The Transmission of Information in the Information Age

DATA APPENDIX

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Timing

The time series of stock prices used in the paper runs from 5/18/2012 to 6/27/2013. Data was read from Yahoo Finance using the R package *pdfetch*. Code to do this import directly is contained in the file *Supplementary_Code/Fetch_data.R*, but the pre-imported data is called in the main source code for the paper.

Key dates in the Snowden event are:

- Initial leak of story on data collection: 2013-06-05
- Protests in Hong Kong: 2013-06-15
- Criminal complaint filed: 2013-06-22

Price series and returns

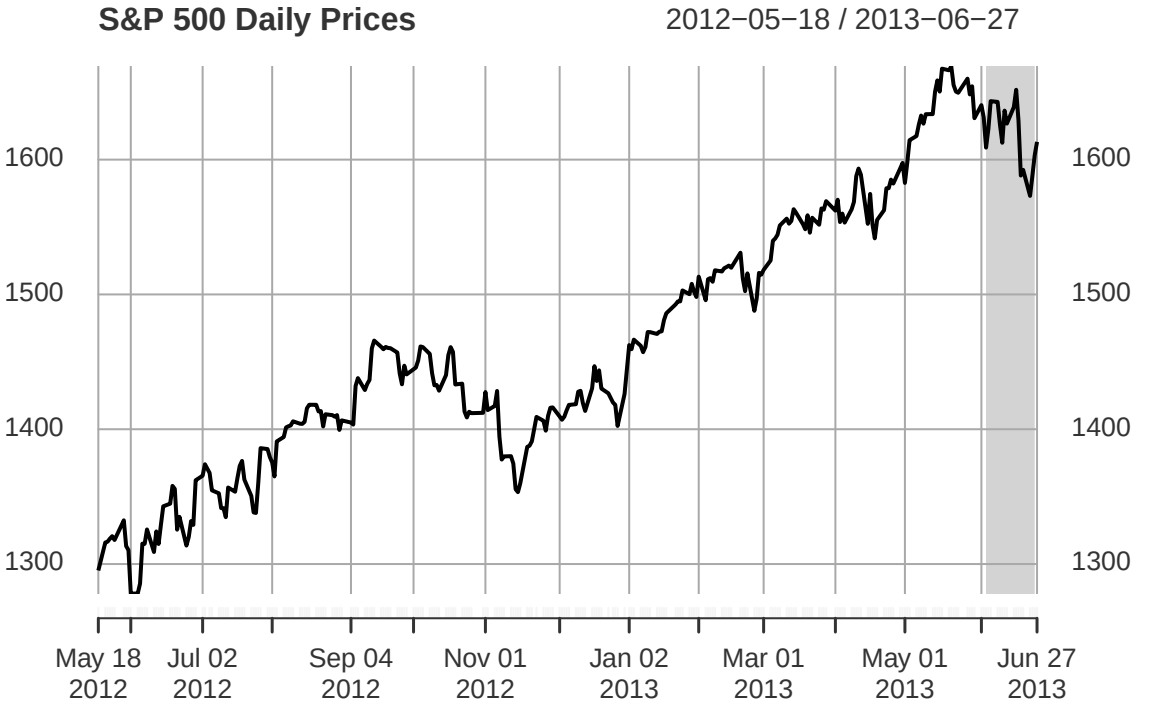
Plots of both prices and daily returns are provided below for all series used in the study. Daily returns are generally expected to be mean zero if the returns series are to be considered stationary. This is tested more formally in specifying the ARMA structure of the mean, but summary statistics of the Returns series show no evidence for the contrary:

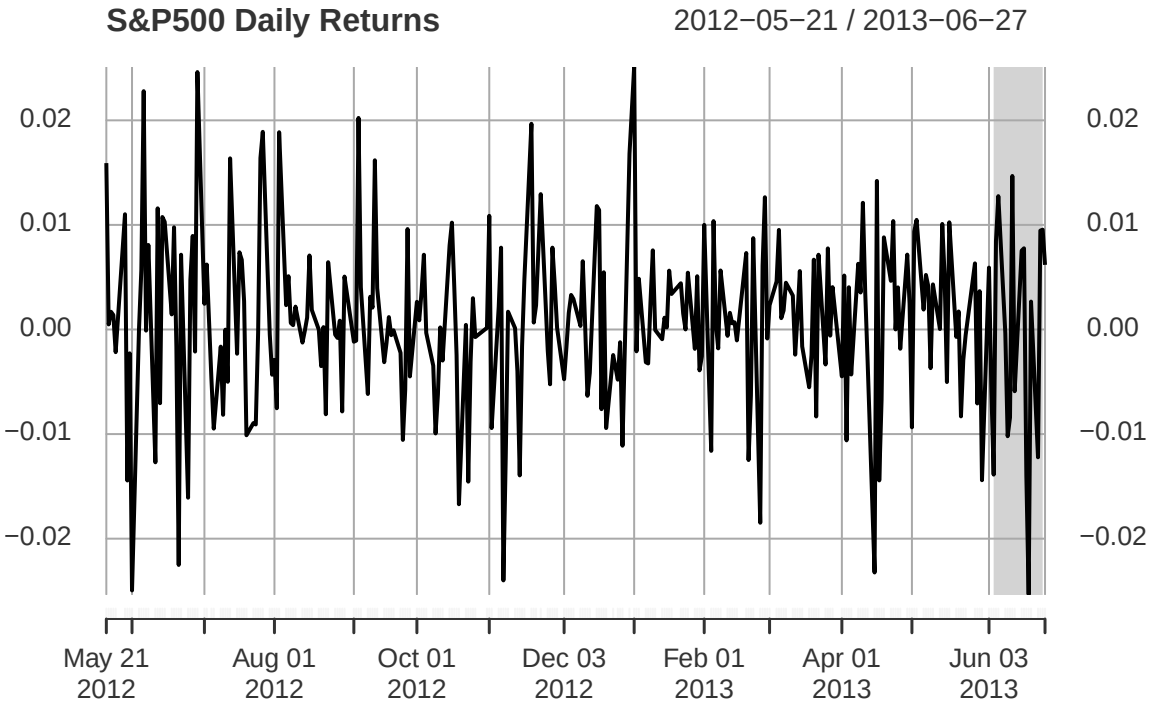
Table 1: Summary statistics of daily returns

