

BUYING AND SELLING (SLUTSKY EQUATION WITH ENDOWMENT)

9.2 (0) Mario has a small garden where he raises eggplant and tomatoes. He consumes some of these vegetables, and he sells some in the market. Eggplants and tomatoes are perfect complements for Mario, since the only recipes he knows use them together in a 1:1 ratio. One week his garden yielded 30 pounds of eggplant and 10 pounds of tomatoes. At that time the price of each vegetable was \$5 per pound.

- a) What is his optimal consumption level?
- b) Suppose that before Mario makes any trades, the price of tomatoes rises to \$15 a pound, while the price of eggplant stays at \$5 a pound. What is now his optimal consumption level?
- c) Find substitution effect, ordinary income effect and endowment income effect.

9.7 (0) Mr. Cog works in a machine factory. He can work as many hours per day as he wishes at a wage rate of w . Let C be the number of dollars he has to spend on consumer goods and let R be the number of hours of leisure that he chooses.

(a) Suppose that Mr. Cog earns \$8 an hour and has 18 hours per day to devote to labor or leisure, and suppose that he has \$16 of nonlabor income per day, $P_c=1$. If Mr. Cog has the utility function $U(C;R) = CR$, how many hours of leisure per day will he choose?

b) Suppose that Mr. Cog's wage rate rose to \$12 an hour. Find pure substitution effect, ordinary income effect and endowment income effect.

c) Suppose that Mr. Cog has a wage of \$ w per hour and a nonlabor income of \$ m . As before, assume that he has 18 hours to divide between labor and leisure. Derive Mr. Cog's supply function for labor.

9.11 (0) Professor Mohamed El Hodiri of the University of Kansas, in a classic tongue-in-cheek article "The Economics of Sleeping," *Manifold*, vol. 17, 1975, offered the following analysis. "Assume there are 24 hours in a day. Daily consumption being x and hours of sleep s , the consumer maximizes a utility function of the form $u = x^2s$, where $x = w(24 - s)$, with w being the wage rate."

(a) In El Hodiri's model, does the optimal amount of sleeping increase, decrease, or stay the same as wages increase?

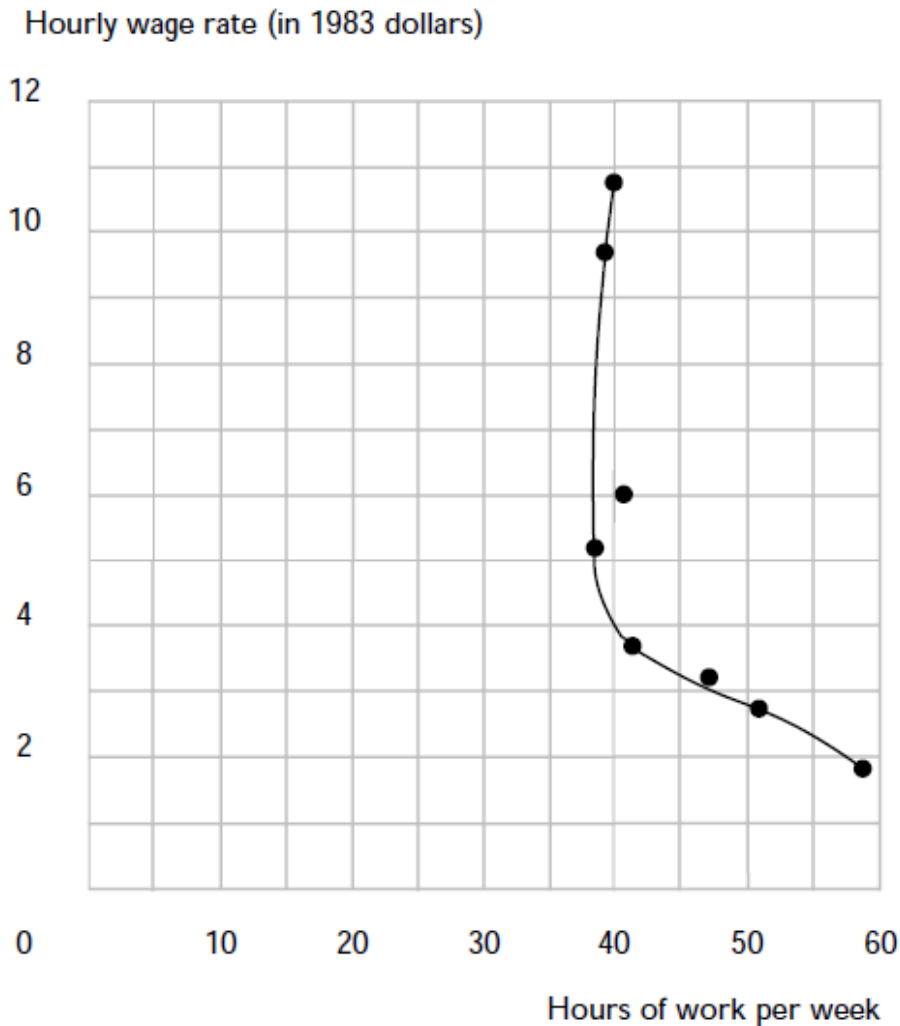
(b) How many hours of sleep per day is best in El Hodiri's model?

9.12 (0) Wendy and Mac work in fast food restaurants. Wendy gets \$4 an hour for the first 40 hours that she works and \$6 an hour for every hour beyond 40 hours a week. Mac gets \$5 an hour no matter how many hours he works. Each has 80 hours a week to allocate between work and leisure and neither has any income from sources other than labor. Each has a utility function $U = cr$, where c is consumption and r is leisure. Each can choose the number of hours to work.

Suppose that the jobs are equally agreeable in all other respects. Since Wendy and Mac have the same preferences, they will be able to agree about who has the better job. Who has the better job?

9.10 (0) In the United States, real wage rates in manufacturing have risen steadily from 1890 to the present. In the period from 1890 to 1930, the length of the work week was reduced dramatically. But after 1930, despite continuing growth of real wage rates, the length of the work week has stayed remarkably constant at about 40 hours per week.

| Year | Wage | Hours Worked |
|------|-------|--------------|
| 1890 | 1.89 | 59.0 |
| 1909 | 2.63 | 51.0 |
| 1920 | 3.11 | 47.4 |
| 1930 | 3.69 | 42.1 |
| 1940 | 5.27 | 38.1 |
| 1950 | 6.86 | 40.5 |
| 1960 | 8.56 | 39.7 |
| 1970 | 9.66 | 39.8 |
| 1983 | 10.74 | 40.1 |



(b) At wage rates below \$4 an hour, does the workweek get longer or shorter as the wage rate rises?

(c) The data in this table could be consistent with workers choosing various hours a week to work, given the wage rate. An increase in wages has both an endowment income effect and a substitution effect. The substitution effect alone would make for a (longer, shorter) _____workweek. If leisure is a normal good, the endowment income effect tends to make people choose (more, less) _____ leisure and a (longer, shorter) _____ workweek. At wage rates below \$4 an hour, the (substitution, endowment income)_____ effect appears to dominate. How would you explain what happens at wages above \$4 an hour?