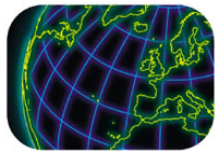


# MACROECONOMICS

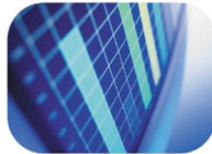


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## MACROECONOMICS

- National income accounts
- Aggregate demand and Aggregate Supply
- Inflation and Unemployment
- Financial, Money and Banking system
- Macroeconomic policies

1



# National Income Accounts



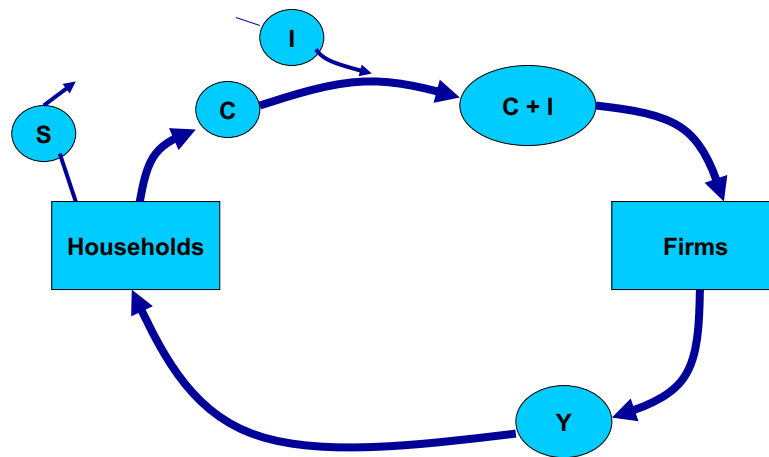
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*In this chapter,  
look for the answers to these questions:*

- What is Gross Domestic Product (GDP)?
- How is GDP related to a nation's total income and spending?
- What are the components of GDP?
- How is GDP corrected for inflation?
- Does GDP measure society's well-being?

3

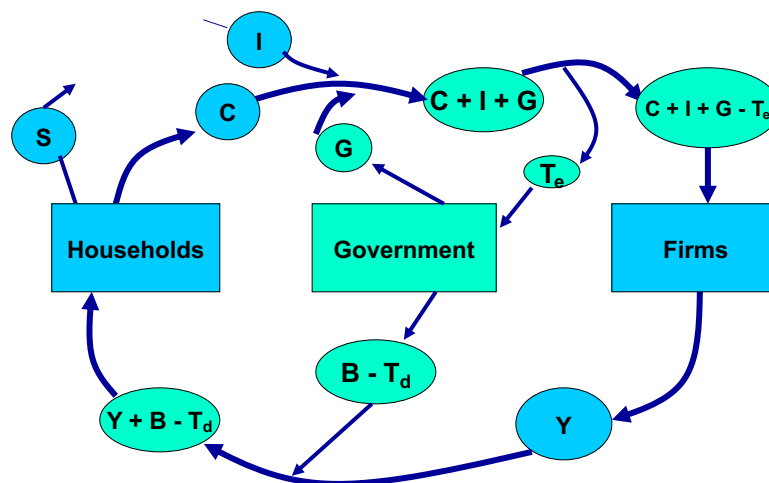
## The circular flow of income, expenditure and output



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## Government in the circular flow



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## Income and Expenditure

- **Gross Domestic Product (GDP)** measures total income of everyone in the economy.
- GDP also measures total expenditure on the economy's output of g&s.

*For the economy as a whole,  
**income equals expenditure**  
because every dollar a buyer spends  
is a dollar of income for the seller.*

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## Gross Domestic Product (GDP) Is...

...the market value of all final goods & services produced within a country in a given period of time.

---

*Goods are valued at their market prices, so:*

- *All goods measured in the same units (e.g., dollars in the U.S.)*
- *Things that don't have a market value are excluded, e.g., housework you do for yourself.*

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## Gross Domestic Product (GDP) Is...

...the market value of all final goods & services produced within a country in a given period of time.

---

*Final goods: intended for the end user*

*Intermediate goods: used as components or ingredients in the production of other goods*

*GDP only includes final goods—they already embody the value of the intermediate goods used in their production.*

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## Gross Domestic Product (GDP) Is...

...the market value of all final goods & services produced within a country in a given period of time.

