

推導效率前緣線

一、過程

1. 先至網路上下載個股價資訊

Date	大立光	兆豐金	統一	裕隆
2020/12/14	3265	28.585	65	36.700001
2020/12/15	3225	28.341	65	36.5
2020/12/16	3325	28.683	65.7	37.5
2020/12/17	3315	28.78	67	36.900002
2020/12/18	3305	28.78	66.5	37.549999
2020/12/21	3340	28.927	66.8	37.25
2020/12/22	3240	28.927	66.1	37
2020/12/23	3260	28.732	65.9	37.200001
2020/12/24	3260	28.732	66	37.349998
2020/12/25	3260	28.634	66.3	41.049999
2020/12/28	3235	28.829	66.9	43.5
2020/12/29	3190	28.829	66.9	42.200001
2020/12/30	3225	29.171	67.8	42.849998
2020/12/31	3195	29.073	67.5	46.900002
2021/1/4	3350	29.171	67.6	50.900002
2021/1/5	3315	29.122	67	48.849998
2021/1/6	3070	28.732	66.1	49
2021/1/7	3030	29.024	66.6	48
2021/1/8	3040	29.268	67.7	46.549999
2021/1/11	3045	29.317	67.3	46.799999
2021/1/12	2990	29.024	67	43.950001
2021/1/13	2995	29.073	67	44.450001
2021/1/14	2960	29.024	66.8	44.299999
2021/1/15	2860	28.585	66	42.75
2021/1/18	2805	28.439	67.4	43.549999
2021/1/19	2880	28.39	67.1	43.049999
2021/1/20	2790	28	64.3	41.450001
2021/1/21	2825	28	66.1	40.950001
2021/1/22	2940	27.902	66.7	43.200001
2021/1/25	3000	28.146	66.7	41.950001
2021/1/26	2980	28	67	41.099998
2021/1/27	2975	28	67.2	43.200001
2021/1/28	3025	27.854	67.9	41.349998
2021/1/29	2940	27.463	68	40.900002

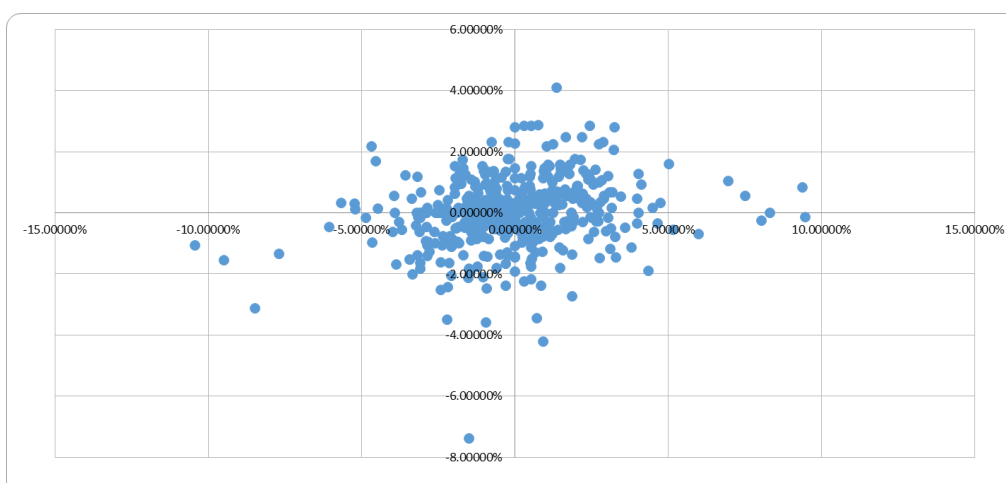
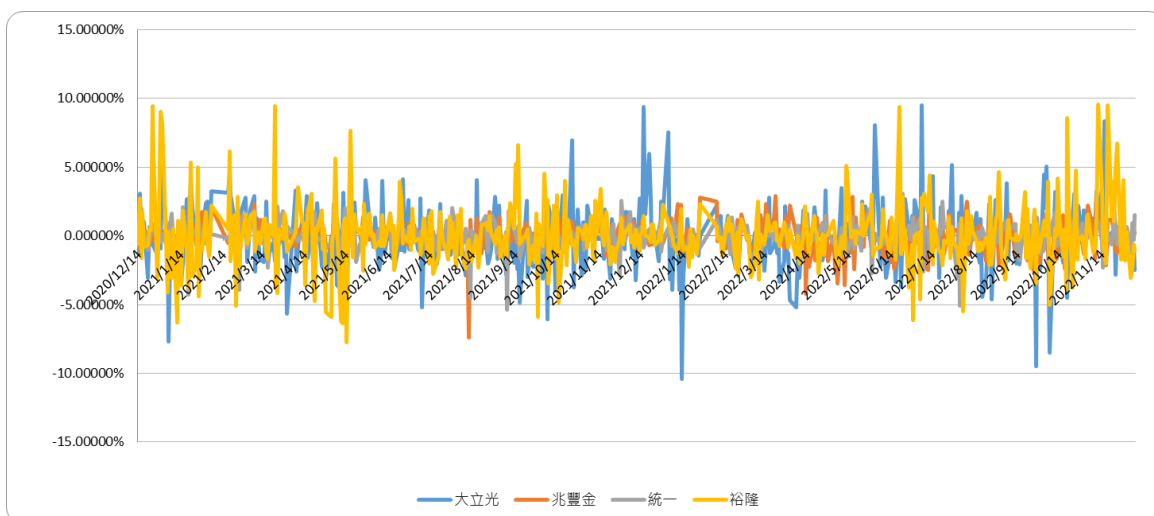
2. 算出他們的報酬率(連續模式)

