Glossary of Chart Terms

This glossary provides a general overview of some of the technical terms used in creating and reading charts (tables, graphs, maps, diagrams, and so on). Although it is focused on economics and social science usage, it is not a glossary of those subjects. For definitions of economics and personal finance terms, we recommend consulting the Econ Lowdown glossary at https://www.stlouisfed.org/education/glossary.

Bolded terms indicate terms defined in this glossary.

Sources of the Example charts are on page 6.

If you would like to suggest a term that would enhance this glossary, please contact eva.k.johnston@stls.frb.org and we will consider adding it.
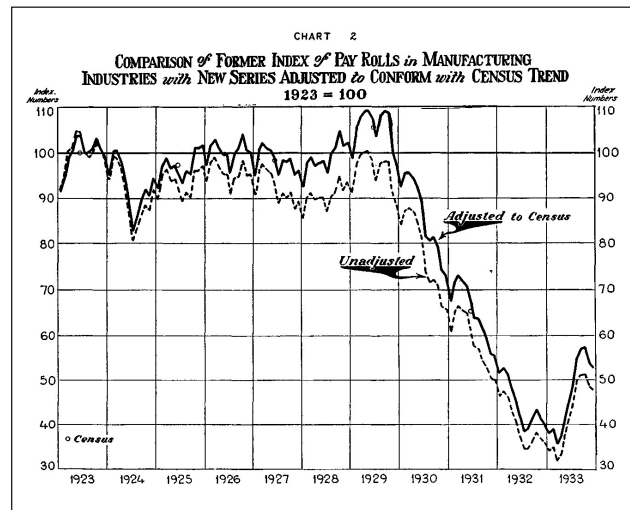
Adjustment: In economics, often used in the phrases "seasonal adjustment" and "inflation adjustment." Adjustment is the practice of tweaking or correcting the **raw data** to better reflect reality or to show a clearer **trend**. Adjusted data should always have a label noting they have been adjusted and how (Example 1).

Average: The "middle" of a set of numbers. Average is usually synonymous with **mean**. Another "middle" number is the **median**.

Axis: One of two lines used to pinpoint locations on a **graph**. The axes (plural of axis) cross each other perpendicularly. The horizontal axis is commonly called the *x*-axis, and the vertical axis is commonly called the *y*-axis. The **Cartesian coordinates** of a point on a **graph** can be found by determining the point's location on the *x*- and *y*-axes.

Example 1: Adjustment

Binary map: A map with regions divided into two classes. A map of the United States with "red states" and "blue states" is a binary map.

Broken axis: A horizontal or vertical **axis** in which part of the scale on the *x*-axis or *y*-axis has been omitted to save space. A broken axis is sometimes indicated with a break in the axis line, two slash marks across the axis line, or squiggly marks on the axis line between the starting and ending points of the break (Example 2). A broken axis can make a **graph** misleading or harder to interpret.

Cartesian coordinates: A pair of axes numbers (usually for "*x*" and "*y*") that indicate a given point on a **graph**. For example, "12, –5" indicates a point that is 12 points to the right of 0 on the *x*-**axis** and 5 points below 0 on the *y*-axis.

Categorical data: Data sorted or classified by specific criteria, such as education, nationality, or **survey** answer. To create a **chart** that groups **data**, such as a pie chart, **raw data** must first be transformed into categorical data.

Causation: The act of causing something—for example "A" causes "B." The implication that data showing an event or **trend** that is **correlated** with another set of data is also the cause of or caused by that other event or trend and that future changes in one **dataset** will spur changes in the other. Most statistics cannot prove causation even with strong **correlation**.

Chart 1–2. Total Government Outlays as a Percent of GDP

Source: OECD, calendar year data.

The United States allocates a smaller portion of its GDP to government than any other nation shown.

Example 2: Broken Axis

Chart: Any graphical representation of information, such as a **graph**, **table**, **diagram**, or map. Chart is a general term and doesn't indicate a specific form of visualization. The term "chart" is used in many fields, not just statistics.

