# Why do people trade?

FINANCIAL TRADING IN R

**Ilya Kipnis**
Professional Quantitative Analyst and R programmer

# What is trading?

- The act of BUYING or SELLING an asset

BUYING $\rightarrow$ tangible product

SELLING $\rightarrow$ financial security

- Cash $\rightarrow$ product $\rightarrow$ cash (hopefully making a profit!)

# Why do people trade?

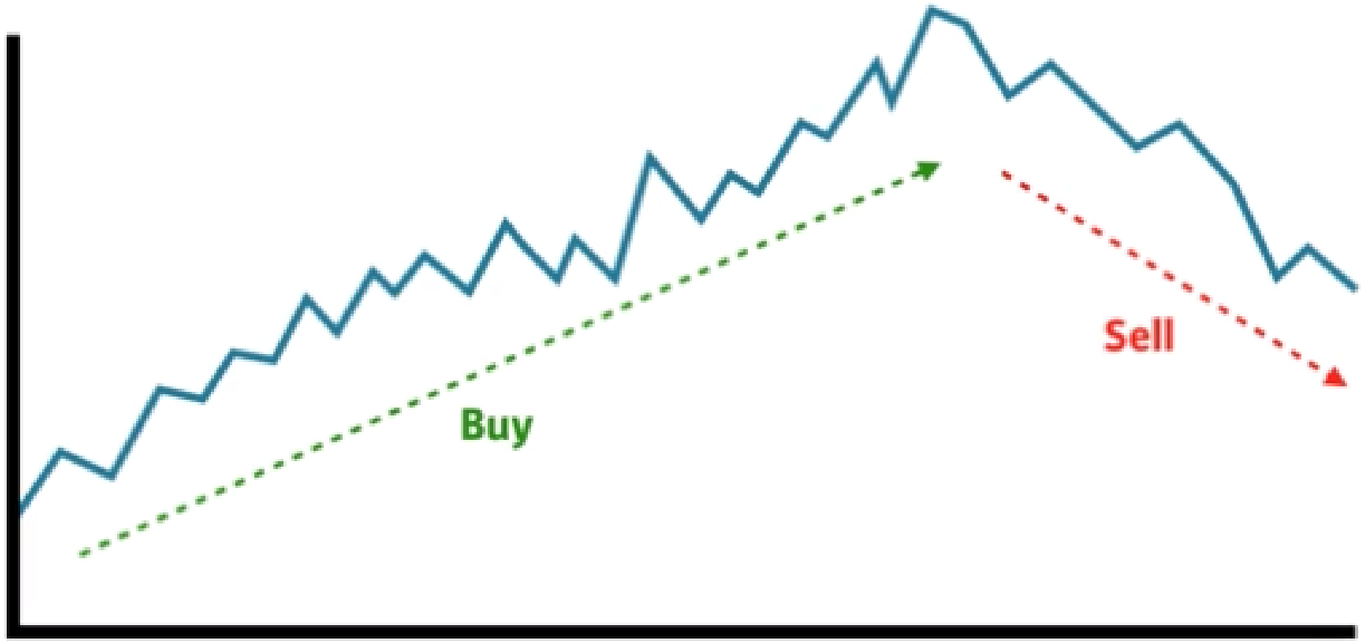
- To make a profit
- To take on, offload, and hedge financial risk
- To protect a company from commodity price movements


- **Systematic trading:** risk/reward payoff is favorable enough to bear the risk

