

~~$\beta = 1.235$~~ , ~~$\beta = 0.268$~~ , ~~$\beta = 1.997$~~ , ~~$\beta = 2.45$~~

	beta_1	beta_2	beta_3	beta_4
	1.235	0.268	1.997	2.45
ri_e	0.1588	0.08144	0.21976	0.256

rf 0.06
r_M 0.14

Year	r_M	r_i	r_i	β	β_i		
1	10	9	22	0.666666667	5	defensive	agressive
2	32	24	48	0.68	1.64	defensive	agressive
3	20	14	30	0.538461538	1.76923	defensive	agressive
4	18	-2	-20	-0.818181818	-2.45455	defensive	agressive
5	17	16	29	0.9	2.2	defensive	agressive
6	3	4	-3	0.75	2.5	defensive	agressive
7	12	8	21	0.2	2.8	defensive	agressive
8	-5	0	-15	0.583333333	1.83333	defensive	agressive
9	18	12	28	0.454545455	1.90909	defensive	agressive
10	21	15	36	0.571428571	2.07143	defensive	agressive
	14.6	10	17.6				

```

rf          7 |
cov_i,M    105.3778  61.44444  166.3778
Beta_i     1  0.583087  1.57887
r_ie       14.6  11.43146  18.99941

delta_i=ri-r  -1.43146  -1.39941

```

beta over last 10 years?

what about the expected return of i, j security?

$r_f = 0,04$,
 $r_M = 0,10$ a
 $\sigma_M = 0,09$

$\sigma_{r_1, M} = 0,0108$
 $\sigma_{r_2, M} = -0,0027$
 $\sigma_{r_3, M} = 0,0054$

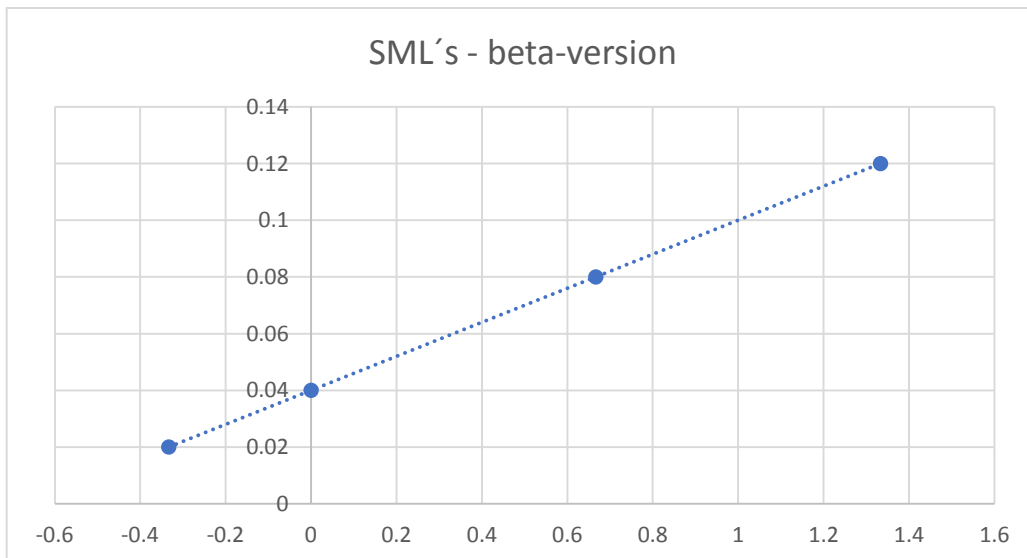
		cov_i,M	
rf	0.04	1	0.0108
r_M	0.1	2	-0.0027
sigma_M	0.09	3	0.0054

