

## Kurzy akcií pro hypotetické kurzovní lístky

Obchodní den na burze	<i>Kurzy akcií jednotlivých firem</i>		
	F1	F2	F3
<b>1.</b>	100	200	1000
<b>2.</b>	110	210	1050
<b>3.</b>	121	205	1080
<b>4.</b>	95	150	1020
<b>5.</b>	98	210	950

1-denní vynosnosti

Var

F1

F2

F3

F1

	0.09531	0.04879	0.04879	0.010072
0.09531	-0.0241	0.028171	0.010072	
-0.24191	-0.31237	-0.05716	0.056104	
0.031091	0.336472	-0.0711	0.001306	

E(ri)

-0.00505

0.012198

-0.01282

Var

0.025852

Sigma

0.160784

fce

Var

0.025852

Sigma

0.160784

2-denní v.

Var

F2	F3					F1	F2
0.001339	0.003796						
0.001317	0.001681		0.19062	0.024693	0.076961	0.060625	0.014541
0.105347	0.001966		-0.1466	-0.33647	-0.02899	0.008281	0.057878
0.105154	0.003396		-0.21082	0.024098	-0.12825	0.024094	0.014398
0.071053	0.003613	E(ri)	-0.0556	-0.09589	-0.02676	Var	0.0465 0.043408
0.266557	0.060106					Sigma	0.215639 0.208347
0.071053	0.003613						
0.266557	0.060106						

F3

0.010758

4.96E-06

0.010301

0.010532

0.102626

Emise	R o k						
	2020				2021		
	I.	II.	III.	IV.	I.	II.	III.
<b>A</b>	1010	1055	1100	1031	988	1065	918
<b>B</b>	2650	3000	3848	3228	3638	4205	3979
<b>C</b>	1505	2030	2190	2325	2250	2443	1700
<b>D</b>	178	300	325	396	351	370	335
<b>E</b>	281	372	358	494	460	539	443
<b>F</b>	2645	3125	3400	3330	3400	3425	3475
<b>G</b>	547	800	803	1070	975	952	997

sigma\_i  
0.098067  
0.146364  
0.198645  
0.220938  
0.190778  
0.077418  
0.181996

Vynos.

<b>IV.</b>
1060
4731
1796
327
468
4100
944

0.04359	0.041769	-0.064781	-0.042602	0.075047	-0.148532688
0.124053	0.248941	-0.175691	0.119571	0.14484	-0.055243762
0.299243	0.075866	0.059818	-0.03279	0.082297	-0.362598541
0.521999	0.080043	0.197589	-0.120628	0.052717	-0.099372474
0.280539	-0.038361	0.322003	-0.071309	0.158489	-0.196145801
0.166763	0.084341	-0.020803	0.020803	0.007326	0.014493007
0.380163	0.003743	0.287059	-0.092976	-0.023872	0.046185735

Covar\_matice

	A	B	C	D	E	F	G
A	0.009617	0.010344	0.013408	0.004913	0.006368	0.005069	-0.003030327
B	0.010344	0.021422	0.0114	-0.000978	-0.006465	0.006738	-0.012350713
C	0.013408	0.0114	0.03946	0.033623	0.02949	0.007957	0.01646218
D	0.004913	-0.000978	0.033623	0.048813	0.032966	0.007341	0.035790339
E	0.006368	-0.006465	0.02949	0.032966	0.036396	0.001804	0.024994008
F	0.005069	0.006738	0.007957	0.007341	0.001804	0.005994	0.002183082
G	-0.00303	-0.012351	0.016462	0.03579	0.024994	0.002183	0.033122442

Correl M

0.098067	0.146364	0.198645	0.220938	0.190778	0.077418	0.18199572	
A	B	C	D	E	F	G	
A	1	0.720674	0.688288	0.226756	0.340369	0.667638	-0.169787138
B	0.720674	1	0.392109	-0.030258	-0.23152	0.594603	-0.463656671
C	0.688288	0.392109	1	0.766101	0.778153	0.517375	0.455352787
D	0.226756	-0.030258	0.766101	1	0.782114	0.429199	0.890092167
E	0.340369	-0.23152	0.778153	0.782114	1	0.122128	0.719858925
F	0.667638	0.594603	0.517375	0.429199	0.122128	1	0.154940723
G	-0.169787	-0.463657	0.455353	0.890092	0.719859	0.154941	1

1	0.720674
0.720674	1
0.688288	0.392109
0.226756	-0.030258
0.340369	-0.23152
0.667638	0.594603
-0.169787	-0.463657

	E(ri)	Var						
0.143827	0.006903	0.001346	0.001216	0.005139	0.002451	0.004644	0.02416	0.018748
0.173106	0.082797	0.001702	0.027604	0.066816	0.001352	0.003849	0.019055	0.008156
0.054934	0.025253	0.075071	0.002562	0.001195	0.003369	0.003254	0.150429	0.000881
-0.02417	0.086882	0.189326	4.68E-05	0.012256	0.043061	0.001167	0.034691	0.012333
0.054899	0.072873	0.043125	0.012373	0.062065	0.020789	0.00733	0.072371	0.000323
0.165392	0.062617	0.010847	0.000472	0.006959	0.001748	0.003057	0.002316	0.010563
-0.05462	0.077954	0.09133	0.005507	0.043725	0.029217	0.010369	0.001009	0.017577