[1] http://www.cntraveler.com/ [2] https://qzprod.files.wordpress.com

# Types of trading

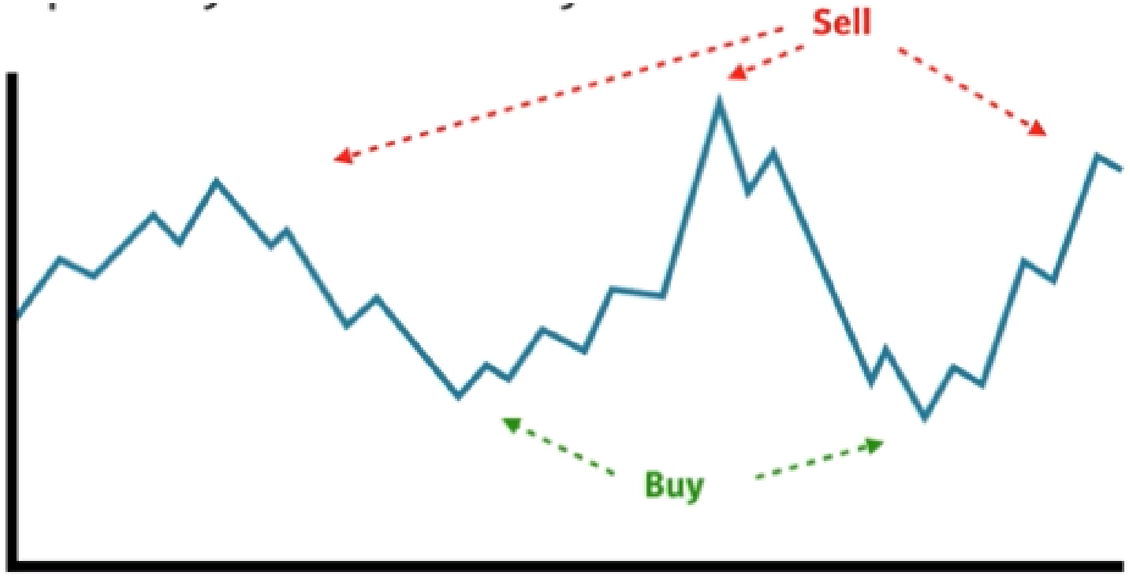
- Divergence (or momentum, trend trading): The movement of a quantity will continue in its current direction




- eg CTA (commodity trading advisors)

# Types of trading

- Convergence (or reversion, cycle trading): The movement of a quantity will eventually reverse




- eg Warren Buffett

# Let's practice!

FINANCIAL TRADING IN R

# Pitfalls of various trading systems

FINANCIAL TRADING IN R

**Ilya Kipnis**
Professional Quantitative Analyst and R programmer

# Pitfalls in trading system development

- Market data is a mix of fear, greed, and noise of millions
- *"Past performance is not indicative of future results."*
- Overfit on past (in-sample) data means bad performance on future (out-of-sample) data

