

EXAMINATION

September 2006

Subject ST5 — Finance and Investment Specialist Technical A

EXAMINERS' REPORT

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. 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.

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Chairman of the Board of Examiners

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General comments

Overall candidates scored well on the bookwork sections of the paper. However, as in previous sittings, many fared less well where answers required application (perhaps reflecting a lack of experience of practical investment problems), especially when numerical answers were required; as a result questions 4 and 5 proved difficult generally with even better candidates seeming unable to work their way through demonstrating that they understood the investments and their key features. This explains why the pass rate was higher than it has been in some previous sittings but more importantly why there were so many "FA" fails.

It is concerning that many candidates appear to have little understanding of the outside world. An example of this is that hardly any realised that the debenture in Q5 would have to be repaid at today's price and not par if it was redeemed.

Better candidates were able to apply the bookwork to the situation outlined in the question.

The solutions should not be taken as comprehensive. There were a number of additional points that could have been made for various questions and these have been rewarded appropriately.

Comments on individual questions

- Q1** *In general this question was answered poorly. Many candidates failed to discuss how asset liability models could be used to oversee national debt management policy, instead describing the steps involved when carrying out an asset liability study. Consequently many candidates only picked up the bookwork marks.*
- Q2** *A bookwork question which was answered well by most candidates.*
- Q3** *Overall candidates scored well on this question. In particular Part (ii) was well answered. Better candidates scored highly on Part (iii).*
- Q4** *This question was answered very poorly with many candidates scoring low marks. It was clear that candidates struggled to understand the various investment options and therefore, were unable to calculate the expected returns required in Part (i). The answers to Part ii were slightly better.*
- Q5** *Another numerical question that was answered poorly. Many candidates failed to apply the ratios relevant for an Investment Trust. For Part (ii) candidates assumed that debt could immediately be paid off at face value rather than using a discounted cashflow approach.*
- Q6** *Candidates answered the bookwork sections of this question well, in particular Part (i). The range of answers in Part iii distinguished the better candidates as they were able to articulate the practical issues when implementing an investment switch. Part iv was generally well answered with candidates showing a good level of knowledge on derivatives.*
- Q7** *Most candidates scored full marks on Part (i). In general Parts (ii) and (iii) were also well answered.*

- 1** ALM is an investigation into longer-term issues, involving the projection of assets and liabilities over periods of several years.

The inputs are the future profile of asset proceeds and liability outgo.

Assets are largely future tax receipts but include future debt issuance and liabilities are future government spending including redemptions and interest on existing debt.

Future proceeds and outgo will be heavily influenced by the economic and business cycles together with many politically driven decisions and other government policies. (Or alternative description of input assumptions.)

The ALM can provide a series of annual differences between income and outgo, under various simulations of the factors noted above.

Debt issuance (repurchase) is the mechanism by which the government makes up any shortfall (excess) in the public finances i.e. the pattern of expected amounts of future issuance is the output of the ALM.

The debt manager will have little or no control over most of the asset or liability items but can use the ALM study to provide it with information as to the likely pattern of future issuance requirements.

It will be able to influence the profile of redemptions and therefore have some impact on the future profile of issuance.

- 2** (i) The Beta of a portfolio is a measure of the portfolio's volatility relative to movements in the whole market.

It is usually defined as the covariance of the return on the portfolio with the return on the market, divided by the variance of the market return.

A beta of 1.2 means the change in value of the portfolio should be 20% greater than the change in value of the market.

- (ii) The performance of the portfolio would be compared to the return on the index.

The portfolio's target return should recognise the pre specified level of risk.

Using an index representative of the market the portfolio is invested in, target returns could be calculated as 1.2x the index return.

(Alternative descriptions using a risk adjusted measure received equivalent credits.)

Quarterly returns for the portfolio could be compared to the quarterly returns on the target over, say, a five year period.

The excess return would indicate the level of value added by the manager.

Other relevant points.

- (iii) The performance will differ because the portfolio will be unlikely to hold stocks and sectors in weights that are wholly representative of the index/may have taken an active position.

The portfolio's beta over the period may have varied to levels above or below 1.2 affecting returns.

The portfolio may have other objectives/constraints which affect performance.

The beta is different.

