Problems for Week 8

These problems come from Chapter 6 of the text, but some known typos have been corrected.

Data for this exercise are available on the course website under the link for Chapter 10. Before starting these exercises, the student should review the relevant portions of the Guide to Working with Economic Data: sections G.10, G.17.

Problem 10.1. Suppose that you buy a car for $12,000. Consider the effects on different balance sheets of alternative ways of financing your purchase. (Show your answers on a T-account and identify increases with a “+” (decreases with a “−” and the dollar value and type of instrument – e.g., “+$1,800 stocks” or “−$500 credit card balance”). How is your balance sheet affected by financing your purchase through (remember balance sheets must always balance):
(a) a loan from your credit union?
(b) a check written on your bank account?
(c) $2,000 withdrawal from your money-market mutual fund and a $10,000 on your credit card account with your bank?
(d) winning the car in a raffle?

Problem 10.2. Now consider the effects of the car purchase on the balance sheets of financial intermediaries. What are the effects on the T-accounts of each financial intermediary in Problem 10.1 if the funds supplied to you are:
(a) raised by the credit union through additional deposits?
(b) by the bank by selling a $12,000 certificate of deposit (i.e., an interest-bearing IOU of the bank).
(c) by the bank by a reduction in its reserves and by the mutual fund by the sale of some holdings of Treasury bills?

Problem 10.3. Suppose that you finance the car purchase in Problem 10.1 through a $12,000 loan from your father, who took the funds from his checking account. What are the effects on each of your T-accounts from your purchase? What would be the effect on your family’s T-account – treating your father and yourself as a single unit?

Problem 10.9. Using a spreadsheet and presenting your results on a single graph, calculate the present value of $1 for every year from the present (0) up to 100 years in the future, for each of the discount rates 0 percent, 1 percent, 5 percent, and 10 percent. What conclusions can you draw from your graph for the relationship of present value to: (i) how far in the future returns are received? (ii) the rate of discount? “Infinity is less than a lifetime.” Comment with respect to your graph.

Problem 10.10. Using both the exact and the approximate formulae, what is the real rate of interest when:
(a) the market rate of interest is 7 percent and the rate of inflation is 2 percent?
(b) the market rate is 35 percent and inflation is 29 percent?
(c) the market rate is 4 percent and inflation is 2 percent?
(d) the market rate is 24 percent and inflation is 2 percent?
Comment on what your calculations suggest about when it is best to use the exact or the approximate formula.

Problem 10.13. Using monthly data, measure the annual rate of CPI inflation \textit{ex post} as
\[
\hat{p} = \frac{P_{t+12}}{P_t} - 1
\]
and express your calculations in percentage points. Measure \textit{ex ante} inflation using the Michigan Survey of Expected CPI Inflation (rate of inflation expected over the twelve months following the reported date). Using the market yield on a 1-year Treasury bill, compute both the \textit{ex ante} and \textit{ex post} real rates of interest and plot them on the same graph. How do they differ? What factors might account for the difference?

Problem 10.16. Calculate the bond price of the following pure discount bonds:
(a) a $1,000 bond maturing in 1 year when yields on similar assets are 3 percent;
(b) a $1,000 bond maturing in 2 years when yields on similar assets are 5 percent;
(c) a $5,000 bond maturing in 10 years when yields on similar assets are 11 percent.

Problem 10.17. Calculate the yield on the following pure discount bonds:
(a) a $75,000 bond maturing in 1 year with a price of $70,754.72;
(b) a $1,000 bond maturing in 5 years with a price of $862.61;
(c) a $5,000 bond maturing in 10 years $1,283.37.