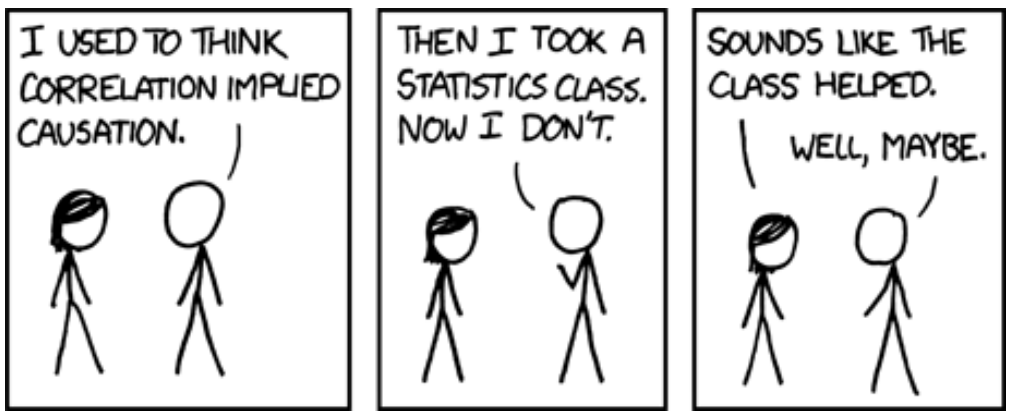
ECON 0150 | Economic Data Analysis

How economists do data analysis.



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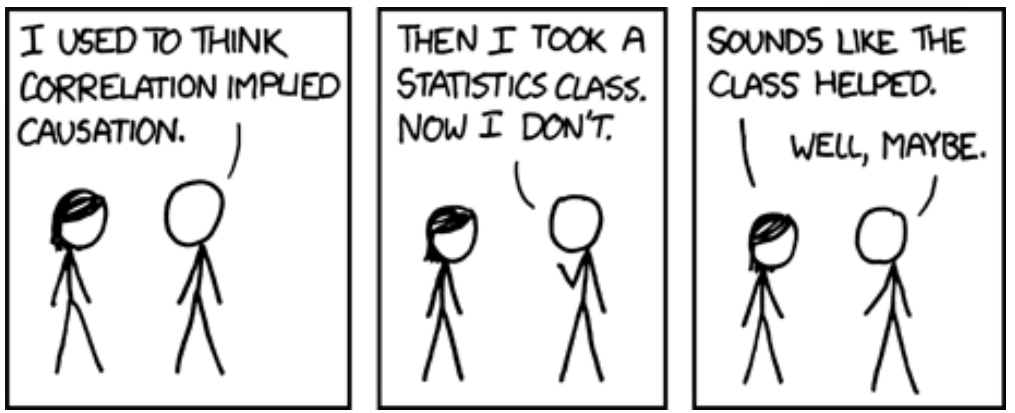

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What is economic data analysis?

The data analysis done by economists :)

Economists use data to build models and inform decisions.

Describing the landscape of economics

- Have incomes risen in the last year?
- How has unemployment changed?
- Has the racial wealth gap narrowed?

Distinguishing between economic theories

- Do voters with neighbors of the same party vote more?
- Does the gender of a Lyft driver impact rates of tipping?
- Is cooperation higher in ‘easier’ repeated prisoner’s dilemmas?

Course Goals

Developing the data analysis pipeline used by economists.

Skillset 1. Summarize data (tables and figures).
Skillset 2: Build and interpret models (general linear model).
Skillset 3: Communicate findings (writting and presentations).