Covar

0.036688	0.034867	-0.07168	-0.0495	0.068145	-0.15544	0.136924
0.041256	0.166145	-0.25849	0.036775	0.062044	-0.13804	0.090309
0.27399	0.050613	0.034566	-0.05804	0.057044	-0.38785	0.029681
0.435117	-0.00684	0.110707	-0.20751	-0.03417	-0.18625	-0.11105
0.207666	-0.11123	0.249129	-0.14418	0.085616	-0.26902	-0.01797
0.104147	0.021725	-0.08342	-0.04181	-0.05529	-0.04812	0.102776
0.302209	-0.07421	0.209105	-0.17093	-0.10183	-0.03177	-0.13258

AA	0.001346	0.001216	0.005139	0.002451	0.004644	0.02416	0.018748
AB	0.001514	0.005793	0.018529	-0.00182	0.004228	0.021456	0.012366
AC	0.010052	0.001765	-0.00248	0.002873	0.003887	0.060286	0.004064
AD	0.015963	-0.00024	-0.00794	0.010273	-0.00233	0.028951	-0.01521
AE	0.007619	-0.00388	-0.01786	0.007138	0.005834	0.041815	-0.00246
AF	0.003821	0.000757	0.00598	0.00207	-0.00377	0.00748	0.014073
AG	0.011087	-0.00259	-0.01499	0.008462	-0.00694	0.004938	-0.01815

	0.001514	0.005793	0.018529	-0.00182	0.004228	0.021456	0.012366
BB	0.001702	0.027604	0.066816	0.001352	0.003849	0.019055	0.008156
BC	0.011304	0.008409	-0.00893	-0.00213	0.003539	0.053539	0.00268

Var	Sigma	fce
0.009617	0.098067	0.098067
0.021422	0.146364	0.146364
0.03946	0.198645	0.198645
0.048813	0.220938	0.220938
0.036396	0.190778	0.190778
0.005994	0.077418	0.077418
0.033122	0.181996	0.181996

Covar

0.009617
0.010344
0.013408
0.004913
0.006368
0.005069
-0.00303

0.010344
0.021422
0.0114

Date	XOM	GS	APPI			
2/17/2022	78.23	349.06	168.88	-0.011121078		
2/18/2022	77.36	346.04	167.3	-0.01118338	-0.00869	-0.0094
2/22/2022	76.46	344.27	164.32	-0.011702149	-0.00513	-0.01797
2/23/2022	76.77	341.19	160.07	0.004046185	-0.00899	-0.0262
2/24/2022	75.8	340.19	162.74	-0.012715568	-0.00294	0.016543
2/25/2022	77.84	350.12	164.85	0.026557054	0.028772	0.012882
2/28/2022	78.42	341.29	165.12	0.007423585	-0.02554	0.001636
3/1/2022	79.17	328.2	163.2	0.009518443	-0.03911	-0.0117
3/2/2022	80.53	336.38	166.56	0.017032359	0.024618	0.020379
3/3/2022	81.04	333.42	166.23	0.006313099	-0.00884	-0.00198
3/4/2022	84.09	329.67	163.17	0.036944734	-0.01131	-0.01858
3/7/2022	87.12	321.89	159.3	0.035398907	-0.02388	-0.024
3/8/2022	87.78	321.37	157.44	0.00754716	-0.00162	-0.01174
3/9/2022	82.79	333.59	162.95	-0.05852638	0.03732	0.034399
3/10/2022	85.36	329.9	158.52	0.030570325	-0.01112	-0.02756
3/11/2022	84.92	327	154.73	-0.005168005	-0.00883	-0.0242
3/14/2022	81.88	324.98	150.62	-0.036454889	-0.0062	-0.02692
3/15/2022	77.22	329.16	155.09	-0.05859622	0.01278	0.029245
3/16/2022	76.93	340.76	159.59	-0.003762586	0.034634	0.028602
3/17/2022	78.98	343.27	160.62	0.026298776	0.007339	0.006433
3/18/2022	78.67	345.38	163.98	-0.003932831	0.006128	0.020703
3/21/2022	82.2	339	165.38	0.043893403	-0.01865	0.008501
3/22/2022	81.84	343.01	168.82	-0.004389193	0.01176	0.020587
3/23/2022	83.13	335.61	170.21	0.015639539	-0.02181	0.0082
3/24/2022	83.38	336.23	174.07	0.003002825	0.001846	0.022425
3/25/2022	85.2	337.49	174.72	0.021592962	0.00374	0.003727
3/28/2022	82.81	335.3	175.6	-0.028452596	-0.00651	0.005024
3/29/2022	82.37	339.66	178.96	-0.005327474	0.01292	0.018954
3/30/2022	83.78	335.59	177.77	0.016972974	-0.01205	-0.00667
3/31/2022	82.59	330.1	174.61	-0.014305744	-0.01649	-0.01794
4/1/2022	83.12	330.22	174.31	0.006396823	0.000363	-0.00172
4/4/2022	83.16	328.21	178.44	0.000481128	-0.00611	0.023417
4/5/2022	82.73	323.96	175.06	-0.005184182	-0.01303	-0.01912
4/6/2022	83.65	316.26	171.83	0.011059122	-0.02406	-0.01862
4/7/2022	85.05	314.15	172.14	0.016597903	-0.00669	0.001802
4/8/2022	86.84	321.39	170.09	0.020827945	0.022785	-0.01198
4/11/2022	83.85	320.76	165.75	-0.035037835	-0.00196	-0.02585
4/12/2022	85.6	319.78	167.66	0.020655795	-0.00306	0.011458
4/13/2022	86.81	321.97	170.4	0.01403654	0.006825	0.01621
4/14/2022	87.83	321.64	165.29	0.011681351	-0.00103	-0.03045
4/18/2022	88.55	329.88	165.07	0.008164247	0.025296	-0.00133
4/19/2022	87.76	335.95	167.4	-0.008961559	0.018233	0.014016
4/20/2022	87.96	341.06	167.23	0.002276316	0.015096	-0.00102
4/21/2022	87.03	334.3	166.42	-0.010629279	-0.02002	-0.00486
4/22/2022	85.13	319.77	161.79	-0.022073411	-0.04444	-0.02822
4/25/2022	82.26	321.42	162.88	-0.034294478	0.005147	0.006715
4/26/2022	82.29	313.12	156.8	0.000364619	-0.02616	-0.03804
4/27/2022	84.64	313.23	156.57	0.028157351	0.000351	-0.00147
4/28/2022	87.2	318.41	163.64	0.02979734	0.016402	0.044166



