

# Building Blocks of Economics: Consumer Price Index (CPI)

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The views expressed are mine, and not necessarily those of the Atlanta Fed, the St. Louis Fed, Federal Reserve System, or Middle Tennessee State University.

# **What are the Fed's goals for the macroeconomy (dual mandate)?**

**Maintain Maximum Employment**

**Maintain Price Stability**

**What indicators might be used to gauge these?**

# Economic Indicators...

## ...Looking Back



## ...to Project Forward



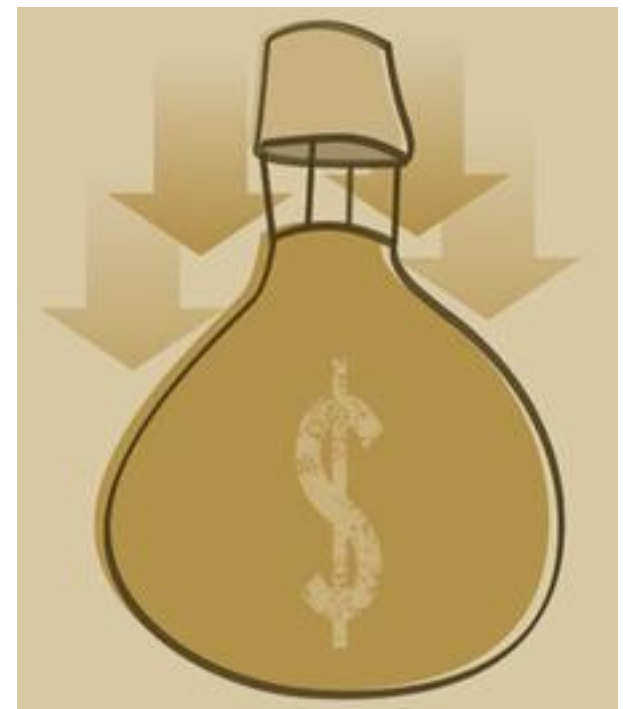
**Inflation** is a general **rise** in the level of prices over time. It is a **sustained increase** in the *price level* of goods and services. As a result, it takes **more money** to buy the same goods and services.

Inflation means **prices go up!**



**Deflation** is a general **decline** in the level of prices over time. It is a **sustained decrease** in the *price level* of goods and services. As a result, it takes **less money** to buy the same goods and services.

Deflation means **prices go down!**



## History of United States Postage Rates (Rate for first-class postage for letter --one ounce)

Date	Rate	Date	Rate
July 6, 1932	3 cents	April 3, 1988	25 cents
August 1, 1958	4 cents	February 3, 1991	29 cents
January 7, 1963	5 cents	January 1, 1995	32 cents
January 7, 1968	6 cents	January 10, 1999	33 cents
May 16, 1971	8 cents	January 7, 2001	34 cents
March 2, 1974	10 cents	June 30, 2002	37 cents
December 31, 1975	13 cents	January 8, 2006	39 cents
May 29, 1978	15 cents	May 14, 2007	41 cents
March 22, 1981	18 cents	May 12, 2008	42 cents
November 1, 1981	20 cents	May 11, 2009	44 cents
February 17, 1985	22 cents	January 22, 2012	45 cents

Sources:

[http://en.wikipedia.org/wiki/History\\_of\\_United\\_States\\_postage\\_rates](http://en.wikipedia.org/wiki/History_of_United_States_postage_rates)

<http://www.akdart.com/postrate.html>

# CPI Inflation Calculator

- [www.bls.gov/bls/inflation.htm](http://www.bls.gov/bls/inflation.htm)

