

Written Exam for the M.Sc. in Economics, Winter 2011/2012

Advanced Development Economics – Macro Aspects

Master's Course

2.1.2012

(3-hour, closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by “eksamen på dansk” in brackets, you must write your exam paper in Danish. If you are in doubt about which title you registered for, please see the print of your exam registration from the students' self-service system.

The percentage weights assigned to each question should only be regarded as indicative. The final grade will ultimately be based on an assessment of the quality of the answers to all questions in the exam in their totality

A. Verbal question (50%)

Consider the following production function

$$Y = K^\alpha (AhvL)^{1-\alpha}$$

Where Y is GDP; K is the capital stock; A is an index capturing productivity (technology etc); h is a measure of human capital in the sense of schooling, v is a measure of human capital in the sense of health (v for “vitality”) and L is the labor force. The parameter α is bounded between zero and one.

Question A1. Shastry and Weil conducts a development accounting analysis using this set-up. (a) Why is it reasonable to put “ v ” in the production function? (b) How do the authors measure “ v ”, and what do they find? (c) Discuss briefly strengths and weaknesses of their analysis.

In a highly influential empirical study on the “colonial origins of comparative development”, Acemoglu, Johnson and Robinson hypothesize that poor institutions, in the sense of checks and balances on government and thus property rights protection, were put in place by colonial rulers in countries with high *settler mortality rates* at the end of the 19th century.

Question A2. (a) Explain how this hypothesis can be of use in empirically identifying the impact of property rights institutions on long-run income per capita. (b) Do you find the exclusion restriction is plausible in this case? Explain.

B. Analytical question (50%)

Consider an economy in the process of development. Time is discrete, $t=0,1,2,\dots$ and extends into the infinite future. Individuals live for two periods. Each “household” is represented by a unique parent, who will be rearing a number of off-spring, n_t . Accordingly, as a matter of accounting, the population at time $t+1$, L_{t+1} , is given by the population in the previous period multiplied by the number of off-spring: $L_{t+1}=n_tL_t$.

In the first period of life individuals are children. During this period, the child live off the consumption of her parent. In period two individuals are grown up. They work and decide on how to divide their resulting income, y_t , between consumption, c_t , and expenditure on having off-spring on their own, n_t . Since individuals have log preferences defined over consumption and offspring the optimal number of offspring can be shown to be $n_t = \eta y_t$, where η is a positive parameter reflecting the weight on the number of children in the utility function and the cost of a child in units of income. Finally, income per capita, $y_t = A(X/L_t)^\alpha$, where $0 < \alpha < 1$, A represents the level of technological development and X is a fixed factor (land).

Question B1. Show that the law of motion for income per capita can be written

$$y_{t+1} = \eta^{-\alpha} y_t^{1-\alpha} \equiv \phi(y_t)$$

Definition: A steady state is a $y_{t+1} = y_t = y^*$ such that $y^* = \phi(y^*)$.

Question B2. Examine the mathematical properties of $\phi(y)$ and proceed to construct the phase diagram for the model in (y_t, y_{t+1}) space. Does a steady state exist? Is it unique? Is it stable? Derive steady state income per capita, y^* .

Question B3. Suppose the economy is in steady state. Analyze, using the phase diagram, the consequence of a subsequent permanent increase in technology, A . What happens to y on impact? In the long-run steady state? Explain what the economic intuition is for these results.

Question B4. Derive steady state population density and discuss what the long-run impact is from a permanent increase in A .

Question B5. Discuss the model's empirical plausibility and it's potential policy relevance.