4/29/2022	85.25	305.49	157.65	-0.02261618	-0.04142	-0.03729
5/2/2022	86.41	310.42	157.96	0.01351534	0.016009	0.001965
5/3/2022	88.19	314.66	159.48	0.020390144	0.013566	0.009577
5/4/2022	91.7	324.11	166.02	0.039028746	0.02959	0.04019
5/5/2022	90.31	313.07	156.77	-0.015274172	-0.03466	-0.05733
5/6/2022	91.69	312.96	157.28	0.01516517	-0.00035	0.003248
5/9/2022	84.46	308.89	152.06	-0.082135306	-0.01309	-0.03375
5/10/2022	85.02	305.06	154.51	0.00660845	-0.01248	0.015984
5/11/2022	86.79	301.55	146.5	0.020604932	-0.01157	-0.05323
5/12/2022	86.3	299.41	142.56	-0.005661786	-0.00712	-0.02726
5/13/2022	88.86	306.99	147.11	0.029232476	0.025001	0.031418
5/16/2022	90.95	303.44	145.54	0.023247763	-0.01163	-0.01073
5/17/2022	92.11	312.97	149.24	0.012673654	0.030923	0.025105
5/18/2022	90.65	306.73	140.82	-0.015977567	-0.02014	-0.05807
5/19/2022	91.14	308.2	137.35	0.005390816	0.004781	-0.02495
5/20/2022	91.86	306.8	137.59	0.007868915	-0.00455	0.001746
5/23/2022	93.89	316.61	143.11	0.021858184	0.031475	0.039335
5/24/2022	94.4	313.95	140.36	0.005417221	-0.00844	-0.0194
5/25/2022	96.3	314.9	140.52	0.019927256	0.003021	0.001139
5/26/2022	96.64	323.63	143.78	0.003524374	0.027346	0.022934
5/27/2022	97.59	328.58	149.64	0.009782264	0.015179	0.039948
5/31/2022	96	326.85	148.84	-0.016426797	-0.00528	-0.00536
6/1/2022	97.84	321.85	148.71	0.018985259	-0.01542	-0.00087
6/2/2022	97.67	324.25	151.21	-0.001739022	0.007429	0.016671
6/3/2022	99.09	318.68	145.38	0.014434059	-0.01733	-0.03932
6/6/2022	98.84	320.51	146.14	-0.002526147	0.005726	0.005214
6/7/2022	103.37	321.51	148.71	0.044812473	0.003115	0.017433
6/8/2022	104.59	314.68	147.96	0.011733093	-0.02147	-0.00506
6/9/2022	102.33	304.22	142.64	-0.021845002	-0.03381	-0.03662
6/10/2022	100.46	287.02	137.13	-0.018443276	-0.0582	-0.03939
6/13/2022	95.85	283.32	131.88	-0.04697518	-0.01297	-0.03904
6/14/2022	96.1	282.54	132.76	0.002604847	-0.00276	0.00665
6/15/2022	94.89	290.07	135.43	-0.01267098	0.026302	0.019912
6/16/2022	91.39	284.98	130.06	-0.037582263	-0.0177	-0.04046
6/17/2022	86.12	279.79	131.56	-0.059394345	-0.01838	0.011467
6/21/2022	91.48	284.81	135.87	0.060378695	0.017783	0.032236
6/22/2022	87.86	284.54	135.35	-0.040375752	-0.00095	-0.00383
6/23/2022	85.21	286.17	138.27	-0.030625864	0.005712	0.021344
6/24/2022	86.9	302.75	141.66	0.019639269	0.056321	0.024222
6/27/2022	89.03	300.78	141.66	0.024215325	-0.00653	0
6/28/2022	91.5	299.49	137.44	0.027365592	-0.0043	-0.03024
6/29/2022	88.12	303.28	139.23	-0.037639416	0.012575	0.01294
6/30/2022	85.64	297.02	136.72	-0.028547104	-0.02086	-0.01819
7/1/2022	87.55	299.23	138.93	0.022057641	0.007413	0.016035
7/5/2022	84.81	297.2	141.56	-0.031796656	-0.00681	0.018753
7/6/2022	83.28	293.76	142.92	-0.018205024	-0.01164	0.009561
7/7/2022	85.94	298.6	146.35	0.031440989	0.016342	0.023716
7/8/2022	86.08	296.47	147.04	0.001627718	-0.00716	0.004704
7/11/2022	85.64	293.18	144.87	-0.005124668	-0.01116	-0.01487
7/12/2022	84.5	292.53	145.86	-0.013400918	-0.00222	0.006811

