ECO 332: VALUATION AND PORTFOLIO MANAGEMENT
END TERM (Winter 2024)

1. Suppose that seven portfolios experienced the following results during a ten-year period:

Portfolio	Avg. Annual return (%)	Standard deviation (%)	Correlation with the market
A	15.6	27.0	0.81
B	11.8	18.0	0.55
C	8.3	15.2	0.38
D	19.0	21.2	0.75
E	-6.0	4.0	0.45
F	23.5	19.3	0.63
G	12.1	8.2	0.98
Market	13.0	12.00	
Treasury Bills	6.0		

a) Rank these portfolios using i) Sharpe's method ii) Treynor's method

b) Compare the rankings in part (a) and explain the reasons behind any differences noted. Explain why Sharpe's and Treynor's measures of performance give conflicting performance rankings? ***(8,3marks)***

Portfolio	Avg. Annual return (%)	Standard deviation (%)	Correlation with the market	beta value	Sharpe	Treynor
A	15.6	27	0.81	1.82	0.36	5.27
B	11.8	18	0.55	0.83	0.32	7.03
C	8.3	15.2	0.38	0.48	0.15	4.78
D	19	21.2	0.75	1.33	0.61	9.81
E	-6	4	0.45	0.15	-3.00	-80.00
F	23.5	19.3	0.63	1.01	0.91	17.27
G	12.1	8.2	0.98	0.67	0.74	9.11
Market	13	12		1.00	0.58	7.00
Treasury Bills	6					

Portfolio Sharpe
F
G
D
Market
A
B
C
E

Portfolio, Treynor
F
D
G
B
Market
A
C
E

Calculation of beta values	2 marks
Sharpe Ratio	2 marks
Treynor Ratio	2 marks
Ranking	2 marks
Explanation –	3 marks

Comments : Many students have calculated Treynor Ratio incorrectly because they have made erros in calculating beta values.
No marks have been given for explanations if rankings are not proper

2. MEGATRON LTD. paid a dividend of Rs.2.60 during the last year and the growth rate in the dividends is expected to be 8%. The current market price of the stock is Rs.30.00. The beta of the stock is 1.60 and the return on the market index is 13%. If the risk-free rate of return is 8%, by how much should the price of the stock be raised in percentage terms so that it is at equilibrium? ***(4 marks)***

Required rate of return: $R_F + \beta (R_M - R_F) = 8\% + 1.6 \times (13\% - 8\%) = 8\% + 8\% = 16\%$ 1 mark

Expected Rate of Return: $[\{D_0 (1 + g)/P_0\} + g] = [\{2.60 \times (1+0.08)/30\} + 0.08\% = [2.808/30] + 0.08 = 0.0936 + 0.08 = 0.1736 = 17.36\%$

At equilibrium, required rate of Return is equal to the Expected rate of return.

Thus, $0.16 = [\{2.60 \times (1 + 0.08)\} /P_0] + 0.08$; Or,

$0.16 = [2.808/P_0] + 0.08$; Or,

$[0.16 - 0.08] = [2.808/P_0]$; Or, $P_0 = 2.808/0.08 = 35.10$ 2 marks

Hence , the price should be increased by = [35.10 - 30.00] = 5.10 or [5.10/30.00]×100 = 17% so that it is at equilibrium 1 mark

3. ABC Ltd. currently pays Rs.5 as dividend which is expected to grow at 10% for the next three years after which it is expected to level off at 5% for ever. Determine the Value of the stock using the Multi-stage dividend discount model. Use a discount rate of 15% ***(8 marks)***

$D_1 = Rs5.00(1 + 0.10) = Rs5.50$

$D_2 = Rs5.00(1 + 0.10)^2 = Rs6.05$

$D_3 = Rs5.00(1 + 0.10)^3 = Rs6.655$

$D_4 = Rs5.00(1 + 0.10)^3(1 + 0.05) = Rs6.98775$

$V_3 = \frac{Rs6.98775}{0.15-0.05} = Rs69.8775$ 5 marks

$V_0 = \frac{Rs5.50}{1+0.15} + \frac{Rs6.05}{(1+0.15)^2} + \frac{Rs6.655}{(1+0.15)^3} + \frac{Rs69.8775}{(1+0.15)^3} V_0 \approx Rs59.68$ 3 marks

Merely mentioning dividend values fetch only 1 mark at best

4. A fund manager has to pay Rs.10 lacs in 2 years time. He has options to invest in one year and three-year bonds.

One year bonds: Face Value Rs.1000/- Coupon 7%. Available in the market at YTM of 10%

Three year bonds: Face Value Rs.1000/- Coupon 8%. YTM 10%

The manager is considering investing a part of the amount in 1-year bonds and the balance in 3-year bonds.

a) Using immunization technique determine how much amount should be invested in each types of bonds.

b) Show how immunization technique accomplishes the desired result. Assume ending period YTM of 9%, 10% and 11%.

(5,7 marks)

Money required to purchase bonds = $\frac{1,000,000}{(1.10)^2}$ = Rs.826,446

Strategy: Make the weighted average duration of the portfolio = 2 years

$w_1 + w_3 = 1$

$w_1 x1 + w_3 x2.78 = 2$

Solving the above equations we get

$w_1 = 0.4382$ & $w_3 = 0.5618$

This implies that 43.82% portfolio should be in one-year bonds and 56.18% in 3 year bonds

Amount invested in 1 year bonds	Rs.3,62,149	43.82% of Rs.826,446
Price of 1 year bond	Rs.972.73	
No of one year bonds	$\frac{362149}{972.73} = 372.3$	Assuming fractional bonds can be purchased
Amount invested in 3 year bonds	Rs.4,64,297	56.18% of Rs.826,446
Price of 3 year bond	Rs.950.25	
No of 3 year bonds	$\frac{464297}{950.25} = 488.6$	

5 marks

	Yield to Maturity at the end of one year		
	9%	**10%**	**11%**
Value at t = 2 from reinvesting one yr bond proceeds			
(1070 x 372.3 x (1 +y)	**4,34,213**	**4,38,197**	**4,42,181**
Value at t= 2 of three year bonds			
Value from reinvesting coupons recd at t = 1			
80 x 488.6 x (1+y)	**42,606**	**42,997**	**43,388**
Coupons recd at t = 2			
80 x 488.6	**39,088**	**39,088**	**39,088**
Selling price at t= 2			
1080 x 488.6 / (1+y)	**4,84,117**	**4,79,716**	**4,75,395**
Aggregate value of the portfolio at t =2	**10,00,025**	**9,99,998**	**10,00,051**

7 marks

Comments: If part A is not calculated correctly no marks have been given for part B. Merely putting in some values do not fetch any marks