

*Time: 30 minutes.*

1. Assume there are only two countries (the U.S. and Saudi Arabia) producing two goods (oil and food) with mobile labor and two specific factors, aboveground and underground resources. Assume both countries operate under conditions of perfect competition. The U.S. is abundant in aboveground resources, while Saudi Arabia is abundant in underground resources. Oil is relatively intensive in underground resources.

- a) For Saudi Arabia, show the free trade equilibrium using PPFs and indifference curves, with food on the horizontal axis. Label the production point Q1, and the consumption point C1.
- b) Suddenly, Saudi Arabia makes a significant discovery of underground resources. Show Saudi Arabia's new free trade equilibrium, assuming it is too small to affect the world price of either oil or food. Label these points Q2 and C2.
- c) Suppose instead that Saudi Arabia could have a significant effect on its terms of trade. Show this new equilibrium, and label the points Q3 and C3.
- d) Could this growth be immiserizing for Saudi Arabia? If no, what conditions are violated? If yes, what other conditions would have to be met?
- e) How would this growth affect overall welfare in the U.S., assuming (incorrectly) that there are no externalities for oil production or consumption.

2. Suppose England and Germany both produce beer under conditions of monopolistic competition, economies of scale, and identical costs. Suppose that the size of each country's beer market is fixed, but Germany's market is twice as big.

- a) Which country has the higher autarky price, and why?
- b) How would free trade affect prices in both countries, and why?
- c) How would free trade affect firm profits in the short run?
- d) How would free trade affect the number of firms in the long run?
- e) Show these predictions using the Krugman-Obstfeld diagram from class.