Written Preliminary Ph.D. Examination

Graduate Program in Applied Economics

June 27, 2012

Labor Economics

Instructions

• IDENTIFY YOURSELF BY CODE LETTER, not name, on all pages.

• Start each question at the top of a new page.

• You are to answer a total of **FOUR** out of the six questions.

• You have four hours to complete the examination.

• **This is a closed book exam.** No notes, articles, books or other sources may be used other than the article provided to you for Question 1.
Question 1. This question concerns the article by Amuedo-Dorantes and Bansak distributed before the exam.

a. The authors use a difference-in-differences methodology to identify labor market effects of amnesty. Evaluate this approach (as applied in this paper). What does it do well? What concerns do you have?

b. The discussion of the left panel of figure 2 (discussion is the first part of “Exiting employment” on p. 447) tells a reasonable story but cobbles together two different models in a confusing way and, in addition, the figure does not fully illustrate the story. Complete the figure and present the argument in a more coherent way.

c. (very short) In the right panel of figure 2, the horizontal segment of the budget constraint embodies an unstated assumption. Explain.
Question 2. The “old” way of studying whether racial/ethnic discrimination results in differential outcomes was to estimate an equation like the following:

\[ Y_i = X_i \beta + \delta M_i + \epsilon_i, \]

where \( Y_i \) is a labor market outcome (log wage, hiring, availability of benefits, etc.), \( X_i \) is a vector of productivity relevant characteristics of individual \( i \) (education, experience, etc.), and \( M_i \) is an indicator for whether \( i \) is a member of the minority group. A negative estimated value of \( \delta \) was taken as evidence of discrimination.

a. Outline the shortcomings of this approach.

b. Describe and critique at least two newer approaches to measuring differential outcomes. Pay particular attention to how well the approaches address the shortcomings you outlined in part a.
**Question 3.** Consider a three-period model with the following timeline:

In period 1, the worker can make firm-specific human capital investments $s$ at cost $s^2$.

In period 2, the firm can make general human capital investments $\tau$ at cost $\tau^2$.

In period 3, the firm makes a wage offer and workers decide whether to stay at the firm or work in the competitive labor market outside the firm.

Investments $s$ and $\tau$ are observable to all, and the firm makes a take-it-or-leave-it wage offer (no bargaining). The firm’s production function has the following form:

$$f(\tau, s) = (1 + \tau)(1 + s),$$

where $\tau$ is general human capital and $s$ is firm-specific human capital. Outside the firm specific human capital has no value, so the production function is

$$g(\tau, s) = 1 + \tau.$$

a. For given values of $s$ and $\tau$, what is the wage offer that the firm will make to the worker in period 3? Explain.

b. What incentive does the firm have to invest in general human capital in this model? What incentive does the worker have to invest in specific human capital? Explain.

*Hint:* Use backwards induction. Starting with the period 3 wage offer from part a, determine the firm’s profit function and amount of general training ($\tau$) in period 2. Given that, what is the worker’s optimal level of investment in specific human capital in period 1?

c. Empirical evidence suggests that firms pay for (some) training in general human capital for workers. Describe this evidence and compare the predictions from the standard (i.e., Becker) model of human capital with an alternative in which firms have an incentive to pay for general training. Explain.

d. Why do workers who suffer an involuntary job loss (e.g., due to a plant closing) suffer large wage losses? Discuss this empirical finding in light of the models described in part c.
Question 4. The government imposes a payroll tax on workers’ earnings at a rate $t$ on earnings below a given ceiling of $E^*$. An individual’s total tax payment ($T$) is therefore:

$$T = \begin{cases} 
tWH & \text{if } WH < E^*, \\
T^* & \text{if } WH \geq E^*. 
\end{cases}$$

In other words, the wage rate net of the payroll tax is $W(1-t)$ below the earnings ceiling, and $W$ above the ceiling.

a. Draw and describe the single period budget constraint relevant to the individual’s static labor supply decision with and without the payroll tax. Label your graph.

b. Describe the alternative utility maximizing choices, both graphically and in words. In other words, illustrate some possible indifference curves and describe the resulting labor supply decisions.

c. What are the expected labor supply effects of imposing such a tax? Describe and explain all possible labor supply responses (including those above and below $E^*$, and those who may enter or exit the labor force).

d. Based on the existing empirical labor supply literature, do you think men or women in the U.S. would have a larger labor supply response to an increase in the payroll tax rate? Why? You should make clear distinctions between those at different points of the budget constraint and for married vs single people.
Question 5. There is a longstanding literature in economics on individual labor supply decisions that largely focuses on the decision whether or not to work, and if so, for how many hours, ignoring the specifics of the job. At the same time, much of personnel economics focuses on the supply of effort, taking the decision to be employed as given. Finally, the literature on compensating differentials addresses how workers sort themselves into different jobs, taking as given the decision to work.

Superficially, these literatures seem to be disjoint. Evaluate the extent to which this is true. If there are theoretical or empirical linkages, what are they? Use references to specific aspects of models and/or specific papers. (Note: This is a deliberately open-ended question and there are many ways to answer. An intelligent and informed response that touches on all three literatures is expected, not a comprehensive review. Astounding insight is welcome, but not required.)
**Question 6.** Suppose that a firm and worker contract on output because effort is not observable. Instead, observable output, $q$, is a noisy function of effort, $e$, such that $q = ae + \mu$ where $\mu$ is mean 0 and i.i.d. with standard deviation of $\sigma$. Output is sold at price $p$ and the worker has a reservation utility of $U_0$. Suppose the worker is a risk-neutral expected utility maximizer with utility being a function of income, $I$, and effort: $U = I - c(e)$. Income is the sum of salary payments, $S$, plus a piece rate, $b$, based on output such that $I = S + bq$.

a. Solve for the optimal piece rate and salary. Be clear and precise in your derivation. Be explicit about any additional assumptions you make.

b. How does the optimal piece rate change with the following changes in the environment? Explain the economic intuition behind your answer:

- Higher ability worker (i.e. higher value of $a$).
- Noisier production environment (higher $\sigma$).
- Risk averse worker. (You do not need to solve a new model, just provide a verbal economic rationale for your answer.)