Liberty High School

AP Macroeconomics

Mr. Lopez

Chapter 24 study Guide

Measuring the Cost of Living

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_

Part 1 – Key terms

1. Consumer price index:
2. Inflation rate:
3. Basket (of goods and services):
4. Bureau of Labor Statistics:
5. Producer price index:
6. Cost of living:
7. Standard of living:
8. Substitution base:
9. Indexed contract:
10. Cost of living allowance (COLA):
11. Nominal interest rate:
12. Real interest rate:

Part 2 – Problems and Short Answers:

1. The following table shows the prices and the quantities consumed in the country known as the University States. Suppose the base year is 2011. Also suppose that 2011 is the year the typical consumption basket was determined, so the quantities consumed during 2011 are the only quantities required to calculate the CPI in every year.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Price of Books** | **Quantity of Books** | **Price of Pencils** | **Quantity of Pencils** | **Price of Pens** | **Quantity of Pens** |
| 2011 | $50 | 10 | $1.00 | 100 | $5.00 | 100 |
| 2012 | 50 | 12 | 1.00 | 200 | 10.00 | 50 |
| 2013 | 60 | 12 | 1.50 | 250 | 20.00 | 20 |

1. What is the value of the CPI in 2011?
2. What is the value of CPI in 2012?
3. What is the value of CPI in 2013?
4. What is the inflation rate in 2012?
5. What is the inflation rate in 2013?
6. What type of bias do you observe in the CPI and corresponding inflation rates you generated above?
7. If you had a COLA clause in your wage contract based on the CPI calculated above, would your standard of living likely increase, decrease, or stay the same during the years 2011 to 2013? Why?
8. Again, suppose you had a COLA clause in your wage contract based on the CPI calculated above. If you personally only consume pens (no paper or pencils) would your standard of living likely increase, decrease, or stay the same during the years 2011 to 2013? Why?
9. The following table contains the CPI and the Federal Minimum Hourly Wage Rates for the period 1965 through 2012

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **CPI** | **Min Wage** | **Year** | **CPI** | **Min Wage** | **Year** | **CPI** | **Min wage** |
| 1965 | 31.5 | $1.25 | 1981 | 90.9 | $3.35 | 1997 | 160.5 | $5.15 |
| 1966 | 32.4 | 1.25 | 1982 | 96.5 | 3.35 | 1998 | 163 | 5/15 |
| 1967 | 33.4 | 1.40 | 1983 | 99.6 | 3.35 | 1999 | 166.6 | 5.15 |
| 1968 | 34.8 | 1.60 | 1984 | 103.9 | 3.35 | 2000 | 172.2 | 5.15 |
| 1969 | 36.7 | 1.60 | 1985 | 107.6 | 3.35 | 2001 | 177 | 5.15 |
| 1970 | 38.8 | 1.60 | 1986 | 109.6 | 3.35 | 2002 | 179.9 | 5.15 |
| 1971 | 40.5 | 1.60 | 1987 | 113.6 | 3.35 | 2003 | 184 | 5.15 |
| 1972 | 41.8 | 1.60 | 1988 | 118.3 | 3.35 | 2004 | 188.9 | 51.5 |
| 1973 | 44.4 | 1.60 | 1989 | 124 | 3.35 | 2005 | 195.3 | 5.15 |
| 1974 | 49.3 | 2.00 | 1990 | 130.7 | 3.80 | 2006 | 201.6 | 5.15 |
| 1975 | 53.8 | 2.10 | 1991 | 136.2 | 4.25 | 2007 | 207.3 | 5.85 |
| 1976 | 56.9 | 2.30 | 1992 | 140.3 | 4.25 | 2008 | 215.3 | 6.55 |
| 1977 | 60.6 | 2.30 | 1993 | 144.5 | 4.25 | 2009 | 214.5 | 7.25 |
| 1978 | 65.2 | 2.65 | 1994 | 148.2 | 4.25 | 2010 | 218.1 | 5.25 |
| 1979 | 72.6 | 2.90 | 1995 | 152.4 | 4.25 | 2011 | 224.9 | 7.25 |
| 1980 | 82.4 | 3.10 | 1996 | 156.9 | 4.75 | 2012 | 229.6 | 7.25 |

