

In-class exercise 7: GDP and CPI

EC 201

Spring 2022

Q1. In the economy of Hoover, there are three producers: a bread producer, a cheese producer, and a pizza producer. Bread and cheese produced are sold both to the pizza company for inputs in the production of pizzas and to consumers as final goods. The table below summarizes the activities of the three companies.

	Bread company	Cheese company	Pizza company
Cost of inputs	\$0	\$0	\$50 (bread) 35 (cheese)
Wages	25	30	75
Value of output	100	60	200

Calculate the GDP using the three methods we learned in class.

1. Value added approach.

2. Expenditure approach.

3. Income approach.

Q2. The following table provides the annual real GDP (in billions of 2009 dollars) and nominal GDP (in billions of dollars) for the United States.

	2009	2010	2011	2012	2013	2014	2015
Real GDP (billions of 2009 dollars)	14,418.7	14,783.8	15,020.6	15,354.6	15,583.3	15,961.7	16,348.9
Nominal GDP (billions of dollars)	14,418.7	14,964.4	15,517.9	16,155.3	16,663.2	17,348.1	17,947.0

1. Calculate the GDP deflator for each year.

	2009	2010	2011	2012	2013	2014	2015
Real GDP (billions of 2009 dollars)	14,418.7	14,783.8	15,020.6	15,354.6	15,583.3	15,961.7	16,348.9
Nominal GDP (billions of dollars)	14,418.7	14,964.4	15,517.9	16,155.3	16,663.2	17,348.1	17,947.0
GDP deflator	100.0	101.2	103.3	105.2	106.9	108.7	109.8

2. Use the GDP deflator to calculate the inflation rate for all years except 2009.

	2009	2010	2011	2012	2013	2014	2015
GDP deflator	100.0	101.2	103.3	105.2	106.8	108.7	109.8
Inflation		1.2%	2.1%	1.8%	1.6%	1.6%	1.0%

3. By what percentage did Real GDP grow from 2011 to 2012? By what percentage did nominal GDP grow during the same period? What percentage of growth in nominal GDP was due to inflation between 2011 and 2012?

Q3. In 2011, consumption spending is \$8,000, government purchases of goods and services is \$1,000, and investment spending is \$2,000. If GDP for 2011 is \$10,500, net exports are

Q4. The consumer price index, or CPI, measures the cost of living for a typical urban household by multiplying the price for each category of expenditure (housing, food, and so on) times a measure of the importance of that expenditure in the average consumer's market basket and summing over all categories. However, using data from the consumer price index, we can see that changes in the cost of living for different types of consumers can vary a great deal. Let's compare the cost of living for a hypothetical retired person and a hypothetical college student. Let's assume that the market basket of a retired person is allocated in the following way: 10% on housing, 15% on food, 5% on transportation, 60% on medical care, 0% on education, and 10% on recreation. The college student's market basket is allocated as follows: 5% on housing, 15% on food, 20% on transportation, 0% on medical care, 40% on education, and 20% on recreation. The table below shows the May 2016 CPI for each of the relevant categories.

	CPI May 2016
Housing	242.8
Food	248.0
Transportation	194.6
Medical care	460.5
Education	246.9
Recreation	117.2

Calculate the overall CPI for the retired person and for the college student by multiplying the CPI for each of the categories by the relative importance of that category to the individual and then summing each of the categories. The CPI for all items in May 2016 was 239.4. How do your calculations for a CPI for the retired person and the college student compare to the overall CPI?

Exercise 5. Consider the information about the economy of Pakistan. Note that the currency of Pakistan is the rupee. Calculate Pakistan's GDP. Give your answer in terms of trillions of rupees, and round to two decimals.

- The government purchases: 2.50 trillions of rupees.
- Individuals consume: 12.00 trillions of rupees.
- Individuals save: 5.53 trillions of rupees.
- Businesses invest: 1.35 trillions of rupees.
- Foreigners spend: 0.55 trillions of rupees to purchase Pakistani firms.
- Pakistan imports: 2.64 trillions of rupees.
- Pakistan exports: 1.25 trillions of rupees.