

# ROCR

September 29, 2021

## 1 Rate of Change Rate (ROCR)

<https://www.tradingtechnologies.com/xtrader-help/x-study/technical-indicator-definitions/rate-of-change-rocr/>

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

import warnings
warnings.filterwarnings("ignore")

import yfinance as yf
yf.pdr_override()
```

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

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

# View Columns
df.head()
```

[\*\*\*\*\*100%\*\*\*\*\*] 1 of 1 completed

```
[2]:
```

	Adj Close	Close	High	Low	Open \
Date					
2018-01-02	167.199890	172.259995	172.300003	169.259995	170.160004
2018-01-03	167.170776	172.229996	174.550003	171.960007	172.529999
2018-01-04	167.947266	173.029999	173.470001	172.080002	172.539993
2018-01-05	169.859406	175.000000	175.369995	173.050003	173.440002
2018-01-08	169.228500	174.350006	175.610001	173.929993	174.350006

	Volume
Date	

```

2018-01-02 25555900
2018-01-03 29517900
2018-01-04 22434600
2018-01-05 23660000
2018-01-08 20567800

```

```

[3]: n = 12
df['ROCR'] = (df['Adj Close']/df['Adj Close'].shift(n))

```

```

[4]: df.head(20)

```

```

[4]:      Adj Close      Close      High      Low      Open \
Date
2018-01-02 167.199890 172.259995 172.300003 169.259995 170.160004
2018-01-03 167.170776 172.229996 174.550003 171.960007 172.529999
2018-01-04 167.947266 173.029999 173.470001 172.080002 172.539993
2018-01-05 169.859406 175.000000 175.369995 173.050003 173.440002
2018-01-08 169.228500 174.350006 175.610001 173.929993 174.350006
2018-01-09 169.209091 174.330002 175.059998 173.410004 174.550003
2018-01-10 169.170258 174.289993 174.300003 173.000000 173.160004
2018-01-11 170.131180 175.279999 175.490005 174.490005 174.589996
2018-01-12 171.888031 177.089996 177.360001 175.649994 176.179993
2018-01-16 171.014465 176.190002 179.389999 176.139999 177.899994
2018-01-17 173.839005 179.100006 179.250000 175.070007 176.149994
2018-01-18 173.994293 179.259995 180.100006 178.250000 179.369995
2018-01-19 173.217789 178.460007 179.580002 177.410004 178.610001
2018-01-22 171.800674 177.000000 177.779999 176.600006 177.300003
2018-01-23 171.839493 177.039993 179.440002 176.820007 177.300003
2018-01-24 169.102325 174.220001 177.300003 173.199997 177.250000
2018-01-25 166.083679 171.110001 174.949997 170.529999 174.509995
2018-01-26 166.471924 171.509995 172.000000 170.059998 172.000000
2018-01-29 163.026215 167.960007 170.160004 167.070007 170.160004
2018-01-30 162.065277 166.970001 167.369995 164.699997 165.529999

```

```

      Volume      ROCR
Date
2018-01-02 25555900    NaN
2018-01-03 29517900    NaN
2018-01-04 22434600    NaN
2018-01-05 23660000    NaN
2018-01-08 20567800    NaN
2018-01-09 21584000    NaN
2018-01-10 23959900    NaN
2018-01-11 18667700    NaN
2018-01-12 25418100    NaN
2018-01-16 29565900    NaN
2018-01-17 34386800    NaN

```

2018-01-18	31193400	NaN
2018-01-19	32425100	1.035992
2018-01-22	27108600	1.027696
2018-01-23	32689100	1.023175
2018-01-24	51105100	0.995543
2018-01-25	41529000	0.981417
2018-01-26	39143000	0.983824
2018-01-29	50640400	0.963681
2018-01-30	46048200	0.952590

```
[5]: df.tail()
```

```
[5]:
```

	Adj Close	Close	High	Low	Open \
Date					
2018-12-24	144.656540	146.830002	151.550003	146.589996	148.149994
2018-12-26	154.843475	157.169998	157.229996	146.720001	148.300003
2018-12-27	153.838562	156.149994	156.770004	150.070007	155.839996
2018-12-28	153.917389	156.229996	158.520004	154.550003	157.500000
2018-12-31	155.405045	157.740005	159.360001	156.479996	158.529999