The diversification (or lack of it) may affect volatility of portfolio returns.

The volume and dealing cost impact of trades in the portfolio.

The effects of cash flow.

The impact of tax.

The effects of expenses.

- (iv) The beta of individual stocks can be assessed by calculating the covariance of the return for an individual investment with the return on the index.

If the beta of an individual stock was below 1.2 then the stock could be used as a diversifier for the portfolio as its inclusion would reduce the overall risk of the portfolio.

- 3**
- (i) Popularity — how widely followed is the index by various classes of investors (e.g. asset managers, investment banks, hedge funds etc.).

Benchmarking — is the index used as a benchmark for European equity mandates?

Base currency — what currency should the futures contract use as a base currency?

Currency hedging — should investment returns in the various local currencies be assumed to be hedged against the base currency?

Frequency — how often is the index published?

Total return/withholding taxes — would need to be a total return index (preferably net of withholding taxes).

Method of index construction — e.g. based on largest x European stocks by market capitalisation, or based on a weighted average of underlying country indices?

Frequency of updates to constituents (or any weightings)

Capitalisation weighted, or based on some other weighting process (equal weights, capped weights, economic value, etc.)

Whether part of a series of indices (by country, style, sector etc.), so giving scope for exchange to expand its range of futures contracts in the future if the demand exists.

Suitable indices — FTSE All-World Europe, MSCI Europe, Eurotop, Dow Jones Eurostoxx.

- (ii) Some funds may have restrictions on the use of derivatives. This would mean that a particular fund could not invest in the futures contract.

Some stocks may be excluded for ethical or social reasons (or possibly other reasons in some cases). For example a fund may choose not to invest in alcohol or tobacco stocks.

A subset of the European equity universe may be excluded in some mandates as it is reflected elsewhere in an investor's portfolio, or the investor has decided for strategic reasons to exclude this subset. For example a UK investor may have separate UK equity and European ex-UK mandates.

A fund may have restrictions on self-investment and for very large companies' pension funds this may create operational issues with using the contract. Examples BP, Novartis.

Funds may have maximum holdings in individual securities or countries within Europe. For example a 5% maximum investment in any single stock is a common restriction.

- (iii) Split by country.
Split by sector.
Split into large, mid and small cap stocks.
Split by high/medium/low dividend yield.
Split into growth and income stocks.

Variations — change from stock returns on an unhedged basis to hedged into a range of different currencies (or vice versa).

Changing the base currency.

Changing the weighting approach.

- 4**
- (i) The convertible has a minimum return of £100 per £100 invested assuming company remains solvent. ZDP has maximum of £138, convertible depends on share price.

Convertible is ZDP plus call option.

Option price = $100 - 100/138 = 27.5$.

Convertible return better than ZDP if share price above 92 pence.

ZDP compounds annually at 6.65% p.a.

Share has dividend yield of 3.5% p.a. assuming no change in rate.

Capital growth of 3.15% required to match ZDP over 5 years.

- (ii) The equity could be attractive to any investor. It has a reasonable yield.

(Or equivalent comment from other investment backgrounds.)

The convertible requires a very strong price rise to be attractive to equity orientated investors.

Convertible needs 10.0% to achieve same goal.

It might be of interest to a hedge fund wishing to carry out arbitrage investment.

It could be of interest to an absolute return manager if market volatility was expected to increase.

The ZDP is of interest to risk averse investors with minimum return criteria.

It might be of interest to structured product providers as collateral.

(Other examples of possible investors received equivalent credit.)

It could be of interest to hedge funds in conjunction with the ordinary and convertible to create an absolute/arbitrage return.

