Written Exam for the M.Sc. in Economics 2010-1-R

International Trade and Investment
Final Exam, February 18th, 2010

4-hour closed book exam

- There are three pages in this exam paper, including this instruction page
- You need to answer all THREE questions, so manage your time accordingly.
- Make your math legible and easily followed, with the final answer boxed.
- Partial credit may be given.

Good Luck!

1. Exporters and non-exporters

   Given the empirical research to date, identify whether these statements are true or false.

   (a) Exporting firms, on average, pay higher wages than firms that do not export.

   (b) Exporting firms, on average, sell less to the domestic market than firms that do not export.

   (c) Exporting firms, on average, pay higher wages than firms that both export and import.

   (d) The Extensive margin accounts for most of the trade expansion of French firms across markets

   (e) Firm-product-destination level export prices, on average, increase with distance.

   (f) Most firms that export continue exporting for at least 3 years.

   (g) Border effects are insignificant in free trade areas such as US-Canada.

   (h) In the 1980's, the relative wage of US production workers increased relative to the wage of nonproduction workers.

2. The Rybcynski Theorem.

   We know that GDP is the sum of the value of the I good outputs: ($GDP = \sum_{i=1}^{I} p_i y_i$) and the sum of the value of the M factor inputs $\left(GDP = \sum_{m=1}^{M} w_m V_m\right)$. Suppose the GDP function of Denmark is translog in the I goods and M factors, i.e. it looks like:

$$\begin{aligned}\ln GDP = \alpha_0 &+ \sum_{i=1}^{I} \alpha_i \ln p_i + \sum_{m=1}^{M} \beta_m \ln V_m \\ &+ \frac{1}{2}\sum_{i=1}^{I}\sum_{j=1}^{I} \gamma_{ij} \ln p_i \ln p_j + \frac{1}{2}\sum_{m=1}^{M}\sum_{n=1}^{M} \delta_{mn} \ln V_m \ln V_n \\ &+ \frac{1}{2}\sum_{i=1}^{I}\sum_{m=1}^{M} \varphi_{im} \ln p_i \ln V_m\end{aligned}$$

   where p_i is the exogenous world price of good i, V_m is the endowment of factor m, and the greek letters are unknown parameters.

(a) What conditions do α_i and β_m have to satisfy in order for the GDP to fit the duality conditions?

(b) Given the translog GDP function, what is the expression for $\frac{d(\ln GDP)}{d\ln V_m}$? How is $\frac{d(\ln GDP)}{d\ln V_m}$ related to the value share of factor m in total GDP?

(c) Given the translog GDP function, what is the expression for $\frac{d(\ln GDP)}{d\ln p_i}$? How is $\frac{d(\ln GDP)}{d\ln p_i}$ related to the value share of good i in total GDP?

(d) Suppose you had data on s_m (the value share of factor m in total GDP), s_i(the value shares of good i in total GDP), world prices p_i and factor endowments V_m for all goods i and m. How would you estimate the Rybcynski coefficient, i.e. the change in the output of any good i to a change in endowment of any factor m? (Hint: Deconstruct $\frac{d\ln y_i}{d\ln V_m}$).

3. Consider a version of the Dornbusch, Fischer, Samuelson (1977) model:

- There are two countries, H and F (* denotes F variables) producing a continuum of goods $z \in (0,1)$.
- The foreign country has 9 times the labor force of the home country.
- The constant unit labor requirements are $a(z) = z^2$ and $a^*(z) = 1 - z^2$
- The utility function is $u = \int_0^1 b(z) \ln x(z)\, dz$, where $b(z) = 2z$ and $x(z)$ denotes the quantity consumed of good z.

(a) Verify that $b(z) = 2z$ is a feasible Cobb-Douglas expenditure share.

(b) Determine the range of goods that the home country produces. Determine the Home wage relative to the Foreign wage.

(c) Draw the equilibrium graph relating the relative wage and set of goods produced in each country.