Part I : Data collection

In this part we chose to download the data of 5 banks, BCP, BANK OF AFRICA , ATTIJARI, CIH and BMCI

In [15]:
```
file = open("bmci.aspx", "rt")
bmci = file.read()
file.close()

file = open("boa.aspx", "rt")
boa = file.read()
file.close()

file = open("tijari.aspx", "rt")
tijari = file.read()
file.close()

file = open("cih.aspx", "rt")
cih = file.read()
file.close()

file = open("bcp.aspx", "rt")
bcp = file.read()
file.close()
```

In [95]:

```
import csv
from bs4 import BeautifulSoup

def aspx_to_csv(name_aspx):
    #we open the file store the text in read_file then close the file
    file = open(name_aspx, "rt")
    read_file = file.read()
    file.close()

    #we transform it into beautiful soup then find all the the lines that has <span>
    file_soup = BeautifulSoup(read_file)

    find_all = file_soup.find_all("span")#We browsed the file
    #and found out that only span has the content so we will only use lines that has span

    max_len = len(find_all) #this variable will be used as stop condition for the FOR loop to browse the entire

    lst = []
    #We also found out that every 6 lines of find_all(span) we got another set of data so we decided to
    # get in every single loop 6 successive lines and make the loop jump by 6, for example in the first loop we
    # the content in line 0, 1, 2, 3, 4, 5 then second loop 0+6,1+6,2+6,3+6,4+6,5+6
    # for the first line we only get the text since it is just a date, for the other ones we get the text repla
    # the comma by a dot so we can transform the string into floats
    for i in range(0,max_len,6):
           lst.append([find_all[i].get_text(),
                       float(find_all[i+1].get_text().replace(',','.')),
                       float(find_all[i+2].get_text().replace(',','.')),
                       float(find_all[i+3].get_text().replace(',','.')),
                       float(find_all[i+4].get_text().replace(',','.')),
                       float(find_all[i+5].get_text().replace(',','.'))])
    #30.8 ms ± 1.89 ms per loop (mean ± std. dev. of 7 runs, 10 loops each)

    #this part of the code writes our data in a csv file
    cols= ['date','closing','adjusted','evolution','quantity','volume']
    name = name_aspx.replace('.aspx','')
    with open(name+'_csv.csv', 'w') as f:
        csv_writer = csv.writer(f)
        csv_writer.writerow(cols) #for the first line, columns
        csv_writer.writerows(lst) #for the other lines, data

```

In [22]:
```
bcp = BeautifulSoup(bcp)
max_len = len(bcp.find_all("span"))
max_len
```

Out[22]: 4524

In [23]:
```
%%timeit
bcp_find_all = bcp.find_all("span")
bcp_lst = []

for i in range(0,max_len,6):
       bcp_lst.append([bcp_find_all[i].get_text(),
                       float(bcp_find_all[i+1].get_text().replace(',','.')),
                       float(bcp_find_all[i+2].get_text().replace(',','.')),
                       float(bcp_find_all[i+3].get_text().replace(',','.')),
                       float(bcp_find_all[i+4].get_text().replace(',','.')),
                       float(bcp_find_all[i+5].get_text().replace(',','.'))])

```

12 ms ± 384 µs per loop (mean ± std. dev. of 7 runs, 100 loops each)

In [24]:
```
%%timeit
name = "bcp.aspx"
aspx_to_csv(name)
```

172 ms ± 2.27 ms per loop (mean ± std. dev. of 7 runs, 10 loops each)

Part II : Data processing

In [25]:
```
import csv
```

In [87]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import plotly.graph_objects as go
import plotly.offline as pyo

class Stock:

    def __init__(self,name):
        self.name = name
        aspx_to_csv(name+".aspx")
        self.data = pd.read_csv(name+'_csv.csv')

    def staticgraph(self):

        ''' this an instance method that graphs volumes in bars and value in a line'''

        fig, ax1 = plt.subplots(figsize=(8, 8))
        ax2 = ax1.twinx()
        ax1.bar(self.data.index,self.data['volume'],color='orange',label='volume')
        ax2.plot(self.data.index,self.data["adjusted"],color='blue',label='value')
        ax1.grid(zorder=0)
        plt.legend()
        plt.show()

    def staticgraph_Mm_Sma(self,m,nsma):

