Data Practice with FRED "Measures of Inflation" Objectives

In this FRED data practice, you will learn:

- About different ways to measure inflation (CPI, (steps 4-14), GDP deflator (step 15)

- Different ways to locate data time series in the FRED database (tags, search and browse (steps 2-4, & 15)

- Definitions for inflation, consumer price index (CPI), index, and price level (steps 1-5), core inflation (step 13)

- To view and interpret data in a FRED series (steps 5)

- Calculate the inflation rate from one year to another (step 7)

- To edit graphs in FRED (step 8-) by:
    - changing units (steps 9 & 17)
    - Downloading data from a series (step 10)
    - adding a series to a graph (steps 11-12, & 18-19)
    - adding multiple series to a graph (step 13)
    - Interpret graphs (step 14)

Measures of Inflation

Inflation is an important component of the Federal Reserve's evaluation of its policy measures. Economists, politicians, policymakers, and the public all want to know the change in the general price level and if the price level is generally rising or falling. The government has several measures for inflation. This exercise will guide you through accessing them and ask some questions about the data you find.

1.   The first step in this exercise is to find the Consumer Price Index for Urban Consumers. **Start at the FRED website**, http://research.stlouisfed.org/fred2.

2.   As you follow along in this exercise, the red arrows and circles show you where to access the information. Click the **Tags** tab**.**

3.   In the **Find Tags** search box type **CPI**, and hit enter.   (Using Tags is a quick way to find a data series. See our video tutorial on using tags for more information). Then click on the **cpi link** in the results box.

There are several measures of the CPI; one is the Consumer Price Index for All Urban Consumers: All Items (CPI-U: All Items). Other measures break out the components of CPI—products such as food, energy, housing, and medical care. To begin, we first look at the CPI-U: All Items. Then we will examine the energy component of the index and make some comparisons.

4.   Choose the **Consumer Price Index for All Urban Consumers: All Items**, Seasonally Adjusted (SA). It is usually the first item on the list. **Click the Series title** to see the graph.

5.   Notice that the data for CPI are an **index**. The number **(on the left axis)** represents a **price level** of a basket of goods purchased at different points in time. To view the data in your browser, choose **View Data** (on the left side, under **Tools**). For the most recent observations, click **Last 5 Observations** link above the graph.

6.   Then the **last five data observations** will display.
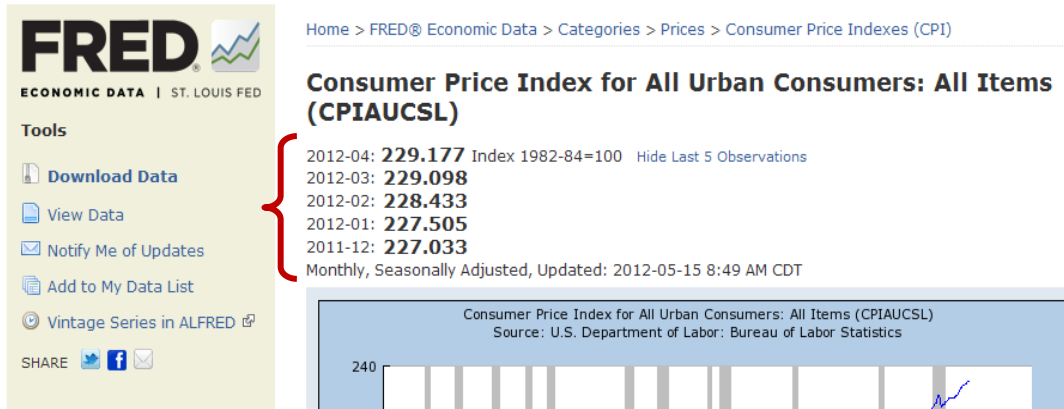
7.   Calculate the inflation rate from February 2011 to February 2012. Hints: You'll need to either **View Data** or **Download Data** to see the data. The formula to use is:

$$\text{Inflation rate in year } 2 = \frac{\text{CPI in year } 2 - \text{CPI in year } 1}{\text{CPI in year } 1} \times 100 \,.$$

8.   Next, edit the CPI: All Items graph. After editing the graph, you will add the CPI for energy (CPI: Energy). CPI: Energy is a subset of the entire Consumer Price Index.

