Modern Portfolio Theory: Performing Portfolio Optimization for a selected group of Stocks

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Economatica

This tool utilizes the Markowitz principle to find the best possible portfolios, given a predefined set of securities, which exhibit the maximum return in relation to risk, i.e., the portfolios belonging to the “Efficient Frontier”.

In this initial screen, the user specifies the list of stocks to be considered, or the investible universe. Most important, the user also needs to inform the target price for each of these stocks.

Based on the information entered, the system immediately calculates Expected Return, Risk, and Tracking Error.

Expected values | Correlations | Optimization | Constraints | Portfolios

Securities	Class	Quote		Expected return %		Risk %		Tracking error %		Sector Economatica
		Current	Target	Nominal	Active	In the period	Annual	In the period	Annual	
1 3M Company	Com	166.61	169.36	1.65	-8.19	19.64	19.64	14.67	14.67	Other
2 American Express Comp	Com	121.11	150.56	24.31	12.29	19.74	19.74	14.17	14.17	Finance and Insurance
3 Apple Inc	Com	190.15	300.00	57.77	42.51	24.16	24.16	18.35	18.35	Electric Electron
4 Boeing Co	Com	353.70	502.67	42.12	28.37	24.98	24.98	19.57	19.57	Vehicle & Parts
5 Caterpillar Inc	Com	124.46	149.50	20.12	8.50	27.04	27.04	20.33	20.33	Industrial Machin
6 Chevron Corp	Com	121.48	133.45	9.85	-0.77	19.25	19.25	15.81	15.81	Oil & Gas
7 Cisco Systems, Inc	Com	55.93	71.824	28.42	15.99	20.81	20.81	13.85	13.85	Electric Electron
8 Coca Cola Co	Com	51.49	55.466	7.72	-2.70	13.76	13.76	14.20	14.20	Food & Beverage
9 Exxon Mobil Corp	Com	74.58	72.637	-2.60	-12.03	17.25	17.25	13.84	13.84	Oil & Gas
10 Goldman Sachs Group In	Com	189.81	206.12	8.59	-1.91	23.71	23.71	17.82	17.82	Finance and Insurance
11 Home Depot Inc	Com	197.30	232.43	17.81	6.41	17.96	17.96	13.63	13.63	Trade
12 Intel Corp	Com	46.03	53.451	16.12	4.89	26.34	26.34	20.75	20.75	Electric Electron
13 Intl Business Machines C	Com	133.31	132.38	-0.70	-10.31	20.06	20.06	15.92	15.92	Electric Electron
14 Johnson & Johnson	Com	138.55	151.07	9.03	-1.52	16.17	16.17	14.30	14.30	Chemical
15 Jpmorgan Chase & Co	Com	109.16	132.98	21.82	10.03	19.60	19.60	14.11	14.11	Finance and Insurance
16 Mcdonalds Corp	Com	205.48	250.99	22.15	10.33	16.24	16.24	16.23	16.23	Other
17 Merck & Co., Inc	Com	82.46	95.80	16.18	4.94	19.08	19.08	17.18	17.18	Chemical
18 Microsoft Corp	Com	131.40	182.71	39.05	25.60	21.85	21.85	14.01	14.01	Software & Data
19 Nike Inc	Com B	83.41	97.558	16.96	5.65	24.08	24.08	20.42	20.42	Textile
20 Pfizer Inc	Com	42.92	47.546	10.78	0.06	16.98	16.98	14.19	14.19	Chemical
21 Procter & Gamble Co	Com	108.77	123.11	13.18	2.23	15.39	15.39	15.58	15.58	Chemical
22 Travelers Companies, Inc	Com	149.53	200.00	33.75	20.81	16.40	16.40	14.07	14.07	Finance and Insurance
23 United Technologies Cor	Com	132.15	147.44	11.57	0.77	18.49	18.49	13.76	13.76	Vehicle & Parts
24 Unitedhealth Group Inc	Com	246.77	302.50	22.59	10.72	20.28	20.28	16.89	16.89	Finance and Insurance
25 Verizon Comm Inc	Com	57.24	62.043	8.39	-2.10	18.12	18.12	18.47	18.47	Telecommunication
26 Visa Inc	Com A	170.05	218.82	28.68	16.23	19.43	19.43	12.59	12.59	Other
27 Walgreens Boots Alliance	Com	51.97	46.12	-11.26	-19.84	23.84	23.84	21.03	21.03	Trade
28 Walmart Inc	Com	106.06	124.14	17.05	5.72	19.21	19.21	18.36	18.36	Trade
29 Walt Disney Co	Com	138.04	157.17	13.86	2.84	18.26	18.26	15.62	15.62	Other

Source: Economatica

Correlations

The next screen of the Optimization Module displays the Correlations Matrix for the eligible universe. The Correlations Matrix is calculated by default over a 36-month period, using daily observations. This period and the method of calculation can be changed using the options provided by the system (example use EWMA).