---

*GDP includes tangible goods  
(like DVDs, mountain bikes, beer)*

*and intangible services  
(dry cleaning, concerts, cell phone service).*

9

## Gross Domestic Product (GDP) Is...

...the market value of all final goods & services produced within a country in a given period of time.

---

*GDP includes currently produced goods, not goods produced in the past.*

10

## Gross Domestic Product (GDP) Is...

...the market value of all final goods & services produced within a country in a given period of time.

---

*GDP measures the value of production that occurs within a country's borders, whether done by its own citizens or by foreigners located there.*

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## Gross Domestic Product (GDP) Is...

...the market value of all final goods & services produced within a country in a given period of time.

---

*Usually a year or a quarter (3 months)*

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## The Components of GDP

- Recall: GDP is total spending.
- Four components:
  - Consumption (**C**)
  - Investment (**I**)
  - Government Purchases (**G**)
  - Net Exports (**NX**)
- These components add up to GDP (denoted **Y**):

$$\mathbf{Y = C + I + G + NX}$$

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## Consumption (C)

- is total spending by households on g&s.
- Note on housing costs:
  - For renters, consumption includes rent payments.
  - For homeowners, consumption includes the imputed rental value of the house, but not the purchase price or mortgage payments.

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## Investment (I)

- is total spending on goods that will be used in the future to produce more goods.
- includes spending on
  - capital equipment (e.g., machines, tools)
  - structures (factories, office buildings, houses)
  - inventories (goods produced but not yet sold)

*Note: “Investment” does not mean the purchase of financial assets like stocks and bonds.*

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## Government Purchases (G)

- is all spending on the g&s purchased by govt at the federal, state, and local levels.
- **G** excludes **transfer payments**, such as Social Security or unemployment insurance benefits. They are not purchases of g&s.

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## Net Exports (NX)

- **NX** = exports – imports
- Exports represent foreign spending on the economy's g&s.
- Imports are the portions of **C**, **I**, and **G** that are spent on g&s produced abroad.
- Adding up all the components of GDP gives:

$$Y = C + I + G + NX$$

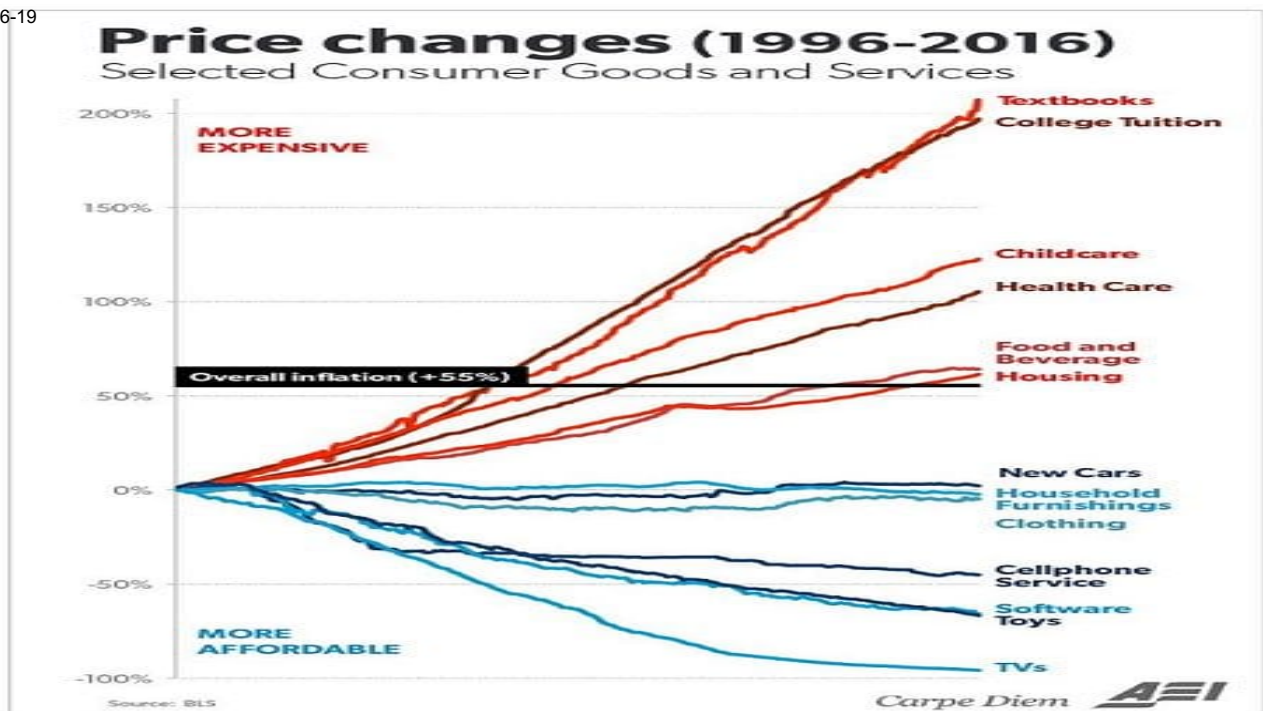
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## U.S. GDP and Its Components, 2012

