



TMBA程式交易部 2023暑期成果發表

商品：比特幣永續期貨
邱士展

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回測設定假設

○ 比特幣永續期貨：

■ 樣本內：2020/01/01-2022/08/31、樣本外：2022/09/01~2023/06/30

■ 手續費：單邊 0.15%

■ 本金：10,000 USD

■ 每筆投入：不限，但不可超過10,000 USD

■ 週期：60分K

策略邏輯

每筆金額：\$ 10000

多單邏輯：

進場：

- 收盤價>EMA 長期均線
- K值>D值
- ADX>50

出場：

- 收盤價<EMA 長期均線
- K值<D值
- ADX<50

空單邏輯：

進場：

- 收盤價<EMA 長期均線
- K值<D值
- ADX>50

出場：

- 收盤價>EMA 長期均線
- K值>D值
- ADX<50

加碼條件：

- 多頭：收盤價<入場價
- 空頭：收盤價>入場價

參數(最佳化):

EMA Length = 180, KD Length = 14, ADX Length = 14

$$EMA = (P * \alpha) + (Previous EMA * (1 - \alpha))$$

P = Current Price

$$\alpha = Smoothing Factor = \frac{2}{1 + N}$$

N = Number of Time Periods

KD指標計算公式：

RSV = (今日收盤價 - 最近n天的最低價) ÷ (最近n天的最高價 - 最近n天最低價) × 100

今日K值 = 昨日K值 × (2/3) + 今日RSV × (1/3)

今日D值 = 昨日D值 × (2/3) + 今日K值 × (1/3)

$$+DI = \left(\frac{Smoothed +DM}{ATR} \right) \times 100$$

$$-DI = \left(\frac{Smoothed -DM}{ATR} \right) \times 100$$

$$DX = \left(\frac{|+DI - -DI|}{|+DI + -DI|} \right) \times 100$$

$$ADX = \frac{(Prior ADX \times 13) + Current ADX}{14}$$

where:

+DM (Directional Movement) = Current High - PH

PH = Previous High

-DM = Previous Low - Current Low

$$Smoothed +/ -DM = \sum_{t=1}^{14} DM - \left(\frac{\sum_{t=1}^{14} DM}{14} \right) + CDM$$

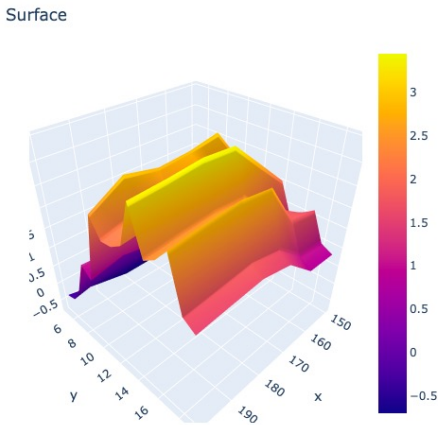
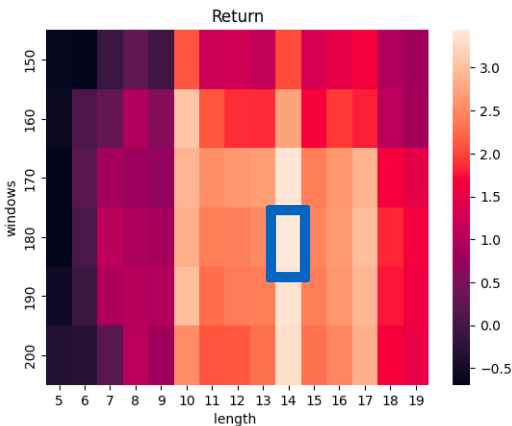
CDM = Current DM

ATR = Average True Range

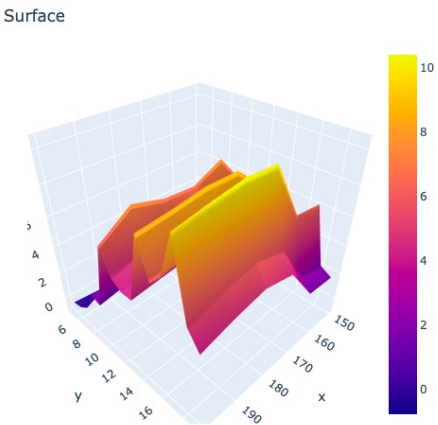
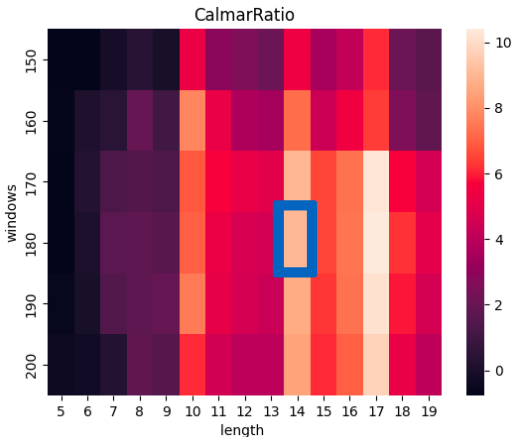
策略最佳化 (樣本內)