   • Start with Consumer Price Index for All Urban Consumers (which you just had up).
   • Click on the **Edit Graph** link.
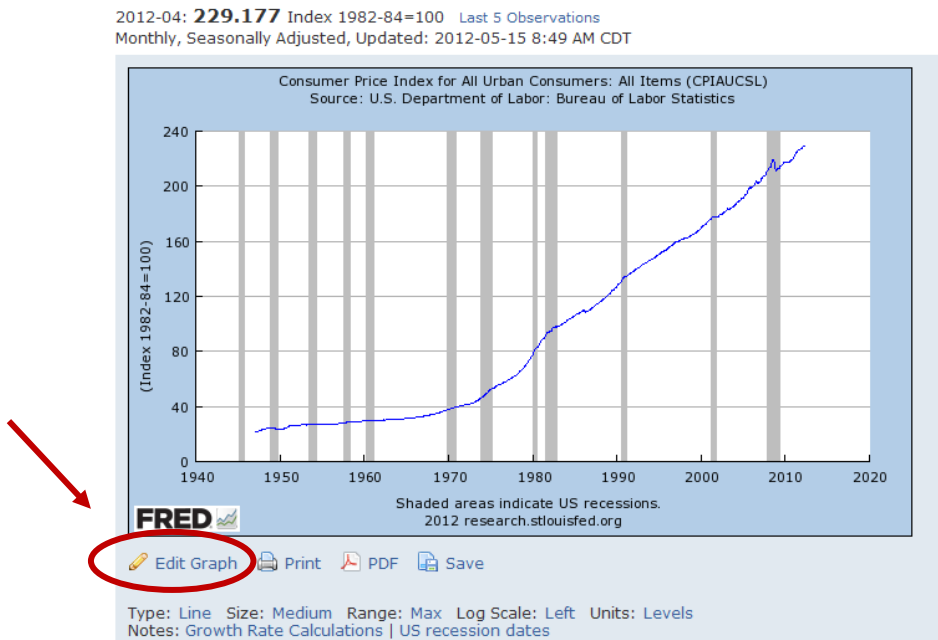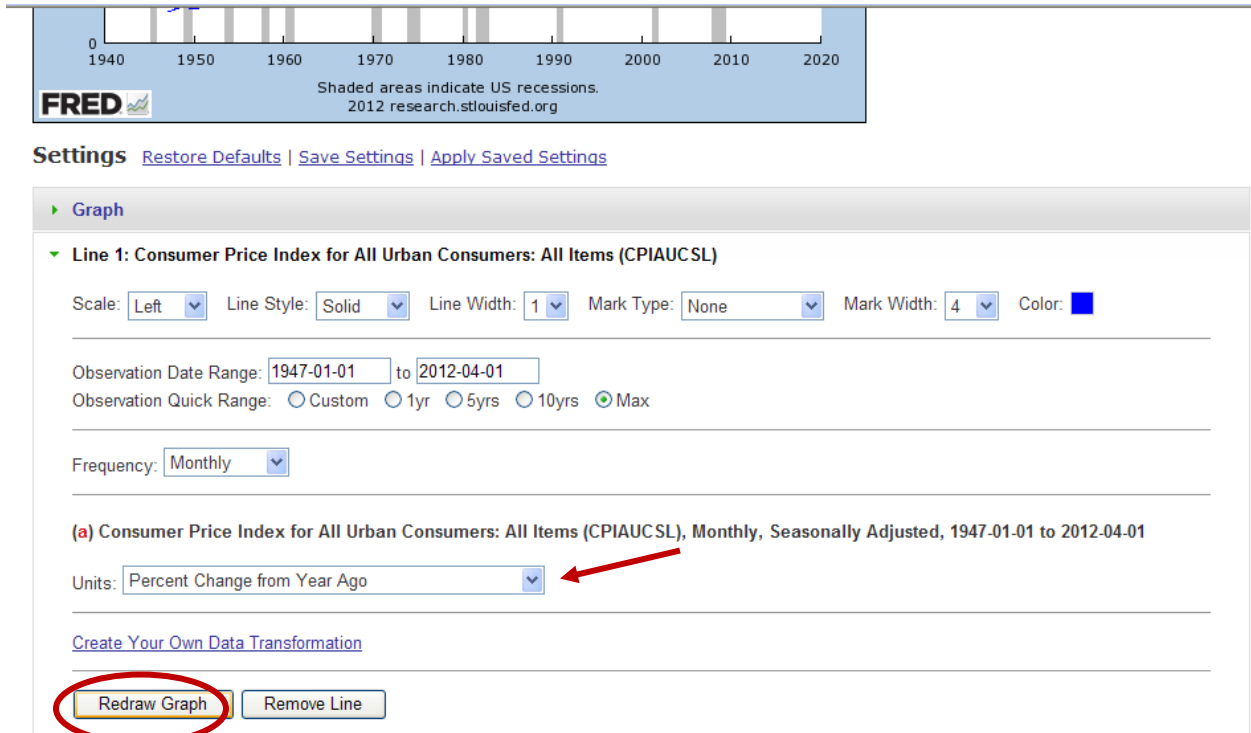
That will bring up a graph to which series can be added, units can be changed, and time period covered can be modified (e.g., 5 years, 1 year).

