

Economic Growth ECON8050

EXAM

Semester 2, 2002

Permitted Materials: anything

Answer FOUR (4) questions.

Reading time: 30 minutes

Writing time: 3 hours

QUESTION 1.

Consider a single sector economy where the output of the representative household is generated by a constant elasticity of substitution production function:

$$(1.1) \quad Y_t = a \left[bK_t^m + (1-b)L^m \right]^{1/m}; \quad a > 0; \quad 0 < b < 1; \quad m < 1; \quad m \neq 0.$$

Y_t represents output of the consumption / investment good;

K_t represents the stock of capital, which depreciates at a constant rate, δ .

L represents the labour force (equal to the population), which is constant over time.

There is no technological change, i.e. the technology parameters (a , b and m) are constant over time. The ratio $1/(1-m)$ is the elasticity of substitution between capital and labour.

The household chooses between investment and current consumption (C_t) in order to maximise V , the discounted value of infinite-lifetime utility derived from consumption:

$$(1.2) \quad V = \int_{t=0}^{\infty} e^{-\rho t} \log(C_t) dt$$

- a) Show that the marginal product of capital is decreasing in K .
- b) What is the rate of growth of output in this economy in the long-run?
- c) Explain and discuss the conditions under which this economy will exhibit strictly positive growth in the long-run (it may be helpful to illustrate with a figure).

QUESTION 2

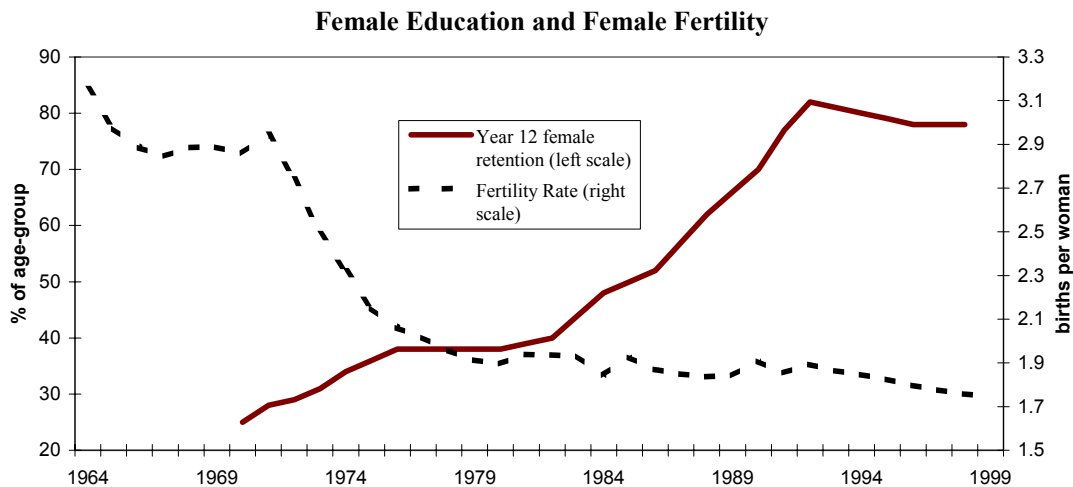
Paul Romer (1990) argues that:

- (i) the non-rivalry of knowledge, along with its partial appropriability, is essential to its role as the engine of long-run growth;
- (ii) the existence of a non-rival, fixed-cost input is incompatible with competitive (price-taking) behaviour by firms;
- (iii) monopolistic pricing by firms using the non-rival input implies that they will under-supply relative to the socially optimal level of output, hence subsidies to research can raise both growth and economic welfare.

Explain and discuss these arguments. Are they supported by evidence?

QUESTION 3

The figure below charts both the Australian fertility rate (number of births per woman) and the proportion of female teenagers who complete Year 12 at school.



- a) Discuss economic models linking endogenous fertility with human capital. Do these models help to explain the relationship between Australian fertility and female education? What other factors might be relevant?
- b) What are the implications of these models for the future growth of GDP *per head of population* in Australia, given that the current level of fertility is predicted to reduce the ratio of working-age to total population from 0.66 in 2002 to 0.60 by 2042.

QUESTION 4

Why doesn't capital flow from rich to poor countries?

QUESTION 5

- a) Explain and discuss critically the economic mechanisms that drive Schumpeterian (quality-ladder) models of creative destruction and endogenous growth. (*Mathematical derivations are not required*).
- b) Are the predictions of these models supported or rejected by the evidence?

QUESTION 6

“Econometric studies of the determinants of long-run economic growth are unable to identify policies that will stimulate growth.”

Discuss with examples on a topic with which you are familiar.