Correlation: The relationship between things that happen or change together. With **data**, a positive correlation means that changes in two or more **data series** happen at the same time or at the same rate and a negative correlation means that changes in two or more data series happen in opposition to one another—one value goes up as the other goes down. Correlation does not necessarily imply **causation**.
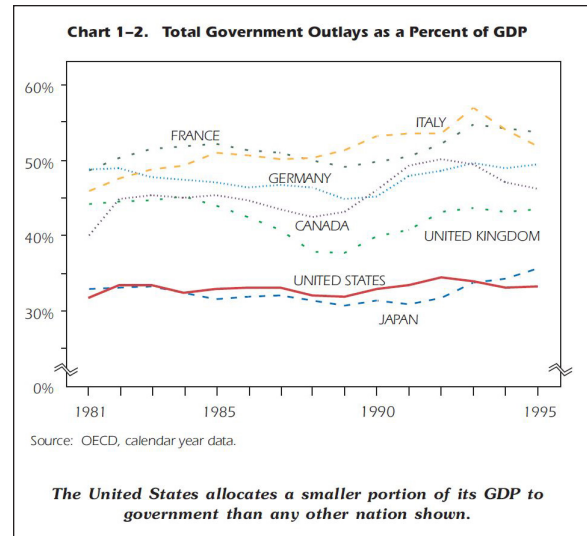
Data: Information with values that measure or represent variables. In economics, the word "data" usually means quantitative, numerical data, rather than qualitative, descriptive data, but is used for both.

Data point: A single **unit** of information, usually represented as a number. *Also known as a datum.*

Dataset or **data series**: A collection of related data points (e.g., city temperature on the first of every month or the heights of students in a classroom). A data series made up of similar data points connected by time is known as a **time series**.

Dataviz: A common abbreviation for "data visualization" that refers to any graphical depiction of **data**, such as charts, including **infographics**. *See also* **chart**.

Diagram: *See* **infographic**.

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Dispersion: A measure of how "spread out" the points in a **dataset** are. A high (or large) dispersion means the highest and lowest values are far apart; a low (or small) dispersion means the values are clustered close together. For example, two datasets might have the same **average**, **mean**, or **median** but have very different dispersions: The average age in a class with students who are 14, 15, and 16 is the same as one with students who are 10, 15, and 20 but the dispersions are very different.

Distribution: A list or presentation of all the values of a **dataset** and how often each of those values occur. When displayed on a **chart**, a "normal distribution" will have the most common values exactly in the middle, with less-common values on either side. This shape is known as the "bell curve." A dataset with an asymmetrical distribution is skewed (see **skew**).

Graph: A **diagram** that uses points and lines to represent the variation of one variable in comparison with one or more other variables. Graphs are commonly drawn as a "+" or "L" shape with a horizontal *x*-**axis** and a vertical *y*-axis.

Gross: In economics, finance, and accounting, gross is the total income, profit, or interest before deductions, depreciation, or losses are subtracted to get the **net** amount.

Index: A kind of measurement, or a **dataset** that uses that kind of measurement as its **unit**. Indexes measure change in a created or composite value (rather than a standard **observation** or measurement). Index values and ranges are created in many different ways, so two indexes may be very different. In economics and finance, an index measures changes over time in the value of some attribute, usually cost, against the value of the same attribute, either at a certain value or on a given date.

Infographic: A visual representation of information used to explain something quickly and clearly. Many infographics contain text along with illustrations and charts. *Also known as* a **diagram**.

Key: *See* **legend**.

Legend: On a **chart**, a list of symbols and/or terms used and their specific meanings. *Also known as* a **key**.

Mean: An **average** number calculated by adding a set of numbers together and then dividing the sum by the number of numbers. For example, the mean of the five numbers "1, 2, 3, 4, 5" is 3: 1 + 2 + 3 + 4 + 5 = 15; 15 divided by 5 is 3.

Median: The middle number in a sorted list of numbers. The median of "1, 2, 5, 60, 70" is 5. When a list has an even number of numbers, the median is the **average** of the two central numbers. For example, the median of "1, 2, 3, 50, 60, 70" is 26.5: (50 + 3)/2 = 26.5. Median is often used instead of **mean** to represent the central tendency of a **dataset** if there are significant **outliers** that would **skew** the **data**, as can be the case with average income. For example, in a group of six people, if five people make $40,000 and one person makes $1,000,000, the mean income is $200,000. The median income of those same six people is $40,000. The median income is a better representation of the central tendency of the group.

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Margin of error: The amount of difference between the results of a **survey** or poll using a **sample** and the results if the entire **population** were surveyed. Surveys with a high margin of error should be considered less reliable.

Methodology: The procedure and calculations used to produce, adjust (see **adjustment**), or revise (see **revision**) a **dataset**.

Mode: The most common number in a set of numbers. The mode of "1, 2, 3, 4, 4, 4, 5" is 4. A set of numbers can have more than one mode.

Net: The remaining amount after deductions have been subtracted from the **gross** amount of something. For example, net exports (defined simply) are gross exports minus imports. A net value less than 0 indicates a deficit (a loss).

Nominal: In economics and finance, indicates the current value of a given measurement, so it has not been adjusted for inflation but is presented "as is." *Also known as* "market value" and "current value." For example, the nominal value of a quarter in 1934 is 25 cents. The **real** inflation-adjusted value of that quarter in today's currency would be different. Because this adjective is not uniformly applied, consider every reported value to be nominal unless otherwise labeled.

