Time series analysis of top US companies

In [1]:
```
import pandas as pd
import fix_yahoo_finance as fyf
from matplotlib import pyplot as plt
from pandas_datareader import data as pdr
fyf.pdr_override()
%matplotlib inline
```

In [2]:
```
CMCSA = pdr.get_data_yahoo('CMCSA', start='2017-01-01')
CMCSA.head()
```

```
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```

Out[2]:

	Open	High	Low	Close	Adj Close	Volume
Date						
2017-01-03	34.834999	34.945000	34.115002	34.525002	33.212471	23670400
2017-01-04	34.755001	35.130001	34.590000	34.935001	33.606884	22010800
2017-01-05	34.794998	35.130001	34.700001	35.075001	33.741566	16986000
2017-01-06	35.105000	35.270000	34.910000	35.134998	33.799274	13528000
2017-01-09	35.070000	35.480000	35.025002	35.415001	34.068638	18135400

In [3]:
```
plt.plot(CMCSA['Close'])
plt.show()
```

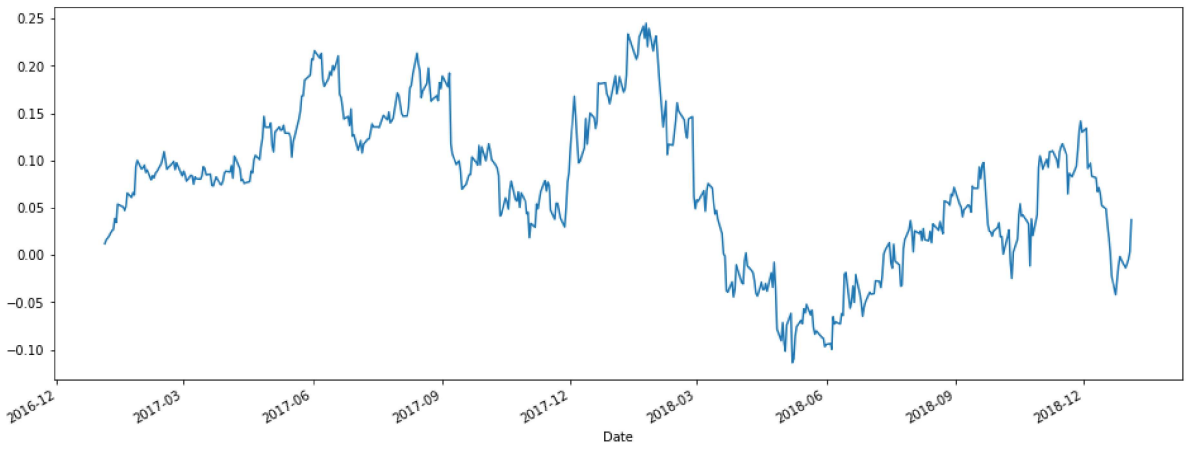
In [4]:
```
CMCSA['dailyReturn'] = CMCSA['Close'].pct_change()
CMCSA['cumReturn'] = CMCSA['Close'].diff().cumsum() / CMCSA['Close'].iloc[0]
CMCSA.head()
```

Out[4]:

	Open	High	Low	Close	Adj Close	Volume	dailyReturn	cu
Date								
2017-01-03	34.834999	34.945000	34.115002	34.525002	33.212471	23670400	NaN	Na
2017-01-04	34.755001	35.130001	34.590000	34.935001	33.606884	22010800	0.011875	0.(
2017-01-05	34.794998	35.130001	34.700001	35.075001	33.741566	16986000	0.004007	0.(
2017-01-06	35.105000	35.270000	34.910000	35.134998	33.799274	13528000	0.001711	0.(
2017-01-09	35.070000	35.480000	35.025002	35.415001	34.068638	18135400	0.007969	0.(

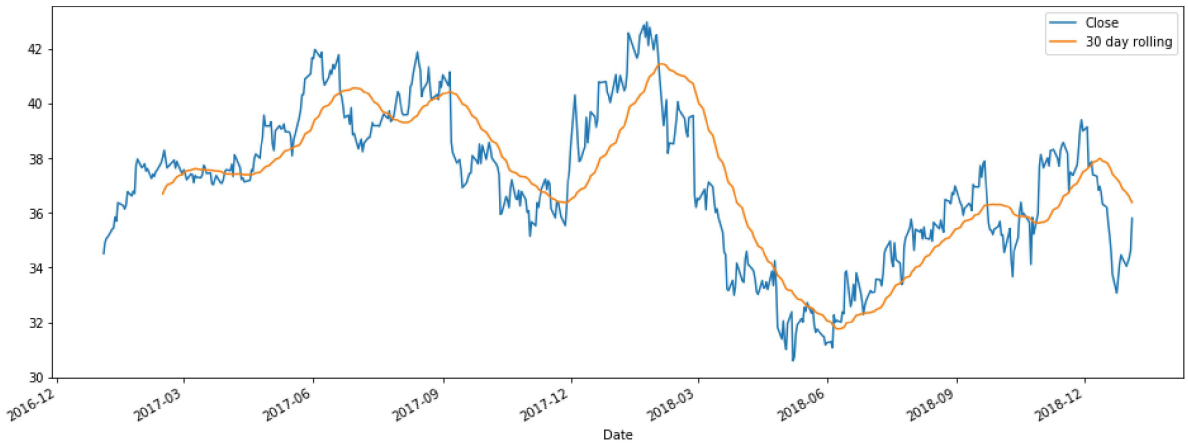
In [5]:
```
CMCSA['cumReturn'].plot(figsize=(16,6))
```

Out[5]: <matplotlib.axes._subplots.AxesSubplot at 0x1b94835cc88>



In [6]:
```
# create new column for 30 days then plot
CMCSA['30 day rolling'] = CMCSA['Close'].rolling(window=30).mean()
CMCSA[['Close', '30 day rolling']].plot(figsize=(16,6))
```

Out[6]: <matplotlib.axes._subplots.AxesSubplot at 0x1b9486025f8>



In [7]:
```
# imports daily closing price and volume
NFLX = pdr.get_data_yahoo('NFLX', start='2014-01-01')[['Close','Volume']]
CMCSA = pdr.get_data_yahoo('CMCSA', start='2014-01-01')[['Close','Volume']]
VZ = pdr.get_data_yahoo('VZ', start='2014-01-01')[['Close','Volume']]
GE = pdr.get_data_yahoo('GE', start='2014-01-01')[['Close','Volume']]
```

