WRITTEN PRELIMINARY Ph.D EXAMINATION
Department of Applied Economics
Spring - 2006
Trade, Development and Growth

For students electing
Macro (8701) & New Trade Theory (8702) 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
I. Trade policy

It is well known that high income countries (DC) utilize three categories of policy instruments to protect agricultural producers. These categories are: market access (e.g., tariffs, quotas), domestic support (subsidized credit to farmers, payments to take land out of production) and export subsidies. Poor countries (LDC) tend to be exporters of agricultural commodities, and agriculture tends to account for a large share of their total exports. The on-going Doha round of negotiations under the WTO seeks to reduce these trade distorting policies. Our analysis of these policies led to the results shown in the following figure.

The lower line shows the gains to LDCs if all countries had removed market access restrictions to agricultural trade in year 2001. However, LDCs tend to have relatively high trade barriers for merchandise trade whereas advanced countries have low barriers. If the LDCs had removed their merchandise trade barriers in 2001, and then all countries had removed market access restrictions to agricultural trade, the LDC gains to agricultural reform (now, ex-post the LDC removal of merchandise barriers) are given by the upper line.
1. Draw upon a static open economy trade model of your choice to explain, for any ONE point in time, why the gain to agricultural reform in LDCs is "sensitive" to the merchandise trade distortion in their economies. State clearly the "economic environment" assumptions you are making. Your answer should include a rigorous discussion of factor payments. You may use graphics, mathematics or both to answer this question.

2. Explain the dynamics of this evolution from the perspective of capital deepening. Ignore the "cycle like" pattern of the upper line. Your answer should entail a discussion of (a) the economic process causing both lines to slope upward, and (b) why the distance between the top and bottom line tends to increase with time.

II. Trade and Multinationals

1. Use your knowledge of trade and multinational theory to explain THREE of the follow four stylized facts below.

   (a) A large proportion of trade and direct investment occurs between relatively similar economies and “neighborhood” economies.

   (b) A large proportion of trade and direct investment is two-way trade in similar products (i.e., intra-industry).

   (c) A large proportion of direct investment is concentrated among developed countries. That is, direct investment tends to flow North-North rather than North-South or South-South.

   (d) A large proportion of direct investment is "horizontal" rather than "vertical."

2. Specify an empirical (e.g., statistical) model of your choice that can or has been used to test ONE of the above (1.a) to (1.d) predictions/explanations of the theory. Describe/discuss how this model serves to test or provide insight to one of the above predictions.
III. Macro-economic Imbalances

Many countries have unique sources of foreign exchange earnings. These include remittances from migrant workers (e.g., North Africa, Mexico), and royalty income from the exports of petroleum, and diamonds, i.e., sectors that are natural resource based and require relatively little of the economy’s other resources to produce. These sources of income often increase domestic income (ignore corruption). Your general task is to explain these "inflows" on the transition growth, long-run growth and structural composition (i.e., share of various sectors in GDP) of an economy. It may be useful to consider these effects relative to the same economy without these inflows. Make explicit your "economic environment" assumptions, such as sectors in the economy, relative factor intensity and so on. While you may use graphics to depict your argument, rely upon mathematical concepts when appropriate. More specifically:

1. Explain why these inflows are unlikely to affect the long-run growth rate of the economy
2. Explain why these inflows may "speed-up" the economy’s transition to long-run growth
3. How will these inflows likely affect the country’s trade balance?
4. Explain how these inflows are likely to alter the final good shares in GDP of say, manufacturing, services and agriculture relative to the case of the same economy without these inflows.
5. How will these inflows likely affect payments to labor?

IV. Growth Theory

Consider the environment of the following three sector, small open economy in which agents produce and consume three types of final goods, indexed \( j = m, s, a \), at each instant in time at price \( p_j \). The services of labor, \( L \), and capital, \( K \), are employed in the production of all three goods while land, \( T \),
a sector specific factor, is also employed in the production of the agricultural
good, \( j = a \). The agricultural good is a pure consumption good that is
internationally traded. The manufactured good, indexed \( j = m \), is both
a consumption and a capital good that is also internationally traded. The
home good, indexed \( j = s \), is a pure consumption good. Labor services
are not traded internationally and domestic residents own the entire stock
of domestic assets. Households earn income from providing labor services \( L \)
in exchange for wages \( w \), earn interest income at rate \( r \) on capital assets \( A \),
and receive rents from agriculture’s sector specific resource, land \( T \).

Let the key primitives be the following. The manufacturing and home
good sectors \((j = m, s)\) employ constant returns to scale technologies that,
at the sector level, can be expressed as

\[
Y_j (t) = F_j (A (t) L_j (t), K_j (t)), \quad j = m, s
\]

(1)

where \( A (t) = e^{xt} \) is exogenous labor augmenting change.

