Results 1: ERC LOWV.L

start_date = '2020-01-01' end_date = '2023-12-31' tickers = ['SPHQ', 'IVE', 'SPYD', 'LOWV.L', 'SPMO']

i	j	Return	Average Volatility	Average Sharpe Ratio
5	22	33.82%	14.19%	2.53
5	44	37.79%	14.18%	2.17
5	66	76.01%	12.55%	2.65
5	126	47.07%	11.58%	2.48
5	252	25.19%	11.63%	2.07
10	22	31.75%	14.97%	1.81
10	44	38.24%	14.65%	1.49
10	66	71.71%	13.28%	1.79
10	126	42.97%	12.26%	1.68
10	252	25.38%	12.22%	1.46
22	22	29.14%	15.60%	1.18
22	44	33.01%	15.32%	1.22
22	66	70.60%	13.78%	1.31
22	126	36.94%	12.47%	1.56
22	252	25.05%	12.58%	1.10
44	44	27.67%	15.80%	0.90
44	66	71.06%	14.09%	1.12
44	126	40.62%	12.78%	1.30
44	252	24.99%	12.73%	0.91

Results 2: ERC SPLV

start_date = '2020-01-01' end_date = '2023-12-31' tickers = ['SPHQ', 'IVE', 'SPYD', 'SPLV', 'SPMO']

i	j	Return	Average Volatility	Average Sharpe Ratio
5	22	41.30%	15.98%	2.38
5	44	53.95%	15.79%	2.13
5	66	75.13%	14.10%	2.73

i	j	Return	Average Volatility	Average Sharpe Ratio
5	126	54.45%	13.21%	2.62
5	252	31.90%	13.03%	1.75
10	22	41.27%	16.54%	1.92
10	44	53.53%	16.37%	1.79
10	66	73.82%	14.71%	1.69
10	126	53.00%	13.77%	1.59
10	252	31.93%	13.50%	1.63
22	22	34.24%	17.17%	1.34
22	44	45.80%	16.88%	1.42
22	66	68.66%	15.00%	1.47
22	126	47.13%	14.07%	1.16
22	252	30.74%	14.01%	1.00
44	44	38.15%	17.62%	1.00
44	66	69.61%	15.38%	1.07
44	126	34.54%	14.30%	0.88
44	252	30.86%	14.18%	0.88

Difference between Results 1 and Results 2

i	j	Return Difference (%)	Volatility Difference (%)	Sharpe Ratio Difference
5	22	7.48	1.79	-0.15
5	44	16.16	1.61	-0.04
5	66	-0.88	1.55	0.08
5	126	7.38	1.63	0.14
5	252	6.71	1.40	-0.32
10	22	9.52	1.57	0.11
10	44	15.29	1.72	0.30
10	66	2.11	1.43	-0.10
10	126	10.03	1.51	-0.09
10	252	6.55	1.28	0.17

i	j	Return Difference (%)	Volatility Difference (%)	Sharpe Ratio Difference
22	22	5.10	1.57	0.16
22	44	12.79	1.56	0.20
22	66	-2.06	1.22	0.16
22	126	10.19	1.60	-0.40
22	252	5.69	1.43	-0.10
44	44	10.48	1.82	0.10
44	66	-1.45	1.29	-0.05
44	126	-6.08	1.52	-0.42
44	252	5.87	1.45	-0.03

> The portfolio with SPLV instead of LOWV.L has a higher return and volatility, but the Sharpe ratio seems to be similar (average of -0.0147). I propose to use SPLV.

