Presenting Statistical Evidence and Graphical Information in Written Work

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Today's Agenda

- Perspectives on graphical and statistical information in writing
- Discussing information or results of other studies
- Discussing your own information or results:
  - Statistics: Summary statistics, graphs/plots, regression analysis
  - Theory: Equations, graphs/figures
- Conclusion

Some Perspectives on Good Writing

- An argument is the centerpiece of good writing; good writing is persuasive
- The information in tables, graphs, etc. is part of your argument; you need to tell your reader what the information *says* as well as what it *means*
- Make your discussion of the information such that your reader cannot help but interpret the evidence in the way that you do

Some Perspectives on Good Writing

- “Tables and graphs are writing, and the usual rules of writing therefore apply…The reader wants statistics given in the simplest form consistent with their use…Tables, graphs, diagrams, and displayed equations should elucidate the argument, not obscure it” (McCloskey, 2000, p. 46-47).

Some Perspectives on Good Writing

- “The purpose of charts, tables, and other graphics is to summarize and illustrate the argument in the text. Every figure should be designed to be easily understood independently of the text” (Greenlaw, 2006, p. 235).

Info./Results of Other Studies

- Typically, not much detail is necessary
- Sufficient information: Summary of research question and methods, main findings, and conclusions
- Detail is only necessary if a prior study's results are particularly interesting or important to your research:
  - Did the study find a result that is at odds with the rest of the literature?
  - Does your research confirm or reject this study's results?

Info./Results of Other Studies

- You may encounter a particularly convenient figure, graph, or piece of statistical information in past research or from a statistical agency
- There is no problem with reproducing a figure, graph, table, or numerical information from a prior study (or statistical agency, etc.)
- If you reproduce a past study's figure, graph, table, or numerical information, be sure to cite the original source

Info./Results of Other Studies

- Example:

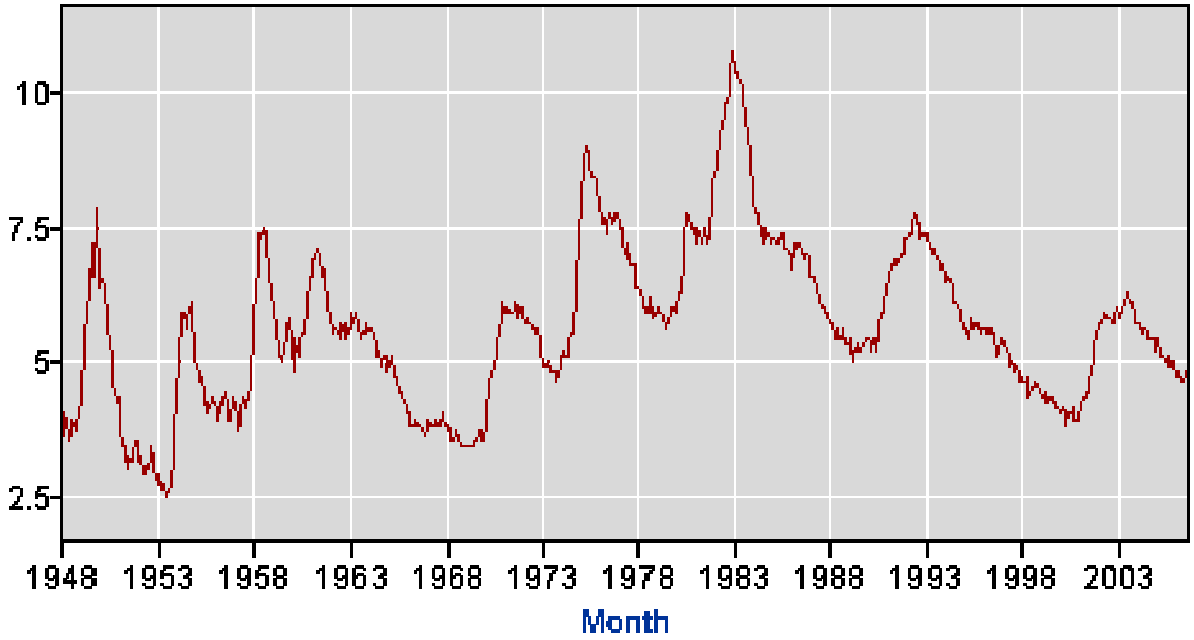

Figure 1: Monthly US Unemployment Rates of Workers Age 16 and Older, 1948-2006 (Source: BLS)

Info./Results of Your Research

- Why does it matter? It is the most important part of your research!
- You are trying to make an argument: why should your reader believe you?
- Statistical, graphical, and mathematical information provide:
  - Background on your problem
  - Support for your claims
  - Tests of your hypotheses
  - Illustration of your argument

Info./Results of Your Research

- Information supporting your argument:
  - Statistics from data (tabular and/or graphical)
  - Estimates from a regression model
  - Equations derived from a model
  - Figures to illustrate how a model works
- Tell your reader what the information *says* as well as what it *means* in the context of your economic theory

Info./Results of Your Research

- General tips:
  - All figures, graphs, and tables need a title
  - Figures/graphs: “Figure [Number]: [Title of figure]”
  - Typically at the bottom of the figure
  - Tables: “Table [Number]: [Title of table]”
  - Typically at the top of the table
  - Help your reader: Titles should be self-explanatory and state the theme of the information

Info./Results of Your Research

- General tips:
  - Figures and tables with self-explanatory titles are not enough!
  - Reference the figure or table in the body of your text
  - Do not simply refer the reader to your results and then let her do the thinking; draw conclusions!