        ''' this an instance method that graphs volumes in bars
        and value, Momentum, Simple Moving Average in lines'''

        fig, ax1 = plt.subplots(figsize=(8, 8))
        ax2 = ax1.twinx()
        ax1.bar(self.data.index,self.data['volume'],color='orange',label='volume')
        ax2.plot(self.data.index,self.data["adjusted"],color='blue',label='value')
        ax1.grid(zorder=0)
        plt.plot(self.momentum(m),color='red',label='Momentum')
        plt.plot(self.sma(nsma),color='green',label='Moving Average')
        plt.legend()
        plt.show()


```

```
    def dynamicgraph(self):
        graph1 = go.Scatter(x=self.data.date, y=self.data.closing, name='Value')
        graph2 = go.Scatter(x=self.data.date, y=self.data.volume, name='Volume', yaxis='y2')
        data = [graph1, graph2]
        layout = go.Layout(title=self.name, xaxis=dict(title='Date'), yaxis=dict(title='Value'),
                           yaxis2=dict(title='Volume', overlaying='y', side='right'))
        # to add shared area of the date
        layout.update(shapes=[dict(type='rect',x0='2022-01-01',y0=0,x1='2022-12-31',y1=self.data["closing"].max
        fig = go.Figure(data=data, layout=layout)
        pyo.iplot(fig)

    def dynamicgraph_Mm_Sma(self,m,nsma):
        graph1 = go.Scatter(x=self.data.date, y=self.data.closing, name='Value')
        graph2 = go.Scatter(x=self.data.date, y=self.data.volume, name='Volume', yaxis='y2')
        graph3 = go.Scatter(x=self.data.date, y=self.momentum(m), name='Moving average (m)', line=dict(color='r
        graph4 = go.Scatter(x=self.data.date, y=self.sma(nsma), name='Simple moving average (sma)', line=dict(c
        data = [graph1, graph2, graph3, graph4]
        layout = go.Layout(title=self.name, xaxis=dict(title='Date'), yaxis=dict(title='Value'),
                           yaxis2=dict(title='Volume', overlaying='y', side='right'))
        # to add shared area of the date
        layout.update(shapes=[dict(type='rect',x0='2022-01-01',y0=0,x1='2022-12-31',y1=self.data["closing"].max
        fig = go.Figure(data=data, layout=layout)
        pyo.iplot(fig)

    def maximumValue(self):
        return self.data['adjusted'].max()

    def minimumValue(self):
        return self.data['adjusted'].max()

    def maximumVolume(self):
        return self.data['volume'].max()

    def maximumQuantity(self):
        return self.data['quantity'].max()

    def momentum(self,N):
        length = len(self.data)
        if type(N) is list:
            lst = []
            columns=[]
            for j in range(len(N)):
```

```
                m = []
                for i in range(0,length):
                    if i < N[j]:
                        continue
                    else:
                        m.append(self.data['closing'][i] - self.data['closing'][i-N[j]])

                lst.append(m)
            df = pd.DataFrame (lst, )
            return lst

        else:
            m= []
            for i in range(0,length):
                if i < N:
                    i=N
                else:
                    m.append(self.data['closing'][i] - self.data['closing'][i-N])
            df = pd.DataFrame (m, columns = ['Momentum N= '+str(N)])
            return df

    def sma(self,N):
        windows = self.data['closing'].rolling(N)

        ma = windows.mean()

        malst = ma.tolist()
        lst = malst[N - 1:]
        df = pd.DataFrame (lst, columns = ['SMA N= '+str(N)])
        return df