9.   Graph Settings are found below the graph, scroll down to find the units.

        • **Change** the display of the units to **"Percent Change from Year Ago"**
        • Click **Redraw Graph.**
        This is a common way to describe inflation—the change year over year.

10.   For more detailed information, you can choose to **Download Data in Graph.** What was the rate of inflation (compared with the previous year) in July 2009?
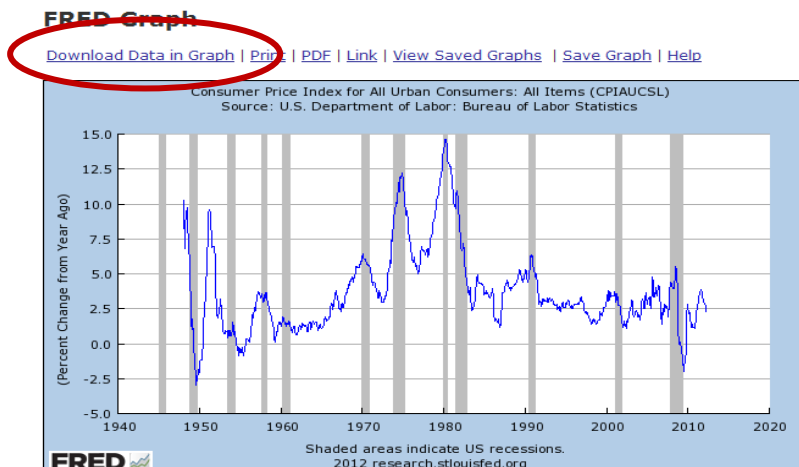
11. Next, scroll down below the graph to the "**Add Data Series**" section.
   • Open it and type **CPI energy** in the search box. The search box automatically makes suggestions based on the words entered.
   • For the comparison, **choose Consumer Price Index for All Urban Consumers: Energy (SA)**.

   Once you select it, those data will be added to a new line on the graph. Notice that the data are automatically represented in the same manner as Line 1 CPI data (percent change from a year ago).

12. The graph now shows the **CPI-U All Items (in blue)** and the **CPI-U Energy (in red)**
Note the legend for the graph is in the lower-right corner.

FRED Graph

Download Data in Graph | Print | PDF | Link | View Saved Graphs | Save Graph | Help

Consumer Price Index for All Urban Consumers: All Items (CPIAUCSL)
Consumer Price Index for All Urban Consumers: Energy (CPIENGSL)

