

## 12. INVESTMENT OBJECTIVES, STRATEGIES AND ISSUES

1. (a) In order to analyse overall performance, it will be appropriate to calculate the investment performance for each fund over an equivalent passive portfolio, and the simple Sharpe and Treynor measures for each fund.

The first thing to do is to calculate via a spreadsheet the standard deviations of returns and mean compound returns for the index and the funds over the three periods. In addition we calculate the betas of the funds by regressing returns on each fund on the returns on the FTSE-100 index.

The estimated values are given below on an annual basis.

		MEAN RETURN	SD OF RETURN	BETA
<b>FIRST YEAR</b>	<b>INDEX</b>	16.50	10.03	1.00
	A	16.77	6.68	0.60
	B	21.48	9.97	0.70
	C	22.39	12.79	1.21
<b>SECOND YEAR</b>	<b>INDEX</b>	5.87	10.83	1.00
	A	9.19	9.51	0.86
	B	8.36	8.06	0.69
	C	16.74	11.44	1.02
<b>WHOLE PERIOD</b>	<b>INDEX</b>	11.06	10.30	1.00
	A	12.92	8.10	0.74
	B	14.73	9.03	0.71
	C	19.53	11.89	1.09

Remember that a passive portfolio is defined as a portfolio consisting of the market portfolio and money market investments with the same beta as the actual portfolio. Hence we have the following passive returns and incremental returns.

	A	B	C
Passive (1)	12.27	13.37	18.67
Active (1)	16.77	21.48	22.39
Incremental (1)	4.50	8.11	3.72
Passive (2)	5.88	5.91	5.86
Active (2)	9.19	8.36	16.74
Incremental (2)	3.30	2.45	10.88

Passive (All)	9.72	9.57	11.54
Active (All)	12.92	14.73	19.53
Incremental (All)	3.20	5.16	8.00

Similarly we calculate the Sharpe and Treynor ratios.

$$\text{Sharpe Ratios} : \frac{R_P - R_F}{\sigma_P}$$

	<u>INDEX</u>	<u>A</u>	<u>B</u>	<u>C</u>
Period 1	1.05	1.61	1.55	1.28
Period 2	N/A	0.34	0.29	0.94
Overall	0.49	0.85	0.97	1.14

$$\text{Treynor Ratios} : \frac{R_P - R_F}{\beta_P}$$

	<u>INDEX</u>	<u>A</u>	<u>B</u>	<u>C</u>
Period 1	10.50	18.04	22.06	13.59
Period 2	N/A	3.73	3.41	10.53
Overall	5.06	9.41	12.37	12.36

### Conclusions

Over the whole period it is evident that fund C has performed best on a risk-adjusted basis on all three measures, albeit very narrowly on the Treynor measure relative to the beta risk taken on.

However, the performance of the funds has been erratic during the sub-periods. In period 1 fund C under-performed both the other funds on each of the measures despite the highest absolute return. This was largely due to the amount of extra beta the fund was running compared with the other two funds. In other words the extra market risk taken on by fund C was not compensated for by sufficient incremental return. More will be revealed by the FAMA decomposition analysis. Given the erratic performance of fund C, a cautious investor might prefer the overall performance of fund B: very close on the Treynor measure overall and definitely superior to fund A overall.

- (b) We now turn our attention to the decomposition of returns. We have already begun this process by calculating the returns of the so-called equivalent passive portfolios. We must also calculate the value of passive portfolios with the trustee's desired betas and passive portfolios with the same total risk as the funds.

### TRUSTEE PORTFOLIOS

PERIOD	A	B	C
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1	13.88	16.50	16.50
2	5.90	5.87	5.87
Both	9.79	11.06	11.06