大立光	兆豐金	統一	裕隆
-1.23268%	-0.85690%	0.00000%	-0.54645%
3.05367%	1.19762%	1.07116%	2.70287%
-0.30121%	0.33956%	1.95937%	-1.61293%
-0.30212%	0.00000%	-0.74907%	1.74617%
1.05343%	0.50718%	0.45012%	-0.80214%
-3.03975%	0.00000%	-1.05344%	-0.67340%
0.61539%	-0.67682%	-0.30302%	0.53909%
0.00000%	0.00000%	0.15163%	0.40241%
0.00000%	-0.34014%	0.45352%	9.44580%
-0.76983%	0.67912%	0.90091%	5.79701%
-1.40080%	0.00000%	0.00000%	-3.03407%
1.09120%	1.17747%	1.33632%	1.52854%
-0.93459%	-0.33501%	-0.44346%	9.03121%
4.73733%	0.33501%	0.14804%	8.18452%
-1.05027%	-0.16737%	-0.89153%	4.11086%
-7.67801%	-1.34909%	-1.35239%	0.30660%
-1.31149%	1.01352%	0.75358%	-2.06193%
0.32949%	0.83682%	1.63816%	-3.06740%
0.16434%	0.16654%	-0.59259%	0.53562%
-1.82275%	-1.00336%	-0.44677%	-6.28305%
0.16708%	0.16793%	0.00000%	1.13123%
-1.17550%	-0.16793%	-0.29895%	-0.33803%
-3.43676%	-1.52416%	-1.20484%	-3.56155%
-1.94181%	-0.51326%	2.09903%	1.85405%
2.63868%	-0.17167%	-0.44610%	-1.15475%
-3.17487%	-1.38411%	4.26243%	-3.78743%
1.24668%	0.00000%	2.76090%	-1.21361%
3.99012%	-0.34904%	0.90362%	5.34887%
2.02027%	0.87033%	0.00000%	-2.93621%
-0.66890%	-0.52129%	0.44877%	-2.04704%
-0.16793%	0.00000%	0.29806%	4.98324%
1.66671%	-0.52402%	1.03629%	4.37681%
-2.85015%	-1.41097%	0.14716%	-1.09423%
-0.17021%	1.76062%	0.00000%	-1.10634%

3.算出他們的統計數據及相關圖表

平均報酬率	-0.08200%	0.01764%	0.00314%	0.10866%
報酬率的變異數	0.05124%	0.01223%	0.01055%	0.05489%
風險	2.26355%	1.10586%	1.02689%	2.34292%

