Volume_Weighted_Moving_Average

September 29, 2021

1 Volume-Weighted Moving Average (VWMA)

https://www.tradingsetupsreview.com/volume-weighted-moving-average-vwma/

[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 = '2018-12-01'
end = '2019-02-01'

# 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
2018-12-03	184.460007	184.940002	181.210007	184.820007	184.030731	
2018-12-04	180.949997	182.389999	176.270004	176.690002	175.935455	
2018-12-06	171.759995	174.779999	170.419998	174.720001	173.973862	
2018-12-07	173.490005	174.490005	168.300003	168.490005	167.770477	
2018-12-10	165.000000	170.089996	163.330002	169.600006	168.875732	

```
2018-12-03  40802500
2018-12-04  41344300
2018-12-06  43098400
2018-12-07  42281600
2018-12-10  62026000
```

[3]:
```
import talib as ta
```

[4]:
```
df['SMA'] = ta.SMA(df['Adj Close'], timeperiod=3)
```

[5]:
```
df['VWMA'] = ((df['Adj Close']*df['Volume'])+(df['Adj Close'].
 ↪shift(1)*df['Volume'].shift(1))+(df['Adj Close'].shift(2)*df['Volume'].
 ↪shift(2))) / (df['Volume'].rolling(3).sum())
df.head()
```

[5]:

Date	Open	High	Low	Close	Adj Close	Volume	SMA	VWMA
2018-12-03	184.460007	184.940002	181.210007	184.820007	184.030731	40802500	NaN	NaN
2018-12-04	180.949997	182.389999	176.270004	176.690002	175.935455	41344300	NaN	NaN
2018-12-06	171.759995	174.779999	170.419998	174.720001	173.973862	43098400	177.980016	177.897734
2018-12-07	173.490005	174.490005	168.300003	168.490005	167.770477	42281600	172.559931	172.544078
2018-12-10	165.000000	170.089996	163.330002	169.600006	168.875732	62026000	170.206690	170.049289

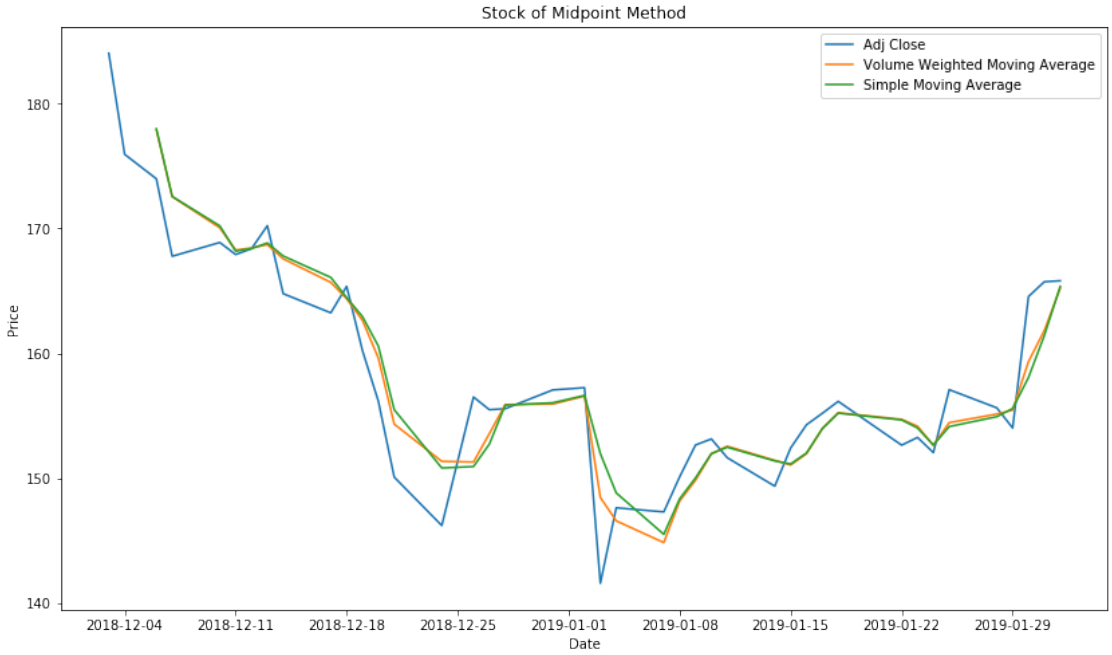
[8]:
```
def VWMA(close,volume, n):
    cv =pd.Series(close.shift(n) * volume.shift(n))
    tv = volume.rolling(n).sum()
    vwma = cv/tv
    return vwma

VWMA(df['Adj Close'],df['Volume'], 3)
```

[8]:
```
Date
2018-12-03          NaN
2018-12-04          NaN
2018-12-06          NaN
2018-12-07    59.253939
2018-12-10    49.346215
2018-12-11    49.462562
2018-12-12    48.943213
```

```
2018-12-13    91.236553
2018-12-14    73.353635
2018-12-17    51.320951
2018-12-18    45.692473
2018-12-19    52.736732
2018-12-20    48.960207
2018-12-21    26.703221
2018-12-24    39.747323
2018-12-26    52.820701
2018-12-27    96.527635
2018-12-28    35.289384
2018-12-31    70.300981
2019-01-02    72.233727
2019-01-03    40.273964
2019-01-04    29.406837
2019-01-07    28.453408
2019-01-08    83.726561
2019-01-09    61.404161
2019-01-10    66.188165
2019-01-11    57.071189
2019-01-14    72.284671
2019-01-15    62.145469
2019-01-16    44.677247
2019-01-17    54.377130
2019-01-18    46.483125
2019-01-22    50.190839
2019-01-23    53.028374
2019-01-24    66.740402
2019-01-25    56.505153
2019-01-28    41.623755
2019-01-29    38.181259
2019-01-30    40.872092
2019-01-31    28.419125
2019-02-01    47.616386
dtype: float64
```

[37]:
```
plt.figure(figsize=(14,8))
plt.plot(df['Adj Close'])
plt.plot(df['VWMA'], label='Volume Weighted Moving Average')
plt.plot(df['SMA'], label='Simple Moving Average')
plt.legend(loc='best')
plt.title('Stock of Midpoint Method')
plt.xlabel('Date')
plt.ylabel('Price')
plt.show()
```



1.1 Candlestick with VWMA

[38]:
```
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()
```

[38]:

	Date	Open	High	Low	Close	Adj Close	Volume	VWMA	SMA	VolumePositive
0	737031.0	184.460007	184.940002	181.210007	184.820007	184.030731	40802500	NaN	NaN	False
1	737032.0	180.949997	182.389999	176.270004	176.690002	175.935455	41344300	NaN	NaN	False
2	737034.0	171.759995	174.779999	170.419998	174.720001	173.973862	43098400	177.897734	177.980016	True
3	737035.0	173.490005	174.490005	168.300003	168.490005	167.770477	42281600	172.544078	172.559931	False
4	737038.0	165.000000	170.089996	163.330002	169.600006	168.875732	62026000	170.049289	170.206690	True

[40]:
```
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.plot(df['VWMA'], label='Volume Weighted Moving Average')
ax1.plot(df['SMA'], label='Simple Moving Average')
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')
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.legend(loc='best')
```

[40]: <matplotlib.legend.Legend at 0x26bf07e4320>