

DEPARTMENT OF ECONOMICS  
QUEEN'S UNIVERSITY

**ECON239: DEVELOPMENT ECONOMICS**

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**Final Examination**

2 – 5 pm, Monday, April 16, 2007

**General Instructions**

This exam is THREE HOURS long. There are TWO SECTIONS each of which is worth 50 percent of the overall marks. Section A consists of eight short questions of which you should do five (5). Section B consists of four long questions of which you should do two (2).<sup>\*</sup> Please answer all questions in the answer booklets provided. If you attempt more than the required number of questions in each section make sure you delete the ones that you don't want marked. Hand held calculators are allowed.

GOOD LUCK!

<sup>\*</sup> Proctors are unable to respond to queries about the interpretation of exam questions. Do your best to answer exam questions as written.

**Section A** (50 percent): Discuss the validity of FIVE (5) 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. The text for each answer should be as concise as possible, but you should include diagrams or examples where appropriate. All questions have equal value.

**A1.** Suppose there are two goods produced in the world: DVDs, which are traded internationally, and hair cuts, which are not. Assume that transport costs are negligible. The following table shows information on the consumption and prices of DVDs and hair cuts in the USA and China:

Country	DVDs Consumed	Hair Cuts Consumed	Price of DVDs in Local Currency	Price of Hair Cuts in Local Currency
USA	9	4	2	4
China	3	4	10	10

The value of the purchasing power parity exchange rate is independent of whether a US or a world-wide basket of goods is used to compute it.

**A2.** The head-count ratio is a better target measure of poverty than the poverty gap index 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.** Hernando de Soto's prescription of wide-spread land-titling programs as the way to liberate the "hidden wealth" of rural households offers a straight-forward cure for high rates of rural poverty.

**A4.** Trade-credit interlinkages increase the economic surplus involved in a credit transaction.

**A5.** Unbalanced economic development undermines the traditional institutions that govern trading relationships in rural areas of less developed economies.

**A6.** Rural labour markets that are characterized by the nutritional efficiency wage model will tend to act in a way which offsets the effects of any existing inequality in non-labour income.

**A7.** UN projections for population growth in less developed economies suggest the need for widespread subsidization of contraceptives.

**A8.** The Prebisch-Singer hypothesis is a sensible motivation for a policy of import substitution.

**Section B** (50 percent): Answer TWO (2) of the following **Long Questions**. They are of equal value.

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

$$y = f(k),$$

where the function  $f(\cdot)$  is increase 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  $\delta$ .

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

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

(b) With the aid of a diagram, explain how the capital stock, along the economy's balanced growth path (steady-state),  $k^*$ , is determined.

(c) If the initial value of  $k$  differs from  $k^*$ , explain, with the aid of a diagram, the process by which the economy converges to the balanced growth path.

(d) Illustrate on a diagram the impact of an increase in the population growth rate,  $n$ , on the level of output per capita along the balanced growth path. Explain the economic intuition behind this effect.

(e) What is  $k^*$  if  $f(k) = 10k^{\frac{1}{3}}$ ,  $s = 0.2$ ,  $n = 0.05$  and  $\delta = 0.1$  ? How could you use this kind of calculation to assess whether the model is validated by cross-country data ?

**B2.** A farmer requires 20 Rupees to invest in fertilizers and farming equipment. She has 10 Rupees of her own savings to invest and borrows the remaining 10 from a local moneylender using a **standard debt contract**. The rate of interest on the debt is a 10%. The farmer can choose whether to cultivate wheat or corn, both of which involve some risk due to environmental conditions. Wheat cultivation yields a crop value of 40 Rupees with probability  $\frac{1}{2}$ , and 10 Rupees with probability  $\frac{1}{2}$ . Corn cultivation yields a crop value of 50 Rupees with probability  $\frac{1}{2}$  and 0 with probability  $\frac{1}{2}$ .

(a) What are the total expected return net of total investment from wheat and corn cultivation ? Which crop is more risky ?

(b) Calculate the expected returns to the farmer and the moneylender, respectively, net of their investments, from each crop.

(c) Why would the farmer and the moneylender disagree about which crop should be planted ? Explain carefully, with the aid of a diagram.

(d) What kinds of economic institutions in the credit market would you expect to arise in response to this kind of fundamental problem ? How would you expect such institutions to vary across the formal and informal sectors and why?

(e) What are the implications of the nature of informal sector credit market institutions for government attempts to lend directly at low interest rates to borrowers in the rural sector ?

**B3.** Consider the following simple rural labour market which lasts for two periods. Suppose workers have a reservation wage of \$10, but that the minimum wage needed to maintain their nutritional status is \$14. In period 1, the value to employers of their work effort is \$20. However, if they are paid less than \$14 then their nutritional status will deteriorate, and in period 2 their productivity will fall to \$14. Suppose there are two employers in the labour market (A and B) and that there is random matching of workers with employers. This means that in period 2 they will hire one of the workers that they hire in period 1 with probability 1/2. In period 1, the employers choose whether to pay the low wage of \$10 (which is just enough to hire the worker), or the high wage of \$14 which will maintain their nutritional status. Assume that in period 2, both employers pay \$10.

(a) If employer A pays \$14 in period 1, what is his expected profit over the two periods if (i) employer B also pays \$14 and (ii) employer B pays \$10?

(b) If employer A pays \$10 in period 1, what is his expected profit over the two periods if (i) employer B also pays \$10 and (ii) employer B pays \$14?

(c) Given that employer B faces a symmetric decision, arrange the profits of the two employers in a “payoff matrix” that shows their profits for each possible combination of period 1 wages.

(d) What is the Nash equilibrium of this “game” between the two employers? Explain why it is an equilibrium, even though there is an alternative outcome that would give both employers higher profits.

(e) Use this example to explain why casual labour markets in rural economies could be a source of low productivity and malnutrition. What could a policy-maker do to address such a problem?

**B4.** Consider a simple economy with only two sectors — urban and rural. Workers in the urban sector who do not obtain formal sector jobs are assumed to be able to obtain informal sector jobs. The wage in the informal sector is fixed at  $w_I = 10$ . There are 10 million workers in the economy and they are all identical and risk-neutral. The following table represents the marginal product of labour (MPL) in the two sectors for various levels of employment:

Workers (millions)	Urban MPL Formal	Rural MPL
0	50	40
1	45	36
2	40	32
3	35	28
4	30	24
5	25	20
6	20	16
7	15	12
8	10	8
9	5	4
10	0	0

(a) On a diagram with the number of workers in the urban sector on the horizontal axis, plot the marginal product labour in each sector. Based on this diagram, estimate what would be the number of workers and the marginal product in each sector in a competitive migration equilibrium?

(b) Now suppose the formal sector wage is raised to  $w_F = 30$ . What would be the demand for workers in the formal sector? Starting from the situation in part (a), what would be an estimate of the probability of obtaining a formal sector job? Would workers start to migrate? Explain

(c) Compute the probability of obtaining a formal sector job, when the number of workers who have migrated to the urban sector is equal to 2, 3, 4, 5, 6, 7, 8 and 9 million respectively.

(d) Use the values from part (c) to compute the expected wage in the urban sector at each of these migration levels. On a new diagram like that in (a), plot the expected urban wage from and the marginal product of labour in the rural sector from the table above.

(e) Based on the diagram in part (d), estimate the numbers of workers in the informal urban sector and the rural sector in a Harris–Todaro migration equilibrium. What is the equilibrium wage in the rural sector? How many more workers migrate relative to the competitive equilibrium?