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
SP500	277	0.001	0.008	−0.025	−0.003	0.006	0.025
Comcast	277	0.001	0.012	−0.033	−0.006	0.009	0.032
Charter	277	0.003	0.017	−0.046	−0.007	0.010	0.099
ATT	277	0.0002	0.010	−0.052	−0.006	0.007	0.038
Verizon	277	0.001	0.011	−0.036	−0.007	0.008	0.034
Century	277	−0.0003	0.019	−0.256	−0.005	0.007	0.035
Google	277	0.001	0.013	−0.083	−0.006	0.009	0.054
Microsoft	277	0.001	0.013	−0.045	−0.007	0.008	0.037
Apple	277	−0.001	0.019	−0.132	−0.010	0.011	0.070
Facebook	277	−0.002	0.034	−0.124	−0.020	0.015	0.175
Yahoo	277	0.002	0.019	−0.090	−0.007	0.012	0.105
AOL	277	0.001	0.025	−0.162	−0.009	0.010	0.199

S&P 500 Index

This index was used as the market index for the study

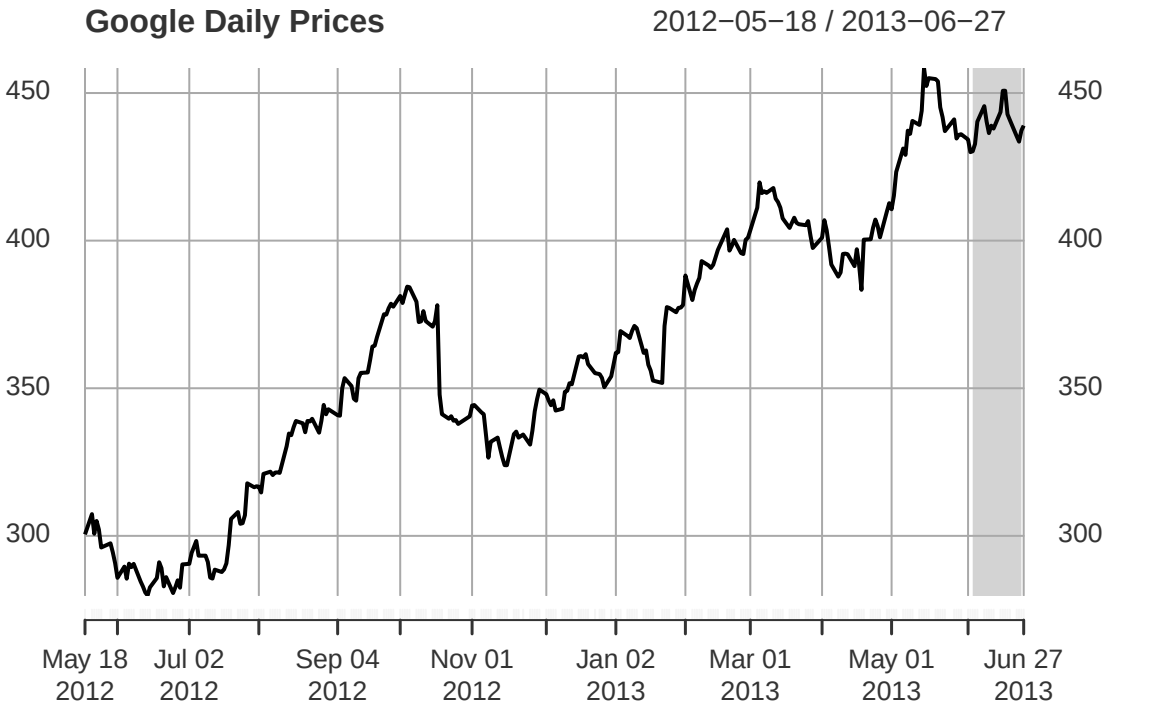


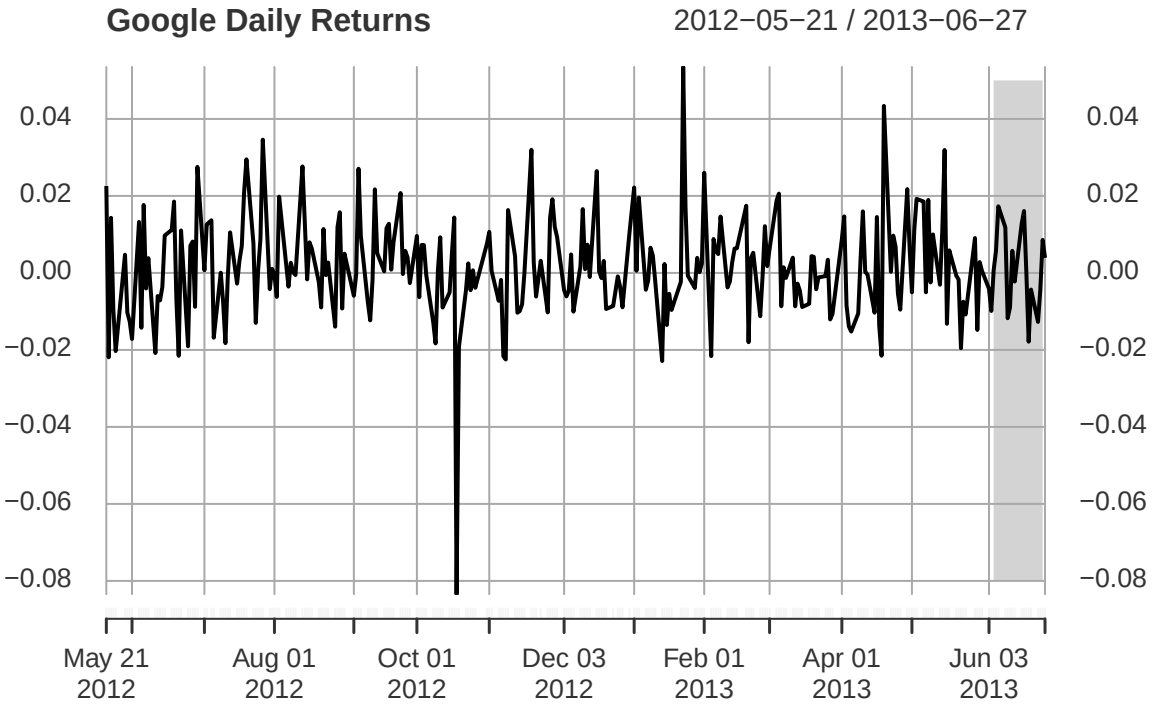


Named sites

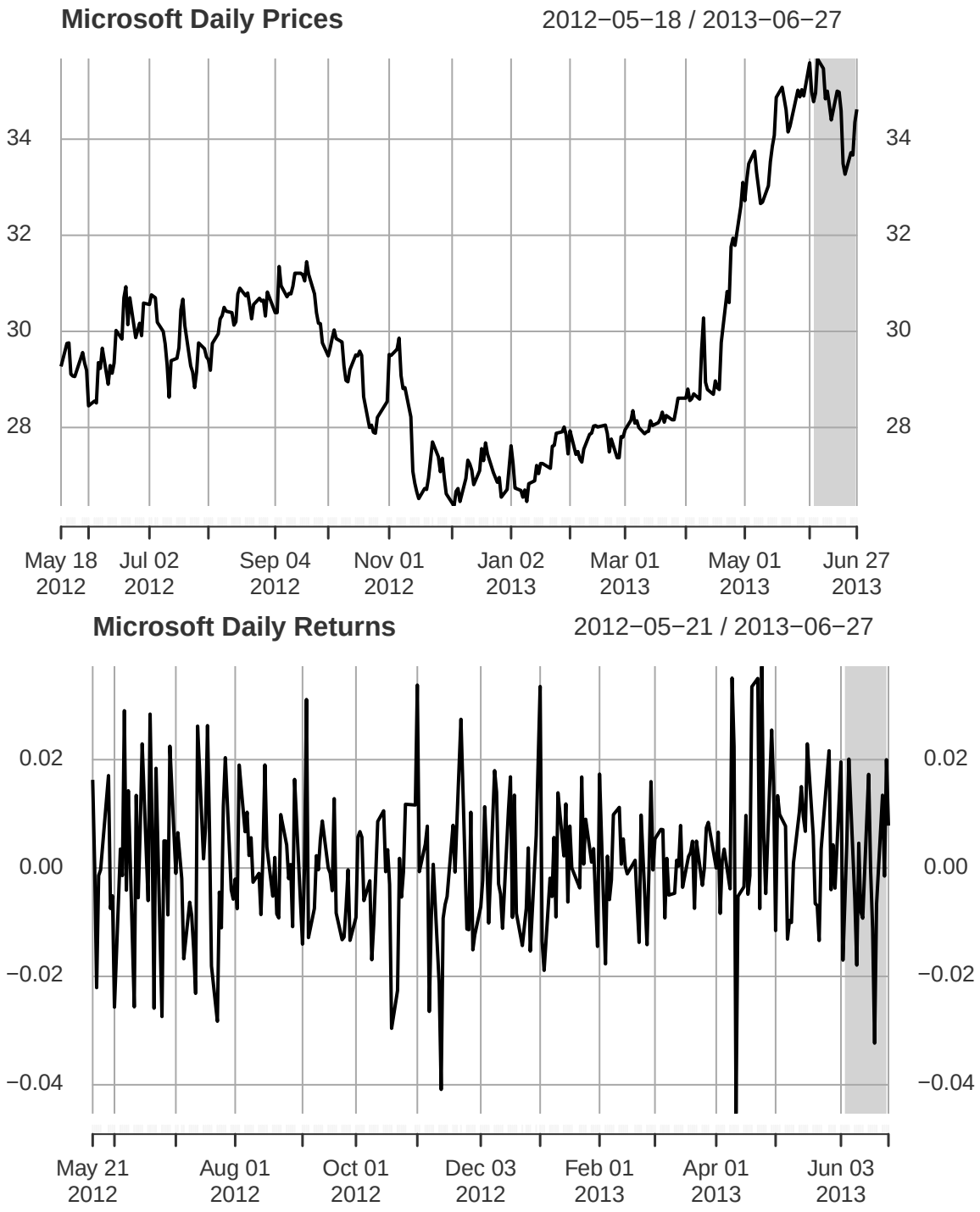
These are the sites named in Snowden's documents as having been providing information to the government through PRISM.

