



## **SECURITIES & INVESTMENT INSTITUTE MASTERS IN WEALTH MANAGEMENT**

### **SUMMER 2009 CHIEF EXAMINERS' REPORT- PORTFOLIO CONSTRUCTION THEORY**

#### **Introduction**

Sections A, B and C of the exam were set to assess candidates' ability to appraise and analyse portfolio construction theory within a wealth management setting. Candidates obtaining 70 percent or more in the exam demonstrated very good knowledge of the material, critical ability, an ability to rigorously analyse problems and to correctly structure answers. Candidates obtaining an exam mark between 60 and 69 percent demonstrated good working knowledge of the material and a good level of competence in its critical assessment. Candidates obtaining an exam mark between 50 and 59 percent demonstrated adequate working knowledge of the material and evidence of some analysis. Candidates obtained low marks for a range of reasons including; limited knowledge of the core material, omitted questions, poor quality answers to quantitative questions and an inability to apply theoretical material to practical settings.

The financial crisis was brought into the exam for this summer paper in a limited way. Questions pertinent to this included (i) as well as to some extent (j) in Section A. For future guidance, candidates should expect significant and contemporary financial events to be brought into the exam to a minor degree where it coincides with the syllabus.

Performance in the exam was generally good. One notable positive was the performance on some of the quantitative questions. This involved question 3 (valuation and performance of ordinary shares) and question 5 (valuation and performance of preference shares) from Section C, as well as (h) (currency) and (o) (after tax compound return) from Section A. These tended to be answered very well by a significant number of candidates. A second positive was the good answers provided to the fixed income questions in Section A.

The aim of the exam is to test a balance of numerical and narrative ability and reasoning. The highest scoring scripts tend to be those that had high quality narrative answers combined with correct numerical answers. The highest scoring candidates had prepared well and were able to answer both types of questions in an informed and clear style. Candidates should expect both types of questions in future papers. Numerical questions are important because to some degree there is greater potential for obtaining full marks.

A major reason for marks not being awarded was due to candidates not demonstrating critical appraisal skills when taking the syllabus across into practical situations. This included:

Suggesting whether there exists a risk premium on holding foreign currency.

- Explaining why equities are growth assets and earnings linked assets.
- Recommending an appropriate risk-free asset.
- Explaining whether active or passive (index) fund management fees need to be paid to obtain levels of diversified risk.

There were many good scripts, and some excellent ones. Scripts were generally well presented. Better presented scripts were double-spaced, structured using bullets or numbers, with sensible use of paragraphs and occasional highlighting. The best scripts were precise, succinct and efficient in their word use. Marking the script with an asterisk or similar to highlight key points and important outcomes was an effective technique used by some candidates. Essay style answers to each question where not required often indicated weakness in an area. Candidates generally performed better on narrative than on numerical questions even though to some degree there is greater potential for full marks on numerical questions. The strongest candidates tended to use one half to two thirds of a work book.

The performance in the exam is described by the following statistics. For sections A, B and C taken together, 14% of candidates achieved a mark below 50%, 16% were awarded a mark of 50-59%, 48% a mark of 60-69%, and 22% were awarded a mark of 70% or more. The mean exam mark for Sections A, B and C taken together was 43.5 out of 70 (62% out of 100) with a standard deviation of 7.1. The maximum mark was 56.5 (81% out of 100) and the minimum 24 (34% out of 100).

Section A comprised 15 questions and was worth 40 marks. 16% of candidates obtained below 50%. 24% obtained 50-59%, 40% obtained 60-69%, and 10% obtained 70% or more. The mean mark for Section A was 24.4 out of 40 and a standard deviation of 4.6. The maximum mark was 35 and the minimum 13.0.

Section B comprised a single question and was worth 20 marks. 8% of candidates obtained below 50%. 14% obtained 50-59%, 42% obtained 60-69%, and 36% obtained 70% or more. The mean mark for Section B was 12.5 out of 20 and a standard deviation of 2.4. The maximum mark was 16 and the minimum 3.

