HW4_analysis_runner

January 2, 2022

1 HW4_analysis_runner

[1]:
```
import papermill as pm
import scrapbook as sb
import pandas as pd
from datetime import datetime, timedelta
import os
```

```
C:\ProgramData\Anaconda3\lib\site-packages\papermill\iorw.py:50: FutureWarning:
pyarrow.HadoopFileSystem is deprecated as of 2.0.0, please use
pyarrow.fs.HadoopFileSystem instead.
  from pyarrow import HadoopFileSystem
```

Run the template notebook across all tokens in the database and the last 2 complete weeks in the data base.

[2]:
```
#Read all data from data/data.db in order to get list of tokens and find the␣
 ↪last two complete weeks
db = pd.read_sql(f'''
SELECT
    *
FROM ohlc
''', 'sqlite:///data/data.db')
db['ts'] = pd.to_datetime(db['ts'])

db.set_index('ts', inplace=True)

db.iloc[-1:]
```

[2]:
```
              open    high    low   close   volume    volumeUSD token chain
ts
2021-12-15  185.07  185.78  184.5  184.89  335.307  62142.63926  COMP   ETH
```

[3]:
```
def last_dow(d: datetime, dow: int) -> datetime:
    '''
    Gets the date of the last day of week, using datetime convention of Monday␣
 ↪is 0 and Sunday is 6
    '''
    dow_d = d.weekday()
    days_delta = (7 - dow) + dow_d if dow_d < dow else dow_d - dow
    return d - timedelta(days=days_delta)
```

```
[4]: # The last two complete weeks are from 2021-11-29 to 2021-12-12
run_dates = [(last_dow(datetime(2021, 12, 1), 2) + timedelta(days=14 * x)) for␣
 ↪x in range(1)]
tokens = db['token'].unique().tolist()
connection_string = 'sqlite:///data/data.db'
```

```
[5]: # Outputs are saved in HW4_outputs
base_output_folder = os.path.expanduser('HW4_outputs')

if not os.path.exists(base_output_folder):
        os.makedirs(base_output_folder)
```

```
[6]: # There is a problem on my end to save file with names similar to those in␣
 ↪lecture examples. As a result I simplified to token name.
for run_date in run_dates:
    for token in tokens:
        print(f'running for {token} for date {run_date} to {run_date +␣
 ↪timedelta(days=14)}', end='\r')
        res = pm.execute_notebook(
            'HW4_analysis_template.ipynb',
            f'{base_output_folder}/{token}.ipynb',
            parameters = {
                'from_date': f'{run_date}',
                'to_date': f'{run_date + timedelta(days=14)}',
                'token': token,
                'connection_string': connection_string
            }
        )
```

```
running for BTC for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for ETH for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for USDT for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for SOL for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for ADA for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]
```

```
running for DOT for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for AVAX for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for ATOM for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for CRV for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for AAVE for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]

running for COMP for date 2021-12-01 00:00:00 to 2021-12-15 00:00:00

Executing:   0%|          | 0/20 [00:00<?, ?cell/s]
```

Summarize avg hourly return by run, avg volatility by run, maximum drawdown over the entire period of each run, range of last close price - first close price in a single DataFrame.

[7]:

```
nbs = sb.read_notebooks('HW4_outputs')
```

[8]:

```
pd.DataFrame([
    pd.Series({
        'token': scrap['token'].data,
        'from_date': scrap['from_date'].data,
        'to_date': scrap['to_date'].data,
        'hourly return': scrap['prices'].data['hourly return'].mean(),
        'hourly vol': scrap['prices'].data['hourly vol'].mean(),
        'MDD': scrap['prices'].data['MDD'][-1],
        'Range of last close price - first close price': scrap['prices'].
 ↪data['close'][-1] - scrap['prices'].data['close'][0]})
    for book, scrap in nbs.notebook_scraps.items()
])
```

[8]:

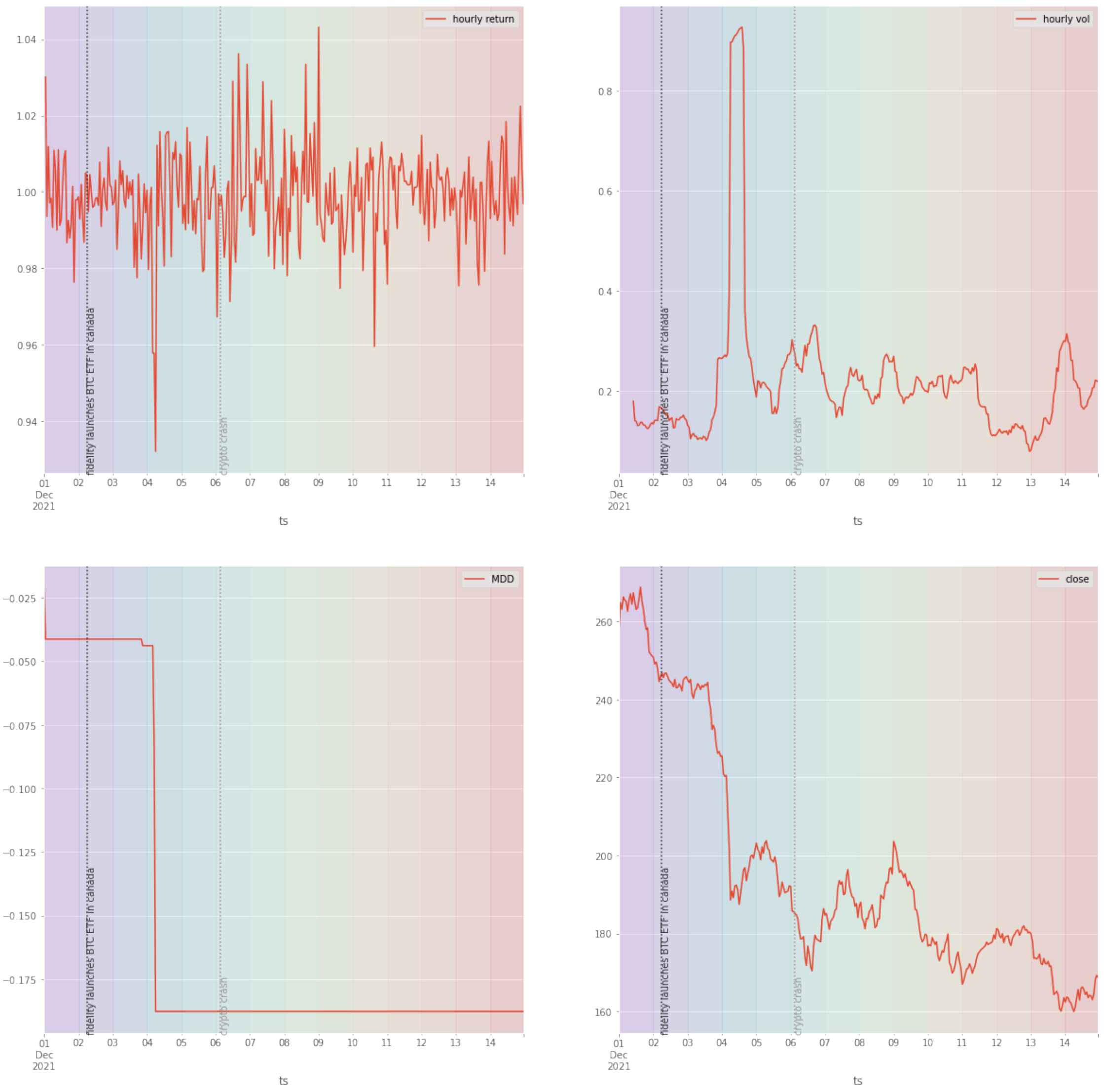
```
  token           from_date             to_date  hourly return  hourly vol  \
0  AAVE 2021-12-01 00:00:00 2021-12-15 00:00:00       0.998815    0.216067
1   ADA 2021-12-01 00:00:00 2021-12-15 00:00:00       0.999450    0.224460
2  ATOM 2021-12-01 00:00:00 2021-12-15 00:00:00       0.999428    0.303370
3  AVAX 2021-12-01 00:00:00 2021-12-15 00:00:00       0.999118    0.283772
4   BTC 2021-12-01 00:00:00 2021-12-15 00:00:00       0.999534    0.157194
5  COMP 2021-12-01 00:00:00 2021-12-15 00:00:00       0.998865    0.234725
6   CRV 2021-12-01 00:00:00 2021-12-15 00:00:00       0.998994    0.324726
7   DOT 2021-12-01 00:00:00 2021-12-15 00:00:00       0.998974    0.248345
8   ETH 2021-12-01 00:00:00 2021-12-15 00:00:00       0.999479    0.177147
9   SOL 2021-12-01 00:00:00 2021-12-15 00:00:00       0.999281    0.248466
```

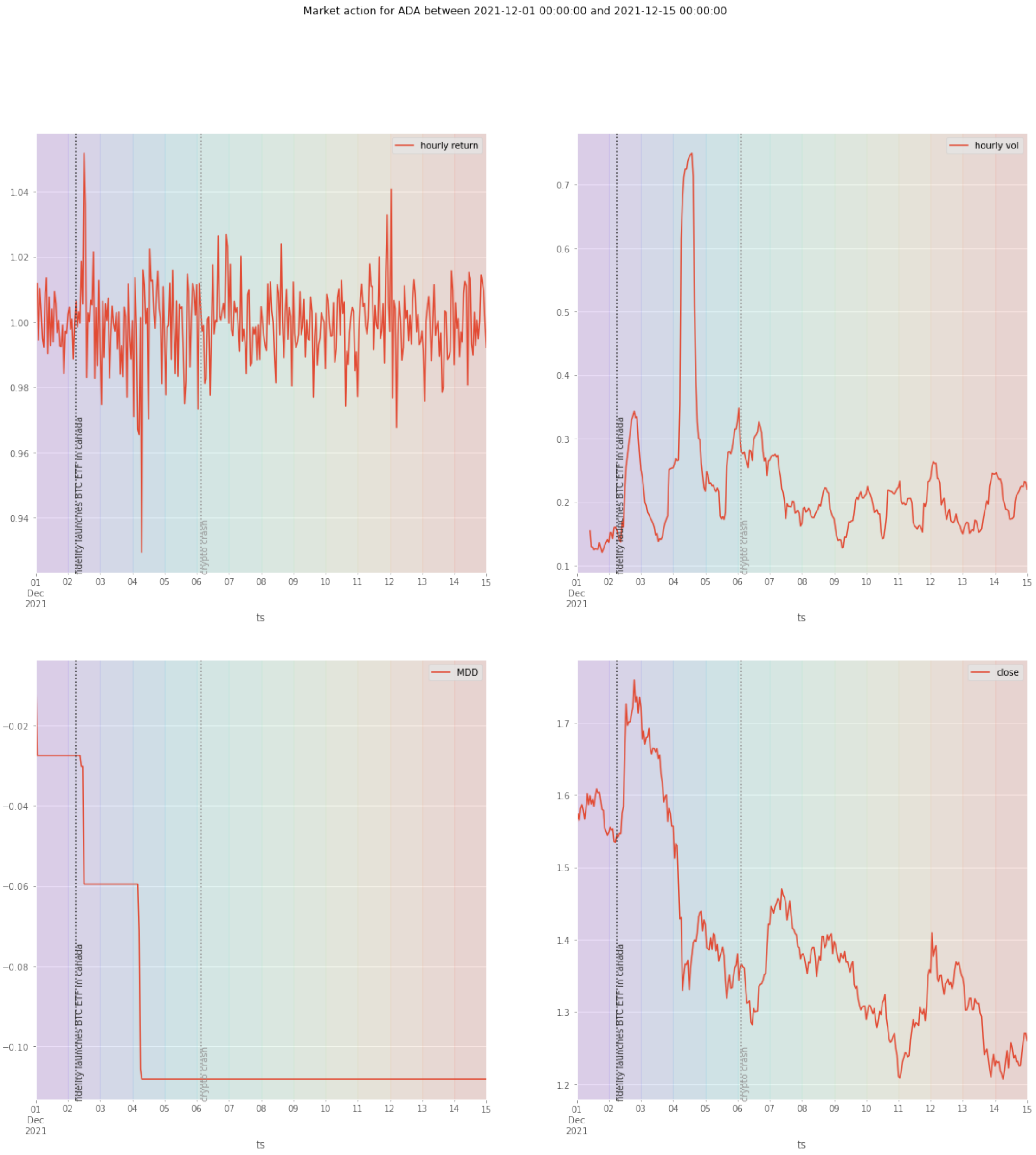
```
10  USDT  2021-12-01 00:00:00  2021-12-15 00:00:00       0.999999    0.010131

         MDD  Range of last close price - first close price
0  -0.187685                                       -88.3180
1  -0.108138                                        -0.2947
2  -0.166814                                        -5.8280
3  -0.145482                                       -35.1400
4  -0.163526                                     -8768.8800
5  -0.152001                                       -93.6200
6  -0.195640                                        -1.6295
7  -0.165718                                       -11.8820
8  -0.114836                                      -796.9200
9  -0.112899                                       -49.3260
10 -0.023415                                        -0.0003
```

