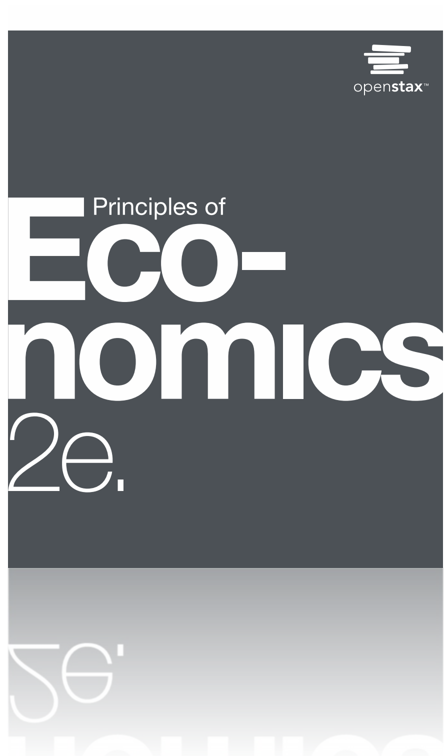
PRINCIPLES OF ECONOMICS 2e

Chapter 22: Inflation



CH.22 OUTLINE

22.1: Tracking Inflation

22.2: Measuring Changes in the Cost of Living

22.3: Inflation in the U.S. and Other Countries

22.4: Confusions Over Inflation

22.5: Indexing and Its Limitations

22.1 Tracking Inflation

Inflation: a general and ongoing rise in the level of prices in an entire economy.

- Inflation -> prices rise over time in most markets.
- does not refer to a change in relative (individual) prices.

Measuring Inflation: use a *price index*.

- Consumer prices are measured with a consumer price index.
  - CPI: a weighted average of prices for a “basket” of goods and services.

Basket of goods and services: a group of different items, where

- The specified quantities of each are “representative” of consumer purchases in the economy.
- used to calculate the price level by aggregating the prices items in the “basket” into a single measure.

Index Numbers

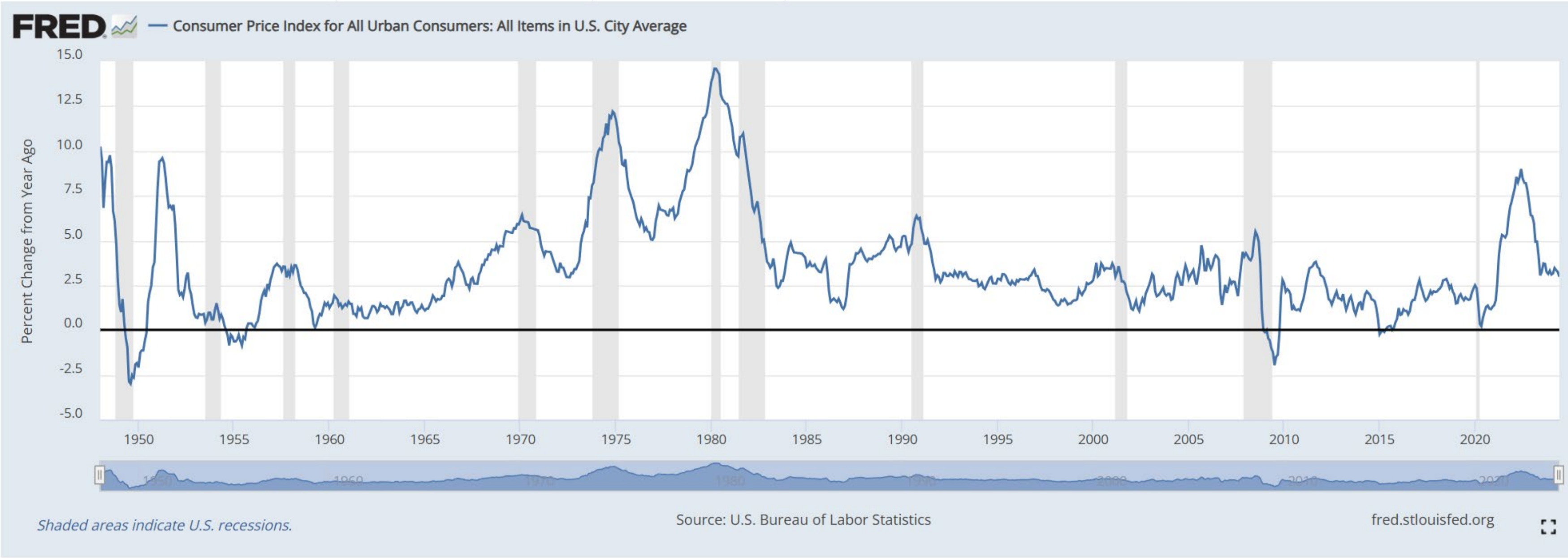
- **Index number:** a unit-free number
  - changes having meaning, but not the level
- **Price Index**:
  - no dollar signs or other units attached.

- **Base year:** arbitrary year for comparisons over time; the value of the index number is defined as 100 for the base year.

- Annual inflation is the percentage change in the price index between adjacent years

$$\frac{\text{(Level in new year - Level in prior year)}}{\text{Level in prior year}} \times 100 = \text{Percentage change}$$

US CPI Over Time



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

Post WWII: inflation and deflation.

1960s: slowly rising inflation.

