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 x 4 + $2 x 10 = $60
2008	$11	$2.50	$11 x 4 + $2.5 x 10 = $69
2009	$12	$3.00	$12 x 4 + $3 x 10 = $78

Compute CPI in each year

2007: 100 x ($60/$60) = 100

2008: 100 x ($69/$60) = 115

2009: 100 x ($78/$60) = 130

Inflation rate:

$$15\% = \frac{115 - 100}{100} \times 100\%$$

$$13\% = \frac{130 - 115}{115} \times 100\%$$

* 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.

	price of beef	*price of chicken*
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.

	price of beef	*price of chicken*
2004	$4	$4
2005	$5	$5
2006	$9	$6

A. Compute the CPI in 2005:

Cost of CPI basket in 2005
= ($5 x 10) + ($5 x 20) = $150

CPI in 2005 = 100 x ($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.

	price of beef	*price of chicken*
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 x 10) + ($6 x 20) = $210

CPI in 2006 = 100 x ($210/$120) = 175

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"…

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

- 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 *x* (CPI in 2005/CPI in 1972)
Value in 2007 = $7,000(207/41.8)
= $7,000 *x* 4.95 = $34,650

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
= (nominal interest rate) – (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

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Answers

Labor force = employed + unemployed

= 145.9 + 8.5

= **154.4** million

U-rate = 100 x (unemployed)/(labor force)

= 100 x 8.5/154.4

= **5.5%**

December 2009 U-rate was 10% !!!

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Answers

Population = labor force + not in labor force

= 154.4 + 79.2

= **233.6**

LF partic. rate = 100 x (labor force)/(population)

= 100 x 154.4/233.6

= **66.1%**

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.