windows for EMA: (150, 210, 10)
 length for KD, ADX: (5, 20, 1)

windows	length	ret	calmarRatio
180	14	3.440608	9.012996
170	14	3.391848	8.990551
190	14	3.356144	8.695532
200	14	3.296712	8.464997
160	10	3.049101	7.781971

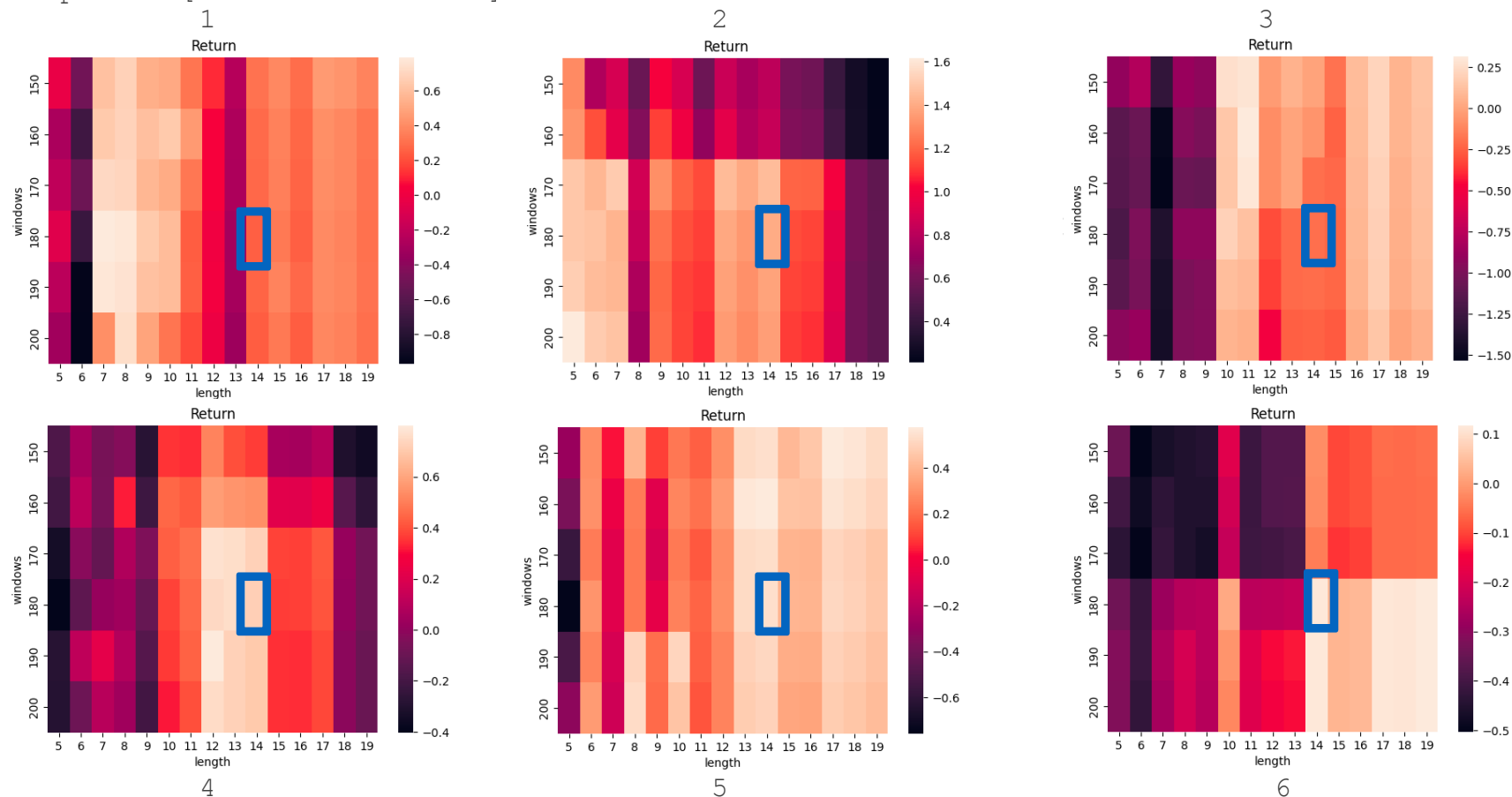


windows	length	ret	calmarRatio
180	17	2.986367	10.404375
170	17	2.885492	10.244620
190	17	2.912980	10.108794
200	17	2.831361	9.736344
180	14	3.440608	9.012996

