CMF

September 29, 2021

1 Chaikin Money Flow (CMF)

https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:chaikin_money_flow_cmf

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

import warnings
warnings.filterwarnings("ignore")

# fix_yahoo_finance is used to fetch data
import fix_yahoo_finance as yf
yf.pdr_override()
```

[2]:
```
# input
symbol = 'AAPL'
start = '2018-06-01'
end = '2019-01-01'

# Read data
df = yf.download(symbol,start,end)

# View Columns
df.head()
```

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

[2]:

Date	Open	High	Low	Close	Adj Close	Volume
2018-06-01	187.990005	190.259995	187.750000	190.240005	188.109222	
2018-06-04	191.639999	193.419998	191.350006	191.830002	189.681396	
2018-06-05	193.070007	193.940002	192.360001	193.309998	191.144821	
2018-06-06	193.630005	194.080002	191.919998	193.979996	191.807312	
2018-06-07	194.139999	194.199997	192.339996	193.460007	191.293152	

```
2018-06-01  23442500
2018-06-04  26266200
2018-06-05  21566000
2018-06-06  20933600
2018-06-07  21347200
```

[3]:
```
n = 20
df['MF_Multiplier'] = (2*df['Adj Close'] - df['Low'] - df['High'])/
 ↪(df['High']-df['Low'])
df['MF_Volume'] = df['MF_Multiplier']*df['Volume']
df['CMF'] = df['MF_Volume'].rolling(n).sum()/df['Volume'].rolling(n).sum()
df = df.drop(['MF_Multiplier','MF_Volume'],axis=1)
```

[4]:
```
df.head(30)
```

[4]:

Date	Open	High	Low	Close	Adj Close	\
2018-06-01	187.990005	190.259995	187.750000	190.240005	188.109222	
2018-06-04	191.639999	193.419998	191.350006	191.830002	189.681396	
2018-06-05	193.070007	193.940002	192.360001	193.309998	191.144821	
2018-06-06	193.630005	194.080002	191.919998	193.979996	191.807312	
2018-06-07	194.139999	194.199997	192.339996	193.460007	191.293152	
2018-06-08	191.169998	192.000000	189.770004	191.699997	189.552856	
2018-06-11	191.350006	191.970001	190.210007	191.229996	189.088135	
2018-06-12	191.389999	192.610001	191.149994	192.279999	190.126358	
2018-06-13	192.419998	192.880005	190.440002	190.699997	188.564056	
2018-06-14	191.550003	191.570007	190.220001	190.800003	188.662933	
2018-06-15	190.029999	190.160004	188.259995	188.839996	186.724884	
2018-06-18	187.880005	189.220001	187.199997	188.740005	186.626022	
2018-06-19	185.139999	186.330002	183.449997	185.690002	183.610168	
2018-06-20	186.350006	187.199997	185.729996	186.500000	184.411102	
2018-06-21	187.250000	188.350006	184.940002	185.460007	183.382751	
2018-06-22	186.119995	186.149994	184.699997	184.919998	182.848785	
2018-06-25	183.399994	184.919998	180.729996	182.169998	180.129608	
2018-06-26	182.990005	186.529999	182.539993	184.429993	182.364288	
2018-06-27	185.229996	187.279999	184.029999	184.160004	182.097321	
2018-06-28	184.100006	186.210007	183.800003	185.500000	183.422302	
2018-06-29	186.289993	187.190002	182.910004	185.110001	183.036682	
2018-07-02	183.820007	187.300003	183.419998	187.179993	185.083466	
2018-07-03	187.789993	187.949997	183.539993	183.919998	181.859985	
2018-07-05	185.259995	186.410004	184.279999	185.399994	183.323410	
2018-07-06	185.419998	188.429993	185.199997	187.970001	185.864655	
2018-07-09	189.500000	190.679993	189.300003	190.580002	188.445404	
2018-07-10	190.710007	191.279999	190.179993	190.350006	188.217972	
2018-07-11	188.500000	189.779999	187.610001	187.880005	185.775650	
2018-07-12	189.529999	191.410004	189.309998	191.029999	188.890366	
2018-07-13	191.080002	191.839996	190.899994	191.330002	189.187012	