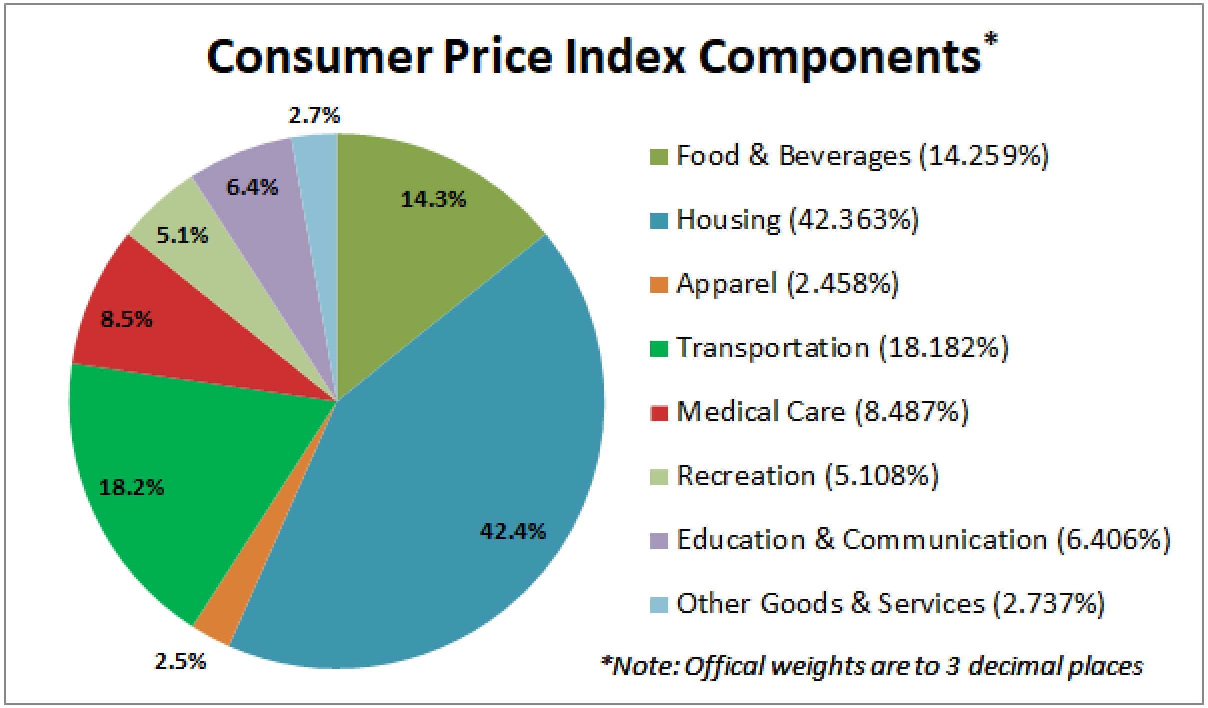
1970s: a decade of high inflation.

1985-2020: lower inflation (and until 2007, the great moderation)

22.2 Measuring Changes in the Cost of Living

- **Consumer Price Index (CPI):**
  - a price index for measuring inflation
  - in U.S., computed by government statisticians at BLS
  - calculate based on the price level from a fixed basket of goods and services that represents the average consumer's purchases.
  - sometimes called the “cost-of-living” index

The Weighting of CPI Components



Source: BLS; The most recent annual reweighting was in December 2021

- BLS classifies expenditures into more than 200 categories, arranged into **8 major groups**: food and beverages, housing, apparel, transportation, medical care, recreation, education and communication, and other goods and services).
    - housing has most weight (including owner equivalent rent)
    - two next highest categories, (transportation and food and beverage) add up to less than housing.

CPI Details

Consumer Price Index Frequently Asked Questions:

https://www.bls.gov/cpi/questions-and-answers.htm

Data Details:

https://www.bls.gov/news.release/cpi.t02.htm

Measures of Core Inflation

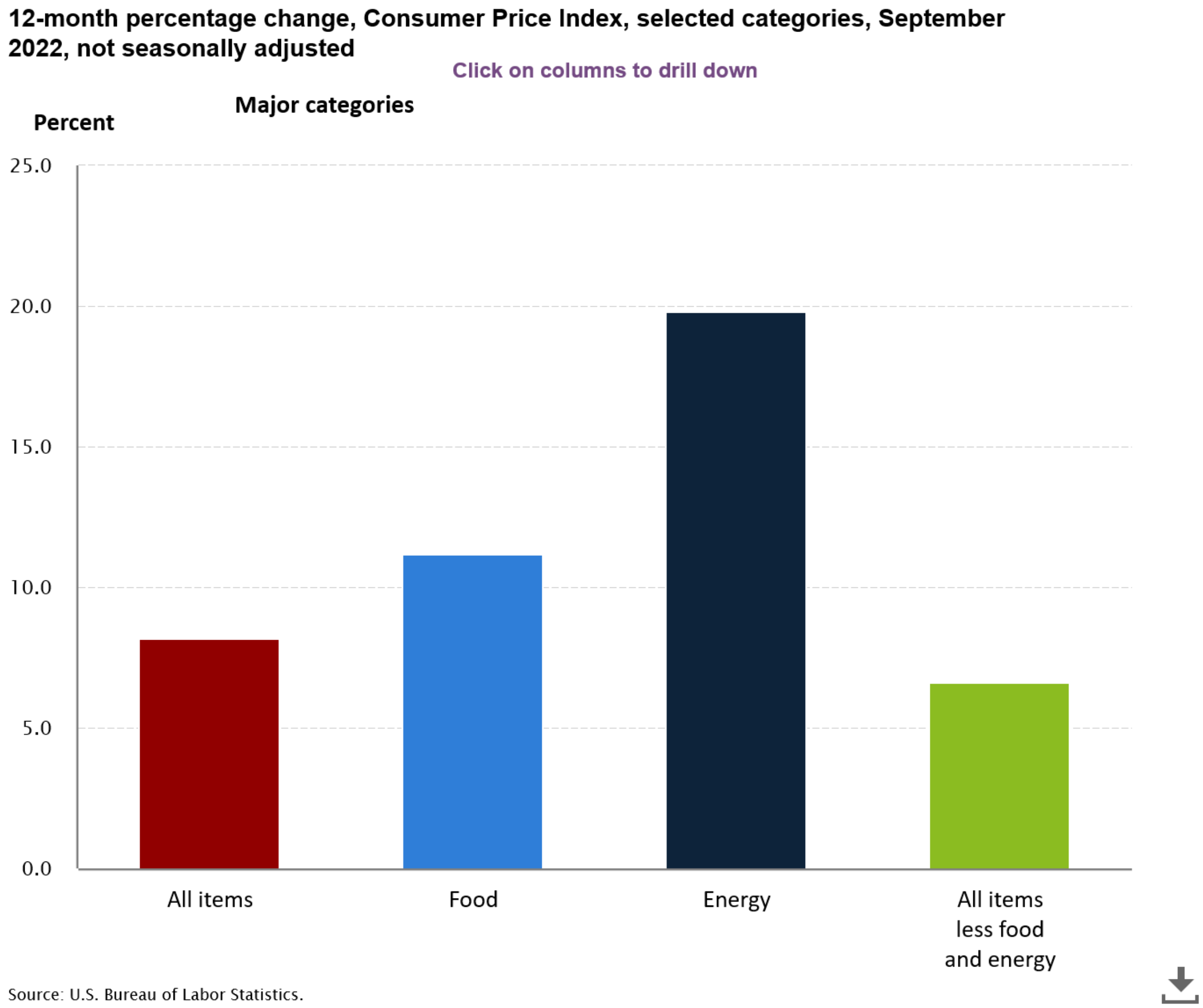
- **Core inflation:** CPI without energy and food prices.
  - provides a better sense of the underlying trends in prices that affect the cost of living.
  - a preferred gauge from which to make important government policy changes.

BLS special aggregate indexes (CPI Table 3):

https://www.bls.gov/news.release/cpi.t03.htm

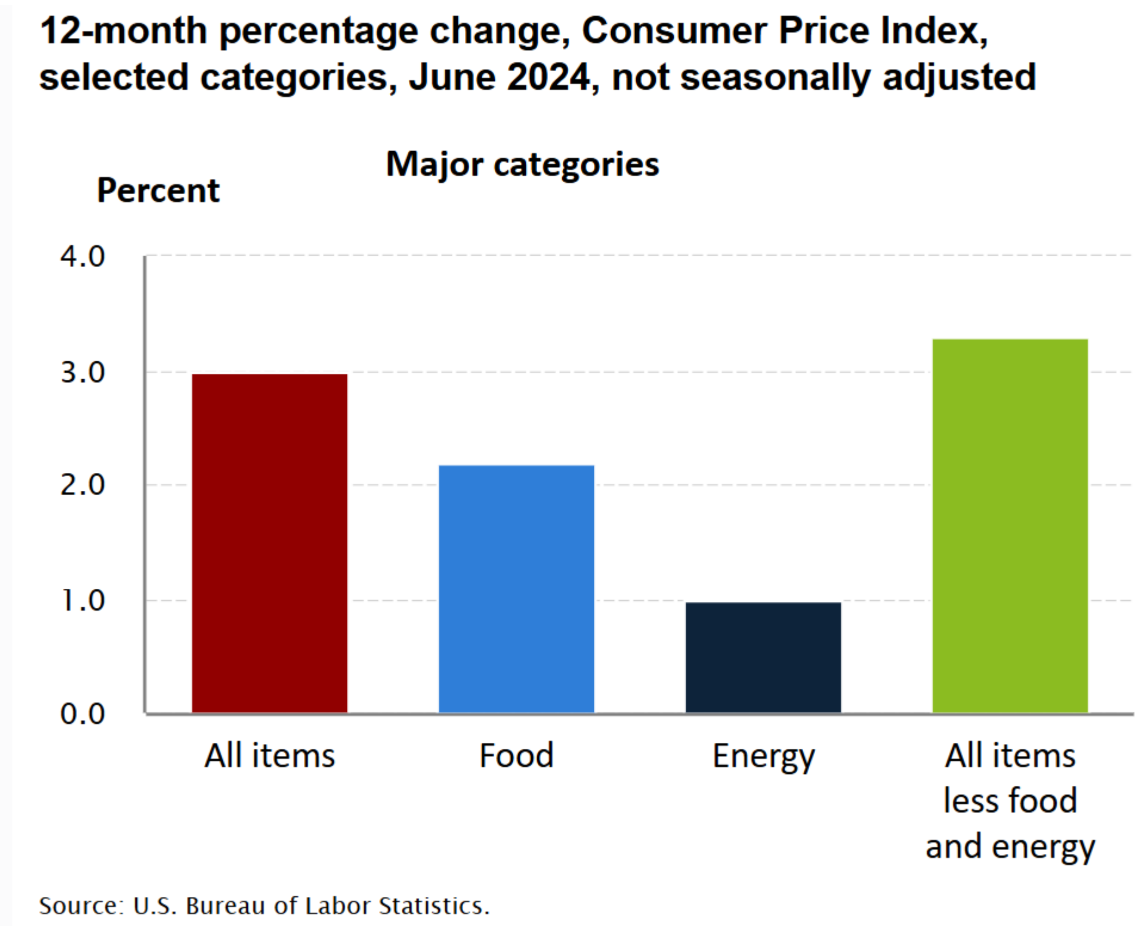
Resource: Comparing Measures of Core Inflation by Todd Clark,
Federal Reserve Bank of Kansas City, Economic Review. 86 (2) QII, 2001.
https://www.kansascityfed.org/documents/1417/2001-Comparing%20Measures%20of%20Core%20Inflation.pdf