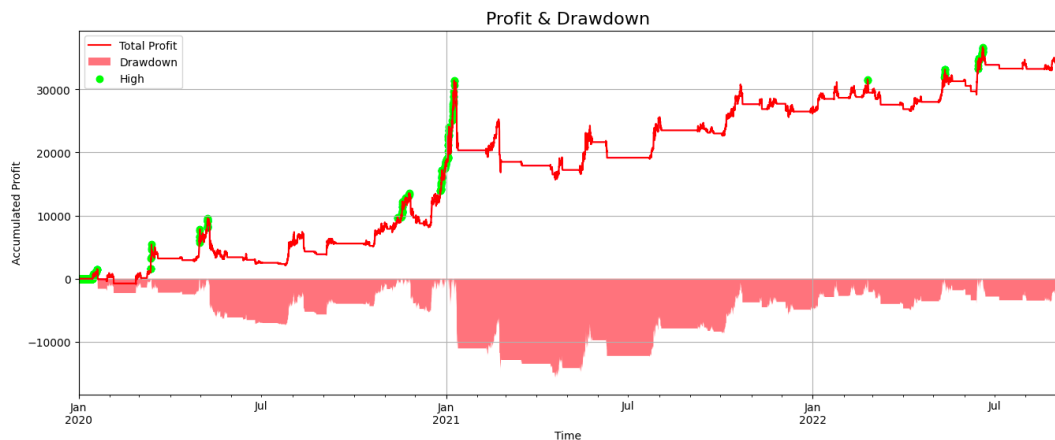


策略最佳化 (切等分考慮)

```
Sample1 = [:'2020-6']  
Sample2 = ['2020-7':'2020-12']  
Sample3 = ['2021-1':'2021-6']  
Sample4 = ['2021-7':'2021-12']  
Sample5 = ['2022-1':'2022-6']  
Sample6 = ['2022-7':'2022-8']
```



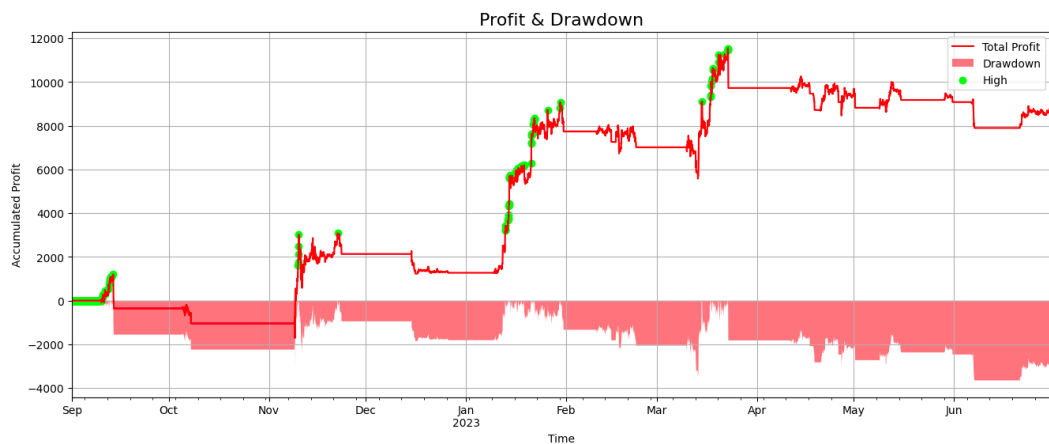
策略績效 (樣本內)



profit: \$34406.08
return: 344.06%
average_annual_return: 94.22%
annualized_std_dev: 0.46
sharpe_ratio: 2.06
mdd: 38.17%
calmarRatio: 9.01
tradeTimes: 110
winRate: 50.0%
profitFactor: 0.6
winLossRatio: 0.58

Time	mdd	ret	2021-04-30	0.379403	-0.019501
2020-01-31	0.169424	0.035626	2021-05-31	0.358851	0.163057
2020-02-29	0.206148	0.048056	2021-06-30	0.295907	-0.080581
2020-03-31	0.144445	0.250656	2021-07-31	0.299818	0.187296
2020-04-30	0.171983	0.227757	2021-08-31	0.190802	-0.042659
2020-05-31	0.331176	-0.154186	2021-09-30	0.202939	-0.012980
2020-06-30	0.366442	-0.064221	2021-10-31	0.211916	0.136299
2020-07-31	0.381739	0.242111	2021-11-30	0.110297	0.003899
2020-08-31	0.290552	-0.109871	2021-12-31	0.140586	-0.035036
2020-09-30	0.295928	0.123853	2022-01-31	0.122595	0.064720
2020-10-31	0.229332	0.193822	2022-02-28	0.067874	0.023182
2020-11-30	0.165911	0.067812	2022-03-31	0.100667	-0.052239
2020-12-31	0.229576	0.369567	2022-04-30	0.120840	0.016844
2021-01-31	0.267110	0.128754	2022-05-31	0.088502	0.089679
2021-02-28	0.351946	-0.047122	2022-06-30	0.091098	0.060945
2021-03-31	0.326001	-0.021151	2022-07-31	0.075172	0.002361
			2022-08-31	0.079784	0.011021