7/13/2022	84.84	290.15	145.49	0.004015548	-0.00817	-0.00254
7/14/2022	83.14	281.59	148.47	-0.020241161	-0.02995	0.020276
7/15/2022	84.54	293.87	150.17	0.016698885	0.042685	0.011385
7/18/2022	86.1	301.26	147.07	0.018284581	0.024836	-0.02086
7/19/2022	88.27	318.05	151	0.024890877	0.054235	0.026371
7/20/2022	89.24	321.45	153.04	0.010929082	0.010633	0.013419
7/21/2022	87.75	326.54	155.35	-0.016837485	0.01571	0.014981
7/22/2022	87.08	323.93	154.09	-0.007664603	-0.00803	-0.00814
7/25/2022	89.98	324.12	152.95	0.032760197	0.000586	-0.00743
7/26/2022	89.63	318.55	151.6	-0.003897405	-0.01733	-0.00887
7/27/2022	91.57	324.54	156.79	0.021413655	0.018629	0.033662
7/28/2022	92.64	329.11	157.35	0.011617296	0.013983	0.003565
7/29/2022	96.93	333.39	162.51	0.045268065	0.012921	0.032267
8/1/2022	94.48	332.08	161.51	-0.025600865	-0.00394	-0.00617
8/2/2022	94.07	327.88	160.01	-0.004349018	-0.01273	-0.00933
8/3/2022	91.02	333.17	166.13	-0.032959956	0.016005	0.037534
8/4/2022	87.19	331.87	165.81	-0.042989561	-0.00391	-0.00193
8/5/2022	88.45	334.67	165.35	0.014347718	0.008402	-0.00278
8/8/2022	88.95	334.68	164.87	0.005636994	2.98E-05	-0.00291
8/9/2022	90.59	336.62	164.92	0.018269407	0.00578	0.000303
8/10/2022	91.45	347.91	169.24	0.009448555	0.032989	0.025857
8/11/2022	93.19	351.68	168.49	0.018848099	0.010778	-0.00444
8/12/2022	94	353.82	172.1	0.008654341	0.006067	0.021199
8/15/2022	92.32	355.85	173.19	-0.01803398	0.005721	0.006314
8/16/2022	91.46	354.97	173.03	-0.009359095	-0.00248	-0.00092
8/17/2022	92.2	353.74	174.55	0.008058391	-0.00347	0.008746
8/18/2022	94.38	354.52	174.15	0.023369056	0.002203	-0.00229
8/19/2022	94.08	349.27	171.52	-0.003183649	-0.01492	-0.01522
8/22/2022	94.01	342.42	167.57	-0.000744325	-0.01981	-0.0233
8/23/2022	98	340.18	167.23	0.041566298	-0.00656	-0.00203
8/24/2022	98.58	341.94	167.53	0.005900943	0.00516	0.001792
8/25/2022	99.09	346.49	170.03	0.005160066	0.013219	0.014812
8/26/2022	97.87	336.4	163.62	-0.01238839	-0.02955	-0.03843
8/29/2022	100.12	333.92	161.38	0.022729398	-0.0074	-0.01378
8/30/2022	96.31	333.63	158.91	-0.038797362	-0.00087	-0.01542
8/31/2022	95.59	332.67	157.22	-0.007503965	-0.00288	-0.01069
9/1/2022	93.87	333.5	157.96	-0.018157292	0.002492	0.004696
9/2/2022	95.59	331.48	155.81	0.018157292	-0.00608	-0.0137
9/6/2022	94.95	326.49	154.53	-0.006717765	-0.01517	-0.00825
9/7/2022	94.14	330.56	155.96	-0.00856738	0.012389	0.009211
9/8/2022	94.91	335.38	154.46	0.008146091	0.014476	-0.00966
9/9/2022	96.5	340.1	157.37	0.016613892	0.013975	0.018664
9/12/2022	97.61	342.58	163.43	0.011436949	0.007265	0.037785
9/13/2022	95.33	328.39	153.84	-0.02363538	-0.0423	-0.06047
9/14/2022	97.67	327.26	155.31	0.024249851	-0.00345	0.00951
9/15/2022	94.83	331.62	152.37	-0.029508593	0.013235	-0.01911
9/16/2022	93.21	326.21	150.7	-0.017230835	-0.01645	-0.01102
9/19/2022	93.2	328.66	154.48	-0.000107312	0.007482	0.024774
9/20/2022	92.44	323.26	156.9	-0.008187882	-0.01657	0.015544
9/21/2022	90.95	320.71	153.72	-0.016249935	-0.00792	-0.02048