	<i>billions</i>	<i>% of GDP</i>	<i>per capita</i>
<b>Y</b>	\$15,596	100.0	\$49,968
<b>C</b>	11,068	71.0	35,459
<b>I</b>	2,078	13.3	6,657
<b>G</b>	3,048	19.5	9,767
<b>NX</b>	-598	-3.8	-1,915

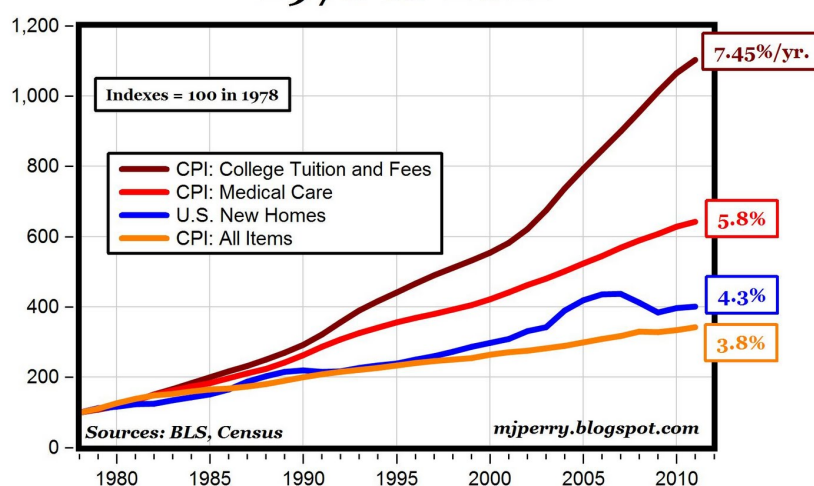
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## College Tuition vs. Medical Care vs. Home Prices vs. CPI: All Items 1978 to 2011



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## Macroeconomic indicators

$$\text{Deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} \times 100\% \quad \text{Deflator}_t = \frac{\sum P_i^t Q_i^t}{\sum P_i^0 Q_i^t} \times 100 \quad \text{take P, Q into account}$$

$$CPI_t = \frac{\sum P_i^t Q_i^0}{\sum P_i^0 Q_i^0} \times 100 \quad \text{take P into account}$$

CPI ≠ Deflator ở Q

CPI chỉ tính đồ gia dụng trong nhà

$$\text{inflation} = \frac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \times 100$$

$$g = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \times 100$$

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## Macroeconomic indicators

	2010		2011		2012	
	Q	P	Q	P	Q	P
Rice	1000	20	1200	22	1100	42
Car	500	100	540	110	600	140
Nominal GDP						
Real GDP						
CPI						
Inflation (CPI)						
Deflator						
Inflation (deflator)						
GDP growth						