策略績效 (樣本外)

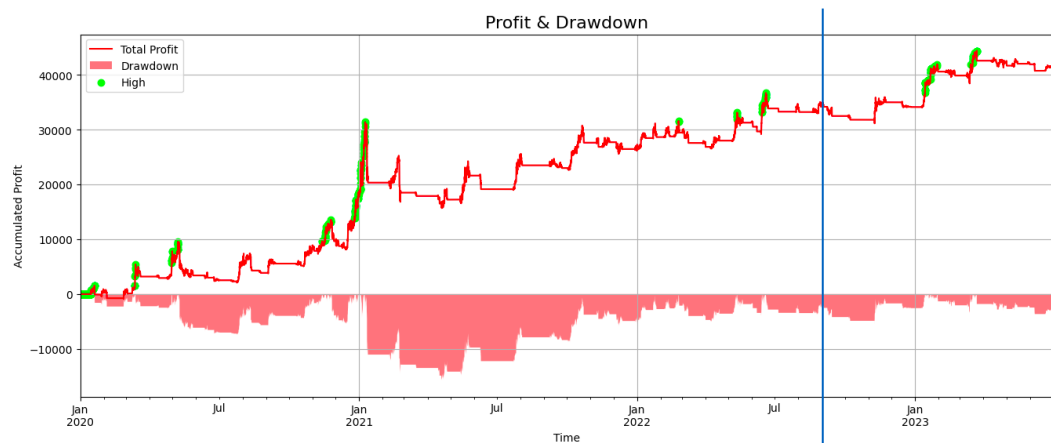


profit: \$8456.17
return: 84.56%
average_annual_return: 134.66%
annualized_std_dev: 0.49
sharpe_ratio: 2.74
mdd: 26.04%
calmarRatio: 3.25
tradeTimes: 34
winRate: 50.0%
profitFactor: 0.42
winLossRatio: 0.37

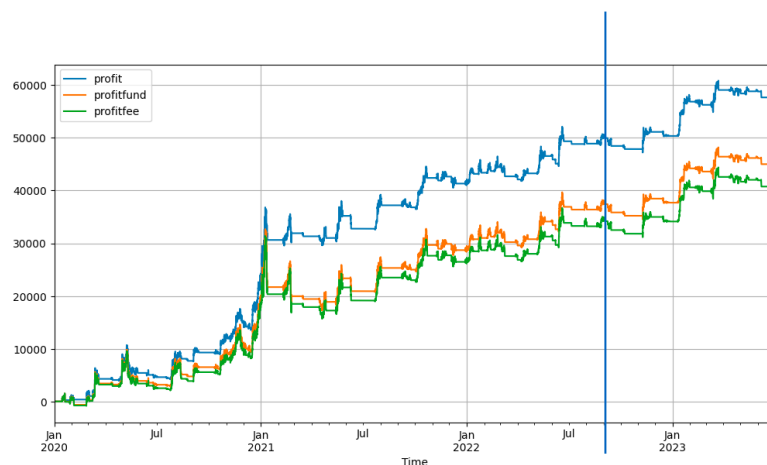


Time	mdd	ret
2022-09-30	0.139063	-0.026373
2022-10-31	0.200314	-0.070542
2022-11-30	0.260410	0.346470
2022-12-31	0.141428	-0.072002
2023-01-31	0.140124	0.474722
2023-02-28	0.123154	-0.037241
2023-03-31	0.183446	0.163688
2023-04-30	0.143049	-0.008280
2023-05-31	0.135347	-0.018235
2023-06-30	0.169507	-0.031856

策略績效 (整體)



profit: \$41320.97
return: 413.21%
average_annual_return: 73.38%
annualized_std_dev: 0.41
sharpe_ratio: 1.81
mdd: 38.17%
calmarRatio: 10.82
tradeTimes: 146
winRate: 49.33%
profitFactor: 0.55
winLossRatio: 0.54



Total_fund_fee_cost: \$12654.59 (30.62%)
Total_fee_cost: \$4281.39 (10.36%)
Total_cost: \$16935.98 (40.98%)



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