

Answers to Ch. 3 review questions.

Multiple choice: 1c, 2a, 3c, 4a, 5c, 6b, 7b, 8d, 9b, 10b, 11d, 12a, 13a, 14b, 15c, 16b, 17a, 18c, 19a, 20d, 21a, 22a, 23c

## ■ Answers to Even-Numbered Review Questions

2. Assume that wages for keyboarders (data entry clerks) are lower in India than in the United States. Does this mean that keyboarding jobs in the United States will be lost to India? Explain.

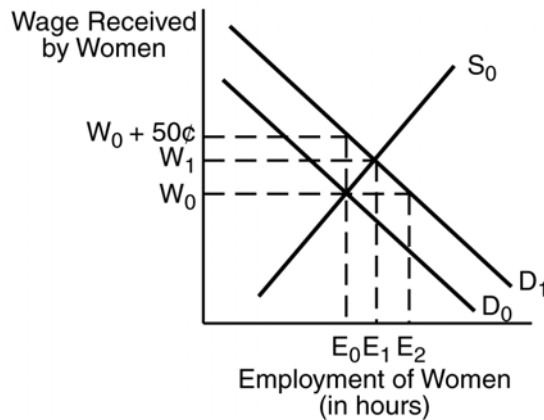
**Answer:** Indian data entry clerks will be substituted for American ones only if the *ratio* of their wage to their marginal productivity is lower. Thus, it is not wage alone that affects the incentives to substitute; marginal productivity is also critical.

4. Suppose that prisons historically have required inmates to perform, *without pay*, various cleaning and food preparation jobs within the prison. Now suppose that prisoners are offered paid work in factory jobs within the prison walls, and that the cleaning and food preparation tasks are now performed by non-prisoners hired to do them. Would you expect to see any differences in the *technologies* used to perform these tasks? Explain.

**Answer:** When inmates were required to work without pay, their wage was essentially zero—and we would expect that prisons to have adopted labor-intensive technologies (using the argument inherent in equation 3.8c). When wages rise, the cost of expanding output using labor becomes greater, and we expect prisons to adopt the use of more capital in the production process.

6. Suppose the government were to subsidize the wages of all women in the population by paying their *employers* 50 cents for every hour they worked. What would be the effect on the wage rate women received? What would be the effect on the net wage employers paid? (The net wage would be the wage women received less 50 cents.)

**Answer:** Consider a simple competitive labor market in which the demand and supply of women are both expressed in terms of the wage received by women (which, in the absence of any subsidy, is assumed to be equal to the wage paid by employers). Given the demand curve,  $D_0$ , and the supply curve,  $S_0$ , market clearing wage and employment levels will be  $W_0$  and  $E_0$ , respectively.



Suppose the government now subsidizes employers by paying them 50 cents for every hour women work. Viewed in terms of the wage received by women, the employers' demand curve will shift up by exactly 50 cents (reflecting the fact that this amount will be paid by the government). At the old market clearing wage received by women,  $W_0$ , the number of women employers want to hire,  $E_2$ , exceeds the number who are willing to work,  $E_0$ . This puts upward pressure on the wage received by women, and this wage rises until the excess demand for labor is eliminated. This equilibrium occurs at the wage rate  $W_1$ , and the employment level  $E_1$ .

It is clear from the figure that the wage received by women increases by less than 50 cents as long as the supply of labor curve is not vertical (i.e., as long as labor supply is responsive to wages). Indeed, the more responsive labor supply is to the wage rate, the less the women's wage will rise. Since the wage paid by employers now equals the wage women receive less the 50-cent subsidy, it is also clear that the wage paid by employers declines (by 50 cents minus the increase in the wage women receive).

It is important to stress to students that one would reach identical conclusions if one analyzed the subsidy in terms of the wage employers pay. If supply and demand curves are drawn in terms of this variable, a 50-cent-an-hour subsidy for women would shift the female labor supply curve down by 50 cents. At the old wage paid by employers, the supply of female labor would now exceed the demand. Downward pressure would be placed on the wage paid by employers and it would fall by less than 50 cents (as long as labor supply was responsive to the wage). As a result, the wage received by women would rise by 50 cents less the fall in the wage paid by employers.

8. If anti-sweatshop movements are successful in raising pay and improving working conditions for apparel workers in foreign countries, how will these changes abroad affect labor market outcomes for workers in the apparel and retailing industries in the United States? Explain.

**Answer:** If increased labor costs abroad are not accompanied by increases in marginal productivity, then there will be incentives to substitute for these foreign workers (with capital or workers elsewhere, including the United States). However, increased costs of manufacturing university apparel also would be expected to reduce sales and the scale of output, which will put downward pressure on employment in the American apparel and retailing industries. The presence of both substitution and scale effects—working in opposite directions—implies that the ultimate effect on American workers in these industries cannot be predicted by theory alone.

## ■ Answers to Even-Numbered Problems

2. The marginal revenue product of labor in the local saw mill is  $MRP_L = 20 - 0.5L$ , where  $L =$  the number of workers. If the wage of saw mill workers is \$10 per hour, then how many workers will the mill hire?

**Answer:** The mill will hire workers until  $MRP_L = W$ .  $20 - 0.5L = 10$  when  $L = 20$  workers.

4. The output of workers at a factory depends on the number of supervisors hired (see below). The factory sells its output for \$.50 each, it hires 50 production workers at a wage of \$100 per day, and needs to decide how many supervisors to hire. The daily wage of supervisors is \$500 but output rises as more supervisors are hired, as shown below. How many supervisors should it hire?

Supervisors	Output (units per day)
0	11,000
1	14,800
2	18,000
3	19,500
4	20,200
5	20,600

**Answer:** The firm needs to compare the marginal cost to the marginal revenue of hiring an additional supervisor. The marginal cost is always \$500 for each extra supervisor. The marginal revenue is the number of additional units produced times the price of output.

Number of Supervisors	MC	MR
1	\$500	$\$0.50 \times 3800 = \$1900$
2	\$500	$\$0.50 \times 3200 = \$1600$
3	\$500	$\$0.50 \times 1500 = \$750$
4	\$500	$\$0.50 \times 700 = \$350$
5	\$500	$\$0.50 \times 400 = \$200$

The firm will hire three supervisors since the marginal revenue generated from hiring the third supervisor exceeds \$500 but the marginal revenue generated from hiring the fourth supervisor is less than \$500.

