

**Subject ST5 — Finance and Investment
Specialist Technical A**

EXAMINERS' REPORT

April 2008

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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Comments

Most candidates scored well on questions 5, 7 and to a lesser extent 2, with many achieving close to full marks. Questions 4, 6 and 3 were the worst answered (3 in particular, with the average candidate achieving less than a third of the marks available).

In every diet there will be candidates who are very close to the pass mark and yet receive an FA – indeed candidates would be very surprised to see just how tightly distributed the marks are; deciding where the pass mark falls will have a material impact on the numbers of candidates who are successful and the examiners take great care to ensure a consistency of standard across candidates, subjects and diets. That said, it was fairly clear where the hurdle should have been set with a clear distinction between candidates graded as a Pass and not. The examiners were disappointed to see that the pass rate for this diet was slightly lower than last time given the pass mark was lower too. Where candidates scored lower it was typically because although they were able to reproduce the required bookwork for one or other question, they were unable to apply the bookwork knowledge appropriately. Few candidates provided satisfactory answers to calculation questions.

Given the intent of the profession to push out in to wider fields involving the practical application of actuarial skills in financial risk management and the increasing numbers of candidates sitting this exam, it continues to be a disappointment that many candidates achieve such low scores. Indeed, it is most astonishing the numbers who achieve grades of FC and FD since this would imply very little knowledge and understanding even after a course of study.

Candidates should note the bias in the paper towards recognising higher level skills and practical application – this is intentional and will continue. Likewise the examination system does properly allow for prior subject knowledge to be assumed. Investment is a necessarily practical subject and at this level, the examiners expect candidates to demonstrate a breadth and depth of competency as would be expected from a practising actuary or senior student in a frequently evolving discipline, particularly for those looking to progress to SA6. Hence simple regurgitation of bookwork will never be sufficient to ensure a Pass grade.

As noted before, in order to succeed, candidates must ensure they familiarise themselves with the prevailing investment issues and the general market background facing institutional investors in the 18 months preceding a diet, more so the solutions (and sources of) being debated by the various stakeholders. A recurring theme in recent years has been a move towards capital market rather than purely insurance and asset management solutions – hence questions regarding corporate finance, banking and derivative approaches to asset and liability risk management or modern financial theory and commercial applications should be considered likely scope for examination. Likewise regulation and globalisation are common issues in many areas.

All extenuating and mitigating circumstances were considered in awarding grades.

1

- (i)
- determining monetary, interest rate and inflation policy
 - regulation of banks
 - implementation of government borrowing
 - ensuring the performance and integrity of financial markets
 - intervention in currency markets
 - printing and minting of notes and coins
 - taxation
 - lender of last resort
- (ii) Liquidity risk is the risk that asset owner is unable to recover full value of asset when sale is desired (or for a borrower, the risk of credit being unavailable when an maturing loan needs to be refinanced/rolled over)
- (iii) Banks typically hold significant amounts of medium to long dated loan assets on their balance sheets, which are highly illiquid. In contrast, their liabilities will typically be shorter-term in nature, including deposits and shorter-term inter-bank loans.

Without a lender of last resort (LOLR), a bank is exposed to the risk that it will not be able to maintain payments to its creditors if sufficiently many deposits are withdrawn or if it is unable to refinance maturing loan payments. The perception that a bank is nearing such a position can lead to a run on the bank as deposits are easily withdrawn which can have wider social and economic impacts.

With a LOLR, a bank is much less likely to end up in such a position. Hence most developed economies have a LOLR system in place, explicitly or implicitly.

- (iv) The key disadvantage is moral hazard. The management of banks would have a weaker incentive to manage liquidity (by term of cashflows under assets and liabilities) as carefully as if a LOLR was not present. This reflects that in the latter scenario a bank would become insolvent and either require “bailing out” by an acquirer, or creditors to the bank would incur losses (and shareholders would almost certainly see their capital extinguished, and management would lose their jobs).

Moral hazard can also be argued to extend to depositors: with a LOLR system a depositor would not need to assess the credit standing of the bank accepting the deposit.

