WRITTEN PRELIMINARY Ph.D EXAMINATION

Department of Applied Economics

Summer – 2007

Trade, Development and Growth

For students electing

Macro (8701) & Micro (8703) option

Instructions

· Identify yourself by your code letter, not your name, on each question

· Start each question's answer at the top of a new page

· You are requested to answer a total of FOUR questions

· Answer ONE question from Set One

· Answer THREE questions from Set Two

· You have four hours to complete this examination
SET ONE

Required Question; Answer ONE Question (I or II but not both)

I. Agriculture's Role in Economic Growth

The World Bank's forthcoming 2008 Word Development Report (WDR) will be the first to focus on agriculture as an engine of economy-led growth since the WDR of 1982. Numerous papers since the 1982 report have explained and documented agriculture's effect on growth, particularly for countries in the early stages of development. This question focuses on anticipating some of the report's main themes. Consider the following environment. Most workers are in agriculture, a large share of income is spent on food so that households are at subsistence levels, and international capital markets are not available. Use your knowledge of growth theory to explain agriculture's likely role in such a country's transition to higher real worker income. You need not develop a specific model, but be analytical in your answers to the following questions.

Drawing upon your knowledge of growth accounting and growth theory,

1) Explain at least three of the likely "main sources" of growth of the economy.
2) Discuss how the initial conditions (low returns to labor and land, and a high proportion of income spent on food) might act as a constraint to the growth of the economy.
3) As the country proceeds in transition growth, that is, as the initial conditions discussed in (2) become less of a constraint
   a) Explain how the activities of rural households engaged in agriculture can provide the conditions for growth of the rest of the economy,
   b) Explain/discuss how the activities discussed in (a) above might cause and/or contribute to the growth of the manufacturing and service sectors
   c) How can the growth of the manufacturing and service sectors impact the transition path of the agricultural sector?
4) How will a policy of import substitution - industrialization likely affect the structure of the economy and "slow down" a country's transition to long-run growth?
II. Miscellaneous Questions on Microeconomic Analysis of Development Issues

1) Economists often claim that there is a “production function” for academic skills. One can also imagine a “demand function” for child academic. Briefly explain the difference between the production function and the demand function for child academic skills. Suppose that school quality, which the household considers to be exogenous, increases. Would the impact of that increase on children’s academic skills be higher in the production function or in the demand function? Briefly explain your answer. There is no need to refer to a particular model presented in class, just give very general arguments.

2) Many economists argue that, in developed countries, increases in the minimum wage will lead to increases in unemployment. Give three arguments as to why this is less likely to happen in developing countries. Cite at least one empirical study discussed in class that supports one of your arguments. Please keep your answers brief.

3) Reinikka and Svensson pointed out a serious problem with foreign aid for education in Uganda. First, briefly describe the problem (2 or 3 sentences is enough). Second, briefly describe a policy that the central government could introduce that is likely to reduce this problem (again, just use 2 or 3 sentences). Third, briefly explain how this problem may complicate attempts to estimate the impact of foreign aid using cross-country regressions (2-3 sentences is sufficient).
SET TWO

Answer THREE of the following four questions (III to VI)

III. Productivity and Technical Change

Answer all of the following 3 questions.

1) Using the relationship between a partial-, a multi-, and a total-factor productivity index, describe what Abramovitz meant by the notion that productivity is a “measure of our ignorance.”

2) In a one output, two input world, illustrate graphically and carefully explain the difference between productivity growth and technical change.

3) Carrying forward the one output two input world, will forming a Paasche input aggregate cause measured changes in multi-factor productivity to over-or under-state the extent of technical change? Illustrate and discuss.
IV. Models of Rural Land Markets.

Consider a land market model, similar to one discussed in class, in which farmer effort determines output. Output, \( Y \), depends on the effort of the (tenant) farmer, where effort is denoted by \( e \), and \( e \) lies between 0 and 1. \( Y \) is a random variable that can take 3 values, 0, 1 and 2. Assume that \( Y \) is related to effort as follows:

\[
\begin{align*}
\text{Prob}[Y = 0] &= (1 - e)/2 \\
\text{Prob}[Y = 2] &= e/4 \\
\end{align*}
\]

1) What is the probability that \( Y = 1 \)?

2) Suppose that tenant effort (\( e \)) is the only variable that determines the probabilities that \( Y \) equals 0, 1 or 2. The farmer does not own any land and so he must rent it from a landlord. Assume that \( e \) is not observed by the landlord. The contract is set up by the landlord as follows:

- Tenant receives \( h \) when \( Y = 2 \)
- Tenant receives \( m \) when \( Y = 1 \)
- Tenant receives \( l \) when \( Y = 0 \)

The tenant has an expected utility function equal to \( E[y_T] - ce^2/2 \), where \( E[y_T] \) is the expected income of the tenant, which is a function of \( e \), and \( ce^2/2 \) is the disutility of effort. Assuming that the tenant maximizes expected utility, derive the tenant's optimal effort (\( e \)) as a function of \( h, m, l \) and \( c \).

3) From the viewpoint of society as a whole, what is the “socially optimal” value of \( e \)?

4) Express the profit of the landlord, denoted by \( \pi \), as a function of \( h, m, l \) and \( e \). Insert your solution for \( e \) from part b) into this expression. Show the first order condition for profit maximization with respect to \( h \) (assume an interior solution).

5) Use your answer for d) to compare the socially optimal level of \( e \) you showed in c) with your derivation for \( e \) in part b). Give an intuitive explanation for your comparison result.
V. Static Trade Theory

The Heckscher-Ohlin-Samuelson model of international trade gave rise to the so called factor endowments theory of comparative advantage. Use such a model for a single, competitive, small and open economy to address the following questions.

1) What are the structural features of this economy relative to its trading partner(s) that predict which good will be exported and which good will be imported?

2) What is the economic "meaning" of this result?

3) What implication does your answer to (1.) above have regarding factor payments, say wages (w) and capital rental (r), when
   a) The country employs the same technology as its trading partners?
   b) The technology employed in the home country only differs from its partners by its rate of labor augmenting technological change?

4) Suppose the country imposes a tariff to help protect (i.e. raise the price of) the good it is importing. What effect does the tariff have on
   a) Factor payments to labor and capital (explain the economic meaning of this effect)?
   b) Explain how the tariff affects the country's comparative advantage?
VI. Economic Growth and Macroeconomic Imbalances

Many of the world's economies, including the U.S., are characterized by fiscal and trade "imbalances". These "imbalances" often cause economic crises (which force a change in policy), or induce an externality on the rest of the world (the case of the U.S.) that seems to persist for consider lengths of time. This question focuses on the economics of these imbalances in the context of transition growth. For purpose of this question, consider a stylized competitive, small and open economy those stock of capital in period $t = 0$ is less than it's long-run equilibrium value in the absence of an "imbalanced" economy. You may use a graphic analysis to answer this question, but use more analytical constructs when ever possible

1) Define and describe the nature of the imbalance in period $t = 0$ on the

   a) The production of goods,

   b) Foreign trade and

   c) Factor payments.

2) Now, consider transition growth ($t > 0$) for the case where, in each $t$, the imbalance persists. Discuss and explain the effect on

   a) The production of goods?

   b) Foreign trade?

   c) Factor payments?

3) Suppose this imbalance eventually precipitates a "crises." Discuss and explain the adjustments in

   a) The production of goods

   b) Foreign trade and

   c) Factor payments

   that are necessary to eventually bring the economy into a "balanced" long-run equilibrium.