***Goal**: I want you to be able to build appropriate statistical models for new problems and interpret their results.*

Course Structure

*The course is divided into **six parts**.*

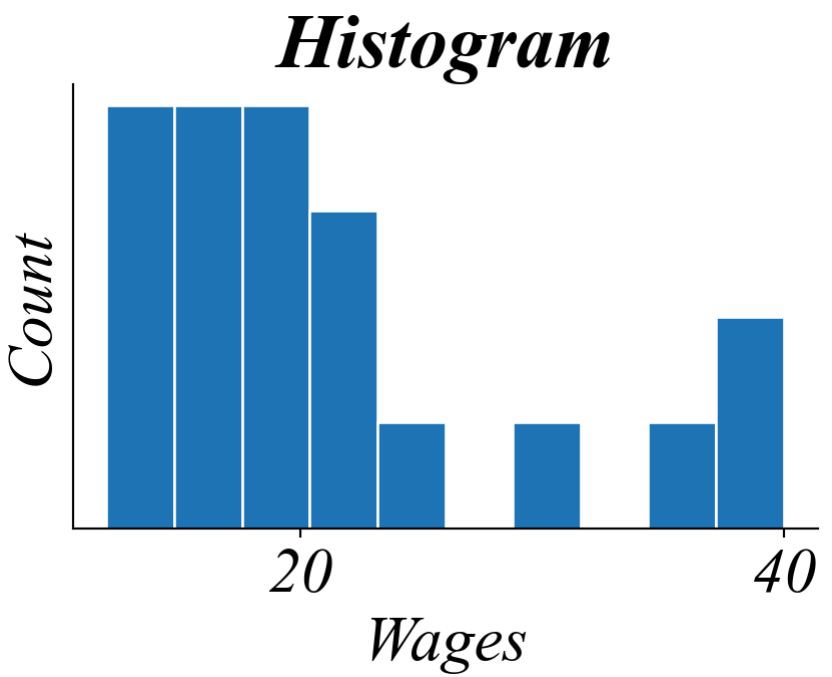
Part 1: Summary Exploratory Data Analysis (EDA)
Part 2: Pattern Exploratory Data Analysis (EDA)
Part 3: Building Linear Models
Part 4: The General Linear Model
Part 5: Advanced GLM
Part 6: Communicating with Data

Part 1: Summary EDA

***Focus**: Understanding data through summarization (eg. tables and figures).*

Example: Analyzing a dataset of wages.

