Correlation between Stock Prices

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Motivation

- Understand if the short term and long term economics in different industries are correlated

  as manifested by stock prices

Data Yahoo Finance

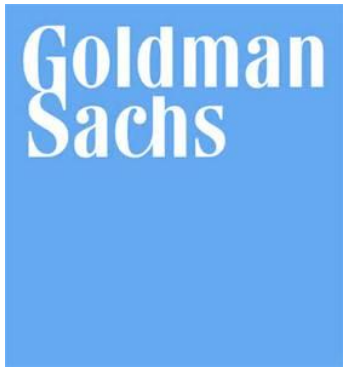
- http://finance.yahoo.com/q?s=DATA
- library(quantmod) in R
- Choose the adjusted stock prices
- Select the years when the data are all available for the stocks of interest.

The stocks of interests

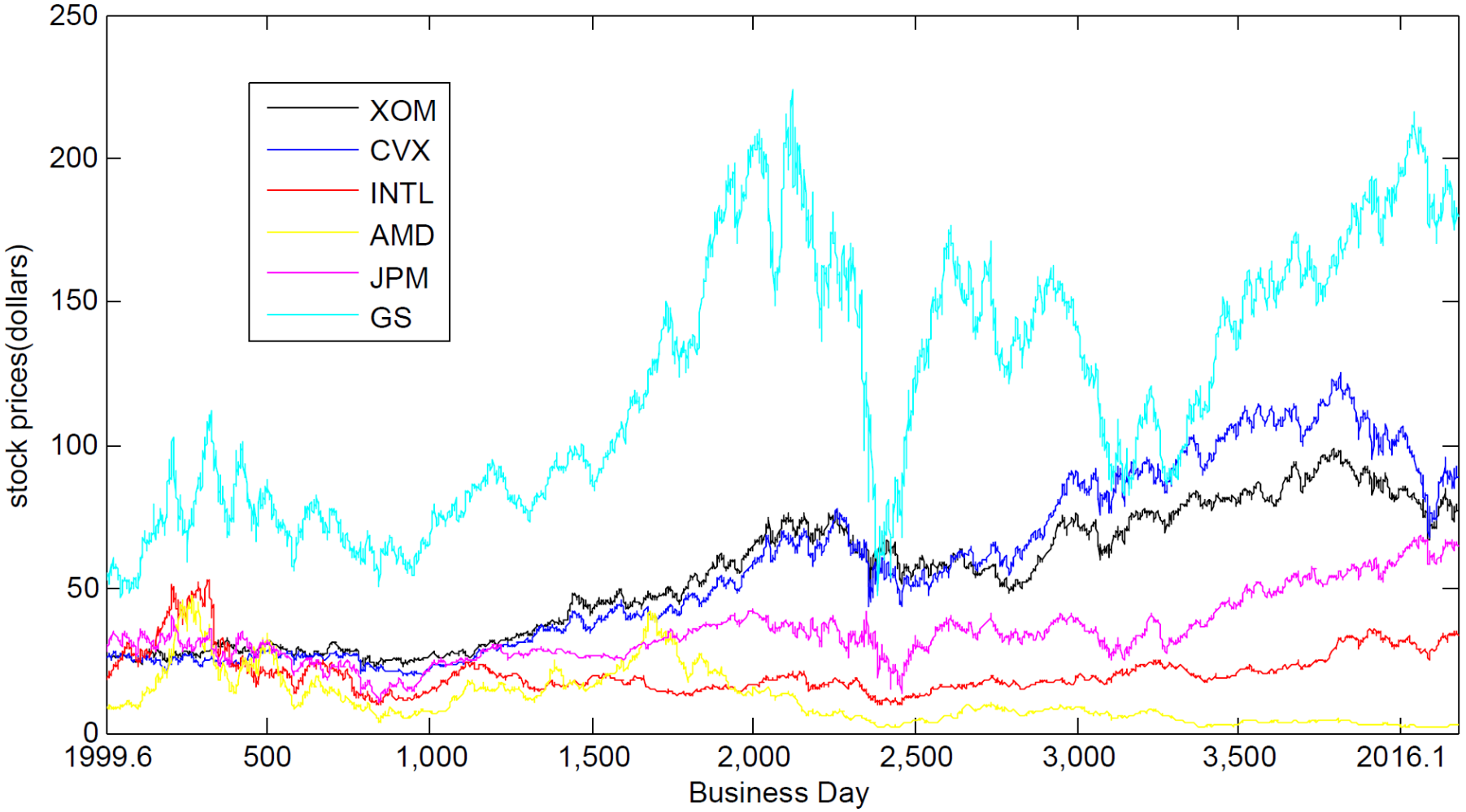