Expected values | Correlations | Optimization | Constraints | Portfolios

Expected values for: 2020-06-07

Beginning: 2016-06-08	End: 2019-06-07	Presence	Securities	Class	3M Company Com	American Express Comp: Com	Apple Inc Com	Boeing Co Com	Caterpillar Inc Com	Chevron Corp Com	Cisco Systems, Inc Com	Coca Cola Co Com	Exxon Mobil Corp Com	Goldman Sachs Group In Com
ok	ok	100.0	3M Company	Com	1.0	0.4462	0.397	0.4475	0.5741	0.3836	0.5139	0.3781	0.4277	0.4437
ok	ok	100.0	American Express Comp:	Com	0.4462	1.0	0.3864	0.4545	0.5165	0.412	0.5099	0.2733	0.4176	0.6138
ok	ok	100.0	Apple Inc	Com	0.397	0.3864	1.0	0.4072	0.4151	0.2778	0.5175	0.1609	0.3132	0.3971
ok	ok	100.0	Boeing Co	Com	0.4475	0.4545	0.4072	1.0	0.5503	0.3799	0.4861	0.2253	0.393	0.4574
ok	ok	100.0	Caterpillar Inc	Com	0.5741	0.5165	0.4151	0.5503	1.0	0.4901	0.5102	0.2235	0.4989	0.5433
ok	ok	100.0	Chevron Corp	Com	0.3836	0.412	0.2778	0.3799	0.4901	1.0	0.4037	0.2536	0.7133	0.4208
ok	ok	100.0	Cisco Systems, Inc	Com	0.5139	0.5099	0.5175	0.4861	0.5102	0.4037	1.0	0.286	0.4216	0.4776
ok	ok	100.0	Coca Cola Co	Com	0.3781	0.2733	0.1609	0.2253	0.2235	0.2536	0.286	1.0	0.2877	0.1367
ok	ok	100.0	Exxon Mobil Corp	Com	0.4277	0.4176	0.3132	0.393	0.4989	0.7133	0.4216	0.2877	1.0	0.4246
ok	ok	100.0	Goldman Sachs Group In	Com	0.4437	0.6138	0.3971	0.4574	0.5433	0.4208	0.4776	0.1367	0.4246	1.0
ok	ok	100.0	Home Depot Inc	Com	0.4714	0.4782	0.3763	0.4209	0.4772	0.3738	0.4668	0.2962	0.3794	0.4247
ok	ok	100.0	Intel Corp	Com	0.4618	0.3629	0.4732	0.3834	0.425	0.2961	0.5348	0.248	0.3677	0.372
ok	ok	100.0	Intl Business Machines C	Com	0.4281	0.4434	0.3605	0.3826	0.4004	0.3393	0.5046	0.2853	0.361	0.3926
ok	ok	100.0	Johnson & Johnson	Com	0.4383	0.3519	0.2695	0.3266	0.2925	0.3048	0.434	0.3953	0.3708	0.2859
ok	ok	100.0	Jpmorgan Chase & Co	Com	0.467	0.6708	0.3603	0.4792	0.5617	0.4406	0.5128	0.1919	0.4546	0.8052
ok	ok	100.0	Mcdonalds Corp	Com	0.249	0.272	0.2144	0.2183	0.2325	0.2379	0.279	0.3215	0.2456	0.2164
ok	ok	100.0	Merck & Co., Inc	Com	0.32	0.3277	0.2204	0.2421	0.2767	0.2866	0.369	0.3188	0.3539	0.3195
ok	ok	100.0	Microsoft Corp	Com	0.4671	0.5208	0.6029	0.4667	0.4911	0.3655	0.6589	0.3096	0.3748	0.4716
ok	ok	100.0	Nike Inc	Com B	0.3711	0.3687	0.3182	0.333	0.3569	0.267	0.4135	0.2529	0.2886	0.3037
ok	ok	100.0	Pfizer Inc	Com	0.4106	0.3955	0.2872	0.3113	0.366	0.3178	0.4503	0.3043	0.3814	0.3215
ok	ok	100.0	Procter & Gamble Co	Com	0.2942	0.2582	0.203	0.2103	0.204	0.2473	0.3134	0.555	0.2765	0.1412
ok	ok	100.0	Travelers Companies, Inc	Com	0.4749	0.4017	0.2417	0.3652	0.3915	0.358	0.3981	0.3991	0.3834	0.4441
ok	ok	100.0	United Technologies Cor	Com	0.5242	0.4853	0.4182	0.5402	0.5361	0.3598	0.513	0.2853	0.3982	0.4643
ok	ok	100.0	Unitedhealth Group Inc	Com	0.3642	0.4095	0.3453	0.3316	0.3172	0.3266	0.3703	0.2266	0.3213	0.3336
ok	ok	100.0	Verizon Comm Inc	Com	0.2348	0.1806	0.0763	0.1789	0.1366	0.2514	0.2548	0.3721	0.2384	0.1464
ok	ok	100.0	Visa Inc	Com A	0.4928	0.5503	0.5874	0.4906	0.5006	0.3913	0.6249	0.2741	0.4011	0.4779
ok	ok	100.0	Walgreens Boots Alliance	Com	0.3198	0.3492	0.2651	0.2543	0.2693	0.2673	0.3485	0.238	0.2654	0.3234
ok	ok	100.0	Walmart Inc	Com	0.261	0.2638	0.2025	0.2509	0.2246	0.2178	0.3429	0.2932	0.244	0.2107
ok	ok	100.0	Walt Disney Co	Com	0.3551	0.3857	0.3334	0.3517	0.3333	0.2374	0.4096	0.2455	0.3415	0.3785