Section C comprised three questions of 5 marks each. Each candidate is to answer any 2 of the 3 questions. As a total of the two questions answered, 26% of candidates obtained below 50%. 14% obtained 50-59%, 8% obtained 60-69%, and 52% obtained 70% or more. The mean mark for Section C was 6.4 out of 10 and a standard deviation of 2.2. In Section C, Q3 (equity valuation and performance) was most popular, with 86% of candidates attempting it. Q4 (corporate bonds) was second most popular, with 66% of candidates attempting it. Q5 (preference shares) was least popular, with 33% of candidates attempting it. In Section C, Question 4 was the least well answered.

## Section A

The aim of Section A was to test knowledge and ability within financial instruments, portfolio construction, portfolio risk and diversification.

### Question 1

There were 15 parts to question 1. The mean, median and modal mark was 24.4, 25.0 and 27.5 respectively out of 40. The maximum mark was 35 and the minimum 13.0. The 15 parts to question 1 are as follows:

a), b) and c) were multiple choice questions worth one mark each. The correct answer to each was d).

d) This question asked whether reinvestment risk was relevant to the yield to maturity calculation of a coupon paying bond and if so, why. The question was answered well by almost all candidates. Coupon reinvestment risk arises because the yield to maturity computation assumes that i) all coupon flows can be reinvested and ii) that all coupons will be reinvested at the promised yield to maturity. Reinvestment will in fact occur at interest rates that prevail when coupons are paid, and these are subject to uncertainty.

e) Answers were of a very variable standard. The key to a good mark lay in setting out clearly the motivations for the answer provided. A good answer explained that the risk premium is a compensation for exposure to market risk. This is expected to be linked to a structural phenomenon that is repeatable. Currency does not fit well with this description. It is not an asset class. Assets held in various foreign currencies are no more likely to yield a higher return because they happen to be priced in a different base currency. Holding a diversified mix of foreign currencies for a period of time is not expected to consistently earn a return. Currencies are volatile and do impact on security returns but in normal conditions this is expected to reflect inflation and interest differentials rather than a premium attached to the actual currency. Based on the reasoning above there is unlikely to be a risk premium to holding foreign currency. This can help to explain why many investors hedge foreign currency exposure.

A common mistake was for candidates to state that the risk premium referred to any type of return earned above a risk-free rate for any security. Based on this incorrect understanding many candidates suggested that volatility in foreign currencies had to represent a risk premium.

A good mark was still given for a different opinion provided it was well argued, articulated and justified.

f) A large majority of candidates understood that the duration of a zero coupon bond maturing in five years time is 5 years. Good answers explained the concept of duration and the time weighting of cash flows.

g) The question tended to be well answered by candidates. Good answers took the position of a long term investor. The key to a good mark lay in setting out clearly the motivations for the choice given in the answer. Inflation is a major concern to a

long term investor. Economic history shows that returns on conventional government bonds can be significantly eroded by inflation. Commodities are a volatile asset class. The returns and yields on property can be volatile, and this can be compounded by problems of illiquidity. This left 10 year inflation linked government bonds as the lowest risk asset class. The most able candidates went on to explain that there always remains the risk of deflation, so even inflation linked UK government bonds are not risk free to a long term investor.

A good mark was still given for a different opinion provided it was well argued, articulated and justified.

h) The question was very well answered by all candidates. Candidates scoring full marks provided a detailed answer, such as:

If the exchange rate for US dollars in Australia is 0.7927 then the equivalent quote in the United States for Australian dollars is  $1 / 0.7927$ . This means that the quote in the United States for Australian dollars is 1.26.

(i) Answers were of a very variable standard. Almost all candidates demonstrated a basic understanding of the concept of corporate governance. Good answers were set out along the following lines:

Some fund managers invested large amounts of client capital in the shares of listed companies in the financial sector with only a partial understanding of their risk exposures and the way that globalisation has increased the interconnectedness of these risk exposures with the real economy. There was a focus on the quantity of profits rather than on how profits were being made and how repeatable this was. This was made worse because in many cases institutional investors are themselves banks. Section E of the 2008 Combined Code on Corporate Governance proposes that institutional shareholders should enter into a dialogue with companies based on the mutual understanding of objectives. This is designed to help ensure the directors discharge their duties in a manner that benefits shareholders. In order to be effective, this process requires a sufficient number of major shareholders to take a long-term view and to engage constructively with the companies in which they invest through dialogue and the use of their voting and other rights.

