FRED® and Economic Education Resources from the St. Louis Fed
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This information is my opinion and does not represent the official views of the Federal Open Market Committee, the Federal Reserve System or the Federal Reserve Bank of St. Louis.
Highlights

• New data series.
• Page One Data Primers.
• Micro-credentials.
• Recently published research.
FRED® Keeps Up With the Times

NEW DATA SERIES
How are lending conditions changing?
https://fred.stlouisfed.org/graph/?g=1aRkE
Learn more about it

• Release announcement:
  https://news.research.stlouisfed.org/2022/12/fred-expands-senior-loan-officer-opinion-survey/

• FRED Blog post:
  https://fredblog.stlouisfed.org/2023/01/cycles-in-lending-standards/
How does the Fed support financial stability?
Bank Term Funding Program Data

https://fred.stlouisfed.org/graph/?g=1aRla

Shaded areas indicate U.S. recessions. Source: Board of Governors of the Federal Reserve System (US) fred.stlouisfed.org
Learn more about it

• Release announcement: https://news.research.stlouisfed.org/2023/03/fred-adds-bank-term-funding-program-data/

• FRED Blog post: https://fredblog.stlouisfed.org/2023/04/the-lender-of-last-resort/
How are inflation trends measured?
Underlying Inflation Gauge Data

https://fred.stlouisfed.org/graph/?g=1aRIR
Learn more about it

• Release announcement:
  https://news.research.stlouisfed.org/2023/05/fred-adds-underlying-inflation-gauge-data/

• FRED Blog post:
  https://fredblog.stlouisfed.org/2023/06/gauging-underlying-inflation/
How is core inflation measured?
New PCE Price Index Data

https://fred.stlouisfed.org/graph/?g=1aRm8
Learn more about it


• FRED Blog post: https://fredblog.stlouisfed.org/2023/10/how-housing-prices-have-impacted-pce-inflation/
Keep up with FRED®

Where can FRED® data take you next?
Resources to Master FRED® Data

PAGE ONE DATA PRIMERS
Overview

• Short essays (under 2,000 words).
• Foundational data literacy skills.
• Advanced FRED® features.
• Find them at:
  https://research.stlouisfed.org/publications/page1-econ
Foundational data literacy skills
Economic data literacy skills

**Data Units in FRED®**

**Compelling Question:** What units should we use to present the data?

**Description:** FRED, the Federal Reserve Economic Data (FRED), provides access to data on a wide range of topics. Depending on the topic, a specific type of data can help tell the story behind the numbers. This article describes the range of data units available in FRED to new data users and can serve as a reference to advanced data users.

**Introduction:** The data accessible through FRED® encompasses many different concepts—such as the percentage of GNP or the number of new home sales. It is critical to understand the different types of data units to properly interpret the data.

**Methodology:** The table below provides a quick reference to common data units found in FRED®, along with explanations for each.

<table>
<thead>
<tr>
<th>Data Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>A percentage is a number (usually expressed as a fraction) that represents a part of a whole.</td>
</tr>
<tr>
<td>Billion</td>
<td>A billion is a very large number used to represent an amount of money or a large quantity.</td>
</tr>
<tr>
<td>Million</td>
<td>A million is another large number used to represent an amount of money or a large quantity.</td>
</tr>
<tr>
<td>Thousand</td>
<td>A thousand is a large number used to represent an amount of money or a large quantity.</td>
</tr>
<tr>
<td>Number</td>
<td>A number is a symbol used to represent a count or a quantity.</td>
</tr>
<tr>
<td>Unit</td>
<td>A unit is a standard measure of a quantity, such as a foot for length, a pound for weight, or a gallon for volume.</td>
</tr>
</tbody>
</table>

**Selecting Units:** FRED® users can change the units of each data series from the default reported by the source. By selecting FRED's data display and navigating to any data series, users can click on the "Graph" tab, select "Edit Line 1," and click on the "Units" drop-down menu to see the different options available. The FRED® website describes the formula used to calculate each of these units and provides options to customize the display according to user preferences.

This article describes how to use different economic data units to provide a more complete and accurate description of economic conditions. High-quality data facilitates good decisionmaking, so the time and effort data providers spend to improve their data benefits everybody who uses those data.

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**Data Revisions with FRED®**

**Compelling Question:** How do revisions and updates improve data?

**Description:** FRED® provides access to current data from more than 130 sources. Some of those sources regularly update their data, and FRED® shows all revisions. This article describes how data users can work with the data, and FRED® serves as a reference for advanced data users.

**Introduction:** Sources like BLS and the Census Bureau periodically update data to produce a more accurate account of long-term trends and patterns.

Every time a new version, or vantage, of a data series is released, FRED® displays the latest version, and the replaces version is marked as "revised." Economic researchers and consumers of data must reference the data in vantage they use to derive the data they access the data. Otherwise, discrepancies between data vantage can undermine the credibility of their work.

This article describes how baseline economic data are revised and updated to provide a more complete and accurate description of economic conditions. High-quality data facilitates good decisionmaking, so the time and effort data providers spend to improve their data benefits everybody who uses those data.

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**Data Geographies with FRED®**

**Compelling Question:** How do map data tell the story behind the numbers?

**Description:** The FRED® online database provides access to current data from more than 130 sources. More than half of all the data in FRED® can be visualized through maps. This article describes how to interpret data maps for new data users and serves as a reference for advanced data users.

**Introduction:** FRED® users can access more than 1,000 national and international time series from its public and private data sources. When the option to view a map is available, the map displays a green “Show Map” button. Clicking on the button changes the data display into a map of the latest available data points from the same region. For example, a FRED® user could examine historical house values in the US and compare the latest values in St. Louis, Missouri, with those in St. Louis, Missouri.