stock = Stock("bcp")
stock.data.head(6)
```

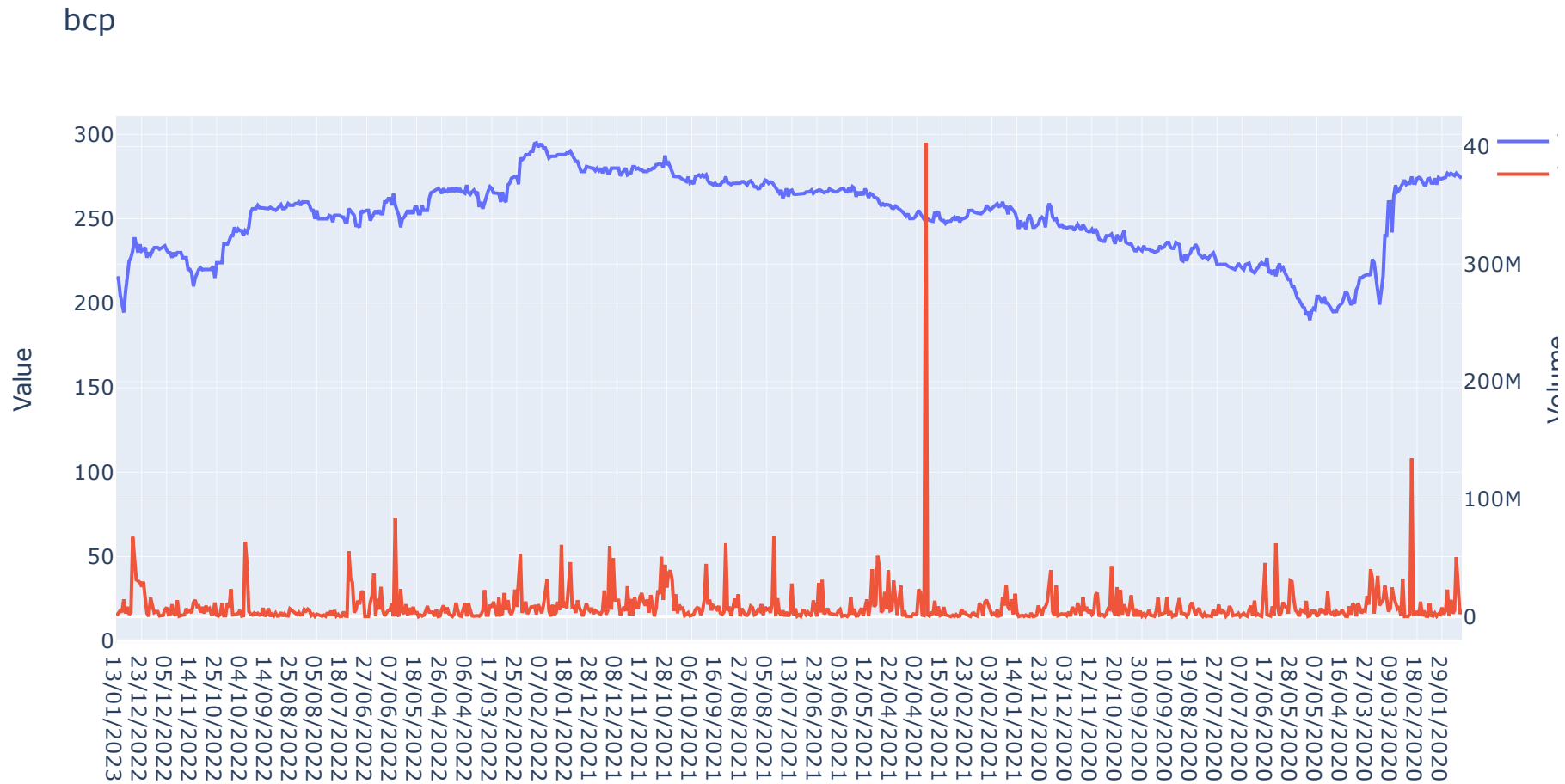
Out[87]:

	date	closing	adjusted	evolution	quantity	volume
0	13/01/2023	215.00	215.00	0.00	3428.0	742280.40

	date	closing	adjusted	evolution	quantity	volume
1	12/01/2023	215.00	215.00	4.88	16859.0	3553199.85
2	10/01/2023	205.00	205.00	4.03	24880.0	5058099.50
3	09/01/2023	197.05	197.05	1.26	18577.0	3689281.55
4	06/01/2023	194.60	194.60	-5.99	74525.0	14511149.80
5	05/01/2023	207.00	207.00	-5.91	12245.0	2618064.00

In [88]:
```
1 stock.staticgraph()
```

In [89]:
```
1 stock.dynamicgraph()
```



In [90]:
```
print('Maximum Value :',stock.maximumValue())
print('Maximum Value :',stock.minimumValue())
print('Maximum Volume :',stock.maximumVolume())
print('Maximum Quantity :',stock.maximumQuantity())
```

