

Problem Set Six Solutions

Chapter 8

3. John Jones owns and manages a café whose monthly revenue is \$5,000. Monthly expenses are:

| | |
|--------------------------------|---------|
| Labor | \$2,000 |
| Food and drink | 500 |
| Electricity | 100 |
| Vehicle lease | 150 |
| Rent | 500 |
| Interest on loan for equipment | 1,000 |

a. Calculate John's monthly accounting profit.

Answer: John's accounting profit is his revenue minus his explicit costs, \$5,000 - \$4,250 = \$750.

b. John could earn \$1,000 a month elsewhere. However, he prefers to run the café. In fact, he would be willing to pay up to \$275 per month to run the café rather than do anything else. Is the café making an economic profit? Should John stay in the café business? Explain.

Answer: Yes, his opportunity cost of his labor to run the café is \$1,000 - \$275, or \$725. Adding this implicit cost to the explicit costs implies that the café is making an economic profit of \$25. Since economic profit is positive $\$25 > 0$, John should stay in business.

c. Suppose the café's revenues and expenses stay the same, but John can now earn \$1,100 a month elsewhere. Is the café still making an economic profit? Explain.

Answer: John's opportunity cost rises by \$100, to \$825 per week. The café is thus now making an economic loss of \$75 per week.

d. Suppose John had not gotten a loan to buy equipment, but had invested his own money. How would your answers to parts a and b change?

Answer: The accounting profit would now be \$1,750. The answer to part b would not change. If John had invested his own money in the café, he would forgo \$1,000 in interest by not putting the money in a savings account. That amount is an opportunity cost that must be included when calculating economic profit.

e. If John can earn \$1,000 a month elsewhere in a job he likes just as well as running the café, how much additional revenue would the café have to collect each month to earn a normal profit?

Answer: To earn a normal profit, the café would have to cover all its implicit and explicit costs. The opportunity cost of John's time is \$1,000, whereas the café's accounting profit is only \$750. Thus, the café would have to earn additional revenues of \$250 a month to make a normal profit.

4. The city of New Orleans has 200 advertising companies, 199 of which employ designers of normal ability at a salary of \$100,000 a year. Paying this salary, each of the 199 firms makes a normal profit on \$500,000 in revenue. However, the 200th company employs Janus Jacobs, an unusually talented designer. This company collects \$1,000,000 in revenues due to Jacob's talent.

a. How much will Jacob's earn? What proportion of his annual salary will be economic rent?

Answer: Jacobs will earn \$600,000/year, the normal \$100,000 salary for a designer plus the \$500,000 economic rent he collects for his special talent (the extra revenue he brings in). 5/6 of his salary is economic rent.

b. Why won't the advertising company for which Jacob's works be able to earn an economic profit?

Answer: If Jacobs's employer withholds some of the additional revenue it takes in as a result of hiring him, some other advertising company will offer him a higher salary and still manage to earn an economic profit. Bidding for Jacobs will continue until firms are indifferent between paying him \$600,000 and hiring any other designer for \$100,000.

5. Explain carefully why, in the absence of patent, a technological innovation invented and pioneered in one tofu factory will cause the supply curve for the entire tofu industry to shift to the right. What will finally halt the rightward shift?

Answer: Assuming that all tofu firms initially earn zero economic profit, the innovation will cause one tofu factory's costs to fall. The firm that owns the factory will make an economic profit in the short run, because the market price of tofu will not change. As other firms adopt the innovation, they too will make an economic profit. This economic profit will attract new firms into the industry, and so the supply curve for tofu will begin to shift to the right, causing the market price of tofu to fall. The decline in price will continue as more firms enter, until there is no more economic profit to be made.

6. The government of a developing country has decided to limit imports of machine tools, to encourage the development of locally made machine tools. To do so, the government offers to sell a small number of machine-tool import licences. To operate a machine-tool import business costs \$30,000, excluding the cost of the import license. An importer of machine tools can expect to earn \$50,000 per year. If the annual interest rate is 10 percent, how much will the government be able to auction the import licenses? Will the owner of a license earn an economic profit?

Answer: If the import licenses were free, owners of each license would make an economic profit of \$20,000/year. When the annual interest rate is 10 percent, the most a buyer will be willing to pay for a stream of \$20,000/year is \$200,000, the amount of money that would have to be put into a savings account to earn \$20,000 interest each year. If the import licenses are auctioned,

they will sell for this price. The buyers of the licenses will make no economic profit.

8. You have a friend who is a potter. He holds a permanent patent on an indestructible teacup whose sale generates \$30,000 a year more revenue than production costs. If the annual interest rate is 20 percent, what is the market value of this patent?

Answer: The market value is how much money someone would need to put in the bank at 20 percent interest to generate annual earnings of \$30,000. This amount is $\$30,000 / .2 = \$150,000$.

9. You have an opportunity to buy an apple orchard that produces \$25,000 per year in total revenue. To run the orchard, you would have to give up your current job, which pays \$10,000 per year. If you find both jobs equally satisfying, and the annual interest rate is 10 percent, what is the highest price you would be willing to pay for the orchard?

Answer: Owning the orchard is owning a stream of $\$25,000 - \$10,000 = \$15,000$ each year, net of the opportunity cost of your time. The highest you would be willing to pay for the orchard is the value that yields zero economic profit, the value which, invested in a bank at 10 percent interest, would also yield \$15,000 a year. Since $\$150,000 (0.10) = \$15,000$, that amount is \$150,000.