The image shows a screenshot of the Bureau of Labor Statistics (BLS) website. The main navigation bar includes links for 'Home', 'Subject Areas', 'Databases & Tools', 'Publications', and 'Economic'. The 'Subject Areas' dropdown menu is open, showing a list of categories including 'INFLATION & PRICES', 'SPENDING & TIME USE', 'UNEMPLOYMENT', 'EMPLOYMENT', 'PAY & BENEFITS', 'PRODUCTIVITY', 'WORKPLACE INJURIES', 'INTERNATIONAL', 'REGIONAL OFFICES', and 'PROGRAMS A-Z'. The 'INFLATION & PRICES' category is selected, leading to the 'Overview of BLS Statistics on Inflation' page. This page contains text about inflation, a list of BLS statistics related to inflation, and a section titled 'Consumer Price Index' which describes the CPI program and lists various CPIs. A red circle highlights the link 'CPI inflation calculator' in the text. An overlay window titled 'CPI Inflation Calculator' is shown, displaying a form with a dollar sign, a year dropdown set to '1980', and a 'Calculate' button. The overlay also includes links for 'About this calculator' and 'Mobile Browser? View full screen.'.

UNITED STATES DEPARTMENT OF LABOR

BUREAU OF LABOR STATISTICS

Subject Areas

Overview of BLS Statistics on Inflation

Inflation can be defined as the overall general upward price movement in the economy. BLS has various indexes that measure different aspects of inflation.

BLS statistics related to inflation:

**Consumer Price Index**

The Consumer Price Index (CPI) program produces a representative basket of goods and services. The CPI is used to measure the change in the price level of the basket over time.

- The CPI for All Urban Consumers (CPI-U)
- The CPI for Urban Wage Earners and Clerical Workers (CPI-W)

The [CPI inflation calculator](#) allows customers to calculate the value of current dollars in an earlier period, or to calculate the current value of dollar amounts from years ago.

Consumer price indexes often are used to escalate or adjust payments for rents, wages, alimony, child support and other obligations that may be affected by changes in the cost of living. There is a fact sheet explaining [how to use the CPI for escalating contracts](#).

An additional price index called the [Chained Consumer Price Index \(C-CPI-U\)](#) is also available. This measure is designed to be a closer approximation to a "cost-of-living" index than the CPI-U or CPI-W.

**Producer Price Indexes**

The Producer Price Indexes (PPIs) are a family of indexes that measure changes in the selling prices received by domestic producers of goods and services. They formerly were referred to as Wholesale Price Indexes. When the PPIs are released, the news media will most often report the percentage change in the index for Finished Goods.

Producer Price Indexes also can be used in escalation contracts. A [fact sheet](#) explaining the details is available.

CPI Inflation Calculator

\$

in 1980

Has the same buying power as:

in 2013

Calculate

About this calculator

Mobile Browser? View full screen.

# What's a Dollar Worth App

- [http://www.minneapolisfed.org/community\\_education/teacher/calc/app.cfm](http://www.minneapolisfed.org/community_education/teacher/calc/app.cfm)

The screenshot shows the website of the Federal Reserve Bank of Minneapolis. The header includes the bank's name and a navigation menu with links like 'ABOUT THE FED', 'BANKING', 'COMMUNITY & EDUCATION', 'RESEARCH', 'THE ECONOMY', 'NEWS & EVENTS', and 'PUBLICATIONS & PAPERS'. The 'COMMUNITY & EDUCATION' section is active, displaying a list of resources including 'Community Development', 'Student Resources', 'Teaching Aids' (with sub-links for articles, economic education, teaching units, and CPI calculator information), and 'Financial Learning for the Public'.

The main content area is titled 'WHAT IS A DOLLAR WORTH? APP'. It explains that the app is available for download on the iTunes store and works on iPhone, iPod Touch, and iPad. A 'Download the app' link is provided, which launches the iTunes page. Below this, it mentions that an Android version is also being developed.

To the right of the text is a smartphone displaying the app's interface. The app shows a calculator where \$100 in 1913 is equivalent to \$2,281.38 in 2011. It includes a 'Calculate' button and a 'Read more...' link.

On the right side of the website, there is a search bar, a dropdown menu for 'Other Federal Reserve Sites', and a section for the '2012 Annual Report Essay' by Narayana Kocherlakota. Below this are 'Related Links' and 'External Links' sections.