### **TOTAL RISK PORTFOLIOS**

#### **FUND A**

##### **PERIOD 1**

$$\% \text{ in Market} = \frac{6.68}{10.03} = 0.67$$

$$\text{Return} = (0.67)(16.50) + (0.33)(6) = 13.00\%$$

##### **PERIOD 2**

$$\% \text{ in Market} = \frac{9.51}{10.83} = 0.88$$

$$\text{Return} = (0.88)(5.87) + (0.12)(6) = 5.88\%$$

##### **ALL**

$$\% \text{ in Market} = \frac{8.10}{10.30} = 0.79$$

$$\text{Return} = (0.79)(11.06) + (0.21)(6) = 9.97\%$$

#### **FUND B**

##### **PERIOD 1**

$$\% \text{ in Market} = \frac{9.97}{10.03} = 0.99$$

$$\text{Return} = (0.99)(16.50) + (0.01)(6) = 16.44\%$$

##### **PERIOD 2**

$$\% \text{ in Market} = \frac{8.06}{10.83} = 0.74$$

$$\text{Return} = (0.74)(5.87) + (0.26)(6) = 5.90\%$$

##### **ALL**

$$\% \text{ in Market} = \frac{9.03}{10.30} = 0.88$$

$$\text{Return} = (0.88)(11.06) + (0.12)(6) = 10.43\%$$

#### **FUND C**

**PERIOD 1**

$$\% \text{ in Market} = \frac{12.79}{10.03} = 1.28$$

$$\text{Return} = (1.28)(16.50) - (0.28)(6) = 19.39\%$$

**PERIOD 2**

$$\% \text{ in Market} = \frac{11.44}{10.83} = 1.06$$

$$\text{Return} = (1.06)(5.87) - (0.06)(6) = 5.86\%$$

**ALL**

$$\% \text{ in Market} = \frac{11.89}{10.30} = 1.15$$

$$\text{Return} = (1.15)(11.06) - (0.15)(6) = 11.83\%$$

We can now for each period show the FAMA decomposition.

**PERIOD 1**

	<b>A</b>	<b>B</b>	<b>C</b>
<b>TRUSTEE PORTFOLIO</b>	13.88	16.50	16.50
<b>PASSIVE PORTFOLIO</b>	12.27 (-1.61)	13.37 (-3.13)	18.67 (+2.17)
<b>TOTAL RETURN</b>	13.00 (+0.73)	16.44 (+3.07)	19.39 (+0.73)
<b>PORTFOLIO</b>			
<b>ACTUAL RETURN</b>	16.77 (+3.77)	21.48 (+5.04)	22.39 (+3.00)

**PERIOD 2**

	<b>A</b>	<b>B</b>	<b>C</b>
<b>TRUSTEE PORTFOLIO</b>	5.90	5.87	5.87
<b>PASSIVE PORTFOLIO</b>	5.88 (-0.01)	5.91 (+0.04)	5.87 (+0.00)
<b>TOTAL RETURN</b>	5.88 (0.00)	5.90 (-0.01)	5.86 (+0.00)
<b>PORTFOLIO</b>			
<b>ACTUAL RETURN</b>	9.19 (+3.31)	8.36 (+2.46)	16.74 (+10.88)

**OVERALL**

	<b>A</b>	<b>B</b>	<b>C</b>
<b>TRUSTEE PORTFOLIO</b>	9.79	11.06	11.06
<b>PASSIVE PORTFOLIO</b>	9.72 (-0.07)	9.57 (-1.49)	11.54 (+0.48)
<b>TOTAL RETURN</b>	9.97 (+0.26)	10.43 (+0.87)	11.83 (+0.30)
<b>PORTFOLIO</b>			
<b>ACTUAL RETURN</b>	12.92 (+2.92)	14.73 (+4.30)	19.53 (+7.70)

The decomposition of returns further reinforces the claims of C to be the best fund manager. This manager has enjoyed positive or zero market timing returns in each period and overall, whereas the market exposure of the other two funds caused under performance significantly in period 1. Each fund has earned extra returns by taking on diversifiable risks, though not significantly in the case of A and C. However, all three funds have earned substantial returns in each period through net selectivity, with fund C showing a 7.70 incremental performance. This combination, with C of market timing ability and stock selection skill, plus the overall performance, would suggest it can be classed as the best fund.

It may further be noted that all the funds significantly outperformed the market, although only in the case of fund C was there a significant contribution from market timing. Given the significant out-performance by all funds attributable to net selectivity, and the erratic performance between years 1 and 2, one's general conclusion would probably be that an investor should purchase an equally weighted portfolio of all three funds, and then bring the overall beta up or down to 1.0 via a derivatives hedging strategy.