In other instances fund managers failed to address concerns with either the executive or the non-executive directors (NEDs) of financial companies. NEDs are a cornerstone of the corporate governance process because they are the principal governance agents on the board for shareholders. They represent the interests of shareholders. Effective running of the board requires the NEDs to understand the viewpoint of the body of shareholders. Section D of the 2008 Combined Code on Corporate Governance proposes that the chairman ensure that the views of shareholders are communicated to the board as a whole, and in particular the NEDs, so that the latter can develop a balanced understanding of the issues and concerns of major shareholders.

(j) The question was generally not well answered by candidates. It meant more than simply highlighting that share prices were volatile.

Good answers explained that equity finance is the permanent risk capital of a company which is designed to shoulder all idiosyncratic risk. As such, a holder of

shares in a company is a 'residual claimant'. A residual claimant is in a riskier position than holders of other financial instruments of the company, such as bonds, because:

1. dividends are paid to shareholders only after the company has paid bondholders, preference shareholders, and decided the level of profits to hold-back and reinvest itself. Nobody can be sure what dividend, if any, a company will pay. It depends what profit the company has made and how confident the company is about the future. When a company anticipates tough times ahead, prudent financial management will normally lead it to at very least consider cutting the dividend.
2. Equity holders have a low priority over a company's operating assets in the event of bankruptcy. The common shareholders receive a payout only after all creditors have first been paid. If there is nothing left the share price falls to zero and shareholders will lose their entire investment.

Low marks were awarded for stating that equities are high risk because they are volatile, have idiosyncratic risk, liquidity risk and are subject to business risk.

(k) Answers were of a very variable standard. Candidates scoring full marks performed the following calculation:

$$\text{cov}_{a,m} / \text{var}_m = \sigma_a \sigma_m \text{cor}_{a,m} / \text{var}_m = 0.45 \times 0.16 \times 0.4 / 0.16^2 = 0.0288 / 0.0256 = 1.125$$

where a is stock A and m is the market

(l) The aim of this question was to test the comprehensiveness of candidates understanding of equities as an asset class. Candidates tended to provide partial answers to this question. Good answers provided two explanations. First, investing in the shares of companies means an investor can gain exposure to the economic growth of a country. This is because corporations pay salaries to households and individuals, as well as provide tax revenues that fund government expenditure and pay salaries of government workers. Increases in factor prices can be passed on in selling prices so that company earnings should increase with inflation. Due to the relationship with inflation and the growth of countries, equities are known as growth assets. Second, firms reinvest their earnings rather than make full payout to equity holders. This means that a major proportion of returns stand to come from capital appreciation rather than income payments as firms use profits to grow the business further.

(m) The aim of this question was to test the comprehensiveness of candidates understanding of equities as an asset class. Candidates tended to provide partial answers to this question. Good answers provided two explanations to the meaning of earnings. First, as a company grows, more is paid in salaries. This growth should lead the value of shares to also grow. For this reason, shares in companies can be seen as matching salary related liabilities and goals set by pension schemes. Due to this, the value of equities are said to be linked to earnings. Second, in theory the value of equities are based on the present value of future earnings. The higher are expected earnings or earnings generating capacity the higher the market value of equities. Within this cash-flow meaning of earnings, the value of equities are said to be linked to earnings.

(n) The question was generally not well answered by candidates. Candidates scoring full marks performed the following calculation:

$$\text{Expected return} = 2\% + (1.5\%) \times (1.0) + (3.5\%) \times (2.0) + (6.0\%) \times (0.0) = 10.5\%.$$

A common mistake was for candidates to add the risk free rate to each of the 3 factors, thereby calculating a return in excess of 14 percent.

(o) The question tended to be well answered by candidates. Candidates scoring full marks performed the following calculation:

$$100 \times [1 + 0.07(1 - 0.25)]^{10} = \text{£}166.81$$

A common mistake was for candidates not to compound the after-tax returns.

## **Section B**

The aim of Section B was to test understanding of portfolio theory as well as its practical application.