- XOM, CVX, INTL, AMD, GS, JPM

CVX

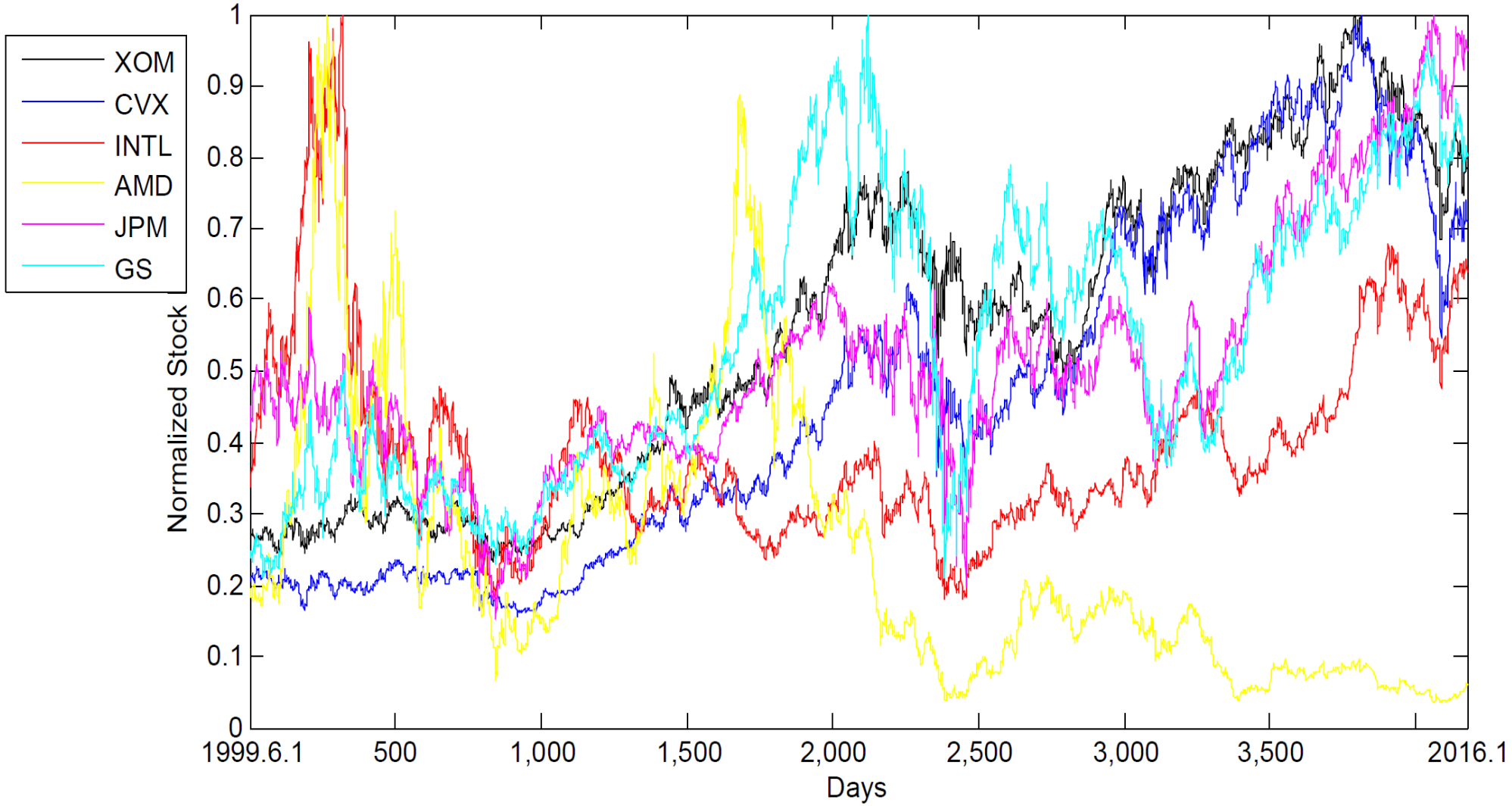
XOM



Stock prices



Normalized Stock Prices

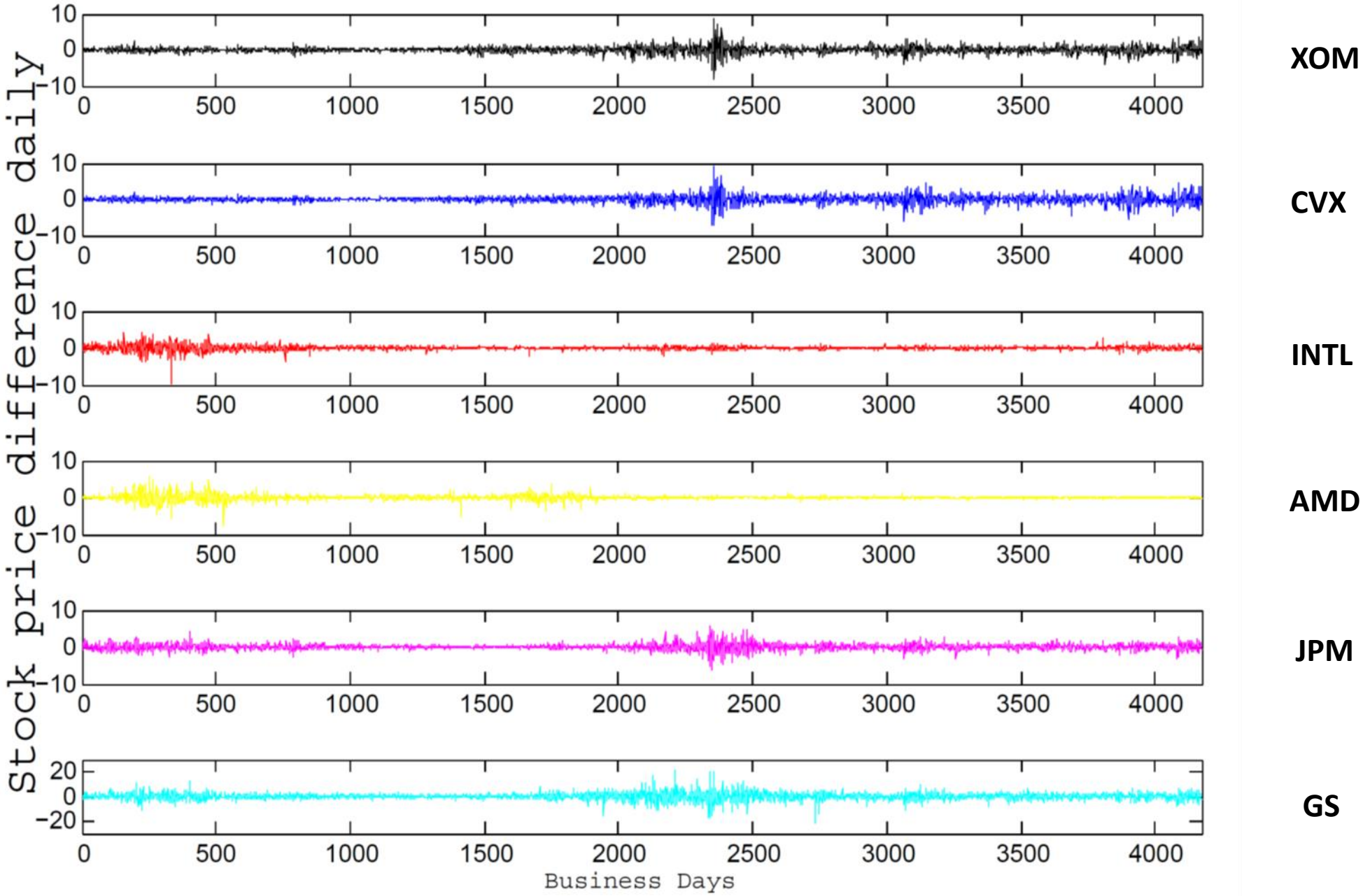


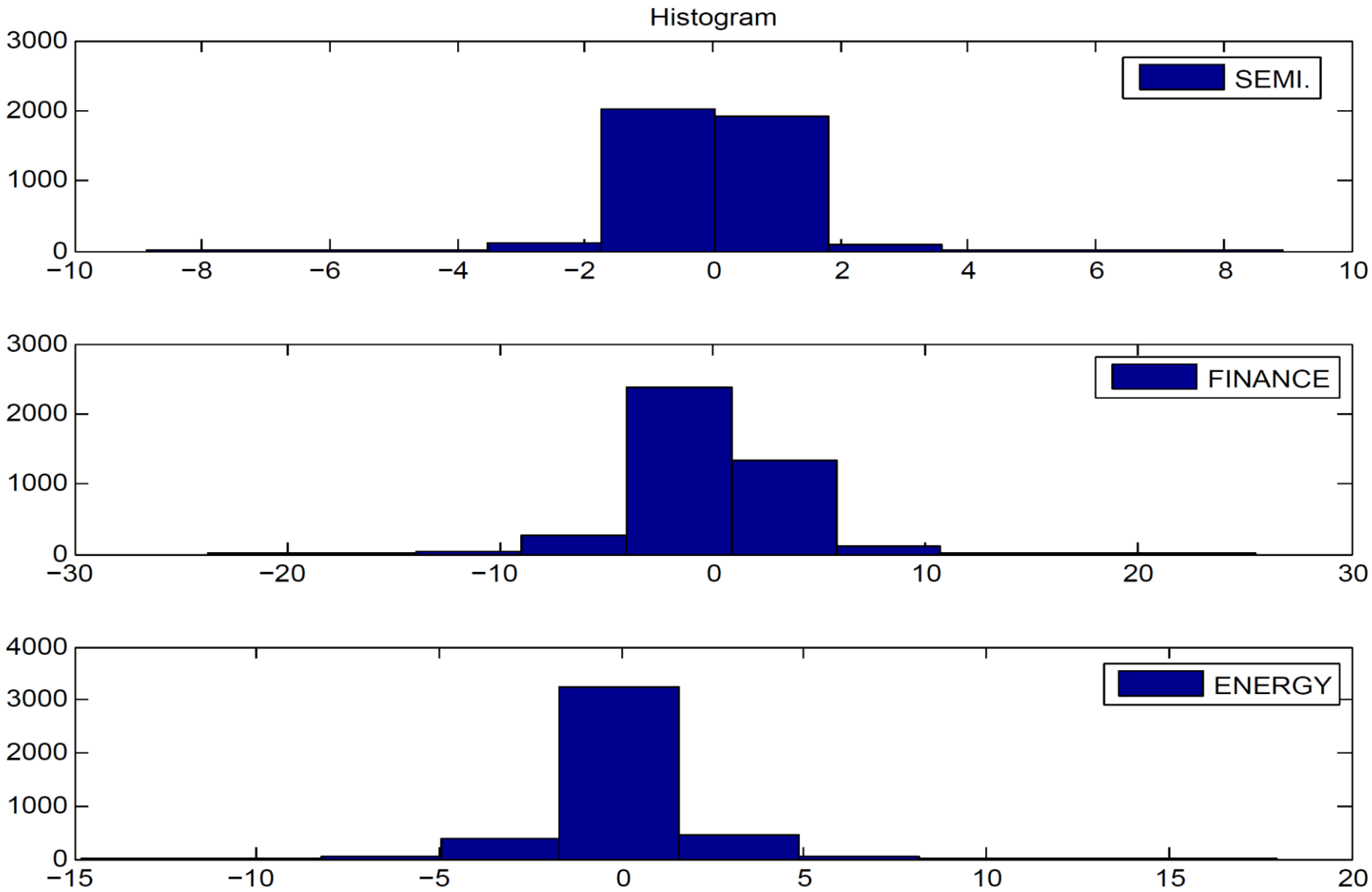
The **daily** "diffference" for the stock prices

- Difference(i) = stock price(i+ 1)– stock price on the day(i)

  where "i" is the index for a particular day

By the difference on each day, we can predict the price on each day by knowing the stock price at some day and do accumulated sum from the day !!