Core Inflation 2022 (Year-on-Year)



Source: https://www.bls.gov/cpi/

Core Inflation 2024 (Year-on-Year)



Source: https://www.bls.gov/cpi/

CPI Bias

Changes in a fixed basket of goods and services can differ from change in cost of living due to:

- **Substitution bias:** an inflation rate calculated using a fixed basket of goods over time tends to overstate the true rise in the cost of living, because it does not allow that the person can substitute away from goods whose prices rise.

- **Quality/new goods bias:** inflation calculated using a fixed basket of goods over time tends to overstate the true rise in cost of living, because it does not account for improvements in the quality of existing goods or the invention of new goods.

Practical Solutions for the Substitution and the Quality/New Goods Biases

- To allow for some substitution between goods, the Bureau of Labor Statistics (BLS) uses sophisticated statistical methods for calculating the CPI.
- Updates the basket of goods behind the CPI more frequently, so that it can include new and improved goods more rapidly.
- Relative to past efforts to measure prices, the substitution bias and quality/new goods bias has been somewhat reduced.
- Nowadays, the rise in the CPI most likely overstates the true rise in inflation by only about 0.5% per year.

Other BLS Price Indices

- **Producer Price Index (PPI):** a measure of inflation based on prices paid for supplies and inputs by producers of goods and services. https://www.bls.gov/ppi/
  - Different industries, commodities, and stages of processing.

- **International Price Program's Import and Export Prices Indexes:** measures prices of merchandise that are exported or imported. https://www.bls.gov/mxp/

- **Employment Cost Index:** a measure of inflation based on wages paid in the labor market. https://www.bls.gov/charts/employment-cost-index/compensation-in-private-industry-and-state-and-local-government-3-month-percent-change.htm

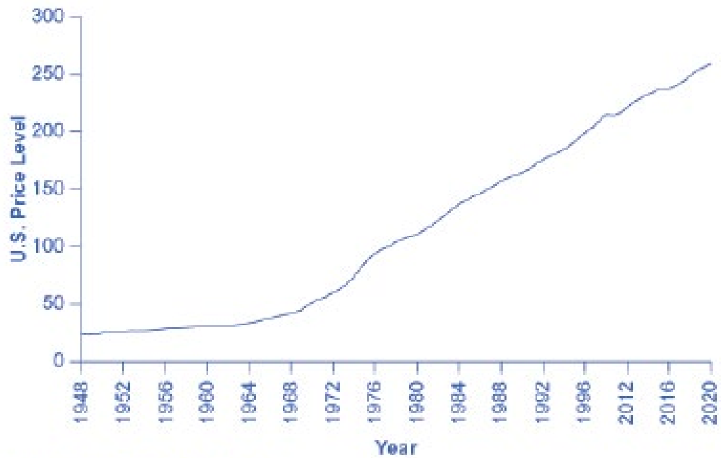
BEA Price Indexes

- **GDP deflator:**
  - based on the prices of all the GDP components (consumption, investment, government, exports minus imports).
  - best measure of economy-wide inflation
  - https://www.bea.gov/data/prices-inflation/gdp-price-deflator
- **Personal Consumption Expenditures (PCE):**
  - based on prices of goods and services purchased by consumers in the United States.
  - https://www.bea.gov/data/personal-consumption-expenditures-price-index

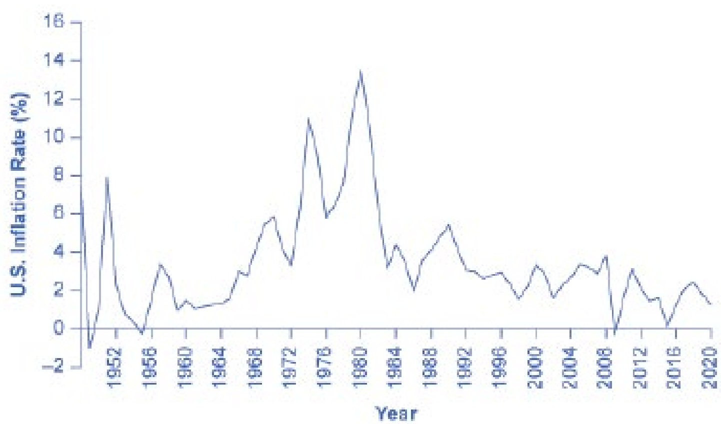
22.3 How the U.S. and Other Countries Experience Inflation

- Notable waves of U.S. inflation:
  - after World War I
  - after World War II
  - the 1970s
- **Deflation** - severe negative inflation.
  - when most prices in the economy are falling.
- Notable periods of U.S. deflation:
  - following the 1920-21 recession
  - the Great Depression of the 1930s
- **Hyperinflation** - an outburst of high inflation that often occurs (although not exclusively) when economies shift from a controlled economy to a market-oriented economy
  - The closest the United States has ever reached hyperinflation was during the 1860–1865 Civil War, in the Confederate states.

