# Today's Agenda

Using OLS regressions to analyze the stock market
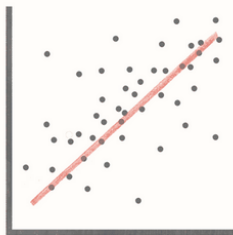
Download the stock market data from Moodle

Justin Leinaweaver (Spring 2022)
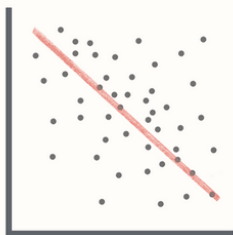
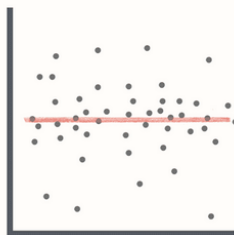# Analyzing the Stock Market with OLS

# Analyzing the Stock Market with OLS



Positive Correlation       Negative Correlation       No Correlation

# Analyzing the Stock Market with OLS

What does the 'beta' tell us about a stock?

# Analyzing the Stock Market with OLS

**KEY TAKEAWAYS**

- Beta indicates how volatile a stock's price is in comparison to the overall stock market.

- A beta greater than 1 indicates a stock's price swings more wildly (i.e., more volatile) than the overall market.

- A beta of less than 1 indicates that a stock's price is less volatile than the overall market.

- A beta of 1 indicates the stock moves identically to the overall market.

What does the 'alpha' tell us about a stock?

# Analyzing the Stock Market with OLS

**KEY TAKEAWAYS**

- Alpha refers to excess returns earned on an investment above the benchmark return.

- Active portfolio managers seek to generate alpha in diversified portfolios, with diversification intended to eliminate unsystematic risk.

- Because alpha represents the performance of a portfolio relative to a benchmark, it is often considered to represent the value that a portfolio manager adds to or subtracts from a fund's return.

S&P 500

Daily Returns (%)
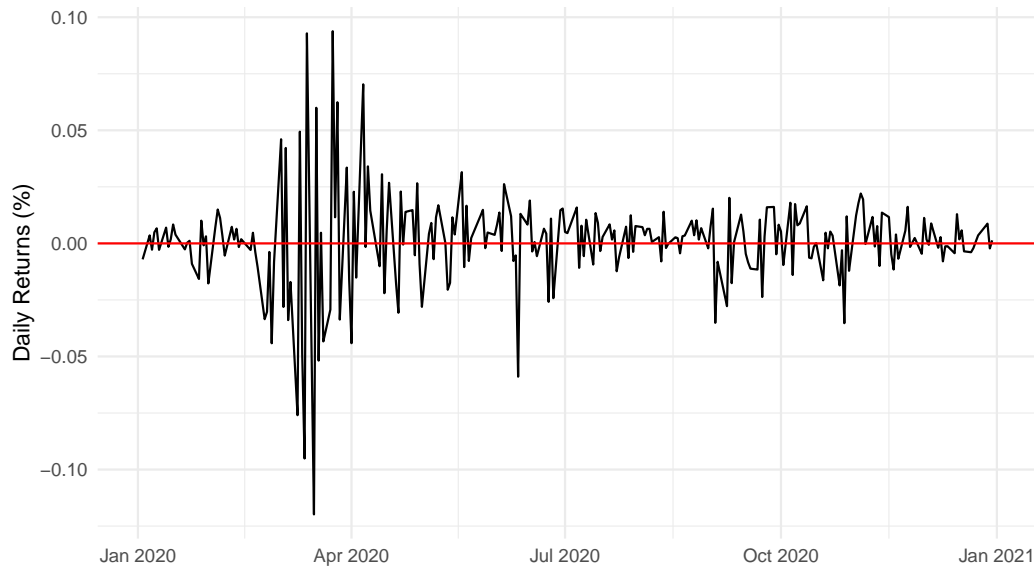
# Analyzing the Stock Market with OLS