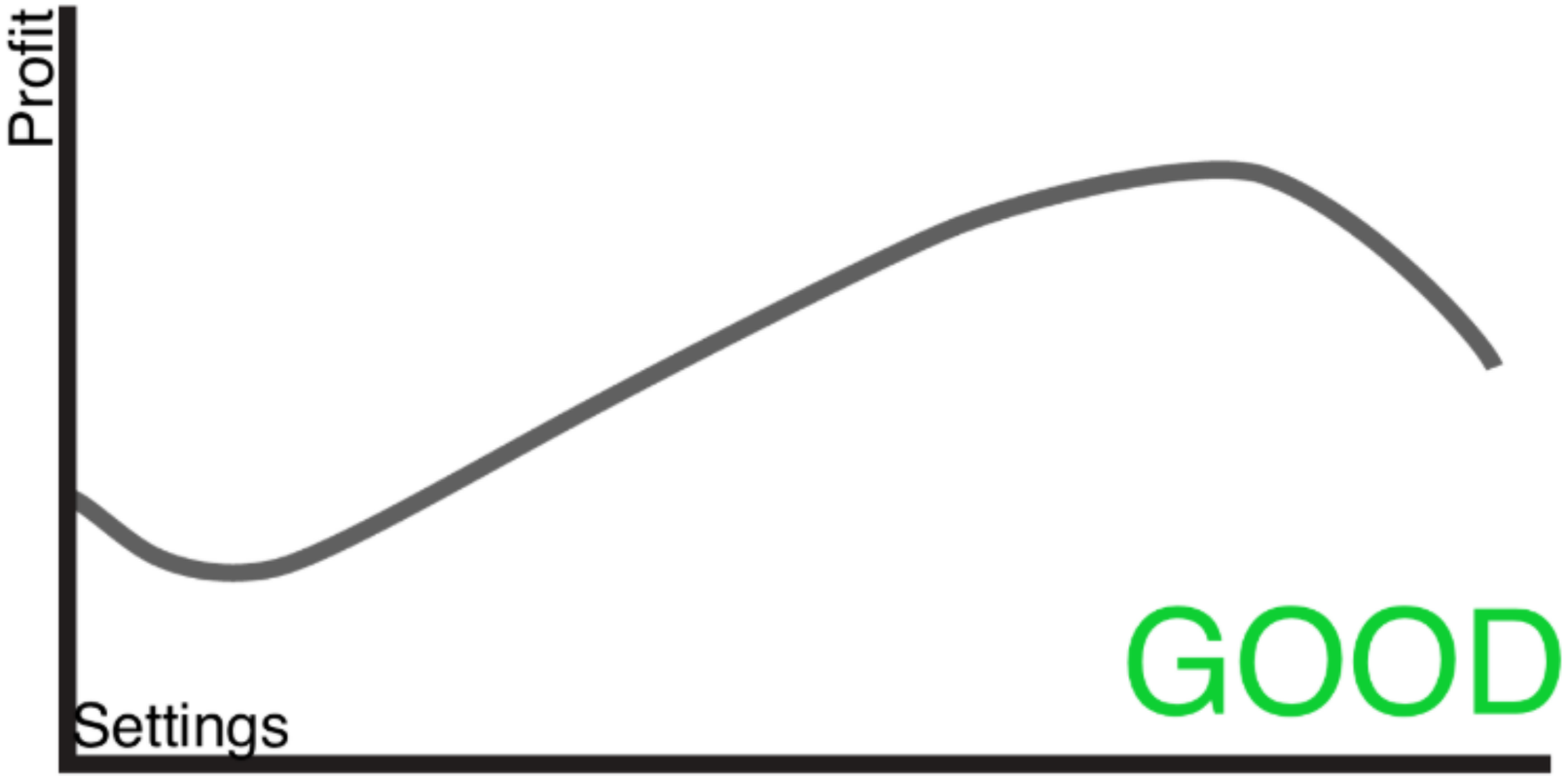
# How to not overfit

- Can cause a system to fail in the future
- Minimize the number of moving objects!
- GOOD strategy

