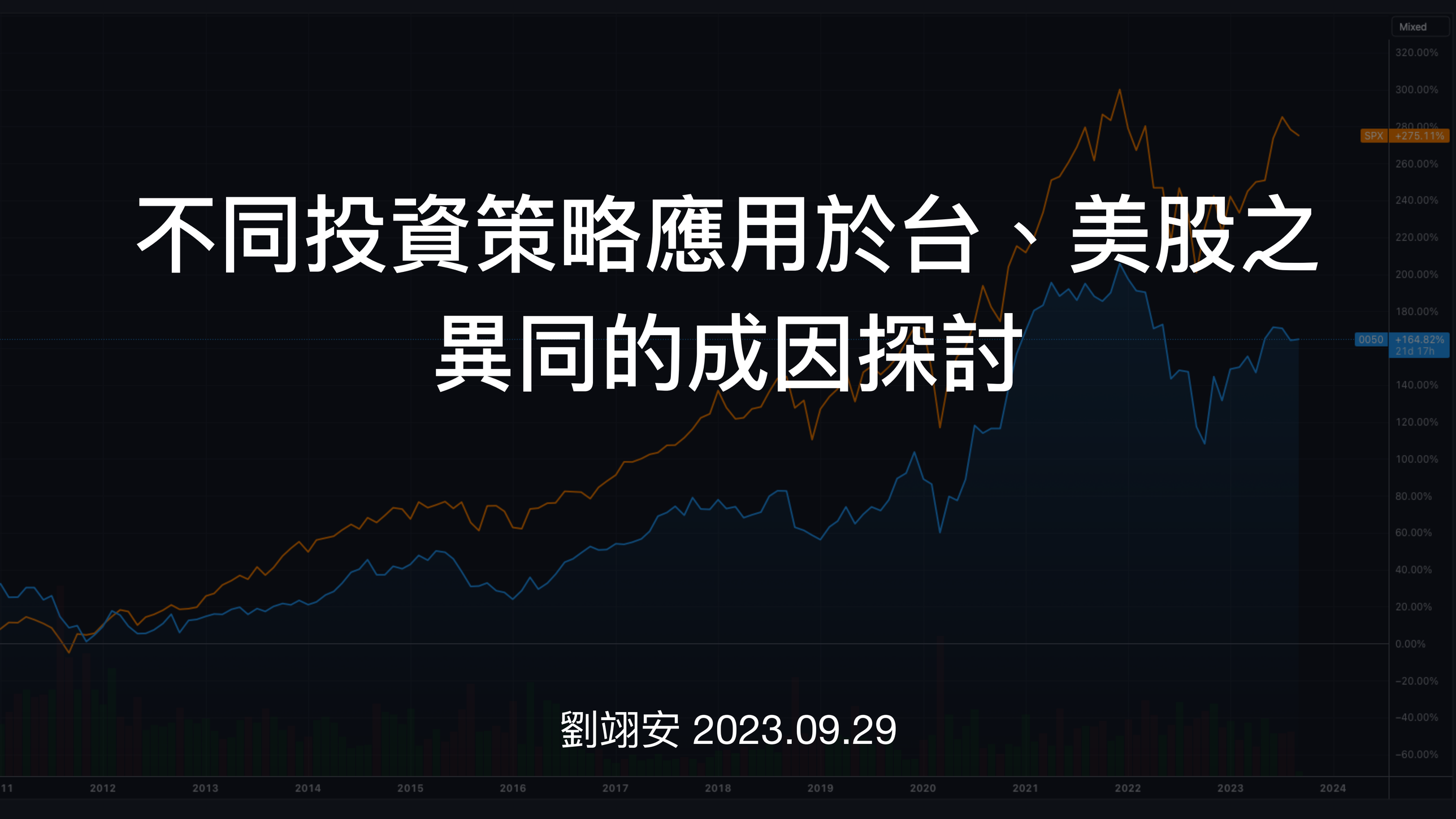

不同投資策略應用於台、美股之異同的成因探討

劉翊安 2023.09.29

台股及美股走向有一定相關性

近十年 “S&P500”、“元大50”對比資料

台股經常跟隨美股走向（黃藍箭頭標示）

近一年“S&P500”、“元大50”對比資料

研究方法及目的

- 研究“四種”不同類型的投資策略
- 應用於“台股”與“美股”指數股票型基金Exchange Traded Fund(ETF)
- 觀察回報相似及相異之處
- 分析可能的原因
- 總結並提出投資建議