U.S. Price Level and Inflation Rates



(a) U.S. price level 1948-2020

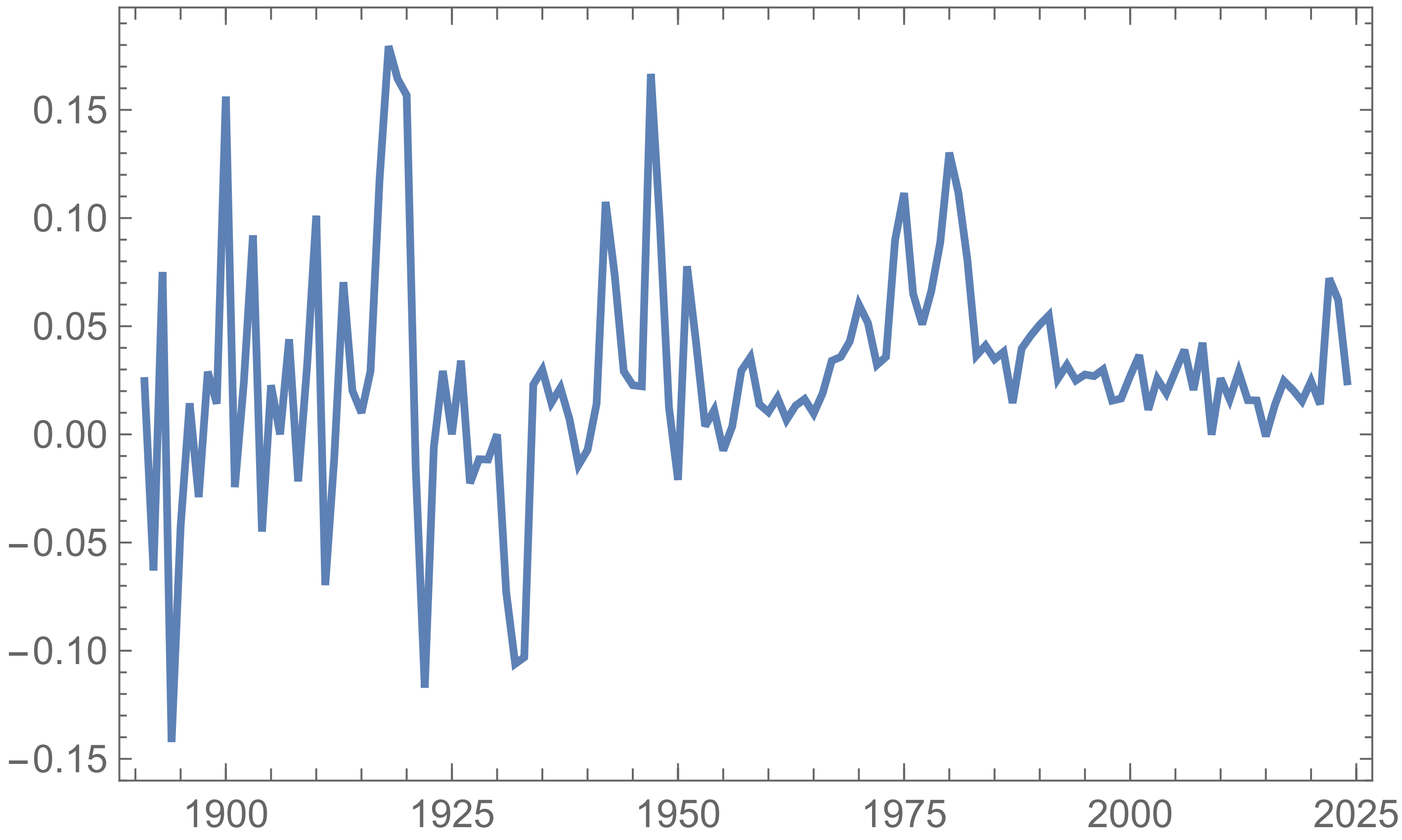


(b) U.S. inflation rate 1948-2020

(a) The U.S. price level rose relatively little over the first half of the twentieth century. Afterwards, it gradually increases until about 1973, then increases more rapidly through the remainder of the 1970s and beyond, with periodic small dips.

(b) It is easier to understand the behavior of prices by looking at their rate of growth (i.e., inflation).