The footer contains links for 'PRIVACY & TERMS', 'DISCLAIMER', 'ACCESSIBILITY', 'GLOSSARY', 'SITE MAP', 'MOBILE SITE', 'TWITTER', 'FACEBOOK', and 'RSS'.





#1

Kara's retirement income is fixed at \$24,000 per year.

#2

During the past two years, the inflation rate has averaged 3% per year. Allen has worked at the same job during this time and received a 1% pay increase one year and a 10% pay increase in another year.

#3

John loaned his friend \$5,000 last year and will be paid back the \$5,000 at the end of this year. The inflation rate for last two years has averaged 2%.



# Price Stability and Inflation

## What are the measures of inflation?

- Consumer Price Index (CPI)
- Producer Price Index (PPI)
- Personal Consumption Expenditures Price Index (PCE)

# Bureau of Labor Statistics (BLS)



- **Federal agency that collects and analyzes economic data**
- **Responsible for measuring labor market activity, working conditions, and price changes in the economy**
- **Provides information for private and public decision making**

# Bureau of Labor Statistics

- [www.bls.gov](http://www.bls.gov)

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- New York-New Jersey (NY City)
- Mid-Atlantic (Philadelphia)
- Southeast (Atlanta)
- Midwest (Chicago)
- Southwest (Dallas)
- Mountain-Plains (Kansas City)
- West (San Francisco)
- Regional Overview

**BEYOND THE NUMBERS**

**Expenditures of urban and rural households in 2011**

This article examines demographic characteristics and spending habits of urban and rural households in the United States in 2011.

[read more »](#)

1 2 3 4 5

[Archives »](#)

After collecting and analyzing data, the BLS reports price changes using the **Consumer Price Index**. The Consumer Price Index (**CPI**) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. The CPI measures changes on a monthly basis.



**NEXT BLS CPI  
REPORT:  
FEBRUARY 2013  
DATA TO BE  
RELEASED  
MARCH 15, 2013**

A national average reflects all the ups and downs of millions of individual price experiences.



The *inflation rate* can be determined comparing the percentage increase in the price level of goods and services from one time period to another.



**Annual Inflation Rate Formula:**

$$\frac{\text{CPI later year} - \text{CPI earlier year}}{\text{CPI earlier year}} \times 100$$

