Economics 152 – Wage Theory and Policy

Problem Set #4
– Due Friday 11/02/2007 –

1. (a) The 1986 Immigration Reform and Control Act (IRCA) made it illegal for employers in the United States to knowingly hire illegal aliens. The legislation, however, has not reduced the flow of illegal aliens into the country. As a result, it has been proposed that the penalties against employers who break the law be substantially increased. Suppose that illegal aliens, who tend to be less skilled workers, are complements with native workers. What will happen to the wage of native workers if the penalties for hiring illegal aliens increase?
(b) In class we discussed an article from The New York Times – “Crackdown upends Slaughterhouse’s Work Force” NYT October 12, 2007 – which reports how law enforcement actions against illegal immigrants affected a large firm in North Carolina. Does this article provide evidence for your predictions from point (a)? What other labor market effects related to the outflow of immigrant workers are discussed in this article?
(c) What does this article say about a wage compensation for the unpleasant working conditions in the slaughterhouse.

2. Consider the case when the labor market is not perfectly competitive, specifically the case when a firm can influence wages.
(a) What is a monopsony? What is the difference between a perfectly discriminating monopsonist and a non-discriminating monopsonist?
(b) Suppose a firm is a perfectly discriminating monopsonist. The government imposes a minimum wage on this market. What happens to wages and employment?
(c) What happens to wages and employment if the government imposes a payroll tax on a non-discriminating monopsonist? Compare the response in the monopsonistic market to the response that would have been observed in a competitive labor market.
(d) Consider a nondiscriminatory monopsonist firm which faces a perfectly elastic demand for its product at a price of $4. This firm also faces an upward sloping labor supply curve $E = 10w - 50$. This implies that the firm faces a marginal cost of labor curve given by $MC = 0.2E + 5$. Assume further that each worker can produce 3 units of output per hour, and that there are no other costs of production. How many workers will the firm hire per hour to maximize profits? What is the hourly wage? What are the firm’s hourly profits?
3. Suppose that the market for labor economists is subject to a cobweb adjustment process, because it takes time to train new labor economists. Specifically, suppose that the supply curve is given by $w = 10 + 5E$ and the demand curve by $w = 50 - 3E$.

(a) What is the initial equilibrium wage and employment level?
(b) Now suppose the government urgently needs labor economists to evaluate a new training program. This sudden demand shock shifts the demand curve up to $w = 70 - 3E$.

Calculate the wage and employment levels in each "round" of the cobweb game as the wage and employment levels slowly adjust to the shock [you can stop with the 6th round].
(c) Sketch the adjustment process in a graph.
(d) What is the new equilibrium level of wage and employment?

4. Consider a competitive economy that has four different jobs that vary by their wage and risk level. The table below describes each of the four jobs.

<table>
<thead>
<tr>
<th>Job</th>
<th>Risk (r)</th>
<th>Wage (w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1/5</td>
<td>$3</td>
</tr>
<tr>
<td>B</td>
<td>1/4</td>
<td>$12</td>
</tr>
<tr>
<td>C</td>
<td>1/3</td>
<td>$23</td>
</tr>
<tr>
<td>D</td>
<td>1/2</td>
<td>$25</td>
</tr>
</tbody>
</table>

All workers are equally productive, but workers vary in their preferences. Consider two workers X and Y who value wage and the risk levels according to the following utility functions:

$$u_X(w,r) = w + \frac{1}{r^2} \quad \text{and} \quad u_Y(w,r) = 0.5 \times w + \frac{2}{r^2}.$$ 

(a) Where does each worker choose to work? What is the relationship between the observed wage and risk levels in the economy called?
(b) Suppose the government regulated the workplace and required all jobs to have a risk factor of 1/5 (that is, all jobs become A jobs). What wage would each worker now need to earn in the A job to be equally happy following the regulation?

5. Suppose a firm must employ 20 workers in order to produce 2000 units of output that the firm has contracted to supply to the government for $1.4 million. The firm must choose how much to invest in safety. The firm can choose any level of safety, S, from 0 to 100. The cost of safety is $C(S) = 50S^2$. Given the firm’s choice of safety, it must pay an annual salary of $60,000 - 300S$. Thus, a firm that chooses $S = 30$ pays $45,000 for this level of safety and pays each worker $51,000. What level of safety will the firm choose, and how much does this cost? How much will each worker earn? How much profit will the firm earn?