Stock_Burke_Ratio_Chart

September 29, 2021

1 Stock Burke Ratio Chart

[1]:
```
# Library
import pandas as pd
import numpy as np
import math
import matplotlib.pyplot as plt

import warnings
warnings.filterwarnings("ignore")

from pandas_datareader import data as pdr
import yfinance as yf
yf.pdr_override()
```

[2]:
```
start = '2019-01-01' #input
end = '2020-07-01' #input
symbol1 = '^GSPC' #input
symbol2 = 'AMD' #input
```

[3]:
```
market = yf.download(symbol1, start=start, end=end)['Adj Close']
stocks = yf.download(symbol2, start=start, end=end)['Adj Close']
```

```
[**********************100%**********************]  1 of 1 completed
[**********************100%**********************]  1 of 1 completed
```

[4]:
```
market_returns = market.pct_change().dropna()
stocks_returns = stocks.pct_change().dropna()
```

[5]:
```
# risk free
rf = yf.download('BIL', start=start, end=end)['Adj Close'].pct_change()[1:]
```

```
[**********************100%**********************]  1 of 1 completed
```

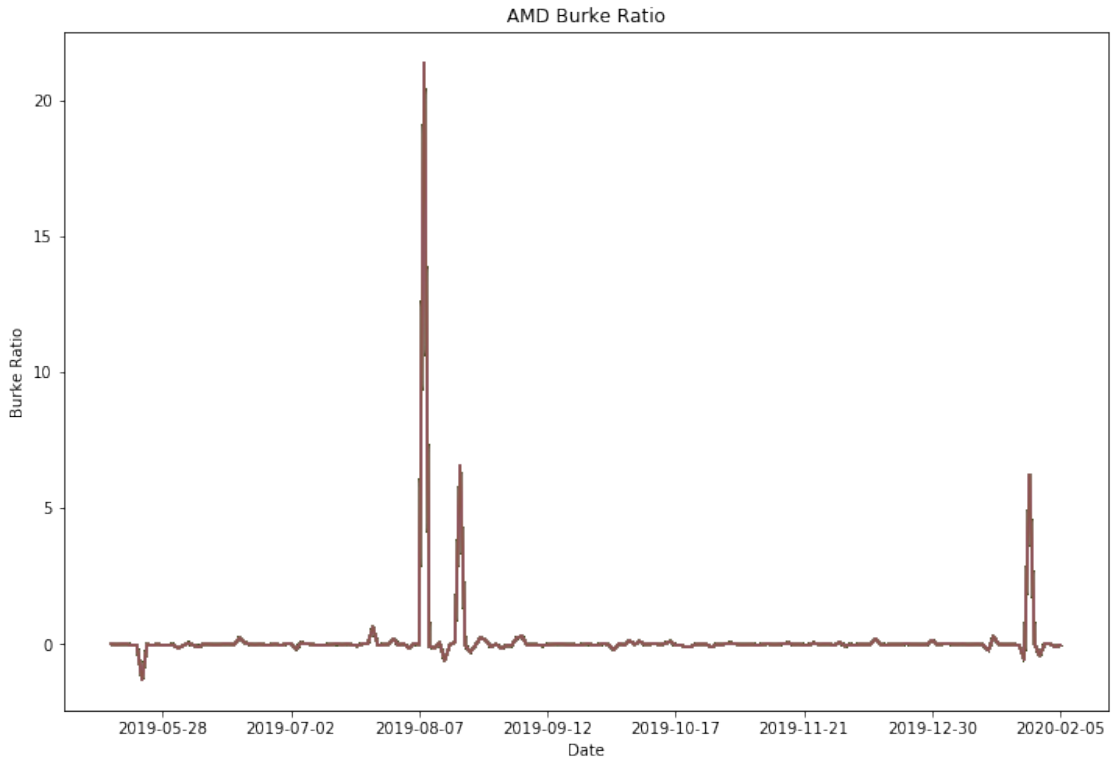
[6]:
```
def burke_ratio(stocks_returns, market_returns):
    mrk_rate_ret = (market_returns[-1] - market_returns[0])/ market_returns[0]
    m = np.matrix([stocks_returns, market_returns])
    beta = np.cov(m)[0][1] / np.std(market_returns)
```

```
    er = rf + beta*(mrk_rate_ret-rf)
    average_dd_squared = 1.0 - ((stocks_returns / np.maximum.
 ↪accumulate(stocks_returns)).mean())**2
    round_average_dd = round(average_dd_squared,4)
    burke_r = (er - rf) /math.sqrt(abs(round_average_dd))
    return burke_r
```