```
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```
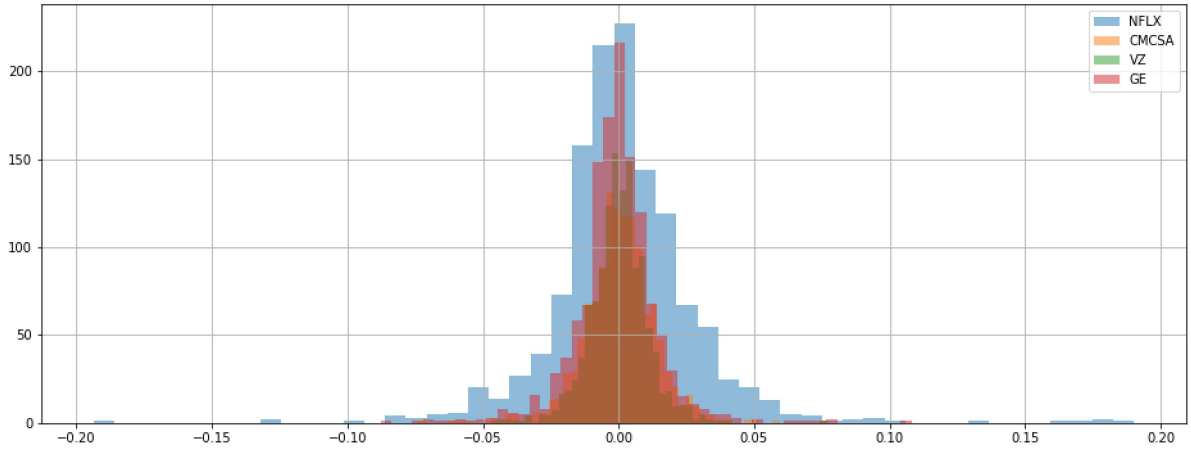

In [8]:
```
# creates daily price change column
NFLX['dailyChange'] = NFLX['Close'].pct_change()
CMCSA['dailyChange'] = CMCSA['Close'].pct_change()
VZ['dailyChange'] = VZ['Close'].pct_change()
GE['dailyChange'] = GE['Close'].pct_change()
```

In [9]:
```
# creates cumulative price change percentage since 2014
NFLX['cumulativeReturns'] = (1+ NFLX['dailyChange']).cumprod()
CMCSA['cumulativeReturns'] = (1+ CMCSA['dailyChange']).cumprod()
VZ['cumulativeReturns'] = (1+ VZ['dailyChange']).cumprod()
GE['cumulativeReturns'] = (1+ GE['dailyChange']).cumprod()
```

In [10]:
```
# histogram of daily returns bucketed into bins of 50
NFLX['dailyChange'].hist(bins=50,label='NFLX', figsize=(16,6),alpha=0.5)
CMCSA['dailyChange'].hist(bins=50,label='CMCSA',alpha=0.5)
VZ['dailyChange'].hist(bins=50,label='VZ',alpha=0.5)
GE['dailyChange'].hist(bins=50,label='GE',alpha=0.5)
plt.legend()
```

Out[10]:
```
<matplotlib.legend.Legend at 0x1b9483e3358>
```



In [11]:
```
# combines daily return data of all companies into a single dataframe
box_df = pd.concat([NFLX['dailyChange'], CMCSA['dailyChange'], VZ['dailyChang
e'], GE['dailyChange']], axis=1)
box_df.columns = ['Netflix returns', 'Comcast returns', 'Verizon returns', 'GE
 returns']
```