Wage	EduYrs
12	8
13	10
14	10
14	11
15	12

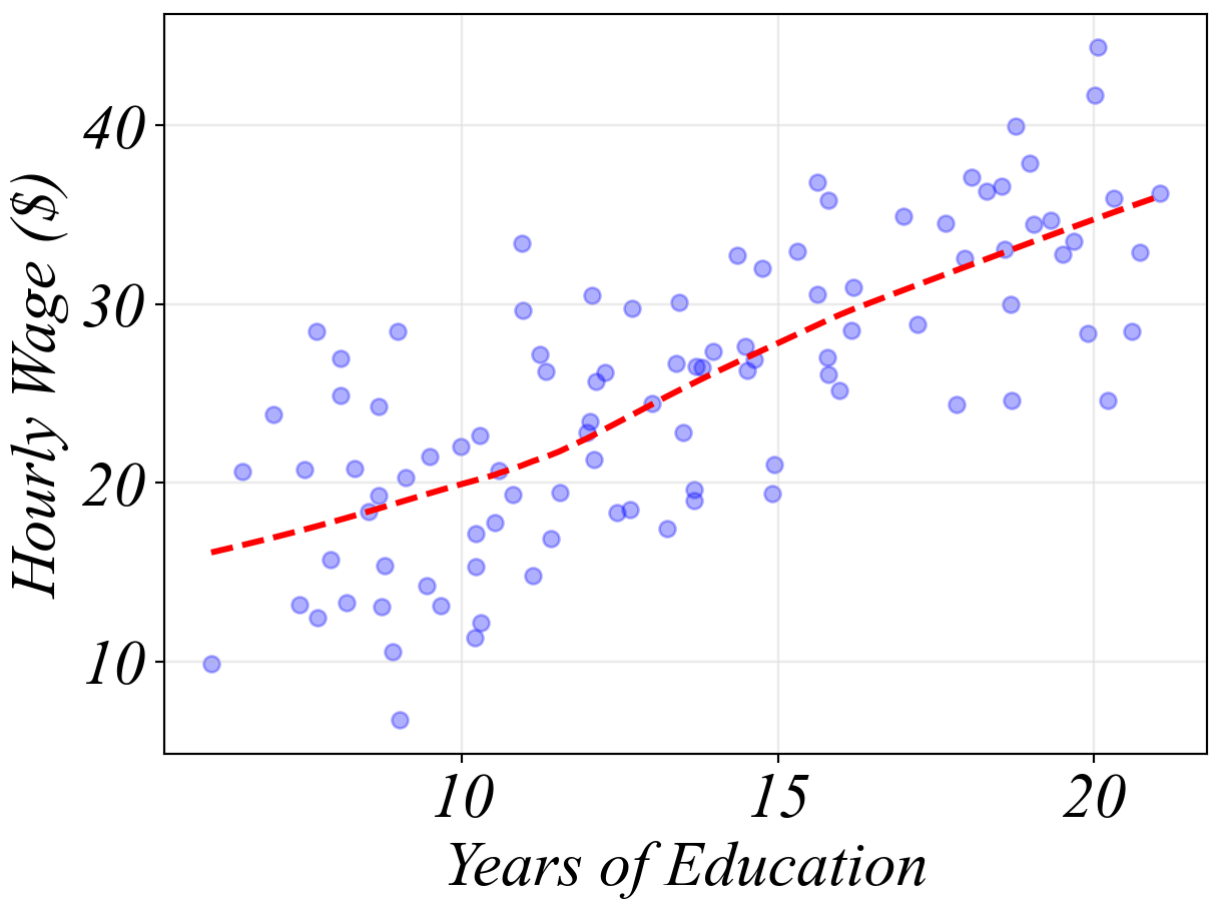


Part 2: Pattern EDA

***Focus**: Understanding relationships between variables (eg. scatterplot).*

Example: Exploring a relationship - education and wages.