Shaded areas indicate US recessions.
2012 research.stlouisfed.org

FRED
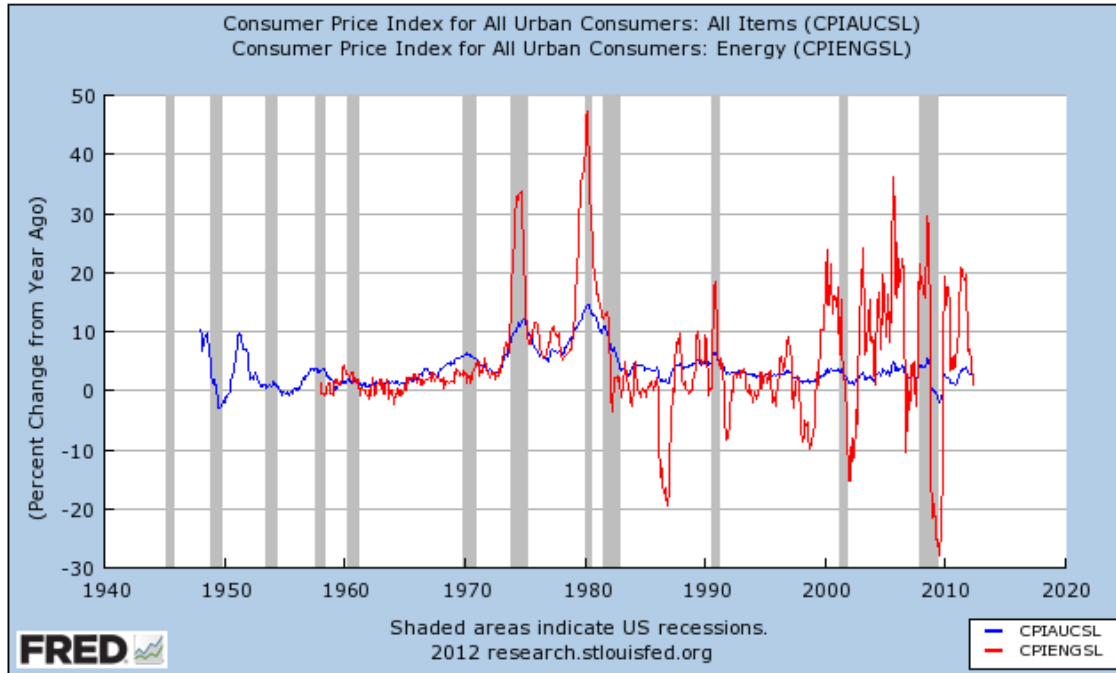
CPIAUCSL
CPIENGSL

Settings Restore Defaults | Save Settings | Apply Saved Settings

▸ Graph

▸ Line 1: Consumer Price Index for All Urban Consumers: All Items (CPIAUCSL)

▸ Line 2: Consumer Price Index for All Urban Consumers: Energy (CPIENGSL)

▸ Add Data Series

13.   CPI-U measures that have food and energy removed (the two most volatile parts of CPI) are often referred to as *core* or *underlying inflation*. When a news headline or the FOMC statement refers to a core inflation measure, it typically is referring to CPI-U Less Food and Energy.

Using some of the earlier skills of locating data, locate the seasonally adjusted data for **CPI-U less food and energy.**

Now add either CPI-U Food or the CPI-U Energy as a separate line on the graph. The steps are illustrated below.
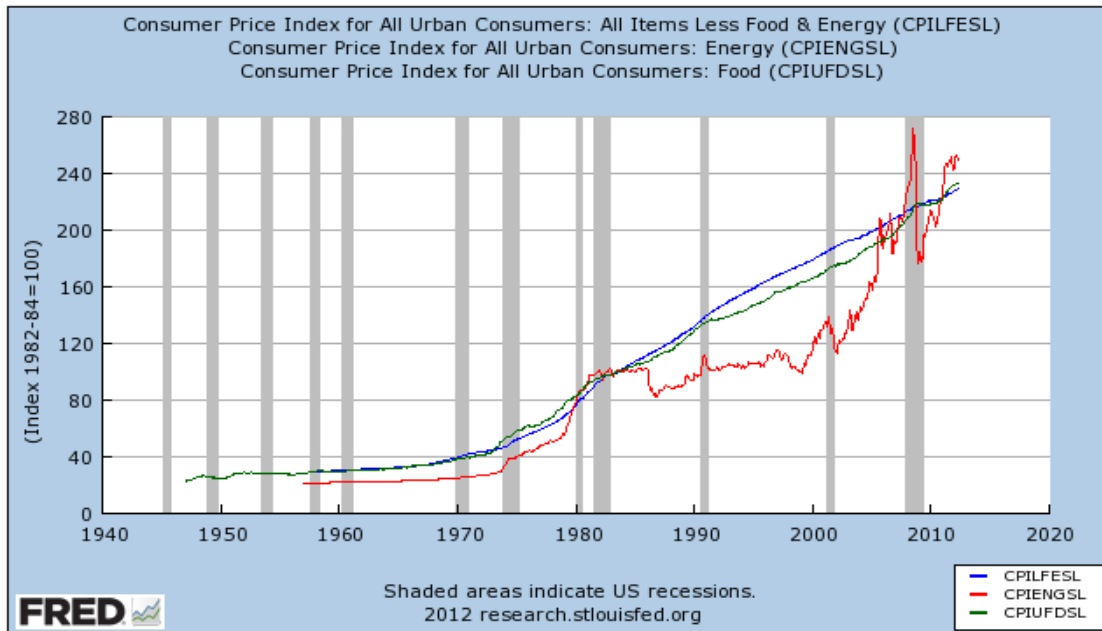
CPI-U: All Items Less Food & Energy is shown in blue
CPI-U: Energy is shown in red
CPI-U: Food is shown in green

FRED Graph

Download Data in Graph | Print | PDF | Link | View Saved Graphs | Save Graph | Help

Consumer Price Index for All Urban Consumers: All Items Less Food & Energy (CPILFESL)
Consumer Price Index for All Urban Consumers: Energy (CPIENGSL)
Consumer Price Index for All Urban Consumers: Food (CPIUFDSL)

Shaded areas indicate US recessions.
2012 research.stlouisfed.org

14.	Based on this graph, during the 1990s was the relative rise in the level of energy prices generally higher or lower than the overall price level?