```
Maximum Value : 295.0
Maximum Value : 295.0
Maximum Volume : 403307301.8
Maximum Quantity : 1616442.0
```

In [91]:
```
stock.momentum(3).head(5)
```

Out[91]:

	Momentum N= 3
0	-17.95
1	-20.40
2	2.00
3	22.95
4	30.30

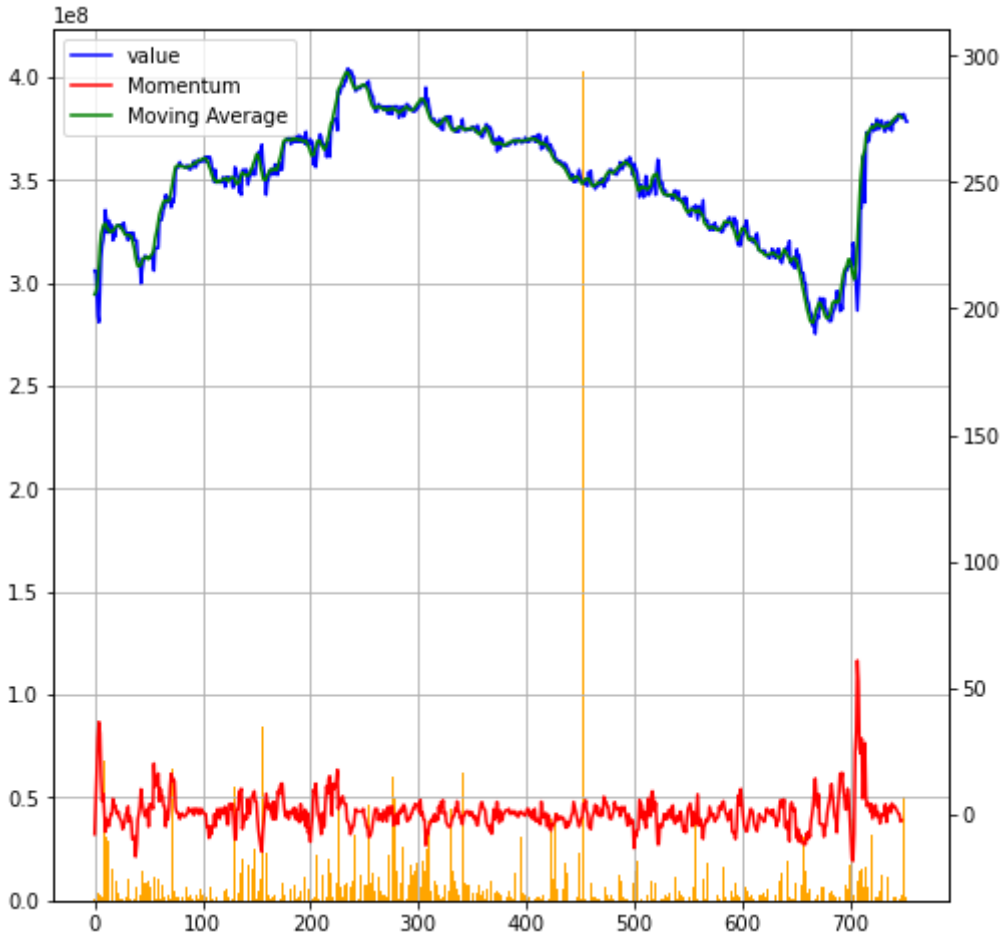
In [92]:
```
1 stock.sma(30)
```

Out[92]:

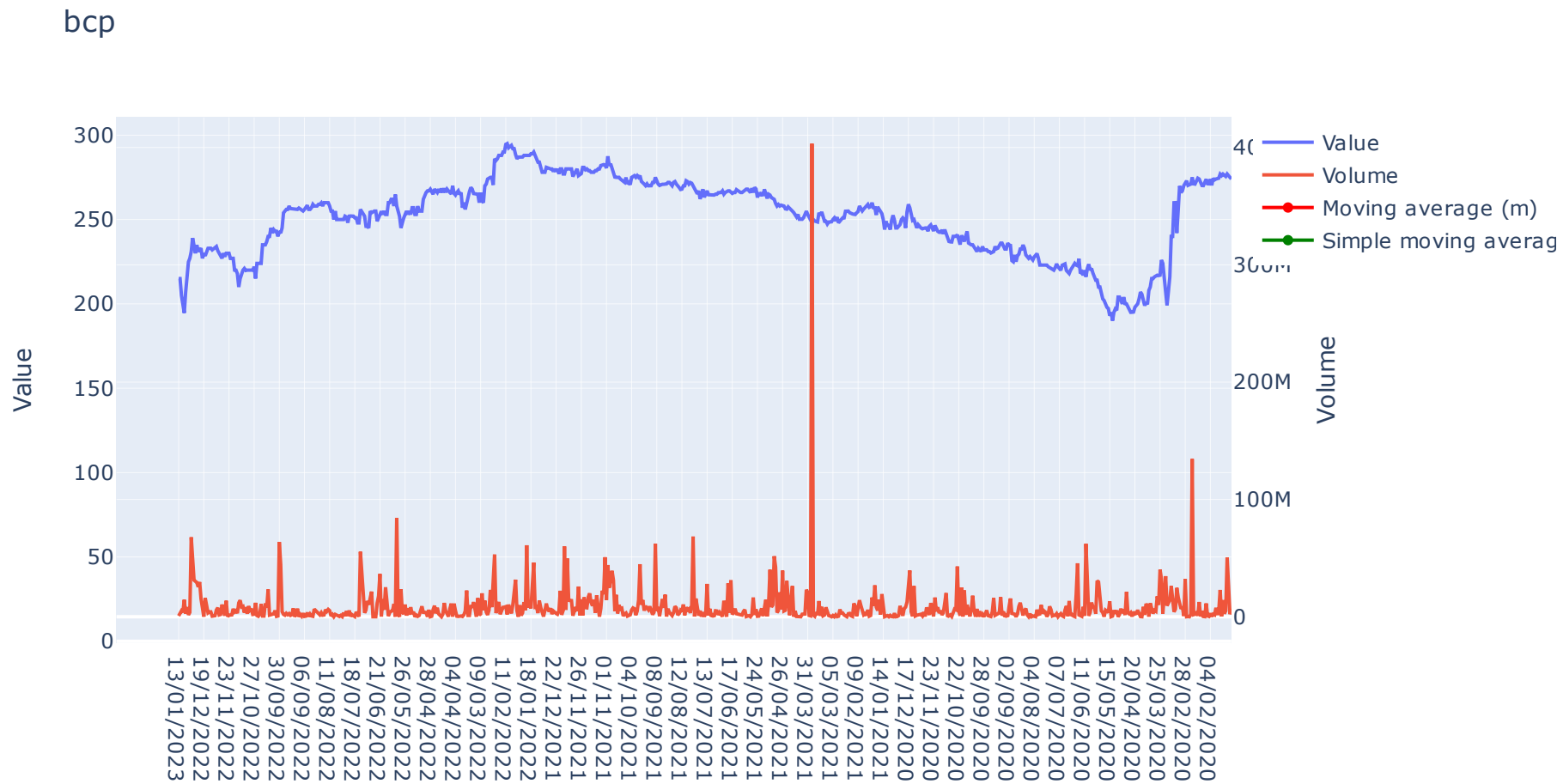
	SMA N= 30
0	226.041667
1	226.536667
2	226.936667
3	227.770000
4	228.801667
...	...
720	273.158333
721	273.358333
722	273.458333
723	273.583333
724	273.683333

725 rows × 1 columns

In [93]:
```
1 stock.staticgraph_Mm_Sma(5,6)
```



In [94]:
```
1 stock.dynamicgraph_Mm_Sma(5,6)
```



In [ ]:
```
1
```