5

- (a) Yield on investments = 3.85%
Yield on year end cash = 5%
Net asset value per share = 200p, discount = 15%
Interest on debt = 8%
Total expense ratio = 0.86%
Dividend per share = 3.45p, yield = 2.0%
Portfolio has high yield ratio to market
Cash return high — need to investigate
Gearing = $140/110 = 27\%$
Gearing slightly high for conventional trust
(Other relevant ratios plus comment received equivalent credit.)
- (b) Debt coupon = 8%, current 10 year interest rate = 4.5% (say)
Cost of paying off debt = $127.69 * 30\text{m}/100 = \text{£}38.31\text{m}$
Assets = $\text{£}101.69\text{m}$, nav per share = 184.89
Income, assuming cash and prorate reduction = 3.92m
Management expense ~ 0.65% = 0.66m, other = 0.3m
Available for div = 2.96m = 5.38 pence = 3.2% yield
Might suggest reducing yield ratio

6

- (i) Selling/purchasing assets in small units
Selling/purchasing assets over a period of time (including use of cashflow)
Using algorithmic trading techniques
Using nominee accounts
Using several banks to carry out the trades
Using derivative contracts
Use cross transactions

All of the above methods will mask the trade to other market participants and can be used in combination.

Derivatives contracts will be suitable in many cases for changing broad exposures quickly although the underlying stocks will still need to be sold/purchased in due course unless the asset allocation change is temporary.

- (ii) These approaches are difficult to implement for unmarketable securities where there is no deep or liquid market.

Assets in this category might include small cap or unquoted equities, certain high yield bonds or smaller bond issues, and property.

- (iii) Significant coordination is needed by the UK, US and Japanese equity managers to ensure that the switch goes smoothly.

It may be useful to appoint a transition manager to coordinate the process if none of the existing asset managers has a specialist team who is able to manage the project.

There may be several asset managers involved in the process.

The managers may need some time to decide which stocks to buy and sell, and this may create further delays as the transition occurs.

In practice, it is likely that the sales of UK and US equities will need to be spread over a period of time, particularly for smaller stocks.

Unless borrowing is permitted (unlikely) the Japanese equity manager can only buy stock after the UK and US equity managers have sold stock...
...allowing for settlement periods

This will delay the transition.

This may have an adverse impact due to market movements
...or currency movements

However, rushing the sales is likely to impact on the value realised from the sale.

Tax liabilities may be brought forward and crystallised, particularly on stocks with large gains since purchase.

Conversely tax losses may be created where stocks are being sold at a loss, and it is not known when those losses might be offset against future gains in the UK or USA.

The process will be time intensive and may be expensive in terms of transaction costs.

It is likely that the fund will suffer both buying and selling fees although these might be mitigated if the asset managers are able to “cross” with transactions for their other clients.

The transition programme will need ongoing monitoring in case market movements mean that the target changes in asset allocation are not achieved, or exceeded.

- (iv) The UK and US equity managers would sell a number of futures contracts with exposure equal to the amount of stock to be sold.

The Japanese equity manager would buy a number of futures contracts with exposure equal to the amount of stock to be purchased.

As the physical sales and purchases are completed the number of futures outstanding will need to be reduced to ensure that the correct exposure is maintained.

If the physical sales and purchases are not completed before expiry of the futures contracts, then any outstanding futures positions will need to be rolled over.

An operational issue with futures is that initial and variation margins will need to be deposited as the counterparty will want collateral for any outstanding positions.

If the various managers do not have sufficient assets to deposit as collateral then borrowing may be necessary.

Advantages:

Switch can be implemented very quickly.

Futures markets is very liquid, with little risk of any market impact (particularly as the futures contracts will be based on market indices).

Purchase of futures reduces pressure on asset managers to construct and execute their buy/sell programs quickly.

If the switch needs to be adjusted the positions can be easily and cheaply reversed without disturbing the underlying stock portfolios.

7 (i) Resources

These companies are involved in the extraction and supply of primary products used throughout the economy. Oil is the most important. Key characteristics are:

- large companies
- commodity price dependent
- risky
- global

Basic industries

This group includes the chemical industry and companies in the building materials and construction industries, as well as companies producing steel and other metals, and those engaged in forestry and paper. As such, these companies are mainly producing intermediate goods.