9/22/2022	90.57	312.92	152.74	-0.00418684	-0.02459	-0.0064
9/23/2022	85.75	301.97	150.43	-0.054686946	-0.03562	-0.01524
9/26/2022	83.98	294.62	150.77	-0.020857375	-0.02464	0.002258
9/27/2022	85.74	291.38	151.76	0.020740727	-0.01106	0.006545
9/28/2022	88.86	300.79	149.84	0.035742671	0.031784	-0.01273
9/29/2022	88.68	296.11	142.48	-0.002027724	-0.01568	-0.05037
9/30/2022	87.31	293.05	138.2	-0.015569404	-0.01039	-0.0305
10/3/2022	91.92	299.15	142.45	0.051453631	0.020602	0.030289
10/4/2022	95.27	314.87	146.1	0.035796322	0.051215	0.0253
10/5/2022	99.12	309	146.4	0.039616333	-0.01882	0.002051
10/6/2022	102.06	304.67	145.43	0.029229588	-0.01411	-0.00665
10/7/2022	101.03	301.08	140.09	-0.010143363	-0.01185	-0.03741
#####	98.84	300.54	140.42	-0.021915152	-0.0018	0.002353
#####	98	294.21	138.98	-0.008534862	-0.02129	-0.01031
#####	98.43	295.31	138.34	0.004378157	0.003732	-0.00462
#####	101.87	307.07	142.99	0.034351884	0.03905	0.03306
#####	99.19	299.99	138.38	-0.026660297	-0.02333	-0.03277
#####	100.62	306.71	142.41	0.014313852	0.022154	0.028707
#####	100.8	313.85	143.75	0.001787311	0.023013	0.009365
#####	103.79	311.76	143.86	0.029231251	-0.00668	0.000765
#####	103.93	310.81	143.39	0.001347959	-0.00305	-0.00327
#####	105.86	325.1	147.27	0.01839988	0.044951	0.026699
#####	106.6	328.7	149.45	0.006966017	0.011013	0.014694
#####	105.88	332.4	152.34	-0.006777144	0.011194	0.019153
#####	107.14	335.69	149.35	0.011830032	0.009849	-0.01982
#####	107.55	337.18	144.8	0.003819502	0.004429	-0.03094
#####	110.7	341.82	155.74	0.028867929	0.013667	0.072834
#####	110.81	344.51	153.34	0.000993192	0.007839	-0.01553
11/1/2022	111.91	348.58	150.65	0.009878008	0.011745	-0.0177
11/2/2022	109.61	349.79	145.03	-0.020766392	0.003465	-0.03802
11/3/2022	111.1	348.87	138.88	0.013502058	-0.00263	-0.04333
11/4/2022	112.31	357.91	138.38	0.010832209	0.025582	-0.00361
11/7/2022	113.64	362.56	138.92	0.011772661	0.012908	0.003895
11/8/2022	114	364.02	139.5	0.0031629	0.004019	0.004166
11/9/2022	108.9	362	134.87	-0.0457684	-0.00556	-0.03375
#####	110.5	378.31	146.87	0.014585473	0.04407	0.085236
#####	113.95	385.17	149.7	0.030744208	0.017971	0.019085
#####	113.37	382.36	148.28	-0.005102897	-0.00732	-0.00953
#####	114.13	382.88	150.04	0.006681291	0.001359	0.0118
#####	112.91	382.33	148.79	-0.010747047	-0.00144	-0.00837
#####	113.06	379.78	150.72	0.001327557	-0.00669	0.012888
#####	112.08	379.2	151.29	-0.008705714	-0.00153	0.003775
#####	110.97	380.21	148.01	-0.009953016	0.00266	-0.02192
#####	114.18	383.87	150.18	0.028516247	0.00958	0.014555
#####	113.61	386.25	151.07	-0.005004611	0.006181	0.005909
#####	113.21	388.86	148.11	-0.003527047	0.006735	-0.01979
#####	109.81	382.36	144.22	-0.030492911	-0.01686	-0.02662
#####	110.54	383.71	141.17	0.006625874	0.003525	-0.02138
#####	111.34	386.15	148.03	0.007211091	0.006339	0.04745
12/1/2022	110.8	383.81	148.31	-0.004861745	-0.00608	0.00189

