

Handout Week 8

1. **Substitutes.** In class, we discussed one problem with CPI: that people substitute to other goods when the price of one good rises. So CPI overstates the rate of inflation. With that in mind:

There are two goods in an economy, X and Y . Everybody in the economy has preferences given by: $U = \sqrt{XY}$ and income W . Fix the price of X at 1 (X is dollars). When people have preferences like this, they want to spend half of their money on X and the other half on Y .

Say that we want to measure inflation as the minimum amount of income a consumer must have to get utility 16.

- Why would this measure be robust to the substitution problem?
 - If P is the price of Y and $P = 1$, how much income do we need to get utility 16? What is the bundle of goods that a consumer with this income consumes? Fix this as the CPI market basket.
 - If $P = 4$, how much income do we need?
 - Using the bundle in part (b), compute the rate of inflation that the CPI would give going from part (b) to part (c).
 - Compute the rate of inflation using the percentage change in the income required to get utility 16.
2. **Real, Nominal Baseball.** Say, we are interested in comparing the value of the payroll of the New York Mets and the San Diego Padres (American baseball teams) over time. [The CPI and GDP numbers are made up; the baseball numbers are real]

Team	Year	Payroll	Wins	CPI	Nominal GDP	Real GDP
Padres	2013	67 million	76	100	10 trillion	10 trillion
	2012	55 million	76	80	8 trillion	10 trillion
Mets	2013	73 million	74	100	10 trillion	10 trillion
	2012	93 million	74	80	8 trillion	10 trillion

[Fun fact: in Major League Baseball, there are 162 games in a season. There were four teams with exactly the same number of wins in both 2012 and 2013, including the Padres and Mets. The other two were the Minnesota Twins and the Arizona Diamondbacks.]

- What is the GDP deflator if we use the same base year as is used in CPI?

- (b) Calculate the approximate value of the payrolls in base-year dollars using the GDP deflator? The CPI?
 - (c) What is the rate of inflation from 2012 to 2013 using the CPI? Using the GDP deflator? What is the inflation rate if you switch the base year for the GDP deflator?
 - (d) One of the difficulties with understanding aggregate measures of inflation is that prices do not all rise at the same rate. Say you are a baseball executive and you want a price index that more accurately reflects your interests: say, the WIN index, which is an index of the total amount paid per win in a given year. What is the value of this index in 2013 if the base year is 2012? What is the rate of inflation according to this measure?
3. **Inflation.** Every year, a farmer needs to borrow one million dollars to plant his crops, and he pays this loan back later in the year after he has sold the crop at market.
- (a) The farmer borrows money at a 5% interest rate. At the end of the first year, when the farmer must pay back his loan, there is unanticipated inflation of 10%. Who benefits? Assume zero inflation was expected. What is the effective interest rate the farmer actually pays?
 - (b) It's time to plant again the next year. Will the two parties agree to the same interest rate? Give one reason why they might keep the interest rate the same and another why they might change it.
 - (c) Consider the demand curve for loans. If borrowers expect inflation to be high next year, does the demand for loans shift to the left or to the right? What about supply? If lenders expect high inflation what happens to the supply curve?
 - (d) Say the farmer believes that the lenders are far more likely to know what inflation is going to be than he is, so he'd like to know what they expect inflation to be. If he sees the lenders offering a nominal interest rate of 5%, what should he believe about the lender's beliefs about inflation?
 - (e) Say the market for loans is perfectly competitive. If demand for loans is given by $P = 9 - Q_d$ and supply by $P = 2Q_s$. What is the marginal lender's beliefs about what inflation will be?
 - (f) Consider an economy of fortune tellers who can see the future perfectly. Does inflation matter? In other words: should the fortune teller economy try to control inflation?