Ec 320, Fall 2008

Dilip Mookherjee

SOLUTIONS TO MIDTERM EXAMINATION

1. (5*6=30 marks) *Indicate whether you agree, partially agree, disagree or partially disagree with the following statements. State any necessary qualifications or modifications. In each case explain your answer with appropriate reasoning and/or citations.*

(a) The Harrod-Domar model states that a country's growth rate of per capita income depends on its rate of savings, whereas the Solow model states that it does not.

Partially agree. The Harrod-Domar model does state that the growth rate depends on the savings rate. The Solow model states that the short run growth rate depends on the savings rate, while the long run growth rate is independent of the savings rate.

(b) The hypothesis of unconditional convergence can be empirically tested by plotting the growth rate of different countries over the period 1960-85 against their growth rates over the period 1950-60 and checking if there is a downward sloping relation between the two variables.

Disagree. Unconditional convergence can be tested by plotting the growth rate over 1960-85 against the level of per capita income in 1960 and examining whether the relationship is negative.

(c) The available statistical evidence concerning the experience of any given country over time indicates no relationship between per capita income and income inequality.

Agree: the analysis of Deininger and Squire, and of Fields and Jakubson, of longitudinal country time series evidence indicates no relationship between per capita income and inequality.

(d) The available statistical evidence concerning the experience of any given country over time indicates no relationship between per capita income and poverty (as measured by the head count index).

Disagree: the evidence for a large number of developing countries over the period between 1981 and 2004 indicates that growth was associated with a significant drop in the head count index below $1 per day. For all low and middle income countries, the HCI dropped from 40% to 14%. This was particularly pronounced in the case of China and India which registered high rates of growth of per capita income over this period.

(e) The Lewis model predicts that opening a country to free trade in agricultural products will slow down the rate of growth.

This depends on whether this country is going to import or export food consequent on opening to trade with the rest of the world. If the country imports food the cost of food will be lowered, which will lower the cost of labor in the modern sector, thus expanding industrial employment and industry profits. Since a fixed fraction of industry profits will be reinvested, this will raise the growth rate of the economy. Moreover, the second phase where growth slows down owing to food shortages will not appear. In this case the opening to trade will speed up growth, and the statement would be false. However in the opposite case where the country exports food, the domestic food price will increase, and in this case the opposite would happen: the urban wage rate would rise and growth would get slowed down and the statement is correct.

2. (10 **marks)** *Consider the Lewis model of a labor surplus economy with a traditional and modern sector, which is currently in the first phase of development. Suppose that the government mandates a minimum wage (which exceeds the wage currently paid) which must be paid by all employers in the modern sector. Describe the effect of this policy on (i) the extent of migration from the traditional to the modern sector; (ii) the rate of growth of per capita income in the economy. (You may restrict your attention to the short run impact, when the country continues to operate in the first phase with surplus labor in the traditional sector.)*

(i) A minimum wage above the prevailing market wage will raise the cost of labor to employers in the modern sector. Given that the demand for labor in the modern sector is downward sloping, this implies that the level of employment in the modern sector will fall.

The effect on migration from the traditional sector is ambiguous, for the following reason. [**I don't really expect the students to be able to answer the question in this way, so they should be graded according to whether they have the correct intuition.**] Let r denote the ratio of the urban wage w_I to the rural wage w_A (fixed in the first phase of the Lewis model). Before the minimum wage policy is introduced, the wages in the two sectors are equal and hence $r = 1$. The minimum wage policy for the urban sector will raise r to a fixed number above one. Using the Harris-Todaro model and the assumption that there will be urban unemployment in which those without a job will earn a zero wage, migration equilibrium requires the expected wage in the urban sector to equal the rural wage: $p.w_I = w_A$ or

$$p = \frac{w_A}{w_I} = \frac{1}{r} \tag{1}$$

where p denotes the probability of finding a job upon migrating to the urban sector. If N_I, M respectively denote the total number of jobs in industry and the number of people who migrate, we have

$$p = \frac{N_I}{M} \tag{2}$$

This tells us that the extent of migration is

$$M = \frac{N_I}{p} = rN_I \tag{3}$$

where the last equality uses equation (1). Now the minimum wage policy raises r and lowers N_I, so the effect on migration is ambiguous (and depends on the elasticity of the demand for labor in the industrial sector — migration falls (rises) if it is elastic (inelastic)).

(ii) The increase in the cost of labor will reduce profits in industry. Since savings and investment in the Lewis model is a constant fraction of industry profits, the policy will cause a reduction in investment in the modern sector. Since growth in the Lewis model is driven by the investment in the modern sector, and the resulting migration from the traditional sector to the modern sector, this will slow down the rate of growth in the economy as a

whole. (During the first phase, the price of food does not change, so any effects operating through the price of food can be ignored.)

3. (10 **marks)** *Comment on the following statement (substantiate your argument with appropriate reasoning and facts):*

> *"The chief purpose of economic development is to raise per capita income and lower poverty, and we know the latter objective is best served by faster growth. Hence LDC governments ought to focus mainly on raising savings and technical progress, rather than trying to reduce inequality or spend on social programs."*

This statement can be disputed on a number of different grounds:

(i) One can dispute the stated purpose of economic development, which can be viewed in broader terms than in the quote above. Following Paul Streeten (as quoted in the text, Ch. 1), or Amartya Sen's arguments, human development and reduction in inequality can be considered ends desirable in and of themselves.

(ii) One can dispute the statement that poverty reduction is best served by faster growth. Reduction in inequality also results in a drop in poverty, for a given per capita income. The reason that poverty tends to drop as per capita income rises along the process of development is that inequality tends to remain unaffected or drop slightly, as longitudinal studies of Fields and Jakubson show. Reducing inequality is one way of accelerating poverty reduction, and one has to assess trade-offs between growth promotion and inequality reduction before concluding that faster growth is the best way of reducing poverty.

(iii) Social programs include health and education can be rationalized as a form of investment in human capital, which also raises productivity, and hence the growth rate of per capita income. That human capital is an important component of the economy's stock of productive capital is indicated by: (a) macro cross-country growth studies of Barro and Mankiw-Romer-Weil which show that the predictions of the Solow model concerning cross-country variations in growth and per capita income are validated only when school enrollment rates are included among the economy's savings activities, and (b) micro-studies

summarized in JEL survey articles by Strauss-Thomas and Glewwe respectively showing high rates of return to investments in health and schooling.