EXAMINATIONS

April 1999

Subject 301 — Investment and Asset Management

EXAMINERS' REPORT

Overall, the most disappointing feature was the number of "bookwork" questions which were badly answered – generally because the candidates gave insufficient information to award marks. They also failed to use all of the information flagged in the questions. In the longer questions, few candidates provided more than the basic answers, and so were unable to distinguish themselves. Comments on individual questions appear in italics at the end of the solution to each question.

1 A total return index can be calculated either by an XD adjustment or a yield adjustment.

XD adjustment — assuming dividend or interest payments are reinvested back into the index on its ex dividend date, i.e. it is added to current market capitalisation, the corresponding increase in the index value would be the investment income divided by the base value. The xd adjustment is the total accumulation of each constituent over the year as each constituent company declares a dividend. It is returned to zero at the end of each year, and a new accumulation is started.

The total return index (TRI) at time t is derived from the index (I) using the ex dividend adjustment (XD) by the formula

$$TRI(t) = TRI(t-1) * I(t) / [I(t-1) - \{XD(t) - XD(t-1)\}]$$

Limitation: There is an assumption that reinvestment takes place on the ex dividend date. It is important to ensure that tax and re-investment assumptions are understood.

Yield adjustment – the income received over the 12 months prior to time t is

$I(t) * y_t$ where y_t is the dividend yield at time t

The total return is obtained by adding the yield adjustment to the capital only index.

Limitation: Over shorter time periods, the income is estimated on a proportionate basis; however, this only gives an approximation, as income is not generally received uniformly over the year.

Bookwork and badly answered - some students mistook two methods to mean two formulas for the same method (and lost potential marks).

2 The beta of a portfolio is a measure of the volatility of the portfolio relative to movements in the whole market as measured by an index. It is defined as the covariance of the return on the portfolio with the return on the market index, divided by the market index return.

The risk adjusted measures which make use of beta are

Treynor Measure — measure of reward per unit of systematic risk defined as

$T = (R_p - r) / B_p$

where R_p is the return on the portfolio
r is the risk free rate of return over the period, and
B_p is the systematic risk in the portfolio

Jensen Measure — is a measure of return relative to a benchmark with the same degree of risk

$J = R_{\text{portfolio}} - R_{\text{benchmark}}$, where $R_{\text{benchmark}} = r + B_p (R_{\text{market}} - r)$

Standard bookwork - well answered.

3 First determination is whether a "real" or "nominal" rate is required.
Real rate is used in conjunction with cash flows which are determined on the basis of present day money values which exclude the effects of future price inflation.
Nominal rate used if the cash flows (and the financing payments) take account of the effects of inflation.
In this case, the rate should be equal to the real rate, compounded with the assumed average rate of price inflation.

If risk is not wholly allowed for in the cash flows, then it should be built into the discount rate for the project.
In particular, would expect systematic risk to be allowed for by varying the discount rate, according to the level of "riskiness" of the project.

The starting point for the risk discount rate should be based on the cost of capital. The current cost of raising capital should be based on an incremental cost allowing for an average of equity and debt capital for the entity (company) involved.
For debt capital, this will be (index-linked rate + a corporate risk premium based on company's credit rating) * $(1 - t)$ to allow for corporation tax.
For equity capital, this is expected total real return + an allowance for equity risk premium.

If the project is deemed to have a higher level of systematic risk, then a higher rate would apply, considered as an additional risk premium based on other experience.
Or, by making an arbitrary addition to the rate.

While one cannot be precise in making this adjustment for risk, grossly distorted rates (due to arbitrary additions due to risk) are unlikely to be helpful.

