Written Exam for the M.Sc. in Economics winter 2013-14

Advanced Development Economics – Macro aspects

Master's Course

January 2nd , 2014

(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.

The exam consists of 2 pages in total.

A : Verbal questions

Question A.1.
In 1967 the Suez canal was abruptly closed until 1975. Explain how this event might allow us to identify the impact of trade on growth econometrically.

Question A.2.
The impact of life expectancy on growth has been debated intensively in recent years. Provide an overview of this debate.

B: Analytical questions

Rent-seeking and development

Consider an economy where individuals have a choice between three sorts of occupations: they can be a rent-seeker, a cash-crop "market farmer" or a subsistence farmer. As a market farmer you earn an income of α if you are *not* approached by a rent-seeker. This level of income exceeds the potential as a subsistence farmer, γ: $\alpha>\gamma$. A rent seeker can at most extract β units of income from the market farmer, and nothing from a subsistence farmer who are shielded from rent-seeking. Agents are rational, i.e. they know the structure of the model. The ratio of rent seekers to market farmers is denoted n, which is also the probability that a market farmer is approached by a rent-seeker.

Question B.1. *Provide an interpretation of the parameter β.*

The *expected* pay-off to being a market farmer, as a function of the relative number of rent-seekers, is $\alpha-\beta n$ for $n<n'=(\alpha-\gamma)/\beta$, and γ for $n\geq n'$. Similarly the pay-off to being a rent-seeker is β for $n<n'$ and $(\alpha-\gamma)/n<\beta$ for $n\geq n'$.

Question B.2. *Explain the logic behind these pay-offs.*

An equilibrium in this economy is an allocation of the population between cash-crop production, subsistence production, and rent-seeking.

Question B.3. *Assume $\beta<\gamma$. Characterize the equilibrium of the economy, and the level of per capita income.* (hint: it is helpful to illustrate the pay-offs in a simple figure, with pay-offs on the vertical axis, and *n* on the horizontal axis.)

Question B.4. *Assume $\beta>\alpha$. Characterize the equilibrium of the economy, and the level of per capita income.* (hint: it is helpful to illustrate the pay-offs in a simple figure, with pay-offs on the vertical axis, and *n* on the horizontal axis.)

Question B.5. *Assume $\alpha>\beta>\gamma$. Characterize the equilibrium of the economy, and the level of per capita income.* (hint: it is helpful to illustrate the pay-offs in a simple figure, with pay-offs on the vertical axis, and *n* on the horizontal axis.)

Question B.6. *Discuss the empirical relevance of the model.*

<u>Optimal fertility, income and child mortality</u>

Consider an adult household member who has the following utility function

$$U=\gamma\log(n)+(1-\gamma)\ln(c)$$

Where *n* is the number of surviving children (i.e., "net fertility"), and *c* is household consumption. Only a fraction σ of the born children survive: $n=\sigma b$,where b is the number of births. We assume there is no uncertainty regarding survival: parents know the fraction of births where the children die off with subjective certainty.

The household has a total income of *y,* which is spend on consumption and having offspring. The total cost of *n* offspring is $\lambda ny+pb$, which thus has a component that depends on surviving children and a component which is relevant even if the child does not survive birth (*pb*). The problem of the household is to $\max_{c,n} U=\gamma\log(n)+(1-\gamma)\log(c), s.t.\ y\geq c+\lambda ny+pn/\sigma$.

Question B.7. *Solve the household problem and derive optimal family size, n.*

Question B.8. *Assume p=0. How does n depend on income, y? How does optimal n depend on σ? Explain why n depends on y and σ in the manner suggested by the formula*

Question B.9. *Assume p>0. How does n depend on income, y? How does optimal n depend on σ? Explain why n depends on y and σ in the manner suggested by the formula.*

Question B.10. *Discuss how the model potentially informs the debate about the causes of the demographic transition.*