[9]:

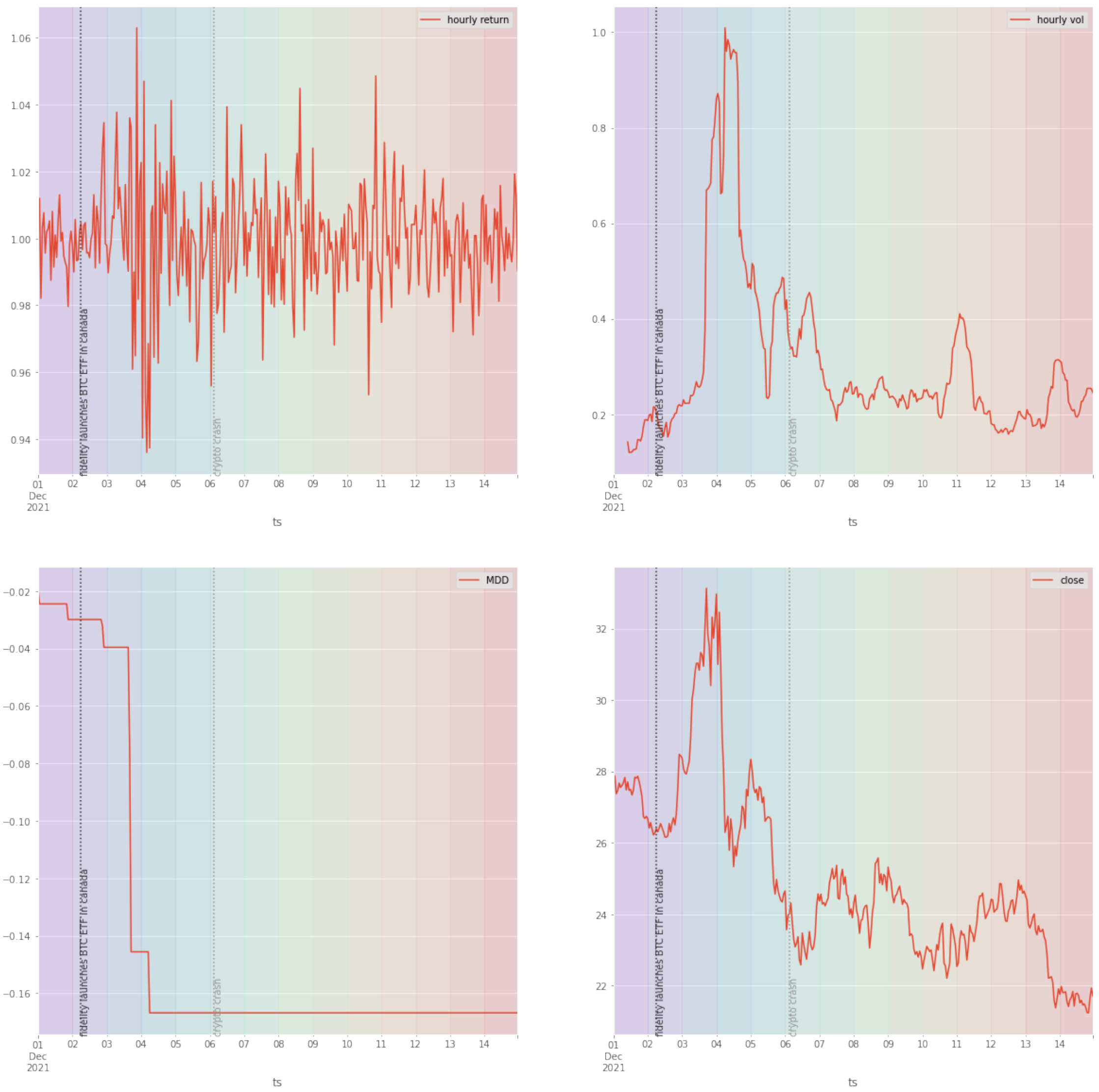
```
[nbs[nb_name].reglue('summary_plot') for nb_name in nbs]
```

