Stockholm University

Department of Economics

Course name:	**Development Economics**
Course code:	**EC7310**

Examiner:	**Jakob Svensson**
Number of credits:	**7,5 credits**
Date of exam:	**Saturday 5 December 2015**
Examination time:	**3 hours [09:00-12:00]**

Write your identification number on each paper and cover sheet (the number stated in the upper right hand corner on your exam cover).

Use one cover sheet per question. Explain notions/concepts and symbols. If you think that a question is vaguely formulated, specify the conditions used for solving it. Only legible exams will be marked. **No aids are allowed.**

The exam consists of 4 questions. Question 1 is worth 30 points, question 2 is worth 20 points, question 3 is worth 30 points, and question 4 is worth 20 points, for 100 points in total. For grade E 50 points are required, for D 60 points, C 70 points, B 80 points and A 90 points.

Your results will be made available on your "My Studies" account (www.mitt.su.se) on 18 November at the latest.

Good luck!

Multiple choice: True or false

State if the following statements are true or false or provide the requested number (sub-question a). You do not need to provide any additional information (even if you may need to "solve" the different "problems" yourself). *Each correct sub-question is worth 5 points. Each incorrect sub-question is scored −5 points. A blank answer is scored 0 points.* The maximum total score on question 1 is 30 points. The minimum total score is 0 points (even if # incorrect answers > # correct answers).

1. Please state if the following statements are "true" or "false" or provide the requested number (sub-question a).

   (a) In a fictional economy, suppose that output grew at 4%, capital input at 4%, and labor input at 1%. The production function is $Y = BK^\alpha L^{1-\alpha}$, where the total labor bill is measured as 50% of total income. How much in percent of total labor productivity (output per worker) was accounted for by technology (B)?

   (b) In de Mel, Mckenzie, and Woodruff's (2008) paper on the returns to capital, the authors show that firm owners with more assets have lower return to capital.

   (c) In Banerjee, Gertler, and Ghatak's (2002) paper on the tenancy reform in West Bengal, the authors show (in their model) that adding eviction as an additional instrument to control the tenant will only affect the behavior of tenants with low relative income (or low outside option).

   (d) In Miguel and Kremer's (2004) deworming paper, the authors find no evidence of across-school externalities when the distance to the nearest treatment school is more than 3 kilometers.

   (e) In Acemoglu and Johnsson's (2007) paper on health and income at the macro level, the authors find a positive significant effect of health (life expectancy) on population but no significant effect of health on number of births.

   (f) In Banerjee, Gertler, and Ghatak's (2002) paper on the tenancy reform in West Bengal, the authors find that the effect of reform (on yield) was lower in the first four years after the reform compared to years 5-8 after the reform.

Short essays

You should not use more than 2 pages to answer the question. Worth 20 points.

2. Discuss the two mechanisms to cope with risk illustrated in the work of Townsend (1994) and Paxson (1992). What are the key assumptions in their models and are they reasonable? What are the key implications of their models?

Problems

Question 3 is worth 30 points and question 4 is worth 20 points.

3. Suppose teachers engage in two tasks: t_1 and t_2. Teachers produce human capital H according to

$$H = f_1 t_1 + f_2 t_2$$

where f_j:s are marginal products of time. Teachers are paid according to a performance contract $w = s + bP$, where s is a base salary, P is a performance measure (test scores) and b is a bonus rate. A teacher's utility U is given by

$$U = w - \frac{1}{2}\left(t_1 - \bar{t}\right)^2 - \frac{1}{2}(t_2)^2$$

where $\bar{t}_1$ denotes the norm for teaching.

The principal does not directly observe H or t_j, but she knows f_j and she observes test scores P and knows that P is a function

$$P = t_1 + t_2 \ .$$

(a) Assume the principal wants to maximize $H + U - w$. Explain intuitively what the principal then maximizes?

(b) Solve for the teacher's optimal choice of task 1 and task 2 when either $b = 0$ and when $b > 0$ and interpret your findings.

(c) Solve for the optimal contract; i.e. solve for s and b, when the principal maximizes $H + U - w$ (assuming the principal does not directly observe H or t_j) and that the teacher's outside option is given by U_0. Interpret your findings.

(d) Compare the amount of human capital produced when $b = 0$ and when b is the solution to the optimal contract in question 3c.

4. Consider the following model of schooling. Assume the household head makes the decision for his/her child. The household has one child that it can potentially send to school. There are two periods. In period 1, the child either works at home, goes to school, or both. In the second period, the child is an adult and works for a wage. In period 1, the household head derives direct benefit from the child's work (at home), while in period 2 the household head benefits from transfers from the child (now an adult). The household head's utility function is

$$U = c_1 + \delta c_2$$

where c_t is the household head's consumption in period t (i.e. the difference between income and the cost and return of schooling and home production in each period). δ is a discount factor. In each period the household receives an exogenously given income of y. The household cannot borrow or save.

Cognitive skills, a, are acquired according to

$$a = s^\alpha$$

where $\alpha \in [0,1]$ and $s \in [0,1]$ is the share of time in period 1 spent in school ("years of schooling").

The unit cost of schooling is p (so total cost for s years of schooling in period 1 is ps). The household head's marginal return from having the child work at home is η (so total income generated from home production by the child in period 1 is $\eta(1-s)$).

The relationship between income for the child as an adult in period 2, y_c, and a child's cognitive skills (determined in period 1), a, is

$$y_c = \omega a$$

and a share γ of the child's income as an adult in period 2 is transferred to the head of the household.

Solve the head of household's problem; i.e. derive an expression for the years of education he/she will choose for his/her child. Interpret you findings and discuss how p, η, ω, and y_c affect s.