

ECON1002 Intro. Macro.

Week 3 Tutorial

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1. Early Feedback Task

- Thursday 6pm (5%)

1.1. Review Questions

- Concept check 3.2 & 3.3
- Example 3.2
- Example 3.4
- Example 3.5

2. Practice Problems

1. A typical consumer's food basket in the base year 2000 is as follows:

30 chickens at \$3 each

10 hams at \$6 each

10 steaks at \$8 each

A chicken feed shortage causes the price of chickens to rise to \$5 each in the year 2001.

Hams rise to \$7 each, and the price of steaks is unchanged.

- a. Calculate the change in the 'cost-of-eating' index between 2000 and 2001.

'Cost-of-eating' index measures a basket of foods that is thought to be representative to 'cost-of-eating', which is listed above.

In 2000, the basket costs $30 \times \$3 + 10 \times \$6 + 10 \times \$8 = \230

In 2007, the basket costs $30 \times \$5 + 10 \times \$7 + 10 \times \$8 = \300

$$\Delta CoE_{2001} = \frac{CoE_{2001} - CoE_{2000}}{CoE_{2000}} = \frac{300 - 230}{230} = 30.4 \%$$

- b. Suppose that consumers are completely indifferent between 2 chickens and 1 ham. For this example, how large is the substitution bias in the official 'cost-of-eating' index?

Substitution bias = consumers change their basket of goods when a price increase hits, but what measured by the original index has not changed. Meaning now the index has overstate the effect of inflation.

Consumer in this case can exchange 2 chickens with 1 ham, i.e. utility not changing if a consumer consumes 1 more ham but 2 less chicken. And because 1 ham is cheaper than 2 chickens after price change, consumers will always consume 1 more ham rather than 2 more chicken.

In this case, consumers will consume 15 hams and 10 steaks, then the cost of the bracket is $15 \times \$7 + 10 \times \$8 = \$255$. Thus, the change in 'cost-of-eating' index without substitution bias is

$$\Delta CoE'_{2001} = \frac{CoE'_{2001} - CoE_{2000}}{CoE_{2000}} = \frac{255 - 230}{230} = 10.87 \%$$

$$\text{Substitution Bias} = \Delta CoE_{2001} - \Delta CoE'_{2001} = 30.4\% - 10.87\% = 19.53 \%$$

2. A typical family's expenditures each month are as follows:

20 pizzas at \$10 each

Rent of apartment, \$600 per month

Petrol and car maintenance, \$100

Phone service (basic service + 10 long distance calls), \$50.

In the following year, the price of pizzas have risen to \$11 each, apartment rent is \$640, petrol and maintenance has risen to \$120, and phone service has dropped in price to \$40

- a. Find the CPI in the subsequent year and the rate of inflation between the base year and the subsequent year.

Again, CPI measures the cost of a basket of goods that contains goods and services that are considered essential.

$$CPI_{base} = \$10 * 20 + \$600 + \$100 + \$50 = \$950$$

$$CPI_{new} = \$11 * 20 + \$640 + \$120 + \$40 = \$1020$$

$$\text{Inflation} = \frac{CPI_{new} - CPI_{base}}{CPI_{base}} = \frac{1020 - 950}{950} = 7.37\%$$

- b. The family's nominal income rose by 5% between the base year and the subsequent year. Are they worse off or better off in terms of what their income is able to buy?

Worse off, because price level has increased more than nominal income, i.e. a decrease in real income.

- c. How do you measure inflation? What causes it? Why is inflation a problem?

CPI is a common way to measure inflation. There could be a lot of cause for inflation, for example, booming economy, rising oil price or fiscal stimulus.

Shoe-leather cost - cost associated with changes in allocation of financial assets

Noise in price system - increases the cost of setting prices

Distortion in tax system - unexpected change in tax bracket

Distortion in distribution - unindexed contract

Menu cost - reprinting menu is expensive

3. For each of the following scenarios, use supply demand analysis to predict the resulting changes in the real interest rate, national savings and investment.

- a. Parliament passes a 10 percent investment tax credit. Under this program, for every \$100 that a firm spends on new capital equipment, it receives an extra \$10 in tax refunds from the government.

This encourages investment, so investment goes up, driving up the real interest rate and saving

- b. A reduction in military spending moves the government's budget from deficit into surplus.

Government moves from deficit to surplus means that public and national savings goes up, which drives down the real interest rate but more investment.