Google

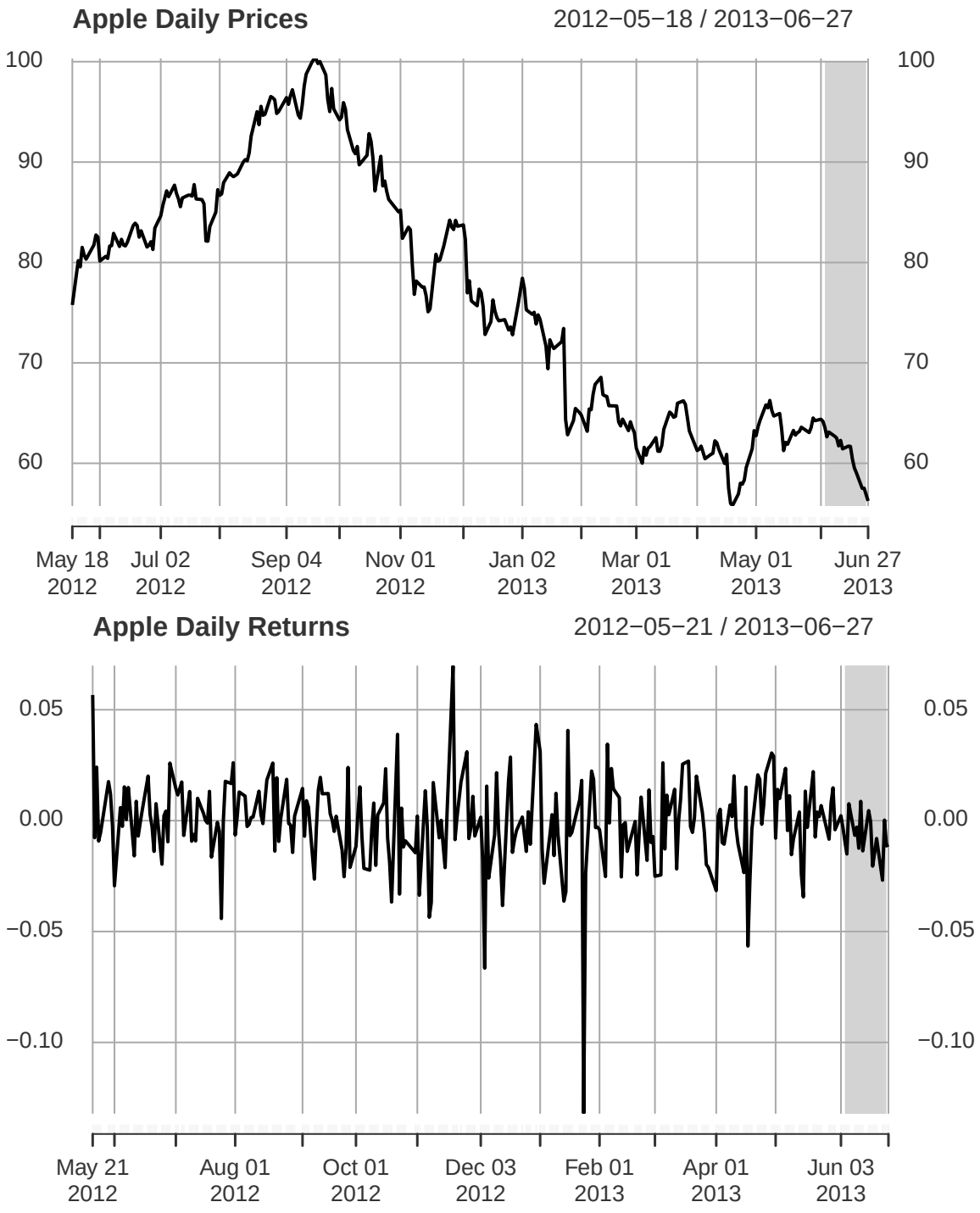




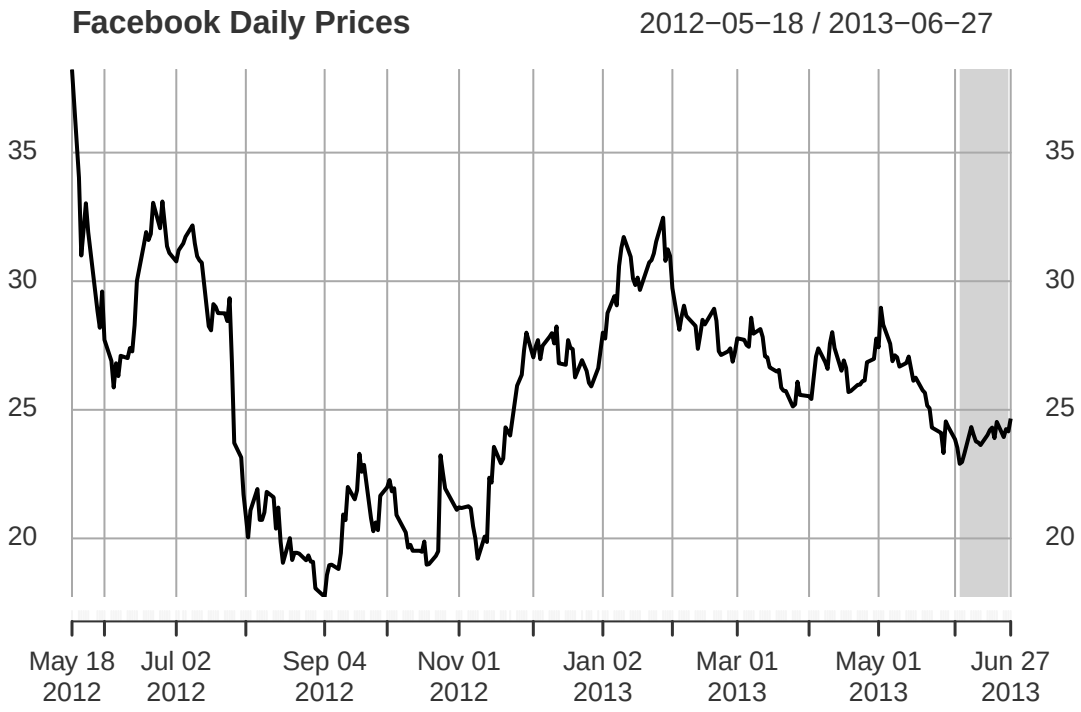
Microsoft

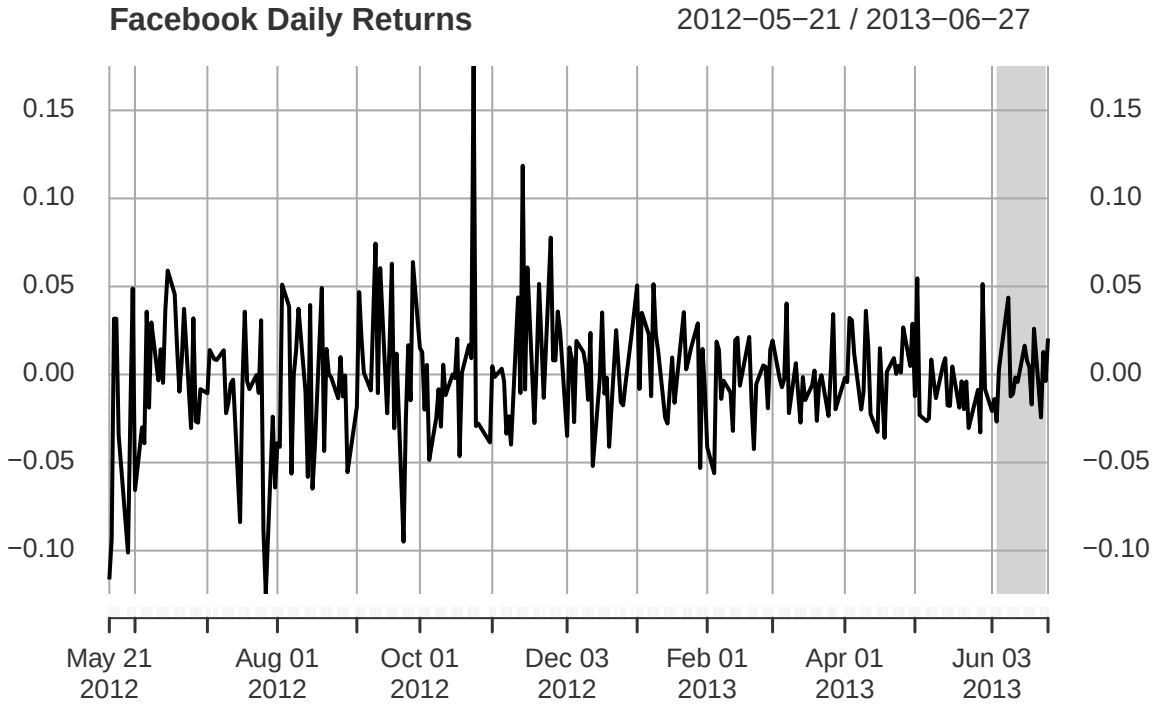

Microsoft Daily Prices
2012−05−18 / 2013−06−27
34
32
30
28
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013
Microsoft Daily Returns
2012−05−21 / 2013−06−27
0.02
0.00
−0.02
−0.04
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013