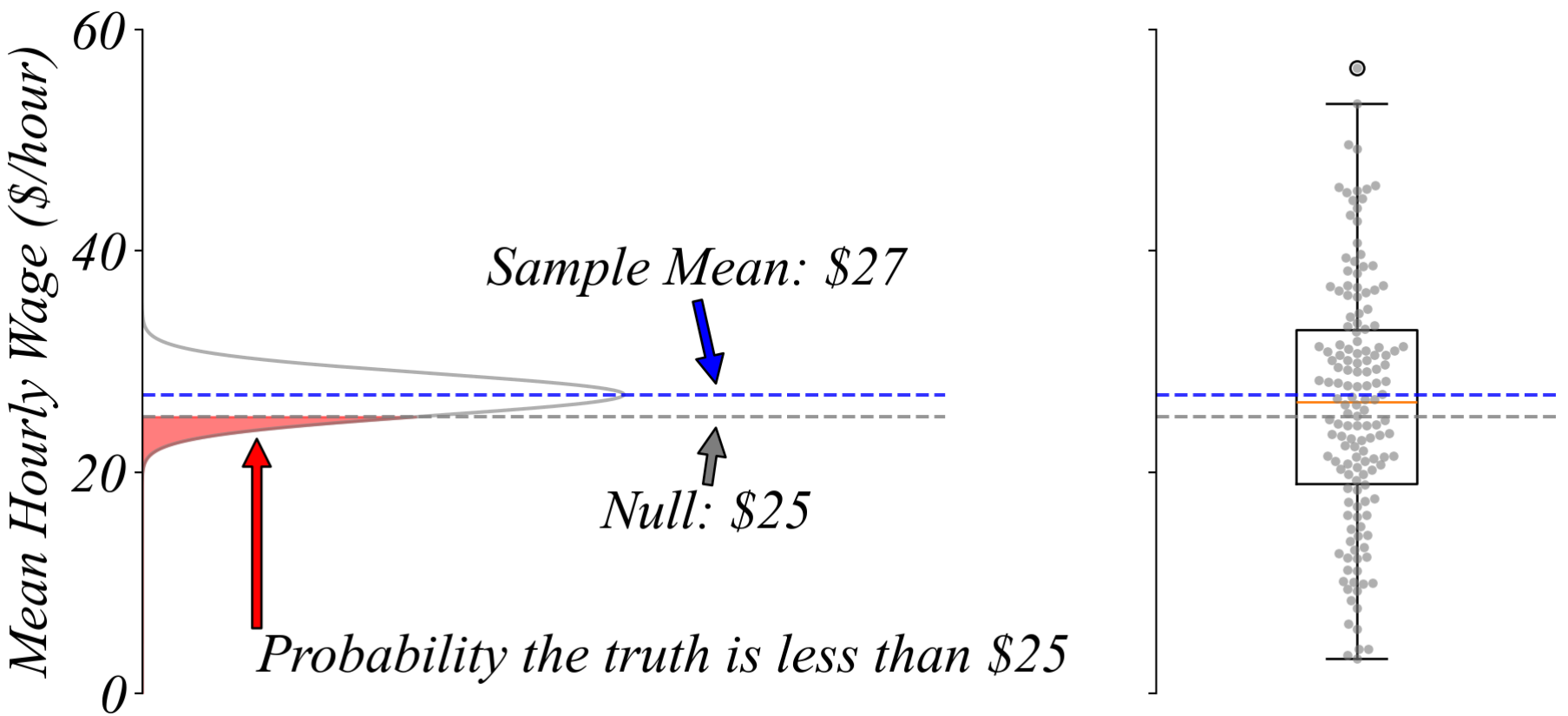
Wage	EduYrs
14	10
15	12
16	12
18	13
18	14
20	14
22	15



