Department of Economics
Queen's University

ECON239: Development Economics
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Midterm Exam
Monday 11:30 am – 12:50 pm., November 2, 2009

Section A (50 percent)**:** Discuss the validity of THREE (3) of the following statements. In your answer define or explain as precisely as possible any terms or concepts which are underlined, with particular reference to the context in which they are being used. You should aim to make your answer no longer than a single side (two sides if double-spaced), and you should include diagrams and/or real-world examples where appropriate. All questions have equal value.

A1. Cross–country comparisons of real GNI per capita converted into US dollars at official exchange rates are a misleading indicator of relative standards of living.

A2. The poverty gap index is a better target measure of poverty then the headcount ratio because it is likely to lead to less of a bias in poverty reduction policies towards individuals who are already close to the poverty line.

A3. While a country may not fully benefit from the discovery of a new natural resource, the average standard of living of its citizens cannot fall as a result.

A4. The positive cross-country correlation between latitude and agricultural output per person reflects the effects of malaria risk.

A5. The widespread use of sharecropping despite its low productivity relative to fixed-rent tenancy may be understood once we allow for the role of asymmetric information.

Section B (50 percent)**:** Answer ONE (1) of the following **Long Questions.**

B1. Consider the following version of the augmented Solow growth model. Suppose the relationship between output per worker, y, physical capital per worker, k, and human capital per worker, h, at any point in time is represented by

$$y = f(k, h),$$

where the function $f(\cdot)$ is increasing in k and concave. Suppose also that there is no technological change, population growth is n, the savings rate is s and the rate of depreciation of capital is δ.

(a) Explain intuitively why the dynamic evolution of k is described by the equation

$$\Delta k = sf(k, h) - (n + \delta)k.$$

(b) With the aid of a diagram, illustrate the steady state capital stock per worker, k^*. If the initial value of k differs from k^*, illustrate the process by which the economy converges to the balanced growth path.

(c) Illustrate on a diagram the impact of an increase in the stock of human capital, h, on the level of output per capita along the balanced growth path. Describe how the economy adjusts from its original steady state to its new one.

(d) Under the neoclassical assumption that wages are proportional to human capital, explain how you might go about estimating relative human capital across countries.

(e) Consider two countries that have the same production function

$$y = k^{\frac{1}{2}} h^{\frac{1}{2}}$$

and equal values of $s = 0.2$, $n = 0.02$ and $\delta = 0.08$. If one of these countries has twice the human capital of the other, what does this imply for their relative per capita outputs in steady state?

B2. A plot of land is owned by a Landlord but worked by a Tenant. If the Tenant provides effort L she incurs a cost $C(L)$, which increases at an increasing rate with L. The value of output from the plot is given by the production function

$$y = g(L) + x,$$

where $g(L)$ increases at a decreasing rate with L, and x represents random variations in output due to climatic conditions. The Landlord can observe the output produced by the Tenant, but cannot monitor or infer the amount of effort she exerts.

(a) Using the above information, write down the incomes of the two parties under (1) a wage contract, (2) a rental contract and (3) a sharecropping contract.

(b) In each of these contracts describe how the risk is allocated between to two parties. What about the incentives faced by the Tenant to exert effort ?

Assume that the Landlord is risk–neutral, but the Tenant is risk–averse. This risk-aversion is represented as a cost which increases at an increasing rate with the Tenant's share of output.

(c) With the aid of a diagram, explain how the theoretical constrained–efficient output share received by the Tenant, $1-\alpha^*$, and the associated effort level, L^*, are determined in a sharecropping contract.

(d) Using the same diagram as in **(c)** illustrate the total losses (due to bad incentives and risk) under the sharecropping contract, relative to the full–information case.

(e) Suppose the government introduces a crop insurance program and assume that the only effect of this is to lower the Tenant's marginal cost of risk by a constant proportion at each level of effort. According to the above theory, how would this affect the constrained–efficient share ? Explain your answer using a diagram.