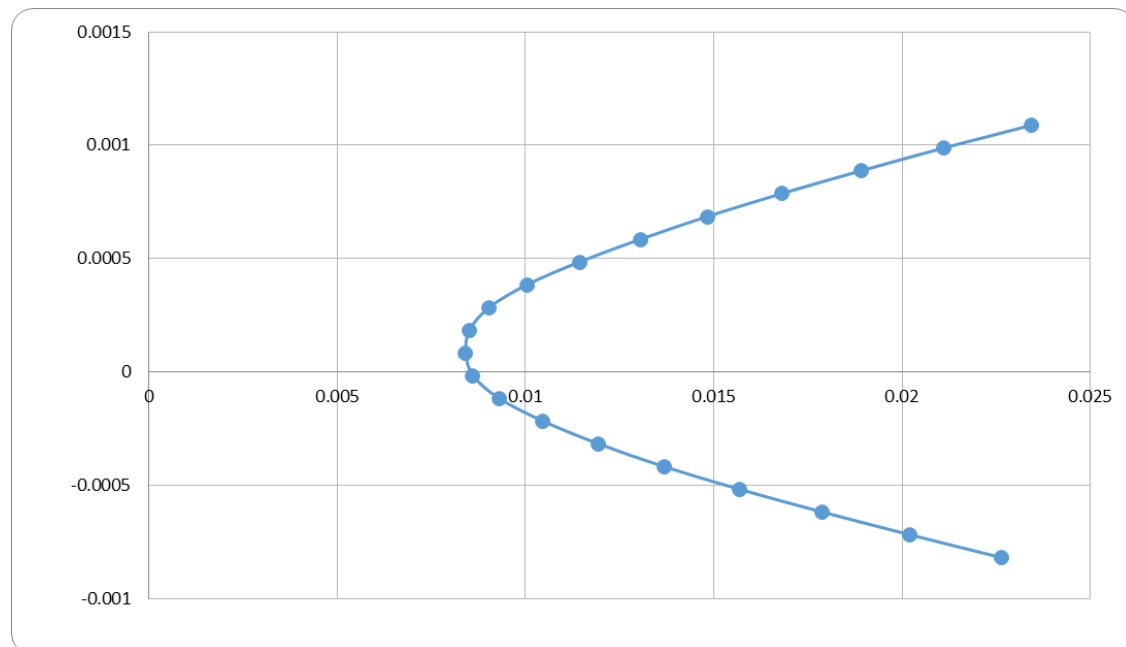
連續模式				
相關係數	大立光	兆豐金	統一	裕隆
大立光	1			
兆豐金	0.227046428	1		
統一	0.178440952	0.28917	1	
裕隆	0.194661098	0.202311	0.183279	1
共變異數	大立光	兆豐金	統一	裕隆
大立光	0.000512368			
兆豐金	5.68339E-05	0.000122		
統一	4.14773E-05	3.28E-05	0.000105	
裕隆	0.000103235	5.24E-05	4.41E-05	0.000549
平均報酬率	-0.08200%	0.01764%	0.00314%	0.10866%