Most countries have taken the view that this latter aspect of moral hazard is acceptable, whereas the former is less acceptable (except where necessary to prevent contagion to other financial institutions).

The other key disadvantage is whether the losses that might accrue to the central bank under the LOLR system would ultimately be borne by taxpayers.

However in the long run it is not good for the economy for an inefficient business to receive such support.

- (v) Moral hazard and central bank losses can be reduced by ensuring that banks borrowing from the LOLR pay a penal rate of interest on loans. In reality this is unlikely to compensate for the credit risks associated with this type of lending.

Other measures may include requiring additional collateral for LOLR loans, nationalisation of a failing bank and ensuring that all other sources of financing have been explored including acquisitions or other “marriage broking”.

Regulation of liquidity management, asset quality, approved persons for management may also mitigate the disadvantages.

2

- (i)
- Asset class mismatch between equities and bonds
 - Country mismatch between overseas assets and UK assets
 - No private equity holding going forward
- (ii)
- Use of futures/derivatives/swaps to make current assets look like the target assets
 - Detailed example – e.g.: Short US equity futures by £400m, emerging market £100m, private equity £150m
 - Long UK equity £200m, UK gilts £350m, overseas bonds £100m
 - Ask current managers to restructure their current holdings to replicate asset classes using physical holdings
- (iii)
- Futures – might not have suitable futures, especially private equity,
 - basis risk between active manager and future benchmark,
 - costs of putting on derivative position,
 - extra management required to manage future contracts
 - Physical sell – investment costs (commissions, taxes) of moving to interim strategy and then extra costs of moving to final strategy once selected. Existing managers might not have capability of managing in other asset classes.

(iv)

- Taxes, commissions, spread costs, market impact costs, FX costs, administration and custodian costs

(v)

- Taxes, commissions likely to be unchanged
- Spreads widen
- Market impact costs increased
- Custodian costs likely to increase as larger number of split trades due to poor liquidity
- Probably moving to more liquid/tradable currencies within overseas bond exposures but will need to sell out of emerging positions

3

(i) Reasonable formulae, with consistent assumptions, such as:

$$PV = £9m \left[1 + \frac{z_1^{\text{inf}-0.25}}{Inf_{1-0.25-5}} \sum_{t=1}^{29} (1 + z_t^{\text{inf}-0.25})^{-t} (1 + z_t)^{-t} \right] + £100 \left[\sum_{t=0}^{29} (1 + z_t)^{-t} \right]$$

where Inf_t is the realised inflation index at time t , z_t is the zero coupon bond rate at time t and $z_t^{\text{inf}-0.25}$ is the inflation rate at time t (with 3 month lag)

credit also available for assuming that the inflation rate is a series of forwards, in which case the formula would be as follows:

$$PV = £9m \left[1 + \frac{z_1^{\text{inf}-0.25}}{Inf_{1-0.25-5}} \sum_{t=1}^{29} \left(\prod_{i=1}^t (1 + z_i^{\text{inf}-0.25}) \right) (1 + z_t)^{-t} \right] + £100 \left[\sum_{t=0}^{29} (1 + z_t)^{-t} \right]$$

(ii) The first 1 payment (at time $t=0$) would be excluded from the inflation swap as there is no inflation linkage. The remaining 29 payments are inflation linked.

Under these latter payments, the life office would pay out £9m pa plus 5 years' known historic inflation (from 5y 3m ago to 3m ago, assuming a 3 month lag in obtaining inflation data) plus actual future inflation (from 3m ago to the payment date less 3 months) at the time of each annual payment. In return the life office would receive £9m pa plus 5 years' known historic inflation (from 5y 3m ago to 3m ago, assuming a 3 month lag in obtaining inflation data) plus expected future inflation under the inflation swap curve (from 3m ago to the payment date less 3 months).

(iii) From a regulatory capital perspective the life office may find a fixed nominal payment more attractive than an inflation-linked payment if its liabilities are fixed in nature.