- c. The government raises taxes on corporate profits. Other tax changes are also made, such that the government's deficit remains unchanged.

National savings remains unchanged, but investments decreases. So real interest rate decreases.

- d. Concerns about job security raise precautionary saving.

Private savings go up, driving up national saving and drive down real interest rate, which results in an increase in investments.

3. EFT Revision

CONCEPT CHECK 3.2

Following are CPI values for the years 1929 through 1933. Find the rates of inflation between 1929 and 1930, 1930 and 1931, 1931 and 1932, and 1932 and 1933.

YEAR	CPI
1929	0.091
1930	0.087
1931	0.078
1932	0.074

Source: Australian Bureau of Statistics 2012, 'Year book', Table 29.8 Retail/consumer price index numbers,
[http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0-2012-Main%20Features-Consumer%20Price%20Index%20\(CPI\)-158](http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0-2012-Main%20Features-Consumer%20Price%20Index%20(CPI)-158).

How did inflation rates in the 1930s differ from those in the 1970s?

CONCEPT CHECK 3.3

The table following shows Japanese data on the rate of inflation and one measure of the nominal interest rate, the prime lending rate. Based on these data, what do you conclude about the effects of deflation on Japan's real interest rate?

YEAR	PRIME LENDING RATE (%)	INFLATION RATE (%)
2006	1.63	0.242
2007	1.88	0.059
2008	1.68	1.379
2009	1.48	-1.345

4. Self Review Questions

1. What is meant by the distortions in the tax system introduced by inflation?
2. What is the difference between CPI and GDP deflator?
3. What are the problems caused for the measurement of inflation by changes in the quality of goods and services over time?
4. What are the costs of inflation? Who, if any, benefits from inflation?
5. Distinguish between household savings and national savings. For Australia, what factors have contributed to a persistent decline in household savings over the past two decades?

EXAMPLE 3.2 – AN INDEXED EMPLOYMENT CONTRACT

How much do workers get paid when they have an indexed contract?

An employment contract provides for a first-year wage of \$12.00 per hour and specifies that the real wage will rise by 2 per cent in the second year of the contract and by another 2 per cent in the third year. The CPI is 1.00 in the first year, 1.05 in the second year and 1.10 in the third year. What are the dollar wages that must be paid in the second and third years of the contract?

Because the CPI is 1.00 in the first year, both the nominal wage and the real wage are \$12.00. Let w_2 stand for the nominal wage in the second year. Deflating by the CPI in the second year, we can express the real wage in the second year as $w_2/1.05$. The contract says that the second-year real wage must be 2 per cent higher than the real wage in the first year, so $w_2/1.05 = \$12.00 \times 1.02 = \12.24 . Multiplying through by 1.05 to solve for w_2 , we get $w_2 = \$12.85$, the nominal wage required by the contract in the second year. In the third year the nominal wage w_3 must satisfy the equation $w_3/1.10 = \$12.24 \times 1.02 = \12.48 . Solving this equation for w_3 yields \$13.73 as the nominal wage that must be paid in the third year.

EXAMPLE 3.4 – THE PRICE LEVEL, RELATIVE PRICES AND INFLATION

How are the price level, relative prices and inflation related?

Suppose the value of the CPI is 1.20 in the year 2016, 1.32 in 2017 and 1.40 in 2018. Assume also that the price of oil increases 8 per cent between 2016 and 2017 and another 8 per cent between 2017 and 2018. What is happening to the price level, the inflation rate and the relative price of oil?

The price level can be measured by the CPI. Since the CPI is higher in 2017 than in 2016 and higher still in 2018 than in 2017, the price level is rising throughout the period. Since the CPI increases by 10 per cent between 2016 and 2017, the inflation rate between those years is 10 per cent. However, the CPI increases only about 6 per cent between 2017 and 2018 ($1.40/1.32 = 1.061$), so the inflation rate decreases to about 6 per cent between those years. The decline in the inflation rate implies that although the price level is still rising, it is doing so at a slower pace than the year before.

The price of oil rises 8 per cent between 2016 and 2017. But because the general inflation over that period is 10 per cent, the relative price of oil—that is, its price relative to all other goods and services—falls by about 2 per cent ($8\% - 10\% = -2\%$). Between 2017 and 2018 the price of oil rises by another 8 per cent, while the general inflation rate is about 6 per cent. Hence the relative price of oil rises between 2017 and 2018 by about 2 per cent ($8\% - 6\%$).