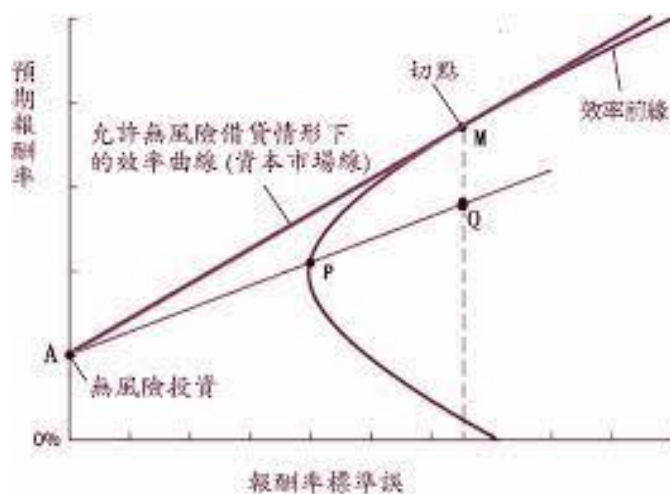
4. 計算投資組合風險及報酬率

W1	W2	W3	W4	SUM	軌跡					
0.76424174	0.00000000	0.23575826	0.00000000	1.00000000	投資組合風險	投資組合報酬	W1	W2	W3	W4
投資組合報酬率					1	0.023429174	0.0010865	0	0	0
-0.0006193					2	0.021101384	0.000986158	0	0.111474408	0
FIXED RETURN					3	0.018905447	0.000885816	0	0.220618097	0
-0.0006193					4	0.01680409	0.000785474	0	0.330860451	0
					5	0.014847288	0.000685132	0	0.413657776	0.02461959
投資組合風險					6	0.013070105	0.000584789	0	0.415594802	0.11708778
0.01789033					7	0.011441156	0.000484447	0	0.417551325	0.21048677
					8	0.010048144	0.000384105	0	0.419527347	0.30481657
					9	0.009041916	0.000283763	0	0.421464372	0.39728476
					10	0.008514676	0.000183421	0	0.42344039	0.49161457
					11	0.008417587	8.30789E-05	0.050943891	0.400505476	0.51443784
					12	0.008607276	-1.7263E-05	0.118261219	0.352043043	0.52969574
					13	0.009300435	-0.00011761	0.218789846	0.250349332	0.53086082
					14	0.0104631	-0.00021795	0.319318473	0.148655621	0.53202591
					15	0.011942943	-0.00031829	0.418845241	0.04797538	0.53317938
					16	0.013683454	-0.00041863	0.52852743	0	0.47147257
					17	0.015691432	-0.00051897	0.646384588	0	0.35361541
					18	0.017890334	-0.00061932	0.764241739	0	0.23575826
					19	0.020217959	-0.00071966	0.882098902	0	0.11790111
					20	0.022635546	-0.00082	1	0	0
				0.0019065						
				0.000100342						

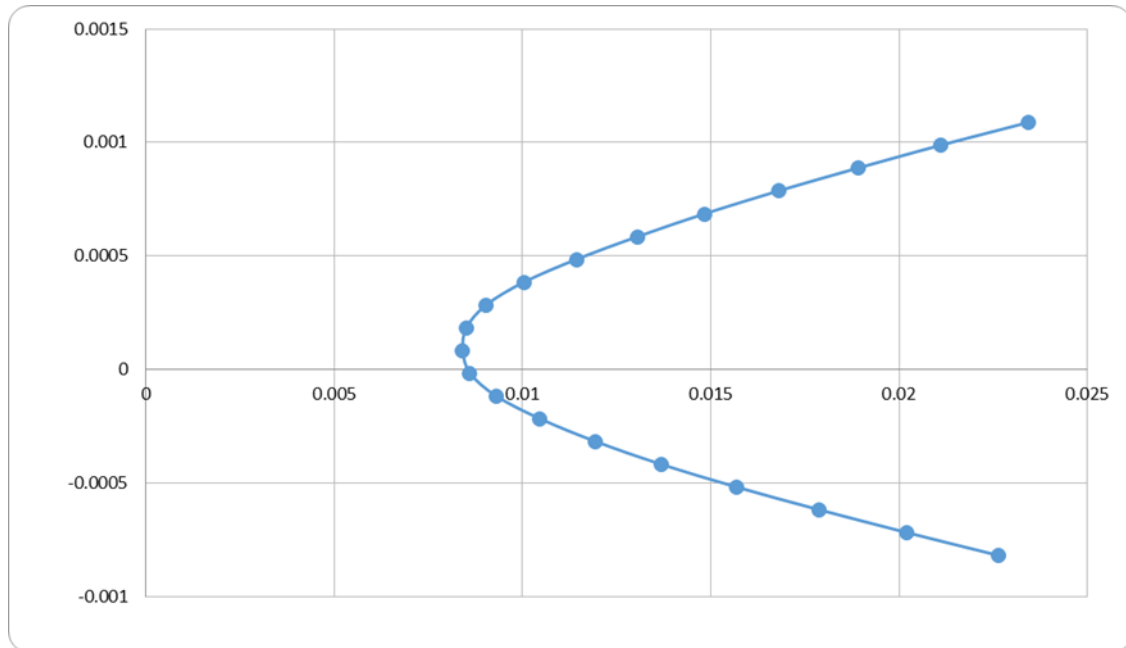
5. 得到效率前緣線



二、比較



投資組合報酬率



投資組合風險

我的效率前緣線理論上應該是成功的，因為在相同風險下，投資者會選擇較高的報酬率，所以應該只會有上半部，相似於正確的效率前緣線。