Securities	Home Depot Inc Com	Intel Corp Com	Intl Business Machines C Com	Johnson & Johnson Com	Jpmorgan Chase & Co Com	Mcdonalds Corp Com	Merck & Co., Inc Com	Microsoft Corp Com	Nike Inc Com B	Pfizer Inc Com	Procter & Gamble Co Com	Travelers Companies, Inc Com	United Technologies Cor Com
3M Company	0.4714	0.4618	0.4281	0.4383	0.467	0.249	0.32	0.4671	0.3711	0.4106	0.2942	0.4749	0.5242
American Express Comp:	0.4782	0.3629	0.4434	0.3519	0.6708	0.272	0.3277	0.5208	0.3687	0.3955	0.2582	0.4017	0.4853
Apple Inc	0.3763	0.4732	0.3605	0.2695	0.3603	0.2144	0.2204	0.6029	0.3182	0.2872	0.203	0.2417	0.4182
Boeing Co	0.4209	0.3834	0.3826	0.3266	0.4792	0.2183	0.2421	0.4667	0.333	0.3113	0.2103	0.3652	0.5402
Caterpillar Inc	0.4772	0.425	0.4004	0.2925	0.5617	0.2325	0.2767	0.4911	0.3569	0.366	0.204	0.3915	0.5361
Chevron Corp	0.3738	0.2961	0.3393	0.3048	0.4406	0.2379	0.2866	0.3655	0.267	0.3178	0.2473	0.358	0.3598
Cisco Systems, Inc	0.4668	0.5348	0.5046	0.434	0.5128	0.279	0.369	0.6589	0.4135	0.4503	0.3134	0.3981	0.513
Coca Cola Co	0.2962	0.248	0.2853	0.3953	0.1919	0.3215	0.3188	0.3096	0.2529	0.3043	0.555	0.3991	0.2853
Exxon Mobil Corp	0.3794	0.3677	0.361	0.3708	0.4546	0.2456	0.3539	0.3748	0.2886	0.3814	0.2765	0.3834	0.3982
Goldman Sachs Group In	0.4247	0.372	0.3926	0.2859	0.8052	0.2164	0.3195	0.4716	0.3037	0.3215	0.1412	0.4441	0.4643
Home Depot Inc	1.0	0.4131	0.4083	0.3319	0.4442	0.2951	0.2539	0.4709	0.4172	0.3749	0.2724	0.3769	0.4419
Intel Corp	0.4131	1.0	0.3802	0.2944	0.3923	0.2117	0.2465	0.5716	0.3251	0.3227	0.2149	0.3137	0.3917
Intl Business Machines C	0.4083	0.3802	1.0	0.3033	0.4285	0.2345	0.341	0.4705	0.3145	0.3573	0.3063	0.3911	0.4952
Johnson & Johnson	0.3319	0.2944	0.3033	1.0	0.3209	0.3033	0.4661	0.3649	0.2851	0.5439	0.3824	0.3728	0.3601
Jpmorgan Chase & Co	0.4442	0.3923	0.4285	0.3209	1.0	0.2586	0.3305	0.4519	0.3369	0.3918	0.1658	0.5111	0.4842
Mcdonalds Corp	0.2951	0.2117	0.2345	0.3033	0.2586	1.0	0.2241	0.3096	0.1872	0.2351	0.2801	0.3389	0.2441
Merck & Co., Inc	0.2539	0.2465	0.341	0.4661	0.3305	0.2241	1.0	0.2835	0.2466	0.5736	0.2961	0.3286	0.2974
Microsoft Corp	0.4709	0.5716	0.4705	0.3649	0.4519	0.3096	0.2835	1.0	0.4106	0.3747	0.2595	0.3742	0.4959
Nike Inc	0.4172	0.3251	0.3145	0.2851	0.3369	0.1872	0.2466	0.4106	1.0	0.2678	0.2199	0.2849	0.3418
Pfizer Inc	0.3749	0.3227	0.3573	0.5439	0.3918	0.2351	0.5736	0.3747	0.2678	1.0	0.3065	0.3673	0.4005
Procter & Gamble Co	0.2724	0.2149	0.3063	0.3824	0.1658	0.2801	0.2961	0.2595	0.2199	0.3065	1.0	0.3101	0.2719
Travelers Companies, Inc	0.3769	0.3137	0.3911	0.3728	0.5111	0.3389	0.3286	0.3742	0.2849	0.3673	0.3101	1.0	0.4355
United Technologies Cor	0.4419	0.3917	0.4952	0.3601	0.4842	0.2441	0.2974	0.4959	0.3418	0.4005	0.2719	0.4355	1.0
Unitedhealth Group Inc	0.3589	0.2951	0.3431	0.334	0.3519	0.2818	0.3204	0.4287	0.2743	0.41	0.1934	0.3568	0.3476
Verizon Comm Inc	0.2391	0.1635	0.2457	0.3407	0.1839	0.2335	0.3042	0.1875	0.1863	0.2912	0.3663	0.3101	0.1941
Visa Inc	0.5162	0.4973	0.4726	0.3569	0.4496	0.2941	0.2994	0.7388	0.3992	0.3868	0.2523	0.3365	0.4965
Walgreens Boots Alliance	0.3131	0.2915	0.2799	0.3366	0.3209	0.204	0.2885	0.3536	0.2743	0.3255	0.2477	0.2714	0.3353
Walmart Inc	0.3436	0.2376	0.2594	0.2918	0.2168	0.2593	0.2813	0.2509	0.2492	0.3078	0.3119	0.2757	0.3026
Walt Disney Co	0.3553	0.3347	0.3549	0.248	0.4329	0.2239	0.2461	0.3734	0.3469	0.3116	0.2524	0.3139	0.3551

