Eco202, Prof. Bill Even
Chapter 5 questions.

The Consumer Price Index, Inflation, and Real versus Nominal Variables.

Suppose that there are three goods in the economy: gasoline, housing, and food. The prices of each are listed below for three different years. The typical consumer is assumed to purchase a "bundle" that contains 20 gallons of gas, 1 unit of housing, and 30 units of food.

<table>
<thead>
<tr>
<th>Year</th>
<th>Price of a gallon of gas</th>
<th>Price of a unit of housing</th>
<th>Price of a unit of food</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>$1</td>
<td>$300</td>
<td>$2</td>
</tr>
<tr>
<td>1989</td>
<td>$1</td>
<td>$350</td>
<td>$3</td>
</tr>
<tr>
<td>1990</td>
<td>$2</td>
<td>$400</td>
<td>$3</td>
</tr>
</tbody>
</table>

1. Using 1980 as the base year, compute the consumer price index for:
   a. 1980__________ 
   b. 1989__________ 
   c. 1990__________ 

2. What is the inflation rate between 1989 and 1990? ________

3. Suppose that "the bundle" contained more gasoline but the same amount of housing and food. Would the inflation rate computed between 1989 and 1990 be higher or lower? Why?

4. On the basis of the wages rate listed below and the price indexes you computed above, what are the real wage rates (in 1980 dollars)?

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Wage rate</th>
<th>Real Wage Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>$10</td>
<td>___</td>
</tr>
<tr>
<td>1989</td>
<td>$12</td>
<td>___</td>
</tr>
<tr>
<td>1990</td>
<td>$14</td>
<td>___</td>
</tr>
</tbody>
</table>

5. If the real wage rate for 1990 (in 1980 dollars) is $10, on the basis of the price indexes you computed above, what would the nominal wage in 1990 have to be?

6. How could the nominal wage rate rise but the real wage rate fall over time?

7. How could the real wage rate rise but the nominal wage rate fall over time?

Real versus Nominal GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal GDP (in billions)</th>
<th>Real GDP (in billions)</th>
<th>P-Deflator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>513.4</td>
<td>1973.2</td>
<td>___</td>
</tr>
<tr>
<td>1970</td>
<td>1010.7</td>
<td>2875.8</td>
<td>___</td>
</tr>
<tr>
<td>1980</td>
<td>2708.0</td>
<td>3776.3</td>
<td>___</td>
</tr>
<tr>
<td>1987</td>
<td>4540.0</td>
<td>4540.0</td>
<td>___</td>
</tr>
<tr>
<td>1990</td>
<td>5513.8</td>
<td>4884.9</td>
<td>___</td>
</tr>
<tr>
<td>1991</td>
<td>5671.8</td>
<td>4848.4</td>
<td>___</td>
</tr>
</tbody>
</table>

8. Compute the GDP price deflators for each of the above years.

9. What is the base year that must have been used for computing real GDP? How can you tell?

10. According to the available information,
   a. what was the inflation rate between 1990 and 1991?
   b. what was the average annual inflation rate between 1960 and 1990?
   c. On average, how much higher are prices in 1990 than in 1960?
Measuring GNP/GDP

11. What is the difference between GNP and GDP?

12. What are the four components of the expenditure side of GNP?

13. Why is it difficult to make a comparison of two countries' standards of living on the basis of their per capita GNP?

14. When comparing GDP over time to determine how production has changed, should the comparison be based upon real or nominal GDP? Why?

Applying and estimating growth rates.

15. Suppose that you put $100 in the bank today and it earns 6% interest for 20 years. What will your balance at the end of the 20 years be (assume interest compounds).

16. If you can earn 8 percent interest, how much would you have to deposit in the bank today to cover a $1000 bill due 10 years from now?

17. If you invested $1000 in a mutual fund in 1990, reinvested all the dividends since then, and now have an account balance of $1800, what was your average annual rate of return?

Answers

1a. 100; 1b. 121; 1c. 139
2. 14.9%
3. The inflation rate would be higher because the inflation rate for gasoline is higher than that for food or housing. Hence, increasing the "weight" on gasoline would cause the "weighted average" of inflation rates to increase.
5. $13.90
6. Since the real wage equals the nominal wage divided by the price level, the percentage change in the real wage between two periods equals the percentage change in the nominal wage minus the percentage change in the price level. Hence, if prices increase more than nominal wages in percentage terms, the real wage will drop.
7. The only way that the real wage could rise as the nominal wage falls is if prices fall over time (i.e. there is negative inflation). This can be seen using the relationship described in #6.
9. 1987 is the base year because the deflator is 100 for that year.
10a. 3.6%
10b. 4.2 percent using formula from book; 5.0% using \((112.9/26)^{1/30}-1\).
10c. 4.3 times higher as demonstrated by the ratio of the 1990 to the 1960 GDP deflator.
11. GDP includes production by domestically located factors of production whereas GNP includes production by domestically owned factors.
12. Consumption (C), Investment (I), Government Spending (G) and Net Exports (NX).
13. Several reasons: Differences in the value of home production (do-it-yourself work), differences in the size of the underground economy, differences in things valued but not sold in the market (environment, safety, etc.).
14. When comparing GNP over time, the comparison should be made on real, not nominal, terms. The reason is that changes in real GNP reflect changes in only the amount of goods and services produced. Changes in nominal GNP can reflect either changes in prices or the amount produced.
15. $320.71
16. $463.19
17. 6.05%