



# Unit 2 Test Review

The Components of GDP

Real versus Nominal GDP

Inflation

The Consumer Price Index (CPI)

Real Interest Rate

Business Cycles

Unemployment



📖 Recall: GDP is total spending. (expenditure)

📖 Four components:

📖 Consumption (C)

📖 Investment (I)

📖 Government Purchases (G)

📖 Net Exports (NX)





📖 These components add up to GDP (denoted Y):



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



# Consumption (C)

Beware of  
intermediate  
goods!


-  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.




# 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.



# 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.



# 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:

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




# Real versus Nominal GDP

📖 Inflation can distort economic variables like GDP, so we have two versions of GDP: One is corrected for inflation, the other is not.





📖 **Nominal GDP** values output using current prices. It is not corrected for inflation.

📖 **Real GDP** values output using the prices of a *base year*. Only the change in amounts produced are calculated. Real GDP is corrected for inflation.



# 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





# How the CPI Is Calculated

## *Fix the "basket."*

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

## *Find the prices.*

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

## *Compute the basket's cost.*

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



*Choose a base year and compute the index.*  
The CPI in any year equals

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

*Compute the inflation rate.*

The percentage change in the CPI from the preceding period.

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

# EXAMPLE

basket: {4 pizzas, 10 lattes}

year	price of pizza	price of latte	cost of basket
2007	\$10	\$2.00	$\$10 \times 4 + \$2 \times 10 = \$60$
2008	\$11	\$2.50	$\$11 \times 4 + \$2.5 \times 10 = \$69$
2009	\$12	\$3.00	$\$12 \times 4 + \$3 \times 10 = \$78$

Compute CPI in each year

2007:  $100 \times (\$60/\$60) = 100$

2008:  $100 \times (\$69/\$60) = 115$

2009:  $100 \times (\$78/\$60) = 130$

Inflation rate:

$$\left. \begin{array}{l}
 15\% \\
 13\%
 \end{array} \right\} = \frac{115 - 100}{100} \times 100\%$$

$$\left. \begin{array}{l}
 13\% \\
 13\%
 \end{array} \right\} = \frac{130 - 115}{115} \times 100\%$$

\* 2007 base year

# ACTIVE LEARNING 1

## Calculate the CPI

CPI basket:

{10 lbs beef,  
20 lbs chicken}

The CPI basket cost \$120  
in 2004, the base year.

	<i>price of beef</i>	<i>price of chicken</i>
2004	\$4	\$4
2005	\$5	\$5
2006	\$9	\$6

**A.** Compute the CPI in 2005.

**B.** What was the CPI inflation rate from 2005-2006?

# ACTIVE LEARNING 1

## Answers

CPI basket:

{10 lbs beef,  
20 lbs chicken}

The CPI basket cost \$120  
in 2004, the base year.

	<i>price of beef</i>	<i>price of chicken</i>
2004	\$4	\$4
2005	\$5	\$5
2006	\$9	\$6

A. Compute the CPI in 2005:

$$\begin{aligned} &\text{Cost of CPI basket in 2005} \\ &= (\$5 \times 10) + (\$5 \times 20) = \$150 \end{aligned}$$

$$\text{CPI in 2005} = 100 \times (\$150/\$120) = 125$$

# ACTIVE LEARNING 1

## Answers

CPI basket:

{10 lbs beef,  
20 lbs chicken}

The CPI basket cost \$120  
in 2004, the base year.

	<i>price of beef</i>	<i>price of chicken</i>
2004	\$4	\$4
2005	\$5	\$5
2006	\$9	\$6

**B.** What was the inflation rate from 2005-2006?

Cost of CPI basket in 2006

$$= (\$9 \times 10) + (\$6 \times 20) = \$210$$

$$\text{CPI in 2006} = 100 \times (\$210/\$120) = 175$$

$$\text{CPI inflation rate} = (175 - 125)/125 = 40\%$$



The formula used to calculate the inflation rate is:

$$\text{Inflation rate} = \frac{\text{CPI Year 2} - \text{CPI Year 1}}{\text{CPI Year 1}} \times 100$$






## Comparing Dollar Figures from Different Times


 Example: the minimum wage

 \$1.15 in Dec 1964


 \$5.85 in Dec 2007

 \$7.25 in Dec 2009

 Did min wage have more purchasing power in Dec 1964 or Dec 2007?