## Example:

Jan 2012 = 226.665

Jan 2013 = 230.28

$$A = 230.28 - 226.665 = 3.615$$

$$B = 3.615 / 226.665 = .015949$$

$$C = .015949 * 100 = 1.59\% (1.6\%)$$



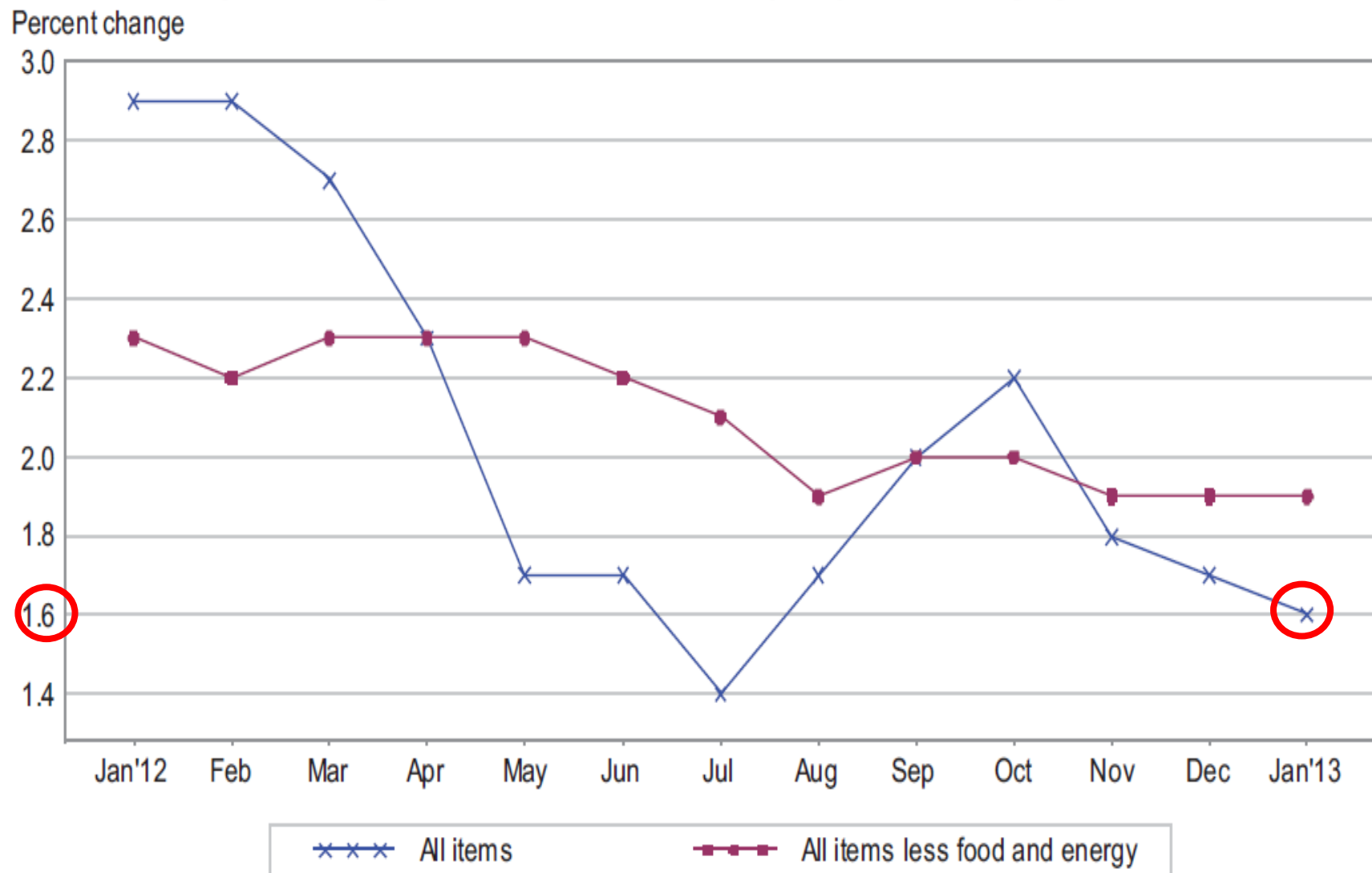
## Annual Inflation Rate Formula:

$$\frac{A \text{ CPI later year} - B \text{ CPI earlier year}}{B \text{ CPI earlier year}} \times 100$$



CPI = Over the last 12 months, the all items index increased **1.6** percent before seasonal adjustment.

Chart 2. 12-month percent change in CPI for All Urban Consumers (CPI-U), not seasonally adjusted, Jan. 2012 - Jan. 2013



- Source: Bureau of Labor Statistics – Consumer Price Index – January 2013 - <http://www.bls.gov/news.release/pdf/cpi.pdf> 16

CPI = Over the last 12 months, the all items index increased **1.6** percent before seasonal adjustment.