- BAD strategy

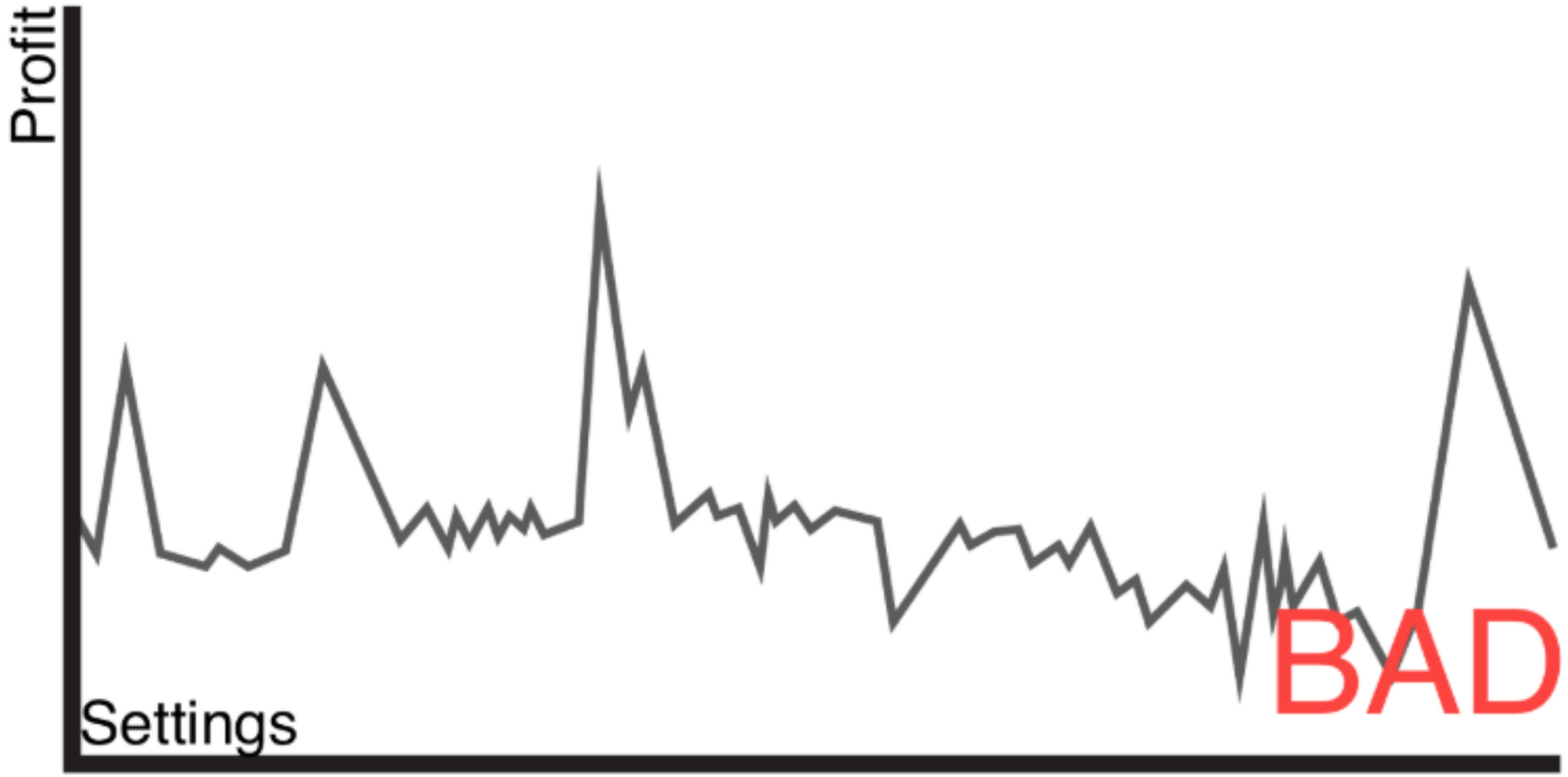
# Stability with system settings

-System should behave similarly for similar settings levels



# Stability with system settings

-System should behave similarly for similar settings levels



# Hypothesis testing

- Perform hypothesis tests
  - Relationship between an indicator & future returns?
  - Signal process to generates outperformance?
- Most of these are beyond the scope of the course, but keep them in mind

# Let's practice!

FINANCIAL TRADING IN R

# Getting financial data

FINANCIAL TRADING IN R

**Ilya Kipnis**

Professional Quantitative Analyst and R programmer

# Obtaining data from Yahoo!

- Every trading system relies on data (often costly)
- Yahoo! Finance has free data
- Use the `getSymbols()` command in quantmod

# 2 ETFs in this course

- LQD:

```
getSymbols("LQD", from = "1990-01-01", src = "yahoo", adjusted = TRU
```

```
           LQD.Open LQD.High LQD.Low LQD.Close LQD.Volume LQD.Adjust
2002-07-30   101.30   102.00  101.25    101.37      21200     52.168
2002-07-31   101.80   102.25  101.55    101.99     272000     52.487
2002-08-01   102.40   103.10  102.30    102.99     111700     53.002
2002-08-02   102.90   103.30  102.45    103.20      29200     53.110
2002-08-05   103.65   103.65  102.51    102.95     166500     52.982
2002-08-06   102.50   102.65  102.10    102.60     430100     52.801
```

  - Spy: see exercises

# quantmod functions

- `Op()` : Opening day prices
- `Hi()` : Maximum value traded during the day
- `Lo()` : Minimum value traded during the day
- `Cl()` : Last price that was traded
- `Vo()` : Number of trades that day
- `Ad()` : Adjusted closing price, adjust for dividends & splits