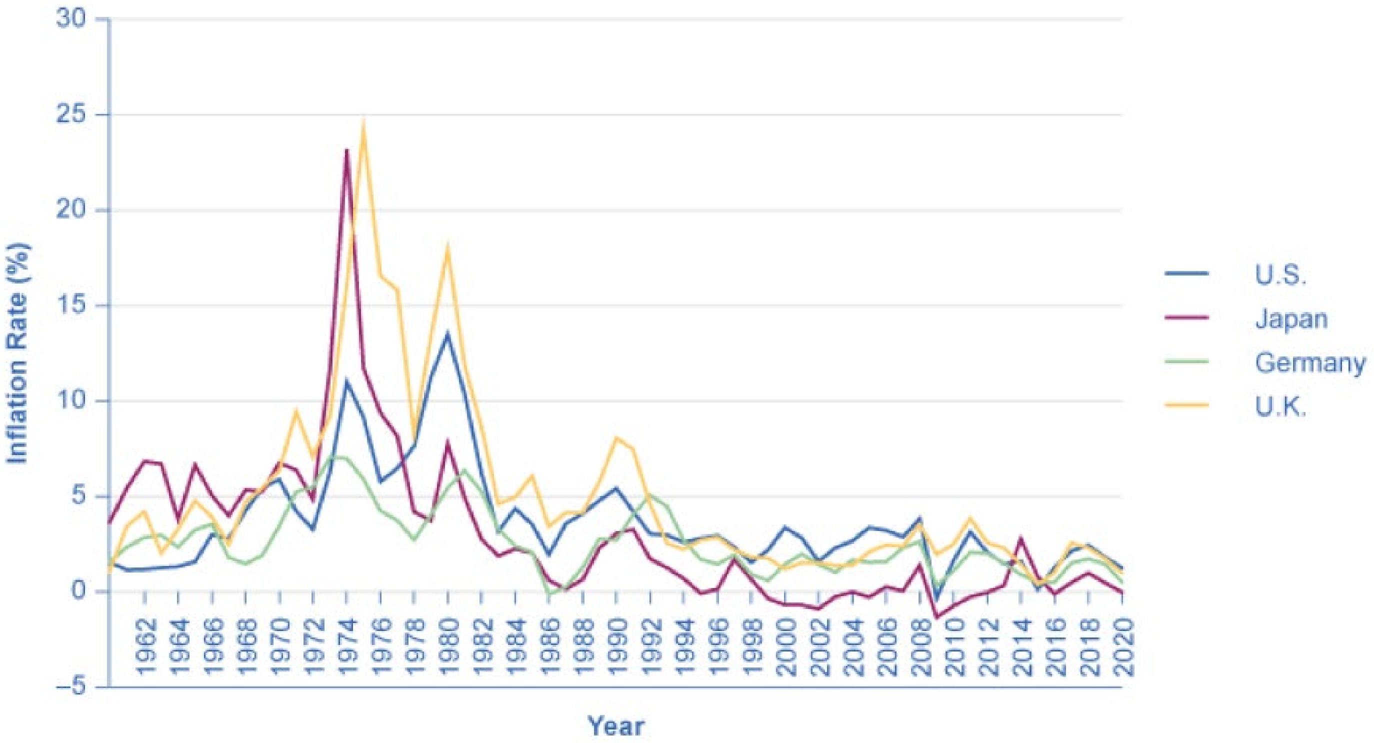
US Inflation (CPI) Since 1871



Data Source: http://www.econ.yale.edu/~shiller/data.htm

In 1916 inflation is almost 8%, but jumps to about 17% in 1917, drops drastically to close to –11% in 1921, goes up and down periodically, with peaks in the 1940s and the 1970s, until settling to around 1.3% in 2016. Post-pandemic inflation was then briefly high.

Countries with Relatively Low Inflation Rates, 1960–2016



- This chart shows the annual percentage change in consumer prices compared with the previous year's consumer prices in the United States, the United Kingdom, Japan, and Germany.

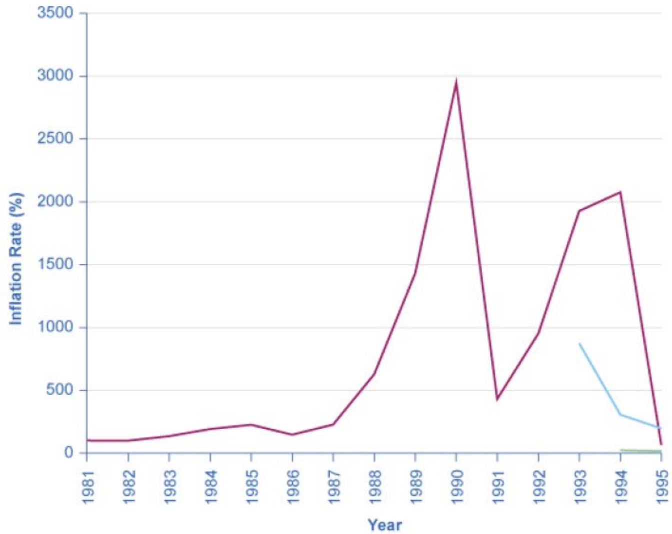
Countries with Relatively High Inflation Rates, 1980–2016

These charts show inflation rates in Brazil, China, and Russia.