12/2/2022	109.86	380.58	147.81	-0.008519964	-0.00845	-0.00338
12/5/2022	106.85	371.54	146.63	-0.027780874	-0.02404	-0.00802
12/6/2022	103.88	362.91	142.91	-0.028189605	-0.0235	-0.0257
12/7/2022	103.65	359.92	140.94	-0.0022165	-0.00827	-0.01388
12/8/2022	104.42	358.08	142.65	0.007401351	-0.00513	0.01206
12/9/2022	103.54	359.14	142.16	-0.008463188	0.002956	-0.00344
#####	106.09	363.18	144.49	0.024329732	0.011186	0.016257
#####	107.25	368.69	145.47	0.010874805	0.015058	0.00676
#####	106.46	360.38	143.21	-0.007393239	-0.0228	-0.01566
#####	105.44	349.83	136.5	-0.009627229	-0.02971	-0.04799
#####	104.7	346.35	134.51	-0.007043	-0.01	-0.01469
#####	105.17	344.61	132.37	0.00447898	-0.00504	-0.01604
#####	106.69	344.49	132.3	0.014349382	-0.00035	-0.00053
#####	108.06	350.16	135.45	0.012759158	0.016325	0.02353
#####	105.88	345.58	132.23	-0.020380261	-0.01317	-0.02406
#####	108.68	345.51	131.86	0.026101436	-0.0002	-0.0028
#####	110.19	341.97	130.03	0.013798382	-0.0103	-0.01398
#####	108.38	340.87	126.04	-0.016562624	-0.00322	-0.03117
#####	109.2	343.43	129.61	0.007537493	0.007482	0.027931
#####	110.3	343.38	129.93	0.010022918	-0.00015	0.002466
1/3/2023	106.51	346.22	125.07	-0.034965057	0.008237	-0.03812
1/4/2023	106.82	347.7	126.36	0.002906279	0.004266	0.010261
1/5/2023	109.21	343.76	125.02	0.02212745	-0.0114	-0.01066
1/6/2023	110.53	348.08	129.62	0.012014343	0.012489	0.036133
1/9/2023	108.47	353	130.15	-0.018813322	0.014036	0.004081
1/10/2023	110.09	357.36	130.73	0.01482453	0.012276	0.004447
1/11/2023	111.37	364.48	133.49	0.011559842	0.019728	0.020893
1/12/2023	113.22	369.94	133.41	0.016474819	0.014869	-0.0006
1/13/2023	113.15	374	134.76	-0.000618448	0.010915	0.010068
1/17/2023	112.93	349.92	135.94	-0.001946232	-0.06655	0.008718
1/18/2023	110.61	349.09	135.21	-0.020757648	-0.00237	-0.00538
1/19/2023	111.32	350.75	135.27	0.006398427	0.004744	0.000444
1/20/2023	113.35	341.84	137.87	0.018071423	-0.02573	0.019038
1/23/2023	112.76	349.14	141.11	-0.005218675	0.02113	0.023229
1/24/2023	113.81	348.33	142.53	0.00926869	-0.00232	0.010013
1/25/2023	113.21	349.63	141.86	-0.005285881	0.003725	-0.00471
1/26/2023	117.76	354.97	143.96	0.03940418	0.015158	0.014695
1/27/2023	115.61	353.7	145.93	-0.018426206	-0.00358	0.013591
1/30/2023	113.56	357.46	143	-0.017891152	0.010574	-0.02028
1/31/2023	116.01	365.81	144.29	0.021345098	0.023091	0.00898
2/1/2023	114.74	365.71	145.43	-0.01100773	-0.00027	0.00787
2/2/2023	111.15	369.47	150.82	-0.031788023	0.010229	0.036392
2/3/2023	111.92	369.95	154.5	0.006903654	0.001298	0.024107
2/6/2023	111.73	370.8	151.73	-0.001699039	0.002295	-0.01809
2/7/2023	114.92	374.4	154.65	0.028150943	0.009662	0.019062
2/8/2023	113.92	375.1	151.92	-0.008739787	0.001868	-0.01781
2/9/2023	114.35	367.99	150.87	0.003767473	-0.01914	-0.00694
2/10/2023	119.17	371.28	151.01	0.041287125	0.008901	0.000928
2/13/2023	117.8	374.02	153.85	-0.011562732	0.007353	0.018632
2/14/2023	116.42	371.78	153.2	-0.011783972	-0.00601	-0.00423

2/15/2023	116.07	374.34	155.33	-0.003010867	0.006862	0.013808	
2/16/2023	115.73	370.2	153.71	-0.00293354	-0.01112	-0.01048	
			E(ri)	0.001566427	0.000235	-0.00038	Var fce sigma

Covar_M		
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0.00015	0.000239	0.000496

