

Year	$r_M$	$r_i$	$r_j$	$\beta_i$	$\beta_j$
1	10	9	22		
2	32	24	48		
3	20	14	30		
4	18	-2	-20		
5	17	16	29		
6	3	4	-3		
7	12	8	21		
8	-5	0	-15		
9	18	12	28		
10	21	15	36		

covar      105.3778   61.44444

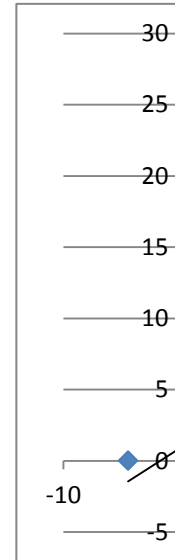
beta      0.583087

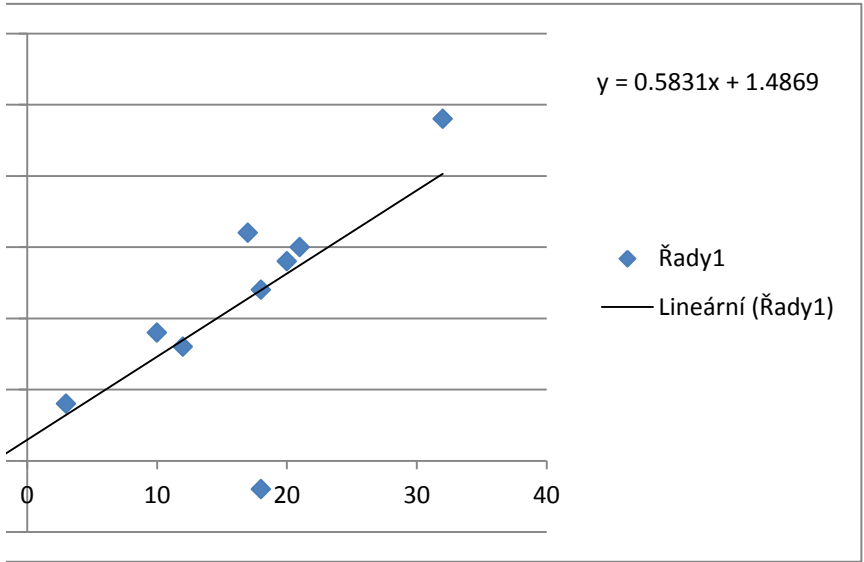
alfa

beta

10      146      100  
146      3080      2013

0.324757   -0.01539   alfa      1.486925  
-0.01539   0.001054   beta      0.583087





Day	A	B	C	D	E	Market Ind	returns!!!
1	570	98.4	669.1	53.9	103.5	333.4	0.001755927 0.002035
2	569	98.2	715	53.8	103	338.9	0.009180855 0.016427
3	563.8	96.6	725	53.2	101.9	346.8	-0.020192065 0.001036
4	575.3	96.5	716	53.9	100	347.8	-0.033837815 -0.00517
5	595.1	97	725	55.6	101.6	350.9	-0.012856008 -0.01433
6	602.8	98.4	727.5	57	101.2	348.1	0.001660303 -0.00608
7	601.8	99	716.6	54.7	102	349.4	0.000831186 -0.06264
8	601.3	105.4	721.5	55.6	101.6	354.2	-0.022203034 -0.10356
9	614.8	116.9	718.6	55.9	101.7	361.1	-0.021402378 -0.02283
10	628.1	119.6	717.8	56.5	100.5	372.7	-0.001431867 0.054997
11	629	113.2	729.5	56.4	103.4	371.6	0.016672396 0.033232
12	618.6	109.5	702.6	54.9	102.3	395.9	-0.030879423 0.041964
13	638	105	750.8	55	102.8	397.6	-0.027822506 0.000953
14	656	104.9	789.7	56.6	99.8	406.1	-0.009104767 -0.00381
15	662	105.3	799.1	56.9	101.4	400.7	-0.011116233 -0.00379
16	669.4	105.7	805	56	100.9	396.6	-0.045698047 -0.02615
17	700.7	108.5	870	56.7	95.3	398.2	-0.011775691 -0.01645
18	709	110.3	937.6	57	65.7	400.9	-0.005625894 -0.02064
19	713	112.6	948.8	56.8	99.4	399.1	0.007037327 -0.01148
20	708	113.9	951.5	56.5	99.2	401.1	

rf 3%p.a. 0.000119

Min. Variance

sigma\_i

0.000267119 0.001223  
0.016343774 0.034975

CM

0.000267119 0.000122  
0.000122378 0.001223  
0.000257158 -0.00011  
0.000190277 0.000168  
-0.000253024 -1.4E-05  
-7.66363E-05 -2E-05

