Monthly Research Report

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An observation

Comparison Data of 'S&P 500' and 'Yuanta 50' in the Past Decade

Methodology and Goals

- Studying common stock market trading method.
  - Test three common methods.
- Seek higher trading returns.
  - Incorporating stock market observations.
  - Integrating prediction / trading methods.

Testing Three Trading Methods

Dataset

- Data Source: 0050 Taiwan Stock Market - Yuanta/P-shares Taiwan Top 50
- Data Selection Period: January 1, 2014, to November 4, 2023

	Date	Price	Open	High	Low	Vol.	Change %
0	11/03/2023	125.45	125.00	125.60	124.70	9.13M	0.76%
1	11/02/2023	124.50	123.15	124.50	123.15	10.20M	2.26%
2	11/01/2023	121.75	122.00	122.15	121.25	4.85M	0.50%
3	10/31/2023	121.15	122.40	122.45	121.10	11.95M	-0.70%
4	10/30/2023	122.00	122.40	122.85	121.75	9.79M	-0.25%
...	...	...	...	...	...	...	...
2397	01/08/2014	57.80	57.70	57.95	57.70	7.61M	0.17%
2398	01/07/2014	57.70	57.75	57.90	57.70	13.13M	0.00%
2399	01/06/2014	57.70	57.75	57.95	57.55	14.87M	-0.26%
2400	01/03/2014	57.85	58.45	58.45	57.70	14.51M	-1.20%
2401	01/02/2014	58.55	58.70	58.75	58.35	10.76M	-0.26%

2402 rows × 7 columns

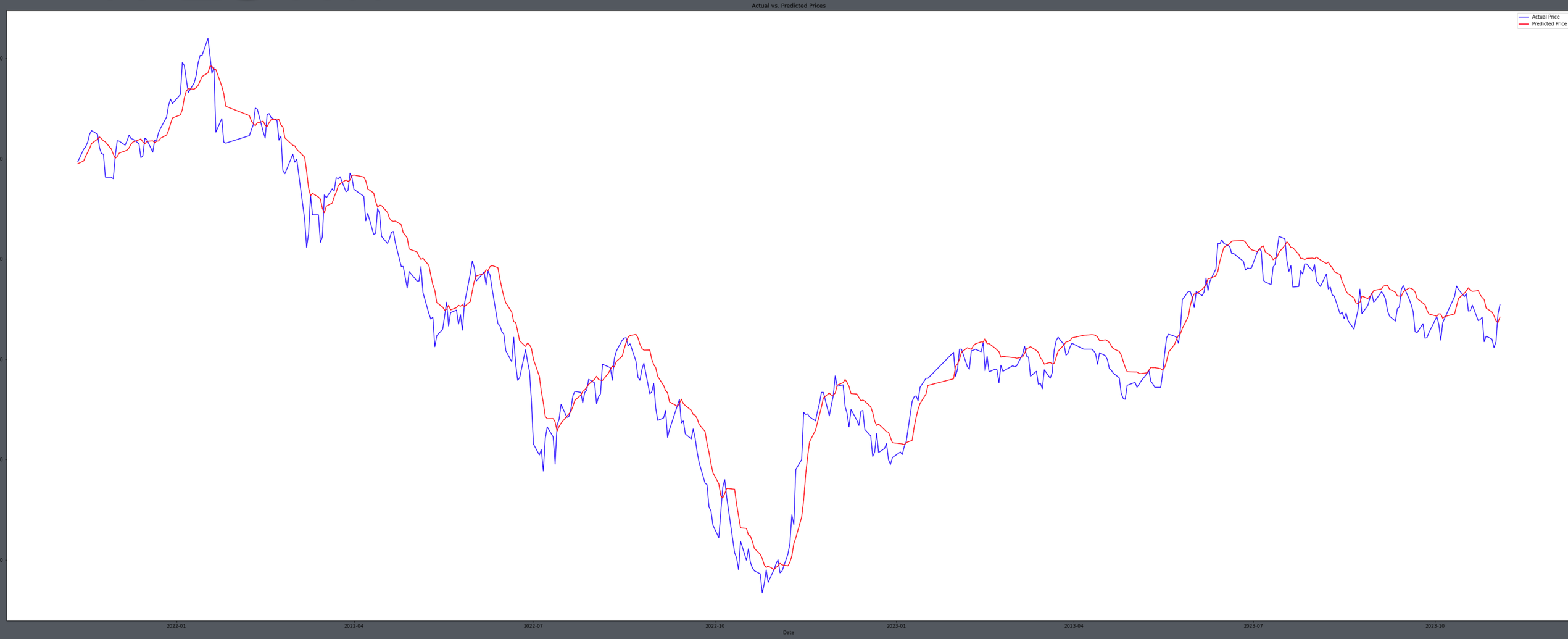
原始資料格式

1. LSTM

- Using data from the past ten days as the training set for each training.
- ```
  # 設定時間窗口大小
  time_steps = 10
  ```
- The first 80% of the data is the training set.
- ```
  # 分割訓練集和測試集
  train_size = int(len(X) * 0.8)
  test_size = len(X) - train_size
  trainX, testX = X[0:train_size], X[train_size:len(X)]
  trainY, testY = y[0:train_size], y[train_size:len(y)]
  ```