Info./Results of Your Research

- General tips:
  - Discuss the contents of the figure or table:
    - Interpret the information for your reader
    - What does the figure or table show?
    - Any interesting information you want your reader to know?
    - How is the information related to your argument?

Info./Results of Your Research

- General tips:
  - Keep these two slogans in mind while writing:
    1. I need to write about my results
    2. The interpretation of my results is as important as my results

Info./Results of Your Research

- Statistical information: Summary statistics
  - Two forms: 1. Tables, 2. Graphs
  - Purpose:
    - Background information
    - Illustrates trends (or differences)
    - What trends are there in the data? Changes over time…across countries, firms, etc.?

Info./Results of Your Research

- Statistical information: Summary statistics
  - Tables: Info. that summarizes your data
  - What to include:
    - Clear, descriptive title of the table and its variables
    - Units of measurement for each variable
    - Measure of central tendency (e.g., average)
    - Measure of variability (e.g., standard deviation)
    - Minimum and maximum values
    - Correlation with other variables

Info./Results of Your Research

- Statistical information: Summary statistics
  - Tips for tables:
    - Don’t let the table stand alone
    - Explain its contents to your reader
    - Think about questions that the data can answer and discuss them in the text of your paper

Info./Results of Your Research

- Statistical information: Summary statistics
  - Figures/graphs: Visual summaries of your data
  - What to include:
    - Clear, descriptive title of the figure
    - If a graph, clear labels for axes and curves
    - If a graph, a clearly labeled key to distinguish curves
    - Units of measurement for each variable

Info./Results of Your Research

- Statistical information: Summary statistics
  - Tips for figures:
    - Don’t let the figure stand alone
    - Explain its contents to your reader
    - What does the figure show?
    - What are the important trends/differences?
    - How does it relate to the point you want to make?

Info./Results of Your Research

- Statistical information: Regression analysis
  - Tables: Info. that summarizes your estimation results
  - What to include:
    - Clear, descriptive title of the table and its variables
    - Units of measurement and source for each variable
    - Signs and values of estimated coefficients
    - Indication of each estimate's statistical significance
    - Standard error of each estimate (or *t*-statistic)
    - Sample size, measure of goodness-of-fit, and overall statistical significance

Info./Results of Your Research

- Statistical information: Regression analysis
  - Typical format for a table of regression results: What could improve this table?
  - Tips for tables:
    - Discuss estimates on important variables; provide interpretation
    - Are the estimates statistically significant? Economically significant?
    - Do the results confirm your theory? Do they reject it?

Info./Results of Your Research

- Mathematical information: Equations
  - Treat equations as part of a sentence:
    - If an equation ends a sentence, a period (.) should follow it
    - If an equation is part of a clause, a comma (,) should follow it
    - Major equations deserve numbers, minor ones do not
    - Explain and interpret parts of any displayed equation

Info./Results of Your Research

- Mathematical information: Figures/graphs
  - Figures should illustrate and simplify your model, not obscure it
  - Figures need clear, descriptive titles
    - “Figure [Number]: [Title of figure]”
    - Typically at the bottom of the figure
  - Figures need labels for anything that is not obvious to the reader
  - You must reference the figure in the body of your text and then discuss its interpretation and meaning

Online Resources

- Online Writing Lab at Purdue University:
  - http://owl.english.purdue.edu/workshops/hypertext/apa/parts/tables.html
  - http://owl.english.purdue.edu/workshops/hypertext/apa/parts/figures.html
  - Brief comments on the purpose and use of tables and figures in writing

Conclusion

- Cost: It takes time to format tables, figures, graphs, and equations

- Benefits (huge):

  – The support for your argument will be stronger, and your argument will be more convincing

  – Readers may (gasp!) enjoy reading your work and it may become influential

Resources for Writing in Economics

- Steven A. Greenlaw *Doing Economics: A Guide to Understanding and Carrying Out Economic Research.* Houghton Mifflin Company. New York. 2006.
- http://college.hmco.com/economics/greenlaw/research/1e/students/index.html

- Deirdre N. McCloskey *Economical Writing.* Waveland Press, Inc. Prospect Heights. 2000.
- http://www.waveland.com/Titles/McCloskey.htm

- Robert H. Neugeboren *The Student's Guide to Writing Economics.* Routledge. New York. 2005.
- http://www.routledge-ny.com/shopping_cart/products/product_detail.asp?sku=&isbn=0415701236&parent_id=&pc=