From a valuation perspective, the life office may feel that inflation is an asset that is worth selling if it expects inflation in the future to be lower than the current breakeven rate of inflation in the swap markets.

- (iv) The key sources of risk are:

Freehold

- Downturn in the economy can lead to a decline in value as occupancy levels fall. The long lease provides a degree of protection provided the bank continues to occupy the building and maintains rental payments.
- Oversupply of new office space leads to a decline in value as occupancy levels fall. The long lease provides a degree of protection.
- Location falls out of favour. Reversion value will therefore fall (relative to similar properties in other locations), and lower rent likely to be realised on a fresh lease. Long lease provides some protection.
- Building design/specification falls out of favour. Reversion value will therefore fall (relative to other properties in same locations), and lower rent likely to be realised on a fresh lease. Long lease provides some protection.

Lease

- Tenant cancels lease. This becomes increasingly likely towards the end of the lease as the tenant will be looking at its needs in the future, and there may be fewer penalties for cancelling late in the term (assuming a market rent is being charged, otherwise there would be an incentive to stay or sub-let the building).

Earlier in the lease this is a possibility due to restructuring or M&A activity (or possibly the default of the bank) – a new tenant would need to be found and potentially the inflation swap may no longer match the new lease.

- Tenant renegotiates lease. This could happen at any time during the lease, and becomes more likely if economic factors are such that rental yields are falling generally (depending on the terms of the lease). Mismatching issue if the renegotiated lease breaks the direct inflation link assumed under the inflation swap (eg move to fixed % increases each year, or rent review based on rents on comparable properties).
- Cost of fulfilling covenants or pursuing leaseholder to fulfil
- Void risks. Under either scenario above, there is a risk of void (incomplete/nil occupancy) which would lead to a loss of rental income. Void risk increases with time and a downturn in the economy

Inflation swap

- Changed/broken/new lease. The inflation swap would need to be cancelled/netted out or run off as the hedge against the inflation linkage in

the rental payments would no longer be valid. This would create further costs and possible liquidity issues.

- Default risk (if explained well)

4

(i) FTSE World Indices

The FTSE World Indices cover over 80% of the world's equity markets in terms of market capitalisation and are broad market indices that aim to cover the vast majority of the free float stocks that are available to overseas investors. Index values are shown for each country, in 5 currencies: Sterling, US Dollar, Japanese Yen, Euro and the local currency. There are also regional groupings of countries (weighted by market cap) and an All-World Index.

Morgan Stanley Capital International Indices

This is a series of international equity indices covering both developed and emerging markets. They are calculated on a market capitalisation weighted arithmetic basis and total returns are published both gross and net of withholding tax, and in US Dollar, Euro and local currencies.

(ii) Replication in tracker portfolio

Sampling

ETF

Buy futures

Buy assets (e.g. cash or stocks) and engage in an OTC swap to pay the return on the assets and receive equity market return

(iii) Stocks not available to foreign investors are not included in these indices. This is not the case for most local indices, so these are often more suitable for performance measurement purposes than local indices.

Some local indices are weighted averages or total return based

They have a consistent methodology between countries.

They are easier to obtain than some local indices (single data source).

Also, some local indices do not restrict constituent weightings to the free float, which means they are unsuitable for performance measurement purposes.

Finally, there are index values shown net of withholding taxes and in various currencies which may be helpful for an overseas investor.

(iv) The key feature that is needed for an exchange-traded derivative contract is liquidity. This means that the contract should be based on the most popular local index to maximise demand from users of the derivative.

This is less of an issue for OTC markets, where client preferences will be more important.

Liquidity of the underlying stocks is also important to ensure that the derivative price closely tracks the underlying stocks (as pricing variations can be arbitrated away rapidly).

This leads to a preference for large-cap stocks over small-cap stocks within the underlying index.

Using a large-cap index as opposed to a broad-market index also means that the price of the derivative and index value are both available continuously throughout the day, improving liquidity further.

Where the underlying index is not continuously quoted or the index constituents are illiquid, it is likely that pricing of the derivatives will include wider spreads to reflect this illiquidity and uncertainty.