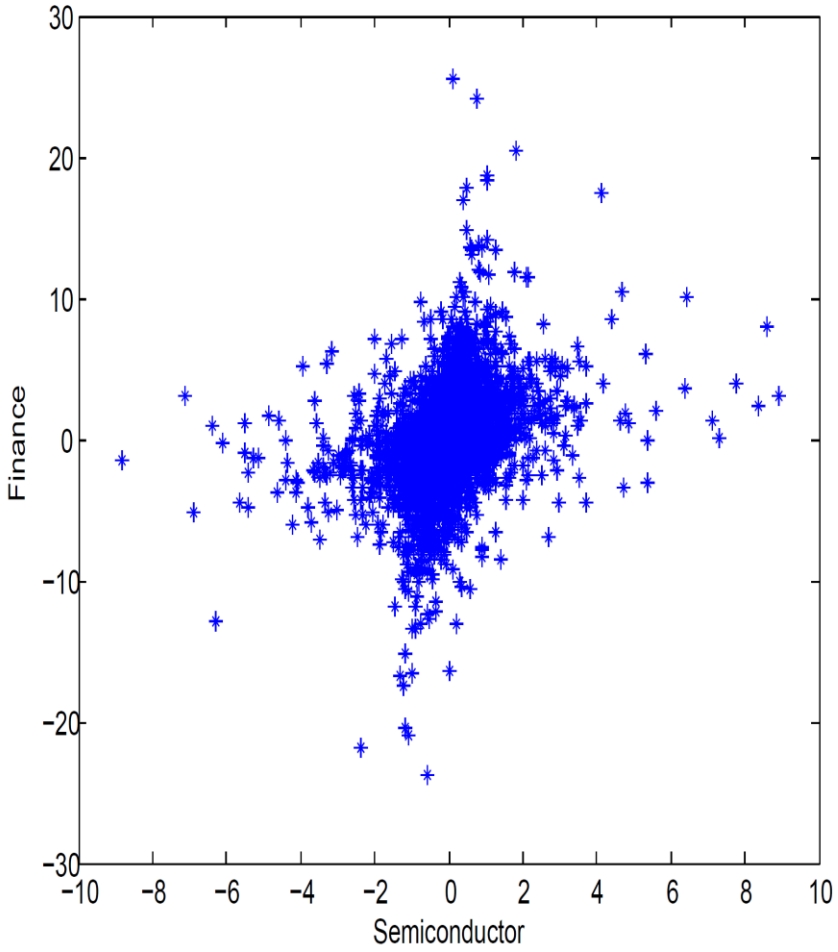

Stock price difference daily
Business Days
XOM
CVX
INTL
AMD
JPM
GS

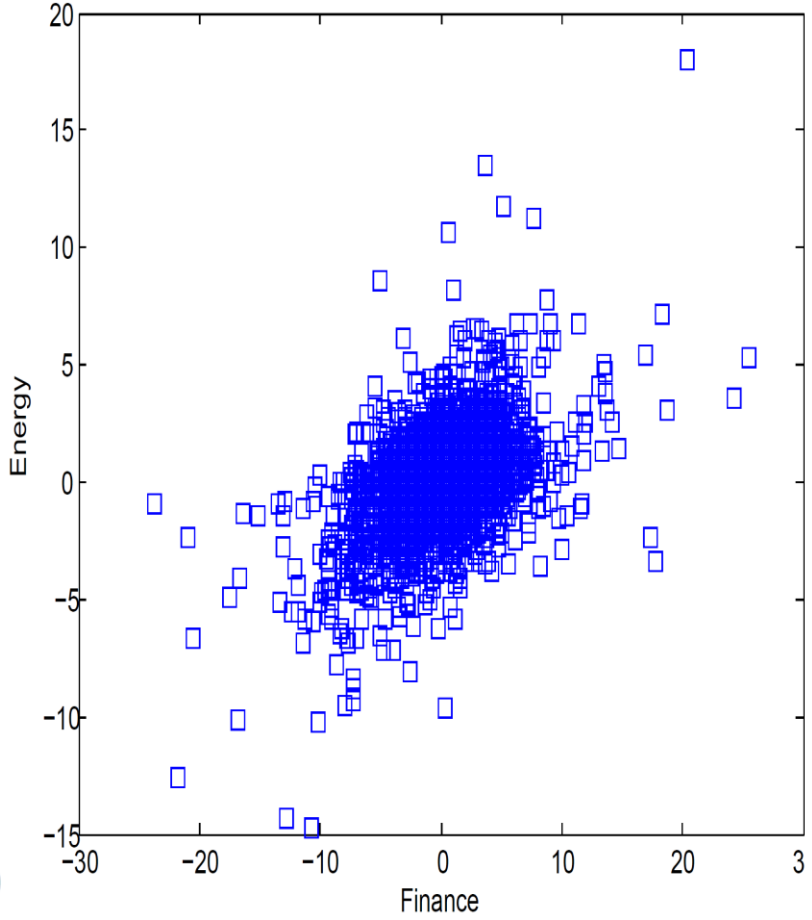

Histogram
SEMI.
3000
2000
1000
0
−10
−8
−6
−4
−2
0
2
4
6
8
10
FINANCE
3000
2000
1000
0
−30
−20
−10
0
10
20
30
ENERGY
4000
3000
2000
1000
0
−15
−10
−5
0
5
10
15
20