Market action for AAVE between 2021-12-01 00:00:00 and 2021-12-15 00:00:00

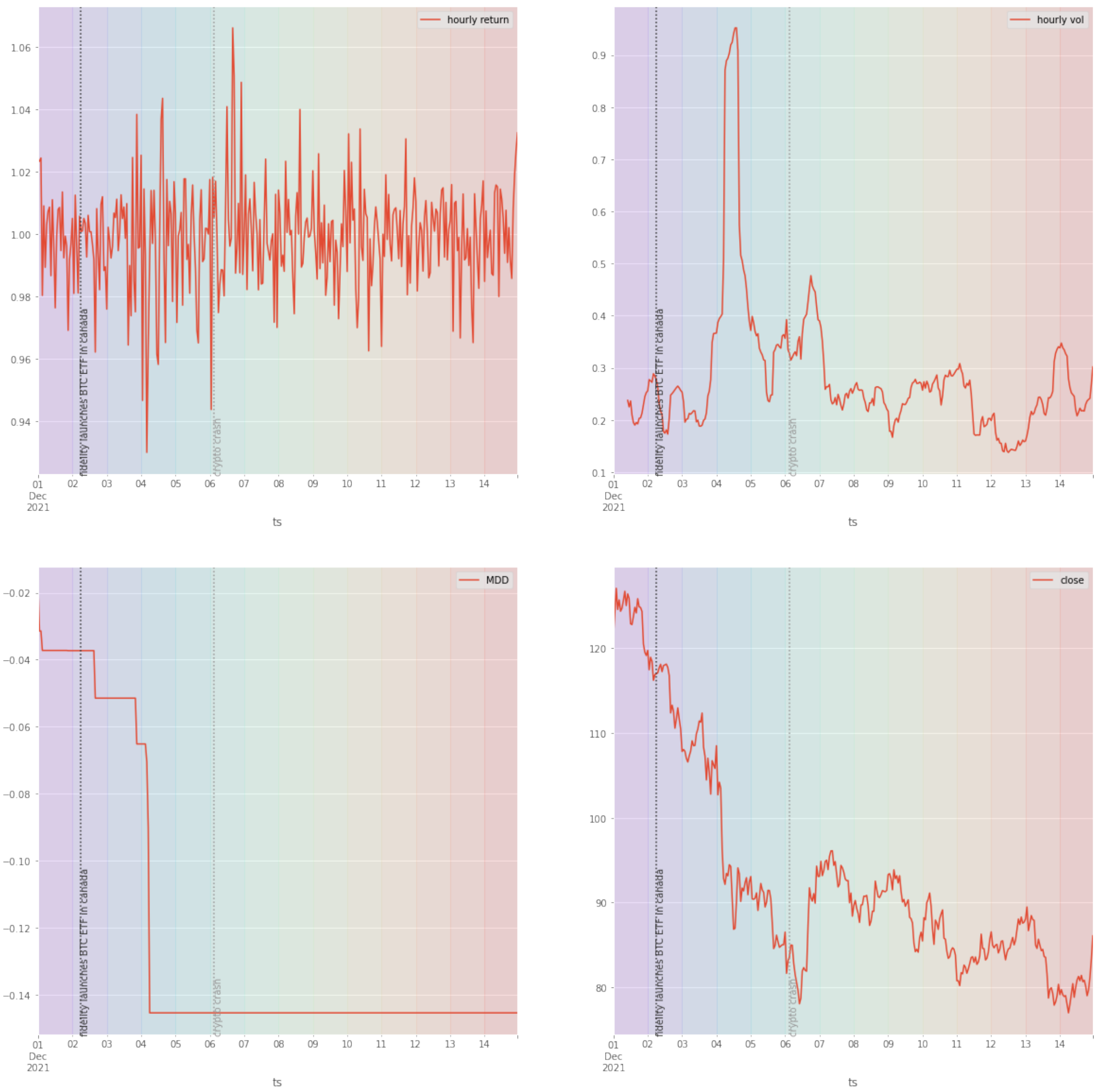



Market action for ADA between 2021-12-01 00:00:00 and 2021-12-15 00:00:00
hourly return
1.04
1.02
1.00
0.98
0.96
0.94
fidelity launches BTC ETF in canada
crypto crash
01 Dec 2021
02
03
04
05
06
07
08
09
10
11
12
13
14
15
ts
hourly vol
0.7
0.6
0.5
0.4
0.3
0.2
0.1
fidelity launches BTC ETF in canada
crypto crash
01 Dec 2021
02
03
04
05
06
07
08
09
10
11
12
13
14
15
ts
MDD
−0.02
−0.04
−0.06
−0.08
−0.10
fidelity launches BTC ETF in canada
crypto crash
01 Dec 2021
02
03
04
05
06
07
08
09
10
11
12
13
14
15
ts
close
1.7
1.6
1.5
1.4
1.3
1.2
fidelity launches BTC ETF in canada
crypto crash
01 Dec 2021
02
03
04
05
06
07
08
09
10
11
12
13
14
15
ts

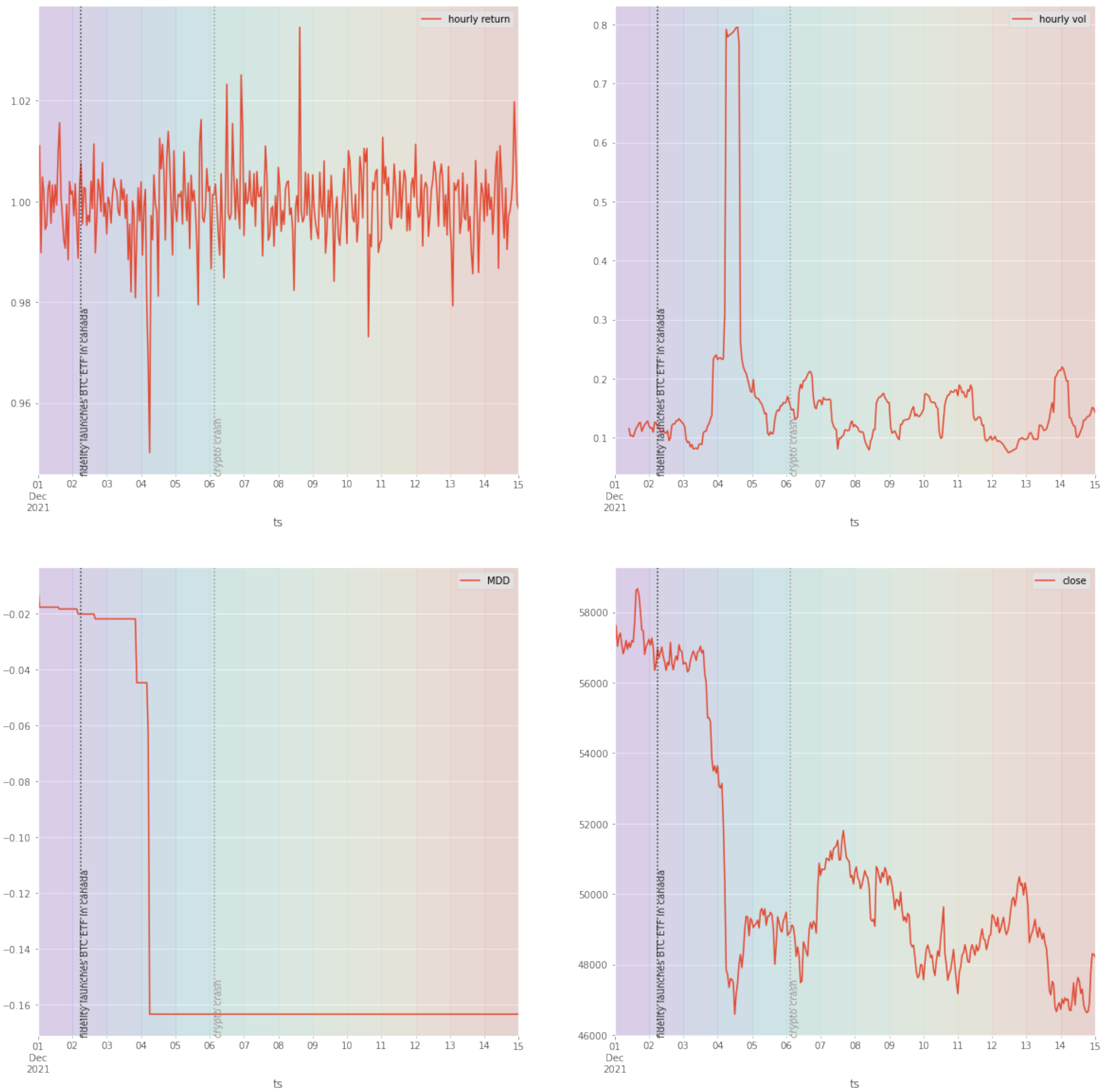
Market action for ATOM between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