研究四種投資策略

1. 動能投資

- 「動能投資」(Quantitative Momentum Investing Strategy)：投資於股票價格上漲幅度最大的股票。在這個專案中，我們將建立一個投資策略，選擇價格動能最高的50支股票。接著，我們將計算出一個等權重組合的這50支股票的推薦交易。

	A	B	C	D	E	F	G
1	Ticker	Price	Number of Shares to Buy	One-Year Price Return	One-Year Return Percentile	Six-Month Price Return	Six-Month Return Percentile
2	AAPL	$523.41	38	144.3%	99.2%	74.0%	98.8%
3	AMD	$88.18	226	187.3%	99.8%	85.4%	99.2%
4	NVDA	$533.71	37	218.4%	100.0%	91.5%	99.6%
5	CARR	$32.25	620	155.7%	99.6%	155.9%	100.0%
6	LB	$32.11	622	81.1%	97.4%	35.6%	91.1%
7	QCOM	$118.10	169	59.7%	93.1%	46.1%	96.0%
8	PYPL	$209.38	95	89.7%	98.2%	88.6%	99.4%
9	UPS	$160.18	124	40.2%	83.8%	70.3%	98.4%
10	FDX	$217.80	91	42.5%	85.5%	49.2%	96.6%
11	VAR	$174.91	114	66.2%	94.5%	33.4%	88.9%
12	PWR	$51.70	386	55.7%	91.3%	39.3%	93.7%
13	BBY	$117.63	170	68.6%	95.4%	37.7%	91.9%
14	QRVO	$132.75	150	88.5%	98.0%	39.1%	93.3%
15	ROL	$57.00	350	74.2%	96.8%	42.6%	94.9%
16	FBHS	$86.53	231	71.2%	96.0%	33.5%	89.1%
17	AMZN	$3475.59	5	92.9%	98.6%	69.1%	98.2%
18	TGT	$158.81	125	46.2%	86.9%	40.0%	94.3%
19	LOW	$172.44	115	57.8%	92.5%	47.0%	96.4%

-

2. 價值投資

- 「價值投資」(Quantitative Value Investing Strategy)：投資於相對於企業價值的一些常見指標（如盈利或資產）最為便宜的股票。在這個專案中，我們將建立一個投資策略，選擇價值指標最佳的50支股票。接著，我們將計算出一個等權重組合的這50支股票的推薦交易。