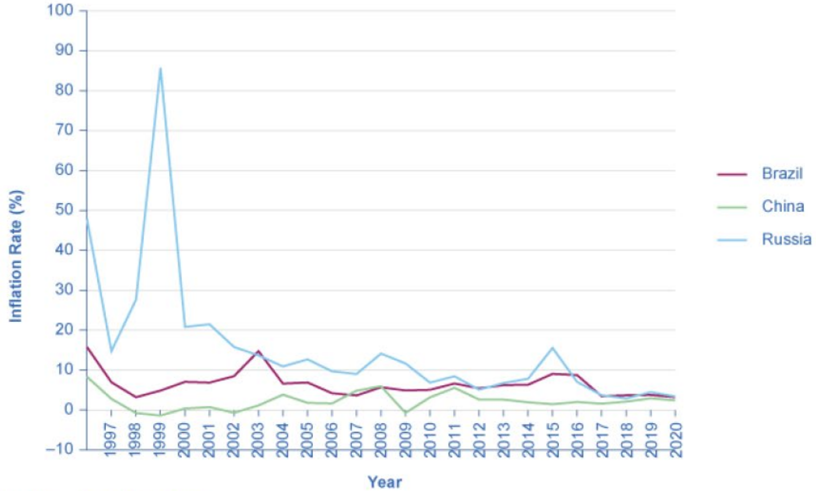
(a) Of these, Brazil and Russia experienced hyperinflation at some point between the mid-1980s and mid-1990s.

(b) Though not as high, China also had high inflation rates in the mid-1990s. Even though inflation rates have come down over the last two decades, several of these countries continue to see significant inflation rates.

(c) (Sources: http://research.stlouisfed.org/fred2/series/FPCPITOTLZGBRA; http://research.stlouisfed.org/fred2/series/CHNCPIALLMINMEI; http://research.stlouisfed.org/fred2/series/FPCPITOTLZGRUS)



(a) Inflation rates 1981-1995



(b) Inflation rates 1996-2020

Zimbabwe’s Hyperinflation

Source: https://www.cnn.com/2016/05/06/africa/zimbabwe-trillion-dollar-note

- At one point, 621,984,228 Zimbabwean dollars equaled one U.S. dollar.
- 2009: the country abandoned its own currency and allowed people to use foreign currency for purchases.
- 2019: use of foreign currency outlawed; reversed in 2020
- June 2022: Treasury announces dollar will be legal tender for 5 years, as Zimbabwe attempts to transition to new Zimbabwe dollar.

22.4 Inflation Confusion

- If prices, wages, and interest rates do not move in sync with inflation, or if they adjust for inflation only after a time lag, then inflation can cause three types of problems:

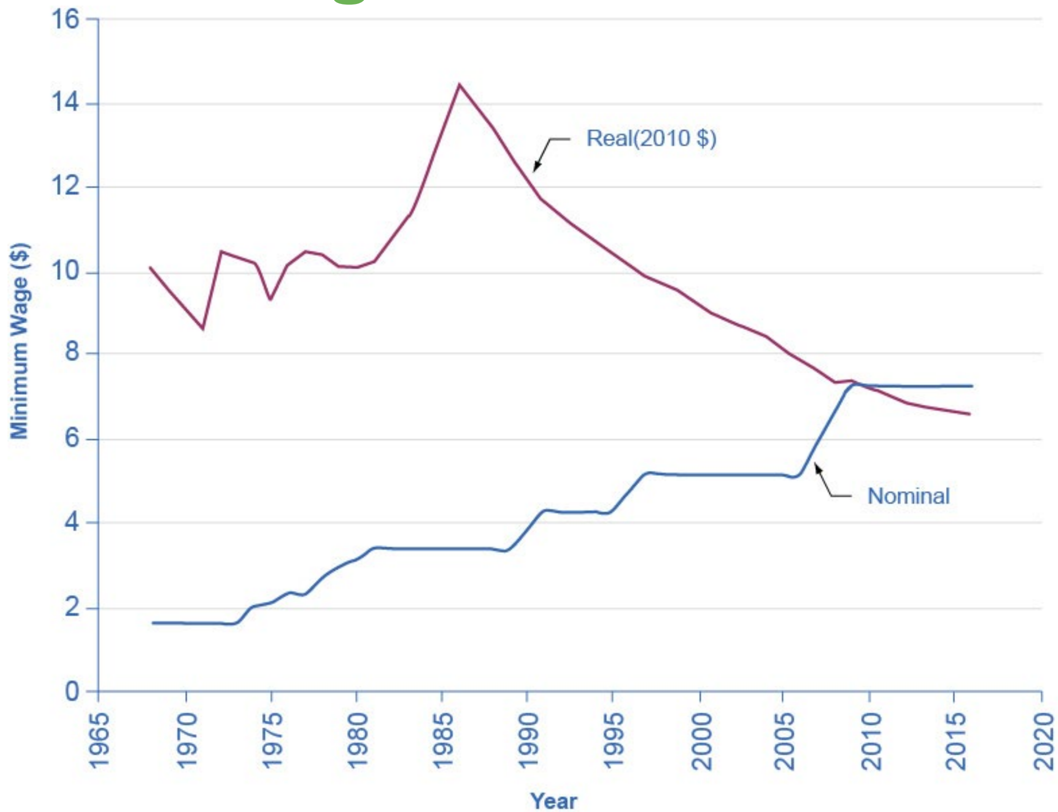
  - unintended redistributions of purchasing power
  - blurred price signals
  - difficulties in long-term planning

Unintended Redistributions of Purchasing Power

- People are hurt by inflation when:
  - they are holding cash
  - they have financial asset investments where the nominal return does not keep up with inflation (also can be exacerbated by taxes)
  - wages lag behind inflation
    - wage adjustments are often somewhat sticky and occur only once or twice a year.
  - they are a retiree receiving a private company defined pension

- Ordinary people can sometimes benefit from inflation.
  - A borrower paying a fixed interest rate can end up better off, because they can repay their loans in dollars that are worth less than originally expected.