Part 3: Building Linear Models

***Focus**: Sampling variation, Central Limit Theorem, and basic testing.*

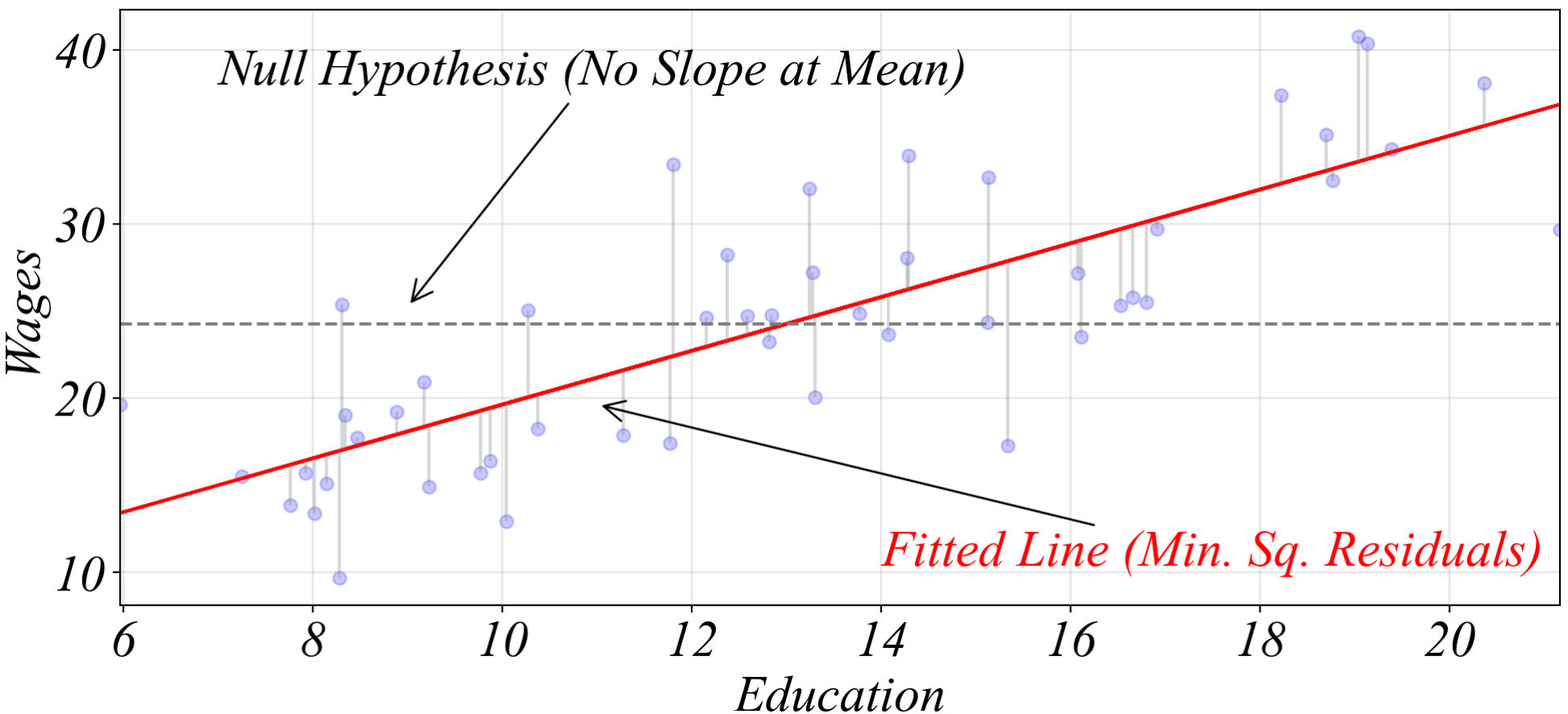
Example: Is the difference from $25 a real pattern or just noise?