	A	B	C	D	E	F	G	H
1	Ticker	Price	Number of Shares to Buy	Price-to-Earnings Ratio	PE Percentile	Price-to-Book Ratio	PB Percentile	Price-to-Sales Rati
2	KSS	$21.39	2337	-31.1	8.0%	0.6	28.0%	
3	HFC	$25.59	1953	-26.2	10.0%	0.7	34.0%	
4	FTI	$7.72	6476	-0.6	62.0%	0.4	20.0%	
5	AAL	$13.80	3623	-1.7	52.0%	-57.6	2.0%	
6	HPE	$9.75	5128	-1671.6	2.0%	0.8	48.0%	
7	CCL	$16.59	3014	-4.2	44.0%	0.4	16.0%	
8	XRX	$19.48	2566	10.2	78.0%	0.7	42.0%	
9	HPQ	$19.81	2523	9.7	70.0%	-23.5	4.0%	
10	UAL	$37.26	1341	-5.9	38.0%	0.9	58.0%	
11	PVH	$58.04	861	-5.3	41.0%	0.7	32.0%	
12	LB	$30.74	1626	-10.7	14.0%	-5.8	6.0%	
13	MPC	$35.94	1391	-3.0	46.0%	0.7	36.0%	
14	DAL	$32.19	1553	-5.3	41.0%	1.3	80.0%	
15	TAP	$37.90	1319	-50.6	4.0%	0.6	26.0%	
16	MRO	$5.44	9192	-6.6	34.0%	0.4	8.0%	
17	SYF	$25.96	1926	8.0	66.0%	1.0	66.0%	
18	BKR	$15.06	3319	-1.0	56.0%	0.5	22.0%	
19	GPS	$18.46	2708	-8.5	20.0%	2.0	94.0%	
20	NWS	$15.23	3282	-7.2	26.0%	0.4	18.0%	
21	DXC	$20.40	2450	-0.9	60.0%	1.1	70.0%	
22	IVZ	$11.14	4488	10.6	82.0%	0.4	10.0%	
23	VIAC	$29.14	1715	14.1	90.0%	1.2	78.0%	

3. 機器學習

- 透過K Nearest Neighbors, VotingClassifier訓練，對’XOM’, ‘AAPL’, ‘ABT’三檔股票做預測

```
do_ml('XOM')
do_ml('AAPL')
do_ml('ABT')
```

Output:

```
Data spread: Counter({'1': 1713, '-1': 1456, '0': 1108})
accuracy: 0.375700934579
predicted class counts: Counter({0: 404, -1: 393, 1: 273})


Data spread: Counter({'1': 2098, '-1': 1830, '0': 349})
accuracy: 0.4
predicted class counts: Counter({-1: 644, 1: 339, 0: 87})


Data spread: Counter({'1': 1690, '-1': 1483, '0': 1104})
accuracy: 0.33738317757
predicted class counts: Counter({-1: 383, 0: 372, 1: 315})
```

```
    clf = VotingClassifier([('lsvc',svm.LinearSVC()),
                            ('knn',neighbors.KNeighborsClassifier
                            ('rfor',RandomForestClassifier())])
```

New output:

```
Data spread: Counter({'1': 1713, '-1': 1456, '0': 1108})
accuracy: 0.379439252336
predicted class counts: Counter({-1: 487, 1: 417, 0: 166})


Data spread: Counter({'1': 2098, '-1': 1830, '0': 349})
accuracy: 0.471028037383
predicted class counts: Counter({1: 616, -1: 452, 0: 2})


Data spread: Counter({'1': 1690, '-1': 1483, '0': 1104})
accuracy: 0.378504672897
predicted class counts: Counter({-1: 524, 1: 394, 0: 152})
```

4. 黃金交叉策略

- 同樣的方法運用在SPY這檔ETF（1.黃金交叉策略應用於SPY 2.黃金交叉策略並允許賣空應用於SPY 3.黃金交叉策略應用於某藥廠 4.買進一次長期持有應用於SPY)

	A SMA	A Buy and Hold	SPY SMA	SPY SMA with Shorts	SPY Buy and Hold
tot_returns	2.907	1.632	3.264	3.796	2.790
annual_returns	0.067	0.047	0.072	0.078	0.066
annual_volatility	0.224	0.425	0.127	0.199	0.199
sharpe_ratio	0.211	0.064	0.408	0.290	0.229
max_drawdown	1.542	2.058	1.586	2.542	1.141
max_drawdown_duration	2449.000	7455.000	941.000	1695.000	2407.000

Future Work

- 透過python程式將投資策略應用於“台股”與“美股”
- 觀察回報相似及相異之處、分析可能的原因
- 總結並提出投資建議

References

- https://github.com/nickmccullum/algorithmic-trading-python
- Python Programming for Finance
- How to Backtest your First Trading Strategy in Python

Thanks