Midterm Exam ECO1102 C-Solution

EXERCISE 1 (20 points)

1. (10pts) *Define real and nominal GDP.*

Nominal GDP is the production of goods and services valued at current prices. Real GDP is the production of goods and services valued at constant prices. Real GDP is a better measure of economic well-being because it reflects the economy's ability to satisfy people's needs and desires. Thus, a rise in real GDP means people have produced more goods and services, but a rise in nominal GDP could occur either because of increased production and/or because of higher prices.

2. (10pts) *Explain briefly what the consumer price index is trying to measure and how it is constructed.*

The consumer price index tries to measure the overall cost of the goods and services bought by a typical consumer. It is constructed by surveying consumers to fix a basket of goods and services that the typical consumer buys, finding the prices of the goods and services over time, computing the cost of the basket at different times, and then choosing a base year. To compute the price index, we divide the cost of the market basket in the current year by the cost of the market basket in the base year and multiply by 100.

EXERCISE 2 (25points)

Below are some data.

Year	Price of Milk	Quantity of Milk (litres)	Price of Honey	Quantity of Honey (litres)
2013	$100	100	$200	50
2014	100	200	200	100
2015	200	200	400	100

1. Compute nominal GDP, real GDP, and the GDP deflator for each year, using 2013 as the base year.
2. Compute the percentage change in nominal GDP, real GDP, and the GDP deflator in 2014 and 2015 from the preceding year.

Solution

1. (15pts) Calculating nominal GDP:

2013: ($100 per L of milk × 100 L milk) + ($200 per L of honey × 50 L honey) = $20000
2014: ($100 per L of milk × 200 L milk) + ($200 per L of honey × 100 L honey) = $40000
2015: ($200 per L of milk × 200 L milk) + ($400 per L of honey × 100 L honey) = $80000

Calculating real GDP (base year 2013):
2013: ($100 per L of milk × 100 L milk) + ($200 per L of honey × 50 L honey) = $20000
2014: ($100 per L of milk × 200 L milk) + ($200 per L of honey × 100 L honey) = $40000
2015: ($100 per L of milk × 200 L milk) + ($200 per L of honey × 100 L honey) = $40000

Calculating the GDP deflator:
2013: ($20000/$20000) × 100 = 100
2014: ($40000/$40000) × 100 = 100
2015: ($80000/$40000) × 100 = 200

2. (10pts) Calculating the percentage change in nominal GDP:
Percentage change in nominal GDP in 2014 = [($40000 – $20000)/$20000] × 100 = 100%.
Percentage change in nominal GDP in 2015 = [($80000 – $40000)/$40000] × 100 = 100%.

Calculating the percentage change in real GDP:
Percentage change in real GDP in 2014 = [($40000 – $20000)/$20000] × 100 = 100%.
Percentage change in real GDP in 2015 = [($40000 – $40000)/$40000] × 100 = 0%.

Calculating the percentage change in GDP deflator:
Percentage change in the GDP deflator in 2014 = [(100 – 100)/100] × 100 = 0%.
Percentage change in the GDP deflator in 2015 = [(200 – 100)/100] × 100 = 100%.

EXERCISE 3 (30points)
Consider the following data:

Year	Nominal GDP	GDP Deflator (base year 2007)
2013	$189300	110
2014	$197500	114

1. What was the growth rate of nominal GDP between 2013 and 2014? (Note: The growth rate is the percentage change from one period to the next.)
2. What was the growth rate of the GDP deflator between 2013 and 2014?
3. What was real GDP in 2013 measured in 2007 prices?
4. What was real GDP in 2014 measured in 2007 prices?
5. What was the growth rate of real GDP between 2013 and 2014?
6. Was the growth rate of nominal GDP higher or lower than the growth rate of real GDP? Explain.

Solution

1. (5pts) The growth rate of nominal GDP between 2013 and 2014 is ($197500 – $189300)/$189300 × 100% = 4.3%.

2. (5pts) The growth rate of the deflator is (114 – 110)/110 × 100% = 3.63%.

3. (5pts) Real GDP in 2013 (in 2007 dollars) is \$189300/(110/100) = \$172090.90.

4. (5pts) Real GDP in 2014 (in 2007 dollars) is \$197500/(114/100) = \$173245.60.

5. (5pts) The growth rate of real GDP is (\$173245.60– \$172090.90)/ \$172090.90× 100% = 0.67%.

6. (5pts) The growth rate of nominal GDP is greater than the growth rate of real GDP because the inflation rate was positive.

EXERCISE 4 (25points)

A small nation produce and consume karaoke machines and CDs, in the following amounts:

	Karaoke Machines		**CDs**	
	Quantity	**Price**	**Quantity**	**Price**
2014	100	\$400	300	\$100
2015	120	600	500	120

1. Using a method similar to the consumer price index, compute the percentage change in the overall price level. Use 2014 as the base year, and fix the basket at 1 karaoke machine and 3 CDs.
2. Using a method similar to the GDP deflator, compute the percentage change of the overall price level. Also use 2014 as the base year.
3. Is the inflation rate in 2015 the same using the two methods? Explain why or why not.

Solution

1.(10pts) The expenditures on the consumption basket in the two years are:
2014: Expenditure = 1 × \$400 + 3 × \$100 = \$700; CPI = 100
2015: Expenditure = 1 × \$600 + 3 × \$120 = \$960; CPI = 960/700 × 100 = 137.1
The inflation rate is 37.1 percent.

2. (10pts) 2014: GDP = 100 × \$400 + 300 × \$100 = \$70000; GDP deflator = 100
2015: Nominal GDP = 120 × \$600 + 500 × \$120 = \$132000;
Real GDP = 120 × \$400 + 500 × \$100 = \$98000;
GDP deflator = 132000/98000 × 100 = 134.69
Inflation rate = 34.69 percent.

3. (5pts) The inflation rates calculated in the two different ways are different because one is based on a consumption basket, while the other is on the GDP deflator. The weights in which each price enters the two price indexes (CPI and GDP deflator) are different.