Results 3: SPY (benchmark)

start_date = '2020-01-01' end_date = '2023-12-31'

i	j	Return (%)	Average Volatility (%)	Average Sharpe Ratio
5	22	53.94	18.00	2.29
5	44	70.66	17.69	2.22
5	66	89.14	16.36	2.54
5	126	59.90	15.73	2.41
5	252	33.00	15.58	1.76
10	22	53.94	18.52	1.85
10	44	70.66	18.37	1.94
10	66	87.41	16.87	1.90
10	126	58.44	16.21	1.78
10	252	33.00	16.03	1.50
22	22	47.70	19.24	1.42
22	44	63.39	18.89	1.53
22	66	82.24	17.17	1.59
22	126	52.86	16.52	1.34

i	j	Return (%)	Average Volatility (%)	Average Sharpe Ratio
22	252	32.17	16.44	1.20
44	44	55.35	19.54	1.17
44	66	82.24	17.46	1.27
44	126	38.08	16.77	0.99
44	252	32.17	16.66	0.98

Difference between Results 3 and Results 2

i	j	Return Difference (%)	Volatility Difference (%)	Sharpe Ratio Difference
5	22	12.64	2.02	-0.09
5	44	16.71	1.90	0.09
5	66	14.01	2.26	-0.19
5	126	5.45	2.52	-0.21
5	252	1.10	2.55	0.01
10	22	12.67	1.98	-0.07
10	44	17.13	1.98	0.15
10	66	13.59	2.16	0.21
10	126	5.44	2.44	0.19
10	252	1.07	2.53	-0.13
22	22	13.46	2.07	0.08
22	44	17.59	1.99	0.11
22	66	13.58	2.17	0.12
22	126	5.73	2.45	0.18
22	252	2.07	2.43	0.20
44	44	17.20	1.92	0.17
44	66	12.63	2.08	0.20
44	126	3.54	2.47	0.11
44	252	1.31	2.48	0.10

> On peut se diriger vers un rebalancement tous les 5 jours avec un entraînement sur 66 ou 126 jours.

Results 4: new points

i	j	Return (%)	Average Volatility (%)	Average Sharpe Ratio
1	5	42.10	nan	nan
1	10	39.30	nan	nan
1	22	41.66	nan	nan
1	44	53.79	nan	nan
1	66	76.91	nan	nan
1	126	55.64	nan	nan
1	252	32.07	nan	nan
2	5	38.61	14.53	29.72
2	10	39.13	13.28	45.64
2	22	41.63	13.35	10.18
2	44	53.91	13.16	-44.89
2	66	76.94	11.33	13.17
2	126	55.91	10.49	28.39
2	252	32.27	10.27	-33.68
3	5	33.79	15.38	3.56
3	10	40.12	14.80	1.97
3	22	42.61	14.82	3.21
3	44	53.48	15.33	2.97
3	66	76.93	13.25	2.38
3	126	55.56	12.40	2.28
3	252	32.10	12.45	1.51
4	5	39.90	15.99	1.79
4	10	39.41	15.48	2.91
4	22	41.18	15.54	2.69
4	44	53.33	15.26	2.68
4	66	76.52	13.70	2.75
4	126	55.47	12.76	2.97
4	252	32.26	12.73	2.12
5	5	36.52	15.95	2.53

i	j	Return (%)	Average Volatility (%)	Average Sharpe Ratio
5	10	39.93	15.95	2.53
5	22	41.30	15.98	2.38
5	44	53.95	15.79	2.13
5	66	75.13	14.10	2.73
5	126	54.45	13.21	2.62
5	252	31.90	13.03	1.75

Results 5: new metrics

start_date = '2020-01-01' end_date = '2023-12-31' tickers = ['SPHQ', 'IVE', 'SPYD', 'SPLV', 'SPMO']

je pense que le true sharpe ratio aurait du etre divisé par le nombre d'années de return pr que le return soit comparable avec la volatilité qui est elle annualisée