Apple

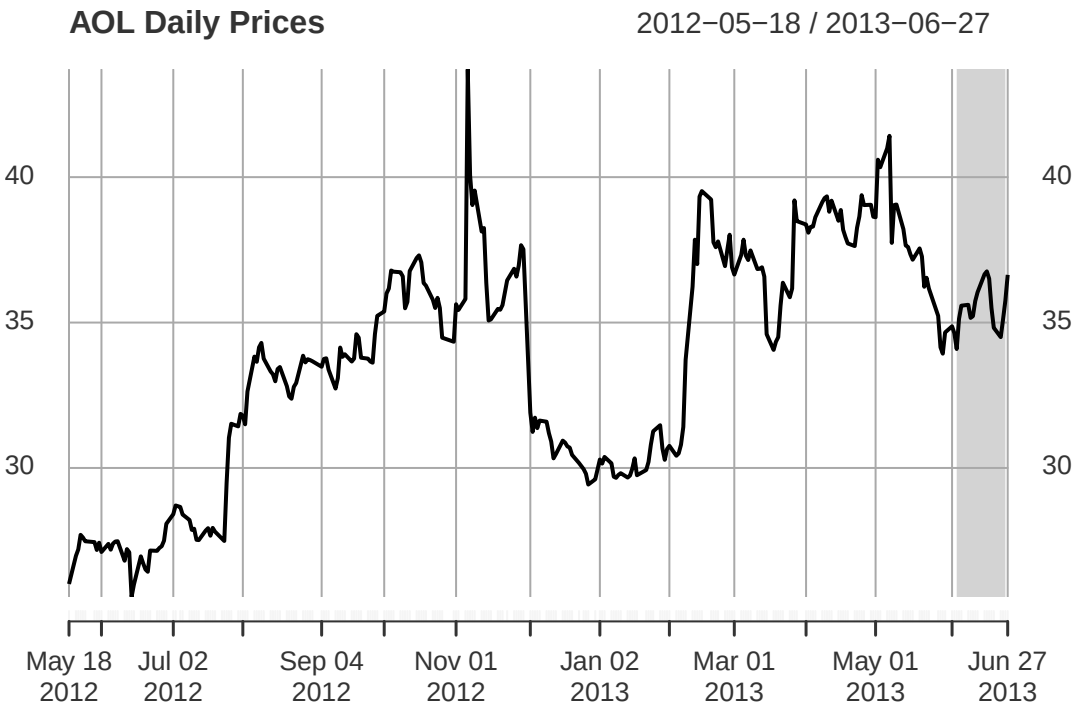

Apple Daily Prices
2012−05−18 / 2013−06−27
100
90
80
70
60
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013
Apple Daily Returns
2012−05−21 / 2013−06−27
0.05
0.00
−0.05
−0.10
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013

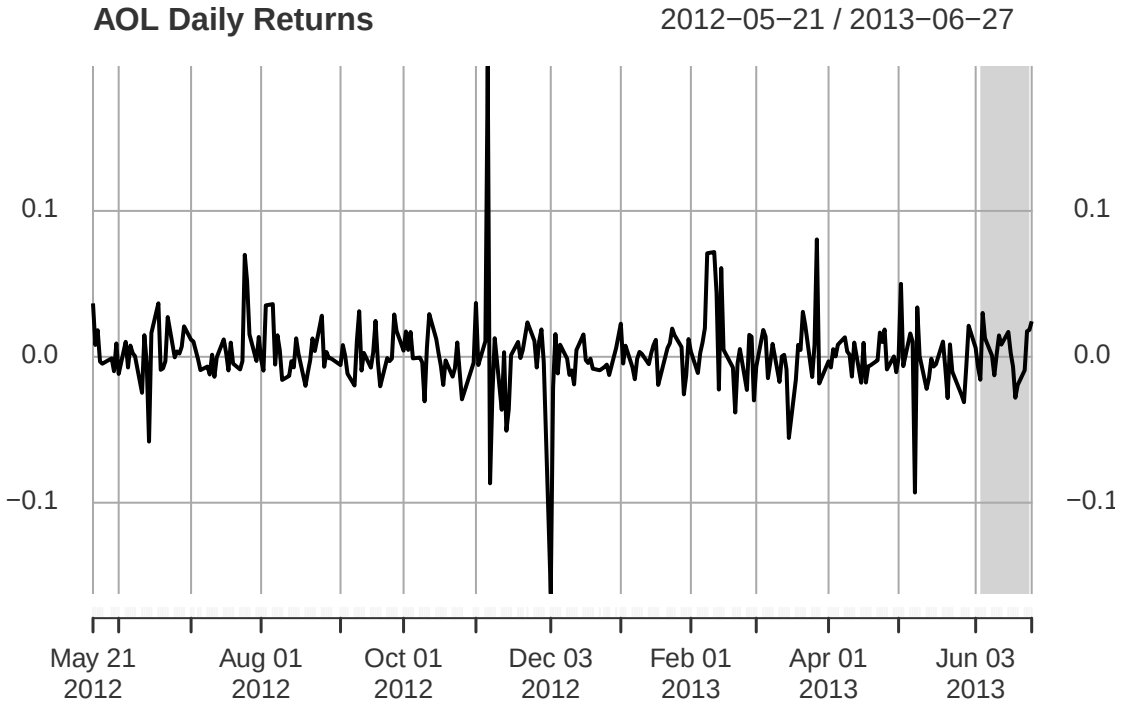
Facebook


Facebook Daily Prices
2012−05−18 / 2013−06−27
35
30
25
20
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013

