Economics 152: Problem Set 1

Due: February 7th, 2019, 3:30pm

Question 1

Consider a person with the utility function

$$U(C, L) = C^{1/3}L^{2/3},$$

where L is leisure time and C is consumption of other goods measured in dollars. The person has V dollars of non-labor income and a wage of w. There are T hours available for either working or leisure.

1. Write down the person's budget constraint. Draw a graph representing this constraint, taking care to label the axes and key points.
2. What are the person's marginal utilities for consumption and leisure? What is her marginal rate of substitution between leisure and consumption?
3. Write down a condition involving the person's marginal rate of substitution that characterizes her optimal choice. Represent this condition graphically and interpret it in words.
4. Solve for the person's optimal choices of leisure and consumption, L^* and C^*, in terms of T, V, and w.
5. Are leisure and consumption normal goods? Explain.
6. Find the person's reservation wage in terms of T and V. How does the reservation wage depend on non-labor income?
7. Now suppose that $T = 24$ hours, $V = 12$, and $w = 2$. Find the person's choices of leisure and consumption, and the utility she obtains.
8. Finally, suppose the person's wage rises from 2 to 4. Find the substitution, income, and total effects of this change on her leisure choice. Represent your results graphically. Is the substitution effect or the income effect stronger in this case?

Question 2

The table below shows hypothetical counts of employed workers, unemployed workers, and the total population aged 16+ in three years:

Year	Employed	Unemployed	Population
2019	180 mil	20 mil	300 mil
2020	140 mil	50 mil	300 mil
2021	150 mil	10 mil	300 mil

1. In each year, compute:
   (a) The labor force participation rate

(b) The employment rate

(c) The unemployment rate

2. In a 2021 op-ed in *The New York Times*, a prominent pundit writes:

"The US experienced a severe recession in 2020. In 2021, the unemployment rate has fallen back below its pre-recession level. This proves that the labor market has recovered and the economic crisis is over."

Assess the pundit's claim in view of the numbers in the table above.

Question 3

You are interested in estimating the effects of wages on employment. You learn that in 2015, the Berkeley local government introduced a ten percent wage subsidy for workers in Berkeley. You have the following data on employment/population ratios in Berkeley and Palo Alto:

Year	Berkeley	Palo Alto
2014	0.6	0.4
2015	0.7	0.3

1. Describe a strategy you might use to estimate the effects of the wage subsidy on labor supply with these data. What assumptions are required for this strategy to yield a valid estimate of the effect of the program?

2. Provide an estimate of the effect of the wage subsidy program.

3. A friend provides you with additional data for Berkeley, Palo Alto and San Francisco. Your new data are:

Year	Berkeley	Palo Alto	San Francisco
2013	0.6	0.5	0.8
2014	0.6	0.4	0.8
2015	0.7	0.3	0.8

What do you conclude from these data about your estimate from part (2)? Provide your new best estimate of the effect of the wage subsidy program.