jupyter vectorBT 均線策略回測測試-以台積電2330為例 Last Checkpoint: 17 分鐘前 (autosaved)

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載入相關套件

In [1]:
```
import vectorbt as vbt
```

In [2]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

從Yahoo finance下載股價資料，載入過去五年台積電(2330)收盤資料

In [3]:
```
data = pd.read_csv(r'C:\Users\npc94\OneDrive\桌面\2330.TW.csv',index_col=0,parse_dates=True)

price= data['Close']
```

In [4]:
```
data.head()
```

In [4]: data.head()

Out[4]:

Date	Open	High	Low	Close	Adj Close	Volume
2017-01-16	180.0	180.5	179.0	179.5	152.734634	30756000.0
2017-01-17	180.5	181.0	179.5	181.0	154.010971	13159000.0
2017-01-18	180.5	181.0	179.5	181.0	154.010971	23693000.0
2017-01-19	179.5	181.0	179.5	180.5	153.585541	24627000.0
2017-01-20	181.0	181.5	180.5	181.0	154.010971	23429000.0

In [5]:
```
data.tail()
```

Out[5]:

Date	Open	High	Low	Close	Adj Close	Volume
2022-01-10	628.0	645.0	627.0	643.0	643.0	38289770.0
2022-01-11	646.0	651.0	639.0	651.0	651.0	33196585.0
2022-01-12	657.0	660.0	650.0	660.0	660.0	38860063.0
2022-01-13	658.0	662.0	655.0	661.0	661.0	38137411.0
2022-01-14	673.0	673.0	661.0	672.0	672.0	95200777.0

設定資料頻率為"日"，並設定交易策略為20天均線和60天均線策略

In [6]:
```
vbt.settings.array_wrapper['freq'] = 'd'
risk_free=0.01

sma20 = price.rolling(20).mean()
sma60 = price.rolling(60).mean()
entries = (sma20 > sma60) & (sma20.shift() < sma60.shift())
exits = (sma20 < sma60) & (sma20.shift() > sma60.shift())

pf= vbt.Portfolio.from_signals(price, entries, exits, fees=0.001425,init_cash=10000) #設定交易稅為千分之1.425以及初始資金為10000
```

投資部位變動繪製

In [7]:
```
price.plot()
sma20.plot()
sma60.plot()
entries.astype(int).plot(secondary_y=True,figsize=(10,6))
(-exits.astype(int)).plot(secondary_y=True,figsize=(10,6))
```

投資部位變動繪製

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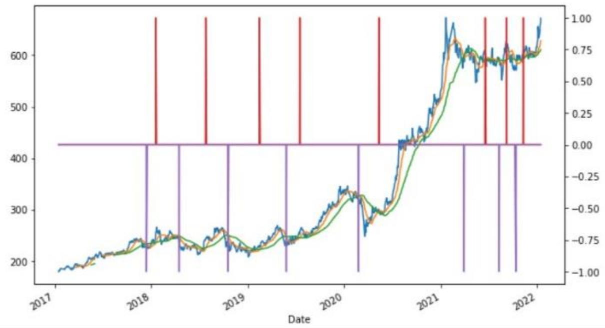
Out[7]: <AxesSubplot:>



交易進出資料

In [8]:
```
pf.orders.records_readable
```

Out[8]:

	Order Id	Column	Timestamp	Size	Price	Fees	Side
0	0	Close	2018-01-19	39.083250	255.5	14.229723	Buy
1	1	Close	2018-04-17	39.083250	238.0	13.255084	Sell
2	2	Close	2018-07-27	37.935955	244.5	13.217361	Buy
3	3	Close	2018-10-19	37.935955	236.0	12.757862	Sell
4	4	Close	2019-02-15	39.327779	227.0	12.721553	Buy
5	5	Close	2019-05-28	39.327779	230.5	12.917701	Sell
6	6	Close	2019-07-18	35.587616	254.0	12.880938	Buy
7	7	Close	2020-02-25	35.587616	322.0	16.329378	Sell
8	8	Close	2020-05-12	38.734238	295.0	16.282905	Buy
9	9	Close	2021-03-30	38.734238	597.0	32.952184	Sell
10	10	Close	2021-06-18	38.239684	603.0	32.858404	Buy
11	11	Close	2021-08-10	38.239684	591.0	32.204506	Sell
12	12	Close	2021-09-07	36.172289	623.0	32.112854	Buy
13	13	Close	2021-10-12	36.172289	575.0	29.638669	Sell

交易圖表繪製

In [9]:
```
fig = price.vbt.plot(trace_kwargs=dict(name='Close'))
sma20.vbt.plot(trace_kwargs=dict(name='Fast MA'), fig=fig)
sma60.vbt.plot(trace_kwargs=dict(name='Slow MA'), fig=fig)
pf.positions.plot(close_trace_kwargs=dict(visible=False), fig=fig)
```

交易獲利統計

In [10]:
```
pf.total_profit()
```

Out[10]: 12810.465836410984

交易數據圖表統計

In [11]:
```
pf.stats()
```

Out[11]:
```
Start                          2017-01-16 00:00:00
End                            2022-01-14 00:00:00
Period                          1220 days 00:00:00
Start Value                                10000.0
End Value                             22810.465836
Total Return [%]                        128.104658
Benchmark Return [%]                    274.373259
Max Gross Exposure [%]                       100.0
Total Fees Paid                          313.91344
Max Drawdown [%]                          22.78361
Max Drawdown Duration            294 days 00:00:00
Total Trades                                     8
Total Closed Trades                              7
Total Open Trades                                1
Open Trade PnL                         2041.038562
Win Rate [%]                             42.857143
Best Trade [%]                             101.942
Worst Trade [%]                          -7.978676
Avg Winning Trade [%]                    43.215052
Avg Losing Trade [%]                     -5.282993
Avg Winning Trade Duration       142 days 08:00:00
Avg Losing Trade Duration         42 days 06:00:00
Profit Factor                             4.184494
Expectancy                             1538.489611
Sharpe Ratio                              1.257654
Calmar Ratio                              1.228135
Omega Ratio                               1.273975
Sortino Ratio                             1.943647
Name: Close, dtype: object
```