[7]:
```
# Compute the running Burke ratio
running = [burke_ratio(stocks_returns[i-90:i], market_returns[i-90:i]) for i in␣
 ↪range(90, len(stocks_returns))]

# Plot running Burke ratio up to 100 days before the end of the data set
_, ax1 = plt.subplots(figsize=(12,8))
ax1.plot(range(90, len(stocks_returns)-100), running[:-100])
ticks = ax1.get_xticks()
ax1.set_xticklabels([stocks.index[int(i)].date() for i in ticks[:-1]]) # Label␣
 ↪x-axis with dates
plt.title(symbol2 + ' Burke Ratio')
plt.xlabel('Date')
plt.ylabel('Burke Ratio')
```

[7]:
```
Text(0, 0.5, 'Burke Ratio')
```



[8]:
```
BR = burke_ratio(stocks_returns, market_returns)
BR
```

[8]:
```
Date
2019-01-03   -0.038631
2019-01-04   -0.038626
2019-01-07   -0.038623
2019-01-08   -0.038623
2019-01-09   -0.038623
2019-01-10   -0.038626
2019-01-11   -0.038628
2019-01-14   -0.038621
2019-01-15   -0.038628
2019-01-16   -0.038626
2019-01-17   -0.038628
2019-01-18   -0.038623
2019-01-22   -0.038626
2019-01-23   -0.038623
2019-01-24   -0.038631
2019-01-25   -0.038621
2019-01-28   -0.038626
2019-01-29   -0.038623
2019-01-30   -0.038628
2019-01-31   -0.038623
2019-02-01   -0.038625
2019-02-04   -0.038626
2019-02-05   -0.038623
2019-02-06   -0.038628
2019-02-07   -0.038623
2019-02-08   -0.038628
2019-02-11   -0.038621
2019-02-12   -0.038628
2019-02-13   -0.038623
2019-02-14   -0.038628
                 …
2020-05-19   -0.038623
2020-05-20   -0.038623
2020-05-21   -0.038626
2020-05-22   -0.038621
2020-05-26   -0.038626
2020-05-27   -0.038621
2020-05-28   -0.038623
2020-05-29   -0.038623
2020-06-01   -0.038626
2020-06-02   -0.038623
2020-06-03   -0.038623
2020-06-04   -0.038623
```

```
2020-06-05   -0.038618
2020-06-08   -0.038626
2020-06-09   -0.038623
2020-06-10   -0.038626
2020-06-11   -0.038618
2020-06-12   -0.038628
2020-06-15   -0.038623
2020-06-16   -0.038623
2020-06-17   -0.038623
2020-06-18   -0.038621
2020-06-19   -0.038623
2020-06-22   -0.038623
2020-06-23   -0.038623
2020-06-24   -0.038623
2020-06-25   -0.038626
2020-06-26   -0.038621
2020-06-29   -0.038623
2020-06-30   -0.038623
Name: Adj Close, Length: 376, dtype: float64
```

[9]:
```
BR.plot(figsize=(12,8), title = symbol2 + ' Burke Ratio')
plt.axhline(y=BR.mean(), color='r', linestyle='-')
plt.xlabel('Date')
plt.ylabel('Burke Ratio')
```

[9]:
```
Text(0, 0.5, 'Burke Ratio')
```