15. Another measure of prices can be found in the data collected for calculating national income. The GDP deflator is the ratio of nominal GDP to real GDP. There are two ways to locate the GDP deflator.

Use the FRED search box and type in **GDP deflator**,

or browse FRED's categories, choosing the **National Accounts** category, then **National Income & Product Accounts**,

and finally **Price Indexes & Deflators.**

16.   From this list, choose **Gross Domestic Product: Implicit Price Deflator**. (Note: Another frequently used measure of prices on the list is the Personal Consumption Expenditures: Chain-type Price Index.)

17.   Now, to add some information to this choice, **change the units** to Percent Change from Year Ago **(% Chg. from Yr. Ago)**

18.   Once you've done that, the options for editing the graph are available. Add the **CPI-U Less Food and Energy** (seasonally adjusted) series.

19.   The GDP deflator (blue line in the graph below) reflects the prices of all goods and services produced domestically, while the CPI (red line below) reflects prices of all goods and services bought by consumers.

FRED Graph

Gross Domestic Product: Implicit Price Deflator (GDPDEF)
Consumer Price Index for All Urban Consumers: All Items Less Food & Energy (CPILFESL)

Shaded areas indicate US recessions.
2012 research.stlouisfed.org

Settings Restore Defaults | Save Settings | Apply Saved Settings

▸ Graph

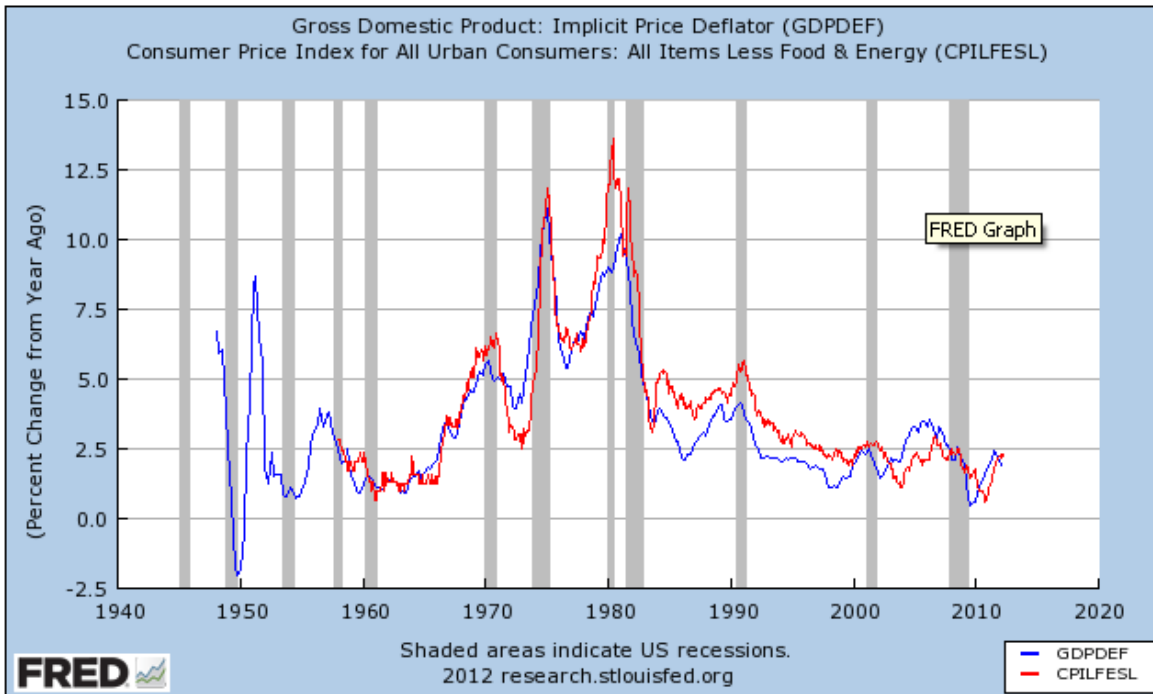▸ Line 1: Gross Domestic Product: Implicit Price Deflator (GDPDEF)

▾ Line 2: Consumer Price Index for All Urban Consumers: All Items Less Food & Energy (CPILFESL)

Measuring inflation is crucial to the FOMC's mandate for price stability. And, understanding inflation and how it is measured is key to being an informed citizen. We hope that you have found FRED to be a useful tool in your understanding of inflation and price stability.