ECO 610
Final Exam
TEI Piraeus/University of Kentucky MBA Program
## October 2009

Name _____ KEY _____

e-mail address _____

Instructions: This exam consists of 13 questions. Answer each question in the space provided. Point values are indicated beside each question. 100 points total. You have four hours to complete this exam, so you should use your time wisely so that you are able to answer all questions. You may use your own textbook, class notes, handouts, or other written material from the course, but you may not borrow anything from another student during the exam. You may use your own calculator, but you may not borrow a calculator from another student. Talking with another classmate during the exam is forbidden! You may ask Petros if you have any questions. Please write clearly. Good luck!

Answer each of the following questions in the space provided. Point values are indicated beside each question. You have already gotten 1 point for signing your name on the cover sheet.

1. (8 pts.) For many years the price of corn was around $3 per bushel. Then because of U.S. government subsidies for the ethanol program that increased the demand for corn, corn prices increased sharply to between $5 and $6 per bushel. In the first diagram below indicate what effect this would have on the market for beef. In the second diagram below indicate what effect this would have on the market for combines (farm machinery used to harvest corn). Briefly explain each answer.

Market for Beef
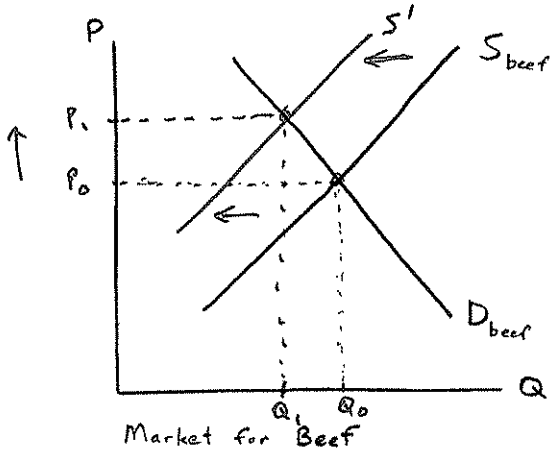
Supply curve for beef shifts leftward, leading to higher price and lower quantity exchanged.

Market for Combines
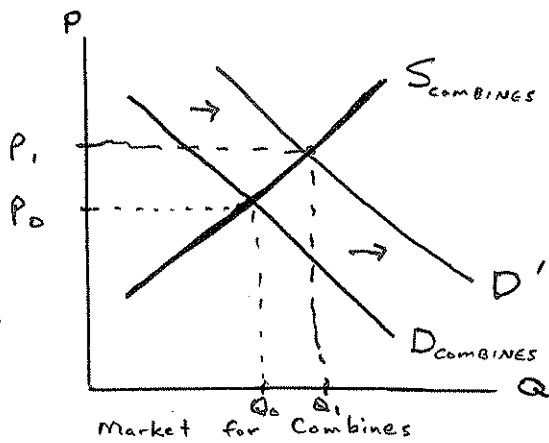
Demand curve for combines shifts rightward, leading to higher price and higher quantity exchanged.

2. (6 pts.) World production of olives is approximately 3 million tons per year. The largest producers are Spain (.96 m tons), Italy (.66 m tons), Greece (.48 m tons), Tunisia (.21 m tons), Turkey (.15 m tons), Syria (.12 m tons), Morocco (.09 m tons). Eleven other countries produce .03 m tons each. Compute the country-level HHI for the olive industry.

$$HHI = \sum_{i=1}^{n} s_i^2 \text{ , where } s_i = \text{market share of } i\text{th country.}$$

$$HHI = (32\%)^2 + (22\%)^2 + (16\%)^2 + (7\%)^2 + (5\%)^2$$
$$+ (4\%)^2 + (3\%)^2 + 11(1\%)^2$$

$$HHI = 1874$$

Note: $s_i \Rightarrow$ for Spain $= \dfrac{.96}{3.0} = 32\%$

for Italy $= \dfrac{.66}{3.0} = 22\%$

etc.

3. (6 pts.) Bauxite mines and alumina refineries usually are owned by the same company. Explain why.

Transportation costs make it more efficient to locate alumina refineries close to bauxite mines. Since an alumina refinery involves a large irreversible investment — there is asset specificity. To avoid the possibility of hold-up, it is efficient for one company to own both stages of production.

