



INSTITUTE OF ACTUARIAL
& QUANTITATIVE STUDIES

Risk Management &
Subject: Investment
Management II

Chapter: Unit 3

Category: Practice Questions

1. IFoA ST5 April 2007 Question 4

A professional fund manager invests in the constituent shares of the FTSE 100 index and weights the investments of the fund on an arithmetic average basis using the market capitalisation of the constituents of the FTSE 100 index. The fund manager adjusts the constituent shares and their weights in line with changes in the weights used in the construction of the index. To all intents and purposes, the fund attempts to track the price and yield performance of the FTSE 100 index.

The investors in the fund asked an independent investment consultant to evaluate the total return performance of the professional fund manager relative to the total return performance of the FTSE 100 index over the last ten years. The independent investment consultant's report examined the fund manager's total return and concluded that the professional fund manager had under-performed the FTSE 100 Total Return Index over the ten-year period in question.

(i) Describe the most likely reasons for the fund-manager's under performance relative to the FTSE 100 index over the past 10 years.

(ii) Outline two ways of reducing the under performance of the fund manager relative to the FTSE 100 index.

2. IFoA ST5 April 2008 Question 4

(i) Describe the two principal global equity index series.

(ii) List five ways in which a large institutional investor can achieve the returns (gross of costs and tax) of a global equity index.

(iii) Explain why this type of index would be more useful for performance measurement for an overseas investor than the most widely quoted local equity index.

(iv) Explain why this type of index would be less suitable than the most widely quoted local equity index as a base for exchange-traded derivative contracts.

3. IFoA ST5 September 2008 Question 5 (Part I & II)

You are an investment manager working for the investment arm of a small life insurance company that has used exchange-traded options as part of its equity portfolio management.

(i) List the uses of equity market indices.

(ii) List the main features and characteristics of the main equity indices of UK, USA, Japan, Germany and France.

4. IFoA April 2009 Question 1

(i) Describe the uses of performance measurement for an investment portfolio.

(ii) Discuss the limitations and disadvantages associated with portfolio performance measurement.

(iii) Describe the key reasons why hedge fund index returns are likely to overstate actual returns and understate volatility for a typical hedge fund investor.

(iv) State the formula for the Sharpe ratio, defining any terms you use.

(v) Explain why hedge funds highlight the Sharpe ratio in their promotional material, rather than the

Treynor or Jensen ratios.

(vi) Describe the key limitations of the Sharpe ratio as a measure of the skill of a hedge fund's managers.

5. IFoA April 2010 Question 6 (excluding part iii)

A charity and an insurance company invest their assets with the same investment manager. The finance directors of the two institutions, who know each other well, are discussing the performance of the investment manager over dinner. They are surprised that the returns of their respective portfolios have differed considerably over the last year.

(i) Suggest reasons why the performance of the two portfolios might differ.

The following portfolio performance and benchmark performance results have been provided by the insurance company.

The strategic asset allocation is 10% domestic equities, 25% overseas equities, 15% cash and 50% bonds. The portfolio at the start of the year was £2.6m with £1.02m invested in equities in line with the equity benchmark split. The cash value at start of the year is £410,000.

<i>Value at the end of</i>	<i>Quarter 1</i>	<i>Quarter 2</i>	<i>Quarter 3</i>	<i>Quarter 4</i>
Domestic Equities value	314.7	335.2	266.2	270.2
Benchmark return	7.4%	6.5%	-7.0%	2.0%
Overseas Equities value	801.5	777.4	612.7	704.6
Benchmark return	10%	-4.2%	-11.0%	12.0%
Cash value	418.2	426.6	439.4	443.8
Benchmark return	1.5%	2.0%	5.0%	1.0%
Bonds value	1216.8	1277.6	1366.1	1420.8
Benchmark return	6.0%	7.0%	2.0%	4.0%

(all figures in £000's)

The portfolio is rebalanced at the end of the second quarter back to the strategic benchmark.

(ii) (a) Calculate the quarterly and the yearly total portfolio returns.

(b) Calculate the quarterly and yearly benchmark returns.

(c) State the under or outperformance of the fund relative to the benchmark for each quarter and for the year.

(iii) State any assumptions you make.

(iv) Explain the limitations and disadvantages associated with measuring the performance of the investment manager.

6. IFoA April 2011 Question 7

A risk averse investor has historically invested her equity portfolio with an index tracking manager, but has recently decided to change to an active equity manager. The investor has four managers to choose

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from and has been provided with the following information on performance over the last four quarters:

	<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Covariance with Index</i>
Manager A	3.5%	2.0%	5.0%	8.5%	0.6
Manager B	2.0%	2.0%	3.0%	4.0%	0.2
Manager C	5.0%	-2.0%	6.0%	11.0%	0.67
Manager D	4.0%	3.0%	4.0%	6.0%	0.4
Index benchmark return	2.0%	2.0%	3.0%	4.0%	
Standard deviation of index	0.6				
Risk free rate	7% p.a.				