General industries

General industrial companies are involved in the various stages in the supply and production of goods. Many of the goods tend to be capital items, i.e. aircraft, ships, machinery, electronic and electrical equipment. The distinctive features of both industry groups are:

- dependent on the level of investment spending
- cyclical
- company profits tend to move ahead of the trade cycle
- dependent on government spending
- volatile profits
- high profit margins when conditions are good
- low gearing because of volatile profits
- possibly exposed to overseas markets and competition

Consumer goods

Companies in the consumer goods groups manufacture consumer durables and non-durables. Durables include cars, furniture, televisions and white goods such as washing machines. Non-durables include food and drink, pharmaceuticals, tobacco, health and household products, beverages and packaging. Generally the impact of an economic cycle is less severe on non-durable consumer goods companies than on general manufacturers. This is especially true for companies producing basic necessities. Thus, the consumer goods group is further divided into cyclical (durable) and non-cyclical (non-durable) sectors. Other key features are:

- increasingly capital intensive
- importance of brand names
- increasingly international

- moderate to high gearing
- low profit margins

Services

These are also now divided into cyclical and non-cyclical sectors. Cyclical service companies include general retailers, transport, hotel and media companies, distributors, restaurants and pubs and support services. Non-cyclicals include food and drug retailers and telecommunication services. Once again, the impact of the economic cycle will be greater on the cyclical group. Other key features are:

- labour intensive
- the more defensive companies in the group may have high gearing
- the domestic market is the most important

Utilities

Utilities are involved in the supply of continuously demanded services to households and business premises. Examples include electricity, water and gas distribution. Most UK utilities were formerly owned by the government, having been privatised during the 1980s. They are vulnerable to some political risk and to changes in the regulations under which they operate. Demand is very stable because the services that they provide are essential, or nearly essential, and because their market share will be stable (often at 100%). Thus, they are less affected by economic cycles than other groups. Other points are:

- they usually require an extensive physical infrastructure. This tends to make them capital intensive
- most utility companies are natural monopolies
- they are usually subject to tight government regulation of prices and vulnerable to other forms of political risk
- they generally have low growth prospects; this leads to a high gross dividend yield
- despite their stable demand and large capital requirements, gearing is low
- they are largely dependent on the domestic market, although some companies are diversifying internationally

Financials

The financial group companies are the various industries making up the financial services industry, e.g. clearing banks, investment banks, general insurance companies and life assurance companies, investment trusts, real estate (property) companies. The key distinctive feature of financial group companies is that they tend to be capital intensive. Otherwise, the features of companies in this group are quite varied between the different sectors:

- banks are highly geared and have volatile profits
- general insurers also have volatile profits and virtually no borrowings

- life insurers have stable profits and low gearing
- labour costs are important for many companies in the group
- the domestic market is most important but there is increasing internationalisation

Information Technology

These are the companies involved in the new industries of information technology hardware, software and the provision of computer services. While investor demand for such shares has caused share prices to increase dramatically in the past, many of the companies have yet to make profits or pay dividends. Dividend yields on these companies are therefore low, and their assets can be largely intangible.

- (ii) The fund manager only has to track the performance of the index.

So replicating the index is not essential.

Investing in many stocks and so having relatively small individual holdings in each stock will result in high dealing costs (necessary each time the relative sector weightings change).

This would reduce the performance of the fund and so cause underperformance relative to the index.

Research has shown that, after overall market movements have been taken into consideration, the share price movements of companies within industrial groupings tends to correlate more closely with each other than with companies in other industries, so holding a subset may well replicate the performance of the sector.

The share price movements reflect the changes that have occurred in the operating environment, and such changes affect companies in the same industries in similar ways.

A specific sector may only represent a small percentage of the index and within that sector the small number of stocks the manager proposes to use may represent a substantial proportion of the total market capitalisation of the sector.

Stratified sampling of the performance of each sector may have shown that the performance of the chosen stocks is a very accurate measure of the performance of the sector as a whole.

Sampling may enable the fund to choose its timing in addressing whether or when to replicate changes to the underlying index.

- (iii) Compare dividend yields, earnings growth and price earnings ratios with the Index.

For example, within each sector for the fund and the index:

- Rank the holdings by increasing yield
- Split each sector into an equal number of holdings (e.g. quintiles)
- Calculate the weighted average yield of each quintile allowing for the value of shareholdings as weights

This will help to determine:

- Consistency with the portfolio
- Identify any style biases (e.g. growth or value)
- How risky the portfolios are relative to the index

Historic comparison of the fund performance with the index quarterly over a period of around three years to determine how well the fund has tracked the index.

Comparison of risk adjusted performance measures e.g. Sharp or pre-specified standard deviation.

END OF EXAMINERS' REPORT