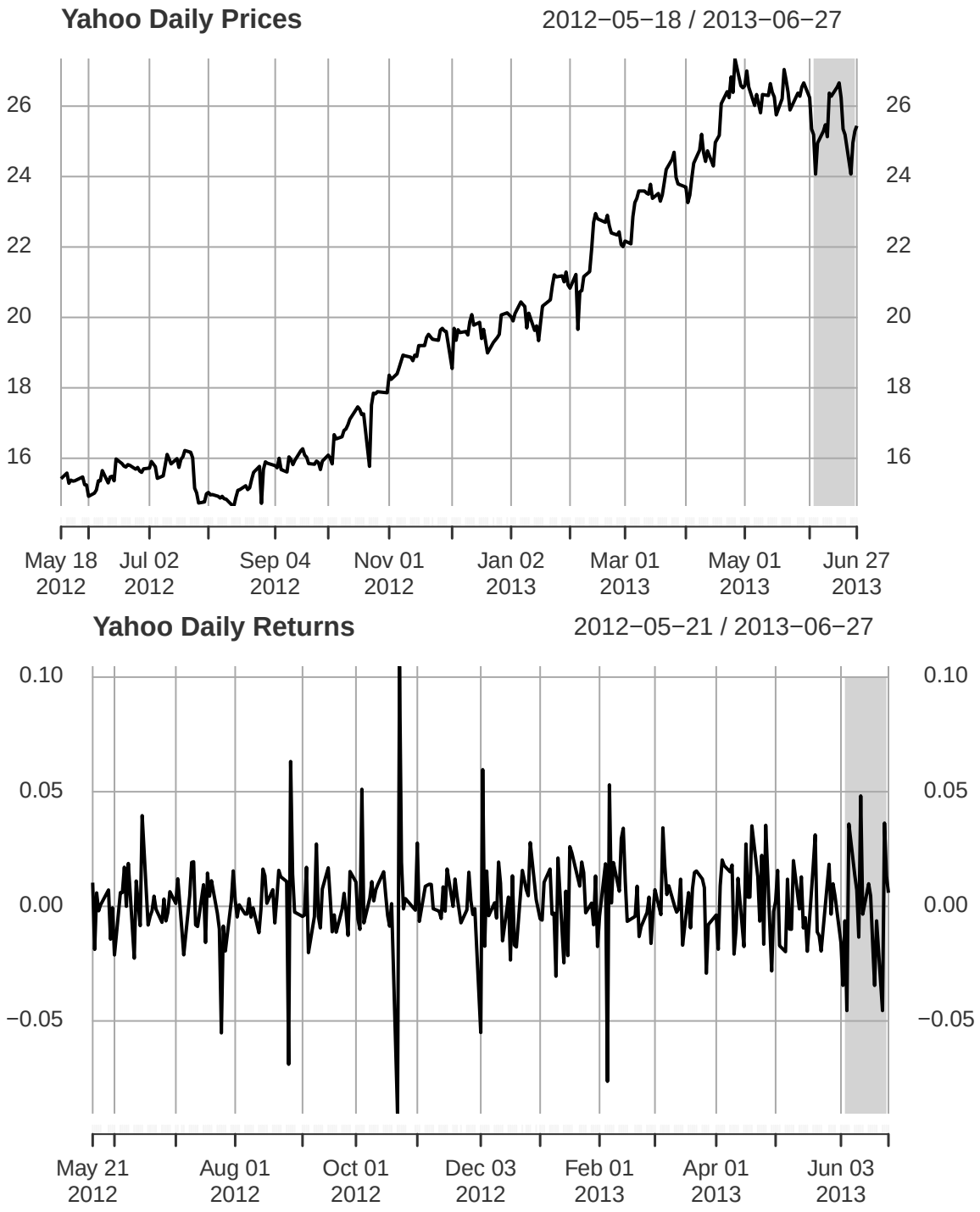

Facebook Daily Returns
2012−05−21 / 2013−06−27
0.15
0.10
0.05
0.00
−0.05
−0.10
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013

AOL


AOL Daily Prices
2012−05−18 / 2013−06−27
40
35
30
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013


AOL Daily Returns
2012−05−21 / 2013−06−27
0.1
0.0
−0.1
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013

