

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

5

| Cenné papíry<br>$i$              | Výnosnost<br>$r_i$ v % | Nadměrná výnosnost<br>$r_i - r_f$ | Beta<br>$\beta_i$ | Nesystematické riziko<br>$\sigma_i^2$ v % | $\frac{r_i - r_f}{\beta_i}$ |
|----------------------------------|------------------------|-----------------------------------|-------------------|---|-----------------------------|
| 1                                | 15                     | 10                                | 1                 | 50  | 10                          |
| 2                                | 17                     | 12                                | 1.5               | 40  | 8                           |
| 3                                | 12                     | 7                                 | 1                 | 20  | 7                           |
| 4                                | 17                     | 12                                | 2                 | 10  | 6                           |
| 5                                | 11                     | 6                                 | 1                 | 40  | 6                           |
| 6                                | 11                     | 6                                 | 1.5               | 30  | 4                           |
| 7                                | 11                     | 6                                 | 2                 | 40  | 3                           |
| 8                                | 7                      | 2                                 | 0.8               | 16  | 2.5                         |
| 9                                | 7                      | 2                                 | 1                 | 20  | 2                           |
| 10                               | 5.6                    | 0.6                               | 0.6               | 6   | 1                           |
| $r_f = 5\%$<br>$\sigma_M = 10\%$ |                        |                                   |                   |   |                             |

0.2  
0.45  
0.35  
2.4  
0.15  
0.3  
0.3  
0.1  
0.1  
0.06

- 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

|         |      |         | Ci  | C*       |
|---------|------|---------|---|----------|
| 0.02    | 0.2  | 0.02    | 1.666667 v portfoliu                      |          |
| 0.05625 | 0.65 | 0.07625 | 3.687943 v portfoliu                      |          |
| 0.05    | 1    | 0.12625 | 4.41989 v portfoliu                       |          |
| 0.4     | 3.4  | 0.52625 | 5.429142 v portfoliu                      |          |
| 0.025   | 3.55 | 0.55125 | 5.451056 v portfoliu                      | 5.451056 |
| 0.075   | 3.85 | 0.62625 | 5.301205 mimo portfolio                   |          |
| 0.1     | 4.15 | 0.72625 | 5.022693 mimo portfolio                   |          |
| 0.04    | 4.25 | 0.76625 | 4.906205 mimo portfolio                   |          |
| 0.05    | 4.35 | 0.81625 | 4.747613 mimo portfolio                   |          |
| 0.06    | 4.41 | 0.87625 | 4.517286 mimo portfolio<br>mimo portfolio |          |

C\* 5.451056

| Zi       | Xi - váhy   | výnosnost |  |          |
|----------|-------------|-----------|--|----------|
| 0.090979 | 0.234769688 | 15.31872  |  | 0.055117 |
| 0.095585 | 0.246656761 | riziko    | beta portfolia                             | 0.06084  |
| 0.077447 | 0.199851412 | 5.160166  | 1.406637                                   | 0.039941 |
| 0.109789 | 0.283308569 |           |  | 0.080264 |
| 0.013724 | 0.035413571 |           | rozptyl systematick nesystematické         | 0.001254 |
| 0.387524 | 1           |           | 26.62731 19.78628 6.84103665<br>6.84103665 |          |

| Zi       | Xi - váhy    | výnosnost |
|----------|--------------|-----------|
| 0.109654 | 6.154509522  | 343.935   |
| 0.130602 | 7.330219188  | riziko    |
| 0.124136 | 6.967301473  | 137.9247  |
| 0.296543 | 16.64390945  |           |
| 0.037068 | 2.080488681  |           |
| -0.02586 | -1.451670859 |           |
| -0.07586 | -4.257994969 |           |
| -0.10086 | -5.661157025 |           |
| -0.12586 | -7.06431908  |           |
| -0.35173 | -19.74128638 |           |
| 0.017817 | 1            |           |