Source: Economatica

Optimization

Following correlations, the next screen will generate the efficient frontier. On the left-hand side, we have the list of stocks with the respective weights corresponding to the highlighted point on the curve.
The Risk x Return graph displays all of the possible portfolios. Each portfolio on the efficient frontier is called an optimal portfolio.
As you select different points on the graph, the corresponding composition of the optimal portfolio is shown to the side.

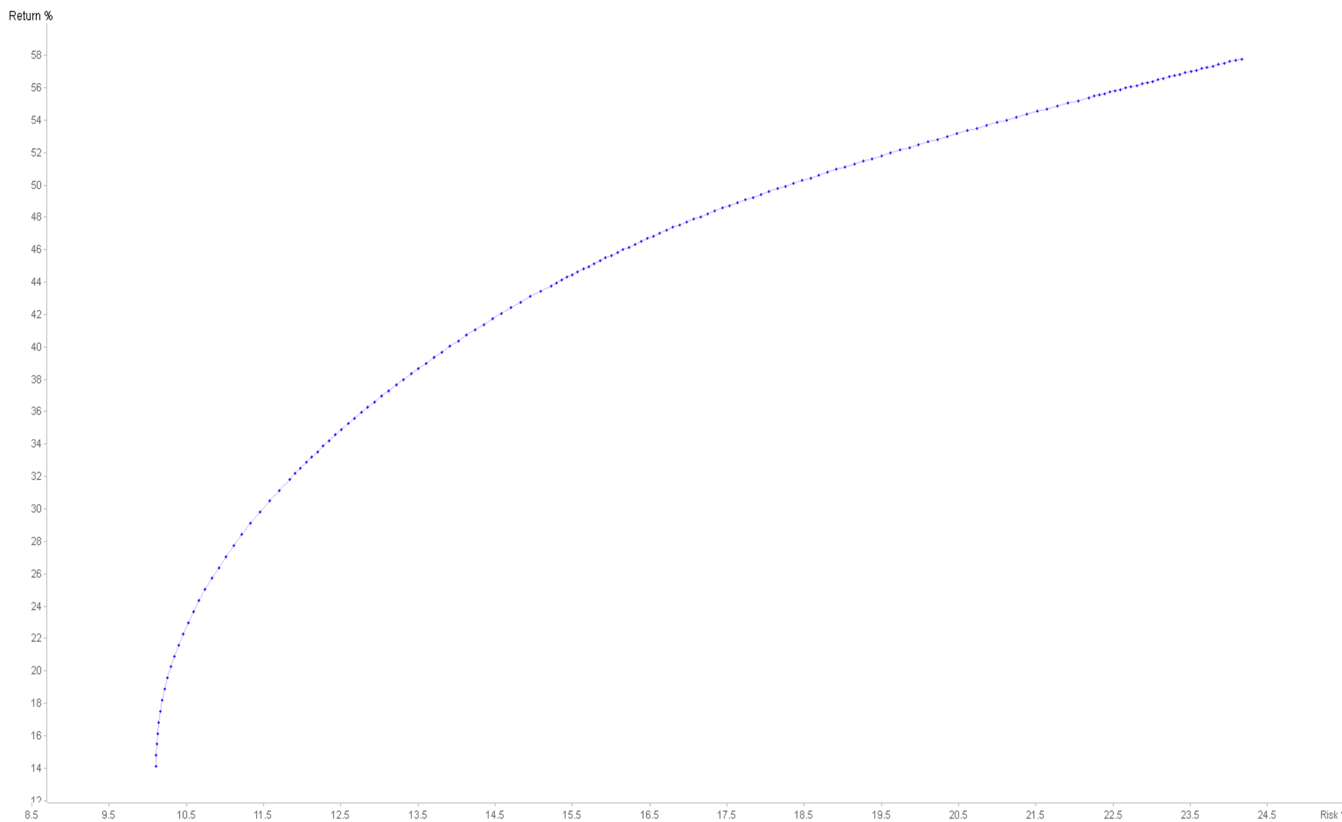
Expected values | Correlations | **Optimization** | Constraints | Portfolios

Expected values for: 2020-06-07

Ratios		
Return %	expct	14.10
Risk %		10.11

Securities	Class	Weight %
1 Coca Cola Co	Com	20.9
2 Mcdonalds Corp	Com	15.0
3 Procter & Gamble Co	Com	9.9
4 Walt Disney Co	Com	8.6
5 Verizon Comm Inc	Com	7.0
6 Exxon Mobil Corp	Com	5.3
7 Walmart Inc	Com	5.2
8 Pfizer Inc	Com	5.0
9 Johnson & Johnson	Com	4.6
10 Travelers Companies, Inc	Com	3.8
11 Unitedhealth Group Inc	Com	2.8
12 Chevron Corp	Com	2.8
13 Home Depot Inc	Com	2.4
14 United Technologies Cor	Com	2.0
15 Apple Inc	Com	1.6
16 Jpmorgan Chase & Co	Com	1.5
17 Merck & Co., Inc	Com	1.5
18 3M Company	Com	0.0
19 American Express Comp	Com	0.0
20 Boeing Co	Com	0.0
21 Caterpillar Inc	Com	0.0
22 Cisco Systems, Inc	Com	0.0
23 Goldman Sachs Group In	Com	0.0
24 Intel Corp	Com	0.0
25 Intl Business Machines C	Com	0.0
26 Microsoft Corp	Com	0.0
27 Nike Inc	Com B	0.0
28 Visa Inc	Com A	0.0
29 Walgreens Boots Alliance	Com	0.0

Risk free		
30 T-Bond	10 yrs	0.0



Source: Economatica

Constraints

This screen allows the user to specify constraints over the portfolios to be plotted on the efficient frontier.
The example below, the blue curve will allow long-only portfolios (the weight of each holding can range from 0 to 100%).
The red curve, on the other hand, will allow short positions. In the example shown, each holding can be assigned a weight from -10% to 10%.