**Table A. Percent changes in CPI for All Urban Consumers (CPI-U): U.S. city average**

	Seasonally adjusted changes from preceding month							Un- adjusted 12-mos. ended Jan. 2013
	July 2012	Aug. 2012	Sep. 2012	Oct. 2012	Nov. 2012	Dec. 2012	Jan. 2013	
All items .....	.0	.5	.5	.2	-.2	.0	.0	1.6
Food .....	.1	.2	.1	.2	.2	.2	.0	1.6
Food at home .....	.0	.1	-.1	.3	.3	.2	.0	1.1
Food away from home <sup>1</sup> .....	.2	.3	.2	.1	.1	.1	.1	2.3
Energy .....	-1.3	4.6	3.9	.1	-3.4	-.8	-1.7	-1.0
Energy commodities .....	-1.3	7.3	6.1	.1	-5.7	-1.5	-3.0	-1.4
Gasoline (all types) .....	-1.4	7.6	6.3	-.1	-6.0	-1.9	-3.0	-1.5
Fuel oil <sup>1</sup> .....	-.5	4.6	4.1	1.1	-.2	.0	-.2	2.0
Energy services .....	-1.2	.4	.4	.2	.6	.3	.4	-.3
Electricity .....	-1.5	.1	.1	.3	.4	.2	1.1	.5
Utility (piped) gas service .....	-.3	1.5	1.2	-.2	1.5	.7	-1.7	-2.5
All items less food and energy .....	.1	.1	.2	.2	.1	.1	.3	1.9
Commodities less food and energy commodities .....	.0	-.2	-.1	.0	-.1	-.1	.2	.4
New vehicles .....	.0	.2	.0	.1	.3	.2	.1	1.7
Used cars and trucks .....	-.6	-1.1	-1.4	-.7	-.4	-.3	.2	-1.3
Apparel .....	-.2	-.1	.5	.6	-.5	.1	.8	2.1
Medical care commodities .....	.7	.3	-.1	.1	-.3	-.3	.1	1.5
Services less energy services .....	.1	.1	.2	.2	.2	.2	.3	2.5
Shelter .....	.1	.2	.2	.2	.2	.1	.2	2.2
Transportation services .....	.0	.0	.5	.6	.2	.4	.5	3.0
Medical care services .....	.3	.2	.3	.1	.3	.3	.2	3.6

<sup>1</sup> Not seasonally adjusted.

- Source: Bureau of Labor Statistics – Consumer Price Index – January 2013 - 17  
<http://www.bls.gov/news.release/pdf/cpi.pdf>

### WHAT'S INCLUDED IN THE CPI?

The CPI is often referred to as the Headline CPI or the “all items index.” Although it does not include literally all items, it includes a representative selection of consumer goods and services. Items are divided into more than 200 categories, arranged into eight major groups:

- Food and beverages
- Housing
- Apparel
- Transportation
- Medical care
- Recreation
- Education and communication
- Other goods and services



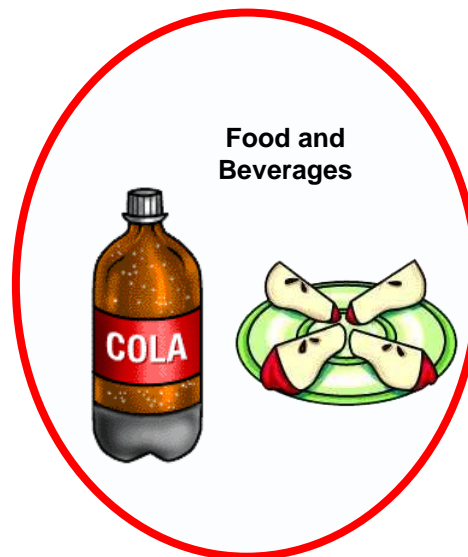
## The Eight Major Groups of the CPI

### Food and beverages

Housing  
Apparel  
Transportation  
Medical care  
Recreation  
Education and communication  
Other goods and services

