

Vortex_Indicator

September 29, 2021

1 Vortex Indicator

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

```
[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 = '2017-01-01'
end = '2019-01-01'

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

# View Columns
df.head()
```

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

```
[2]:
```

	Open	High	Low	Close	Adj Close	\
Date						
2017-01-03	115.800003	116.330002	114.760002	116.150002	112.140007	
2017-01-04	115.849998	116.510002	115.750000	116.019997	112.014503	
2017-01-05	115.919998	116.860001	115.809998	116.610001	112.584129	
2017-01-06	116.779999	118.160004	116.470001	117.910004	113.839249	
2017-01-09	117.949997	119.430000	117.940002	118.989998	114.881950	

	Volume
Date	

```

2017-01-03  28781900
2017-01-04  21118100
2017-01-05  22193600
2017-01-06  31751900
2017-01-09  33561900

```

```

[3]: n = 14 # Number of days
df['Prior Low'] = df['Low'].shift()
df['Prior High'] = df['High'].shift()
df['+VM'] = abs(df['High'] - df['Prior Low'])
df['-VM'] = abs(df['Low'] - df['Prior High'])
df['+VM_'+str(n)] = df['+VM'].rolling(n).sum()
df['-VM_'+str(n)] = df['-VM'].rolling(n).sum()
df['HL'] = df['High'] - df['Low']
df['HC'] = abs(df['High'] - df['Adj Close'].shift())
df['LC'] = abs(df['Low'] - df['Adj Close'].shift())
df['TR'] = df[['HL', 'HC', 'LC']].max(axis=1)

```

```

[4]: df.tail()

```

```

[4]:
      Date  Open      High      Low      Close  Adj Close  \
2018-12-24  148.149994  151.550003  146.589996  146.830002  146.202972
2018-12-26  148.300003  157.229996  146.720001  157.169998  156.498810
2018-12-27  155.839996  156.770004  150.070007  156.149994  155.483154
2018-12-28  157.500000  158.520004  154.550003  156.229996  155.562820
2018-12-31  158.529999  159.360001  156.479996  157.740005  157.066376

      Date  Volume  Prior Low  Prior High      +VM      -VM  +VM_14  \
2018-12-24  37169200  149.630005  158.160004   1.919998  11.570008  44.660002
2018-12-26  58582500  146.589996  151.550003  10.640000   4.830002  54.120010
2018-12-27  53117100  146.720001  157.229996  10.050003   7.159989  62.680008
2018-12-28  42291400  150.070007  156.770004   8.449997   2.220001  67.059998
2018-12-31  35003500  154.550003  158.520004   4.809998   2.040008  70.080003

      Date  -VM_14      HL      HC      LC      TR
2018-12-24  108.750000   4.960007   1.463699   3.496308   4.960007
2018-12-26  104.910004  10.509995  11.027024   0.517029  11.027024
2018-12-27  100.099992   6.699997   0.271194   6.428803   6.699997
2018-12-28   95.839997   3.970001   3.036850   0.933151   3.970001
2018-12-31   86.720002   2.880005   3.797181   0.917176   3.797181

```

```

[5]: del df['HL']
del df['HC']
del df['LC']

```

```
[6]: df['TR_'+str(n)] = df['TR'].rolling(n).sum()
df['+VI_'+str(n)] = df['+VM_'+str(n)]/df['TR_'+str(n)]
df['-VI_'+str(n)] = df['-VM_'+str(n)]/df['TR_'+str(n)]
```

```
[7]: df = df.drop(['Prior Low','Prior_␣
↪High','+VM','-VM','+VM_14','-VM_14','TR','TR_14'],axis=1)
```

