

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2016

Subject ST5 – Finance and Investment Specialist Technical A

Introduction

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

F Layton
Chair of the Board of Examiners
July 2016

A. General comments on the *aims of this subject and how it is marked*

1. The aim of this Finance and Investment Technical A subject is to instil in successful candidates the ability to apply, in simple situations, the principles of actuarial planning and control to the appraisal of investments, and to the selection and management of investments appropriate to the needs of investors.
2. A mix of questions styles is used, covering *knowledge* of the material set out in Core Reading, application of this in calculations and case studies and *higher order skills* such as synthesis and collation of recommendations. Marks are awarded for the constituent elements of calculations, not just for the final answer generated. Scenario appraisal will similarly provide credit for evidence of the issues considered, not solely for the conclusions reached.

B. General comments on *student performance in this diet of the examination*

1. Overall students performed better in this diet compared with those in the past, however there was still a large gulf between those students who had prepared well and those who hadn't.
2. Candidates were still apt to answer the question they would like to have been asked rather than the one which was actually asked, they often ignored information in the question e.g. whether a fund is large or small and just gave a generic answer.

C. Comparative Pass Rates for the past 3 years for this diet of examination

<i>Year</i>	<i>%</i>
April 2016	54
September 2015	44
April 2015	49
September 2014	45
April 2014	45
September 2013	59

Reasons for any significant change in Pass Rates in current diet to those in the past:

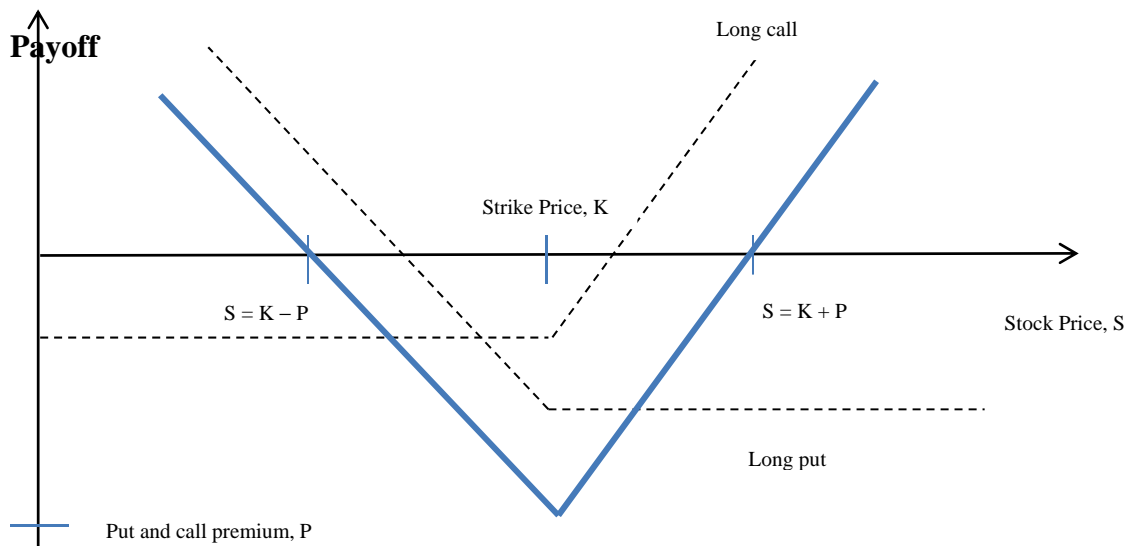
The Pass Rate is rather higher than those of the past, with the exception of September 2013. One contributory factor could have been that there were a number of questions for which the marking scheme contained more than the maximum number of marks for that question. While it was not possible for a candidate to earn more than the maximum marks, it was possible for an incomplete answer to gain the maximum mark. While this approach was adopted in the past it was more extensive in this diet. There will also be the usual variation in Pass Rates from sitting to sitting.

D. Pass Mark

The Pass Mark for this exam was 68%.

Solutions

Q1 (i)



Profit will occur if the stock price at expiry of the options is above $K + P$ or below $K - P$.

- (ii) The strategy produces a loss if the stock price is close to the strike price at expiry, but can lead to a significant profit if there is a large move in stock price either way. This would therefore be an appropriate strategy to adopt if you think there is likely to be a significant move in stock price, but you do not know which way, e.g. this could be due to impending results being announced or a takeover bid for the company being made. For the strategy to be successful, your view of the outcome must be different to the majority of the market otherwise the price of the option would reflect the expected move and therefore be expensive.

