University of California, Davis
Department of Economics
PUBLIC ECONOMICS

Date: June 27, 2002
Time: 3 hours
Reading time: 20 minutes

PRELIMINARY EXAMINATION FOR THE Ph.D. DEGREE

- Please answer **five (5) of the following six (6) questions.** Do *not* answer all six questions, as only the first five answers submitted will be graded.
- Put your answers for each question in a **separate blue book**; that is, use a total of five (5) blue books.
- Put your identifying number on each book.

1. The Value of Income and Revenue under Optimal Taxation

Consider the following statement:

> *When a positive amount of tax revenue must be raised and taxation is designed optimally, the shadow value of a dollar of government revenue is greater than the shadow value of a dollar of income to an individual.*

Write down and explain a model in which you can demonstrate that this is indeed the case. Include in your discussion a formal definition of the deadweight loss of taxation, and use your model to relate the above statement to the concept of deadweight loss. Give an intuitive explanation of your findings. Does this mean that the government is somehow more efficient than private firms or individuals? Explain.

2. Aggregate Willingness to Pay with Identical Consumers

Consider a willingness-to-pay locus in an economy of two identical consumers. (In any given state the two consumers have the same preferences and the same endowments). A certain public project is under consideration, and its value to the consumers depends on the weather, which will either be wet (W) with probability p_W or dry (D) with probability p_D.

a. Illustrate the willingness-to-pay locus for a single consumer as well as the aggregate willingness-to-pay locus, labeling the option price (OP) for an individual consumer, the aggregate option price (AOP), and the aggregate fair bet point (AFB).

b. How do you know that the aggregate fair bet point has an expected value which is no smaller than the aggregate option price?

c. What is the relationship between the aggregate option price and the sum of the individual option prices? How do you know?

d. Under what circumstances would you use the aggregate fair bet point as a measure of the value of the project?

3. "Ability Bias" and the Returns to Education

In their 1994 article "Estimates of the Economic Return to Schooling from a New Sample of Twins" Ashenfelter and Krueger use a sample of twins to estimate the wage return to education. Essentially, the authors estimate the relationship between the within-twin difference in wages and the within-twin difference in education levels. This approach is expected to address the "ability bias" problem that has long plagued estimates of the wage return to education.

a. Describe the "ability bias" problem.

b. How does the approach used by these authors deal with the problem?

c. How do the estimates produced by this study differ from those produced in previous studies of the wage returns to education?

d. Are there any potential problems with this approach? What might explain the differences between Ashenfelter and Krueger's results and those produced by OLS regressions?

4. Unemployment Insurance and Consumption Smoothing

Most of the empirical work on unemployment insurance has focused on estimating the impact of unemployment insurance on unemployment duration and other "negative" behaviors. A researcher wants to estimate the benefits of unemployment insurance. One expected benefit of unemployment insurance is that it helps smooth consumption between periods of employment. In order to estimate the effect of UI on consumption smoothing she estimates the following equation using a sample of individuals who are employed in period *t-1* and unemployed in period *t*:

$$Y_{it} = \alpha + \beta_1 X_{it} + \beta_2 UI_{it} + \varepsilon_{it}$$

where Y is the change in individual i's expenditure on food between years *t-1* and *t*, X is a vector of individual characteristics which may affect the consumption change (such as race and gender) and UI measures the level of benefits individual i received in period *t*.

a. We would expect the estimate of β_2 to be a biased estimate of the effect of UI on consumption smoothing. Explain why. Give as many reasons as you can.

b. Suppose that the researcher's data come from the PSID or a similar type of dataset. Is there a better way to exploit the PSID data than the model described above? What is the best way of isolating the causal effect of UI on consumption given these data? Explain, writing down a different equation if necessary. Describe any remaining problems with the new approach.

5. Joint Labor Supply

Suppose you are interested in analyzing the impact of taxes and transfers on married couples' labor supply. In particular you are interested in the labor supply of secondary earners. For the purposes of this question you can assume that the secondary earner is the woman. Assume that the couple has no non-labor income, they have wages w_0, w_1, choose hours h_0 and h_1, leading to earnings of E_0 and E_1. The subscript *0* refers to the man and *1* to the woman.

a. Present the couple's optimization problem assuming that they have a joint utility function and budget constraint.

b. Now present the woman's labor supply choice in the context of a secondary earner model. (Recall that in the secondary earner model the woman takes the labor supply and earnings of the man as given and exogenous. She then makes the labor supply choice that maximizes utility.) Show this problem graphically and illustrate two alternative utility maximizing choices: working and not working. How do the slopes of the indifference curves differ across these two cases? Consider the comparative statics of the secondary earner model. In particular, how does an increase in the man's hours of work affect the woman's optimal labor supply? How does an increase in the woman's own wage affect her labor supply?

c. Many argue that progressive marginal tax rates and the phase out rate in the Earned Income Tax Credit create adverse work incentives for married women. Use the secondary earner model to formalize these criticisms.

6. Welfare and Family Structure

a. A longstanding criticism of the U.S. welfare system is that it encourages the formation of female headed households. Present an economic model of female headship that demonstrates this prediction. (Assume that a married couple is not eligible for welfare.) Put together the model of your choice but be careful to state your assumptions clearly. In your model, discuss how an increase in benefit levels impacts female headship.

b. Suppose a researcher provides you with the following time series regression:

$$FH_s = 0.5 + 0.01 * B_s$$

where FH_s is the female headship rate in state s and B_s is average welfare benefits in state s. The benefits are expressed in 100s of dollars (so $B=2$ means average monthly benefit levels of $200). Are these results consistent with the theory? Interpret this regression estimates. In particular, what does model say about how increases in benefits affect female headship? Suppose that in this period welfare benefits average $400. Then what does the regression predict about what female headship rates would be if welfare programs were eliminated?

c. This cross state approach is criticized widely in the literature. Why? An alternative estimation approach is taken by Moffitt in his 1994 article "Welfare Effects on Female Headship with Area Fixed Effects." Explain what he does and how this approach addresses the criticisms of the model in part (b).