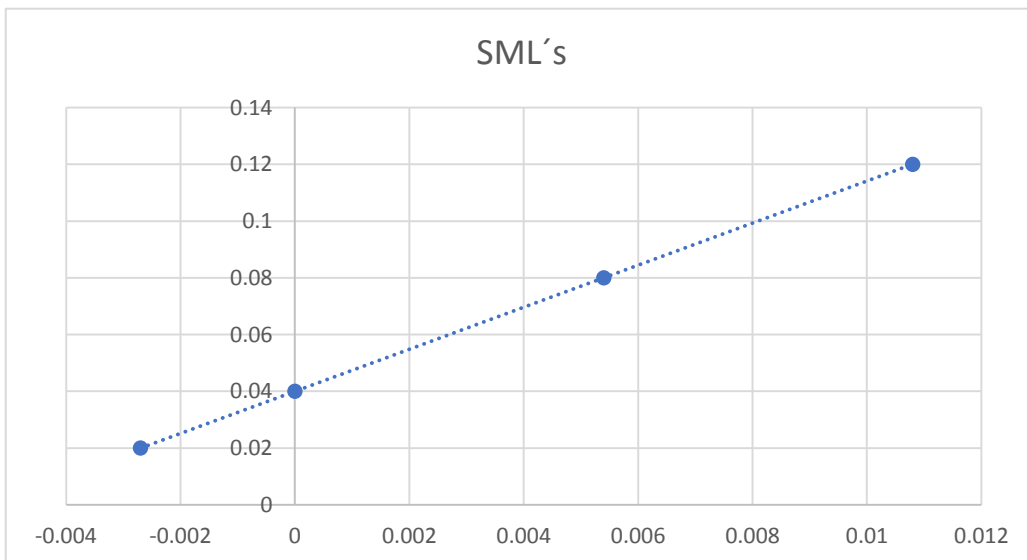
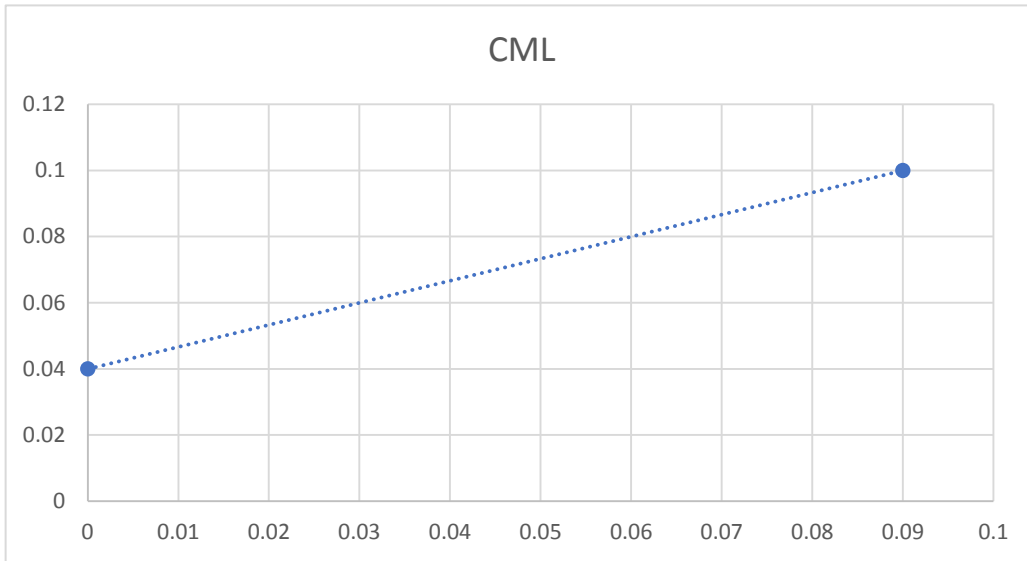
	sigma	return
rf	0	0.04
Market	0.09	0.1

SML

	covar_i,M	return
rf	0	0.04
r1	0.0108	0.12
r2	-0.0027	0.02
r3	0.0054	0.08

	beta_i	return
rf	0	0.04
r1	1.333333	0.12
r2	-0.333333	0.02
r3	0.666667	0.08





	r_i	correlation i a M	sigma i	cov_i,M	beta_i,M	rie	delta_i
S1	15.5	0.9	20	216	1.5	15.5	0
S2	9.2	0.8	9	86.4	0.6	9.2	0
S3	11.2	0.5	15	90	0.625	9.375	1.825
MP	12	1	12	144	1	12	
r_f	5	0	0	0		5	

Day	A	B	C	D	E	Market Index	
1	570	98.4	669.1	53.9	103.5	333.4	
2	569	98.2	715	53.8	103	338.9	-0.00176
3	563.8	96.6	725	53.2	101.9	346.8	-0.00918
4	575.3	96.5	716	53.9	100	347.8	0.020192
5	595.1	97	725	55.6	101.6	350.9	0.033838
6	602.8	98.4	727.5	57	101.2	348.1	0.012856
7	601.8	99	716.6	54.7	102	349.4	-0.00166
8	601.3	105.4	721.5	55.6	101.6	354.2	-0.00083
9	614.8	116.9	718.6	55.9	101.7	361.1	0.022203
10	628.1	119.6	717.8	56.5	100.5	372.7	0.021402
11	629	113.2	729.5	56.4	103.4	371.6	0.001432
12	618.6	109.5	702.6	54.9	102.3	395.9	-0.01667
13	638	105	750.8	55	102.8	397.6	0.030879
14	656	104.9	789.7	56.6	99.8	406.1	0.027823
15	662	105.3	799.1	56.9	101.4	400.7	0.009105
16	669.4	105.7	805	56	100.9	396.6	0.011116
17	700.7	108.5	870	56.7	95.3	398.2	0.045698
18	709	110.3	937.6	57	65.7	400.9	0.011776
19	713	112.6	948.8	56.8	99.4	399.1	0.005626
20	708	113.9	951.5	56.5	99.2	401.1	-0.00704
							E (ri) 0.011411

rf 0.03 p.a.
days in one 0.00012 p.d.

