

$r_f = 0,04,$
 $r_M = 0,10$ a
 $\sigma_{i,M} = \dots$

$r_f = 0.04$
 $r_M = 0.1$
 $\sigma_m = 0.09$
 $\sigma_{im} = 0.0108$
 $\sigma_{jm} = -0.0027$
 $\sigma_{zm} = 0.0054$

$\sigma_{1,M} = 0.1$
 $\sigma_{2,M} = 0.02$
 $\sigma_{3,M} = 0.08$

CML

	ri	sigma_i
rf	0.04	0
market	0.1	0.09

ri

1	0.12
2	0.02
3	0.08

SML1

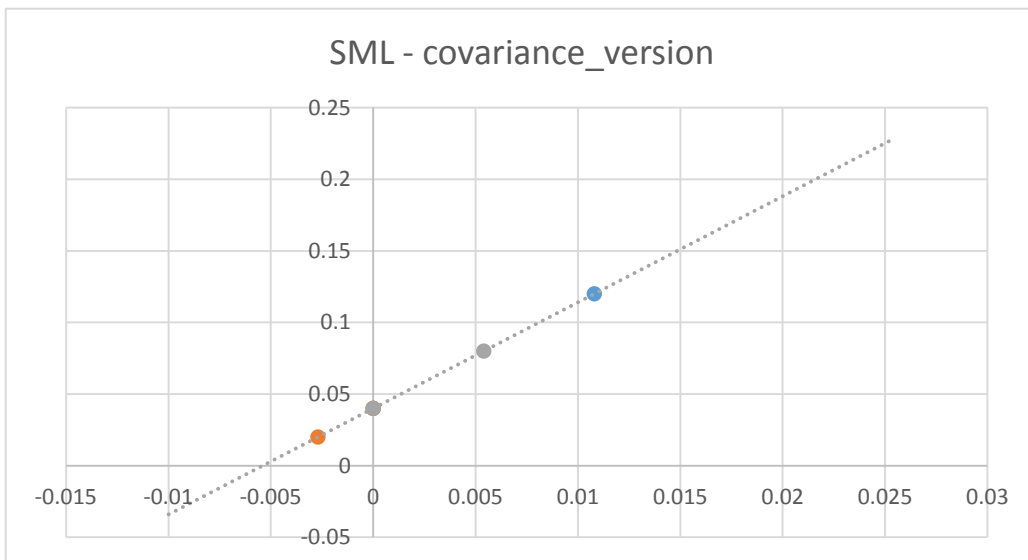
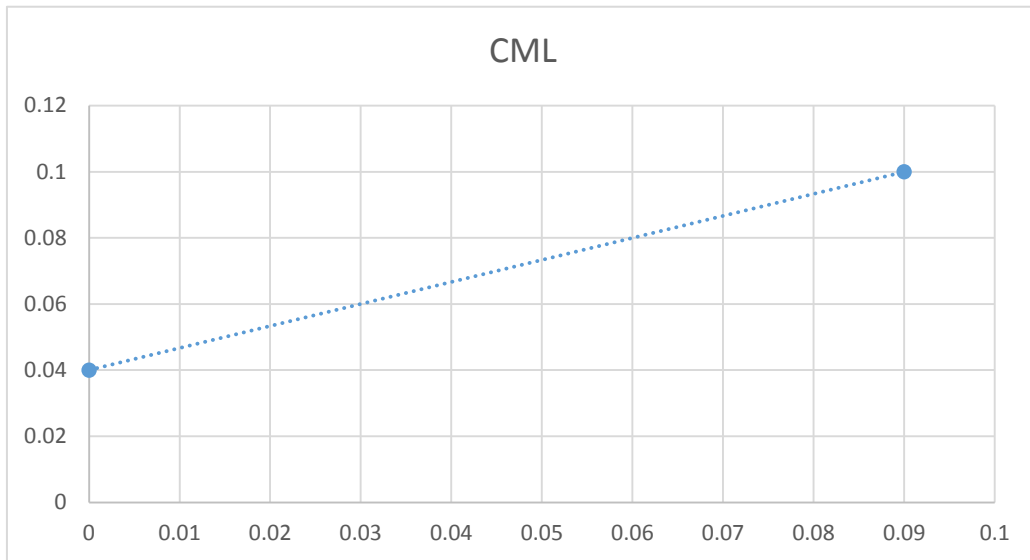
	ri	covar_iM
rf	0.04	0
security 1	0.12	0.0108