This question was generally answered well by those who attempted it.

- Q2 (i) An investor expecting a large cash inflow in the future can protect against a rise in the market by buying index futures** with a contract value equal to the anticipated cash flow. Other derivative instruments that can be used are forwards, call options or total return swaps.

This would require identification of an index or group of indices that is expected to move in line with the underlying equity portfolio.

Any rise in the cost of the planned equity purchase will then be matched by profits on the futures (and vice versa). By hedging, the equities have effectively been purchased in the future at a fixed price.

- (ii) In practice, such hedges will not quite eliminate all risk. In particular, there are two types of risk that remain:

Basis risk – **although the price of a future follows the cash price very closely, the basis may not move exactly as expected.** The exact date of the cash inflow may not be known which makes choosing the future difficult. It may therefore be required to roll the hedge forward by closing out the index futures and taking the same position in futures with a later expiry date. Liquid futures may not be available to hedge the risk.

Cross hedging – **unless the portfolio to be hedged behaves exactly the same as the underlying index, the hedge will not be perfect.** For example, while the constituents underlying the index future may be similar to the equity fund, they are unlikely to move in exactly the same way. The optimal hedge ratio should be determined to minimise this risk.

Counterparty risk – There is a risk that the counterparty involved may default. In the case of futures this is very low, however for forwards there is a higher chance.

Collateral Risk – If the market falls the manager may need to sell shares to fund margin payments to the counterparty.

There is also the risk that the expected cash flow does not materialise.

- (iii) The purpose of hedging is to reduce risk and to make the financial outcome more certain. Other reasons to hedge could include:

If the fund is expecting to disinvest a large sum of money in the future and wants to protect against future risk it could sell index futures.

If you believe that you have chosen the stocks well and they will outperform the market, a hedge using index futures removes the risk of market movements and just leaves the performance relative to the market.

If you are concerned about short term market volatility, using futures could be cheaper than selling the portfolio and buying it back at a later date.

Other valid reasons to be given credit.

A number of candidates just mentioned the use of derivatives as the answer to part (i), this was not an adequate answer. While both cross hedging and basis risk were often given as risks the explanation of both were often confused.

- Q3** (i) Passive investment managers are, typically, index-trackers. They manage assets without taking active investment decisions. Instead, their objective is to track closely the performance of a specified index. **This offers the advantages of lower cost** and volatility (relative to the index), but with **the loss of upside potential** and the implicit restriction to markets and asset classes where a suitable benchmark exists. They may require less monitoring by the investor.

Active investment managers, on the other hand, apply various types of judgement to the selection of portfolios with the objective of outperforming a benchmark. Active investment managers can be divided into two groups:

- multi-asset (balanced) mandates
- specialist mandates

Active management incurs higher costs but offers the prospect of large returns (in excess of fees paid) and the limitation of “peer group” risk. May offer investors a chance to invest in specialist asset classes. However, successful selection of active investment managers is hard to achieve and timing the changes to the line-up of active managers is also very difficult.

(ii)

	Relative Return in year 1	Relative Return in year 2	Total return over 2 years	Relative return over 2 years
Fund A	4%	–6%	8.56%	-3.16%
Fund B	0%	–2%	9.44%	-2.28%

- (iii) Fund A has underperformed over the two years. Fund A has outperformed the benchmark in year 1 but underperformed the benchmark in year 2. These relatively volatile returns compared to the index suggest an active management approach.

Fund B has also underperformed over the two years, however it has outperformed Fund A. Fund B has matched the benchmark return in year 1 but has also underperformed the benchmark in year 2, albeit to a lesser extent than Fund A. This could suggest a relatively passive investment style.

Both funds have underperformed the benchmark over the two year period. However, once fees are netted off the return, it is expected that the performance of Fund A will be significantly worse, i.e. the active manager has not delivered the excess fees hoped for.

Risk adjusted returns may be a better measure of performance.

The returns are only quoted for a relatively short period of time and so may not be representative of the funds long term objectives and past performance is not necessarily a guide to future performance.

A minority of candidates wanted to make part (ii) more complicated by assuming the returns to be produced in the middle of the year and then calculating annual returns. However, overall this was a straightforward question that was answered well.

- Q4** (i) A central bank may be interested in:
monetary, interest rate and inflation policy
banking regulation
implementation of government borrowing
performance and integrity of financial markets
intervention in currency markets
printing and minting of notes and coins, and
taxation
lender of last resort
- (ii) Quantitative Easing (QE) is **a monetary policy used by some central banks to increase the supply of money.**
- (iii) QE is intended to reduce interest rates, increase consumer spending and therefore **stimulate economic growth**, which can improve market confidence.

