Chapter 23: Measuring the Cost of Living

[Chapter 11: Measuring the Cost of Living]

Questions for Review: Answers

1. A 10 percent increase in the price of chicken has a greater effect on the consumer price index than a 10 percent increase in the price of caviar because chicken is a bigger part of the average consumer's market basket.

2. The three problems in the consumer price index as a measure of the cost of living are: (1) substitution bias, which arises because people substitute toward goods that have become relatively less expensive; (2) the introduction of new goods, which are not reflected quickly in the CPI; and (3) unmeasured quality change.

3. If the price of a Navy submarine rises, there is no effect on the consumer price index, since Navy submarines aren't consumer goods. But the GDP price index is affected, since Navy submarines are included in GDP.

4. Since the overall price level doubled, but the price of the candy bar rose sixfold, the real price (the price adjusted for inflation) of the candy bar tripled.

5. The nominal interest rate is the rate of interest paid on a loan in dollar terms. The real interest rate is the rate of interest corrected for inflation. The real interest rate is the nominal interest rate minus the rate of inflation.

Problems and Applications: Answers

1. a. The price of tennis balls increases 0%; the price of tennis racquets increases 50% [=($60-$40)/$40 x 100%]; the price of Gatorade increases 100% [= ($2 - $1)/$1 x 100%].

   To find the percentage change in the overall price level, follow these steps:

   1. Determine the fixed basket of goods: 100 balls, 10 racquets, 200 Gatorades

   2. Find the price of each good in each year:

Year	balls	racquets	Gatorade
1998	$2	$40	$1
1999	$2	$60	$2

3. Compute the cost of the basket of goods in each year:
1998: (100 x $2) + (10 x $40) + (200 x $1) = $800
1999: (100 x $2) + (10 x $60) + (200 x $2) = $1,200

4. Choose one year as a base year (1998) and compute the CPI in each year:
1998: $800/$800 x 100 = 100
1999: $1,000/$800 x 100 = 150

5. Use the CPI to compute the inflation rate from the previous year:
1999: (150 - 100)/100 x 100% = 50%

b. Tennis racquets are less expensive relative to Gatorade, since their price rose 50% while the price of Gatorade rose 100%. The well-being of some people changes relative to the well-being of others. Those who purchase a lot of Gatorade become worse off relative to those who purchase a lot of tennis racquets or tennis balls.

2. To find the percentage change in the overall price level, follow these steps:

a. Determine the fixed basket of goods: 100 heads of cauliflower, 50 bunches of broccoli, 500 carrots

b. Find the price of each good in each year:

Year	cauliflower	broccoli	carrots
1998	$2	$1.50	$.10
1999	$3	$1.50	$.20

c. Compute the cost of the basket of goods in each year:
1998: (100 x $2) + (50 x $1.50) + (500 x $.10) = $325
1999: (100 x $3) + (50 x $1.50) + (500 x $.20) = $475

d. Choose one year as a base year (1998) and compute the CPI in each year:
1998: $325/$325 x 100 = 100
1999: $475/$325 x 100 = 146

e. Use the CPI to compute the inflation rate from the previous year:
1999: (146-100)/100 x 100% = 46%

3. Since the CPI rose 637%, that means [CPI(1997)-CPI(1947)]/CPI(1947) x 100% = 637%, so CPI(1997)/CPI(1947) -1 = 6.37, so CPI(1997)/CPI(1947) = 7.37. So if an item costs under 7.37 times as much in 1997 than it did in 1947, then it's relatively less expensive.

The easiest way to see this is to take the 1947 price, multiply it by 7.37, and compare it to the 1997 price.

University of Iowa tuition: \$130 x 7.37 = \$958 < \$2,470, so the 1997 cost is higher
gallon of gasoline: \$0.23 x 7.37 = \$1.70 > \$1.22, so the 1997 cost is lower
phone call: \$2.50 x 7.37 = \$18.42 > \$0.45, so the 1997 cost is lower
day in hospital: \$35 x 7.37 = \$258 < \$2,300, so the 1997 cost is higher
hamburger: \$0.15 x 7.37 = \$1.11 > \$0.59, so the 1997 cost is lower

4. a. Since the increase in cost was considered a quality improvement, there was no increase registered in the CPI.

   b. The argument in favor of this is that consumers are getting a better good than before, so the price increase equals the improvement in quality. The problem is that the increased cost might exceed the value of the improvement in air quality, so consumers are worse off. In this case, it would be better for the CPI to at least partially reflect the higher cost.

5. a. introduction of new goods; b. unmeasured quality change; c. substitution bias; d. unmeasured quality change; e. substitution bias

6. a. (40¢ - 15¢)/15¢ x 100% = 167%.

   b. (\$10.82 - \$3.35)/\$3.35 x 100% = 223%.

   c. In 1970: \$.15/(\$3.35/60) = 2.7 minutes. In 1990: \$.40/(\$10.82/60) = 2.2 minutes.

   d. Workers' purchasing power rose in terms of newspapers.

7. a. If the elderly consume the same market basket as other people, Social Security would provide the elderly with an improvement in their standard of living each year because the CPI overstates inflation and Social Security payments are tied to the CPI.

   b. Since the elderly consume more health care than younger people, and since health care costs have risen faster than overall inflation, it's possible that the elderly are worse off. To investigate this, you'd need to put together a market basket for the elderly, which would have a higher weight on health care. You'd then compare the rise in the cost of the "elderly" basket with that of the general basket for CPI.

8. a. When inflation is higher than was expected, the real interest rate is lower than expected. For example, suppose the market equilibrium has an expected real interest rate of 3% and people expect inflation to be 4%, so the nominal interest rate is 7%. If inflation turns out to be 5%, the real interest rate is 7% minus 5% equals 2%.

   b. Since the real interest rate is lower than was expected, the lender loses and the borrower gains.

   c. Homeowners in the 1970s who had fixed-rate mortgages from the 1960s benefited from the unexpected inflation, while the banks who made the mortgage loans lost a lot of money.

9. a. With a nominal interest rate of 3% and inflation of 0%, the real interest rate is 3% - 0% = 3%. The after-tax real interest rate is [3% - (3% x .33)] - 0% = 2%. The effective tax rate on real interest income is (3% - 2%)/3% x 100% = 33%.

   b. With a nominal interest rate of 6% and inflation of 3%, the real interest rate is 6% - 3% = 3%. The after-tax real interest rate is [6% - (6% x .33)] - 3% = 1%. The effective tax rate on real interest income is (3% - 1%)/3% x 100% = 67%.

   c. Inflation discourages saving by interacting with the tax system to increase the tax rate on interest income.

10. When bracket creep occurred, inflation increased people's nominal incomes, pushing them into higher tax brackets, so they had to pay a higher proportion of their incomes in taxes, even though they weren't getting higher *real* incomes. As a result, real tax revenue rose.