Minimum Variance

ri
0.011411
0.007699
0.018532
0.002479
-0.00223

0.000267
0.000122
0.000257
0.00019
-0.00025
0.000534
0.000245
0.000514
0.000381
-0.00051
1

Inv_M
3135.688
-308.358
-723.904
-2041.71
-61.714
0.518336

Tangency Portfolio

Covariance

0.000267
0.000122
0.000257
0.00019
-0.00025

Inv_M
7518.836
-396.182
-1270.21
-3395.35
-50.4356

-0.00203	0.066349	-0.00186	-0.00484	0.016362
-0.01643	0.013889	-0.01122	-0.01074	0.023043
-0.00104	-0.01249	0.013072	-0.01882	0.002879
0.005168	0.012491	0.031053	0.015873	0.008874
0.01433	0.003442	0.024868	-0.00394	-0.00801
0.006079	-0.0151	-0.04119	0.007874	0.003728
0.062643	0.006815	0.016319	-0.00393	0.013644
0.103556	-0.00403	0.005381	0.000984	0.019293
0.022834	-0.00111	0.010676	-0.01187	0.031619
-0.055	0.016168	-0.00177	0.028447	-0.00296
-0.03323	-0.03757	-0.02696	-0.0107	0.063344
-0.04196	0.066352	0.00182	0.004876	0.004285
-0.00095	0.050514	0.028676	-0.02962	0.021153
0.003806	0.011833	0.005286	0.015905	-0.01339
0.003791	0.007356	-0.01594	-0.00494	-0.01028
0.026145	0.077651	0.012423	-0.0571	0.004026
0.016454	0.07483	0.005277	-0.37193	0.006758
0.020638	0.011875	-0.00351	0.414053	-0.0045
0.011479	0.002842	-0.0053	-0.00201	0.004999
0.007699	0.018532	0.002479	-0.00223	0.00973

0.000122	0.000257	0.00019	-0.00025
0.001223	-0.00011	0.000168	-1.4E-05
-0.00011	0.001071	0.000203	-0.0015
0.000168	0.000203	0.00033	-0.00026
-1.4E-05	-0.0015	-0.00026	0.017557

0.518336137

vrs

0.000245	0.000514	0.000381	-0.00051	1
0.002447	-0.00021	0.000337	-2.7E-05	1
-0.00021	0.002143	0.000407	-0.00299	1
0.000337	0.000407	0.000659	-0.00052	1
-2.7E-05	-0.00299	-0.00052	0.035114	1
1	1	1	1	0

0

0

0

0

0

1

7.17675E-05

5.8127E-06

9.83657E-06

2.81979E-05

-3.9777E-06

wi

-308.358	-723.904	-2041.71	-61.714	0.518336
450.2518	127.2655	-269.301	0.141659	0.091635
127.2655	713.6363	-162.924	45.92632	0.073796
-269.301	-162.924	2488.709	-14.7721	0.285904
0.141659	45.92632	-14.7721	30.41821	0.030329
0.091635	0.073796	0.285904	0.030329	-0.00043

0.518336

0.091635

0.073796

0.285904

0.030329

-0.00043

Rp

0.008628929

proof

1

Matrix

vrs

0.000122	0.000257	0.00019	-0.00025	0.011291
0.001223	-0.00011	0.000168	-1.4E-05	0.007579
-0.00011	0.001071	0.000203	-0.0015	0.018412
0.000168	0.000203	0.00033	-0.00026	0.002359
-1.4E-05	-0.0015	-0.00026	0.017557	-0.00235

				Zi	wi
-396.182	-1270.21	-3395.35	-50.4356	50.61254	1.28109
939.4912	285.9287	-416.959	13.18743	6.896739	0.174568
285.9287	1452.558	-227.887	102.2446	13.79127	0.349081
-416.959	-227.887	5356.944	10.71687	-33.0782	-0.83727
13.18743	102.2446	10.71687	65.10743	1.285067	0.032527

sum_Zi	39.5074	1
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0.091635 0.073796 0.285904 0.030329

5.81E-06 9.84E-06 2.82E-05 -4E-06
1.03E-05 -7.2E-07 4.41E-06 -3.8E-08
-7.2E-07 5.83E-06 4.29E-06 -3.3E-06
4.41E-06 4.29E-06 2.69E-05 -2.3E-06
-3.8E-08 -3.3E-06 -2.3E-06 1.62E-05

Var_P Sigma_P
0.000215 0.014676
0.587975

1.28109 0.174568 0.349081 -0.83727 0.032527

0.000438	2.74E-05	0.000115	-0.0002	-1.1E-05
2.74E-05	3.73E-05	-6.5E-06	-2.5E-05	-7.7E-08
0.000115	-6.5E-06	0.000131	-5.9E-05	-1.7E-05
-0.0002	-2.5E-05	-5.9E-05	0.000231	7.09E-06
-1.1E-05	-7.7E-08	-1.7E-05	7.09E-06	1.86E-05
Rp	Var_P	Sigma_P		
0.020283	0.00051	0.022591		
			0.897828	