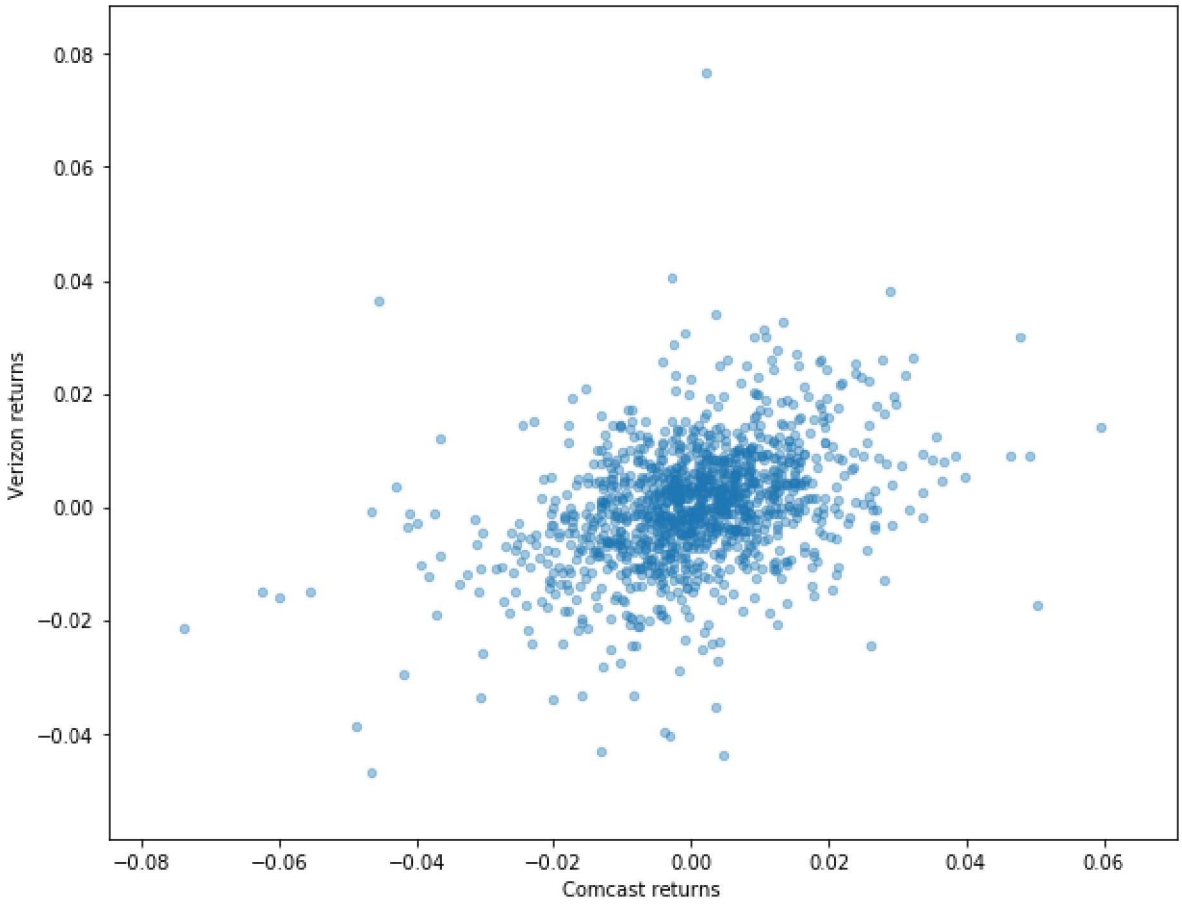
In [12]:
```
box_df.head()
```

Out[12]:

	Netflix returns	Comcast returns	Verizon returns	GE returns
Date				
2014-01-02	NaN	NaN	NaN	NaN
2014-01-03	0.000772	-0.007386	-0.011837	-0.000727
2014-01-06	-0.009722	-0.000979	0.005576	-0.008006
2014-01-07	-0.055817	0.035476	0.012528	0.001101
2014-01-08	0.004389	-0.001514	-0.016227	-0.002932

In [13]:
```
# scatter plot of Comcast and Verizion returns
box_df.plot(kind='scatter', x='Comcast returns', y='Verizon returns', alpha=0.
4,figsize=(10,8))
```

Out[13]: <matplotlib.axes._subplots.AxesSubplot at 0x1b9486ed8d0>



In [14]:
```
# time series chart of cumulative stock returns over the last four years
NFLX['cumulativeReturns'].plot(label='Netflix', figsize=(16,8), title='Cumulat
ive Return')
CMCSA['cumulativeReturns'].plot(label='Comcast')
VZ['cumulativeReturns'].plot(label='Verizon')
GE['cumulativeReturns'].plot(label='GE')
plt.legend()
```

Out[14]: <matplotlib.legend.Legend at 0x1b948a6c9b0>