Can encourage lending by banks and investment by corporations and thus increase employment.

The cost of Government borrowing can also be reduced.

It may also result in a weakening of the currency which may improve trading terms with other countries. However it may also result in 'currency wars'.

Possible risks of QE are to push up the price of government bonds, thereby reducing the yield available to investors. This can increase pension scheme deficits which are often calculated with reference to government bond yields and reduce the income that can be obtained by buying an annuity. It has also been argued that QE results in regressive redistribution of wealth. The lower interest rate may encourage more debt to be taken on, possibly leading to an unsustainable level of debt.

Equity markets are likely to increase in value as future earnings are discounted at a lower discount rate, but this risks a 'bubble' of inflated prices.

In an environment of low interest rates, QE can be used to help ensure that inflation does not fall below target. On the other hand, if QE is too successful in acting against deflation it can lead to higher inflation in the longer term, due to the increased money supply.

(iv)

- Fiscal policy – decisions on the level and structure of taxation and government expenditure and hence, by implication, the public sector borrowing requirement (or debt repayment).
- National debt management policy – the manipulation of the outstanding stock of government debt instruments held by the domestic private sector, in order to influence the level and structure of interest rates or the availability of liquid reserve assets to the banking sector.
- Exchange rate policy – directed towards achieving some target for the exchange rate of the domestic currency in terms of foreign currencies, perhaps with the objective of influencing the country's international trading and investment patterns.
- Prices and incomes policy – aimed at influencing the rates of wage and price inflation.
- Other Monetary policy – Reducing the rate of interest.

Other sensible policies were given credit.

A significant number of candidates struggled with part (iii) in that they could not describe how quantitative easing impacted on the economy.

Q5

		2012/13	2013/14
(i)	Benchmark return	5.00%	13.10%
	Fund return	8.01%	11.50%
	Relative performance	3.01%	–1.60%
(ii)	Stock selection	2.72%	–2.43%
(iii)	Sector Selection	0.29%	0.83%

Most candidates successfully produced the correct answers for part (i) however far less went on to produce the correct solutions to parts (ii) and (iii). Errors in calculation were only penalised once so errors carried forward gained marks.

Q6 (i) Hedge funds typically have **less restrictions on borrowing, short-selling and the use of derivatives** than more regulated vehicles such as mutual funds. Hedge funds were originally characterised by:

- the placing of many aggressive positions on different assets.
- a high level of borrowing given the limited size of the capital of the funds compared to the size of the individual investments.
- a mix of investments for which the price movements would be expected mostly to cancel each other out, except for the positive effect the hedge fund is looking for.
- a willingness to trade in derivatives, commodities and non-income bearing securities.
- a higher risk tolerance than other funds.
- diverse range of strategies available.
- widespread use of performance fees and higher fees.
- less transparency.
- lower liquidity.
- lower level of regulation.
- possible uncorrelated returns.

(ii) **Beta** – The index tracking fund tries to provide market beta returns whereas the market neutral fund tries to minimize exposure to beta.

Alpha/Active – The index tracking fund is designed to follow the index so should not be expected to generate alpha. The hedge fund is designed to exploit stock prices so looks to generate alpha.

Derivatives – The index tracking fund might use some derivatives to replicate market returns if cheaper than holding physical stocks. Market neutral funds use derivatives to try and hedge out market risk.

Leverage – Index tracking funds do not use leverage whereas market neutral funds can use leverage as part of their strategy.

Short-Positions – Index tracking funds are long only so do not take short positions. Market neutral funds hold short positions in stocks they believe will underperform the index.

Tax – The hedge fund will be subject to the Cayman Island tax system which will be different to the tax systems faced by the global fund manager.

Political intervention may result in Cayman Island investments becoming less attractive.

Fees – The index tracking fund is designed to offer relatively cheap exposure and an institutional investor is likely to pay less than 0.15%. Hedge funds are generally a lot more expensive and can cost as much as 2% with 20% outperformance fee.

Benchmark – Index tracking fund will follow a global equity benchmark such as MSCI World. The Market neutral fund would normally use a cash benchmark as the basis for performance analysis.

Operational Risks – The global investment firm is likely to be heavily regulated and has well controlled operations. The Cayman registered hedge fund will be subjected to a lot less regulation and may have poor operational controls as a result. The start-up is likely to be riskier than a global investment manager.