### **Question 2**

This question was generally well answered, with a mean, median and modal mark of 12.5, 13.0 and 13.0 respectively out of 20. The maximum mark was 16 and the minimum 3. A key reason for a low mark was a poorly structured answer. All candidates were able to answer the question to at least some degree.

Almost all candidates correctly plotted the stylised lines that show the different possible combinations of two risky securities when the correlation between two securities is + 1, - 1, and 0. A small minority of candidates showed how the portfolio risk formula changes according to each type of correlation.

A large majority of candidates correctly presented the cloud of all possible portfolio combinations as the opportunity set, as well as illustrated the efficient frontier as the outermost line.

A significant minority of candidates were less competent at adding a risk free rate and drawing the capital market line tangential to the efficient frontier. Good answers explained that security returns are normally expressed in nominal terms and so the risk-free rate should be expressed in the same way. Good answers also explained that the appropriate specification for the risk-free rate was one that matches the holding period of the risky assets. The key to a good mark for (c) lay in setting out clearly the motivations for the choices made for the specification of the risk-free rate. Significant marks were given to candidates who can demonstrate that they can extend investment theory into practical applications.

Part (e) further examined candidates' ability to extend theory into practical application. Good answers explained that the portfolios on the efficient frontier are fully diversified. Diversifiable risk has been removed. As a result, the risk and return obtained will be similar to that of the market. This suggests that the major focus of the efficient frontier as well as the securities market line is beta. An investor should not be prepared to pay active fees for beta performance. Only passive (index) fees should be paid. A separate fee may need to be paid to obtain advice about the appropriate long-term strategic asset allocation that is on (or close to) the efficient frontier. Active

fees only need to be paid if the investor wants to go further and attempt to generate an alpha.

### Section C

The aim of Section C was to sample from three areas of the syllabus not tested in Sections A and B.

#### Question 3

Answers were generally of an average to good standard, with a mean and median mark of 3.5 out of 5 and a modal mark of 5.0. The maximum mark was 5.0 and the minimum 0.0. Candidates scoring full marks performed the following calculations:

(a) The forecasted return is calculated as  $(\text{end price} + \text{any dividends} - \text{start price}) / \text{start price}$ . For Stock A, the expected return =  $(31 + 2 - 25) / 25 = 32\%$ .

A common mistake was to try to use an asset pricing model for the calculation.

(b)  $\text{Beta} = \text{cov}_{b,m} / \text{market portfolio variance}$ , so  $\text{cov}_{b,m} = \text{Beta} \times \text{market portfolio variance}$  (i.e. square of standard deviation) =  $1.2 \times (0.4)^2 = 0.192$ .

where b is stock B and m is the market

(c) The securities market line can be used to examine relative valuation by comparing the forecast return (FR) and required return (RR).

$\text{FR} = (\text{end price} + \text{any dividends} - \text{start price}) / \text{start price} = (10.8 + 0 - 10) / 10 = 8\%$ ,  
 $\text{RR} = \text{risk free rate} + \text{beta} (\text{return on market} - \text{risk free rate}) = 4 + 0.5 (12 - 4) = 8\%$ .

Since  $\text{FR} = \text{RR}$ , stock C is correctly priced.

#### Question 4

Answers were generally of an average to good standard, with a mean mark of 2.9 and a median and modal mark of 3.0. The maximum mark was 4.5 and the minimum 1.0.

(a) The idea of a premium for illiquidity in bonds is controversial because there are often well developed secondary markets. Due to this, an investor does not have to hold a bond to maturity. However, corporate bonds are often not as liquid as government bonds. As a result of this potential inability to readily realise a corporate bond at quoted prices a premium may exist. Corporate bonds are also subject to greater credit risk than government bonds. Credit risk is the risk of a de-rating or up-rating in the credit worthiness of an issuer to reflect the probability of default. Since credit risk cannot be eliminated by diversification an investor is expected to require a risk premium.