```
               Volume       CMF
Date
2018-06-01  23442500       NaN
2018-06-04  26266200       NaN
2018-06-05  21566000       NaN
2018-06-06  20933600       NaN
2018-06-07  21347200       NaN
2018-06-08  26656800       NaN
2018-06-11  18308500       NaN
2018-06-12  16911100       NaN
2018-06-13  21638400       NaN
2018-06-14  21610100       NaN
2018-06-15  61719200       NaN
2018-06-18  18484900       NaN
2018-06-19  33578500       NaN
2018-06-20  20628700       NaN
2018-06-21  25711900       NaN
2018-06-22  27200400       NaN
2018-06-25  31663100       NaN
2018-06-26  24569200       NaN
2018-06-27  25285300       NaN
2018-06-28  17365200 -2.017256
2018-06-29  22737700 -2.029317
2018-07-02  17731300 -1.930931
2018-07-03  13954800 -1.899263
2018-07-05  16604200 -1.933629
2018-07-06  17485200 -1.876069
2018-07-09  19756600 -1.929613
2018-07-10  15939100 -2.005523
2018-07-11  18831500 -2.018630
2018-07-12  18041100 -1.970863
2018-07-13  12513900 -1.980846
```

[5]:
```
fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(3, 1, 1)
ax1.plot(df['Adj Close'])
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')
ax1.set_xlabel('Date')
ax1.legend(loc='best')

ax2 = plt.subplot(3, 1, 2)
ax2.plot(df['CMF'])
#df['Positive'] = df['CMF'] > 0
#ax2.bar(df.index, df['CMF'], color=df.Positive.map({True: 'g', False: 'r'}))
#ax2.axhline(y=0, color='red')
```

```
ax2.grid()
ax2.set_ylabel('Chaikin Money Flow')

ax3 = plt.subplot(3, 1, 3)
df['Positive'] = df['Open'] < df['Adj Close']
colors = df.Positive.map({True: 'g', False: 'r'})
ax3.bar(df.index, df['Volume'], color=colors, alpha=0.4)
ax3.set_ylabel('Volume')
ax3.grid(True)
```

2 Candlestick with CMF

[6]:
```
from matplotlib import dates as mdates
import datetime as dt

dfc = df.copy()
dfc['VolumePositive'] = dfc['Open'] < dfc['Adj Close']
#dfc = dfc.dropna()
dfc = dfc.reset_index()
dfc['Date'] = mdates.date2num(dfc['Date'].astype(dt.date))
dfc.head()
```

[6]:

	Date	Open	High	Low	Close	Adj Close	\
0	736846.0	187.990005	190.259995	187.750000	190.240005	188.109222	
1	736849.0	191.639999	193.419998	191.350006	191.830002	189.681396	
2	736850.0	193.070007	193.940002	192.360001	193.309998	191.144821	
3	736851.0	193.630005	194.080002	191.919998	193.979996	191.807312	
4	736852.0	194.139999	194.199997	192.339996	193.460007	191.293152	

	Volume	CMF	Positive	VolumePositive
0	23442500	NaN	True	True
1	26266200	NaN	False	False
2	21566000	NaN	False	False
3	20933600	NaN	False	False
4	21347200	NaN	False	False

[7]:
```
from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(3, 1, 1)
candlestick_ohlc(ax1,dfc.values, width=0.5, colorup='g', colordown='r', alpha=1.
 ↪0)
ax1.xaxis_date()
ax1.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
ax1.grid(True, which='both')
ax1.minorticks_on()
ax1v = ax1.twinx()
colors = dfc.VolumePositive.map({True: 'g', False: 'r'})
ax1v.bar(dfc.Date, dfc['Volume'], color=colors, alpha=0.4)
ax1v.axes.yaxis.set_ticklabels([])
ax1v.set_ylim(0, 3*df.Volume.max())
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')
ax1.set_xlabel('Date')

ax2 = plt.subplot(3, 1, 2)
ax2.plot(df['CMF'])
#df['Positive'] = df['CMF'] > 0
#ax2.bar(df.index, df['CMF'], color=df.Positive.map({True: 'g', False: 'r'}))
#ax2.axhline(y=0, color='red')
ax2.grid()
ax2.set_ylabel('Chaikin Money Flow')

ax3 = plt.subplot(3, 1, 3)
df['Positive'] = df['Open'] < df['Adj Close']
colors = df.Positive.map({True: 'g', False: 'r'})
ax3.bar(df.index, df['Volume'], color=colors, alpha=0.4)
ax3.set_ylabel('Volume')
ax3.grid(True)
```


Stock AAPL Closing Price
Price
220
200
180
160
01-06-2018
01-07-2018
01-08-2018
01-09-2018
01-10-2018
01-11-2018
01-12-2018
01-01-2019
Date
Chaikin Money Flow
−0.5
−1.0
−1.5
−2.0
2018-07
2018-08
2018-09
2018-10
2018-11
2018-12
2019-01
1e8
Volume
1.0
0.8
0.6
0.4
0.2
0.0
2018-06
2018-07
2018-08
2018-09
2018-10
2018-11
2018-12
2019-01