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

```
[8]:
```

	Open	High	Low	Close	Adj Close \
Date					
2017-01-03	115.800003	116.330002	114.760002	116.150002	112.140007
2017-01-04	115.849998	116.510002	115.750000	116.019997	112.014503
2017-01-05	115.919998	116.860001	115.809998	116.610001	112.584129
2017-01-06	116.779999	118.160004	116.470001	117.910004	113.839249
2017-01-09	117.949997	119.430000	117.940002	118.989998	114.881950
2017-01-10	118.769997	119.379997	118.300003	119.110001	114.997818
2017-01-11	118.739998	119.930000	118.599998	119.750000	115.615723
2017-01-12	118.900002	119.300003	118.209999	119.250000	115.132988
2017-01-13	119.110001	119.620003	118.809998	119.040001	114.930237
2017-01-17	118.339996	120.239998	118.220001	120.000000	115.857086
2017-01-18	120.000000	120.500000	119.709999	119.989998	115.847435
2017-01-19	119.400002	120.089996	119.370003	119.779999	115.644691
2017-01-20	120.449997	120.449997	119.730003	120.000000	115.857086
2017-01-23	120.000000	120.809998	119.769997	120.080002	115.934326
2017-01-24	119.550003	120.099998	119.500000	119.970001	115.828125
2017-01-25	120.419998	122.099998	120.279999	121.879997	117.672188
2017-01-26	121.669998	122.440002	121.599998	121.940002	117.730118
2017-01-27	122.139999	122.349998	121.599998	121.949997	117.739769
2017-01-30	120.930000	121.629997	120.660004	121.629997	117.430817
2017-01-31	121.150002	121.389999	120.620003	121.349998	117.160492
2017-02-01	127.029999	130.490005	127.010002	128.750000	124.305000
2017-02-02	127.980003	129.389999	127.779999	128.529999	124.092606
2017-02-03	128.309998	129.190002	128.160004	129.080002	124.623619
2017-02-06	129.130005	130.500000	128.899994	130.289993	125.791840
2017-02-07	130.539993	132.089996	130.449997	131.529999	126.989029
2017-02-08	131.350006	132.220001	131.220001	132.039993	127.481415
2017-02-09	131.649994	132.449997	131.119995	132.419998	128.402603
2017-02-10	132.460007	132.940002	132.050003	132.119995	128.111710
2017-02-13	133.080002	133.820007	132.750000	133.289993	129.246201
2017-02-14	133.470001	135.089996	133.250000	135.020004	130.923721

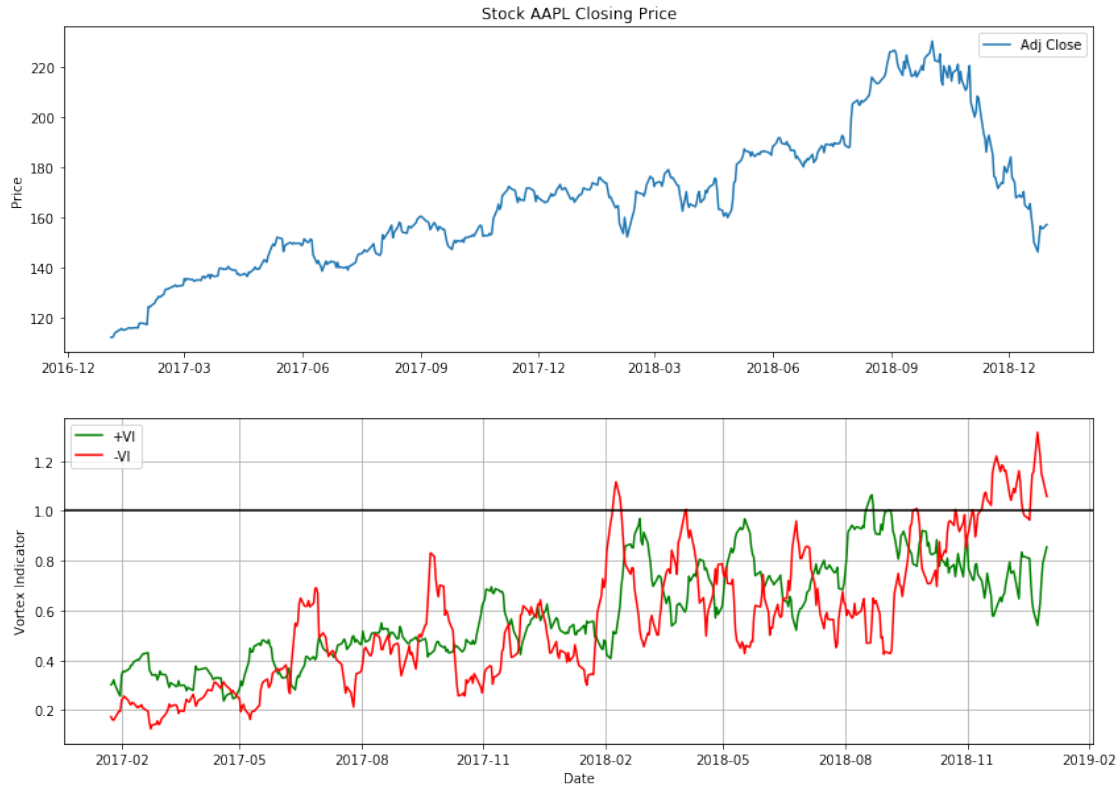
	Volume	+VI_14	-VI_14
Date			
2017-01-03	28781900	NaN	NaN
2017-01-04	21118100	NaN	NaN
2017-01-05	22193600	NaN	NaN