i	j	Return (%)	Average Volatility (%)	Average Sharpe Ratio	Volatility (%)	Sharpe Ratio	True Return (%)	True Volatility (%)	True Sharpe Ratio
2	5	38.61	14.53	29.72	18.59	2.08	38.61	21.55	1.79
2	10	39.13	13.28	45.64	19.93	1.96	39.13	21.59	1.81
2	22	41.63	13.35	10.18	19.98	2.08	41.63	21.67	1.92
2	66	76.94	11.33	13.17	16.36	4.70	76.94	15.99	4.81
3	5	33.79	15.38	3.56	18.15	1.86	33.79	21.50	1.57
3	10	40.12	14.80	1.97	21.45	1.87	40.12	21.63	1.86
3	22	42.61	14.82	3.21	21.53	1.98	42.61	21.70	1.96
3	66	76.93	13.25	2.38	15.76	4.88	76.93	15.98	4.81
5	5	36.52	15.95	2.53	20.56	1.78	36.52	21.53	1.70
5	10	39.93	15.95	2.53	20.69	1.93	39.93	21.57	1.85
5	22	41.30	15.98	2.38	18.79	2.20	41.30	21.71	1.90
5	66	75.13	14.10	2.73	14.74	5.10	75.13	16.02	4.69
10	10	38.49	16.50	1.72	21.30	1.81	38.49	21.61	1.78
10	22	41.27	16.54	1.92	20.82	1.98	41.27	21.73	1.90
10	66	73.82	14.71	1.69	12.59	5.86	73.82	16.04	4.60
22	22	34.24	17.17	1.34	17.18	1.99	34.24	21.81	1.57

i	j	Return (%)	Average Volatility (%)	Average Sharpe Ratio	Volatility (%)	Sharpe Ratio	True Return (%)	True Volatility (%)	True Sharpe Ratio
22	66	68.66	15.00	1.47	15.00	4.58	68.66	16.07	4.27

> It seemes that the best one is (3,66).

Results 6: new dates

start_date = '2016-01-01' end_date = '2019-12-31' tickers = ['SPHQ', 'IVE', 'SPYD', 'SPLV', 'SPMO']

i	j	Return (%)	Average Volatility (%)	Average Sharpe Ratio	Volatility (%)	Sharpe Ratio	True Return (%)	True Volatility (%)	True Sharpe Ratio
2	5	78.02	7.16	-25.10	11.38	6.86	78.02	11.16	6.99
2	10	67.60	7.33	5.57	10.17	6.64	67.60	10.64	6.35
2	22	70.00	7.31	5.53	10.06	6.96	70.00	10.56	6.63
2	66	58.53	7.25	14.89	9.77	5.99	58.53	10.36	5.65
3	5	77.54	8.24	5.21	10.60	7.32	77.54	10.88	7.13
3	10	71.36	7.89	4.17	10.48	6.81	71.36	10.66	6.70
3	22	71.87	7.79	3.51	10.45	6.88	71.87	10.56	6.81
3	66	58.94	7.83	5.08	9.81	6.01	58.94	10.37	5.68
5	5	73.80	8.57	3.60	10.20	7.23	73.80	10.72	6.89
5	10	71.48	8.52	3.36	10.13	7.05	71.48	10.62	6.73
5	22	72.71	8.36	3.35	10.00	7.27	72.71	10.57	6.88
5	66	58.02	8.40	3.92	9.37	6.19	58.02	10.38	5.59
10	10	71.09	8.98	2.81	10.31	6.90	71.09	10.66	6.67
10	22	71.39	8.94	2.69	8.91	8.01	71.39	10.41	6.86
10	66	57.22	8.80	2.87	9.28	6.17	57.22	10.41	5.50
22	22	67.00	9.40	2.19	10.66	6.28	67.00	10.50	6.38
22	66	56.18	9.31	2.12	10.72	5.24	56.18	10.43	5.38

