Retake Exam in the Course:

Topics in Labor Economics

19 April 2010

You have to provide answers to three of the following six problems. If you answer more than three problems only the answers to the first three problems with the lowest numbers will count. Each problem answered is worth 40 minutes of your time.

Your answers have to be in English. Only, if you are a diploma student, your answers can be either in English or in German. In case, please mark at the beginning of the exam, that you are a 'DIPLOMA' student.

The maximum number of credits is 30.

The exam lasts 120 minutes.

Use a new answer sheet for each problem.

Please write your name and your immatriculation number ("Matricelnummer") on top of all answer sheets, if applicable.

The exam consists of 4 pages including this cover page. Please check its completeness.

This is a closed-book exam.

Good Luck!
Please provide answers to three of the following six problems. On the answer sheets, mark clearly which problems you solve.

1.) Describe the basic intertemporal labor supply model with additively separable preferences over time. What is the Frisch labor supply function? What are the labor supply responses to evolutionary wage changes and to parametric wage changes? When modelling empirically intertemporal labor supply, what would you do to take account of the life cycle effect? How do you view an estimate for a static labor supply function from the perspective of the intertemporal labor supply model?

2.) Sketch Card’s basic economic model to explain the amount of human capital investment. What are the implications of this model for the estimation of the causal returns to education? In this context, explain in detail the economic meaning of “Ability–Bias”, “Self–Selection–Bias”, and “Measurement–error–Bias”.

3.) Explain the hypothesis of skill–biased technical change (SBTC) and its implications on labor demand, employment, and wages. Operationalize the concept based on a CES production function. How can SBTC be tested empirically? Discuss and critically assess possible tests. How can one distinguish SBTC from the effects of international trade or from the effects of outsourcing/offshoring abroad?
4.) Consider job search and answer the following questions.

a) Describe the main assumptions of the basic job search model as well as the search strategy of workers (a formal derivation of the model is not necessary). Characterize shortly the additional assumptions required to develop the equilibrium search model.

b) Graversen/van Ours (IZA Discussion Paper 4079) analyze how a mandatory activation program in Denmark reduced unemployment duration. Summarize their identification strategy and their main results. If you were a referee for the paper, which aspects of the paper would you criticize?

5.) Consider the labor supply of a household.

a) Sketch the unitary model and the collective model of household labor supply. What are the limitations of the unitary model? Which empirical regularities can the collective model explain, which the unitary model can not explain?

b) Describe formally in some detail the collective labor supply model used by Chiappori, Fortin, Lacroix (2002) and discuss some of its limitations. In which respects does it fall behind many of the unitary models of labor supply (including the ones that you have encountered during the course “Topics in Labor Economics”)?

c) The political party FDP has recently proposed a reform of the German income tax. Your boss asks you to program a microsimulation model in order to evaluate the effect of the reform on labour supply. Sketch how you would do this. Take account of household labor supply decisions. **Hint:** It is not necessary to mention in your answer details of the reform proposal, or of the existing income tax system. It is enough to sketch the method for a general income tax system and a general reform.

[10 credits]
6.) Assume the following general model of the **technology of skill formation** according to Cunha et al., 2006 (as introduced in our lecture):

\[
\begin{align*}
S^C & = \text{vector of cognitive skills} \\
S^N & = \text{vector of non-cognitive skills} \\
I^k & = \text{parental investment in skill k with } k = C, N \\
S_0 = (S_0^C, S_0^N) & = \text{skills at birth (initial conditions)} \\
S_t^k = f^k_t(S_{t-1}, I^k_t) & = \text{technology of production of skill k in period t with } t = 1, 2 \\
h = g(S_2^C, S_2^N) & = \text{adult human capital}
\end{align*}
\]

a) Explain the feature of 'self-productivity' in this model. [1 credit]

b) Define (using the formulas) and explain the meaning of critical and sensitive periods as well as direct complementarity in the production of skills. [3 credits]

c) Now, the model is specified as follows (as in our lecture):

For the first period:

\[
\begin{align*}
S_1^C &= f_1^C(S_0, I_1^C) = I_1^C \\
S_1^N &= f_1^N(S_0, I_1^N) = I_1^N
\end{align*}
\]

For the second period:

\[
\begin{align*}
S_2^C &= f_2^C(S_1, I_2^C) = \left\{ \chi_1(S_1^C)^\alpha + \chi_2(S_1^N)^\alpha + (1 - \chi_1 - \chi_2)(I_2^C)^\alpha \right\}^{1/\alpha} \\
S_2^N &= f_2^N(S_1, I_2^N) = \left\{ \eta_1(S_1^C)^\sigma + \eta_2(S_1^N)^\sigma + (1 - \eta_1 - \eta_2)(I_2^N)^\sigma \right\}^{1/\sigma}
\end{align*}
\]

What does this specific model imply for different values of \( \alpha \) and \( \sigma \)? [6 credits]

[10 credits]

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**END OF EXAM**