FRED® maps are a type of data visualization known as choropleth maps. The geographical areas in these maps are colored differently according to the value of the data. FRED® displays the data on the map, and the color categories are labeled. For example, the default state-level FRED® map of the house price indexes shows the 50 states plus the District of Columbia in five color groups, from highest to lowest values, with approximately 10 observations each. The geographic display is a spatial heat map of data.

All maps show geographical areas, and the type of geographical contour used in data maps can shape the story behind the numbers. Small-sized nations, states, or counties with large geographical footprints can be difficult to locate in a large-scale map. Changing the type of data visualization can help make these data easier to see. For example, customizing the number of color groups in a map and defining the maximum value represented in each interval can reframe the visualization to suit users’ needs.

This article describes the different data geographies currently available in FRED®, which classifies them according to the resources used to draw their boundaries: political, statistical, and economic.

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*Federal Reserve Bank of St. Louis | Central to America’s Economy*
Advanced economic data literacy skills
Resources to Demonstrate Your FRED® Data Skills

MICRO-CREDENTIALS
What are Micro-Credentials?

A micro-credential is a short, competency-based recognition that allows an individual to demonstrate mastery in a particular area.

Frequently visible in social media as digital badges, micro-credentials offer employers the opportunity to evaluate a potential employee in terms not only of the resume or the cover letter but also based on a more granular body of skill sets and experiences.

The use of digital badges to award micro-credentials has been around for a decade and is now considered mainstream.
FRED®
Data Blogging

Recognizing
Diversity in Data
Overview

• Scaffolded instruction.
• Fully asynchronous.
• Skills organized in modules.
• Find them at:
  [https://www.stlouisfed.org/education/digital-badges](https://www.stlouisfed.org/education/digital-badges)
Recent Publications

RESEARCH ON ECONOMIC EDUCATION
We use the tools of economic analysis to improve economic education.
Our purpose

• Evaluation of current practices.
• Testing of alternatives.
• Evidence-based decision making.
• World dominance.
What do we know about?

ECONOMIC DATA LITERACY SKILLS
Data Citations and Reproducibility in the Undergraduate Curriculum

by Diego Mendez-Carbojo and Alejandro Dellachiesa

https://doi.org/10.1162/99608f92.c2835391
Data

- Online assignment distributed via Qualtrics.
- Three-part assignment with seven closed-format questions.
- $N = 501$ (students from a large public university).
- Demographic controls.
Table 1. Data Literacy Skills

<table>
<thead>
<tr>
<th>Scores, Misconceptions and Errors</th>
<th>Essay A</th>
<th>Essay B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score Correctly Identifying Series</td>
<td>0.57</td>
<td>0.47</td>
</tr>
<tr>
<td>Score Correctly Identifying Source</td>
<td>0.21</td>
<td>0.03</td>
</tr>
<tr>
<td>Score Identifying Incomplete Citation</td>
<td>0.18</td>
<td>-0.04</td>
</tr>
<tr>
<td>Can’t Identify Sources</td>
<td>0.05</td>
<td>0.12</td>
</tr>
<tr>
<td>Confuses Source with Distributor</td>
<td>0.72</td>
<td>0.73</td>
</tr>
<tr>
<td>Considers Citation to be Complete</td>
<td>0.25</td>
<td>0.40</td>
</tr>
</tbody>
</table>

The data literacy scores are calculated as:

\[
Score = \frac{(N_{Correct\ Answers} - N_{Incorrect\ Answers})}{N_{Correct\ Answers}}
\]

The scores can range between 1 (high skill, no incorrect answers) and -1 (low skill, no correct answers).
Summary.

• Very weak student data literacy competencies.

• Frequent misconception of confusing the data source with the distributor.

Instructional takeaways.

• Consistently name the sources of data.

• Embed the practice in all your teaching.
What do we know about?

ACTIVE LEARNING AND GENDER
Diving into the Gap: Recognizing Gender Differences in an Online Learning Activity

Cynthia Harter¹ · Diego Mendez-Carbajo²

https://link.springer.com/article/10.1057/s41302-023-00258-x
Data

- Online survey distributed via Qualtrics.
- Ten closed-format questions.
- $N = 252$ (students multiple colleges and universities).
- Demographic controls.
Percentage of respondents within each major and gender combination group who agree or strongly agree that they enjoy FREDcast.
Summary.

- Different responses by gender to active learning with FREDcast.
- Different attitudes about Economics itself.

Instructional takeaways.

- Use active learning techniques.
- Design an inclusive curriculum.
What do we know about?

CHOICE OF DATA VISUALIZATION TOOLS
Choice of data visualization tool: FRED or spreadsheets?

Diego Mendez-Carbajo a, *, Alejandro Dellachiesa b
Data

• Online assignment distributed via Qualtrics.
• A/B experimental design.
• Graph-building, graph reading, and evaluation.
• $N = 471$ (students from a large public university).
• Demographic controls.
### Table 1.B. Summary Statistics for the Outcome Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>FRED®</th>
<th>Google</th>
<th>Pearson Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Started</td>
<td>Proportion of students who started the assignment</td>
<td>0.79</td>
<td>0.82</td>
<td>0.8228</td>
</tr>
<tr>
<td>Finished</td>
<td>Proportion of students who completed the assignment</td>
<td>0.95</td>
<td>0.86</td>
<td>7.9766***</td>
</tr>
</tbody>
</table>

Note: Asterisks denote the significance level of a Pearson Chi-squared test of independence between groups (** 0.01, ** 0.05, * 0.1)
Summary.

• FRED® was used more frequently than Google Sheets to build basic data graphs.

• No gender gap in confidence using FRED®.

Instructional takeaways.

• Use FRED® in your data assignments.

• Design inclusive assignments.
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