



SECURITIES & INVESTMENT INSTITUTE DIPLOMA

SUMMER 2009

CHIEF EXAMINER'S REPORT- FUND MANAGEMENT

Introduction

The purpose of this exam was to assess candidates' up-to-date knowledge in the fund management field. In particular, both theoretical knowledge and empirical (practical) issues are tested, so the candidates are encouraged to read relevant textbooks, research papers and case studies (where appropriate) to update their knowledge regularly, given the fast-changing fund management industry.

Section A of the paper aims to assess candidates' general knowledge in this area. Candidates showed an excellent understanding of the role of hedgers, arbitrageurs and speculators in question 1; the short selling technique and the impact of 2008 short-selling ban in question 3; the systematic and unsystematic risk computation in question 5 and gold as an investment asset in question 10. Overall, candidates did better than in previous years in this section, gaining an average mark for the section of 15.37/31. Nevertheless, a significant number of candidates did not get any marks or very few marks on questions 6, 8 and 9, showing the weakness on their analytical side, since all those questions were numerical.

Section B was reasonably well answered in this exam by a large number of candidates. They showed a good understanding of the Index Linked Gilts and their use in the pension fund portfolio (part (a)), characteristics of 'growth at reasonable price' stocks (part (d)) and familiarity and herding as behavioural finance biases (part (e)). However, the answers show that candidates are weaker in differentiating between the minimum variance frontier and efficient frontier (part (b)) and that the choice of the correct type of index for index tracking is not understood (part (c)). Additionally, on average, the optional questions from Section C were answered surprisingly poorly, relative to previous years' papers. The main reason for poor performance in this section is that questions were answered only partially, ie, not all the issues in the questions were addressed. One candidate did not attempt to answer the third optional question, only two candidates attempted question 15, around 25% of candidates attempted question 12, while for the vast majority the questions of choice were 13, 14 and 16.

These are the general issues that need to be addressed. I will now elaborate on specific issues corresponding to questions 1-16 respectively.

Section A

Question 1

This was one of the better answered questions. Very few candidates misinterpreted this question and did not explain the roles of the three main types of users of futures contracts, which can be summarised as: 1) the hedgers: seeking to reduce risk, 2) the speculators: risk takers seeking large profits and 3) the arbitrageurs: seeking riskless profits from exploiting market inefficiencies.

Question 2

A few candidates explained how the three prices are calculated, but the majority understands what they represent. A good answer would have included the following: Creation price is the price a manager must pay trustees in order to create a new unit. It is calculated as the lowest offer price of securities in the fund plus accrued interest, stamp duty and commission. Liquidation price is the price a manager receives from the trustee on cancelling the units. It is calculated as the highest bid price of securities in the fund plus accrued interest less commission. Bid price is the price at which the manager is willing to repurchase the units from the unit holders. Liquidation price less any exit charge is the minimum bid price.

Question 3

This was the best answered question in Section A. All but a few candidates note correctly that short-selling is a technique that allows investors to make money from falling share prices. When selling short, investors borrow shares of a company which they then sell in the hope of buying them back later at a lower price, making arbitrage profits. Better answers commented that the main reason for the short selling ban that was introduced in September 2008 was to stabilise the market. The removal of the ban in January 2009 was seen as a key test for embattled banking stocks, but the market participants' views on how effective it was is very mixed.

Question 4

The majority of candidates included in their answers the fact that, using a full replication approach, index fund managers have to buy all the stocks in the index in their exact index proportions, which may be quite costly in terms of transaction costs. However, a few mentioned that regulations may mean that managers cannot invest in small cap stocks at all (or can restrictively invest) or that illiquid stocks should be avoided. For these reasons, portfolio managers may opt for selecting a sample of stocks to track the index. A variety of sampling methods exists but candidates were not expected to elaborate on them.

Question 5

Many candidates answered correctly that the proportion of unsystematic risk in the portfolio is: $1 - R^2 = 1 - \frac{\sigma_s^2}{\sigma_i^2} = 1 - \frac{64}{121} = 47.12\%$ and that there is further scope for diversifying this portfolio.

The correlation of the portfolio with the market is $\sqrt{R^2} = \sqrt{\frac{64}{121}} = 0.73$

Question 6

This was the question with the weakest answers in Section A. To calculate the Sharpe Ratio, the candidates first needed to calculate standard deviation of each portfolio by using the following equation, which was missed by the majority of candidates:

$$\sigma_p = \sqrt{\beta_p^2 \sigma_m^2 + \sigma_{ep}^2} = 0.1676$$

This standard deviation can then be used in the equation for Sharpe Ratio as:

$$S_p = \frac{\bar{r}_p - \bar{r}_f}{\hat{\sigma}_p} = 5.18$$

Sortino ratio should be calculated using:

$$S = \frac{\bar{r}_p - \bar{r}_f}{\sigma_D} = 10.785$$

Treynor ratio should be calculated using:

$$T_p = \frac{\bar{r}_p - \bar{r}_f}{\beta_p} = 0.97$$

Question 7

The answers to this question show reasonable understanding of the CAPM model and market risk premium. Better answers included that the CAPM, in particular SML implies the following relationship:

$$E(R_i) = R_f + \beta_i (E(R_m) - R_f)$$

This suggests that the risk premium on an asset depends on the risk premium of the market and beta coefficient. The question statement is correct in the CAPM world because it is assumed that there is always a positive risk premium so the return on an asset indeed depends mainly on beta. If beta is positive: the higher the beta the higher the expected return. However in the real world, when market risk premiums can be negative, while most asset betas are still positive, the relationship between betas and returns may be the inverse and SML may be downward sloping.

