The Ricardian Trade Model

1. The purpose of this question is to give you the opportunity to develop a model from a narrative, propose questions to ask of the narrative, formulate your questions in the language of the model, conduct an analysis of the model and interpret your results in light of the narrative; also, to teach you some international trade. This, in summary, is how one theorizes.

   The question requires you to develop the Ricardian trade model. There are two countries — call them England and Spain. (Actually Portugal is the traditional second country, but you will want the letter p for other things.) Each country has a stock of labor and can use their labor to make either wine (v) or mutton (m). Production is linear in inputs. Labor is immobile. Wine and mutton for consumption can be freely shipped between the two countries. English and Spanish wine are perfect substitutes (ha!), as are English and Spanish mutton. Both countries consume both wine and mutton.

   The point of the narrative is to investigate the determination of the pattern of trade — who produces what? Manipulating a model just gives mathematical expressions. Interpret all of your conditions you derive in terms of the economics of the problem.

   (a) Describe the global production possibility frontier. Clearly articulate your model. What determines the pattern of production in the two countries at different points on the production possibility frontier?

   (b) What does this model say about market equilibrium?

   (c) Review your intro-econ notes on comparative advantage. How does your analysis in the previous part relate to the idea of comparative advantage? Give a formal expression of the idea that Spain has a comparative advantage in wine.

   (d) What could producer efficiency mean in this model? Is equilibrium producer efficient?

   (e) Now extend the production technology so that the production process for each good uses labor, wine and mutton. Assume that factor inputs are not mobile; each country must produce its own mutton and wine for inputs, but final outputs freely move between the two countries. Repeat your analysis. Can the pattern of trade be the reverse of your first model?

   (f) Now revert to your first model, but add shipping costs. The easiest way to do this is to assume what Paul Samuelson called an iceberg technology. Some fraction of final

product melts away in shipment. For every unit shipped, only a fraction arrives at the destination. How does the presence of shipping costs change your analysis?

(g) In all of these models, in what sense can it be said that equilibrium is dual to productive efficiency?