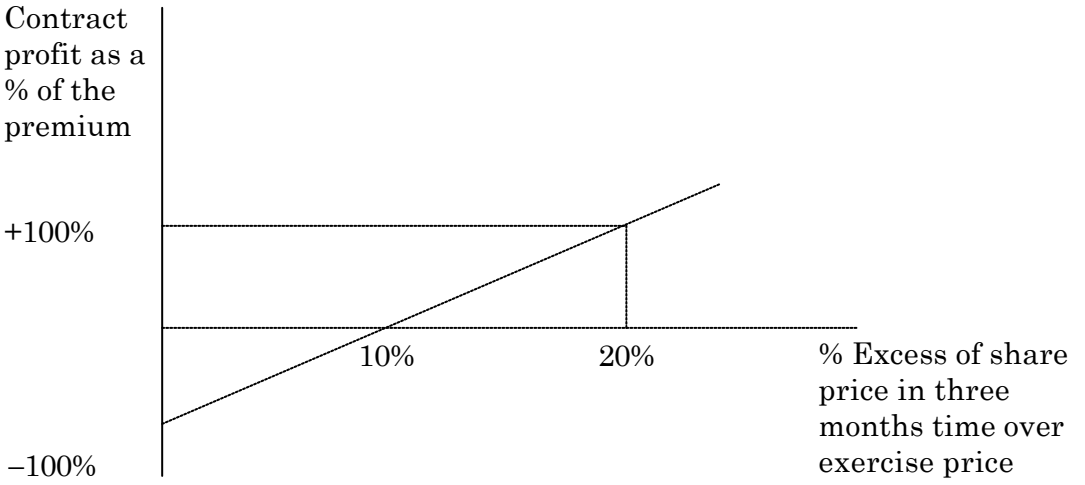
On balance, it may be helpful to evaluate the project at two different rates evaluate the project under both rates, and interpret whether the results are meaningful.

Complications: Using different rates for net positive and net negative cash flows will add to the complexity of calculations, in particular when there are a probability of outcomes.
It will also lead to situations where there are multiple solutions to evaluations of the internal rate of return on the project.

Straight bookwork relating to a new subject. Few students discussed whether to use nominal or real interest rates and there was insufficient explanation as to the costing of the capital. A number of students chose to concentrate on probabilistic and systematic risk, a very small element of the question.

4 As the cash is not available to finance the purchase of the shares, on exercise we must immediately sell the shares.
The contract profit will be determined by the difference between the market price for the shares and the exercise price.
The most that can be lost is the premium paid.
If the market price rises by 10% then the receipt on exercise and resale (ignoring transaction expenses) will equal the premium paid i.e. no loss but no profit.
The contract profit is linearly related to the excess of the share price above the exercise price.

This is shown diagrammatically as follows:



i.e. if the share price does nothing we loose everything, if it goes up 10% we break even and if it goes up 20% we double our money.

Quite well done with students showing a good understanding of what was required.

5 (i) Margin is the collateral which each party to a futures contract must deposit with the clearing house.

When the contract is first struck, the parties will be required to deposit **initial margin** as an amount of cash or other assets (of an acceptable form) with the clearing house for the exchange.
The required amount is changed on a daily basis to mirror risk (**variation margin**).
The closing price for a contract at the end of the day's trading is the **settlement price**.
Variation margin is calculated by reference to the settlement price.
Margin is levied, so that in the event of a party to a contract defaulting the clearing house will protect the other party to the contract by ensuring the contract is fulfilled.
The clearing house will call on the margin deposited to help it fulfil the contract. In this way, the margin finances the guarantee of the contract provided by the clearing house.
If the price of a contract moves adversely for a party then the amount held on the deposit with the exchange will be increased by way of variation margin. Similarly, profits will be remitted on a daily basis.

(ii) The advantages of exchange traded contracts compared to OTC contracts are:

- better liquidity
- better market transparency
- the counter party is the clearing house who will be a good credit whereas for an OTC contract the counter party is the issuing bank and the credit risk will depend on the strength of that bank.

The main disadvantage is that exchange traded contracts are standardised and the particular contract needed may not be available. In the OTC market, a contract may be constructed for your particular need.

Poorly answered - a surprising number of students failed to define the Settlement Price correctly and in general there was some confusion in the differences between futures and options . Part 2 was handled better

6 (i) If the dirty price of a bond is P and its redemption yield is y, the volatility V is:

$$V = \frac{-1}{P}\frac{dP}{dy}$$

(ii) For small changes in yield, the approximate proportionate change in price for a bond is given by:

$$\frac{\nabla P}{P} = -V \times \nabla y$$

where V is the volatility of the bond and ∇y the change in the yield.

For Bond A, the approximate % change in the price is:

$$-2.673 \times 0.005 \times 100 = -1.3\%$$

For Bond B, the approximate % change in the price is:

$$-13.765 \times -0.005 \times 100 = 6.9\%$$

(iii) Such a change in the yield curve may occur when short term inflationary pressures are suppressed by the authorities raising short term interest rates.
This is reflected in the increased yield on short bonds.
The reduction in yields on long bonds reflects a reduction in the expected long term rate of inflation.