Agriculture’s sector level technology is

\[
Y_a (t) = F^a (A (t) L_a (t), K_a (t), A_a (t) T)
\]

where land \( T \) is specific to the sector but can be rented at price \( \pi \) among
firms within the sector. The technology \( F^a (\cdot) \) has the same properties as
(1). Land’s productivity can also grow exogenously as determined by

\[
A_a (t) = e^{\gamma t}
\]

Households are represented by the typical infinitely-lived Ramsey con-
sumer that receives utility from the sequence \( \{C_m, C_a, C_s\}_{t=0}^{\infty} \) expressed as
a weighted sum of all future flows of utility

\[
\int_{t=0}^{t=\infty} \frac{u(C_m, C_a, C_s)^{1-\theta} - 1}{1 - \theta} e^{(n-\rho)t} dt
\]

(2)

The number of household members are assumed to be proportional to the
number of workers, to grow at the exogenously given positive rate \( n \),

\[
L (t) = e^{nt} L (0)
\]

and to discount future consumption at the rate \( \rho > 0 \). The elasticity of inter-
temporal substitution is given by \( 1/\theta \), where \( \theta > 0 \). For the purpose of this
analysis, we specify a constant returns to scale (CRS) Cobb-Douglas form of 
\( u(C_m, C_a, C_s) \).

This question presumes you know the statement of intra-temporal equi-
librium and the derivation of the models differential equations.

1. State (as opposed to derive) the Euler equation that depicts the *representative* household’s optimal rate of expenditure/consumption over time, and briefly discuss the "economic meaning" of this condition.

2. Let \( c(t) \) be the level of aggregate consumption of the representative household. Let \( c_j(t) \) be the level of aggregate consumption of some other \( j-th \) household in this economy, where at point in time \( t \), the level of \( c_j(t) \neq c(t) \) (for purpose here, assume \( c_j(t)/c(t) < 1 \)). These levels may not equal simply because the \( j-th \) household at point in time \( t \) has a different level of labor, capital or land assets. However, all markets are complete.

   (a) Along the transition path, \( t = 0, 1, 2 \cdots \), use your answer to (1) above to suggest how \( c_j(t) \) evolves relative to \( c(t) \)?

   (b) Now, consider an ordering of households \( j = 1, \cdots, J \), where 
       \( c_1(t) < c_2(t) < c_3(t), \cdots, < c_J(t) \) which we rank, and some point 
       in time, say \( t = 0 \), from lowest consumption \( c_1(0) \) to highest con-
       sumption \( c_J(0) \). What does your answer in (2.a) above suggest 
       about this "distribution" (say \( c_j/c \)) of aggregate consumption 
       over time, \( t = 1, 2, \cdots ? \)

3. Comparative statics; Suppose the manufacturing sector is capital in-
tensive, and services is labor intensive. Agriculture is "in the middle", 
but more capital than labor intensive. Further, assume \( \hat{k}(0) < \hat{k}_{ss} \).
You may also make assumptions regarding other parameters, such as 
\( x, n, \) and \( \gamma \).

   (a) Discuss the evolution of the home good price \( p_s \)

   (b) Discuss the effects that explain the evolution of \( y_m, \) and \( y_s \).

   (c) "Show" and discuss the evolution of the land rental rate.
V. The "New Trade Theory"

The new trade theory relaxes assumptions concerning the constant returns to scale and perfect substitutability of commodities produced by firms in the same “industry.” A distinction is also made between the assumption of a national enterprise (NE) that produces in one location and multinational enterprises (MNEs).

Answer ONE of the two questions {(1) or (2) but not both} below.

1. Recent research develops theory models where market structure is determined endogenously. Market structure refers to the choice of firm types—NEs versus MNEs. Demonstrate/show analytically or graphically, and discuss how the equilibrium market structure depends on:

   (a) Firm-level scale economies and plant-level scale economies
   (b) Tariffs and transportation costs
   (c) Similarity of country size and relative endowments

2. Recent research considers the distinction between horizontal and vertical multinationals within the hybrid "knowledge-capital model." According to theoretical predictions,

   (a) what country characteristics explain horizontal multinationals versus vertical multinationals.
   (b) Sketch analytically the key essential features of the knowledge capital model.

VI. State the General Theorem of the Second Best.

1. If a small country is considering the prospect of liberalizing trade in agriculture, how would the Second Best Theorem, and specifically “piecemeal Second Best policy” relate to the argument for restrictions on agricultural imports with negative environmental or health effects?