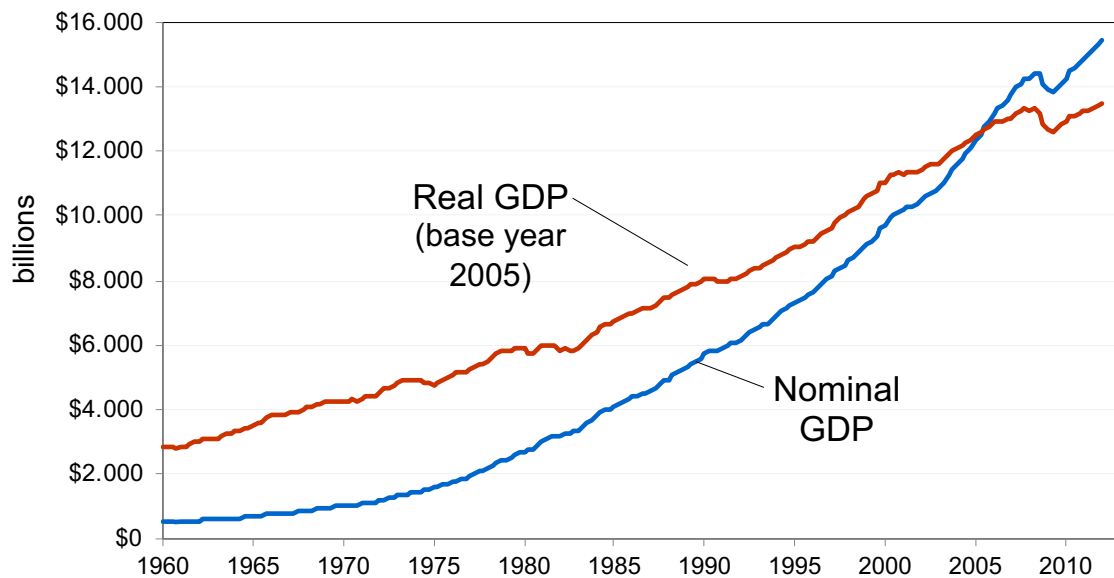
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## Real versus Nominal GDP

- Inflation can distort economic variables like GDP, so we have two versions of GDP:
- **Nominal GDP**
  - values output using current prices
  - not corrected for inflation
- **Real GDP**
  - values output using the prices of a *base year*
  - is corrected for inflation

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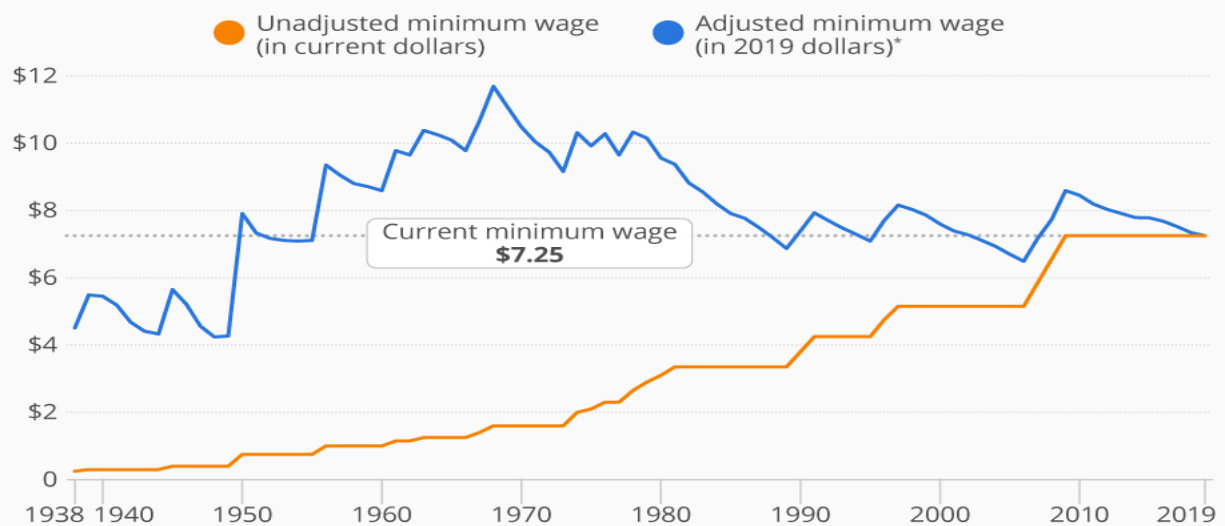
## Nominal and Real GDP in the U.S., 1965–2012



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## A Brief History of the U.S. Minimum Wage

U.S. federal minimum wage since 1938 adjusted and unadjusted for inflation



CC BY ND  
@StatistaCharts

\* adjusted using the Consumer Price Index for All Urban Consumer (CPI-U)  
Source: U.S. Department of Labor

statista

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## The GDP Deflator

- The GDP deflator is a measure of the overall level of prices.
- Definition:

$$\text{GDP deflator} = 100 \times \frac{\text{nominal GDP}}{\text{real GDP}}$$

- One way to measure the economy's **inflation rate** is to compute the percentage increase in the GDP deflator from one year to the next.

