

## LECTURE 15: INFLATION

- I. Why inflation matters
  - a. What is money good for?
    - i. Money isn't what's valuable; it's the stuff you can buy with it.
    - ii. If I double your income but I triple all prices, you will be made worse off.
    - iii. We thus need to consider *inflation*—or the tendency of the price of goods to rise. (*Deflation*—when the price level tends to fall—is also possible.)
  - b. Since inflation tends to make things more expensive, governments and companies adjust for it.
    - i. Social Security has a cost of living adjustment (COLA). If there's a lot of inflation, Social Security payments will increase to compensate.
    - ii. Employers will often increase wages to adjust for inflation (otherwise, employees are effectively getting pay cuts). Employers don't necessarily mind these adjustments because the price level is increasing, including the price they sell at.
  - c. The *nominal* value isn't adjusted for inflation. The *real* value is adjusted for inflation.
    - i. *Nominal* values are useful because they are what's reported by default and require no additional calculation. Because inflation tends to be small, there's no need to adjust for it if you're comparing prices today with prices or incomes last year.
    - ii. *Real* values are useful because they let you compare prices and incomes across a long span of time. If you want to know if a gallon of milk is cheaper now versus 100 years ago, you'll want to adjust for inflation. (It's cheaper now: \$4.67 in 1919 and \$3.49 in 2012.)<sup>1</sup> We use it a lot to adjust GDP so we can compare values over time.
  - d. Other indications of adjusting for inflation are phrases like “in today's dollars” or “in 2010 dollars.”

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<sup>1</sup> <http://historicaltextarchive.com/sections.php?action=read&artid=418;>  
[http://data.bls.gov/images/buttons/download\\_button\\_xls.gif](http://data.bls.gov/images/buttons/download_button_xls.gif)

## II. Consumer Price Index (CPI)

- a. To determine how much prices change from year to year, the government must figure out what these prices are.
- b. But there are millions of goods bought and sold every day; that's a lot of prices to keep track of!
- c. So the good folks at the Bureau of Labor Statistics (BLS) ask Americans what kind of goods they buy and construct a "basket" of just some of them. It's still a lot of goods (over 200 categories in 38 geographic areas) but by tracking this basket they can construct a pretty good Consumer Price Index, which forms the basis of determining inflation.<sup>2</sup>
- d. The goal in constructing the basket is to have a wide variety of goods, a variety that accurately captures what consumers buy, but not put undo focus on any particular good.
  - i. Why? Because inflation is the *general* price level and you don't want any industry-specific good to have too much influence.
  - ii. This is why we have *core inflation*, or inflation after ignoring the prices of energy and food. These prices are particularly volatile. Including them could indicate inflation is much more or less rampant than it is.
- e. CPI works off of a base year which is set at 100. Inflation is calculated in the same way as GDP growth.
  - i. For example, if the CPI is 131, then there's been 31% inflation since the base year:  $(131 - 100)/100$ .
  - ii. If CPI is 246 and was 240 the year before, then there's been 2.5% inflation in the past year:  $(246 - 240)/240$ .

## III. Other measures

- a. Note that the CPI is not the only way to adjust for inflation. The Producer Price Index (PPI) does the same thing but examines the stuff producers, rather than consumers, buy.
- b. The GDP deflator examines all final goods and services and does not rely on a fixed "basket." Of the three, the GDP deflator is broadest but CPI is probably more well-known.

## IV. Quality

- a. Imagine I give you \$5,000 and a choice: spend it now or spend it a hundred years ago (no investments; only buy consumer products). Which would you choose?

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<sup>2</sup> Here's a list of some items in that basket: <http://www.businessinsider.com/breakdown-of-consumer-price-index-basket-2014-1>

- i. If you choose now, why? Prices are lower, much lower, in the past. You should choose the old products, right?
    - ii. But, clearly, something besides the price matters and that changes everything.
  - b. The CPI, and other measures, keeps quantity constant. If you spend more on bananas, that doesn't mean the price of bananas went up. You could have just bought more bananas.
  - c. This is pretty easy thing to do. But it's much harder to keep quality constant. And this is a big weakness of measuring inflation.
    - i. Many products that we enjoy weren't available twenty, fifty, or a hundred years ago. Their prices were effectively infinite.
    - ii. Other products have gotten a lot better; a laptop now and a laptop five years ago might have the same price but clearly you'd prefer the more current laptop. The price, adjusted for quality, has fallen.
  - d. So while adjusting for inflation is a good idea, it's not everything. Claims that wages have stagnated, for example, don't tell the full story even if they adjust for inflation. Life now is, in general, much better than it was in the 1970s.
- V. Why inflation really matters
  - a. When inflation is anticipated, we can adjust a rate (such as inflation or growth rate) to compensate. We thus have the *real* rate, or the interest rate adjusted for inflation:

$$\text{real rate} = \text{nominal rate} - \text{inflation rate}$$

- i. Note this is a simple way to adjust for inflation; there is a more complex, but more accurate way, to adjust.<sup>3</sup>
    - ii. Okay since other people keep track of inflation and can adjust for it, so it doesn't really matter. Right?
  - b. Wrong. Yes, at some level the market makes inflation immaterial; if you double all prices and you double all wages, there should be no change. So what if inflation's high? It typically doesn't matter much if the inflation's foreseen but unanticipated inflation can cause real problems for...
    - i. Fixed-income receivers. Sometimes their income is adjusted for inflation, but it takes time to calculate. If inflation's unexpectedly high, it can create a real problem.

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<sup>3</sup> The actual equation is:  $(1 + \text{nominal rate}) / (1 + \text{inflation rate}) - 1 = \text{real rate}$ .

- ii. Savers. If unanticipated, the interest you receive will be less than the inflation. Even if you're gaining more money in nominal terms, you'll losing it in real terms.
    - iii. Creditors. Unanticipated inflation harms those who lend money out for similar reasons as it harms savers.
  - c. "Unanticipated" means whatever's different from the anticipated inflation rate.
    - i. If inflation is expected to be 4% but it's really 5%, then savers, etc. are worse off because their real interest rate is lower than it should be ("should" determined by the market rate).
    - ii. If inflation is expected to be 4% but it's really 3%, then savers, etc. are better off because their real interest rate is higher than it should be ("should" determined by the market rate).
  - d. Lots of unanticipated inflation deters saving, which creates problems for long-term economic growth. It does, however, encourage spending (since you can either invest/save your money or spend it) which is good for short-term economic growth.
  - e. What's bad for savers is good for borrowers. If you have a lot of student loans, pray for unexpected inflation because it will be easier to earn more and thus easier to pay back your bank.
  - f. All these problems become disastrous under *hyperinflation*—when the price level grows really fast. So fast, what prices should be become difficult to determine.
    - i. In Germany after WWI, prices would rise so fast, customers sometimes had to pay twice as much when they paid the bill compared to when they ordered their food.
    - ii. In 2008, Zimbabwe's inflation was about 14.9 *billion* percent.
- VI. What causes inflation?
- a. An inflation game
  - b. The most common cause is an increase in the money supply. We call this *demand-pull* inflation: when too much money chases too few goods. Consider the following equation:

$$Mv = p_L Y_R$$

- i. Where M is the money supply;
- ii. And v is the velocity of money (how often money changes hands);
- iii. And  $p_L$  is the price level;
- iv. And  $Y_R$  is real GDP.

- c. If you increase the money supply, either you have to be buying and selling more things ( $Y_R$ ) or you have more inflation. This is also known as the quantity theory of money.
  - i. This theory also illustrates why deflation is particularly nasty.
  - ii. If people expect prices to fall, they won't buy anything (because they want to wait until later, when prices are lower).
  - iii. In addition, people are getting paid less (because prices are lower), which is a reduction in GDP.
  - iv. Both effects put downward pressure on velocity, which puts *more* downward pressure on the price level.
  - v. Because deflation is so nasty, countries prefer to have a little inflation (about 2%). Deflation is very hard to get out of.
- d. *Cost-push* inflation comes from when a fundamental good, one that is an input with many other goods, increases in price. That price translates into higher costs for many other goods which push their prices up as well. It is a rarer form of inflation.
  - i. In 1973, OPEC cut production to beef up gas prices, quadrupling the price of oil. Since oil is so important to the economy, this price hike led to inflation.
  - ii. This scenario is unlikely to happen in the foreseeable future because (a) no single organization has this sort of influence on the price of oil anymore and (b) alternative energy is more common now so oil's role in the economy is diminished.
  - iii. Cost-push inflation is controversial. Some economists argue instances such as the 1970s inflation was actually caused by a corresponding increase in the money supply. If money spent on one area goes up and the money supply isn't increasing, then money spent on other areas should go down.