SML2

	ri	covar_iM
rf	0.04	0
security 1	0.02	-0.0027

SML3

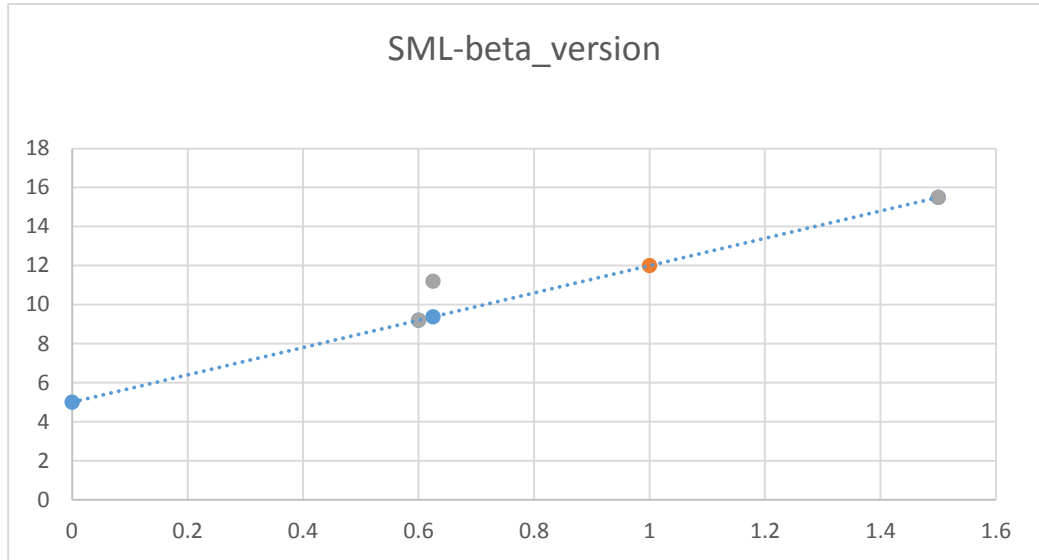
	ri	covar_iM
rf	0.04	0
security 1	0.08	0.0054



	r_i	correlation i a M	sigma i	covar_iM	beta_i	E(ri)	gama	
S1	15.5	0.9	20	216	1.5	15.5	0	corret_pric
S2	9.2	0.8	9	86.4	0.6	9.2	0	corret_pric
S3	11.2	0.5	15	90	0.625	9.375	1.825	undervalue
MP	12	1	12	144	1	12		
rf	5	0	0	0				

	E(ri)	beta_i	ri
rf	5	0	5
s1	15.5	1.5	15.5
s2	9.2	0.6	9.2
s3	9.375	0.625	11.2

e
e
r



Day	A	B	C	D	E	Market Ind	A	B
1	570	98.4	669.1	53.9	103.5	333.4		
2	569	98.2	715	53.8	103	338.9	-0.001755927	-0.00203
3	563.8	96.6	725	53.2	101.9	346.8	-0.009180855	-0.01643
4	575.3	96.5	716	53.9	100	347.8	0.020192065	-0.00104
5	595.1	97	725	55.6	101.6	350.9	0.033837815	0.005168
6	602.8	98.4	727.5	57	101.2	348.1	0.012856008	0.01433
7	601.8	99	716.6	54.7	102	349.4	-0.001660303	0.006079
8	601.3	105.4	721.5	55.6	101.6	354.2	-0.000831186	0.062643
9	614.8	116.9	718.6	55.9	101.7	361.1	0.022203034	0.103556
10	628.1	119.6	717.8	56.5	100.5	372.7	0.021402378	0.022834
11	629	113.2	729.5	56.4	103.4	371.6	0.001431867	-0.055
12	618.6	109.5	702.6	54.9	102.3	395.9	-0.016672396	-0.03323
13	638	105	750.8	55	102.8	397.6	0.030879423	-0.04196
14	656	104.9	789.7	56.6	99.8	406.1	0.027822506	-0.00095
15	662	105.3	799.1	56.9	101.4	400.7	0.009104767	0.003806
16	669.4	105.7	805	56	100.9	396.6	0.011116233	0.003791
17	700.7	108.5	870	56.7	95.3	398.2	0.045698047	0.026145
18	709	110.3	937.6	57	65.7	400.9	0.011775691	0.016454
19	713	112.6	948.8	56.8	99.4	399.1	0.005625894	0.020638
20	708	113.9	951.5	56.5	99.2	401.1	-0.007037327	0.011479

E(ri) 0.011410933 0.007699

rf 0.03 p.a.
 assumption 250
 rf_p.d. 0.00012

covar_iM -7.66363E-05 -2E-05
 var_i 0.000267119 0.001223
 beta_i -0.246231127 -0.06446
 E(ri) -0.002246253 -0.0005