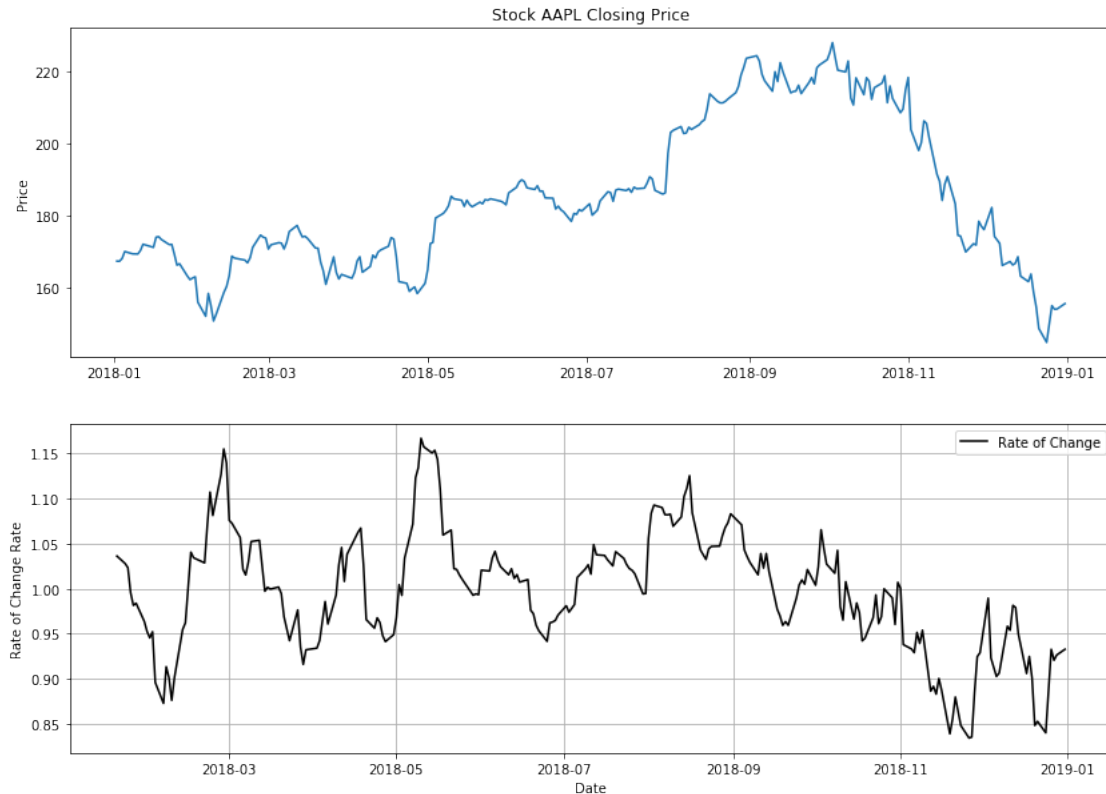
  

	Volume	ROCR
Date		
2018-12-24	37169200	0.840373
2018-12-26	58582500	0.932815
2018-12-27	53117100	0.920696
2018-12-28	42291400	0.926466
2018-12-31	35003500	0.932821

```
[6]: 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')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['ROCR'], label='Rate of Change', color='black')
#ax2.axhline(y=0, color='blue', linestyle='--')
#ax2.axhline(y=10, color='red')
#ax2.axhline(y=-10, color='green')
ax2.grid()
ax2.set_ylabel('Rate of Change Rate')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

```
[6]: <matplotlib.legend.Legend at 0x235965a05f8>
```



## 1.1 Candlestick with (ROCP)

```
[7]: 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'] = pd.to_datetime(dfc['Date'])
dfc['Date'] = dfc['Date'].apply(mdates.date2num)
dfc.head()
```

```
[7]:      Date  Adj Close  Close  High  Low  Open  \
0  736696.0  167.199890  172.259995  172.300003  169.259995  170.160004
1  736697.0  167.170776  172.229996  174.550003  171.960007  172.529999
2  736698.0  167.947266  173.029999  173.470001  172.080002  172.539993
3  736699.0  169.859406  175.000000  175.369995  173.050003  173.440002
4  736702.0  169.228500  174.350006  175.610001  173.929993  174.350006

      Volume  ROCR  VolumePositive
```

0	25555900	NaN	False
1	29517900	NaN	False
2	22434600	NaN	False
3	23660000	NaN	False
4	20567800	NaN	False

```
[8]: 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['ROCR'], label='Rate of Change Rate', color='black')
#ax2.axhline(y=0, color='blue', linestyle='--')
#ax2.axhline(y=10, color='red')
#ax2.axhline(y=-10, color='green')
ax2.grid()
ax2.set_ylabel('Rate of Change')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

```
[8]: <matplotlib.legend.Legend at 0x23596cb5978>
```