U.S. Minimum Wage and Inflation



- After adjusting for inflation, the federal minimum wage dropped more than 30 percent from 1967 to 2010, even though the nominal figure climbed from $1.40 to $7.25 per hour.
- Increases in the minimum wage between 2008 and 2010 kept the decline from being worse - as it would have been if the wage had remained the same as it did from 1997 through 2007. (Sources: http://www.dol.gov/whd/minwage/chart.htm; http://data.bls.gov/cgi-bin/surveymost?cu)

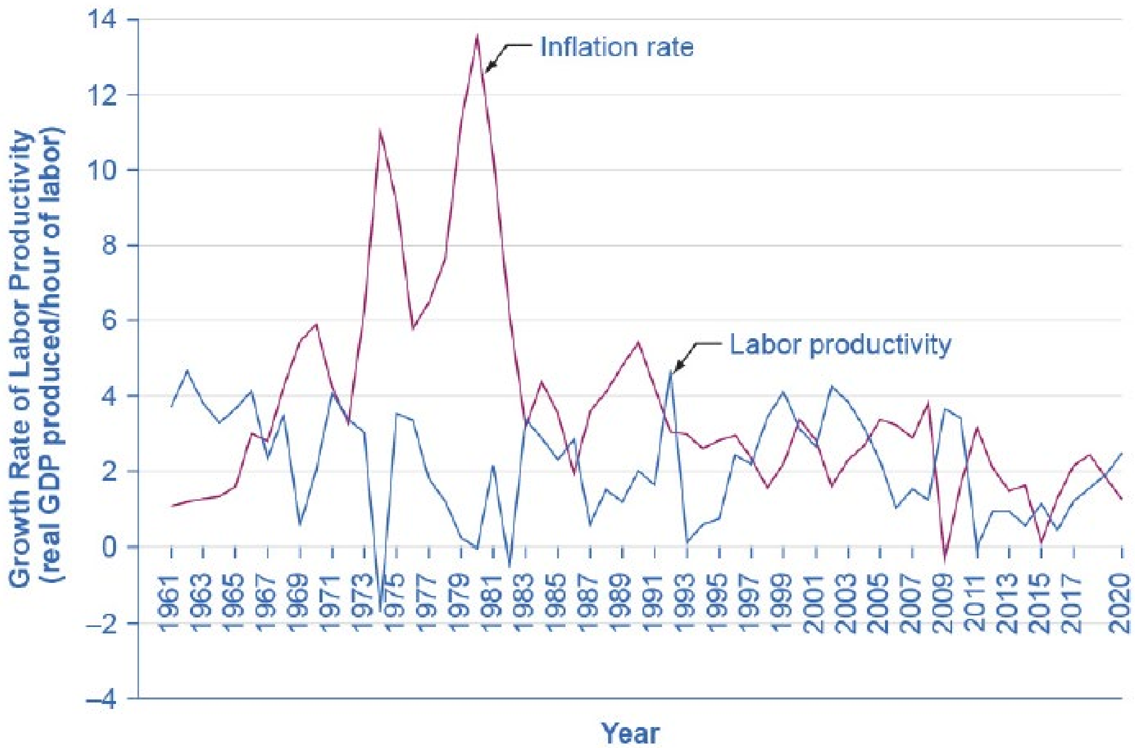
Blurred Price Signals

- Prices are the messengers in a market economy, conveying information about conditions of demand and supply.
- Inflation blurs those price messages.
- Inflation means that we perceive price signals more vaguely, like static on the radio .
- When the levels and changes of prices become uncertain, businesses and individuals find it harder to react to economic signals.

Problems of Long-Term Planning

- Inflation can make long-term planning difficult.
  - Planning for retirement in unknown future dollar levels.
  - More time spent by businesses finding ways of profiting from inflation vs. less time spent on productivity, innovation, or quality of service.

U.S. Inflation Rate and U.S. Labor Productivity, 1961–2014



- Over the last several decades in the United States, there have been times when rising inflation rates have been closely followed by lower productivity rates and *lower inflation* rates have corresponded to *increasing productivity* rates.
- As the graph shows, however, this correlation does not always exist.

22.5 Indexing and Its Limitations

- **Indexed** - a price, wage, or interest rate is adjusted automatically for inflation.

- Examples of indexing arrangements in private markets:

  - **Cost-of-living adjustments (COLAs):**
    - a contractual provision that wage increases will keep up with inflation.

  - **Adjustable-rate mortgage (ARM):**
    - a type of loan a borrower uses to purchase a home in which the interest rate varies with market interest rates.

Indexing in Government Programs

- Examples of indexing arrangements in government programs:
  - The U.S. income tax code is designed so income levels where higher tax rates kick in are indexed to rise automatically with inflation.
  - The level of Social Security benefits increases each year along with the Consumer Price Index.
    - An indexed increase in the Social Security tax base accompanies the indexed rise in the benefit level.
  - U.S. government offers indexed bonds promising to pay a certain real rate of interest above whatever inflation rate occurs.

END