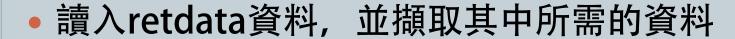
Fama三因子模型

讀入資料



```
import pandas as pd

stock=pd.read_csv('retdata.csv',sep='\t')
stock.head(n=3)
```

| | Date | Hon Hai Precision | TSMC | Uni-President |
|---|------------|-------------------|---------|---------------|
| 0 | 2014-01-02 | 0.3745 | -0.9479 | 0.5587 |
| 1 | 2014-01-03 | -1.2438 | -1.9139 | -0.9259 |
| 2 | 2014-01-06 | -0.5038 | 0.0000 | 0.0000 |

```
stock.index = pd.to_datetime(stock.Date)
UniPresident = stock.iloc[:,3]
UniPresident.head(n=3)
```

```
Date
2014-01-02 0.5587
2014-01-03 -0.9259
2014-01-06 0.0000
```

Name: Uni-President, dtype: float64

讀入三因子資料

#讀入三因子資料

factors=pd.read_csv('factors.csv')
factors.head(n=3)

| | Security Name | CoName | YY/MM/DD | Market Risk Premium | Size Factor (3 Factor) | Book to Market Factor | Risk-free Interest Rate |
|---|---------------|-------------------------------|------------|---------------------|------------------------|-----------------------|-------------------------|
| 0 | Z8888 | TSEC+GreTai Non-Banking index | 2014/01/02 | 0.0145 | 0.7197 | 0.3039 | 1.355 |
| 1 | Z8888 | TSEC+GreTai Non-Banking index | 2014/01/03 | -0.5858 | 0.6868 | 1.0533 | 1.355 |
| 2 | Z8888 | TSEC+GreTai Non-Banking index | 2014/01/06 | -0.4534 | 0.5783 | 0.4498 | 1.355 |

```
factors.index =pd.to_datetime(factors['YY/MM/DD'])
factors.columns
```

將年無風險利率轉化成日無風險利率

#將年無風險利率轉化成日無風險利率

factors['Risk-free Interest Rate']=(factors['Risk-free Interest Rate']**(1/360)-1)*100
factors.head(n=3)

| 0.3039 |
|--------|
| 1.0533 |
| 0.4498 |
| |

合併個股收益率數據與因子收益率數據,並計算統一股票的超額收益率

data=pd.concat([UniPresident,factors.iloc[:,1:]],axis=1).dropna()
data.tail(n=3)

| | Uni- President | CoName | YY/MM/DD | Market Risk Premium | Si |
|----------------|-------------------|-------------------------------|------------|------------------------|----|
| 2014-12- 29 | 1.1134 | TSEC+GreTai Non-Banking index | 2014/12/29 | 0.7341 | |
| 2014-12- 30 | 0.1001 | TSEC+GreTai Non-Banking index | 2014/12/30 | -0.1990 | |
| 2014-12- 31 | 0.4000 | TSEC+GreTai Non-Banking index | 2014/12/31 | 0.4774 | |

```
data['Uni-President'] = data['Uni-President'] - data['Risk-free Interest Rate']
data['Uni-President']
              2.611555
2014-01-02
2014-01-03
              1.126955
2014-01-06
              2.052855
2014-01-07
              1.865955
2014-01-08
              1.678355
2014-12-26
              2.052855
2014-12-27
             2.052855
2014-12-29
              3.166255
2014-12-30
              2.152955
2014-12-31
              2.452855
Name: Uni-President, Length: 248, dtype: float64
```

跑迴歸模型

| | coef | std err | t | P> t | [0.025 | 0.975] |
|------------------------|---------|---------|--------|-------|--------|--------|
| const | -0.0330 | 0.076 | -0.433 | 0.665 | -0.183 | 0.117 |
| Market Risk Premium | 1.0794 | 0.112 | 9.622 | 0.000 | 0.858 | 1.300 |
| Size Factor (3 Factor) | -0.0568 | 0.159 | -0.357 | 0.722 | -0.371 | 0.257 |
| Book to Market Factor | -0.0142 | 0.208 | -0.068 | 0.946 | -0.424 | 0.396 |

 Omnibus:
 46.399
 Durbin-Watson:
 2.153

 Prob(Omnibus):
 0.000
 Jarque-Bera (JB):
 344.846

 Skew:
 0.435
 Prob(JB):
 1.31e-75

 Kurtosis:
 8.711
 Cond. No.
 2.88

利用params提取模型係數

#*利用params 提取模型係數* result.params

const -0.032954
Market Risk Premium 1.079372
Size Factor (3 Factor) -0.056831
Book to Market Factor -0.014195
dtype: float64