- (i) (a) Calculate the outperformance of the investment managers relative to the benchmark.
 (b) Rank the investment managers from 1 to 4, with 1 being the highest outperformer.
- (ii) (a) Calculate the risk adjusted performance of the investment managers using the Jensen measure.
 (b) Rank the investment managers from 1 to 4, with 1 being the highest performer.
- (iii) Discuss which manager is likely to be the most suitable for the investor.
- (iv) Outline the circumstances in which standard deviation is a more appropriate measure of risk for an investor than beta.

7. IFoA September 2011 Question 9 (excluding iii & iv)

You are the investment advisor to the trustees of a pension scheme. The trustees terminated the mandate of one of the scheme's equity investment managers (Super Return Inc) and replaced them with a new equity investment manager (Thinking Portfolio Managers) over the course of the year. At the end of the year the trustees review the scheme's performance and have questioned the actual scheme return relative to the benchmark. The trustees have asked you to produce a report on the performance.

	<i>Period 1</i>	<i>Period 2</i>	<i>Transition Period</i>	<i>Period 4</i>	<i>Period 5</i>
Domestic Equities value	3,500,000		3,000,000		
Domestic Equities return	9.0%	8.0%	7.0%	6.0%	8.0%
Benchmark return	11.0%	7.0%	7.0%	6.0%	5.0%
Overseas Equities value	4,000,000		3,000,000		
Overseas Equities return	4.0%	7.0%	6.0%	5.0%	7.0%
Benchmark return	5.0%	7.0%	5.0%	5.0%	8.0%
Small Cap Equities	2,000,000		1,000,000		
Small Cap Equities return	3.0%	6.0%	6.0%	4.0%	5.0%
Benchmark return	3.0%	6.0%	8.0%	4.0%	3.0%
Cash	500,000		3,000,000		
Cash return	1.0%	1.5%	2.0%	1.0%	3.0%
Benchmark return	1.0%	1.0%	2.0%	1.0%	2.0%

The values in the table above represent the values at the start of the period. The trustees adjusted the allocation to equities and cash to \$10 million at the start of the transition as shown in the table above.

Both managers were measured against the same benchmark:

- Domestic Equities 50%
- Overseas Equities 30%

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- Small Cap Equities 15%
- Cash 5%

Assets are rebalanced at the discretion of the investment manager. Following the transition, Thinking Portfolio Managers' asset allocation was in line with the benchmark. No other rebalancing took place apart from during the transition period.

(i) Calculate the benchmark return and the portfolio return for the following:

- Super Return Inc (Periods 1 and 2 separately)
- Assets during transition (Period 3)
- Thinking Portfolio Managers (Periods 4 and 5 separately)

(ii) Calculate:

- The cash value taken out of the scheme at the start of the transition period.
- Total scheme portfolio return and benchmark return over the entire period.

8. IFoA April 2014 Question 4

The following information relates to the performance of two investment trusts and their equivalent benchmark index over a three-year period. The annual risk-free rate of return over this period was 4% per annum.

	<i>Trust A</i>	<i>Trust B</i>	<i>Index</i>
Annual return (% p.a.)	9.0	8.0	7.0
Standard deviation (% p.a.)	13.5	9.5	6.5
Correlation coefficient with index	0.36	0.75	1.00

- Calculate four different risk adjusted performance measures for each trust.
- Comment on the results from part (i), stating any limitations that apply to them.

9. IFoA September 2019 Question 6

The following market data and information has been provided about a pension fund wholly invested in US equities:

<i>Date</i>	<i>Market Value of fund (\$000s)</i>	<i>Domestic Share Index (Capital only)</i>	<i>Dividend Yield on Domestic Share Index (% per annum)</i>
31 Dec 2012	3,600	1500	
31 Mar 2013	3,600	1603	4.3
30 June 2013	4,050	1776	4.2
30 Sept 2013	4,500	1797	3.9
31 Dec 2013	4,200	1680	4.2

<i>Period (2013)</i>	<i>Contribution Income (Outgo if negative) (\$000s)</i>	<i>Investment Income (\$000s)</i>
Q1	56	52
Q2	30	60
Q3	187	60
Q4	-52	68

Contributions and investment income all occur on the last day of each quarter.

(i) Calculate for each period and over the full year:

- (a) the time-weighted return.
- (b) the money-weighted return.
- (c) the index return.

State any assumptions made.

(ii) Comment on these returns.

(iii) Compare the investment income actually received by the fund with the investment income that would have been received if the fund had been invested in the index.

(iv) Explain the conclusions that might be drawn about the stock selection policy of the fund, using the information from parts (ii) and (iii).

10. IFoA April 2015 Question 2

- (i) Describe the main limitations of portfolio performance measurement.
- (ii) Propose an action that could be taken to address each of the limitations described in part (i).

11. IFoA April 2017 Question 4

- (i) List the uses of investment indices.
- (ii) Describe the main components of the FTSE UK Index Series of indices.

The trustees of a self-administered UK pension fund are considering the choice of an index against which the fund's UK equity performance could be benchmarked.

- (iii) Propose, with reasons, indices that might be adopted for this purpose.



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