2017-01-06	31751900	NaN	NaN
2017-01-09	33561900	NaN	NaN
2017-01-10	24462100	NaN	NaN
2017-01-11	27588600	NaN	NaN
2017-01-12	27086200	NaN	NaN
2017-01-13	26111900	NaN	NaN
2017-01-17	34439800	NaN	NaN
2017-01-18	23713000	NaN	NaN
2017-01-19	25597300	NaN	NaN
2017-01-20	32597900	NaN	NaN
2017-01-23	22050200	NaN	NaN
2017-01-24	23211000	0.301500	0.172761
2017-01-25	32377600	0.305567	0.162048
2017-01-26	26337600	0.321374	0.159289
2017-01-27	20562900	0.302071	0.168282
2017-01-30	30377500	0.265051	0.195188
2017-01-31	49201000	0.256289	0.194959
2017-02-01	111985000	0.339537	0.238756
2017-02-02	33710400	0.355697	0.247552
2017-02-03	24507300	0.352808	0.255390
2017-02-06	26845900	0.362187	0.238816
2017-02-07	38183800	0.366201	0.227502
2017-02-08	23004100	0.379322	0.221314
2017-02-09	28349900	0.380444	0.230279
2017-02-10	20065500	0.391943	0.227919
2017-02-13	23035400	0.402433	0.209441
2017-02-14	33226200	0.401325	0.215496

```
[9]: fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(2, 1, 1)
ax1.plot(df['Adj Close'])
ax1.set_title('Stock ' + symbol + ' Closing Price')
ax1.set_ylabel('Price')
ax1.legend(loc='best')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['+VI_14'], label='+VI', color='g')
ax2.plot(df['-VI_14'], label='-VI', color='r')
ax2.axhline(y=1, color='black')
ax2.grid()
ax2.legend(loc='best')
ax2.set_ylabel('Vortex Indicator')
ax2.set_xlabel('Date')
```

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



1.1 Candlestick with Vortex Indicator

```
[10]: 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()
```

```
[10]:
```

	Date	Open	High	Low	Close	Adj Close	\
0	736332.0	115.800003	116.330002	114.760002	116.150002	112.140007	
1	736333.0	115.849998	116.510002	115.750000	116.019997	112.014503	
2	736334.0	115.919998	116.860001	115.809998	116.610001	112.584129	
3	736335.0	116.779999	118.160004	116.470001	117.910004	113.839249	
4	736338.0	117.949997	119.430000	117.940002	118.989998	114.881950	

	Volume	+VI_14	-VI_14	VolumePositive
0	28781900	NaN	NaN	False
1	21118100	NaN	NaN	False

2	22193600	NaN	NaN	False
3	31751900	NaN	NaN	False
4	33561900	NaN	NaN	False

```
[11]: from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(2, 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')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['+VI_14'], label='+VI', color='g')
ax2.plot(df['-VI_14'], label='-VI', color='r')
ax2.axhline(y=1, color='black')
ax2.grid()
ax2.legend(loc='best')
ax2.set_ylabel('Vortex Indicator')
ax2.set_xlabel('Date')
```

```
[11]: Text(0.5,0,'Date')
```