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## The Consumer Price Index (CPI)

- measures the typical consumer's cost of living
- the basis of cost of living adjustments (COLAs) in many contracts and in Social Security

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## How the CPI Is Calculated

### 1. **Fix the “basket.”**

The Bureau of Labor Statistics (BLS) surveys consumers to determine what’s in the typical consumer’s “shopping basket.”

### 2. **Find the prices.**

The BLS collects data on the prices of all the goods in the basket.

### 3. **Compute the basket’s cost.**

Use the prices to compute the total cost of the basket.

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## How the CPI Is Calculated

### 4. **Choose a base year and compute the index.**

The CPI in any year equals

$$100 \times \frac{\text{cost of basket in current year}}{\text{cost of basket in base year}}$$

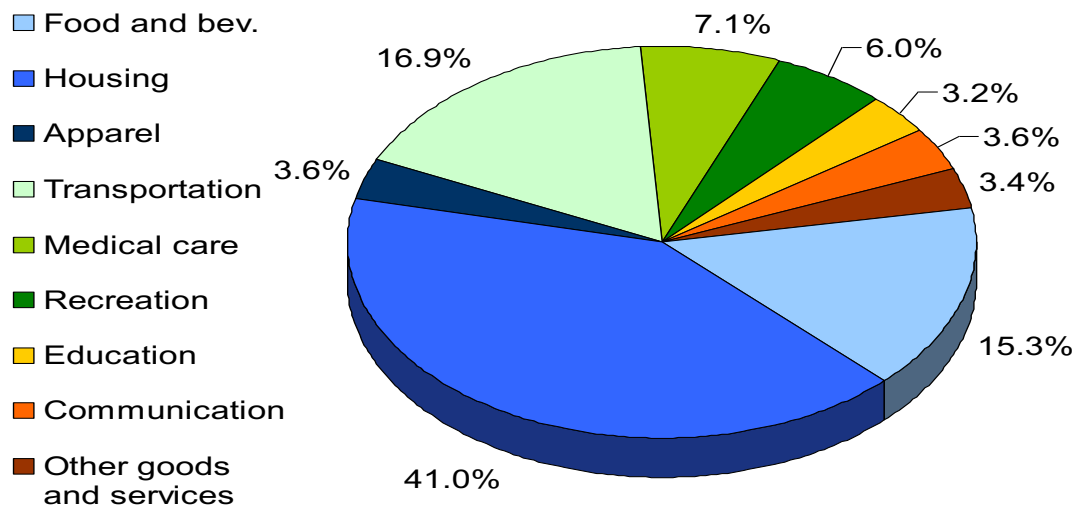
### 5. **Compute the inflation rate.**

The percentage change in the CPI from the preceding period.

$$\text{Inflation rate} = \frac{\text{CPI this year} - \text{CPI last year}}{\text{CPI last year}} \times 100\%$$

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## What's in the CPI's Basket?



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## Problems with the CPI: *Substitution Bias*

- Over time, some prices rise faster than others.
- Consumers substitute toward goods that become relatively cheaper, mitigating the effects of price increases.
- The CPI misses this substitution because it uses a fixed basket of goods.
- Thus, the CPI overstates increases in the cost of living.

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### **Problems with the CPI:** ***Introduction of New Goods***

- The introduction of new goods increases variety, allows consumers to find products that more closely meet their needs.
- In effect, dollars become more valuable.
- The CPI misses this effect because it uses a fixed basket of goods.
- Thus, the CPI overstates increases in the cost of living.

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### **Problems with the CPI:** ***Unmeasured Quality Change***

- Improvements in the quality of goods in the basket increase the value of each dollar.
- The BLS tries to account for quality changes but probably misses some, as quality is hard to measure.
- Thus, the CPI overstates increases in the cost of living.

