



Department of Economics

**Course name:** Development Economics

**Course code:** EC7310

**Examiner:** Jakob Svensson

**Number of credits:** 7,5 credits

**Date of exam:** Wednesday 28 October 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.**

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The exam consists of 6 questions. Question 1 is worth 25 points, questions 2 and 3 are worth 15 points each, questions 4 and 5 are worth 13 points each, and question 6 is worth 19 points, for 100 points in total. For grade E 50 points are required, for D 55 points, C 60 points, B 75 points and A 90 points.

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

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**Good luck!**

## Multiple choice: True or false

State if the following statements are true or false or provide the requested number (sub-question a,b). 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 25 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" provide the requested number (sub-questions a,b).
  - (a) In a fictional economy, suppose that output grew at 2%, capital input at 2%, 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) Based on data of average years of schooling of adults (15+) from 1960 to 2010, approximately how many years does the low income group lag behind the high income group (Hint: the correct answer is one of the following numbers: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100)
  - (c) In Miguel and Kremer's (2004) deworming paper, the authors show that average school participation of students in treatment schools receiving deworming treatment when offered was not significantly higher than average school participation of students in treatment schools that did not receive deworming treatment.
  - (d) In Banerjee's et al. (2013) evaluation of a microfinance program in India, the authors find that while the majority of households did take up microloans, there was no impact on average monthly expenditure per capita.
  - (e) In Acemoglu, Johnson, Robinson's (2001) paper on the colonial origins of comparative development, the authors show that their main IV estimate is larger than the OLS estimate; i.e., that the OLS regression underestimate the true effect of institutional quality on long run income.

## Short essays

You should not use more than 2 pages to answer each question. Worth 15 points each.

2. Chen and Ravallion (2010) exploit new data and revise the methodology for estimating global poverty. Briefly discuss these changes and Deaton's critique of the new approach. [15p]
3. Jack (2013) discusses a series of market inefficiencies that constrain the adoption of beneficial agricultural technologies. Briefly discuss three of these market inefficiencies. [15p]

## Problems

Worth between 10-25 points each.

4. Consider the following model with a landlord and a tenant. The tenant's output  $y$  (working on the landlord's land) is  $y = e + \theta$ , where  $\theta$  is a random error term with mean 0 and where  $e$  is effort exerted by the tenant.

The landlord observes only  $y$ . Assume the landlord offers a contract to the tenant of the form

$$y_T = \alpha y - R$$

where  $y_T$  is the tenant's payoff,  $\alpha$  is the sharing rule and  $R$  is the fixed rent the tenant must pay.

Assume the cost of exerting effort (for the tenant) is

$$c(e) = \frac{1}{2}ce^2$$

where  $c > 1$ . Assume further that the tenant have no outside option and that both the tenant and the landlord is risk-neutral.

Solve for the optimal sharecropping contract (that is  $\alpha$  and  $R$ ) and interpret your results. [13p]

5. Consider the following Solow growth model

$$Y = BK^\alpha L^{1-\alpha-\beta} T^\beta$$

where  $\alpha + \beta < 1$ ,  $B$  is a Hicks neutral productivity term,  $K$  is capital,  $L$  is labor and  $T$  is fixed amount of land. The capital accumulation equation is

$$\dot{K} = sY - \delta K$$

Let  $T = 1$  (normalization),  $n = 0$ ,  $g = 0$ , and  $B = 1$ . Solve for the steady state income per capita level and interpret your findings. [13p]

6. Consider a firm with a production technology  $Y = f(K, \theta) = \theta K^\alpha$ , where  $K$  is capital and  $\theta$  is ability. The firm owner has no assets but can borrow at a market rate  $r$ .

- (a) Assume that there are two types of firms, low ability types with  $\theta = 1$  and high ability types with  $\theta = 2$ . Further assume that  $\alpha = \frac{1}{2}$  and that  $r = \frac{1}{4}$ . Solve for the optimal level of the capital stock for the two types of firms and interpret your results. [9p]
- (b) Assume now instead that firms only can borrow up to a maximum of 9 units; i.e., that the firms face a borrowing constraint  $K \leq 9$ . Determine the marginal product of capital for the two types of firms and interpret your results. [10p]