# Plotting financial data

Plot data using the `plot()` command

```
plot(Cl(LQD))
```

# Let's practice!

FINANCIAL TRADING IN R

# Adding indicators to financial data

FINANCIAL TRADING IN R

**Ilya Kipnis**
Professional Quantitative Analyst and R programmer

# Trading indicators

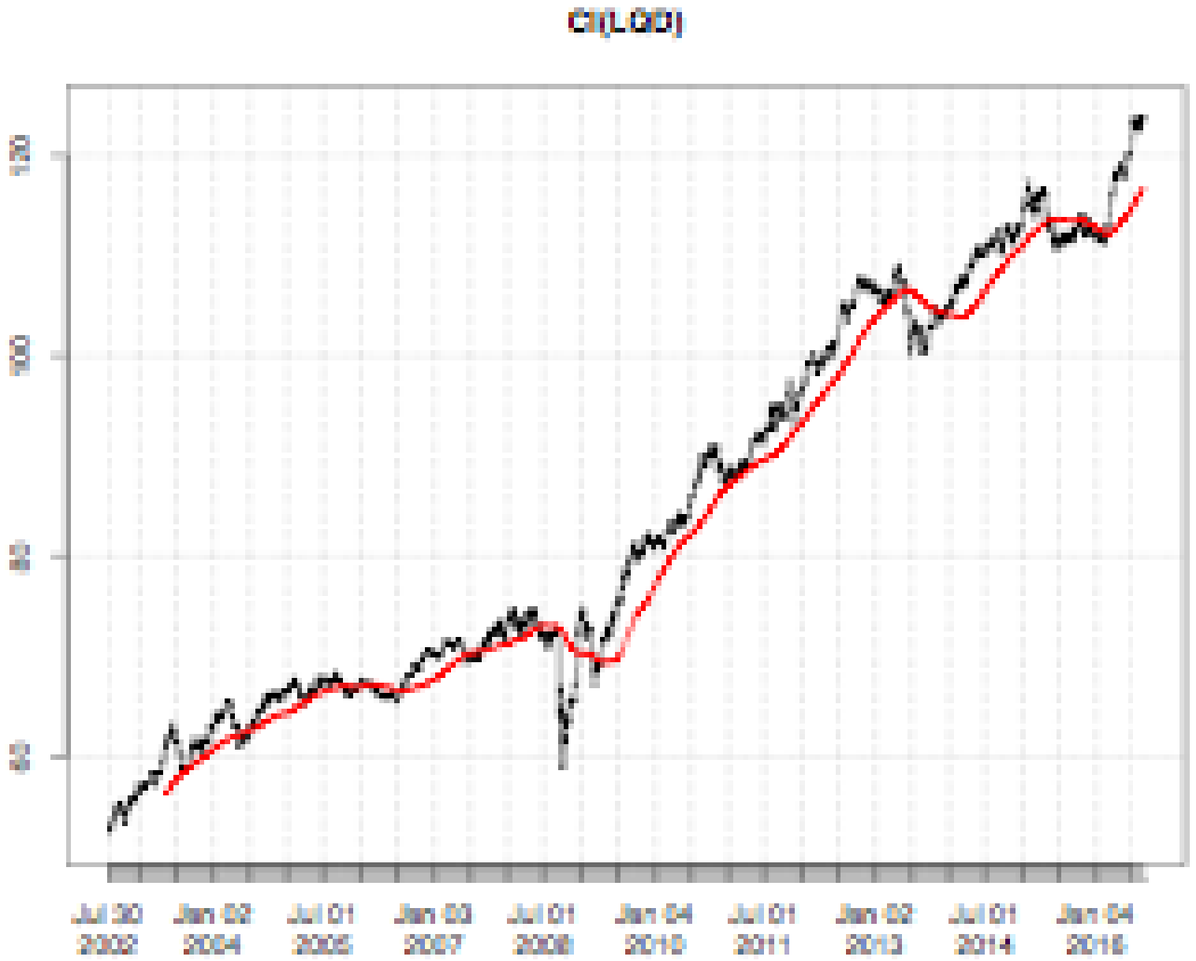
- TTR: toolbox of classical trading indicators
- SMA (Simple Moving Average)
- Popular for CTA's: 200-day moving average
  - Displays where prices have been over the past 10 months

# Using SMA()

```
# Compute a simple moving average (SMA) across 200 days
sma <- SMA(x = Cl(LQD), n = 200)

# Add the SMA line to your plot of LQD closing price
plot(Cl(LQD))
lines(sma, col = "red")
```

# The trend line



# Let's practice!

FINANCIAL TRADING IN R