

Competition Policy and Strategy

Assignment 4

Exercise 4.1 (Dynamic Efficiency II)

This exercise builds on the setting discussed in exercise 3.2. Consider a duopolistic market for a homogeneous good with demand function $q(p) = 1680 - 4p$. In the initial situation, both suppliers have identical constant unit costs equal to $c_0 = 9$. Assume that at most one firm can deploy a new technology for exactly one period which allows it to produce at reduced constant unit costs of $c_1 = 6$.

- a) What is the maximum amount a firm in Bertrand competition would be willing to pay for this technology?
- b) Calculate the consumer surplus in equilibrium. Do so for a situation with Cournot competition as well as a situation with Bertrand competition. In each situation, distinguish between two cases: First, both firms have symmetric costs, and second, one firm invests into the new technology.
- c) What is the increase in total welfare of this technology for each competition model? (Hint: Calculate the willingness to pay of a social planner.)

Exercise 4.2 (Patents)

Two firms are in Bertrand competition and face the demand function $Q(p) = 100 - p$. In the initial situation, both firms have marginal costs equal to $c_h = 20$. There is now the possibility to implement an innovation that causes fixed costs of $F = 50$ and reduces marginal costs to $c_l = 10$.

- a) Formulate the payoff matrix for the case where patent protection is available and determine the Nash equilibrium/-a.
- b) Formulate the payoff matrix for the case where there is no patent protection and determine the Nash equilibrium/-a.
- c) Explain the differences between the two situations with and without patent protection.

Exercise 4.3 (Competition Policy)

Familiarize yourself with some facts and considerations concerning competition policy:

- a) To what extent can the existence of market power affect the efficiency of the market? What form of efficiency should be given particular attention?
- b) Describe what is meant by *consumer welfare standard* and *total welfare standard*. What are the arguments for and against measuring market efficiency in terms of consumer surplus and total welfare, respectively?
- c) What is meant by the *rule of reason* and the *per se rule*? Give examples of applications of the *per se rule*.

Exercise 4.4 (Herfindahl-Hirschman-Index - HHI)

Consider a market for a homogeneous good for which demand can be described by the function $Q(P) = 600 - P$. The good is supplied by two producers who are in Cournot competition. Production incurs a constant marginal cost of $c = 300$.

- a) Calculate the equilibrium price and the HHI. In addition, determine the consumer surplus.
- b) Firm 1 can reduce its marginal cost to $c = 150$ through a process innovation. Calculate the *HHI* for the new situation. In addition, determine the consumer surplus again.
- c) The *HHI* is often used to measure the intensity of competition in a market. Based on your results for the previous tasks, argue whether this approach would yield meaningful results in the case described.