Part 4: Basic General Linear Model

***Focus**: Single and multiple regression, residual analysis, and testing.*

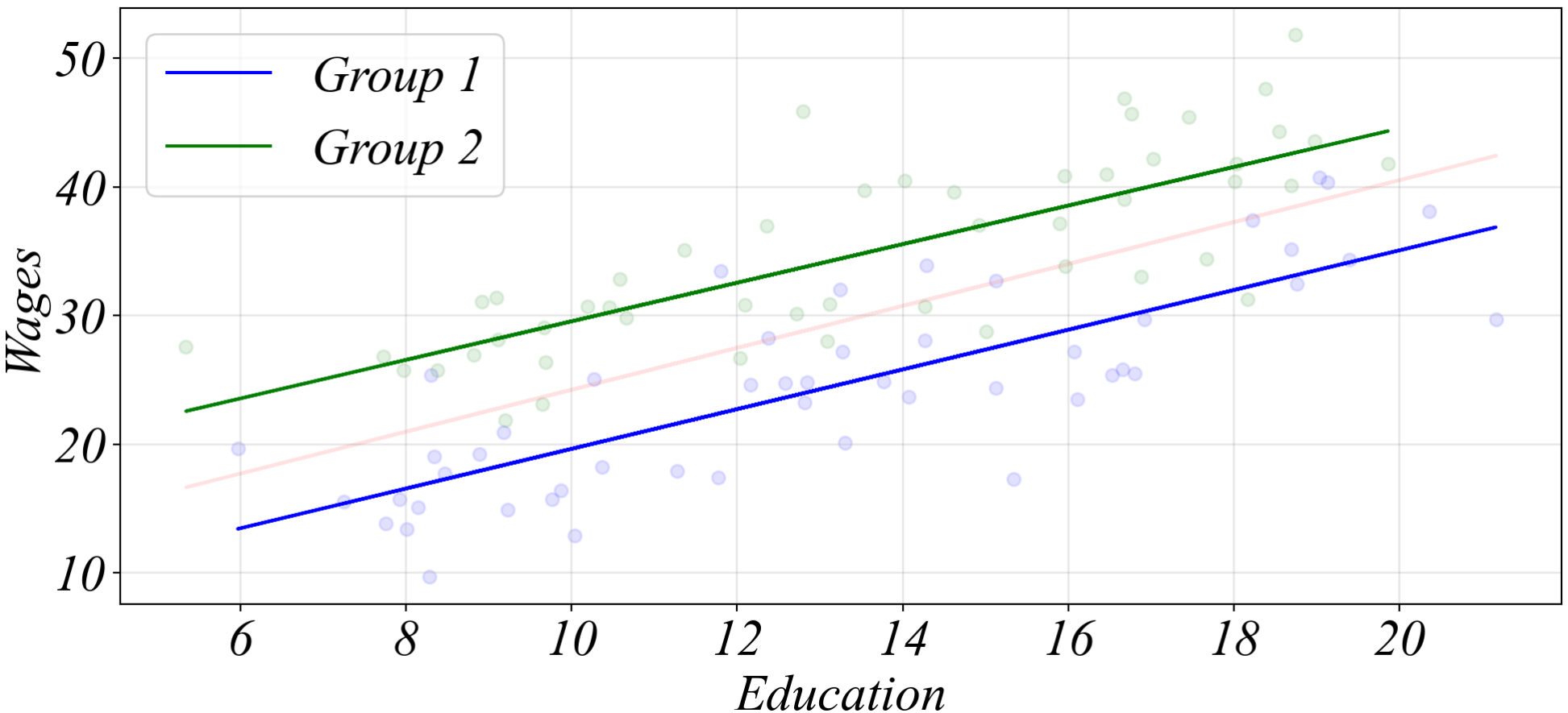
Example: Is the positive slope a real pattern or just noise?



Part 5: More General Linear Model

***Focus**: Fixed effects, repeated measures, time series.*

Example: Do different groups have different relationships?



Part 6: Communicating with Data

***Focus**: Clear narratives, effective visualization, presentation skills.*

Examples: Some student work from last semester!

Course Logistics

Resources & Tools

Software: Excel & Python

Website: ECON_0150

People (office hours on Canvas):

- TA/Grader: Jacob Stenstrom (DCY14@pitt.edu)
- UTA: Tucker Forte (TGF16@pitt.edu)

Optional Textbooks:

- *Data Visualization and Analysis in R* by Dustin Fife
- *How Charts Lie* by Alberto Cairo
- *Analysis of Economic Data* (2nd ed.) by Gary Koop

Grading Breakdown

Homework (10%)

- Most Fridays at 5PM; lowest 3 dropped.

MiniExams (70%)

- Weekly in the first 10 minutes; lowest 3 dropped.
- Open-book, open-note (no electronics).

Final Capstone (20%)

- Presentation + paper.
- Demonstrate full analysis from start to finish.

Policies

Email Policy:

- Response may take up to 1-2 days.
- Be concise with your questions.
- My email is off evenings and weekends.

AI Policy:

- Encouraged as a learning and coding tool :)
- Your work must be your own.
- Cite your source.

Academic Conduct: Adhere to the Academic Integrity Code.

Looking Ahead

First Homework:

- Due Friday (Jan 17) at 5PM on Gradescope

First MiniExam:

- First class of Week 3 (Jan 27/28) during the first 10 minutes.
- Bonus “preview” question on material not yet covered.

Other Dates:

- Jan 20: MLK Day, no class
- Feb 26/27: Asynchronous class
- Mar 2 - 9: Spring recess

Getting Set Up

Excel:

- Free for students through Pitt's institutional access

Python:

- Google Colab Notebooks (*recommended*)
- Anaconda and JupyterLab (*more advanced*)

Survey and Demo