Applications

Who Bears the Burden of the Payroll Tax?

28. Consider a labor market where the labor demand and supply curves are given by the equations

\[
\text{Demand: } W_D = 30 - 0.04L.
\]

\[
\text{Supply: } W_S = 0.05L - 15.
\]

28a. Calculate the equilibrium wage and employment level.

28b. Suppose the government imposes a payroll tax of $9 per labor unit on the employer. Calculate the new equilibrium wage and employment level. What is the new per-unit cost of labor to the firm?

28c. What percentage of the tax is ultimately paid by the workers? What percentage is paid by the firm?

28d. What similarity do you see between the analysis of payroll tax burdens and proposals that employers be required to provide certain benefits (like health insurance or parental leave) to their employees? What are the likely effects of such mandates?

Effects of Deregulation on the Demand for Labor

*29. The theory behind deregulating various product markets like air travel, trucking, and so on was to break down monopoly power, do away with regulation that was generally ineffective, and make the markets more competitive. Holding all else constant, when monopoly power is broken down, an industry should be able to produce more output at a lower price.

Consider a firm with a production function given by the equation

\[
Q = \sqrt{L\sqrt{K}}.
\]

In the short run suppose the level of capital is fixed at 16 units. The marginal product of labor in the short run is given by the equation

\[
MP_L = \frac{2}{\sqrt{L}}.
\]

Suppose initially that a firm has been granted monopoly power by the government and faces a demand curve given by \( P = 20 - 0.5Q \). The firm faces competition in the labor market where the going price of labor is $10. Suppose that regulation is ineffective and the firm acts as a normal profit-maximizing monopolist.

*29a. Find the equation for the firm’s labor demand curve. Find the optimal level of labor for the firm to demand.

29b. Given your answer to 29a, how much output will the firm produce and what price will it charge?

*29c. Now suppose the market in which the firm sells its product is deregulated and new competitors enter the market. Suppose the price of the product falls to $15. Find the equation for the firm’s demand curve for labor under competition. Using the new demand curve expression, find the optimal level of labor for the firm to demand. How much output will the firm produce now?

*29d. On the same graph, plot the demand curves and the quantity of labor demanded before and after deregulation.
29e. In general (without computing specific numbers), what effect do you think deregulation would have on a firm’s long-run demand for labor? Explain your reasoning.

29f. If regulators are actually effective in keeping a firm from exploiting its monopoly status, some economists suspect that such firms may actually pay a wage that is higher than the going rate. Explain the reasoning behind this argument.

**Wage Subsidies**

*30. Consider a firm that hires low-skilled workers. The firm’s demand for this labor is given by the equation

\[ W = 16 - 0.1L, \]

or equivalently,

\[ L = 160 - 10W. \]

To stimulate the employment of low-skilled workers, suppose the government institutes a wage subsidy program. The program is a “targeted” subsidy in that the firm will receive a subsidy only if it hires people previously on welfare. The program is also a “marginal” or “incremental” subsidy in that the subsidy applies only to new hires made from the targeted groups. The firm will not receive subsidies for existing workers. Finally, the subsidy will be structured so that the firm receives 50 percent of the difference between the wage they pay and the program’s “target wage” of $8. (If the firm pays the workers $8 or more they receive no subsidy.) Suppose the firm currently pays the going wage for unskilled labor of $4.

30a. Before the subsidy was enacted, what was the quantity of labor demanded? Graph the demand curve before the subsidy and indicate the firm’s wage and employment level.

*30b. Under the program, assuming the wage actually paid is $4, what subsidy does the firm receive for each new hire? What is the effective cost to the firm of each new hire?

*30c. What is the quantity of labor the firm will demand at a wage of $4 under the subsidy program? On the same graph as in 30a, draw the demand for labor under the subsidy program.

*30d. At a wage of $4, is the demand for labor flatter or steeper under the subsidy program? Would the slope increase or decrease if the subsidy were 75 percent of the difference between the target wage and the actual wage?

*30e. Given the original information, what is the total payment the government must make to the firm? What would the cost to the government be if the subsidy applied to all workers, not just new hires?

*30f. If the original demand for labor were steeper, would the employment effects of the subsidy be larger or smaller? Explain your reasoning.

*30g. Why do subsidy programs targeted to specific groups not always have the type of effect this example predicts?