

Economics 304

Suggested Problems #2

Fall 2014

These problems are drawn from last year's problem sets and midterm exam. They are intended to give you a focus for study, to make sure that you understand the key analytical concepts we have covered in the course. They are not required and you are not to hand in solutions. But I strongly recommend that you work through them (ideally in groups) to make sure that you understand the solutions. Come and talk with me if you have difficulties; that's often how students learn!

From problem sets:

1. Box 5.4 discusses the effect of minimum-wage laws on the natural unemployment rate. In this problem we explore this relationship in more detail.
 - a. The minimum wage in Oregon is \$8.95 per hour; the distribution of average hourly earnings for Oregon workers (as of 2012) has the following properties:

Mean	\$21.75
10 th percentile	\$9.30
25 th percentile	\$11.49
Median (50 th percentile)	\$17.14
75 th percentile	\$26.59
90 th percentile	\$39.66

- Given the actual wage distribution, is the minimum wage irrelevant for the Oregon labor market?
- b. Consider a model of a segmented labor market, in which there are two distinct markets for, respectively, skilled and unskilled labor. Suppose that the market-clearing wage lower than the minimum wage in the unskilled market is but higher in the skilled market. Draw diagrams of the two markets noting the market-clearing wage and the minimum wage in both.
 - c. In the short run, there is no spillover in labor supply between markets because it takes time to acquire skills and skilled workers would not choose to work at unskilled jobs. However, there may be spillovers in labor demand. How would the presence of the minimum wage affect the skilled labor market if skilled and unskilled workers are substitutes in production? What if they are complements?
 - d. In the long run, workers choose whether or not to acquire skills. Why might the presence of the minimum wage discourage skill acquisition? Why might the presence of the minimum wage encourage skill acquisition? Show the effects on

the skilled and unskilled labor markets in each case: where the discouraging effect dominates and where the encouraging effect dominates.

- e. Based on your answers to the previous parts of this question, why do labor unions (whose members are usually skilled workers) lobby in favor of increases in the minimum wage?
2. Suppose that you are tasked with estimating the natural rate of unemployment for Oregon. Why might the natural rate in Oregon differ from that in other states or the aggregate United States? How would you go about estimating the Oregon natural rate? (I don't expect too much detail about statistical or econometric methods. Focus on the general approach you think is appropriate and the variables that you might consider.) Once you got an estimate, how would be it be useful?
 3. The long-run analysis in Chapter 6 puts the Cambridge " k " in a central role in money demand.
 - a. In what units is k measured?
 - b. Explain (as in footnote 4) how k is related to "money velocity."
 - c. What are the units of velocity?
 - d. The derivation of equation (6.5) is based on the assumption that k (and velocity) is constant. Given the pace of financial innovation in recent decades—introduction, spread, and interconnection of ATMs, development of phone-based and later online banking, etc.—would you expect that k would generally increase or decrease over time?
 - e. Given your answer to the previous question, how would this affect the steady-state rate of inflation, given the rates of money growth and real GDP growth?
 4. Draw a budget-constraint/indifference-curve diagram to illustrate each of the following situations with current consumption (C_1) on the horizontal axis and future consumption (C_2) on the vertical axis. You should assume that the person is approximately a consumption smoother, so that whether she is initially a saver or dissaver (borrower) is determined mainly by her endowment point. Be sure to identify clearly the endowment point, the budget constraints before and after the change, and the amounts saved or dissaved before and after the change.
 - a. A person who is initially a saver in period 1 and who responds to an increase in the real interest rate by decreasing saving.
 - b. A person who is initially a saver in period 1 and who responds to an increase in the real interest rate by increasing saving.
 - c. A person who is initially a dissaver (borrower) in period 1 and who responds to an increase in the real interest rate by increasing saving (reducing dissaving).

- d. Explain (based on substitution and income effects) why the fourth case (dissaver who increases dissaving when the real interest rate rises) is impossible.
5. Explain why the real interest rate rather than the nominal interest rate is used in the budget constraint for consumers. Explain why the real interest rate rather than the nominal interest rate is relevant for firms deciding whether to invest in real capital.
6. Explain the fallacy in the following statement: “Increases in the real interest rate will raise investment because households will find the higher rate of return more attractive.”
7. Consider a model in which individuals live for three periods, earning income of Y_1 , Y_2 , and Y_3 and consuming C_1 , C_2 , and C_3 . You may assume that they receive and leave no bequests.
- Show the equation for the individual’s lifetime budget constraint.
 - Solve for permanent income using an extension of equation (8.2) in the textbook.
 - Assuming for simplicity that the real interest rate is zero and that the consumer chooses perfectly smooth consumption, what consumption level will she choose in each year if $Y_1 = \$20,000$, $Y_2 = \$100,000$, and $Y_3 = \$0$ and she has access to perfect capital markets? In an economy comprising many such consumers, what pattern of borrowing and lending will emerge among individuals of various ages?
 - How would her consumption in each period be different if the government had a program giving a \$30,000 transfer payment to all young people, paid for by a \$30,000 tax on all middle-aged people?
 - How would her consumption in each period be affected if the government had a Social Security program that paid old people \$30,000 and taxed middle-aged people \$30,000 to pay for it?
 - Re-do parts c through e under the assumption that young individuals are totally unable to borrow due to imperfections in the capital market.
 - What implications does your analysis have for government transfer policies?
8. The table below documents changes in monetary variables during the early years of the Great Depression (quantities in billions of dollars):

	August 1929	March 1933
Currency held by public	3.9	5.5
Demand deposits	22.6	13.5
Reserves	3.2	2.9

- What was the money supply in each period? What was the monetary base in each period?
- Calculate the money-supply multiplier in each period as the ratio of the money supply to the base.

- c. Calculate the money-supply multiplier in each period using the formula presented in class:

$$\frac{M}{M0} = \frac{C / D + 1}{C / D + R / D}.$$

Do you get the same answer?

- d. This period was famous for “bank runs” in which panicked depositors raced to their banks to get in line to withdraw their funds before the feared bank closure occurred. How would you expect the currency-deposit ratio and reserve-deposit ratio to change during such a time? Is this reflected in the data? What was the relative importance of each of these changes in the change in the money-supply multiplier? (In other words, what would the multiplier have been if one ratio changed and the other did not, or if the other ratio changed and the first did not?)
- e. How could the Federal Reserve have used open-market operations offset the effect of changes in the multiplier on the money supply? Did they do so?
- f. Ben Bernanke is a renowned scholar of the Great Depression. Based on what you know about the Federal Reserve response to the financial crisis in 2008, did he put into practice the lessons of the 1929–1933 period?

From exams:

- 9.
- Explain why the nominal interest rate must be positive in financial-market equilibrium.
 - In 1933, the U.S. nominal interest rate on government Treasury bills was about 0.5% and the consumer price index *fell* by about 5%. What was the real interest rate? Was this rate high or low by historical standards and how did that affect the motivation to invest?
 - Why would it have been difficult for the Federal Reserve to affect the incentives for investment spending by changing interest rates?
10. Use the modern theory of consumption to explain why an increase in government spending might reduce current consumption by the same amount regardless of whether it is funded by increased current taxes or by increased government borrowing.
11. Suppose that a technological innovation raises the marginal product of capital. Use the theories of investment developed in class to explain how this would affect firms’ investment demand. (Graphs are strongly encouraged.)