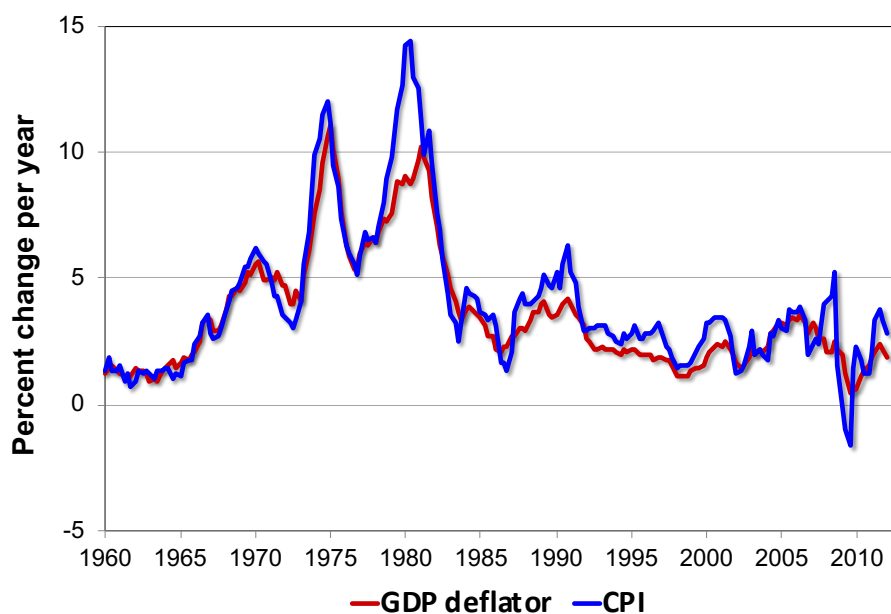
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## Problems with the CPI

- Each of these problems causes the CPI to overstate cost of living increases.
- The BLS has made technical adjustments, but the CPI probably still overstates inflation by about 0.5 percent per year.
- This is important because Social Security payments and many contracts have COLAs tied to the CPI.

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## Two Measures of Inflation, 1960–2012



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## Contrasting the CPI and GDP Deflator

Imported consumer goods:

- included in CPI (based on cost of basket)
- excluded from GDP deflator based on GDP (domestic products only)

Capital goods: hàng hóa tư bản, tư liệu sản xuất (nhà xưởng, trang thiết bị)

- excluded from CPI
- included in GDP deflator (if produced domestically)

The basket:

- CPI uses fixed basket
- GDP deflator uses basket of currently produced goods & services

This matters if different prices are changing by different amounts.

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## Correcting Variables for Inflation:

### Comparing Dollar Figures from Different Times

- Inflation makes it harder to compare dollar amounts from different times.
- Example: the minimum wage
  - \$1.15 in Dec 1964
  - \$7.25 in Dec 2010
- Did min wage have more purchasing power in Dec 1964 or Dec 2010?
- To compare, use CPI to convert 1964 figure into “2010 dollars”...

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## Correcting Variables for Inflation: Comparing Dollar Figures from Different Times

Amount in today's dollars	=	Amount in year $T$ dollars	x	$\frac{\text{Price level today}}{\text{Price level in year } T}$
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- In our example,
  - “year  $T$ ” is 12/1964, “today” is 12/2010
  - Min wage was \$1.15 in year  $T$
  - CPI = 31.3 in year  $T$ , CPI = 220.3 today

*The minimum wage  
in 1964 was \$8.09  
in 2010 dollars.*

$$\text{\$8.09} = \$1.15 \times \frac{220.3}{31.3}$$

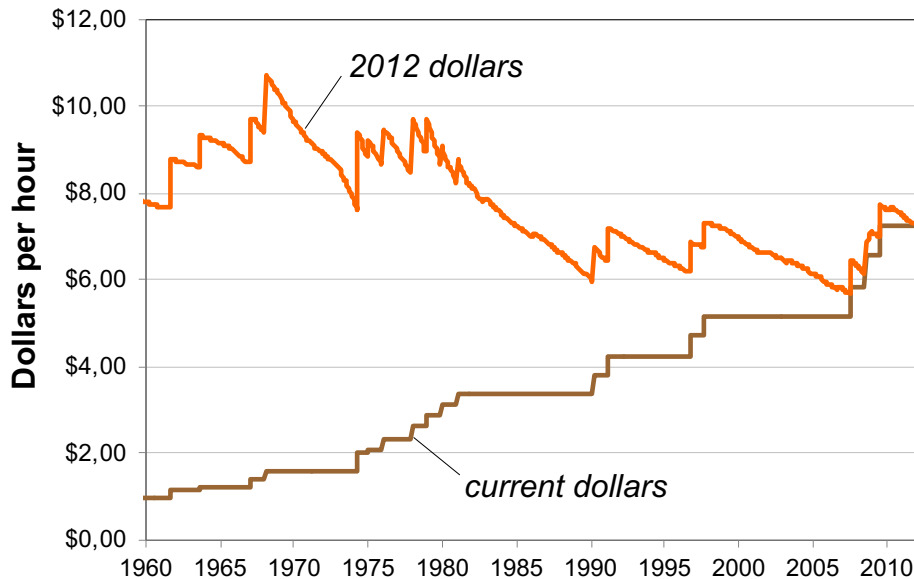
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## Correcting Variables for Inflation: Comparing Dollar Figures from Different Times

- Researchers, business analysts, and policymakers often use this technique to convert a time series of current-dollar (nominal) figures into constant-dollar (real) figures.
- They can then see how a variable has changed over time after correcting for inflation.
- Example: the minimum wage...