Expected values | Correlations | Optimization | **Constraints** | Portfolios

	Securities	Class	Blue			Red			Green			Yellow		
			min	max	vol	min	max	vol	min	max	vol	min	max	vol
1	3M Company	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
2	American Express Comp	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
3	Apple Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
4	Boeing Co	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
5	Caterpillar Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
6	Chevron Corp	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
7	Cisco Systems, Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
8	Coca Cola Co	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
9	Exxon Mobil Corp	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
10	Goldman Sachs Group In	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
11	Home Depot Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
12	Intel Corp	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
13	Intl Business Machines C	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
14	Johnson & Johnson	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
15	Jpmorgan Chase & Co	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
16	Mcdonalds Corp	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
17	Merck & Co., Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
18	Microsoft Corp	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
19	Nike Inc	Com B	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
20	Pfizer Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
21	Procter & Gamble Co	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
22	Travelers Companies, Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
23	United Technologies Cor	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
24	Unitedhealth Group Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
25	Verizon Comm Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
26	Visa Inc	Com A	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
27	Walgreens Boots Alliance	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
28	Walmart Inc	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
29	Walt Disney Co	Com	0.0	100.0	free	-10.0	10.0	free	0.0	100.0	free	0.0	100.0	free
	Risk free													
30	T-Bond	10 yrs	0.0	0.0	free	0.0	0.0	free	0.0	0.0	free	0.0	0.0	free

Source: Economatica

Portfolios

This screen guides the user in constructing or saving portfolios. These could be optimized portfolios (portfolios whose composition were saved in the Optimization screen), hypothetical portfolios, or real portfolios looking to be optimized. As the portfolios are created, the system automatically calculates key portfolio metrics including Return, Risk, Sharpe, VAR, and many more.

The portfolios will be plotted relative to the efficient frontier, and the user can choose to optimize the portfolio using various options available.

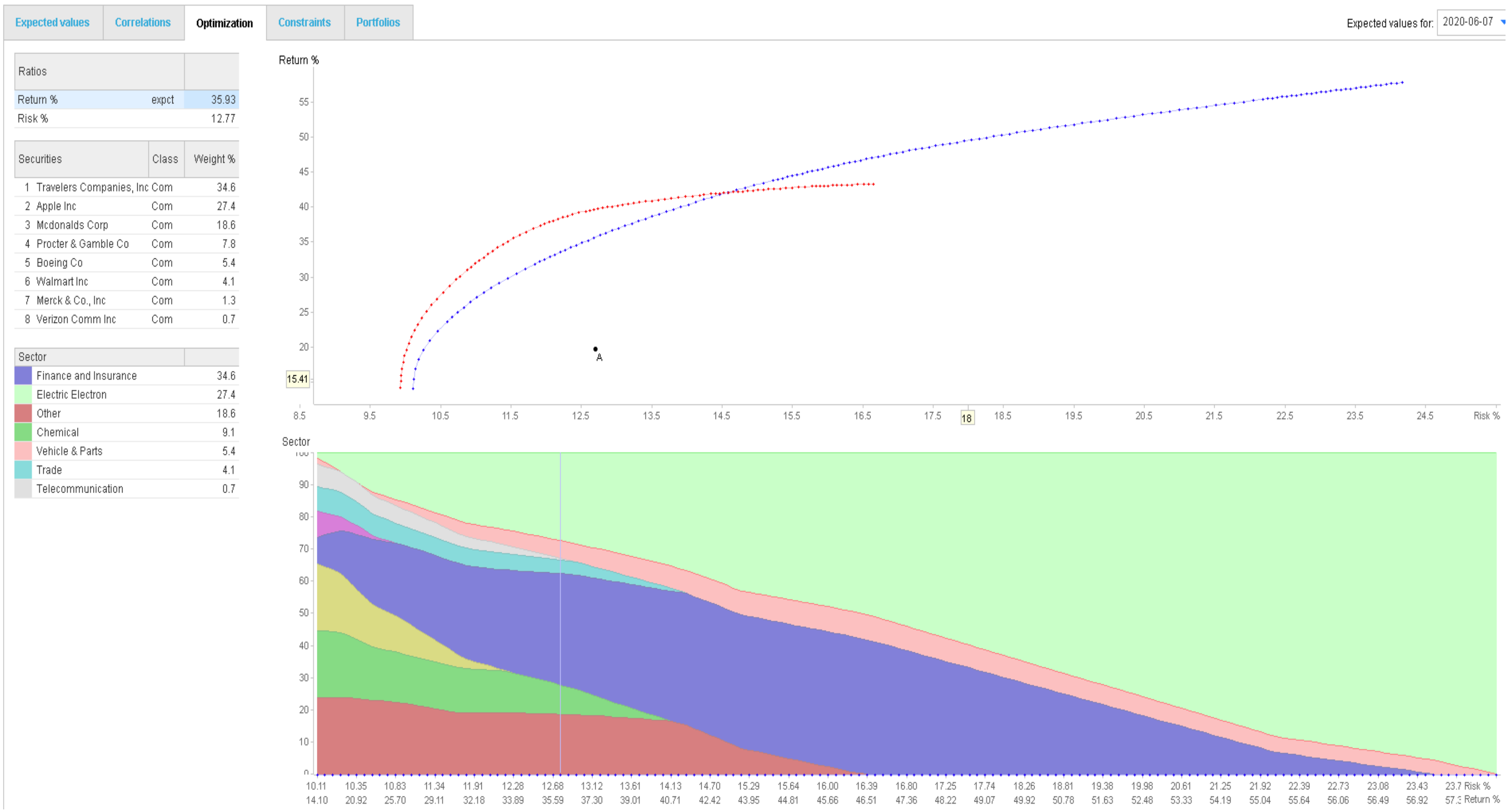
Expected values | Correlations | Optimization | Constraints | **Portfolios**

