

**PRELIMINARY EXAMINATION FOR THE Ph.D. DEGREE**

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- Please answer all of the following 4 questions.
- Put your identifying number on your exam.

Question 1.

Using a diagram, show that employers who discriminate against members of a particular group because they (the employers) are prejudiced cannot be profit maximizers. What does this imply about the likelihood of observing this type of discrimination in the labor market?

Question 2.

Researchers have long been interested in knowing how much an additional year of schooling increases an individual's wages. One of the problems with estimates of the wage return to schooling that are based on simple cross-sectional regressions is that they are likely to reflect omitted variables bias.

- a) What are some possible sources of this bias? Are they likely to lead to an upward biased or a downward biased estimate of the wage return to education?
  
- b) In their 1991 article, "Does Compulsory Schooling Attendance Affect Schooling and Earnings?" Angrist and Krueger use an individual's quarter of birth as an instrument for their level of education.
  - i) How do they justify using this instrument? i.e. Why would quarter of birth be correlated with the regressor of interest, but not correlated with the dependent variable?
  - ii) Describe at least two potentially serious problems with this instrument. How will these problems affect the magnitude of the estimates? Why?
  - iii) An alternative to using quarter of birth as an instrument for educational attainment would be to use variation in compulsory schooling laws across states and over time. Why might compulsory

schooling laws be a better instrument for educational attainment than quarter of birth? Does this instrument have the same problems as you discussed in ii? Explain your answer.

Question 3.

Altonji (1986) focuses on estimation of the intertemporal labor supply elasticity. In particular he uses data from the Panel Study of Income Dynamics to estimate the following equation:

$$(1) \quad n_t - n_{t-1} = \beta_1(w_t - w_{t-1}) + \beta_2(\ln \lambda_t - \ln \lambda_{t-1}) + \varepsilon_t$$

Where:

- $n_t$  is the log of hours of work in year  $t$
  - $w_t$  is the log of the wage in year  $t$ , calculated as total earnings divided by total hours of work
  - $\lambda_t$  is the marginal utility of wealth in year  $t$
  - $\varepsilon_t$  is an error term
- a. How does Altonji handle the fact that the marginal utility of wealth will not be observed, and in general will depend on assets, all past and future wages, and other variables?
  - b. What are the major problems for estimating  $\beta_1$  via OLS? How does Altonji overcome these problems? Discuss alternative instrumental variables for estimating  $\beta_1$  and the pros and cons of each. Be sure to place your answer in the context of the specific (1<sup>st</sup> differenced) form of equation 1 above.

In subsequent work, Pistaferri (2003) has estimated a similar relationship to Altonji's using a data set that contains information on individual workers' expected future wages. In particular, Pistaferri estimates an equation similar to:

$$(2) \quad n_t - n_{t-1} = \beta_1 E_{t-1}(w_t - w_{t-1}) + \beta_2 [(w_t - w_{t-1}) - E_{t-1}(w_t - w_{t-1})] + \beta_3 (\ln \lambda_t - \ln \lambda_{t-1}) + \varepsilon_t$$

where  $E_{t-1}$  indicates expectations of future values taken at time  $t-1$ .

- c. Consider Altonji's underlying assumption about the extent to which individuals anticipate future wage changes. In light of this, what might be the advantage of splitting wage changes into the two components (terms multiplied by  $\beta_1$  and  $\beta_2$ ) in equation 2? Carefully explain why it matters to the estimation whether wage changes are anticipated or not.
- d. How are estimates of intertemporal labor supply elasticities related to questions about how individuals respond to permanent shifts in their wage profiles, such as those induced by tax policy changes and studied by Blundell, Duncan and Meghir (1998)?

#### Question 4.

A recent study by Adams and Neumark (2005) investigates the effects of “living wage laws” imposed in a variety of US cities. Living wage provisions require that any firms contracting with the city or other local governments must pay workers a minimum amount per hour, generally set significantly above the federal minimum wage. Adams and Neumark have access to data on employment and wages for individuals residing in two sets of cities over a number of years: (1) cities which have passed living wage laws at some point during the sample period, and (2) cities in which there were campaigns for living wage laws that did NOT pass.

- a. Describe how you would construct an estimate of the effect of living wage laws on employment using the data described above. Be sure to include the following elements in your discussion:
  - i. The population of individuals to be included in the analysis
  - ii. The basic regression specification to identify the effect on employment, including the key variables of interest, and important control variables
  - iii. The appropriate interpretation of the resulting estimates
- b. Briefly discuss the pros and cons of the strategy you describe in part (a) for identifying the effects of living wage laws. What are its main strengths and main weaknesses?
- c. How might the number of years of data available before and after the living wage laws are passed affect your estimation strategy? What do we know from the minimum wage literature about how many years of data might be necessary to identify the full effect of such wage provisions?
- d. Will your strategy for estimating the effects of living wage provisions provide information on the elasticity of labor demand? Why or why not?