1. Inflate the 1965 minimum wage to its equivalent value measured in 2012 prices.
2. What happened to the standard of living of minimum wage workers over this forty seven year period?
3. Deflate the 2012 minimum wage to its equivalent value measured in 1965 prices?
4. Do these two methods give you consistent results with regards to the standard of living of minimum wage workers over time?
5. The minimum wage did not change over the eight year period from 1981 to 1989. By what percentage did the purchasing power of the minimum wage decline over this period? (Hint: inflate the value of the minimum wage in 1981 to its equivalent in 1989. Then generate the percentage change)
6. What happened to the standard of living of minimum wage workers over the period from 1990 to 2000? (Inflate the 1990 minimum wage and compare it to the 2000 minimum wage).
7. Suppose that you lend your roommate $100 for one year at 9% nominal interest.
   1. How many dollars of interest will your roommate pay you at the end of the year?
   2. Suppose at the time you both agree to the terms of the loan, you both expected the inflation rate to be 5% during the year of the loan. What do you both expect the real interest rate to be on the loan?
   3. Suppose at the end of the year, you are surprised to discover that the actual inflation rate over the year was 8%. What is the actual real interest rate generated by this loan?
   4. In the case described above, actual inflation turned out to be higher than expected. Which of the two of you had the unexpected gain or loss. Your roommate (the borrower) or you (the lender)?
   5. What would the real interest rate on the loan have been if the actual interest rate had turned out to be 11 percent?
   6. Explain what it means to have a negative real interest rate?
8. What does the consumer price index attempt to measure?
9. What are the steps that one must go through in order to construct a consumer price index?
10. Which would have a greater impact on the CPI, a 20% increase in the price of Rolex watches or a 20% increase in the price of new cars? Why?
11. Suppose there is an increase in the price of imported BMW automobiles (which are produced in Germany). Would this have a larger impact on the CPI index or the GDP deflator? Why?
12. If the Bureau of Labor Statistics failed to recognize the increase in memory, power, and speed, of newer model computers, in which direction would the CPI be biased? What do we call this type of bias?
13. From 1978 to 1979, minimum wage increased 25 cents. Did minimum wage workers see an increase in their standard of living? (Use the information in the table above for reference)
14. What does the real interest rate measure?
15. Suppose you lend money to your sister at a nominal rate of 10% because you both expect the inflation rate to be 6%. Furthermore, suppose that after the loan was repaid, you discover that the actual inflation rate over the life of the loan was only 2%. Who gained at the other’s expense, you or your sister and why?
16. Paying close attention to the question immediately above, make a general statement with regards to who gains or loses borrower or lender) on a loan contract when inflation turns out to be higher or lower than expected?
17. If workers and firms negotiate a wage increase based on their expectations of inflation, who gains or loses (the workers or the firm) if actual inflation turns out to be higher than expected? Why?

Part 3 – True or false

1. \_\_\_\_\_\_\_An increase in the price of imported cameras is captured by the CPI but not the GDP deflator.
2. \_\_\_\_\_\_\_An increase in the price of helicopters purchased by the U.S. military is captured by the CPI.
3. \_\_\_\_\_\_\_Because an increase in gasoline prices causes consumers to ride their bikes more and drive their cars less, the CPI tends to underestimate the cost of living.
4. \_\_\_\_\_\_\_\_An increase in the price of diamonds will have a greater impact on the CPI than an equal percentage increase in the price of food because diamonds are much more expensive.
5. \_\_\_\_\_\_\_The “base year” in a price index is the benchmark year against which other years are compared.
6. \_\_\_\_\_\_\_If the CPI rises at 5% per year, then every individual in the country needs exactly a 5% increase in their incomes for their standard of living to remain constant.
7. \_\_\_\_\_\_\_ The producer price index (PPI) is constructed to measure the change in price of total production.
8. \_\_\_\_\_\_\_If the Bureau of Labor statistics fails to recognize that recently produced automobiles can be driven for many more miles than older models, then the CPI tends to overestimate the cost of living.
9. \_\_\_\_\_\_\_If your wage increases from $5.00 to $6.25 while the CPI rises from 112 to 121 you should feel an increase in your standard of living.
10. \_\_\_\_\_\_\_The largest category of goods and services in the CPI is medical care.
11. \_\_\_\_\_\_\_It is impossible for real interest rates to be negative.
12. \_\_\_\_\_\_\_If the nominal interest rate is 12% and the rate of inflation is 7%, then the real interest rate is 7%
13. \_\_\_\_\_\_\_If lenders demand a real rate of return of 4% and they expect inflation to be 5%, then they should charge 9% interest when they extend loans.
14. \_\_\_\_\_\_\_\_If borrowers and lenders agree on a nominal interest rate and inflation turns out to be greater than they had anticipated, lenders will gain at the expense of borrowers.
15. \_\_\_\_\_\_\_If workers and firms agree on an increase in wages based on their expectations of inflation and inflation turns out to be less than they expected, workers will gain at the expense of firms.

Part 4 – Additional Critical Thinking

1. Your grandfather quit smoking cigarettes in 1995. When you ask him why he quit, you get a surprising answer. Instead of reciting the health benefits of quitting smoking, he says , “I quit because it was getting just too expensive. I started smoking in 1965 in Vietnam and cigarettes were only 45 cents a pack. The last pack I bought was $2.00, and I just couldn’t justify spending more than four times as much on cigarettes as U used to.”
   1. In 1965 the CPI was 31.5. In 1995 the CPI was 152.4. While it is commendable that your grandfather quit smoking, what is wrong with his explanation?
   2. What is the equivalent cost of a 1965 pack of cigarettes measured in 1995 prices?
   3. What is the cost of a 1995 pack of cigarettes measured in 1965 prices?
   4. Do both methods give you the same conclusion?
   5. The preceding example demonstrates what economists refer to as “money illusion”. Why do you think economists might choose the phrase “money illusion” to describe their behavior?