1. LSTM

- R2 Score: 0.9535430373937358
- RMSE: 2.4544517600216915



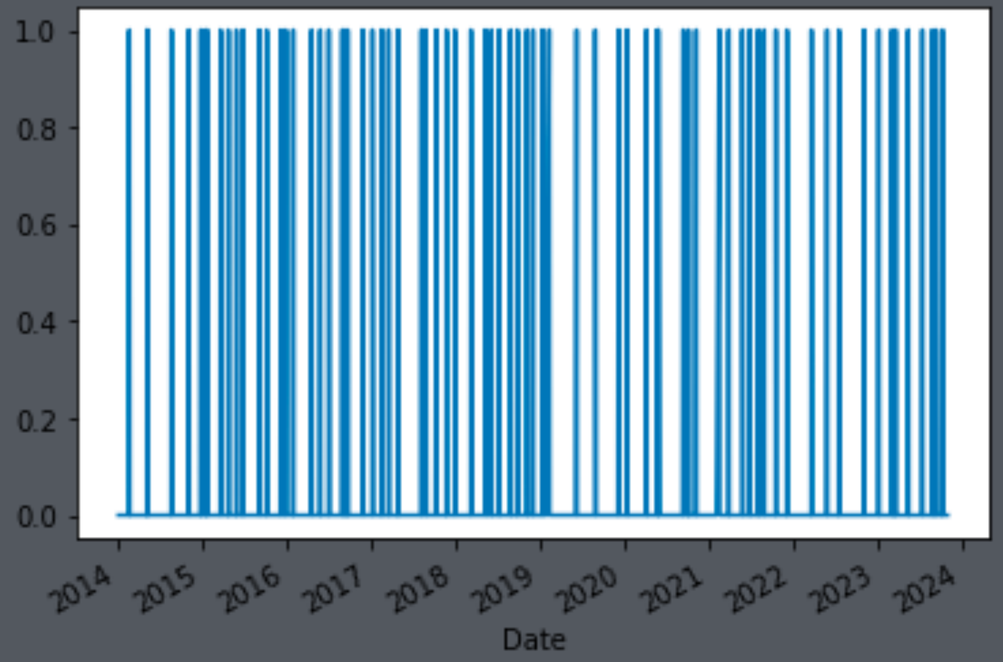
實際價格及預測走勢圖

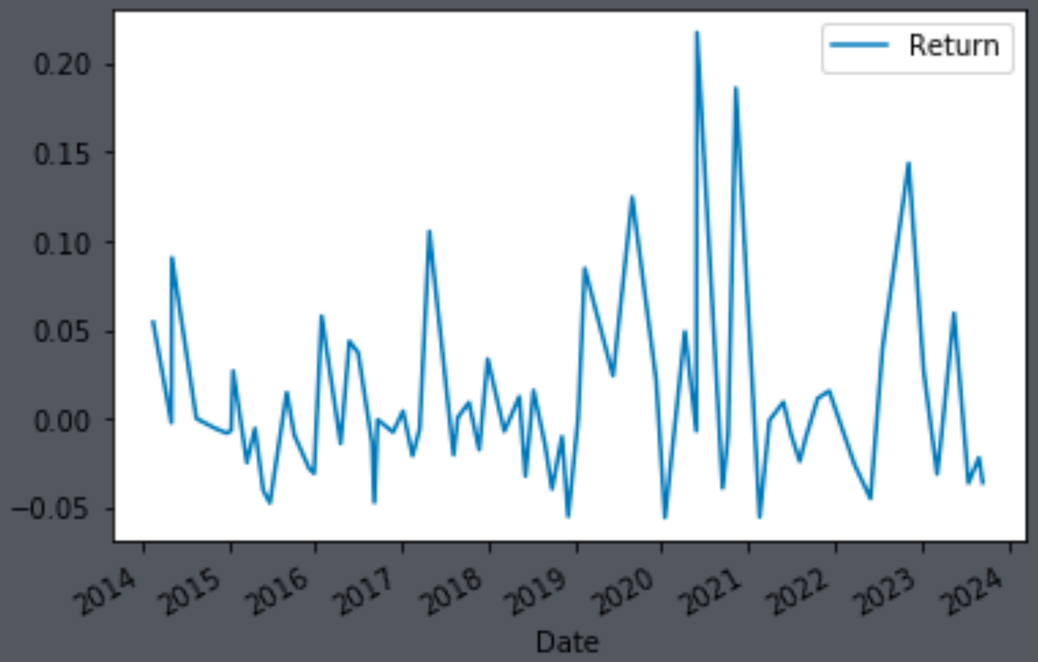
2. Golden Cross

- Moving Average Parameters: Short = 5, Long = 20
- Total Return Rate of Backtesting Analysis: 62.48%

原始資料走向圖

長短均線





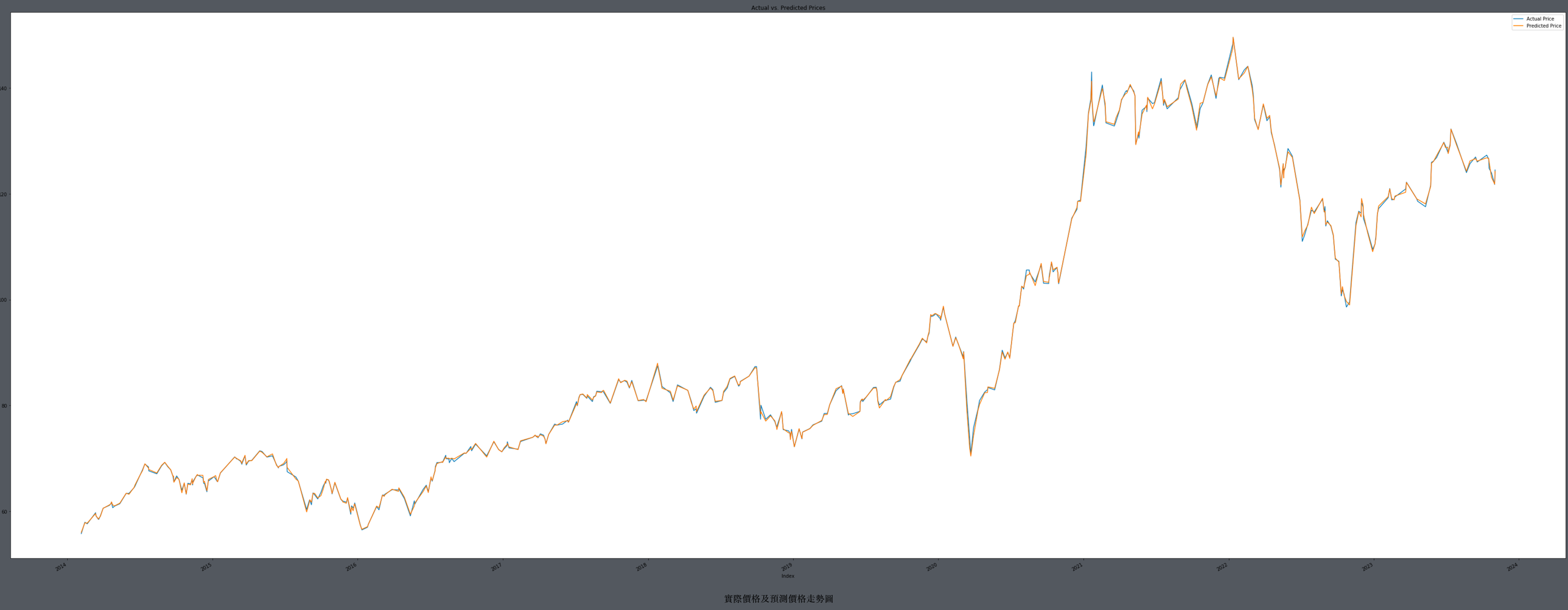
3. Machine Learning

- 80% of the data is the training set, and 20% is the test set

```
# 將資料分為訓練和測試集
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

3. Machine Learning

- R2 Score: 0.9997980640298204
- Issue: No concept of time series



實際價格及預測價格走勢圖

Future Work

- Seek higher trading returns.
  - Incorporating stock market observations.
  - Integrating prediction / trading methods.

References

- https://wealth.businessweekly.com.tw/GArticle.aspx?id=ARTL000091498&p=1
- https://github.com/nickmccullum/algorithmic-trading-python
- Python Programming for Finance
- How to Backtest your First Trading Strategy in Python
- https://medium.com/overfitted-microservices/looking-for-correlations-in-the-stock-market-1b90bd438745

Thanks For Concentration