

# Econ 105C

## Problem Set 1: GDP and Price Indexes

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### Section 1:

1. *All* of the following are important macroeconomic variables *except*:
  - A) real GDP.
  - B) the unemployment rate.
  - C) the marginal rate of substitution.
  - D) the inflation rate.
2. The statistic used by economists to measure the value of economic output is:
  - A) the CPI.
  - B) GDP.
  - C) the GDP deflator.
  - D) the unemployment rate.
3. GDP is *all* of the following *except* the total:
  - A) expenditure of everyone in the economy.
  - B) income of everyone in the economy.
  - C) expenditure on the economy's output of goods and services.
  - D) output of the economy.
4. Economic statistics are not perfect. Explain at least one way in which each of the following statistics as currently calculated in the United States fails to completely or accurately measure the corresponding economic concept (in parentheses):
  - a. real GDP per person (economic well-being);
  - b. CPI (cost of living);
  - c. unemployment rate (involuntary unemployment).
5. Two equivalent ways to view GDP are as the:
  - A) total payments made to all workers in the economy or the total profits of all firms and businesses in the economy.
  - B) total expenditures on all goods produced in the economy or the total income earned from producing all services in the economy.

- C) total profits of all firms and businesses in the economy or the total consumption of goods and services by all households in the economy.
- D) total income of everyone in the economy or the total expenditure on the economy's output of goods and services.

6. There are a number of statistics computed to measure the price level, such as the GDP deflator and the CPI. The choice of which of these measures to use depends in many cases on the specific question in which you are interested. For each of the following situations, state whether the CPI or GDP deflator is a more appropriate measure to use and explain why the statistic is preferred.

- A) You are interested in looking at the impact of higher prices of imported oil in the overall cost of living.
- B) The government is interested in whether increases in defense spending are affecting the price level.
- C) An economic consulting firm is investigating the impact on the aggregate price level of more computers and electronic technology used in production.

7. Macroeconomics is based on microeconomics for *all* of the following reasons *except*:

- A) when we study the economy as a whole, we must consider the decisions of individual economic actors.
- B) aggregate variables are simply the sum of variables describing many individual decisions.
- C) macroeconomic decision-makers, when they make their choices, are required to maximize utility functions.
- D) to understand the determinants of aggregate investment, we must think about a firm's deciding whether to build a new factory.

8. The total income of everyone in the economy is exactly equal to the total:

- A) expenditure on the economy's output of goods and services.
- B) consumption expenditures of everyone in the economy.
- C) expenditures of all businesses in the economy.
- D) government expenditures.

9. Exhibit: Quantity Consumed and Price of Good

	Base Year	Current Year
Price of good A	100	200

Quantity of good A	100	200
Price of good B	100	100
Quantity of good B	100	100

In the exhibit, the citizens of country XYZ come to desire more of good A. As a result, the quantity and price of the good both rise.

- A) Compute nominal GDP in the base year and later year.
- B) Compute real GDP in the base and later years (in base-year prices).
- C) Compute the GDP deflator in the later year, using your answers to parts a and b.
- D) Compute a fixed-weight price index for the later year, using the base-year quantities as weights.
- E) Which price index rises faster, the GDP deflator (Paasche) index or the fixed-weight index (Laspeyres) index?

## Section 2:

1. ABC Computer Company has a \$20,000,000 factory in Silicon Valley. During the current year ABC builds \$2,000,000 worth of computer components. ABC's costs are labor, \$1,000,000; interest on debt, \$100,000; and taxes, \$200,000. ABC sells all its output to XYZ Supercomputer. Using ABC's components, XYZ builds four supercomputers at a cost of \$800,000 each (\$500,000 worth of components, \$200,000 in labor costs, and \$100,000 in taxes per computer). XYZ has a \$30,000,000 factory. XYZ sells three of the supercomputers for \$1,000,000 each; but at the end of the year, it had not sold the fourth. The unsold computer is carried on XYZ's books as an \$800,000 increase in inventory.
  - a) Calculate the contribution to GDP of these transactions using the product, income, and expenditure approaches, showing that all three approaches yield the same answer.
  - b) Repeat part (a), but now assume that in addition to its other costs, ABC also paid \$500,000 for imported computer chips.
2. For each of the following transactions, determine the contribution to the current year's GDP. Explain the effects on the product, income, and expenditure accounts.
  - a) Colonel Hogwash purchases a Civil War-era mansion for \$1,000,000. The broker's fee is 6%.
  - b) Homemaker enters the work force, taking a job that will pay \$20,000 over the year. The homemaker must pay \$8,000 over the year for professional child care services.
  - c) A Japanese manufacturer builds an auto-plant in Tennessee for \$100,000,000, using only local labor and materials.
3. The country of Econrules has produced the following quantities of novels, audio tapes, and videos, with the price of each listed in dollar terms.

	2001		2002	
	Quantity	Price	Quantity	Price
Elvis Tapes	4,000	\$20	2,000	\$15
Frank Sinatra Tapes	4,000	\$15	5,000	\$15
Bob Hope Tapes	2,000	\$30	6,000	\$20

- a) Using the fixed-weight price index, with 2001 as the base year, what are the price indices for 2001 and 2002? What is the rate of inflation using this index? What is the percentage change in real output using this index?
- b) Using the variable-weight price index, with 2001 as the base year, what are the price indices for 2001 and 2002? What is the rate of inflation using this index? What is the percentage change in real output using this index?
- c) Using the chain-weight price index, what are the price indices for 2001 and 2002? What is the rate of inflation using this index? What is the percentage change in real output using this index?