The action of the authorities over short term inflation may have led long bond investors to feel more confident for the prospects of long term inflation.

Broadly well-answered.

7 (i) The gap between rental yields and dividend yields can be broken down into the following components:

(property risk premium – expected rental growth) – (equity risk premium – expected dividend growth).

For properties with low rental growth, a comparison of rental yield with the gross redemption yield on conventional bonds may be more appropriate.

In which case, the gap between rental yields and the bonds gross redemption yield on bonds should be equal to:

(property risk premium – expected rental growth) – inflation risk premium.

(ii) Portfolio based indices measure rental values, capital values or total returns of actual rental properties. An index will produce results particular to the portfolio underlying its construction.

The barometer type of index aims to track movements in the general property market by estimating the maximum full rental values of a number of hypothetical rack-rented properties.

A portfolio based index may be inappropriate if the portfolio underlying the index differs significantly from the portfolio held. Further, typically the return on the index is a money weighted return so the index performance will be effected by the timing of the cash flow of the underlying portfolio. A barometer index may be unsuitable for portfolio performance measurement since an investor could not closely match its movement with an actual portfolio of property holdings.

Part 1 was answered reasonably well. Candidates showed a good understanding of the main principles involved. However, marks were needlessly lost in part 2 as answers were too short (and incomplete).

8

- The individual's personal tax circumstances
- The rate of tax charged on an investment
- Tax allowances, e.g. indexation allowance, tax free limits on ISAs, etc.
- The components which make up the total return on the investment
- How the tax is charged on these different components of the investment return
- The timing of tax charges
- Whether the tax is paid at source, or has to be paid subsequently
- The liability of the investor to income and capital gains tax (and other duties)
- The extent to which losses and gains can be aggregated between different investments or over different time periods for tax purposes.

Bookwork - reasonably well done although poorer candidates rapidly ran out of ideas.

9

- General factors applicable to investment analysis of any company
- Management — ability to meet them and discuss issues
- Quality of product — knowledge issue
- Prospects for market growth — availability of good industry data
- Competition — identification and familiarity issues
- Input costs and retained profits — quality of accounting data
- History — availability of back data and quality of that data
- Financial analysis — quality of initial data

- Sources of information — its quantity and quality, accessibility, language issues
- Valuation — local methodology, applicability and quality of data

Near bookwork – the better candidates identified that this was more than the standard question on overseas investment and tailored their answer accordingly. Failure to do this lost marks.

10 Two of the principal considerations will be whether the market reaction is "knee jerk" or based on a change in company expectations. Has the company issued any statements along with its reported earnings decline?

The company will be valued on growth criteria, as a growing company in a growing sector.

It is important to identify what has caused the profit decline — this means breaking down the results to determine components adding to the bottom line decline, e.g.

- what has happened to turnover, for this company as an absolute and relative to sector
- what has affected costs of the business — are there any special expenses
- have there been particular exceptional items, e.g. increase in R&D expenditure
- are there particular write-offs leading to the decline
- etc.

It is also important to determine what were the preceding expectations for the company, and for other companies operating in the same sector.
Is this merely a company specific item or are there sector wide implications which need consideration?

Are there any particular special features of the company — recent staff changes at senior level, changes of accounting practice, takeover activity, which may have contributed to the decline.

The balance sheet should be examined for the changes — debt increases, cost of funding debt, etc.

In terms of its relative positioning, the fall in share price may have presented a buying opportunity relative to the sector if the fall is overdone.
It is important to realise that share price moves are based on prospective factors.

At the same time, it is fairly often the case that bad news comes through in several stages so it is important to ensure that if the analysis suggests that the price fall is overdone, nevertheless there is a risk of further bad news emerging to take the price lower before it might recover.

The business sector is not described. Specific sector analysis will also be required.

This question was answered very poorly. In particular, many candidates became bogged down in how to analyse a company. This question was about a specific event, i.e. how to analyse the unexpectedly poor results of a growth company in a growth sector, and its effect on the share price. Of those candidates who had identified a number of the appropriate issues, few then went on to give any substance to these issues, or to suggest how to conduct a detailed analysis of the profit and loss account .