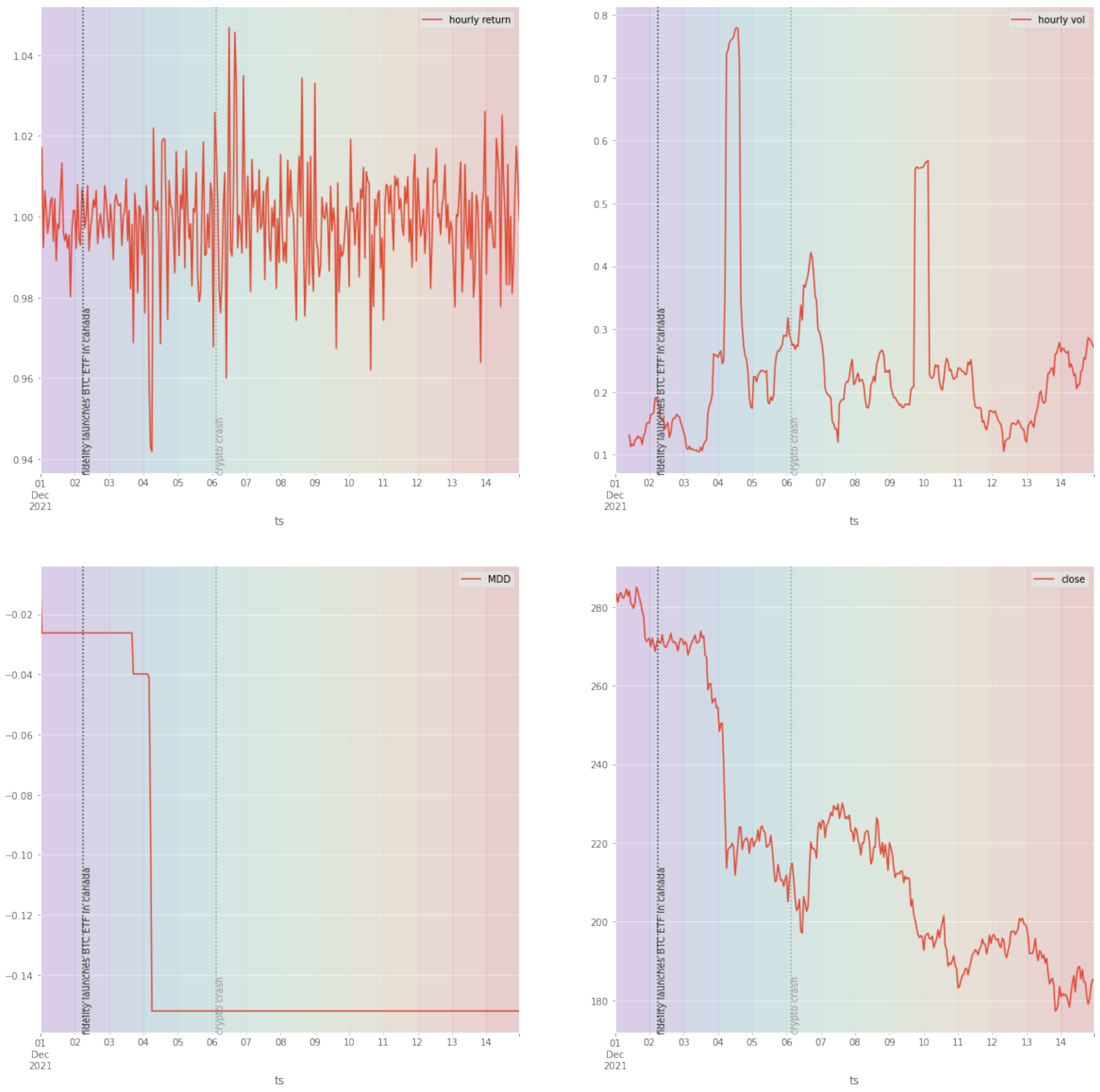
Market action for AVAX between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



