property market may have moved significantly in the time it takes to put the last two things in place.

The costs of dealing in property are very high compared with say international equities or bonds. It is difficult to generate good investment returns from tactical property investment.

The valuation of property investments is very different from say that of equities or bonds which are quoted on a stock exchange. The manager would need to consider the systems necessary to produce fund valuations when direct property investments are held.

- (ii) It may be difficult for the manager to redeem units in a property unit trust quickly. For example, property unit trusts may reserve the right to defer cancellation of units for periods of six months or so.

Property unit trusts often maintain a significant amount of cash in their portfolios in order to be able to meet redemptions. So the investment is a combination of cash and commercial property.

A pure commercial property unit trust may not exist.

He might represent a large percentage of a fund and therefore create liquidity problems.

- 10**
- (i) The returns from and risk of bonds and equities varies depending on the time period over which they are measured.

For example, the geometric mean of nominal returns on UK Gilts (as quoted in the Core Reading for Subject 301) were 5.1% per annum over the period 1899-2000, 13.1% per annum over the period 1975-2000 and 12.6% per annum over the period 1990-2000.

The investor would need to have some idea of his investment time horizon. Then examine the returns and risks over a number of periods of similar length to his time horizon to get a feel for the stability of returns and risk levels for that time horizon.

- (ii) As equities have in the past outperformed bonds over any long period of time, the higher the proportion of equities in the fund the higher the expected return.

The risk of a portfolio consisting of two asset classes is not a linear combination of the risks of the two asset classes.

The risk of the portfolio, σ_n , is given by the equation:

$$\sigma_n = \{p^2 \sigma_b^2 + (1-p)^2 \sigma_e^2 + 2p(1-p)\rho \sigma_b \sigma_e\}^{1/2} \quad \text{Equation 1}$$

Where σ_n is the expected risk of the portfolio, σ_b is the historical risk of bonds, σ_e is the historical risk of equities and ρ is the coefficient of correlation between bonds and equities.

Equation 1 can be minimised with respect to p to determine the proportion in bonds to give the minimum risk.

The value of p that minimises Equation 1, will determine the expected return on the portfolio.

A key determinant of the minimum risk level is the coefficient of correlation between bonds and equities.

If bonds and equities were perfectly correlated the risk of the portfolio would be a linear combination of the two risks.

As returns on bonds and equities are not perfectly correlated, the risk will be somewhat lower than that of a linear combination of the risks of bonds and equities.

return will be a combination of allocation to bonds and equities
and the actual returns of bonds and equities

actual returns will most likely differ from expected because of changes in
risk free (real) rate of return
inflation
risk premiums
exchange rates
economic/corporate profit growth
supply/demand constraints

If objective is to match particular liabilities, nature and term will dictate type of assets

Specific types of bonds and equities may be necessary to minimise risk e.g. corporates, overseas, passive management, growth/value.

- 11** (i) Inflation
Short-term interest rates
Fiscal deficit
The exchange rate
Institutional cash flow
Other economic factors

- (ii) (a) Corporate bonds are unlikely to carry the same security as loans made to a government. The yield differential will be based on the differences between the borrowers.

The risk of default requires investors to demand high yield. The default risk (and hence the additional premium) increases with pressures on profits.

Liquidity will also be an issue. Corporate bonds are less liquid than gilts, again leading to investors demanding additional yield premium. Add to this, the potential impact of world events causing investors to move to ultra secure investments will lead to an increase in the yield premium over government bond yields.

- (b) Demand features dominate the drivers of the level of the equity market. Central to this will be investors' expectations for corporate profits. Investors will reflect the level of risk (over government securities) they are willing to take. They will accept a lower premium if they are confident about future corporate profitability.

Investor views on economic growth, interest rates and inflation expectations as well as general market confidence will drive the equity market.

As growth starts to slow, equity markets start to fall in anticipation of corporate profitability being lower.

Demand shifts towards bond based securities and government bonds in particular.

Company insolvency has increased the risk of corporate bonds. The yield premium on corporates over government bonds increases. Actual defaults also serve to drive underperformance relative to government bonds.

Short-term interest rates (expected and in time actual) reduce as the government looks to stimulate demand. As economic confidence begins to recover, investors are more willing to accept equity risk and corporate default risk. After a period of underperforming the bond markets, equity returns improve.