Observation: In economic **data**, an observation is generally synonymous with a single **data point** on a given table or in a **time series** and includes both a data value (a measurement) and a time value (when the data value was recorded). Because economics is a social science, economic data are usually observations rather than measurements alone. For example, the measurement "$17 trillion" is not a valid observation for gross domestic product, but "Quarter 1, 2015: $17 trillion" is a valid observation because it includes both a data value and a time value.

Outlier: A **data point** in a **dataset** that is significantly different from the rest. On a **graph** of a dataset, an outlier is not in line with the **trend** of the rest of the data or is outside the highest concentration of data points.

Point: *See* **data point**.

Population: A complete, inclusive group (usually people, but could also be organizations, plants, or animals) in a given place (e.g., a city, nation, or neighborhood) or a group with a particular characteristic (e.g., speaking a given language) that is defined and studied to gather **data**. Social scientists usually use a **sample** to study a population.

Raw data: **Data** as they were originally recorded, with no adjustments or alterations. Removing obvious errors and applying an **adjustment** are common changes made to raw data.

Real data: In economic or financial **data**, "real" or "real value" indicates the data have been adjusted (see **adjustment**) for inflation. Unadjusted data are referred to as **nominal** data.

Real value: *See* **real data**.

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Response rate: For a **survey**, the number of people (or organizations, families, or groups) that answer the questions. It can be difficult to judge the accuracy of a survey (*see also* **margin of error**) without knowing the response rate.

Revision: A change made to **data** to correct inaccuracies or account for additional information. A lot of economic data are revised on a regular schedule, and the revisions are applied retroactively. Because of revision, an **observation** for a historical date might not be the same value that was recorded on that date.

Sample: A subset of a larger group of people or things that is measured (studied or surveyed) to learn about the entire group. Sampling allows researchers to study groups without studying that group's entire **population**. Studying only a sample can result in **sampling error**. Knowing the size and makeup of a sample can help you judge the validity of the research that uses it.

Sampling error: Mistakes and misinterpretations caused by observing or measuring a **sample** of a **population** instead of the whole population. The difference between the characteristics of the whole population and the sample group is the sampling error. For instance, if 20 people in a full population of 100 people have blue eyes and 80 have brown eyes, but a random sample of 25 people includes all 20 blue-eyed people, the sampling error would incorrectly imply that the majority of the population has blue eyes. *See also* **margin of error**.

Series: *See* **data series** and **time series**.

Significance: *See* **statistical significance**.

Skew: A **dataset** with skew has a lopsided **distribution** of **data** when presented on a **graph**. Skewed data often have a **mean** that is illogical or misleading. See the average income example in **median**.

Standard deviation: A measurement of the amount of variation (or **dispersion**) among points in a dataset. Not to be confused with **margin of error**.

Statistical significance: A mathematical calculation that indicates whether any **trend** or pattern in **data** cannot exclusively be attributed to chance or coincidence. Statistical significance is not the same as the practical significance or the importance of the data or research.

Survey: A form of **data** gathering that involves asking people questions. Nearly all survey data are based on a **sample** of people from a **population**.

Table: An arrangement of **data** using rows and columns to illustrate categories of information. Data arranged in a table are often called *tabular* data.

Time series: A kind of **data series** in which individual **observations** or **data points** are collected over time in chronological order and at regular intervals (e.g., hourly, daily, or yearly) to show a **trend**. Economics and meteorology are two fields that commonly use time series to show changes in conditions over time.

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Trend: The direction of change (or development) in a set of **data**. For example, data on a **graph** might be said to have an "upward" or "downward" trend. Trend can also be used as a verb to describe the way the data points seem to move over time: For example, "U.S. gross domestic product is trending upward." Data can have different trends over different ranges of time.

Unit: The item or the standard used for counting or measuring **data** in a **dataset**. For example, a unit may be a currency, a person, or a created scale such as an **index**.

Sources

Chart 1: Adjustment: Olenin, Alice; Talbert, Lewis Emerson and United States Bureau of Labor Statistics. "Revised Indexes of Factory Employment and Pay Rolls, 1919 to 1933." *Bulletin of the United States Bureau of Labor Statistics*, No. 610, 1935, p. 13; https://fraser.stlouisfed.org/title/4132?start_page=17.

Chart 2: Broken Axis: U.S. Office of Management and Budget. *A Citizen's Guide to the Federal Budget: Fiscal Year 1998*. February 6, 1997, p. 3; https://fraser.stlouisfed.org/title/424/item/7266?start_page=7.

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