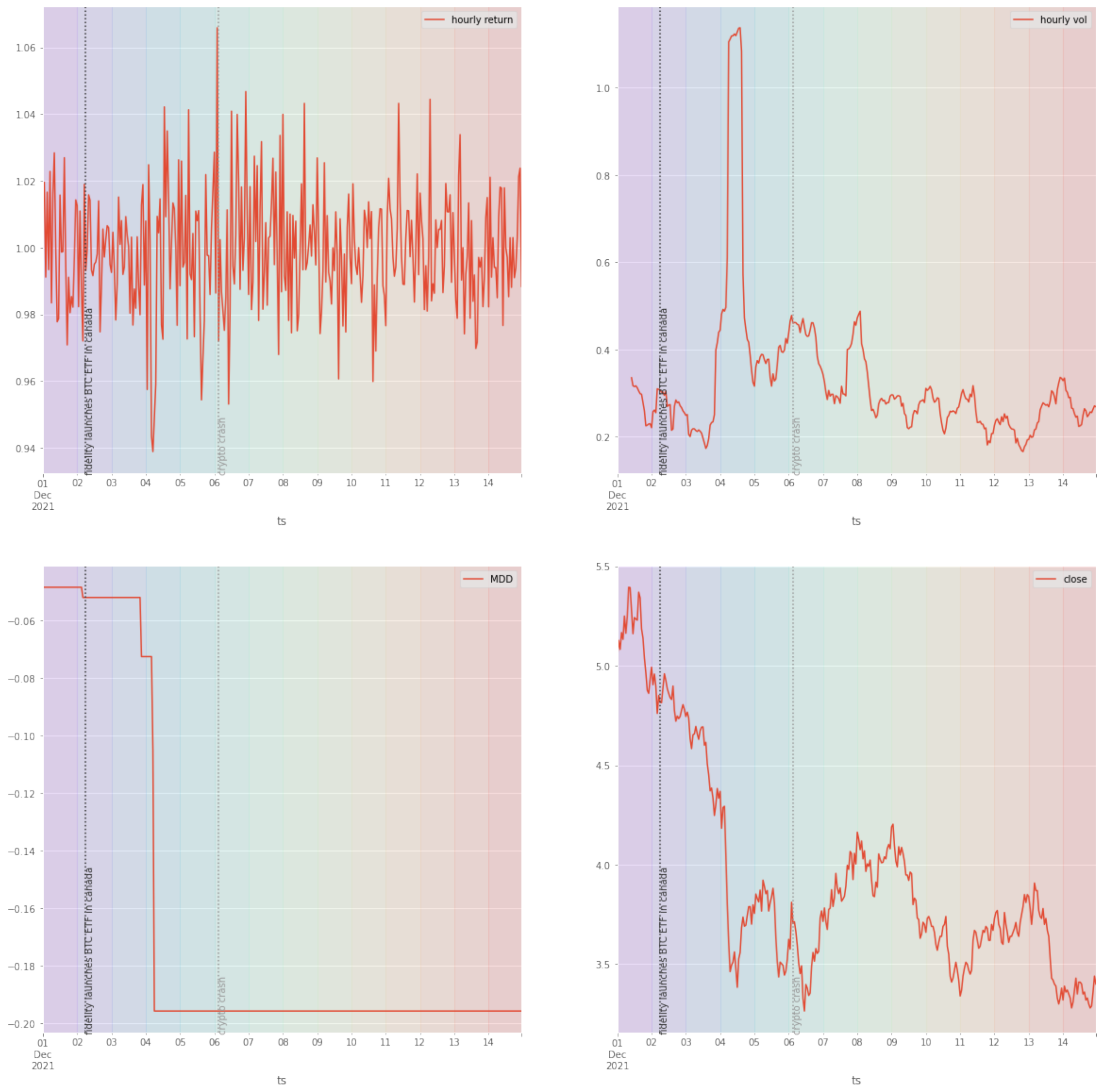
Market action for BTC between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



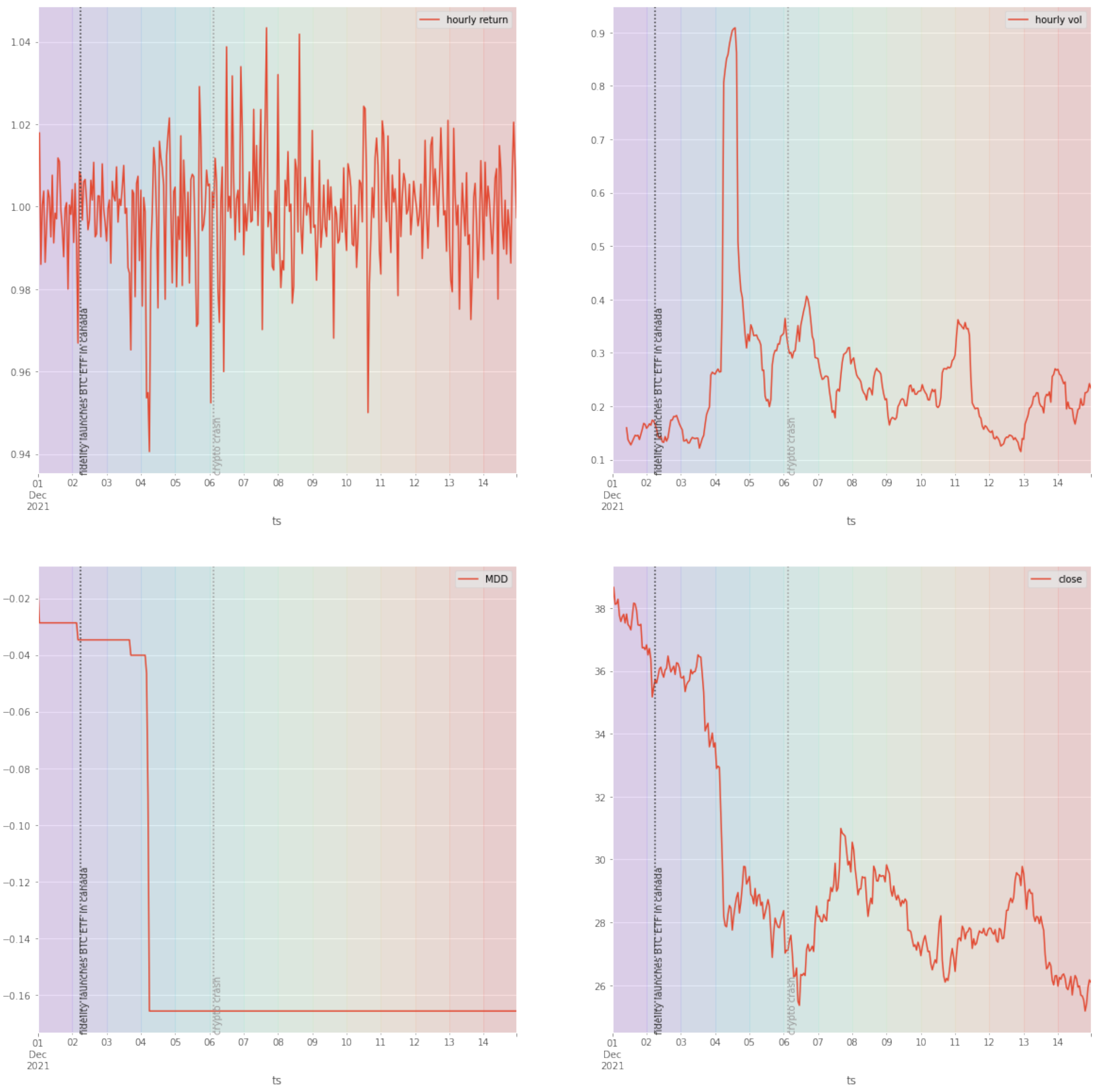
Market action for COMP between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