Portfolio		Value $	Weight %	Number of shares	Expected return in period %	Risk in the period %
A		8,100.00	100.0	73.75	19.73	12.75
Securities	**Class**					
1 3M Company	Com	800.00	9.9	4.80	1.65	19.64
2 American Express Comp	Com	0.00	0.0	0.00	24.31	19.74
3 Apple Inc	Com	450.00	5.6	2.37	57.77	24.16
4 Boeing Co	Com	1,000.00	12.3	2.83	42.12	24.98
5 Caterpillar Inc	Com	0.00	0.0	0.00	20.12	27.04
6 Chevron Corp	Com	0.00	0.0	0.00	9.85	19.25
7 Cisco Systems, Inc	Com	900.00	11.1	16.09	28.42	20.81
8 Coca Cola Co	Com	0.00	0.0	0.00	7.72	13.76
9 Exxon Mobil Corp	Com	0.00	0.0	0.00	-2.60	17.25
10 Goldman Sachs Group In	Com	0.00	0.0	0.00	8.59	23.71
11 Home Depot Inc	Com	700.00	8.6	3.55	17.81	17.96
12 Intel Corp	Com	0.00	0.0	0.00	16.12	26.34
13 Intl Business Machines C	Com	0.00	0.0	0.00	-0.70	20.06
14 Johnson & Johnson	Com	1,200.00	14.8	8.66	9.03	16.17
15 Jpmorgan Chase & Co	Com	0.00	0.0	0.00	21.82	19.60
16 Mcdonalds Corp	Com	0.00	0.0	0.00	22.15	16.24
17 Merck & Co., Inc	Com	0.00	0.0	0.00	16.18	19.08
18 Microsoft Corp	Com	300.00	3.7	2.28	39.05	21.85
19 Nike Inc	Com B	0.00	0.0	0.00	16.96	24.08
20 Pfizer Inc	Com	0.00	0.0	0.00	10.78	16.98
21 Procter & Gamble Co	Com	900.00	11.1	8.27	13.18	15.39
22 Travelers Companies, Inc	Com	0.00	0.0	0.00	33.75	16.40
23 United Technologies Cor	Com	750.00	9.3	5.68	11.57	18.49
24 Unitedhealth Group Inc	Com	0.00	0.0	0.00	22.59	20.28
25 Verizon Comm Inc	Com	1,100.00	13.6	19.22	8.39	18.12
26 Visa Inc	Com A	0.00	0.0	0.00	28.68	19.43
27 Walgreens Boots Alliance	Com	0.00	0.0	0.00	-11.26	23.84
28 Walmart Inc	Com	0.00	0.0	0.00	17.05	19.21
29 Walt Disney Co	Com	0.00	0.0	0.00	13.86	18.26

Ratios		
Return (year) %	hist	19.15
	expct	19.73
Risk (year) %		12.75
Sharpe (year)	hist	1.31
	expct	1.38
VAR parametric	$ - 1d - 95%	106.68
	$ - 1w - 95%	234.85
	$ - 1m - 95%	488.89
	$ - 1y - 95%	1,693.55
Related to the benchmark		
Active return (year) %	hist	8.44
	expct	8.14
Tracking error (year) %		5.74
Informat ratio (year)	hist	1.47
	expct	1.57
Treynor (year) %	hist	18.58
	expct	19.61
Jensen´s alpha (year) %	hist	16.71
	expct	9.91
Beta observed		0.90
Beta weighted		0.90
Correlation (r)		0.89