1. Calculate the rate of return for the stock you are analyzing (e.g. BIG) AND the market (e.g S&P 500)

   - = (Current / Last) - 1

2. Regress the returns of the stock (the outcome) on the returns of the market (the predictor)

# Analyzing the Stock Market with OLS

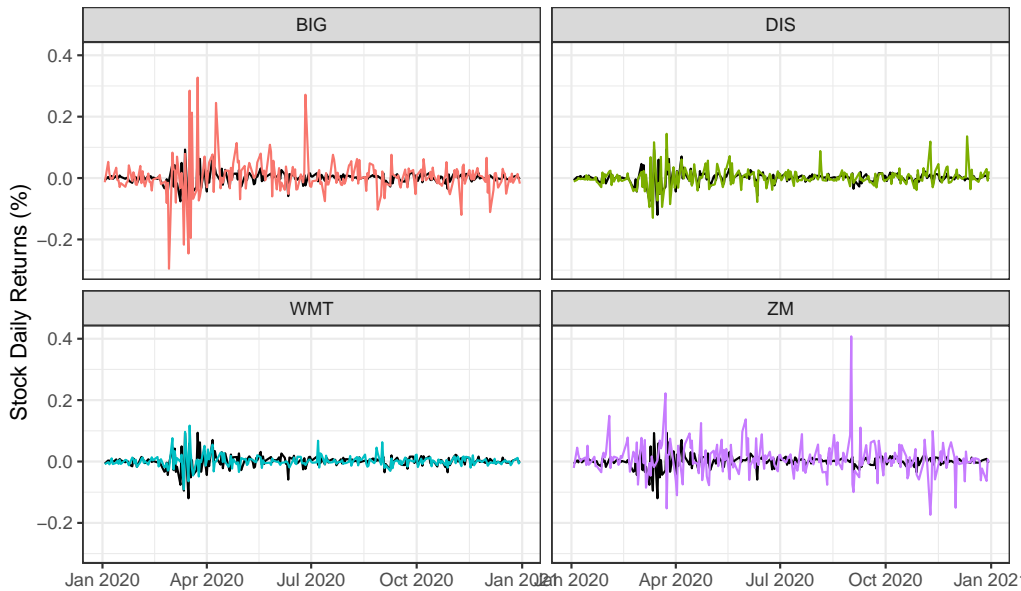Market: S&P 500

Analyze: Walmart, Disney, Zoom and Big Lots

**For Each Stock:**
1. Fit regressions and format in a table
2. Line plot: Market vs Stock Returns
3. $100 investment in 2020?

|                                  | ZM        | WMT      | DIS       | BIG      |
| -------------------------------- | --------- | -------- | --------- | -------- |
|                                  | (1)       | (2)      | (3)       | (4)      |
| SP500                            | −0.18     | 0.51*    | 1.05*     | 1.42*    |
|                                  | (0.16)    | (0.05)   | (0.06)    | (0.15)   |
| Constant                         | 0.01*     | 0.001    | 0.0005    | 0.003    |
|                                  | (0.003)   | (0.001)  | (0.001)   | (0.003)  |
| Observations                     | 251       | 251      | 251       | 251      |
| Adjusted $R^2$                   | 0.001     | 0.31     | 0.54      | 0.26     |
| Residual Std. Error (df = 249)   | 0.05      | 0.02     | 0.02      | 0.05     |
| F Statistic (df = 1; 249)        | 1.27      | 114.21*  | 292.83*   | 86.89*   |

*Note:*                                                    *p<0.05

|  | ZM | WMT | DIS | BIG |
|---|---|---|---|---|
|  | (1) | (2) | (3) | (4) |
| SP500 | −0.18 | 0.51* | 1.05* | 1.42* |
|  | (0.16) | (0.05) | (0.06) | (0.15) |
|  |  |  |  |  |
| Constant | 0.01* | 0.001 | 0.0005 | 0.003 |
|  | (0.003) | (0.001) | (0.001) | (0.003) |
| Observations | 251 | 251 | 251 | 251 |
| Adjusted $R^2$ | 0.001 | 0.31 | 0.54 | 0.26 |
| Residual Std. Error (df = 249) | 0.05 | 0.02 | 0.02 | 0.05 |
| F Statistic (df = 1; 249) | 1.27 | 114.21* | 292.83* | 86.89* |

*Note:* *$p<0.05$

| invest_sp500 | invest_wmt | invest_dis | invest_zm | invest_big |
|---|---|---|---|---|
| $114.56 | $123.24 | $122.25 | $514.26 | $166.08 |