Question 8

Although almost all candidates recognised that a risk free portfolio can be created from A and B due to their perfect negative correlation, only a small number calculated the weight of A and B that would be used to construct a risk free portfolio. The risk free portfolio can be constructed from A and B as they have perfect negative correlation coefficient, so that:

$$w_A \sigma_A - (1 - w_A) \sigma_B = 0$$

$$0.14w_A - 0.15 + 0.15w_A = 0$$

$$0.29w_A = 0.15$$

$$w_A = \frac{0.15}{0.29} = 0.5172 = 51.72\%$$

$$w_B = 1 - 0.5172 = 0.4828 = 48.28\%$$

Question 9

The answers to this question were very weak. Although the majority recognised that the duration of bond A is 2 years (it is a zero coupon bond so its duration is equal to the maturity) and calculated that the duration of bond B is 1.94 years (which has to be calculated using Macaulay duration equation), all but one candidate fail to calculate the duration of bond C, which amounts to 21 years (this is an undated bond so $D=(1+y)/y$).

Question 10

This was one of the questions that candidates answered very well. The majority recognised that investors generally buy gold for two main reasons: to gain financially from increasing gold prices, and/or as a hedge or safe haven against any economic, political, social or currency-based crises. In addition, better candidates wrote that one could invest in gold indirectly through gold exchange traded funds, spread betting, gold certificates, derivatives or shares for example. Short elaboration was expected.

Section B

Question 11

The answers in this section were of a good standard in general. Better answers would have included the following:

a) Like conventional gilts, index-linked gilts pay coupons which are initially set in line with market interest rates. However, their semi-annual coupons and principal payment are adjusted by the RPI. As with all index-linked bonds, there exists a lag between the publication of the inflation index and the indexation of the bond. From their introduction in 1981 index-linked gilts had an eight-month indexation lag. However in 2005, the UK Debt Management Office announced that all new issues of index-linked gilts would use a three-month indexation lag design. In September 2005, the UK Government issued the longest ever index-linked government bond, 1¼% Index-linked Treasury Gilt 2055, maturing on 22 November 2055. Using gilts and index-linked gilts, a pension scheme can construct a low risk cash flow matching portfolio with the objective of producing the required cash flow at the time it is needed. In other words, the liability cash flows are approximately equal and synchronised with the asset cash flows. In addition, these gilts provide a good hedge against inflation.

b) Given the level of risk or standard deviation, investors prefer positions with higher expected return and given the expected return, they prefer the positions of lower risk. Taking this into account, we can determine the minimum variance set of portfolios. It is the set that “given a particular level of expected return, the portfolio on the minimum variance set will have the lowest standard deviation, and therefore the lowest variance, achievable with the available population of stocks”. The efficient frontier is the part of minimum variance set that covers all portfolios that not only have minimum risk but also maximum level of return for that level of risk. Graph showing this is expected. In addition, a short discussion stating that property can be part of the efficient frontier was expected.

c) Market value or capitalisation weighted index:

- The largest stock has the largest influence on the index value
- Example: S&P 500, FTSE 100
- Replicate the precise effect that changing share values would have on a portfolio comprising the same underlying index constituents weighted in accordance with their relative market capitalisations
- They have a broad coverage of the market being represented. Therefore, they are the most suitable indices to assess market trends, act as performance benchmarks and provide a basis for index tracking.

Price weighted index:

- The highest price stock has the greatest influence on the index value
- Example: Dow Jones Industrial Average Index
- Price weighted arithmetic indices ignore the number of shares in issue and favour highly priced shares
- Not representative of the real world portfolio – limited use as performance measurement benchmarks

Fundamental weighted index:

- Selects, ranks and weights companies, not by market capitalisation, but by financial data points, such as sales, cash flow, book value, or dividend yield.
- How do they work?
- Stocks are reviewed using fundamental factors *not* the stock price/market capitalisation
- Only recently available and not widely used

d) The characteristics of stocks in the GARP approach are: they are neither the lowest P/E ratio as in value stocks, nor the highest growth potential stocks, but somewhere in between. They could be preferred by investors who do not want to invest in extreme value and growth stocks.

e) Familiarity: investors want well known companies with strong brand names in their portfolio, predominantly domestic companies as well. This influences UK pension fund portfolio to invest mostly domestically. Herding: investors make irrational decisions by following the actions of others rather than looking at company fundamentals for example. This behaviour can lead to market bubbles as seen in 1990s.

