Lecture 10

Example 1
Consider three securities with following characteristic:

Security	b_{i_1}	b_{i_2}	W_i	σ_{e_i}
S1	0,40	1,85	0,25	3%
S2	-0,50	0,75	0,40	2%
S3	0,67	-0,25	0,35	0,5%
	$\beta_{F_1} = 1,20$	$\beta_{F_2} = 0,80$	$\sigma_{F_1} = 0,24$	$\sigma_{F_2} = 0,14$

a) Calculate beta for every security
b) Calculate the risk of each security (the factors are not correlated).

1. Return of securities (X,Y) are generated by three factors. What will be the expected return of every security? Calculate the risk of securities and thus calculate the risk of portfolio. Use following data:
   $F_1 = 4\%,\ F_2 = 6,5\%,\ F_3 = 9\%,\ r_f = 3\%\quad X_1 = 65\%,\ X_2 = 35\%,$
   $b_{x_1} = 0,08,\ b_{y_1} = 0,75,\ b_{x_2} = 0,40,\ b_{y_2} = 0,65,\ b_{x_3} = 1,48,\ b_{y_3} = 0,59$, $\alpha_x = 6\%$, $\alpha_y = 9\%$
   $\sigma_{F_1} = 10\%,\ \sigma_{F_2} = 9,5\%,\ \sigma_{F_3} = 12\%,\ \sigma_{e_x} = 14\%,\ \sigma_{e_y} = 25\%$, $e_x = 2,5\%$, $e_y = 1,85\%$
   $\beta_{F_1} = 1,20$, $\beta_{F_2} = 0,56$, $\beta_{F_3} = 1,58$

2. According an analysis the CAPM model is validated on the market. From the market we have obtained data for calculation:
   $\sigma_M^2 = 624,\ cov(F_1, r_M) = 256,\ cov(F_2, r_M) = 850,\ b_{A_1} = 0,75,$
   $b_{A_2} = 1,50,\ b_{B_1} = 0,85,\ b_{B_2} = 1,70,\ X_A = 48\%,\ X_B = 52\%$

a) Calculate beta for security A and B.
b) Calculate the expected return of every security, if $r_f = 6\%$ a $r_M = 12\%$,
c) Calculate the risk of portfolio

3. The return of securities on the market is generated by two factors. If we have 1000.00 for investment what will be the portfolio-beta for every of this two factors? The security B will be shorted in the amount of 500.00.

CP	b_{i_1}	b_{i_2}	r_i
A	0,50	0,80	16,2
B	1,50	1,40	21,6
r_f	0,00	0,00	10,0