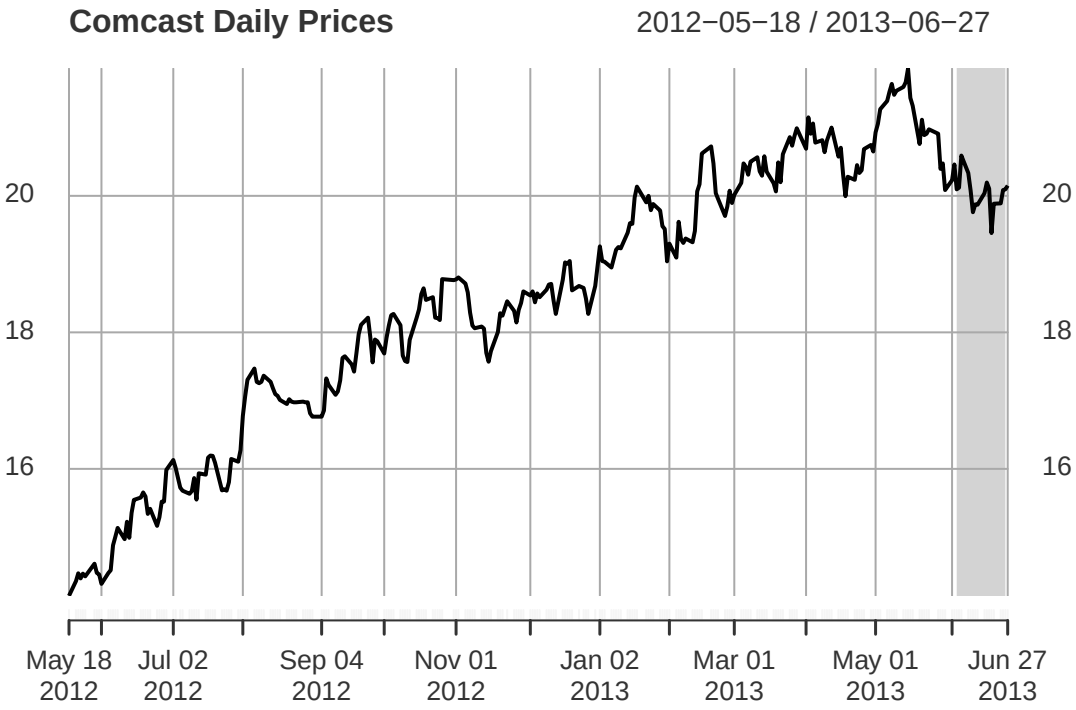
Yahoo

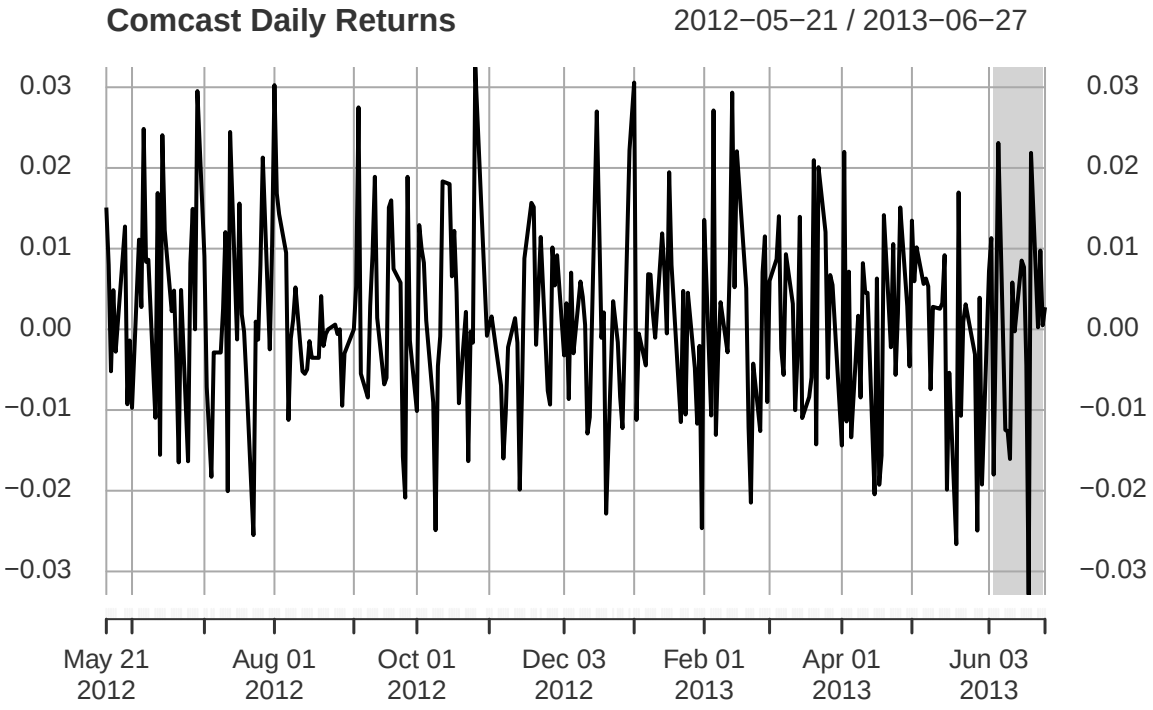

Yahoo Daily Prices
2012−05−18 / 2013−06−27
26
24
22
20
18
16
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013
Yahoo Daily Returns
2012−05−21 / 2013−06−27
0.10
0.05
0.00
−0.05
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013

Internet Service Providers (Providers)

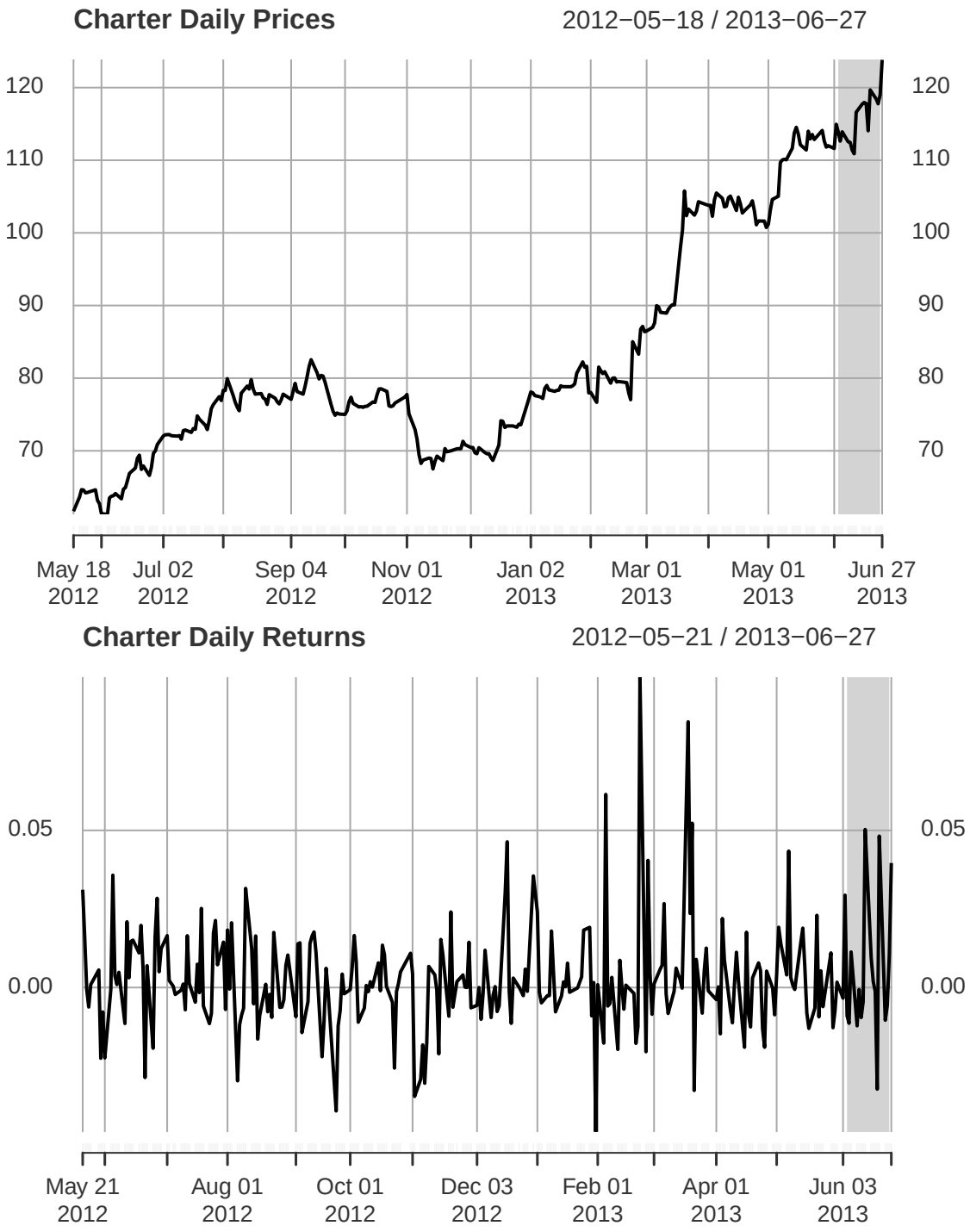
Companies not directly implicated in Snowden's revelations as being involved in government surveillance, but related in a way that investors could plausibly connect them.