### Examples

Breakfast cereal  
Milk  
Coffee  
Chicken  
Wine  
Full-service meals  
Snacks



## The Eight Major Groups of the CPI

Food and beverages

**Housing**

Apparel

Transportation

Medical care

Recreation

Education and communication

Other goods and services

### Examples

Rent of primary residence

Owners' equivalent rent

Fuel oil

Bedroom furniture



furniture



Housing

## The Eight Major Groups of the CPI

Food and beverages

Housing

**Apparel**

Transportation

Medical care

Recreation

Education and communication

Other goods and services

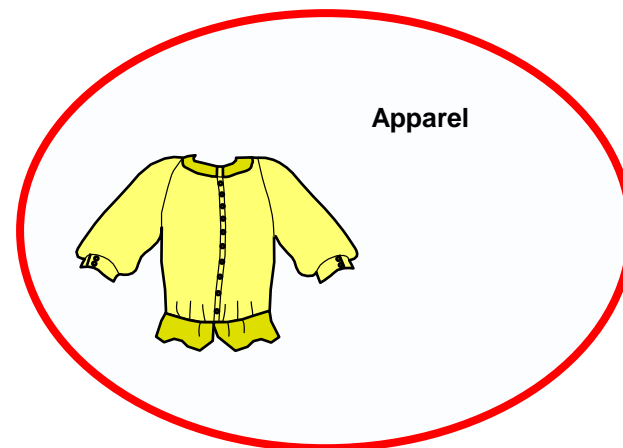
### Examples

Men's shirts

Women's sweaters

Women's dresses

Jewelry



## The Eight Major Groups of the CPI

Food and beverages

Housing

Apparel

**Transportation**

Medical care

Recreation

Education and communication

Other goods and services

## Examples

New vehicles

Airline fares

Gasoline

Motor vehicle insurance

Transportation





## The Eight Major Groups of the CPI

Food and beverages

Housing

Apparel

Transportation

**Medical care**

Recreation

Education and communication

Other goods and services

### Examples

Prescription drugs

Medical supplies

Eyeglasses

Eye care

Hospital services

Medical Care



## The Eight Major Groups of the CPI

Food and beverages

Housing

Apparel

Transportation

Medical care

**Recreation**

Education and communication

Other goods and services

### Examples

Televisions

Toys

Pets and pet products

Sports equipment

Admissions



Recreation

## The Eight Major Groups of the CPI

Food and beverages

Housing

Apparel

Transportation

Medical care

Recreation

**Education and communication**

Other goods and services

## Examples

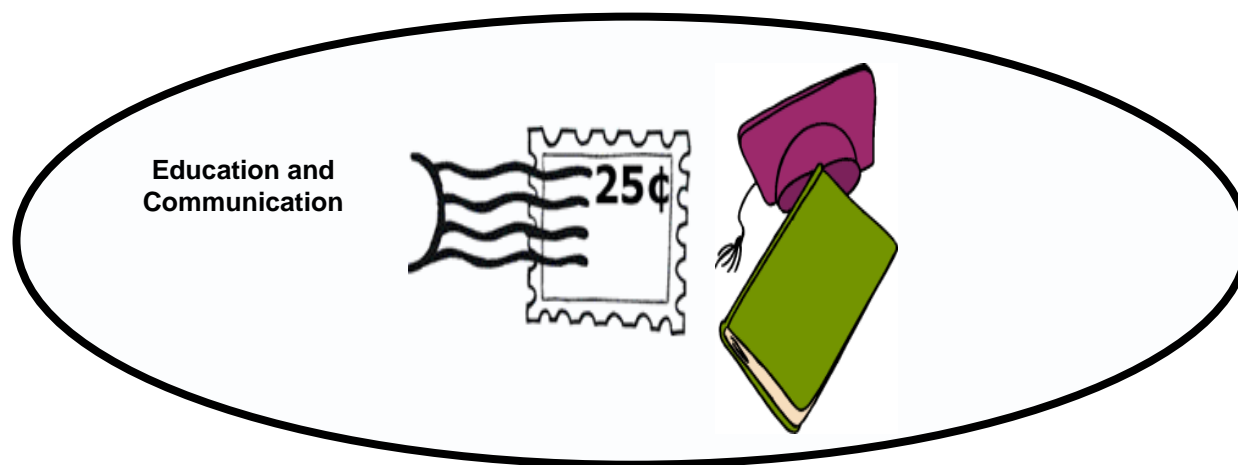
College tuition

Postage

Telephone services

Computer software

Computer accessories



## The Eight Major Groups of the CPI

Food and beverages

Housing

Apparel

Transportation

Medical care

Recreation

Education and communication

**Other goods and services**

## Examples

Tobacco

Smoking products

Haircuts

Manicures

Funeral expenses

Other goods  
and services



# WHAT'S *NOT* INCLUDED IN THE CPI?

The CPI **excludes**

- **Taxes** (such as income and Social Security taxes) not directly associated with the purchase of consumer goods and services
- **Investment items**, such as stocks, bonds, real estate, and life insurance (these items relate to savings and not to day-to-day consumption expenses)

# Building Blocks of Economics: Consumer Price Index (CPI)



## What is the core CPI?

The **core CPI** is the CPI **excluding food and energy**.