> (3,5) ou (5,22) à la limite

Results 7: new dates

start_date = '2013-01-01' end_date = '2024-10-31'

i	j	Return (%)	Average Volatility (%)	Average Sharpe Ratio	Volatility (%)	Sharpe Ratio	True Return (%)	True Volatility (%)	True Sharpe Ratio
2	5	206.34	10.07	6.36	15.26	13.52	206.34	16.38	12.59
2	22	190.57	10.29	-3.45	14.77	12.90	190.57	16.33	11.67
2	66	200.34	10.35	4.94	14.85	13.49	200.34	16.42	12.20
3	5	193.87	11.26	3.54	15.39	12.60	193.87	16.46	11.77
3	22	186.22	11.30	3.64	14.28	13.04	186.22	16.32	11.41
3	66	201.73	11.12	4.17	16.24	12.42	201.73	16.43	12.28
5	5	177.06	11.97	2.90	15.52	11.41	177.06	16.41	10.79
5	22	193.48	11.88	2.85	14.40	13.43	193.48	16.34	11.84
5	66	201.55	11.92	3.14	13.60	14.82	201.55	16.43	12.27
10	22	192.46	12.42	2.14	13.09	14.70	192.46	16.30	11.80
10	66	201.97	12.35	2.53	14.28	14.14	201.97	16.44	12.29
22	22	183.47	12.77	1.88	12.15	15.10	183.47	16.30	11.25
22	66	202.59	12.84	2.03	12.15	16.67	202.59	16.44	12.33
44	66	203.23	13.21	1.73	11.61	17.51	203.23	16.46	12.35
44	126	165.97	13.22	1.72	12.44	13.34	165.97	16.67	9.96
66	126	169.09	13.82	1.48	12.91	13.10	169.09	16.67	10.14
126	252	164.72	14.66	1.38	13.56	12.15	164.72	17.10	9.64
252	252	162.90	15.11	1.34	16.66	9.78	162.90	17.14	9.50

> Je pense que le fait que les (.,66) soient élevés vient d'un "biais" entre 2020 et 2023 (pcq ce n'était pas du tout présent avant). Si on exclut ceux-là, on semble voir une tendance qui viserait à privilégier des rebalancements plus fréquents. Le (2,5) présente le meilleur sharpe ratio et est probablement le plus robuste. Si on veut augmenter la fréquence, je pense que le mieux c'est de prendre un (5,22).

Results 8

full, (2,5) Annualized Returns, Volatility and Sharpe Ratio Risk Parity: 9.51%, 19.05%, 0.50 Equal Weight: 9.38%, 19.41%, 0.48 SPY: 11.56%, 20.42%, 0.57 Min Variance: 8.22%, 18.92%, 0.43

precovid, (2,5) Annualized Returns, Volatility and Sharpe Ratio Risk Parity: 9.67%, 12.83%, 0.75 Equal Weight: 9.73%, 13.31%, 0.73 SPY: 10.37%, 15.03%, 0.69 Min Variance: 8.84%, 12.00%, 0.74

full, (5,22) Annualized Returns, Volatility and Sharpe Ratio Risk Parity: 9.60%, 19.16%, 0.50 Equal Weight: 9.46%, 19.49%, 0.49 SPY: 11.64%, 20.49%, 0.57 Min Variance: 8.08%, 18.72%, 0.43

precovid, (5,22) Annualized Returns, Volatility and Sharpe Ratio Risk Parity: 9.67%, 12.95%, 0.75 Equal Weight: 10.10%, 13.44%, 0.75 SPY: 10.68%, 15.16%, 0.70 Min Variance: 9.28%, 11.71%, 0.79

full, (22,66) Annualized Returns, Volatility and Sharpe Ratio Risk Parity: 10.01%, 19.19%, 0.52 Equal Weight: 10.05%, 19.48%, 0.52 SPY: 12.49%, 20.44%, 0.61 Min Variance: 9.78%, 18.21%, 0.54

precovid, (22,66) Annualized Returns, Volatility and Sharpe Ratio Risk Parity: 12.50%, 12.01%, 1.04 Equal Weight: 12.51%, 12.54%, 1.00 SPY: 13.18%, 14.18%, 0.93 Min Variance: 13.68%, 10.73%, 1.27

> Je pense que ça confirme que le mieux c'est (2,5) mais la partie covid fausse les résultats parce que la tech a surperformé et que le SPY est très tech et avec un ERC je pense qu'on réduit l'expo tech.