Source: Economatica

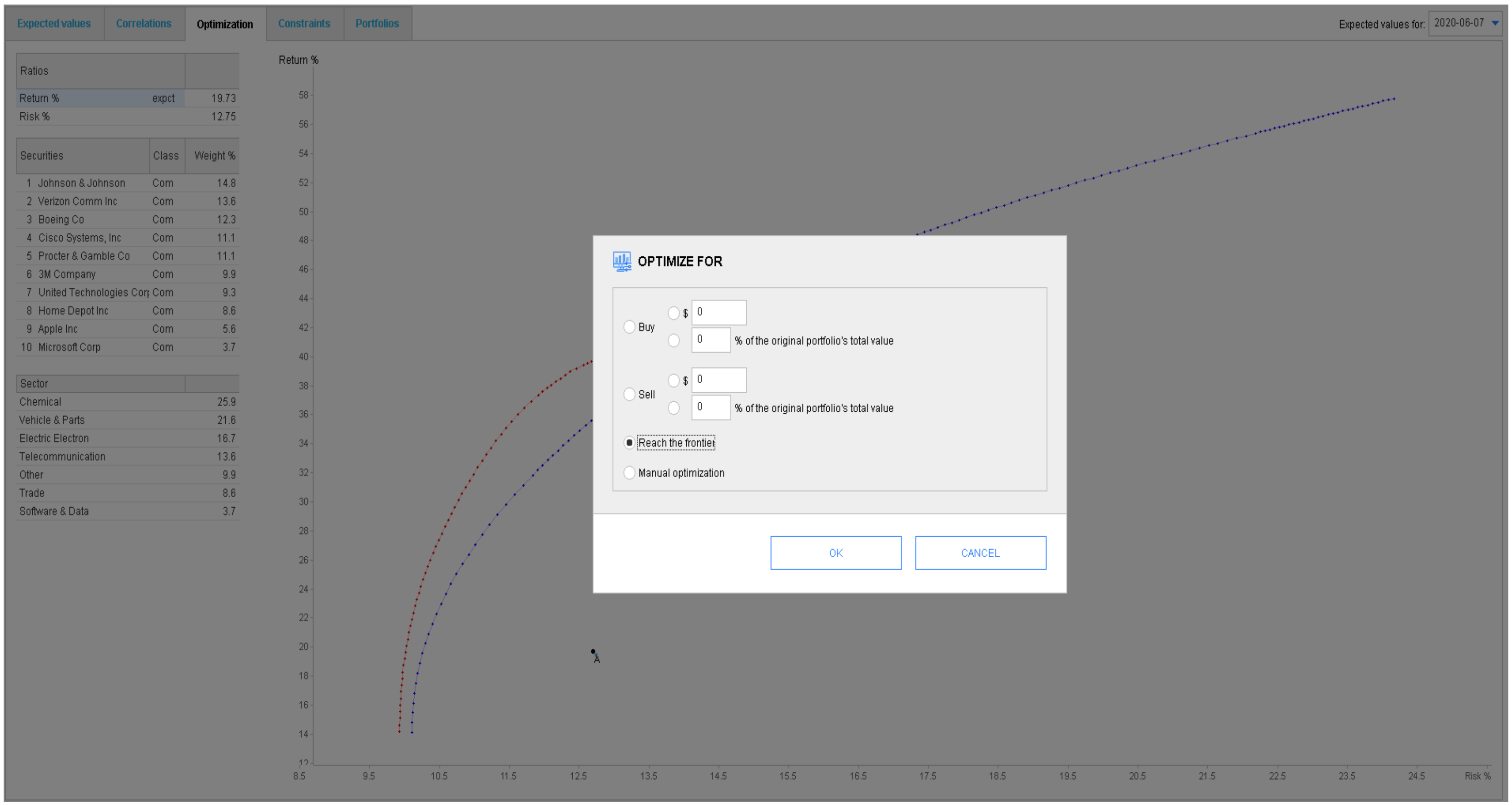
Here we can observe the portfolio A, constructed in the step above, plotted under two efficient frontiers. A long only frontier (blue), and a frontier which allows short positions (red). In addition, the sector composition of the selected portfolios is displayed in the bottom pane.



Source: Economatica

Optimizing

In this step we have asked the system to optimize Portfolio A. Of the options provided, we've asked the system to show us the operations (buy/sell) required to take portfolio A to a desired point on the frontier.



Source: Economatica