11 Factors to consider are pattern of GDP growth, inflation and the exchange rate.

GDP Growth: Raising of short rates will take some time (6–9 months lag) to affect the real economy.
The time lag and the degree of impact will depend on the nature of borrowings by the private sector (i.e. short or long fixed or floating in nature).

Eventually, however, the economy will slow; domestic demand will weaken as corporate profitability is hurt by higher debt servicing costs and consumption slows.

Inflation will also not react immediately but eventually as domestic demand slows it will fall.

Initially the **exchange rate** should rise.
This will help to dampen inflation and economic growth in as much as it will weaken the competitiveness of the export orientated sector and increase the level of cheaper imports.
How rapid or prolonged this slowdown becomes depend on the reaction of the central bank.
If short rates are not cut as inflation falls and the economic slowdown bites, then under the weight of what will become increasingly high real rates of interest will be a risk that the economy slips into recession.

Bond Market

The reaction of the bond market should be positive.
How positive and how immediate the reaction will be depends on how quickly inflationary expectations will start to reduce.
Also in view of the strong growth being experienced prior to rates being raised it is reasonable to assume that (all things being equal) tax receipts will be buoyant and the supply of Government Debt will be shrinking.
This favourable supply demand balance should help boost bond prices further and it is likely that the yield curve will invert.
If high short rates persist and the slowdown gathers pace inflationary expectations will continue to fall and bonds will continue to perform well.

Equity Market

Strong growth should have boosted corporate profitability and hence the equity market is likely to have responded well initially.
As fears of higher interest rates and inflation grow (prior to the first rate rise) the equity market is likely to have started to discount the coming bad news.
The general level of the equity market will subsequently be affected by the combined influence of the following:

(i) How quickly and how severely investors revise down their expectations of future corporate profitability in the face of a slowing economy and a strong currency.

(ii) How much of this is offset by the positive influence of falling bond yields.

In general lower bonds yields and lower inflation should improve the relative valuation arguments for equities.
However, if expectations of growth and inflation fall to levels associated with recessionary conditions any further deteriorations will be negative for equity markets since they will lead investors to expect a severe corporate profitability squeeze.

Reasonably well answered, although a number of candidates showed insufficient knowledge of basic economics . Again, few candidates detailed issues specific to the requirements of the question.

12 (i) Let d = dividend yield
g = assumed dividend growth rate

Then $d + g$ = Required risk free real rate of return (RFRR) and expected inflation (EI) + equity risk premium (ERP).

(ii) In a prolonged recession the outlook for profits growth will be negative.

This means that expected dividend growth (g) will probably be negative as well.

Assume that the RFRR and the ERP remain constant (if anything the RFRR may fall a little and the ERP could rise).

It is also safe to assume that in a recession the EI will also have fallen and could be negative. However it is unlikely that it will have fallen anything like the extent that g will have fallen.
Hence, in order to preserve the relationship in (i) d will have to rise; and the rise could be substantial.

e.g. normal conditions could be

$(d) + (g) = (\text{RFRR}) + (\text{EI}) + (\text{ERP})$

2½% + 3% = 2½% + 2% + 1%

Say *g* becomes –3% + EI falls to –2%.

d would need to rise to 4½%

Other points

- dividends can often be maintained by companies in spite of severe profits falls
- the theoretical relationship is a very long term one and in practice *g* may only be negative for a couple of years before returning to a positive number

(iii) The economic conditions in the two countries are very different.

The home economy is in deep recession, which would be expected to be a poor environment for equity investment. The attraction of investing in the equity market of the neighbouring country is the expected more favourable level of investment growth.
If inflation is stable (even though high), then it need not be a problem for the equity market. The more favourable conditions would be an advantage for investing in the neighbouring country.

However, if the inflationary conditions were unstable, or if the neighbouring country was intending to act on reducing inflation, the outlook for the market would be more uncertain, although the prospects of reducing interest rates should prove to be a market support.

From the perspective of a foreign investor, a currency mismatch would be introduced.
In particular, it is likely that with high inflationary conditions, the currency would devalue.
The extent of devaluation would depend on the level of inflation offset by the level of real economic growth.

The risk for a foreign investor would depend upon the nature of their liabilities.

The advantage and disadvantage of the move ultimately will come down to the trade-off between higher growth reduced by expected currency devaluation.

This was poorly answered - a surprising number of candidates failed to use their answer to part 1 to help them with part 2 of the question. Few candidates related Part 3 to the earlier parts of the question.