Final Exam
December 20, 2001

Answer all questions. Write your answers in a blue book.

Be sure to look ahead and budget your time. Don't waste time on parts of questions that you can't answer. Leave space and come back to them if you have time.

1. Suppose that a country were to discover an easy and costless fix for its educational system that would make all of its people, say, 10% more productive than they were before. That is, in any production relationship, any given output can be produced with 10% less labor than was needed before. Examine the implications of this change for the country's

   i) production,

   ii) trade,

   iii) real factor prices, and

   iv) overall level of economic well-being,

   in each of the following contexts. Assume in each case that the improvement in productivity occurs in only the one country, and assume also that preferences across industries are homothetic. **Do not** take the time to demonstrate the truth of your answers. Although you are welcome to scribble some diagrams to help you see what is happening, I will grade only the results that you state.

   (a) A Ricardian 2-good model of a small open economy, completely specialized under free and frictionless trade.

   (b) Same as (a), but the country is large.

   (c) The Dornbusch-Fischer-Samuelson continuum of goods model with free trade.

   (d) Heckscher-Ohlin 2-good model of a small open economy that produces both goods but exports the labor-intensive good, under free and frictionless trade.

   (e) Same as (d), but the country has a (non-prohibitive) tariff.

   (f) Specific factors model (with labor mobile between sectors and other factors specific) of a small open economy under free and frictionless trade.

   (g) Krugman (1980) one-sector differentiated products model of two initially identical countries trading freely.

2. The following are (very approximate, to make your calculations simpler) data for national income and population for the United States and for the world as a whole (including the U.S.):

	Population (millions)	Income ($billions)
United States	300	8,000
World	6,000	32,000

Assume for simplicity that in all countries, the available labor force equals exactly 1/3 of the population and that U.S. trade is balanced.

(a) Applying the Heckscher-Ohlin-Vanek Theorem, what should the net labor content of U.S. trade be?

(b) Explain in words what it means for the net labor content of U.S. trade to be what you said in part (a).

(c) Under the assumptions of the HOV Theorem, write and explain the formula showing how to calculate the net labor content of U.S. trade, and explain in words what data would be needed to apply this formula.

(d) Based on the empirical work of Trefler and others, approximately what would you expect to find if you were actually to measure the net labor content of U.S. trade? Explain your expectations in terms of that literature.

(e) Suppose that a large portion of GNP in all countries consists of non-traded goods. How, if at all, would this matter for the validity and/or the usefulness of the HOV Theorem?

3. Suppose that there are two factors, capital and labor, and three goods, X, Y, and Z. Good X is the most labor intensive and good Z the most capital intensive. All of the goods are homogeneous products. There are many countries, with factor endowments sufficiently diverse that there is ***not*** factor price equalization, even though trade is free and frictionless. Consider a single small country in this world – call it Apnia – one whose initial factor endowments permit it to produce both goods X and Y and to export good X.

   (a) Draw a Lerner Diagram appropriate to this situation. Include a point showing the factor endowments of Apnia, then identify and label Apnia's nominal wage of labor, w^0, it nominal rental on capital, r^0, and the quantities of both factors employed in the three industries, labeled v_x^0, v_y^0, and v_z^0 respectively.

   (b) What can you say for sure, based on the information given, about this country's pattern of trade? That is, what does or might it export, what does or might it import, and does it engage in intra-industry trade?

   (c) Suppose now that the population in this country (only) becomes larger, increasing its labor force by the same proportion. The change is small enough that it continues to produce both X and Y. Its capital stock and all conditions in the rest of the world remain unchanged. Assuming homothetic preferences, how will the quantities of this country's exports and imports of each good change?

   (d) For the change in part (c), what will happen to the country's

      i) Real wage of labor

      ii) Real rental rate on capital

      iii) Total GDP

      iv) Per capita GDP

   (e) Suppose now that industry Z produces differentiated products in the manner of Krugman (1980), not the homogeneous product assumed above. How would that change your answer to part (b)?