# Labor Economics Field Exam
# September 2012

## Instructions

You have 4 hours to complete this exam.

This is a closed book examination. No written materials are allowed. You can use a calculator.

**THE EXAM IS COMPOSED OF TWO QUESTIONS. EACH QUESTION IS WORTH 100 POINTS. YOU MUST OBTAIN AN AVERAGE OF 75 POINTS IN THE TWO QUESTIONS TO PASS THE LABOR FIELD EXAM.**

**Please answer each question in separate booklets.**

**First Question. 100 Points**

Consider an economy populated by men and women who live for five periods, $t = 1, ..., 5$, and are endowed with a particular initial wealth $W_i$ and ability $\phi_i$. There are two levels of ability, $\phi_L$ and $\phi_H$ with $0 < \phi_L < \phi_H$. In the first period $t = 1$, they all attend and graduate from high school (there is no decision). In the second period $t = 2$, they receive with probability $0 \leq \eta_{hs} \leq 1$ a wage offer from the distribution for high school graduates $f_{hs}(w)$, which is independent of ability. Conditional on the wage offer, they have to decide whether to work at the given wage, attend college, or stay at home (if they have no wage offer, set the wage to zero). If they decide to work or stay at home, they cannot choose college in later periods. If they decide to attend college they pay tuition in the amount $CT$. Individuals that graduate from college receive with probability $0 \leq \eta_c \leq 1$ a wage offer from the distribution for college graduate $f_c(w)$ for the rest of their life. The college distribution is such that for each wage realization $w_c = (1 + \phi_i) w_{hs}$, i.e. the college distribution is obtained by shifting to the right the high school distribution by an amount that depends on the individual ability. College lasts just one year. The only human capital is the one accumulated in school (experience has no effect on the wage).

At age $t = 3$, all individuals meet a potential partner with match quality $\theta$ and decide whether to marry. If they choose not to marry, they will stay single for the rest of their life. If they choose to marry, the two spouses make joint decisions cooperatively without commitment. In each period in which they are married, a couple draws a new match quality and gives birth to a child with probability $pc$. If a couple gives birth to a child, the mother cannot work in that period. A married couple with children has to pay a fixed cost $CC$ for each child. In periods, $t = 3, 4, 5$ individuals choose consumption, labor supply, savings given the wage offers they receive in that particular period. Married individuals can also choose to divorce if optimal. If they divorce, they will be single for the rest of their life. If they have children, they stay with the mother who pays the entire cost.

The divorce rate in the economy $d_t$ is common knowledge and it is used in periods 2 and 3 by individuals to learn the probability they will divorce in case they get married. The divorce rate is constant at 5%.

1. (10 points) Consider a single individual in period $t = 5$. Write down her or his decision problem. Consider a married couple in period $t = 5$. Write down their decision problem.

2. (10 points) Write down the decision problem of a single individual and of a couple in period $t = 4$.

3. (10 points) Write down the decision problem of an individual who meets a potential spouse in period $t = 3$.

4. (10 points) Consider an individual in period $t = 2$. Write down his or her decision problem. How does the information about the current divorce rate affect the decision problem?

5. (10 points) Do the decisions of men and women differ? If yes, in what dimensions?

6. (10 points) Now suppose that for exogenous reasons the divorce rate doubles to 10%. What is the effect of this change on the individual decisions in period $t = 2$? What about period $t = 3$?

7. (10 points) Now suppose that in case of divorce, the father keeps the children and has to pay the entire cost. Moreover, when the couple gives birth to a child the father cannot work in that period. How does your answer to part 5 change?

8. (10 points) Now suppose that in case of divorce, the mother and father split the time they spend with their children and the corresponding cost. Moreover, they both can work in case of a birth. How does your answer to part 5 change?

9. (10 points) What data do you need to estimate the model (you can create experiments to generate the data you need as long as they are feasible)? What estimation method would you use to estimate the model?

10. (10 points) Suppose you have successfully estimated the model. Describe at least two counterfactuals/policies that would be interesting to simulate using the estimated model.

**Second Question. 100 Points**

Choose **THREE** out of the next four questions. Each answer should be approximately one page long. Each is worth 33.3 points.

(a) A researcher can observe the exact day of the month on which retirees are paid their Social Security benefits (suppose that this day varies randomly across the population). He uses a regression discontinuity analysis to test for changes in consumption around this date. He finds that consumption is 15% higher on the day in which households receive their Social Security check than it was the previous day, and interprets this as a rejection of the Life-Cycle/Permanent Income Hypothesis.

Comment on any issues you can think of that would question the researcher's conclusion.

(b) You are interested in measuring the magnitude of productivity risk for workers aged 60 to 70. (Suppose, for simplicity, that there is no employment risk at these ages.)

You start by analyzing the data for these workers. You find that by age 60 all of them are working full-time. From age 61 onwards, you observe some workers becoming retired (i.e. working 0 hours) in every period. You also observe many individuals working part-time for one or two periods before full retirement.

You read an article talking about a phenomenon called "partial retirement". Many workers are not sure whether they are ready to retire. Partial retirement is defined as an arrangement whereby a worker voluntarily chooses to work part-time for some years in order to get used to retirement before completely withdrawing from the labor force. Hourly wages are lower for partially retired workers than for full-time workers.

Explain how you would incorporate partial retirement into a life cycle model of consumption and labor supply in order to obtain unbiased estimates of productivity risk. Explain how inappropriately modeling partial retirement can lead to biased estimates.

(c) Early papers in the literature estimating the intertemporal elasticity of substitution of labor supply (IES) run OLS or IV regressions of hours on wages. Different papers have argued that this procedure may lead to incorrect conclusions if young workers need to accumulate human capital. As a result, other researchers have argued that we should use samples of older workers to estimate the IES.

Imagine that you have data following workers from age 50 to age 70. Let us assume that by age 50 all men in your sample are working, and by age 70 all of them have already retired. Let us also assume that we can ignore human capital accumulation for this sample of workers. Can you think of any other issues that would lead to biased estimates of the IES in the standard regressions?

(d) You read a newspaper article claiming that many Baby Boomers are at risk of running out of assets before the end of their lives, since a significant proportion of them have virtually no savings by the time they retire.

However, different papers have argued that the saving behavior of these households is optimal from a life-cycle perspective. Which arguments do they use to support this claim?