Correl_M			
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0.000176	2.88E-05	0.00031
6.15E-06	8.5E-05	0.000667
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0.000625	0.000814	0.000176
3.43E-05	0.000665	4.05E-06
6.32E-05	0.001548	0.000128
0.000239	0.000595	0.000431
2.25E-05	8.23E-05	2.58E-06
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0.001145	0.000582	0.000558
3.58E-05	3.43E-06	0.000129
0.003611	0.001375	0.001209
0.000841	0.000129	0.000739
4.54E-05	8.22E-05	0.000568
0.001446	4.14E-05	0.000705
0.00362	0.000157	0.000877
2.84E-05	0.001183	0.00084
0.000612	5.05E-05	4.64E-05
3.02E-05	3.47E-05	0.000444
0.001792	0.000356	7.88E-05
3.55E-05	0.000133	0.000439
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2.06E-06	2.59E-06	0.00052
0.000401	1.23E-05	1.68E-05
0.000901	4.55E-05	2.92E-05
4.75E-05	0.000161	0.000374
0.000237	0.000151	3.96E-05
0.000252	0.00028	0.000308
2.33E-05	1.64E-08	1.8E-06
1.18E-06	4.02E-05	0.000566
4.56E-05	0.000176	0.000351
9.01E-05	0.00059	0.000333
0.000226	4.8E-05	4.75E-06
0.000371	0.000508	0.000135
0.00134	4.83E-06	0.000649
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0.000156	4.34E-05	0.000275
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4.21E-05	1.37E-05	8.32E-05
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2.26E-05	0.00023	0.00022
5.34E-06	0.000402	0.000525
0.0016	4.62E-05	2.74E-06
1.88E-05	2.43E-05	4.7E-06
1.29E-05	0.000169	0.000231
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8.23E-05	9.71E-06	0.000106
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4.33E-05	0.000203	8.63E-05
0.000226	0.000189	0.000363
9.74E-05	4.94E-05	0.001456
0.000635	0.00181	0.003611
0.000515	1.36E-05	9.77E-05
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2.8E-06	5.25E-05	0.000633
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0.001448	0.000363	5.89E-06
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0.000137	0.000146	0.001371
0.000551	4.12E-06	7.45E-06
0.000102	0.000463	9.86E-05
7.91E-06	1.22E-05	1.8E-05
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4.88E-08	0.000519	9.49E-05
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4.77E-08	1.08E-05	8.39E-06
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2.92E-05	0.000116	0.000227
6.96E-05	0.00012	0.000381
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3.29E-07	5.78E-05	0.00023
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2.55E-06	1.43E-05	2.06E-05
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0.000851	0.000315	0.000379
4.45E-05	5.71E-05	8.38E-05
2.62E-05	1.26E-06	0.000148
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5.71E-08	4.8E-05	0.000176
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0.000726	8.73E-05	0.000223
4.32E-05	3.54E-05	3.95E-05
2.59E-05	4.22E-05	0.000377
0.001028	0.000292	0.000688
2.56E-05	1.08E-05	0.000441
3.19E-05	3.73E-05	0.002287
4.13E-05	3.99E-05	5.14E-06

0.000102	7.55E-05	9E-06
0.000861	0.000589	5.84E-05
0.000885	0.000563	0.000641
1.43E-05	7.24E-05	0.000182
3.4E-05	2.87E-05	0.000155
0.000101	7.4E-06	9.39E-06
0.000518	0.00012	0.000277
8.66E-05	0.00022	5.09E-05
8.03E-05	0.00053	0.000234
0.000125	0.000897	0.002267
7.41E-05	0.000105	0.000205
8.48E-06	2.78E-05	0.000245
0.000163	3.4E-07	2.32E-08
0.000125	0.000259	0.000572
0.000482	0.00018	0.000561
0.000602	1.92E-07	5.88E-06
0.00015	0.000111	0.000185
0.000329	1.2E-05	0.000948
3.57E-05	5.25E-05	0.000801
7.15E-05	1.45E-07	8.08E-06
0.001335	6.4E-05	0.001425
1.8E-06	1.62E-05	0.000113
0.000423	0.000135	0.000106
0.000109	0.00015	0.001333
0.000415	0.00019	1.99E-05
0.000176	0.000145	2.33E-05
9.99E-05	0.00038	0.000452
0.000222	0.000214	4.97E-08
4.77E-06	0.000114	0.000109
1.23E-05	0.00446	8.27E-05
0.000498	6.81E-06	2.51E-05
2.33E-05	2.03E-05	6.73E-07
0.000272	0.000674	0.000377
4.6E-05	0.000437	0.000557
5.93E-05	6.54E-06	0.000108
4.7E-05	1.22E-05	1.88E-05
0.001432	0.000223	0.000227
0.0004	1.46E-05	0.000195
0.000379	0.000107	0.000396
0.000391	0.000522	8.76E-05
0.000158	2.59E-07	6.8E-05
0.001113	9.99E-05	0.001352
2.85E-05	1.13E-06	0.000599
1.07E-05	4.24E-06	0.000314
0.000707	8.89E-05	0.000378
0.000106	2.67E-06	0.000304
4.84E-06	0.000375	4.3E-05
0.001578	7.51E-05	1.7E-06
0.000172	5.07E-05	0.000361
0.000178	3.9E-05	1.49E-05

2.1E-05	4.39E-05	0.000201
2.02E-05	0.000129	0.000102
0.000479	0.000327	0.000496
0.000479	0.000327	0.000496
0.021883	0.018079	0.022264

Odhady 1. experta		Odhady 2. experta		Odhady 3. Experta	
$C_{i1k}$	$p_{i1\%}$	$C_{i2k}$	$p_{i2\%}$	$C_{i3k}$	$p_{i3\%}$
80	10	100	20	120	50
100	80	120	30	160	50
180	10	150	50		

P0

P_t	p_i1	p_i2	p_i3	suma_pij	normaci P	ri	ri*pi
80	0.1			0.1	0.033333	-0.22314	-0.00744
100	0.8	0.2		1	0.333333	0	0
120		0.3	0.5	0.8	0.266667	0.182322	0.048619
150		0.5		0.5	0.166667	0.405465	0.067578
160			0.5	0.5	0.166667	0.470004	0.078334
180	0.1			0.1	0.033333	0.587787	0.019593
					1		0.206685

var_i	var_i*pi
0.184753	0.006158
0.042719	0.01424
0.000594	0.000158
0.039513	0.006586
0.069337	0.011556
0.145238	0.004841
Var	0.043539
Sigma	0.208661