4. (6 pts.) Because your aunt was just elected mayor of Athens, you are granted a monopoly on the sale of bottled water at the top of Lycabettus Hill. Your marginal costs are 1.5 € per bottle sold. From experience you know that when you raise or lower price by x percent, quantity sold falls or rises by 2x percent. Currently you are charging 2.5 € per bottle. Is this the profit-maximizing price? Explain why or why not, including any formula that you use in your answer.

$$\eta = \frac{\% \Delta Q_x}{\% \Delta P_x} = 2 \; ;$$

for profit maximization set price so that

$$\frac{P - MC}{P} = \frac{1}{\eta}$$

$$MC = 1.5$$

$$\frac{P - 1.5}{P} = \frac{1}{2}$$

$$2P - 3 = P$$

$$P = 3$$

so if current price of 2.5 € is too low!

5. (6 pts.) Briefly explain how a market system answers the three basic economic questions.

(1) What goods will be produced?
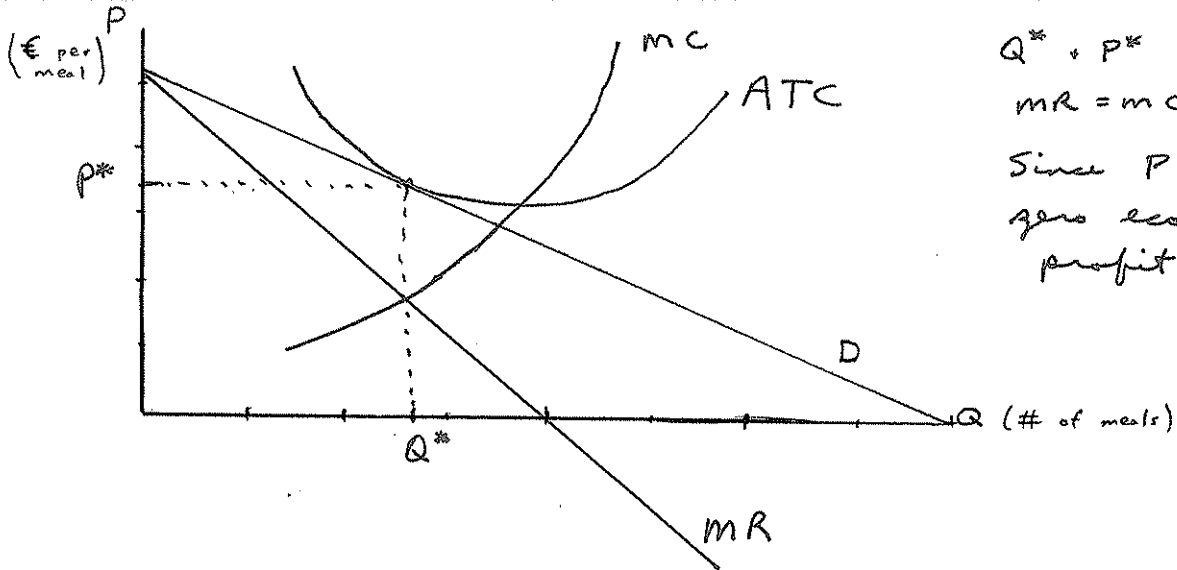
Consumers vote with their euros.

(2) How? what production techniques will be used?

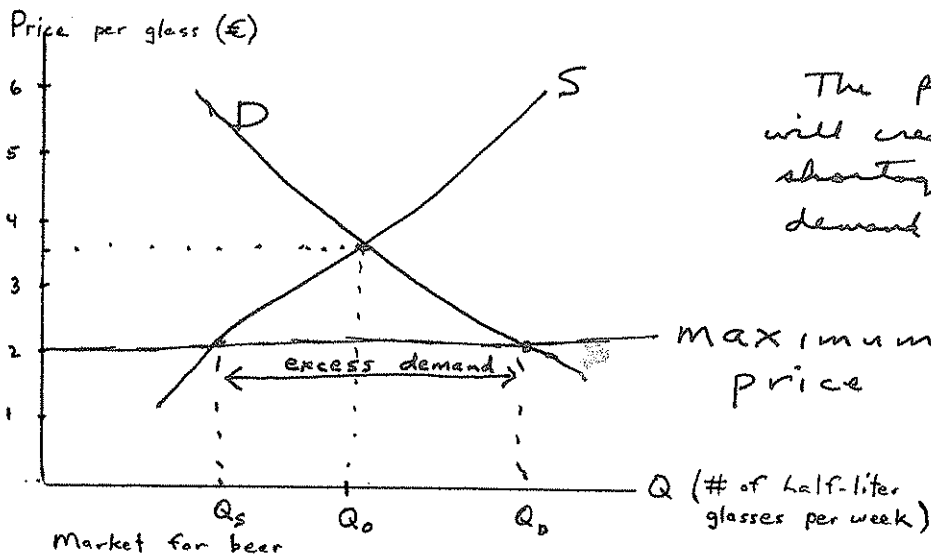Profit maximizing producers consider input prices and choose the mix that minimizes cost.