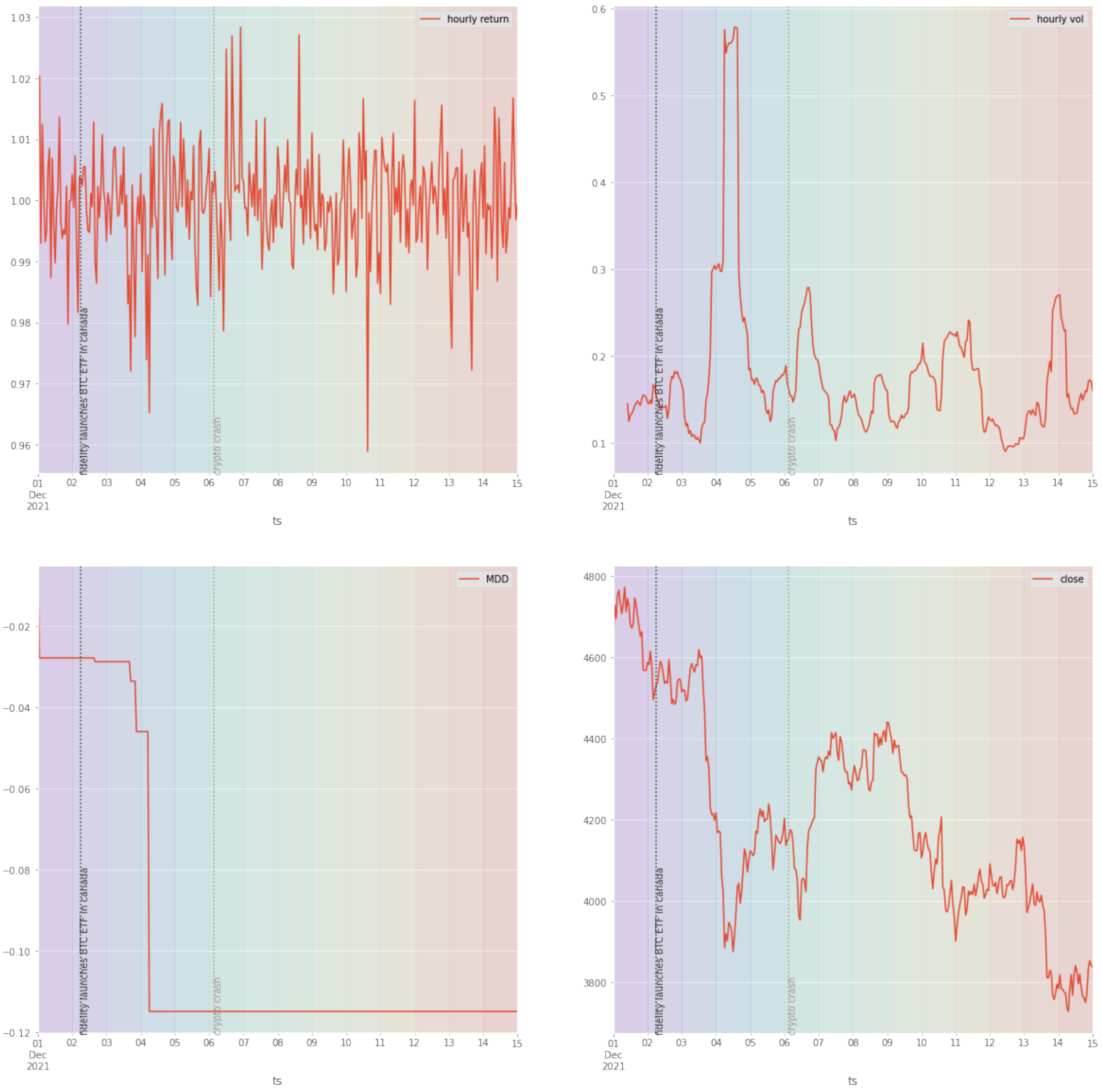
Market action for CRV between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