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## The U.S. Minimum Wage in Current Dollars and Today's Dollars, 1960–2012



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## Correcting Variables for Inflation: **Indexation**

A dollar amount is **indexed** for inflation if it is automatically corrected for inflation by law or in a contract.

COLA: cost of living adjustment

For example, the increase in the CPI automatically determines

- the COLA in many multi-year labor contracts
- adjustments in Social Security payments and federal income tax brackets

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## Correcting Variables for Inflation: Real vs. Nominal Interest Rates

The nominal interest rate:

- the interest rate not corrected for inflation
- the **rate of growth in the dollar value** of a deposit or debt

The real interest rate:

- corrected for inflation
- the **rate of growth in the purchasing power** of a deposit or debt

**Real interest rate**

$$= (\text{nominal interest rate}) - (\text{inflation rate})$$

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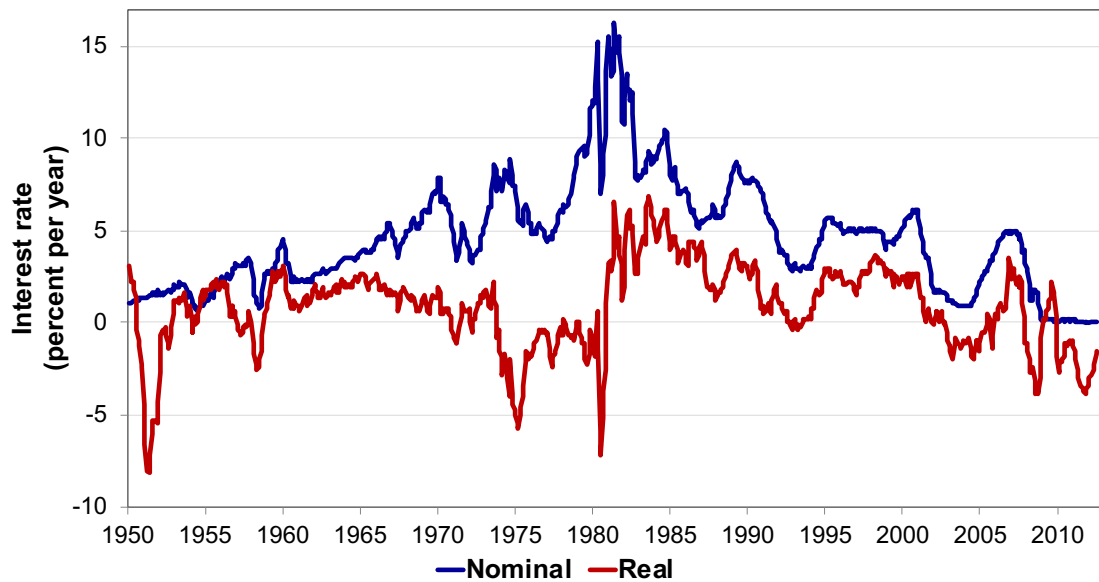
## Correcting Variables for Inflation: Real vs. Nominal Interest Rates

Example:

- Deposit \$1,000 for one year.
- Nominal interest rate is 9%.
- During that year, inflation is 3.5%.
- Real interest rate  
    = Nominal interest rate – Inflation  
    = 9.0% – 3.5% = **5.5%**
- The purchasing power of the \$1000 deposit has grown 5.5%.

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### Real and Nominal Interest Rates in the U.S., 1950–2012



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### GDP Does Not Value:

- the quality of the environment
- leisure time
- non-market activity, such as the child care a parent provides his or her child at home
- an equitable distribution of income

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## Then Why Do We Care About GDP?

- Having a large GDP enables a country to afford better schools, a cleaner environment, health care, etc.
- Many indicators of the quality of life are positively correlated with GDP. For example...