(b) Both the probability that the firm cannot repay par value to its various claimants as well as market capitalisation should be related to expectations for corporate earnings, cash flow and profitability. Most of the time, the market value of a firm is a long way from the par value of its liabilities. When the market value is a long way above par value equity risk and credit risk may have a low correlation. When the cushion of market capitalisation shrinks close to the par value of liabilities, equity risk and credit risk naturally have more in common. Correlation may then increase. For example, if investors forecast difficult and risky times ahead for the firm, so the prospect that the firm's ability to repay creditors in full is more doubtful and this can be expected to lead to a closer relationship between equity risk and credit risk. Some firms with consistently lower valuations than others also have closer correlation between their equity and credit risk.

(c) An investor who has sought diversification by holding both bonds and equities is likely to sell bond B. Holding bond B has significantly greater exposure to equity-like risk which the investor is trying to diversify through investing in bonds. All other risk factors are highly similar.

### **Question 5**

The question was generally well answered by candidates, with a mean, median and modal mark of 3.3, 3.5 and 5.0 respectively. The maximum mark was 5.0 and the minimum 1.0. Candidates scoring full marks performed the following calculations:

(a) Preferred stock can be valued by dividing the annual dividend by the required rate of return. The shares need to yield 7%. With the preference share a perpetuity the value of the annual dividend (£1) is capitalised at the required rate of return (7%). The present value of the dividend / required return =  $1.0 / 0.07 = £14.3$ .

(b) The shares need to yield 10%. The value of the annual dividend (£9) is capitalised at the required rate of return (10%). Price =  $0.9 / 0.1 = £9$ .

(c) Preference shares pay a fixed dividend (albeit a fixed amount of an original nominal value). The dividend may be paid even if the company is making a loss. If no dividend is paid the dividend due is accrued and the cumulative dividend then paid before ordinary shares. This means that preference shares are higher ranking in dividend payments than ordinary shares. Second, preference shares have less participation in increasing dividends than ordinary shares but are higher ranking in a winding-up. This means that preference shares are less volatile and more protected. Third, there is the possibility of some capital gain if the perceived credit quality of the firm improves.

## **Taxation and Trusts**

This year's summer examination produced some excellent scripts and some very poor ones.

A number of candidates clearly made a decision to specialise in certain parts of the workbook and struggled to produce good answers to parts of questions, losing easy marks. Just less than half the candidates scored less than 50% of the marks available with most of these scripts scoring 14/15 marks out of the possible 30 marks available. On the positive side, approximately, 40% of scripts scored 17 or above marks out of the 30 available.

### **Section D – 20 marks available**

This Case Study type question was generally reasonably well answered although just 40% of the scripts scored 10 marks or above out of the 20 marks available. A simple question like “what business format should Tommy choose?” threw a number of candidates. Some even skipped answering that part of the question, throwing away 25% of the 20 marks available. How many business formats exist? Working out the basic difference between a company and a sole trader should not have caused so much trouble!

The remainder of the question concerned UK tax considerations in general, UK inheritance tax considerations and UK capital gains tax. This should not have given any reasonably prepared candidate an opportunity to score easy marks. Many failed because they omitted either UK inheritance tax or UK Capital gains tax considerations. The workbook should have been useful to all candidates answering this question, but many failed to write down even basic tax planning ideas in relation to each type of tax.

Those candidates who were well prepared, and gave the answer some thought, scored very highly on this type of question.

### **Section E – 10 marks available**

Three questions were presented based on examples taken from the workbook. Candidates were required to answer two questions out of the three available.

**Question 7** was generally well answered with over half the candidates scoring 3 or more marks out of the 5 available. It was a very straight-forward discussion of the Trustee Act 2000, straight from the workbook.

**Question 8** was based on an example in the workbook and should have been relatively straight forward. Around half the candidates attempted this question. The majority struggled to score the 5 marks available with less than half scoring 3 or more marks.

**Question 9** was perhaps the easiest question on this paper. Almost all candidates managed to score 3 or more marks. Answers were sometimes very brief, perhaps too brief to give a proper explanation of each term which carried one mark each. Easy marks were lost by candidates who failed to explain “Taper Relief”.

Overall, the vast majority of this year's candidates passed or were borderline fails on this section of the paper. Clearly future candidates must remember that the examination questions are based on the syllabus and that leaving out one or two sections/taxes is not the best idea. Equally, candidates in the future should remember that it is their responsibility to show their knowledge to the examiner. One sentence answers rarely demonstrate much knowledge of a 5-mark question.