 To compare, use CPI to convert 1964 figure into "today's dollars" ...




$$\text{Amount in today's dollars} = \text{Amount in year } T \text{ dollars} \times \frac{\text{Price level today}}{\text{Price level in year } T}$$

📁 In our example,

📁 year  $T = 12/1964$ , "today" = 12/2007

📁 Min wage = \$1.15 in year  $T$

📁 CPI = 31.3 in year  $T$ , CPI = 211.7 today

*The minimum wage in 1964 was \$7.78 in today's (2007) dollars.*

$$\$7.78 = \$1.15 \times \frac{211.7}{31.3}$$

# Example: your Daddy's wage

Your father graduated from school and took his first job in 1972, which paid a salary of \$7,000. What is this salary worth in 2007 dollars?

CPI in 1972 = 41.8

CPI in 2007 = 195

Value in 2007 = 1972 salary  $\times$  (CPI in 2007/CPI in 1972)

Value in 2007 = \$7,000(195/41.8)  
= \$7,000  $\times$  4.67 = \$32,690

## 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**

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

# Real vs. Nominal Interest Rates

## Example:

- 📖 Deposit \$1,000 for one year.
- 📖 Nominal interest rate is 4.9%.
- 📖 So you expect to have \$1,049.00 next year
- 📖 During that year, inflation is 3.5%. (it takes \$35 more to get the same stuff, so you only gained \$14)
- 📖 Real interest rate
  - = Nominal interest rate - Inflation
  - = 4.9% - 3.5% = **1.4%**
- 📖 The purchasing power of the \$1000 deposit has grown 1.4%.

# Labor Force Statistics

BLS divides population into 3 groups:

 **Employed:** paid employees, self-employed, and unpaid workers in a family business

 **Unemployed:** people not working who have looked for work during previous 4 weeks

 **Not in the labor force:** everyone else

The **labor force** is the total # of workers, including the employed and unemployed.



**Unemployment rate** (“u-rate”):  
% of the labor force that is unemployed

$$\text{u-rate} = 100 \times \frac{\text{\# of unemployed}}{\text{labor force}}$$

**Labor force participation rate:**  
% of the adult population that is in the labor force

$$\text{labor force participation rate} = 100 \times \frac{\text{labor force}}{\text{adult population}}$$

# ACTIVE LEARNING 1

## Calculate labor force statistics

Compute the labor force, u-rate, adult population, and labor force participation rate using this data:

### Adult population of the U.S. by group, June 2008

# of employed	145.9 million
# of unemployed	8.5 million
not in labor force	79.2 million

# ACTIVE LEARNING 1

## Answers

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$$\begin{aligned}\text{Labor force} &= \text{employed} + \text{unemployed} \\ &= 145.9 + 8.5 \\ &= \mathbf{154.4} \text{ million}\end{aligned}$$

$$\begin{aligned}\text{U-rate} &= 100 \times (\text{unemployed}) / (\text{labor force}) \\ &= 100 \times 8.5 / 154.4 \\ &= \mathbf{5.5\%}\end{aligned}$$

December 2009 U-rate was 10% !!!



# ACTIVE LEARNING 1

## Answers

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$$\begin{aligned}\text{Population} &= \text{labor force} + \text{not in labor force} \\ &= 154.4 + 79.2 \\ &= \mathbf{233.6}\end{aligned}$$

$$\begin{aligned}\text{LF partic. rate} &= 100 \times (\text{labor} \\ &\text{force}) / (\text{population}) \\ &= 100 \times 154.4 / 233.6 \\ &= \mathbf{66.1\%}\end{aligned}$$



## Cyclical Unemployment vs. the Natural Rate

There's always some unemployment, though the u-rate fluctuates from year to year.

### **Natural rate of unemployment**

- ☞ the normal rate of unemployment around which the actual unemployment rate fluctuates

### **Cyclical unemployment**

- ☞ the deviation of unemployment from its natural rate
- ☞ associated with business cycles, which we'll study in later chapters



# Explaining the Natural Rate: An Overview

Even when the economy is doing well, there is always some unemployment, including:

## Frictional unemployment

- 📖 occurs when workers spend time searching for the jobs that best suit their skills and tastes
- 📖 short-term for most workers



## Structural unemployment

- 📖 occurs when there are fewer jobs than workers
- 📖 usually longer-term



The natural rate of unemployment consists of

📖 *frictional unemployment*


📖 It takes time to search for the right jobs

📖 Occurs even if there are enough jobs to go around

📖 *structural unemployment*

📖 When wage is above eq'm, not enough jobs

📖 Due to min. wages, labor unions, efficiency wages



In later chapters, we will learn about *cyclical unemployment*, the short-term fluctuations in unemployment associated with business cycles.