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

Tangency P

7518.836014 -396.182  
-396.1822772 939.4912  
-1270.206012 285.9287  
-3395.350697 -416.959

-50.43558186 13.18743

-0.06635	0.001857	0.004843	-0.01636
-0.01389	0.011215	0.010737	-0.02304
0.012491	-0.01307	0.018822	-0.00288
-0.01249	-0.03105	-0.01587	-0.00887
-0.00344	-0.02487	0.003945	0.008011
0.015096	0.041188	-0.00787	-0.00373
-0.00681	-0.01632	0.003929	-0.01364
0.004028	-0.00538	-0.00098	-0.01929
0.001114	-0.01068	0.01187	-0.03162
-0.01617	0.001771	-0.02845	0.002956
0.037572	0.026956	0.010695	-0.06334
-0.06635	-0.00182	-0.00488	-0.00428
-0.05051	-0.02868	0.029617	-0.02115
-0.01183	-0.00529	-0.0159	0.013386
-0.00736	0.015944	0.004943	0.010285
-0.07765	-0.01242	0.0571	-0.00403
-0.07483	-0.00528	0.371931	-0.00676
-0.01187	0.003515	-0.41405	0.0045
-0.00284	0.005296	0.002014	-0.005

-0.01141  
-0.0077  
-0.01853  
-0.00248  
0.002233

-0.01853	-0.00248	0.002233	-0.00973
0.001071	0.00033	0.017557	0.000311
0.032732	0.018153	0.132502	0.017642
0.000257	0.00019	-0.00025	-7.7E-05
-0.00011	0.000168	-1.4E-05	-2E-05
0.001071	0.000203	-0.0015	-0.00014
0.000203	0.00033	-0.00026	-5.8E-05
-0.0015	-0.00026	0.017557	-0.00035
-0.00014	-5.8E-05	-0.00035	0.000311

VRS

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

wi

-723.904	-2041.71	-61.714	0.518336	1	0.518336	0.518336137	0.091635
127.2655	-269.301	0.141659	0.091635	2	0.091635	7.17675E-05	5.81E-06
713.6363	-162.924	45.92632	0.073796	3	0.073796	5.8127E-06	1.03E-05
-162.924	2488.709	-14.7721	0.285904	4	0.285904	9.83657E-06	-7.2E-07
45.92632	-14.7721	30.41821	0.030329	5	0.030329	2.81979E-05	4.41E-06
0.073796	0.285904	0.030329	-0.00043	lambda1	-0.00043	-3.97774E-06	-3.8E-08

proof

1

VarP

0.000215

Rp

-0.00863

sigma\_p

0.014676

Zi

wi

-1270.21	-3395.35	-50.4356	1	-51.1878	1	1.260247252
285.9287	-416.959	13.18743	2	-6.99845	2	0.172302052
1452.558	-227.887	102.2446	3	-13.8732	3	0.341558317
-227.887	5356.944	10.71687	4	32.7609	4	-0.806574801

102.2446 10.71687 65.10743

5 -1.31873

5 0.032467179

sum_Zi	-40.6173	Proof	1
abs_val	40.61731		
			wi_absV
Rp	-0.01996		-1.26025
			-0.1723
sigma_p	0.022236		-0.34156
			0.806575
			-0.03247
abs_V_in_sumZi			
Rp	0.019964		
sigma_p	0.022236		

0.073796 0.285904 0.030329

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

1.260247 0.172302 0.341558 -0.80657 0.032467

VRS

-0.01153 0.000424 2.66E-05 0.000111 -0.00019 -1E-05  
-0.00782 2.66E-05 3.63E-05 -6.3E-06 -2.3E-05 -7.6E-08  
-0.01865 0.000111 -6.3E-06 0.000125 -5.6E-05 -1.7E-05  
-0.0026 -0.00019 -2.3E-05 -5.6E-05 0.000214 6.81E-06

0.002114            -1E-05   -7.6E-08   -1.7E-05   6.81E-06   1.85E-05

VarP            0.000494

-1.26025   -0.1723   -0.34156   0.806575   -0.03247

0.000424   2.66E-05   0.000111   -0.00019   -1E-05

2.66E-05   3.63E-05   -6.3E-06   -2.3E-05   -7.6E-08

0.000111   -6.3E-06   0.000125   -5.6E-05   -1.7E-05

-0.00019   -2.3E-05   -5.6E-05   0.000214   6.81E-06

-1E-05   -7.6E-08   -1.7E-05   6.81E-06   1.85E-05

VarP            0.000494