Exam in the Course:

Topics in Labor Economics

15 February 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 (“Matrikelnummer”) on top of all answer sheets, if applicable.

The exam consists of 5 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 and illustrate graphically the static labor supply model with the possibility of transfer income but without taxes. Regarding transfer income, discuss both the case of Arbeitslosengeld II (Germany) and the case of an earned income tax credit (US) in a very stylized way. Distinguish between participation and hours worked. What is the reservation wage?

How do participation and hours worked react in response to ...

- (For the German case:)
  ... an increase of nonlabor income?
  ... a reduction in benefit reduction rates?

- (For the US case:)
  ... an increase in the wage subsidy in the phase-in area?
  ... an increase in the maximum total wage subsidy?

In your answer, distinguish between workers who do not work before the change and workers who do work before the change. Assume that leisure is not an inferior good. Which welfare model do you think involves stronger incentives to work? What type of empirical evidence would you need to provide a reliable answer to the previous question?

**Note:** A formal mathematical derivation of the labor supply responses is not necessary.

[10 credits]

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”.

[10 credits]
3.) Describe formally the static labor demand model. Explain the formal optimization problem with the three decision variables output $Y$, employment $L$, and capital $K$.

a) Assume monopolistic competition in the goods market and monopsonistic competition in the factor markets. Interpret the economic content of the first order conditions. What is the economic interpretation of the Lagrange multiplier? Is there a well defined labor demand function? Explain and illustrate graphically the determination of the level of employment by the firm.

b) Now assume competitive factor markets but still monopolistic competition in the goods market. How do the answers to part a) change? Explain and illustrate graphically the substitution effect and the scale effect in labor demand.

[10 credits]

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, what aspects of the paper would you criticize?

[10 credits]
5.) Consider the collective model of labour supply. Provide short and concise answers to the following questions.

a) The unitary model of labour supply assumes that the household chooses household consumption $c$ and individual labour supplies $h^f$ and $h^m$ which maximize $U(h^m, h^f, c)$, subject to the constraint that $c \leq w^m h^m + w^f h^f + y$, where $y$ is household non-labour income. Discuss shortly the limitations of this model.

b) A popular alternative to the unitary model is the collective model, of which the article discussed in class (Pierre-André Chiappori, Bernard Fortin, and Guy Lacroix, 2002, "Marriage Market, Divorce Legislation, and Household Labor Supply," Journal of Political Economy, is an example. Write down the household’s maximization problem in the collective model. Include two distribution factors $s_1$ and $s_2$ and a vector $z$ of preference factors.

c) What is the definition of a “distribution factor” in the sense of the collective model? What are the two distribution factors that Chiappori, Fortin, and Lacroix use in their empirical application? Discuss possible threats to the validity of the distribution factors used by Chiappori, Fortin, and Lacroix. How do they deal with these concerns in their empirical section?

d) Assume from now on that $s_1$ and $s_2$ are valid distribution factors. Chiappori, Fortin, and Lacroix derive a first testable restriction on individual labour supply functions, namely that

$$\frac{\partial h^m / \partial s_2}{\partial h^m / \partial s_1} = \frac{\partial h^f / \partial s_2}{\partial h^f / \partial s_1}$$

Which assumption – in addition to the existence of the two distribution factors $s_1$ and $s_2$ – is needed to derive this restriction? Why do Chiappori, Fortin, and Lacroix not derive and test restrictions on individual consumption demand as well?

e) Under an additional assumption, the household’s maximization problem can be decentralized as follows: the couple first divides up non-labour income into $\phi^f$ and $\phi^m = y - \phi^f$; in a second stage, each spouse chooses $c^i$ and $h^i$, $i = \{m, f\}$, in order to maximize his or her own utility function, subject to $c^i \leq w^i h^i + \phi^i$. Which additional assumption allows for such a decentralization?

f) Assume that the assumption asked for in the previous question has been imposed. Discuss which parts of the sharing rule $\phi^f$ can and which parts cannot be identified from the estimation of individual labour supply functions.

g) Discuss some general limitations of the labour supply model used by Chiappori, Fortin, Lacroix (2002). In which respects does it fall behind many of the unitary models of labour supply (including the ones that you have encountered during the course “Topics in Labor Economics”)?

[10 credits]
6.) Consider Heckman’s technology of skill formation.

a) A journalist wants you to explain the basic ideas of Heckman’s technology of skill formation (as introduced in our lecture). Explain the ideas in concise but accurate sentences as for a reader from a none-scientific background. Specifically, explain the main ideas of the model including the meaning and impacts of self-productivity and complementarity.

b) Now you are a Ph.D. student again (not a journalist): Criticize Heckman’s technology of skill formation (referring to the model as introduced in the lecture). In your opinion: What are innovative and positive features of this model? Which features or assumptions are more problematic? Explain your critique using accurate sentences and referring to the technology’s formulas whenever appropriate. Be as specific as possible.

[10 credits]

END OF EXAM