

1. Suppose that consumers in the hypothetical economy of Reedia buy three goods: cell phones, abalone dinners, and “other stuff.” The consumption by the average consumer in Reedia bought the indicated quantities of each good at the prices shown in 1985 and 2015.

| Good            | 1985   |          |              | 2015  |          |              |
|-----------------|--------|----------|--------------|-------|----------|--------------|
|                 | Price  | Quantity | Expenditures | Price | Quantity | Expenditures |
| Cell phones     | \$2000 | 0.001    | \$2          | \$50  | 1        | \$50         |
| Abalone dinners | \$10   | 12       | \$120        | \$200 | 0.01     | \$2          |
| Other stuff     | \$100  | 10       | \$1,000      | \$200 | 12       | \$2,400      |
| Total           |        |          | \$1,122      |       |          | \$2,452      |

- a. The Consumer Price Index uses a “Laspeyres” price index based on the base-year (1985 in this example) market basket. Suppose that the base year is 1985. How much would the 1985 market basket have cost at 2015 prices? How much did it cost in 1985? What would be the 2015 value of the CPI based on this market basket with 1985 = 100?
  - b. The GDP consumption deflator uses a “Paasche” price index based on the given-year (2015 in this example) market basket. How much did the 2015 market basket cost at 2015 prices? How much would it have cost at 1985 prices? What would be the 2015 value of the GDP consumption deflator with 1985 = 100?
  - c. Which of the price indexes overstates and which understates inflation and why?
  - d. How might each of the following alternatives lead to a better measure of inflation?
    - 1) Taking the (geometric) average of the Laspeyres and Paasche indexes
    - 2) Using a chain-weighted index that only compares prices in adjacent years rather than times 30 years apart
2. Suppose that the country of Frugalia increases its saving rate—the proportion of income that households allocate to private saving.
- a. Using a graph of the loanable-funds market, show the effect that this would have on the equilibrium real interest rate and on the level of capital investment in Frugalia (ignoring any international repercussions).

- b. What, if any, effect would this change in capital investment and saving have on aggregate demand in the year in which it occurs? What effect would it have on potential per-capita GDP in the long run?
  - c. If there are diminishing marginal returns to capital in Frugalia, how would the marginal product of capital change over time? How would the increase in the saving rate affect Frugalia's growth rate in long-run steady-state equilibrium?
3. If the marginal tax rate on nominal interest payments is 25%, compute the before-tax real interest rate (*i.e.*, the real interest rate if there were no tax) and the after-tax real interest rate (the rate of return after taxes are taken out) in each of the following cases:
- a. The nominal interest rate is 10% and the inflation rate is 5%.
  - b. The nominal interest rate is 8% and the inflation rate is 3%.
  - c. The nominal interest rate is 6% and the inflation rate is 1%.
  - d. In general, with the 25% marginal tax on nominal interest, how much does the before-tax nominal interest rate have to rise to compensate for a one-percentage-point rise in inflation in order to keep the after-tax real interest rate unchanged? What does this imply about the "Fisher effect" in an economy in which nominal interest is taxed? Would the same be true if the government taxed real interest income rather than nominal? Explain.