Comcast



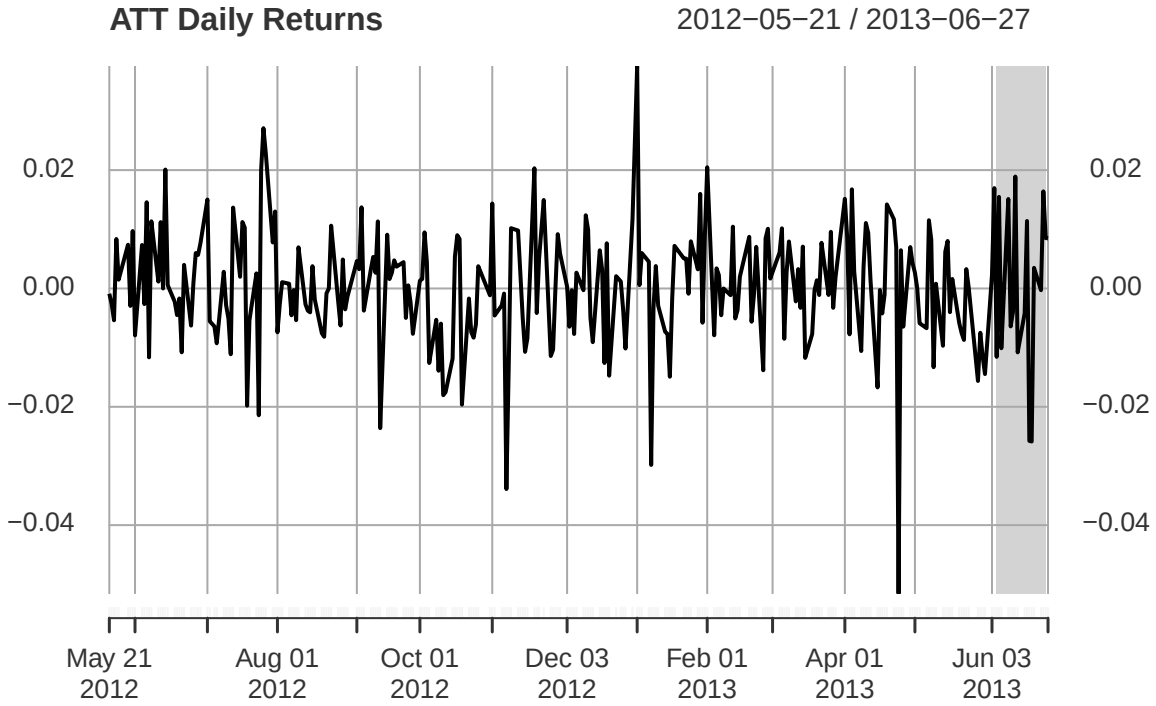


Charter

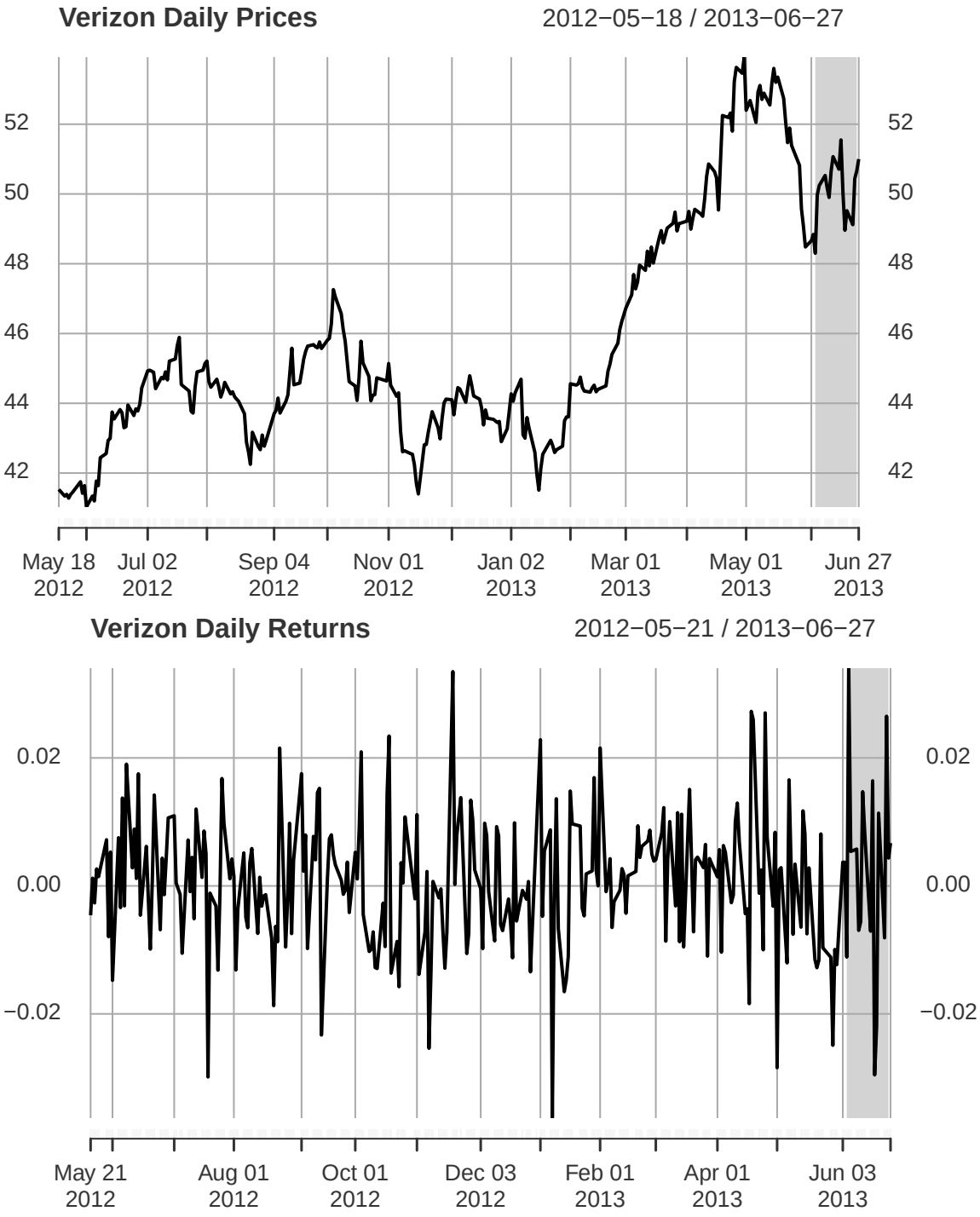

Charter Daily Prices
2012−05−18 / 2013−06−27
120
110
100
90
80
70
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013
Charter Daily Returns
2012−05−21 / 2013−06−27
0.05
0.00
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013

ATT

ATT Daily Prices
2012−05−18 / 2013−06−27
38
37
36
35
34
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013


ATT Daily Returns
2012−05−21 / 2013−06−27
0.02
0.00
−0.02
−0.04
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013

Verizon


Verizon Daily Prices
2012−05−18 / 2013−06−27
52
50
48
46
44
42
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013
Verizon Daily Returns
2012−05−21 / 2013−06−27
0.02
0.00
−0.02
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013

Century

Century Daily Prices
2012−05−18 / 2013−06−27
42
40
38
36
34
May 18 2012
Jul 02 2012
Sep 04 2012
Nov 01 2012
Jan 02 2013
Mar 01 2013
May 01 2013
Jun 27 2013
Century Daily Returns
2012−05−21 / 2013−06−27
0.00
−0.05
−0.10
−0.15
−0.20
−0.25
May 21 2012
Aug 01 2012
Oct 01 2012
Dec 03 2012
Feb 01 2013
Apr 01 2013
Jun 03 2013