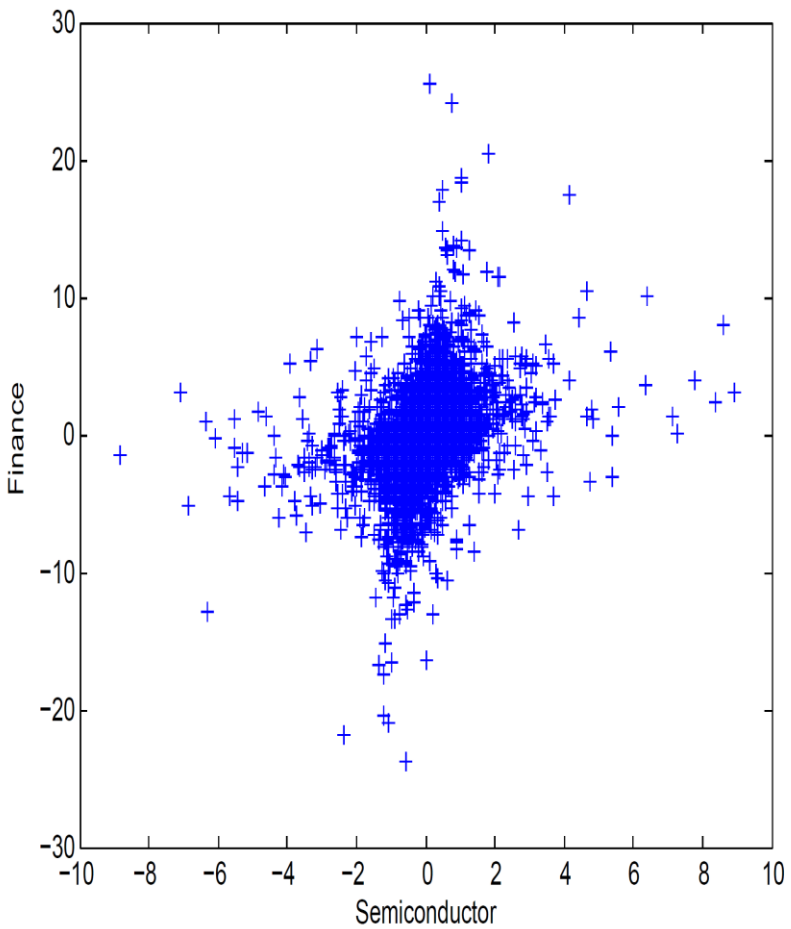
Observations

- It seems to have strong correlation for stocks within the same sectors
- There seems to have strong correlation between the finance sector and energy sector
- Semiconductor sector seems not to dance with other sectors

Scatter plots







Correlation between sectors

	Semiconductor	Finance	Energy
Semiconductor	1.0000	0.3382	0.1968
Finance	0.3382	1.0000	0.4784
Energy	0.1968	0.4784	1.0000

Hypothesis

- Null Hypothesis: One sector is not correlated with another sector

pvalue <0.05

1.0e-037 *

0	0.0000	0.9989
0.0000	0	0.0000
0.9989	0.0000	0

Conclusion

- Semiconductor sector seems not to dance with energy sector
- However, finance sector is correlated statistically with both semiconductor industry and energy industry
- Chevron and Exxon have the same investment values with stronger correlation in past 10 years.

Correlation matrix between companies

1.0000	0.4425	0.1976	0.2213	0.0999	0.0939
0.4425	1.0000	0.3320	0.3300	0.2369	0.2209
0.1976	0.3320	1.0000	0.6926	0.4454	0.4470
0.2213	0.3300	0.6926	1.0000	0.4308	0.4303
0.0999	0.2369	0.4454	0.4308	1.0000	0.8438
0.0939	0.2209	0.4470	0.4303	0.8438	1.0000