Min.Variance portfolio

Covar_M
 0.000267119 0.000122
 0.000122378 0.001223
 0.000257158 -0.00011
 0.000190277 0.000168
 -0.000253024 -1.4E-05

System of Matrices

0.000534238 0.000245
 0.000244757 0.002447
 0.000514316 -0.00021
 0.000380554 0.000337
 -0.000506048 -2.7E-05
 1 1
 3135.688208 -308.358

-308.3583546	450.2518
-723.9039686	127.2655
-2041.711841	-269.301
-61.71404383	0.141659
0.518336137	0.091635

C	D	E	
0.066349	-0.00186	-0.00484	0.016362
0.013889	-0.01122	-0.01074	0.023043
-0.01249	0.013072	-0.01882	0.002879
0.012491	0.031053	0.015873	0.008874
0.003442	0.024868	-0.00394	-0.00801
-0.0151	-0.04119	0.007874	0.003728
0.006815	0.016319	-0.00393	0.013644
-0.00403	0.005381	0.000984	0.019293
-0.00111	0.010676	-0.01187	0.031619
0.016168	-0.00177	0.028447	-0.00296
-0.03757	-0.02696	-0.0107	0.063344
0.066352	0.00182	0.004876	0.004285
0.050514	0.028676	-0.02962	0.021153
0.011833	0.005286	0.015905	-0.01339
0.007356	-0.01594	-0.00494	-0.01028
0.077651	0.012423	-0.0571	0.004026
0.07483	0.005277	-0.37193	0.006758
0.011875	-0.00351	0.414053	-0.0045
0.002842	-0.0053	-0.00201	0.004999
0.018532	0.002479	-0.00223	0.00973

positive
positive
positive
positive
negative
positive
positive
positive
positive
negative
positive
positive
positive
negative
negative
positive
positive
negative
positive

-0.24623
0.216607
0.070644
1.292229
0.00034

-0.00014	-5.8E-05	-0.00035	0.000311
0.001071	0.00033	0.017557	0.000311

-0.46036	-0.18606	-1.12845	1
-0.0043	-0.00167	-0.01072	0.00973

beta	alfa	beta
-0.24623	0.013807	-0.06446
0.216607	0.004275	0.480577
0.070644	0.016213	0.001057
1.292229	17	0.017993
0.00034	0.004468	2.33E-05

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

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

vrs
0
0
0
0
0
1

-723.904	-2041.71	-61.714	0.518336
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wi
0.518336
0.518336137 0.091635

127.2655	-269.301	0.141659	0.091635	0.091635	7.17675E-05	5.81E-06
713.6363	-162.924	45.92632	0.073796	0.073796	5.8127E-06	1.03E-05
-162.924	2488.709	-14.7721	0.285904	0.285904	9.83657E-06	-7.2E-07
45.92632	-14.7721	30.41821	0.030329	0.030329	2.81979E-05	4.41E-06
0.073796	0.285904	0.030329	-0.00043	-0.00043	-3.9777E-06	-3.8E-08

proof 1

Rp 0.008629

0.013807	-0.24623	0.013807
0.004275	-0.24623	0.013807
0.016213	-0.24623	0.013807
17	-0.24623	0.013807
0.004468	-0.24623	0.013807

alfa	beta	alfa	beta	alfa	beta
0.008326	-0.46036	0.023011	-0.18606	0.00429	-1.12845
0.009485	0.435922	0.008604	0.245452	0.004844	1.800924
0.03597	0.061566	0.032628	0.032694	0.018372	0.022574
17	1.115282	17	0.574584	17	0.392624
0.021996	0.001187	0.018098	0.000194	0.005738	0.007134

0.073796 0.285903523 0.030329

9.84E-06	2.81979E-05	-4E-06
-7.2E-07	4.40873E-06	-3.8E-08
5.83E-06	4.28886E-06	-3.3E-06
4.29E-06	2.6937E-05	-2.3E-06
-3.3E-06	-2.25589E-06	1.62E-05

Var_p 0.000215376 Sigma_p 0.014676

total risk = syst. Risk+unsyst. Risk

sym risk is $\beta_p^2 \cdot \text{var}_m$

$\beta_p = \sum w_i \cdot \beta_i$

beta_p -0.254929935

VarP_syst- β 2.02271E-05 0.004497

Unsys_par 0.000195149 0.01397

alfa

0.008746

0.035544

0.134796

17

0.30889