Transparency – hedge funds may be less transparent, in terms of holdings, investment process, etc., than a traditional index tracking fund.

Liquidity & dealing or Marketability – hedge funds may be less liquid and less frequently priced than the index fund.

Part (i) was generally well answered, however the answers to part (ii) were much more varied. The well prepared candidates did well whereas the weaker ones failed to pick up on the differences in the two funds, in particular their relative sizes and location of operations. A commonly held erroneous view was that index trackers could not use derivatives.

Q7 (i) Forms of short term borrowing facilitated by banks:

- Banker's acceptances and eligible bills
- term loans
- evergreen credit (permission to borrow up to a specified limit, with no fixed maturity)
- revolving credit (similar to evergreen credit, but with a fixed maturity of up to 3 years)
- bridging loans (advances to be repaid from specified income)
- international bank loans
- Overdrafts
- Factoring

(ii) Issues that differentiate between different types of loan include:

- Commitment – whether there is prior commitment by the lender to advance funds when required (often requiring payment of a commitment fee to the lender).
- Maturity – the term for which the lending is made.
- Rate of interest – this may be either fixed or floating.
- Security – whether the loan is to be secured against assets (either fixed or liquid assets).
- Size of loan
- Repayment schedule – Is it capital and interest, interest only with capital repayment at the end or full roll up with capital and interest all paid at maturity.
- Subordination – where the loan ranks in the capital structure.
- Covenants – loans may differ in the type and extent of applicable covenants.

(iii) Loan Amount – **loans A & C are for \$10,000 whereas loan B is for \$9,000 so in the absence of any other difference B the repayments for loan B would be 10% cheaper than loans A & C.** If loan B is chosen the individual will have to find \$1,000 to make up the shortfall between the loan value and the car's value. Depending on the source of the \$1,000 there may be an additional cost involved.

Term of loan – loans A & C are for 60 months while the term of loan B is 50 months, **again in the absence of any other difference the repayments for loan B would be greater than for loans A & C. In fact if the three loans attracted the same rate of interest the repayments on loan B would be higher than for on loans A & C despite being for \$1,000 less.** E.g. If the interest rate was 0% then the repayments for A & C would be \$166.67 per month and \$180 per month for loan B. This is likely to be true even when interest is added as rates are currently at historic lows. While the monthly repayments on loan B would be higher the overall amount paid would be lower as less interest would be paid due to the shorter term.

Rate of interest – The rates of interest on loans A & B are fixed whereas the rate on loan C is variable, given interest rates are at historic lows and the economy has been through a recession it is likely that the expectation is for interest rates to rise. **It would therefore be expected for the interest rates charged on fixed rate loans to stand at a premium to that charged on variable rate loans**, the premium would depend on how quickly interest rates are expected to rise and what level they are expected to reach during term of loan. In the absence of any other difference it would be expected that loan C would be cheaper than loans A & B. Given loan B is for a shorter term the premium over the variable rate may be lower than that for loan A.

Security – **Loan B requires the car to act as security, secured loans will attract lower rates of interest than unsecured loans** as the lender can seize the security if the borrower defaults and realise its value. That means in the absence of any other differences the rate of interest charged on loan B will be lower than that charged on loans A & C.

Initially loan C is likely to be cheaper than loan A as loan A has a fixed rate and loan C is variable, however loan C may become more expensive depending on how fast interest rates rise.

Therefore initially loan C is likely to be the cheapest loan though depending on how the interest rate changes it may become more expensive, in which case loan A would be cheaper.

Credit was given if there was a reasoned argument why another loan is cheaper.

- (iv) The security discount that Loan B attracts is fairly worthless given the rapid depreciation of the asset secured against it. Therefore, the discount applied to the loan rate for the security relative to unsecured loan is likely to be minimal. **However, in Part (iii) it was concluded that Loan C would be cheapest per month so it does not alter answer to Part (iii).**

Credit was given to candidates that came up with a reasoned argument why it would alter the answer to part (iii).

Parts (i) and (ii) were straightforward bookwork and competent candidates did well. In part (iii) Examiners were looking for candidates to consider all the facets of the loans and reach a reasoned conclusion as to which loan they believed to be the cheapest. It did not matter which loan was chosen provided the reasons were clearly stated.

Candidates who had failed to give a conclusion in part (iii) subsequently found it difficult to gain full marks in part (iv).

END OF EXAMINERS' REPORT