

14.44/444

Problem Set #4

Due March 9, 2007

1. Suppose that you are trying to determine whether OPEC is an effective cartel. Suppose there is an exogenous and unanticipated shock to world oil supplies --- e.g. political unrest that causes oil exports from Venezuela to fall to zero. Discuss how you would go about distinguishing between the following models of imperfect competition if you could observe market prices, output levels for individual countries, and the short run marginal oil production costs of individual countries before and after the demand shock.

- a. Textbook cartel
- b. Dominant firm/fringe firm
- c. Cournot (quantity) competition
- d. Perfect competition

2. If oil and natural gas are close substitutes discuss the effect of a negative shock to world oil supplies as in (1) on field prices, import prices, quantities, and market clearing conditions for natural gas sold in the U.S. under the following conditions:

a. Field prices for natural gas produced in the U.S. and prices for imported gas are unregulated. Pipelines pass through the cost of the gas they purchase in the field in the prices they charge to local distribution companies.

b. The field price of natural gas produced in the U.S. is subject to a price ceiling equal to the pre-shock domestic price of natural gas while imported gas prices are unregulated. Pipelines are required to charge the average prices they pay for domestic and imported gas to local distribution companies.

c. The pipeline network in the U.S. was operating at full capacity prior to the supply shock.