Problems for Week 7

These problems come from Chapters 8 and 9 of the text.

Problems

Data for this exercise are available on the course website under the link for Chapter 8 (insert web link here). Before starting these exercises, the student should review the relevant portions of the Guide to Working with Economic Data: section G.2.3, G.3 and G.16.

Problem 8.1. Using the production function and the rule for profit maximization, show graphically how to derive the labor-demand curve. What affect would an increase in technological progress have on labor demand? What effect would a decrease in real wage rates have on labor demand?

Problem 8.3. The U.S. tax code assumes that each taxpayer begins to pay taxes only after having achieved a certain minimum income (the standard deduction). Using the labor supply analysis of this chapter conjecture what the effect of raising the standard deduction by $1,000 would be on the labor supply of a relatively high income taxpayer, who already pays $10,000 a year in income taxes. How would your answer differ for a taxpayer who, though liable for tax before the change, owed no tax after the change? (Hint: your answer should be formulated in terms of income and substitution effects and the likely behavior of taxpayers with different levels of income.)

Problem 8.4. Conjecture the effect of an increase in the marginal rate of taxation on labor supply of each of the two taxpayers as in Problem 8.3.

Problem 8.9. Figure 8.11 shows a secular rise in the participation rates for all civilian workers, even though it also shows a secular decline in the participation rates for prime-age male workers. Before doing any data analysis, conjecture what might account for this difference. Then plot the participation rates for males, females, and teenagers (16-19 year olds, male and female) against the NBER business cycle dates. Rethink your conjecture. Is it supported by the data? If so, how? If not, modify your conjecture and explain how the data support your new view.

Problem 8.10. Referring to the data plotted in Problem 8.9, describe the differences in the secular (i.e., long-term) and cyclical behavior of participation rates. How do they differ by age and sex? What social and economic factors might account for the differences?

Problem 8.12. Using the data and the (Cobb-Douglas) functional forms of equations (6.17') and (6.18) in Chapter 6 and assuming that the economy is and remains fully employed:
(a) compute the real wage consistent with the actual hours of employment;

(b) how much would the real wage have to change to justify an increase of 1 percent in the total number of hours employed?

(c) how much would the hours of labor change if the real raise increased 1 percent?

(d) how much would the real wage change if total factor productivity increased by 1 percent holding hours constant?

(e) how much would hours change if total factor productivity increased by 1 percent holding real wages constant?

Problem 9.1. The following are selected data for Australia:

<table>
<thead>
<tr>
<th>Year</th>
<th>Labor Force (thousands)</th>
<th>Employment (thousands)</th>
<th>Population (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>7,588</td>
<td>6,974</td>
<td>16.02</td>
</tr>
<tr>
<td>1989</td>
<td>8,228</td>
<td>7,720</td>
<td>16.81</td>
</tr>
<tr>
<td>1996</td>
<td>9,127</td>
<td>8,344</td>
<td>19.29</td>
</tr>
</tbody>
</table>

(a) Calculate the unemployment rate for 1996 and the participation rate for 1986.

(b) If employment is converted to an index number for employment that takes the value of 100 in 1986. What is the value of this index in 1989?

Problem 9.2. Using the labor-supply/labor-demand diagram show how an economy that starts at full employment would generate unemployment through adopting a minimum wage above the market-clearing wage. Discuss how the quantitative effects of the minimum wage depend on the steepness of the labor-supply and labor demand curves. To what economic features of firms or workers do the relative steepnesses correspond? How might this simple analysis tell less than the whole story about minimum wage increases?