

# Exam in ECON1910, Spring 2012

## Guidelines for examiners

This exam consists of two parts. You need to answer all the questions in Part 1 *and* all the questions in Part 2. You can write in English or Norwegian.

### Part 1: Short questions (weight 1/3)

Answer *briefly* (about one page each) the following two questions:

- (a) Two countries, North and South, both produce and consume the same two goods, Rice and Computers, in autarky. Assume that labor is the only input factor in the production of the two goods. Both countries are endowed with 100 units of labor. The table below shows how much labor is needed to produce the two goods in the two countries.

Labor required	One computer	One sack of rice
In North	4	2
In South	1	1

Assume initially that there is no trade between the two countries. If we open for trade, will both countries continue to produce both goods? If not, is it possible to predict which country will specialize in the production of which good? Can trade be welfare-improving in this case? Why or why not?

**Answer:** *Comparative advantages: North has a comparative advantage in the production of rice, since the relative price of rice is  $1/2$  in the North and  $1$  in the South (The example is similar to the example used in the textbook (Ray, Ch. 16), but here the South has absolute advantage in the production of both goods rather than North and the North has comparative advantage in Rice rather than computers). If we open for trade, North will specialize in the production of rice while the South will specialize in computers. Since the relative productivities are different for the two countries, there are gains from trade. The consumption possibility frontier with trade dominates the production possibility frontier = consumption possibility frontier without trade.*

- (b) An aid organization is interested in finding the causal effect of providing a meal during the school day on school attendance in Ethiopia. Suggest a research design that would allow the aid organization to identify the effect of such a program.

**Answer:** *Evaluation using a randomized controlled trial is the way to go. A good answer must outline how such an experiment should be performed, i.e. should we compare students to students in the same class, should we compare students to students in different classes or perhaps across different schools. The correct design depends on whether there are spill-over effects from the treatment group to the control group. The really good students should notice that spill-over effects probably is less of a problem here than for the example we used in the lecture, which was the effect of textbooks on learning.*

Figure 1: Real GDP per capita growth 1960–2005 vs. GDP per capita in 1960. Data from Penn World Tables.

## Part 2: Essay question (weight 2/3)

Answer *all* of the following questions. Each question has the same weight.

- (a) Explain how and why accumulation of capital may lead to growth in GDP per capita in the short run and in the long run in the Solow growth model. What is the effect of a change in the savings rate  $s$  on short run and long run growth and level of GDP per capita?

*Answer: Standard Solow model-stuff. Note that the students are not required to use math—a verbal (and perhaps graphical) analysis of the model is fine, provided that the candidate is precise on the mechanisms in the model.*

- (b) Figure 1 shows a scatterplot of *growth rates* of GDP per capita from 1960 to 2005 (on the  $y$ -axis) and the *level* of GDP per capita in 1960 (on the  $x$ -axis) for a set of countries.<sup>1</sup> Is the Figure consistent with the predictions of the Solow model? Discuss some factors that can explain the difference between what the model predicts and what we see in the graph.

*Answer: There are two possible answers here: 1. the figure is not consistent with the simple Solow model, and the explanations for this can for example be related to institutions etc. (along the lines of Acemoglu and Robinson), or 2. the figure might be consistent with the Solow model if we assume different savings rates, population growth rates etc across countries, i.e. an argument along the lines of Mankiw, Romer, and Weil. We really were after the first answer, but the second is obviously also OK.*

- (c) Explain what we mean by a poverty trap (at the macro level) and how it would manifest itself in a model similar to the one discussed in (a). What factors can cause such poverty traps? Is the graph studied in (b) consistent with a model with poverty traps?

*Answer: This is covered in Easterly (2009). We discussed varieties of a Solow model where the production function is non-concave so multiple equilibria. Non-linear savings also covered, but in less detail. Several factor inducing poverty traps were mentioned, but most emphasis on non-convexities in production and big push-arguments. The graph should have low levels of growth until some level (where the trap “is”) and then high growth suddenly after. Not seen in graph!*

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<sup>1</sup>Note that the  $x$ -axis is on a log-scale. This is not important, it is just done to make the graph more readable.