	$\bar{r}_i$	$\sigma_i$	$\rho_{1,2} = 1$	$\rho_{1,2} = 0,5$
$C_1$	5%	20%	$\rho_{1,2} = -1$	$\rho_{1,2} = -0,5$
$C_2$	15%	40%	$\rho_{1,2} = 0$	

	$P_1$	$P_2$	$P_3$	$P_4$	$P_5$	$P_6$	$P_7$
$X_1$	1	0.83	0.67	0.5	0.33	0.17	0
$X_2$	0	0.17	0.33	0.5	0.67	0.83	1

Rp                    0.05      0.067      0.083      0.1      0.117      0.133      0.15

Var\_P

Ro

1	0.04	0.054756	0.070756	0.09	0.111556	0.133956	0.16
0.5	0.04	0.043468	0.053068	0.07	0.093868	0.122668	0.16
0	0.04	0.03218	0.03538	0.05	0.07618	0.11138	0.16
-0.5	0.04	0.020892	0.017692	0.03	0.058492	0.100092	0.16
-1	0.04	0.009604	0.00	0.01	0.040804	0.088804	0.16

Sigma\_P

0.2	0.234	0.266	0.3	0.334	0.366	0.4
0.2	0.20849	0.230365	0.264575	0.306379	0.35024	0.4
0.2	0.179388	0.188096	0.223607	0.276007	0.333736	0.4
0.2	0.144541	0.133011	0.173205	0.241851	0.316373	0.4
0.2	0.098	0.002	0.1	0.202	0.298	0.4

$X_i / P_i$	A	B	C	D	E
$X_1$	0.2	0.25	0.5	0.3	0.1
$X_2$	0.2	0.25	0.1	0.4	0.2
$X_3$	0.6	0.5	0.4	0.3	0.7

Portfolia

Rp\_i            0.2184      0.216      0.1968      0.2154      0.225

Var\_Pi            156.88    148.3125    187.41      128.46      172.22

Sigma\_Pi        12.52517    12.17836    13.68978    11.33402    13.12326

var\_coef        0.017437    0.017736    0.014376    0.019005    0.017145

$$[\sigma_{ij}] = \begin{pmatrix} 459 & -211 & 112 \\ -211 & 312 & 215 \\ 112 & 215 & 179 \end{pmatrix}$$

$$[R_i] = \begin{pmatrix} 16,2 \\ 24,6 \\ 22,8 \end{pmatrix}$$

Covar\_M

459	-211	112
	312	215
		179

ri

0.162
0.246
0.228



<i>Cenný papír</i>	<i>Oček. výnos</i>	<i>Riziko</i>	<i>Podíl v. portfoltu</i>
$C_i$	$r_i$	$\sigma_i$	$X_i$
$C_1$	0.15	0.28	0.6
$C_2$	0.21	0.42	0.4

Rp            0.174

VarP        SigmaP

ro

1	0.112896	0.336
0.8	0.101606	0.318758
0.6	0.090317	0.300528
0.4	0.079027	0.281118
0.2	0.067738	0.260264
0	0.056448	0.237588
-0.2	0.045158	0.212505
-0.4	0.033869	0.184035
-0.6	0.022579	0.150264
-0.8	0.01129	0.106253
-1	0	0

Cenný papír	Oček. výnos	Riziko	Podíl v portfoliu
$C_i$	$r_i$	$\sigma_i$	$X_i$
$C_1$	0.13	0.28	0.2
$C_2$	0.25	0.42	0.4
$C_3$	0.21	0.35	0.1
$C_4$	0.41	0.48	0.2
$C_5$	0.3	0.39	0.1

$$[p(C_i C_j)] = \begin{pmatrix} 1 & 0,30 & 0,41 & -0,23 & 0 \\ & 1 & 0,25 & -0,09 & \\ & & 1 & -0,22 & 0 \\ & & & 1 & 0 \\ & & & & 1 & 0 \end{pmatrix}$$

Rp                    0.259

VarP                 0.049122

SigmaP              0.221635

Correl\_M

1	0.3
0.3	1
0.41	0.25
-0.23	-0.09
0.13	0

Covar\_M

sigma	0.28	0.42
0.28	0.0784	0.03528
0.42	0.03528	0.1764
0.35	0.04018	0.03675
0.48	-0.03091	-0.01814
0.39	0.014196	0

wi	0.2	0.4
0.2	0.003136	0.002822
0.4	0.002822	0.028224
0.1	0.000804	0.00147
0.2	-0.00124	-0.00145
0.1	0.000284	0

VarP                 0.049122

$$\begin{pmatrix} 0,30 & 0,41 & -0,23 & 0,13 \\ 1 & 0,25 & -0,09 & 0 \\ & 1 & -0,22 & 0,31 \\ & & 1 & 0,14 \\ & & & 1 \end{pmatrix}$$

0.41	-0.23	0.13
0.25	-0.09	0
1	-0.22	0.31
-0.22	1	0.14
0.31	0.14	1

0.35	0.48	0.39
0.04018	-0.03091	0.014196
0.03675	-0.01814	0
0.1225	-0.03696	0.042315
-0.03696	0.2304	0.026208
0.042315	0.026208	0.1521

0.1	0.2	0.1
0.000804	-0.00124	0.000284
0.00147	-0.00145	0
0.001225	-0.00074	0.000423
-0.00074	0.009216	0.000524
0.000423	0.000524	0.001521