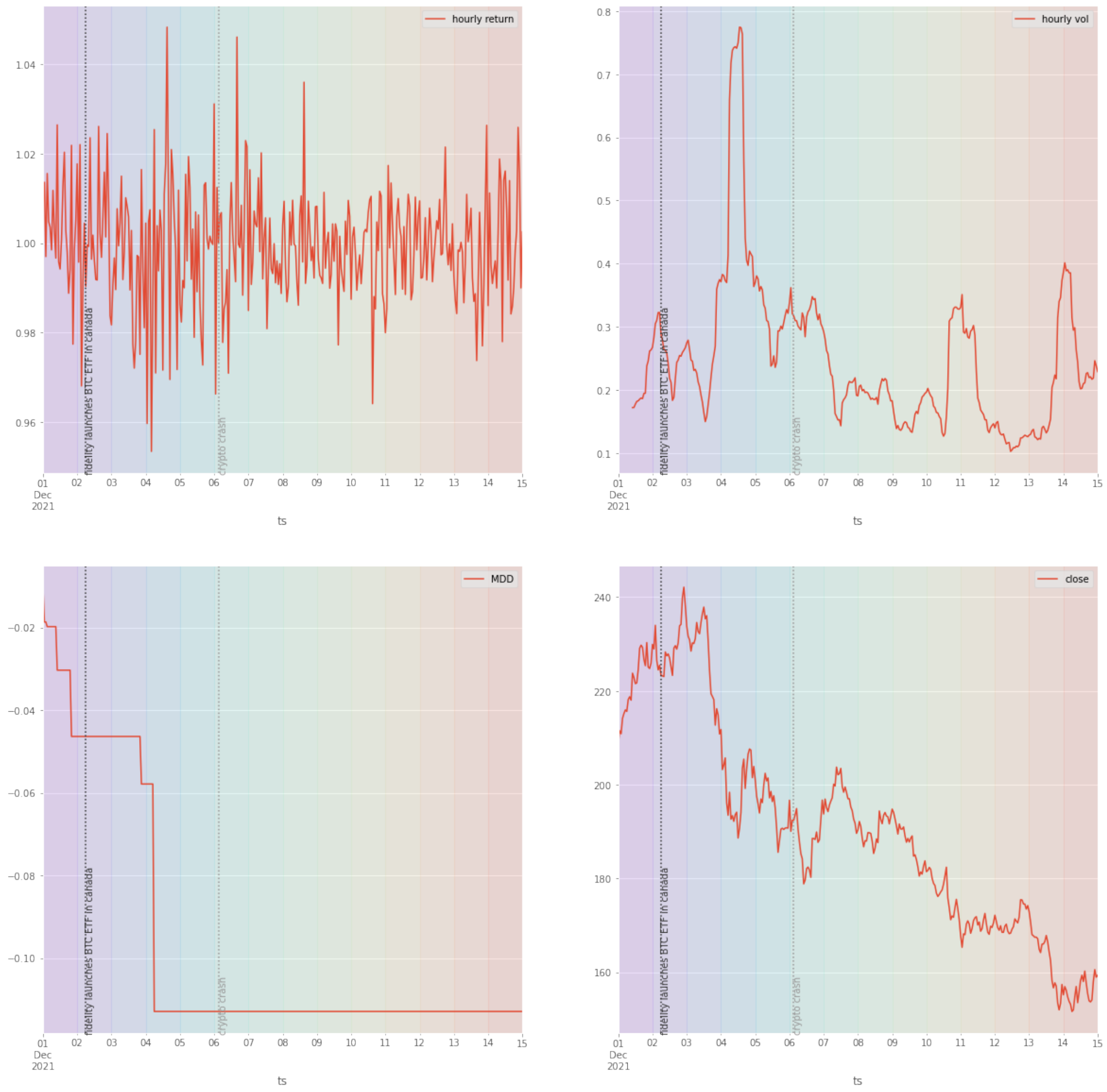
Market action for DOT between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



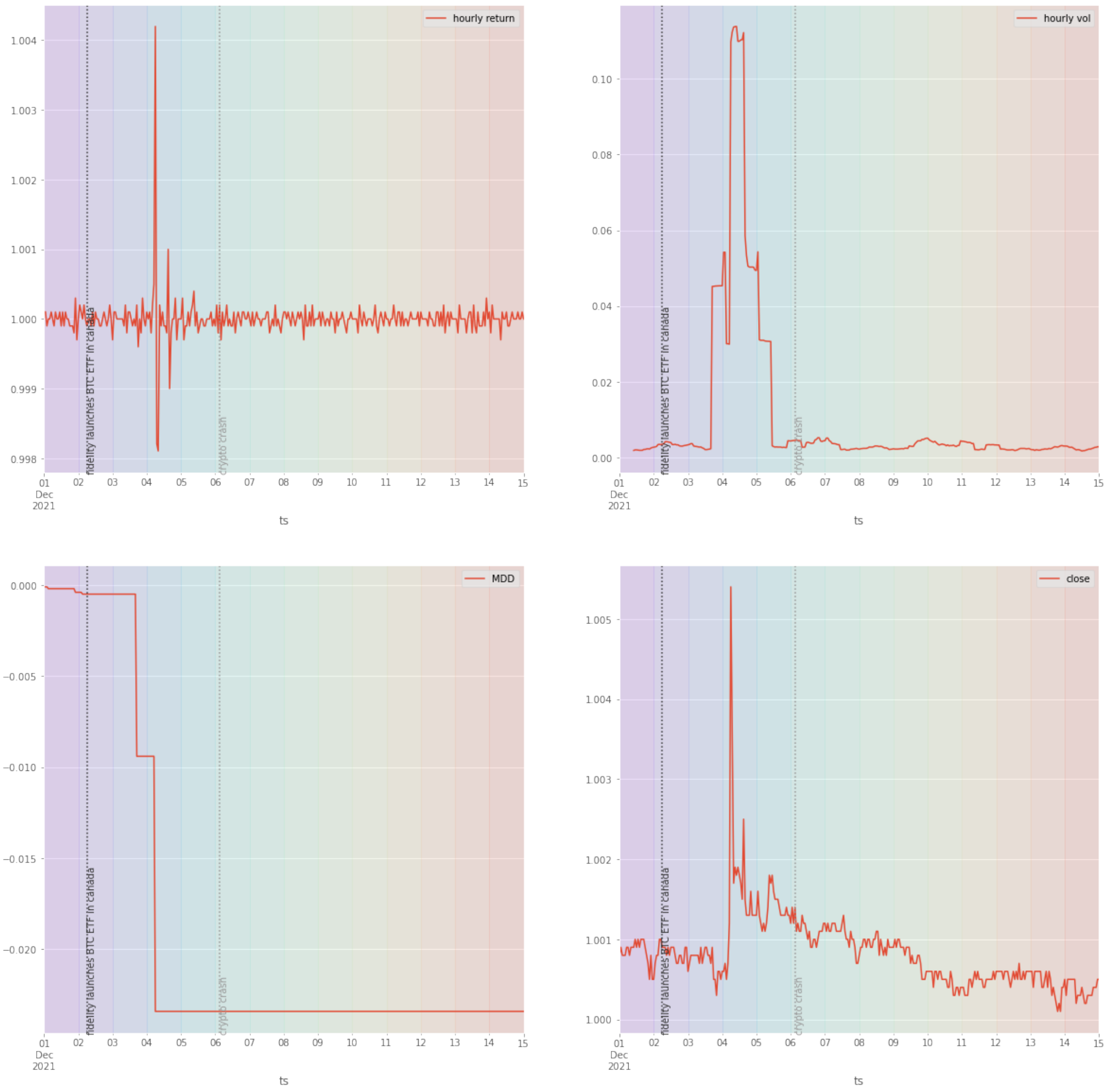
Market action for ETH between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



Market action for SOL between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



Market action for USDT between 2021-12-01 00:00:00 and 2021-12-15 00:00:00



```
[9]: [None, None, None, None, None, None, None, None, None, None, None]
```

```
[ ]:
```