

Příklad 1

Vyřešte portfolio sestavené z těchto cenných papírů, máme-li zadané tyto hodnoty:

Cenné papíry i	Výnosnost \bar{r}_i v%	Nadměrná výnosnost CP $\bar{r}_i - r_f$	Beta β_i	Nesystematické riziko $\sigma_{\epsilon_i}^2$ v %
1	15	10	1	50
2	17	12	1.5	40
3	12	7	1	20
4	17	12	2	10
5	11	6	1	40
6	11	6	1.5	30
7	11	6	2	40
8	7	2	0.8	16
9	7	2	1	20
10	5.6	0.6	0.6	6

$r_f = 5\%$

$\sigma_{\epsilon_i}^2 = 10$

- 1) Vypočítat C_i u jednotlivých cenných papírů a určit C^*
- 2) Vypočítat váhy jednotlivých cenných papírů v portfolio, je-li zakázán sell short a je-li povolen
- 3) Vypočítat výnosnost a riziko portfolií

rf 5
 sigmaM^2 10

$\frac{\bar{r}_i - r_f}{\beta_i}$
10
8
7
6
6
4
3
2.5
2
1

$\frac{(\bar{r}_i - r_f) \cdot \beta_i}{\sigma_{\varepsilon_i}^2}$	$\frac{\beta_i^2}{\sigma_{\varepsilon_i}^2}$	$\sum_{i=1}^n \frac{(\bar{r}_i - r_f) \cdot \beta_i}{\sigma_{\varepsilon_i}^2}$	$\sum_{i=1}^n \frac{\beta_i^2}{\sigma_{\varepsilon_i}^2}$
0.2	0.02	0.2	0.02
0.45	0.05625	0.65	0.07625
0.35	0.05	1	0.12625
2.4	0.4	3.4	0.52625
0.15	0.025	3.55	0.55125
0.3	0.075	3.85	0.62625
0.3	0.1	4.15	0.72625
0.1	0.04	4.25	0.76625
0.1	0.05	4.35	0.81625
0.06	0.06	4.41	0.87625

$\frac{\beta_i}{\sigma_{\varepsilon_i}^2}$	$\frac{\bar{r}_i - r_f}{\beta_i} - C^*$	$\frac{\beta_i}{\sigma_{\varepsilon_i}^2} \cdot \left(\frac{\bar{r}_i - r_f}{\beta_i} - C^* \right) = Z_i$
0.02	4.548944	0.090979
0.0375	2.548944	0.095585
0.05	1.548944	0.077447
0.2	0.548944	0.109789
0.025	0.548944	0.013724
		0.387524
0.02	5.482714	0.109654
0.0375	3.482714	0.130602
0.05	2.482714	0.124136
0.2	1.482714	0.296543
0.025	1.482714	0.037068
0.05	-0.51729	-0.02586
0.05	-1.51729	-0.07586
0.05	-2.01729	-0.10086
0.05	-2.51729	-0.12586
0.1	-3.51729	-0.35173
		0.017817

$$\sum_{i=1}^n \frac{\beta_i^2}{\sigma_{\varepsilon_i}^2}$$

Ci

1.666667	v portfoliu
3.687943	v portfoliu
4.41989	v portfoliu
5.429142	v portfoliu
5.451056	v portfoliu
5.301205	mimo portfolio/nakrátko
5.022693	mimo portfolio/nakrátko
4.906205	mimo portfolio/nakrátko
4.747613	mimo portfolio/nakrátko
4.517286	mimo portfolio/nakrátko

$$\frac{\beta_i}{\sigma_{\varepsilon_i}^2} \cdot \left(\frac{\bar{r}_i - r_f}{\beta_i} - C^* \right) = Z_i$$

X_i

0.23477		0.055117	
0.246657		0.06084	
0.199851		0.039941	6.841037
0.283309	výnosnost	15.31872	0.080264
0.035414	riziko	5.160166	0.001254

1

6.15451		37.87799	
7.330219		53.73211	
6.967301		48.54329	
16.64391		277.0197	
2.080489		4.328433	
-1.45167		2.107348	
-4.25799		18.13052	
-5.66116		32.0487	12595.01
-7.06432	výnosnost	343.935	49.9046
-19.7413	riziko	137.9247	389.7184

1

Příklad 2

Vyřešte portfolio sestavené z těchto cenných papírů, máme-li zadané tyto hodnoty:

Cenné papíry	Výnosnost	Nadměrná výnosnost CP $\bar{r}_i - r_f$	Beta	Nesystematické riziko
	\bar{r}_i v%		β_i	$\sigma_{\varepsilon_i}^2$ v %
i				
1	19	16	1	20
3	11	8	0.5	10
2	23	20	1.5	30
6	9	6	0.5	50
4	25	22	2	40
5	13	10	1	20
7	14	11	1.5	30
8	10	7	1	50
9	9.5	6.5	1	50
11	11	8	1.5	30
10	13	10	2	20
12	8	5	1	20
14	7	4	1	20
13	10	7	2	40

$r_f = 3\%$ $\sigma_M^2 = 10$

- 1) Vypočítat C_i u jednotlivých cenných papírů a určit C^*
- 2) Vypočítat váhy jednotlivých cenných papírů v portfolio, je-li zakázán sell short a je-li povolen
- 3) Vypočítat výnosnost a riziko portfolií

rf 3
 sigmaM^2 10

$\frac{\bar{r}_i - r_f}{\beta_i}$
16
16
13.33333333
12
11
10
7.33333333
7
6.5
5.33333333
5
5
4
3.5

$\frac{(\bar{r}_i - r_f) \cdot \beta_i}{\sigma_{\varepsilon_i}^2}$	$\frac{\beta_i^2}{\sigma_{\varepsilon_i}^2}$	$\sum_{i=1}^n \frac{(\bar{r}_i - r_f) \cdot \beta_i}{\sigma_{\varepsilon_i}^2}$	$\sum_{i=1}^n \frac{\beta_i^2}{\sigma_{\varepsilon_i}^2}$
0.8	0.05	0.8	0.05
0.4	0.025	1.2	0.075
1	0.075	2.2	0.15
0.06	0.005	2.26	0.155
1.1	0.1	3.36	0.255
0.5	0.05	3.86	0.305
0.55	0.075	4.41	0.38
0.14	0.02	4.55	0.4
0.13	0.02	4.68	0.42
0.4	0.075	5.08	0.495
1	0.2	6.08	0.695
0.25	0.05	6.33	0.745
0.2	0.05	6.53	0.795
0.35	0.1	6.88	0.895

$$\frac{\beta_i}{\sigma_{\varepsilon_i}^2} \quad \frac{\bar{r}_i - r_f}{\beta_i} - C^* \quad \frac{\beta_i}{\sigma_{\varepsilon_i}^2} \cdot \left(\frac{\bar{r}_i - r_f}{\beta_i} - C^* \right) = Z_i$$

0.05	6.469136	0.323457
0.05	6.469136	0.323457
0.05	3.802469	0.190123
0.01	2.469136	0.024691
0.05	1.469136	0.073457
0.05	0.469136	0.023457
		0.958642

0.05	9.085427	0.454271
0.05	9.085427	0.454271
0.05	6.41876	0.320938
0.01	5.085427	0.050854
0.05	4.085427	0.204271
0.05	3.085427	0.154271
0.05	0.41876	0.020938
0.02	0.085427	0.001709
0.02	-0.41457	-0.00829
0.05	-1.58124	-0.07906

0.1	-1.91457	-0.19146
0.05	-1.91457	-0.09573
0.05	-2.91457	-0.14573
0.05	-3.41457	-0.17073

0.970528

$$\sum_{i=1}^n \frac{\beta_i^2}{\sigma_{\varepsilon_i}^2}$$

Ci

5.333333	v portfoliu
6.857143	v portfoliu
8.8	v portfoliu
8.862745	v portfoliu
9.464789	v portfoliu
9.530864	v portfoliu
9.1875	mimo portfolio/nakrátko
9.1	mimo portfolio/nakrátko
9	mimo portfolio/nakrátko
8.537815	mimo portfolio/nakrátko
7.647799	mimo portfolio/nakrátko
7.491124	mimo portfolio/nakrátko
7.296089	mimo portfolio/nakrátko
6.914573	mimo portfolio/nakrátko

$$\frac{\beta_i}{\sigma_{\varepsilon_i}^2} \cdot \left(\frac{\bar{r}_i - r_f}{\beta_i} - C^* \right) = Z_i$$

X_i

Cpi

1	0.337411		0.113846
3	0.337411		0.113846
2	0.198326		0.039333
6	0.025757		0.000663
4	0.076626	výnosnost	17.14939
5	0.024469	riziko	3.841852
			0.005872
			0.000599
			1

4.875394

1	0.468066		0.219086
3	0.468066		0.219086
2	0.330684		0.109352
6	0.052399		0.002746
4	0.210475		0.0443
5	0.158956		0.025267
7	0.021574		0.000465
8	0.00176		3.1E-06
9	-0.00854		7.3E-05
11	-0.08146		0.006636

10	-0.19727			0.038916	
12	-0.09864			0.009729	15.14624
14	-0.15015	výnosnost	22.62617	0.022546	
13	-0.17591	riziko	4.496906	0.030945	