Section C

Question 12

Around a quarter of candidates attempted answering this question. Almost none of the candidates explained the convexity of puttable bonds. It is expected that callable and puttable bonds are defined. Better answers should recognise the following: The convexity of option free and puttable bonds is positive while the convexity of callable bonds is negative. The reason for negative convexity of callable bonds is price compression which occurs when yields decrease, as the issuer is more likely to exercise the call option. The reason for more positive convexity of a puttable bond in comparison to otherwise identical bond with no put option attached is that at the high

yield levels put option is more likely to be exercised by the bond holder and such puttable bonds would be more expensive. The graphs showing all three types of convexity were expected.

Question 13

Overall, this was one of the better answered question in this section, attempted by a large number of candidates. The good answers differentiate between systematic (market) risk and unsystematic (company specific) risk. The discussion regarding possible ways of risk reduction should involve the following: i) When randomly selecting stocks, the total risk is reduced (in particular due to reduction of unsystematic risk, systematic risk is only averaged out). Graph showing this is expected. The obvious question that needs answering is “How large is the ‘large number of stocks that needs to be included in a portfolio to diversify’?”. The financial theory states that that number is around 25-30 stocks, but nowadays practice shows one should hold around 200 stocks (Malkiel (2003)); ii) Unsystematic risk is reduced due to inclusion of stocks with low correlations. Market risk is only averaged out here, not eliminated. Expect equations and derivation only in better answers; iii) Taking the opposite position in stock index futures to the one we have in the equity market (i.e. if we are long in equity portfolio we should go short in futures) will eliminate systematic (market risk).

Question 14

This was not a very well answered question; many candidates only partially explained how portfolio managers generate alphas through these strategies. Good answers should explain that the merger arbitrage is based on the following idea: when one corporation announces an intention to acquire another, it generally offers to buy the target firm's stock at a premium over the current market price. Upon that announcement, the target firm's stock price generally rises to a level just below the offer price. It won't rise to the offer price because of uncertainty about the merger actually taking place. Therefore a merger arbitrage manager generates profits by going long in the target stock and shorting the bidder. Exceptional answers should recognise that much can happen to derail a planned merger. Regulators might block the merger on antitrust grounds. Shareholder might feel the merger is not in their best interest and vote to block it. Unanticipated events, such as a market crash or war, might intervene and make the merger infeasible in the new economic or geopolitical environment. If the merger fails to go through, the targeted firm's stock price will immediately fall, often to a level below where it was before the merger was announced. In market neutral arbitrage investors try to eliminate market risk (hence market neutral) and generate alphas for example by taking the opposite position in different assets of the same company: long in equity and short in convertible bond of the same stock. Finally, fund of funds is portfolio of different funds, constructed to achieve diversification across different funds to eliminate fund specific risk associated with strategy/managers etc.

Question 15

Only two candidates attempted answering this question. Good answer should have included the following: ROI is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. It measures how effectively a company is using its resources to generate profits irrespective of the source of finance of those resources (equity or debt). Equation was

expected. One can examine the trend of the ratio over time or compare ratio in one year to similar companies' ratio or ratio of companies in the same industry. Advantages: easy to calculate, easy to interpret. Problems: uses financial statements information which can be manipulated; the ratio will be distorted by inflation, since financial statements may reflect assets purchased at different time shown at their historical costs.

Tobin's Q ratio is defined as market value of assets over replacement cost of assets. If it is greater than 1 the market values the company above the replacement cost, hence any value added on new investment will exceed the cost. In this case it will be advantage of shareholders to invest in new assets as this will increase their wealth. When it is less than 1, the value added of new investment will be below cost, hence it should not be undertaken. Advantages: could be used for ranking firms; looking at changes in Q over time indicates how firm's investment opportunities are changing over time; links with price to book ratio in relation to asset based valuation. Problems: it is difficult to calculate, which is why various proxies are often used.

Shiller's P/E is cyclically adjusted P/E ratio (CAPE), representing a long term average for the S&P 500 index. The CAPE mutates the impact of the business cycle by averaging 10 years of earnings. It thus provides a good picture of the market's value regardless of where we are in the business cycle. Shiller's P/E has recently finally dropped below fair value for the first time in 15 years.

Question 16

Traditionally, questions related to market efficiency are well answered, as it is the case in this question. It is interesting to note that, with the exception of one candidate, all candidates attempted this question. What was expected in all answers is the standard analysis of various forms of market efficiency to start with. If markets are efficient in the weak form sense, one cannot use past information to make arbitrage profits – hence technical analysis is useless. If markets are efficient in the semi strong form sense, then one cannot use publicly available information widely used in fundamental analysis to make profits – hence fundamental analysis would be useless. Discussion regarding these issues was expected.