- 5**
- (i) The principal aims of regulation are:
- to correct market inefficiencies and to promote efficient and orderly markets
 - to protect consumers of financial products
 - to maintain confidence in the financial system
 - to help reduce financial crime
- (ii) A self-regulatory system is organised and operated by the participants in a particular market without direct government intervention.

Advantages:

The system is implemented by the people with greatest market knowledge.

System is implemented by people who are incentivised to maximise cost benefit ratio of regulation and ensure system is non-bureaucratic.

Should be more flexible than the alternatives and be able to respond rapidly to changes in market needs.

Cooperation with a self-regulatory organisation may be more forthcoming than with a government agency (but not necessarily).

Disadvantages:

Regulator will be perceived to be closer to industry than customers.

This can lead to a lack of confidence from consumers and purchasers...

...particularly when criticism of industry is high in the wider economy

Self-regulatory organisation likely to have fewer powers to fine and punish industry members than a government agency established under statute.

Barriers to entry

- 6**
- (i) The bank has become a riskier investment – there may be an additional sector risk if this bank's performance impacts or infers a wider contagion.
As the bank increases its risk the expected return investors seek from the investment should also increase
However, the investment only makes 1% of portfolio so although bank has increased in risk the impact at the total portfolio level should be minimal.
- (ii) Expect the share price to increase
Regret aversion – by maintaining existing arrangements people minimise the pain associated with feeling of loss
Overconfidence in their ability
Status Quo bias – like to keep things the same
Good diversifier in overall portfolio

Could be part of an index tracking portfolio
Tax considerations
Income may be appreciated

- (iii) Individual is close to retirement hence would expect to be in less risky investments where capital more guaranteed.
However, depends exactly when investor expects to retire.
Small part of overall portfolio so might be suitable if most other holdings are relatively safe.
If majority of investments are equity then probably not suitable.
- (iv) Write options eg put options for a lower price than the current share price for which the investor will receive a premium.
The closer to the current price the higher the premium they will receive.
- (v) Using example in (iv) to answer (v) and (vi):
Will keep premium
Current holdings will increase in value by 30%
- (vi) Will make loss on put options and
Would have to buy additional shares at agreed price
Making higher loss and increasing exposure to bank.
Existing holdings decrease in value

7

- (i) Factors that are important in valuing a company:
Management ability
Quality of products
Prospects for market growth
Competition
Input costs
Retained profits
History
- (ii) Sources of information:
The financial press and other commercial information providers
The trade press
Published accounts
Public statements by the company
The exchange where the securities are listed
Government sources of statutory information that a company has to provide
Visits to the company
Discussions with the company's management
Discussions with competitors
Stockbrokers' publications.

- (iii) (a) A house builder is economically sensitive.
The earnings will rise and fall with the economic cycle, they are volatile.
Investors try to anticipate the future earnings profile.
When the economy is buoyant earnings will be high however investors will be discounting an economic slowdown and therefore the p/e will be lower than the average p/e for the company through the cycle.
- Similarly when earnings are low the p/e is likely to be high as investors look forward to an upswing in the economy.
- (b) Tobacco companies are economically insensitive.
Therefore the p/e of the tobacco company is relatively insensitive to the economic cycle.
Investors have no need to anticipate the future earnings profile.
- (c) A retail bank is economically sensitive
The earnings will rise and fall with the economic cycle, they are volatile.
Investors try to anticipate the future earnings profile.
- (iv) Discounted cash flow valuations can be very useful in valuing a company.
The result of a discounted cash flow number is an absolute number that can be compared to other DCF valuations.
DCF valuations can be used where a company generates no profit and pays no dividend for instance a start up.
It would depend on the sector being analysed, some sectors are more suited to DCF valuations than others.
DCF valuations are more time consuming.
DCF valuations can be very sensitive to the assumptions made e.g. the discount rate and the growth rate.
DCF can be difficult to explain to others.

END OF EXAMINERS' REPORT