Food and energy prices tend to be more **volatile** and subject to **more price variation**-sharp and often short-term movements **can obscure longer-term** and underlying trends in other categories.

For example, gasoline prices can change several cents per gallon overnight. By excluding food and energy, the core CPI indicates the short-run inflation trend without the risk of volatile prices concealing the true picture of that trend.



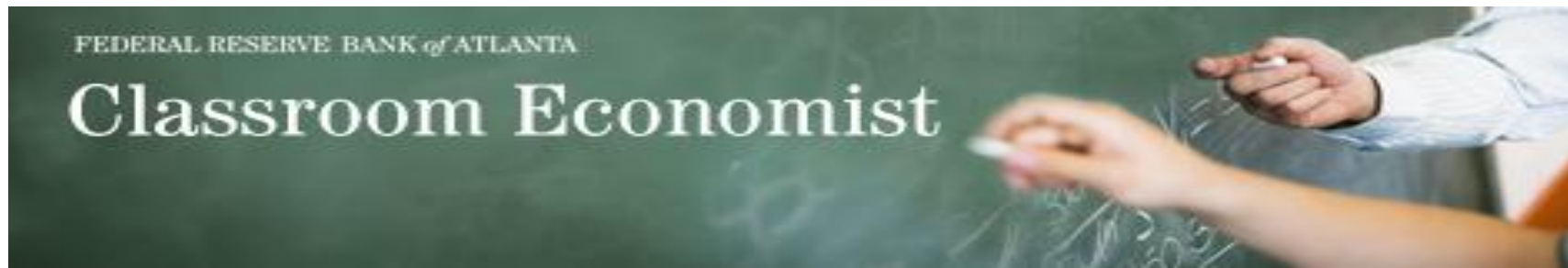
# The Fed's Beige Book – March 6, 2013

## Employment, Wages & Prices

- The majority of Districts reported that price pressures remained modest.
- Retail prices were steady or slightly rising in most Districts.
- Atlanta service industry contacts noted that stronger sales were likely to put upward pressure on prices over the next year.
- Plans to increase selling prices were limited among most District contacts.

### Let's Review:

- How is inflation defined? Deflation?
- How does inflation affect purchasing power?
- How is the inflation rate defined?
- What is the Consumer Price Index and how does it differ from core CPI?
- What are the categories of consumer spending included in the CPI and the core CPI?
- What is the role of the Bureau of Labor Statistics?
- How does the Fed use this data?



# The Classroom Economist

- <http://www.frbatlanta.org/edresources/classroomeconomist>

## ▼ Inflation

This inaugural issue of the *Classroom Economist* explains key concepts regarding inflation, including inflation targeting, the consumer price index, core inflation, and more.

 [An Economist's Perspective](#)

 [Lesson demonstration](#)

[Lesson on Inflation](#)—This lesson reinforces key inflation concepts. Use it to prepare teachers for the classroom or to teach students.

[Interactive Whiteboard](#) (.notebook, 8 MB)

[Test Your Knowledge](#)

[The Fed Explains Inflation](#)

[Resources Guide](#)

# The Fed Explained: The Fed Explains Inflation

- <http://www.frbatlanta.org/about/fedexplained/>





### Online Student Learning Modules

- **The Great Inflation**

[http://www.stlouisfed.org/education\\_resources/the-great-inflation-online-course/](http://www.stlouisfed.org/education_resources/the-great-inflation-online-course/)

- **Time Value of Money**

[http://www.stlouisfed.org/education\\_resources/time-value-of-money-online-course](http://www.stlouisfed.org/education_resources/time-value-of-money-online-course)



### Market Basket Lesson Plan and Whiteboard Activity

- [http://www.stlouisfed.org/education\\_resources/market-basket/](http://www.stlouisfed.org/education_resources/market-basket/)

- Additional resources are included on the CPI related resources handout





# Questions?