| Cenné papíry<br>i | Výnosnost<br>$r_i$<br>v% | Nadměrná<br>výnosnost CP<br>$r_i - r_f$ | Beta<br>$\beta_i$ | Nesystematické<br>riziko<br>$\sigma_i^2$<br>v % | $\frac{r_i - r_f}{\beta_i}$ |
|-------------------|--------------------------|---|-------------------|---|-----------------------------|
| 1                 | 19                       | 16                                      | 1                 | 20  | 16                          |
| 3                 | 11                       | 8                                       | 0.5               | 10  | 16                          |
| 2                 | 23                       | 20                                      | 1.5               | 30  | 13.3333                     |
| 6                 | 9                        | 6                                       | 0.5               | 50  | 12                          |
| 4                 | 25                       | 22                                      | 2                 | 40  | 11                          |
| 5                 | 13                       | 10                                      | 1                 | 20  | 10                          |
| 7                 | 14                       | 11                                      | 1.5               | 30  | 7.33333                     |
| 8                 | 10                       | 7                                       | 1                 | 50  | 7                           |
| 9                 | 9.5                      | 6.5                                     | 1                 | 50  | 6.5                         |
| 11                | 11                       | 8                                       | 1.5               | 30  | 5.33333                     |
| 10                | 13                       | 10                                      | 2                 | 20  | 5                           |
| 12                | 8                        | 5                                       | 1                 | 20  | 5                           |
| 14                | 7                        | 4                                       | 1                 | 20  | 4                           |
| 13                | 10                       | 7                                       | 2                 | 40  | 3.5                         |

$r_f = 5\%$   
 $\sigma_M = 10\%$

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



3 10

|      |       |      |       | Ci                                |
|------|-------|------|-------|-----------------------------------|
| 0.8  | 0.05  | 0.8  | 0.05  | 5.333333 v portfoliu              |
| 0.4  | 0.025 | 1.2  | 0.075 | 6.857143 v portfoliu              |
| 1    | 0.075 | 2.2  | 0.15  | 8.8 v portfoliu                   |
| 0.06 | 0.005 | 2.26 | 0.155 | 8.862745 v portfoliu              |
| 1.1  | 0.1   | 3.36 | 0.255 | 9.464789 v portfoliu              |
| 0.5  | 0.05  | 3.86 | 0.305 | 9.530864 v portfoliu              |
| 0.55 | 0.075 | 4.41 | 0.38  | 9.1875 mimo portl                 |
| 0.14 | 0.02  | 4.55 | 0.4   | 9.1 mimo portl                    |
| 0.13 | 0.02  | 4.68 | 0.42  | 9 mimo portl                      |
| 0.4  | 0.075 | 5.08 | 0.495 | 8.537815 mimo portl               |
| 1    | 0.2   | 6.08 | 0.695 | 7.647799 mimo portl               |
| 0.25 | 0.05  | 6.33 | 0.745 | 7.491124 mimo portl               |
| 0.2  | 0.05  | 6.53 | 0.795 | 7.296089 mimo portl               |
| 0.35 | 0.1   | 6.88 | 0.895 | 6.914573 mimo portl<br>mimo portf |

C\*

| Zi       | Xi - váhy | výnosnost   |                |                        |
|----------|-----------|-------------|----------------|------------------------|
| 0.323457 | 0.337411  | 17.14938828 |                |                        |
| 0.323457 | 0.337411  | riziko      | beta portfolia |                        |
| 0.190123 | 0.198326  | 3.841851833 | 0.994205       |                        |
| 0.024691 | 0.025757  |             |                |                        |
| 0.073457 | 0.076626  |             |                |                        |
| 0.023457 | 0.024469  |             |                |                        |
| 0.958642 | 1         |             | rozptyl        | systematicl nesystemat |
|          |           |             | 14.75983       | 9.884431 4.875394      |
|          |           |             |                | 4.875394               |

| Zi       | Xi - váhy | výnosnost   |
|----------|-----------|-------------|
| 0.454271 | 0.468066  | 22.62616822 |
| 0.454271 | 0.468066  | riziko      |
| 0.320938 | 0.330684  | 4.496905951 |
| 0.050854 | 0.052399  |             |
| 0.204271 | 0.210475  |             |
| 0.154271 | 0.158956  |             |
| 0.020938 | 0.021574  |             |
| 0.001709 | 0.00176   |             |
| -0.00829 | -0.00854  |             |
| -0.07906 | -0.08146  |             |
| -0.19146 | -0.19727  |             |
| -0.09573 | -0.09864  |             |

|          |          |
|----------|----------|
| -0.14573 | -0.15015 |
| -0.17073 | -0.17591 |
| 0.970528 | 1        |

C\*

9.530864

folio

9.530864

0.113846

0.113846

0.039333

0.000663

0.005872

0.000599

tické