(3) For whom?

whoever both wants and can afford to pay for the good gets it.

6. (6 pts.) Your professor's observation after observing the restaurant business in the Plaka and surrounding areas for the past five years is that the industry is in a state of long-run equilibrium. The diagram below contains the demand curve facing a typical restaurant. Draw the MC, MR, and ATC curves that are consistent with your professor's observation.

P
$\left(\begin{array}{c}€ \text{ per} \\ \text{meal}\end{array}\right)$

MC

ATC

P*

D

Q (# of meals)

Q*

MR

Q^* , P^* where $mR = mc$.

Since $P = ATC$, zero economic profit

7. (6 pts.) The price of a half-liter glass of beer at Athens bars and restaurants is typically between three and four Euros. Residents and tourists consume Q_0 glasses of beer in a typical week. The mayor and city government of Athens are concerned that poor university students have to limit their intake of beer because the price is so high. They decide to impose a price ceiling (maximum price) of two Euros on every glass of beer sold in Athens. Illustrate in the diagram below the current market situation and then show the effect a price ceiling will have. How do you think restaurants and bars will respond?

Price per glass (€)

6

5

4

3

2

1

D

S

excess demand

maximum price

Q (# of half-liter glasses per week)

Q_s Q_o Q_b

Market for beer

The price ceiling will create a shortage or excess demand for beer.

Bars will probably reduce the size of a glass of beer from 0.5 liter to 0.25 liter.

8. (8 pts.) Your parents completely own the house that they live in. It has a current market value of 240,000€. Their current monthly expenses for taxes and insurance on the property are 200€. Your father, who earns 25€ per hour in his job, typically spends four hours per week of his leisure time on yard work and other maintenance of the property. Your parents have looked at a new townhouse development nearby where they could rent a townhouse for 1000€ per month. They like these townhouses just as much as their current house. They would not have to pay taxes and insurance if they lived there, but their expenses for phone, electricity, and other utilities would be the same as in their current house. Maintenance and yard work would be handled by the owner of the townhouses. Your parents have a small portfolio of stocks and bonds, on which they earn a five percent rate of return. You ask them why they don't sell the house and move to the townhouses. They respond that they can't afford it. What do you think about their logic?

Cost of living in their current house:

① interest earnings foregone on 240,000€

240,000€ @ 5% = 12,000€ per year

or 1000€ per month

② taxes and insurance — 200€ per month

③ time spent on maintenance and upkeep —

4 hrs. per week @ 25€ = 100€ per week

times 4 weeks per month = 400€ per month

Total cost = 1000 + 200 + 400 = 1600€ per month

So if they can rent a townhouse that they like just as much for 1000€ per month, they should sell the house and move.

9. (4 pts.) Briefly explain why Greek vintners are struggling.

Greek vintners are generally small in size and cannot take advantage of economies of scale. So their costs tend to be higher than vintners in other countries.
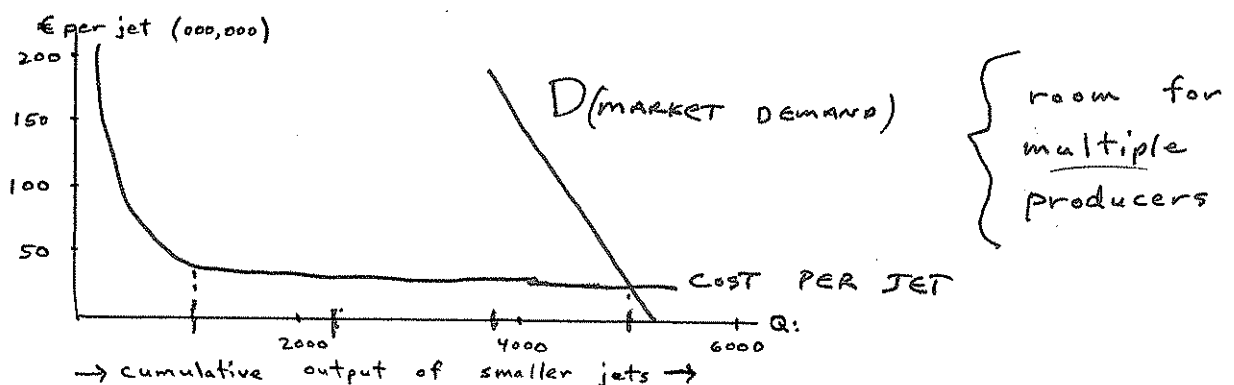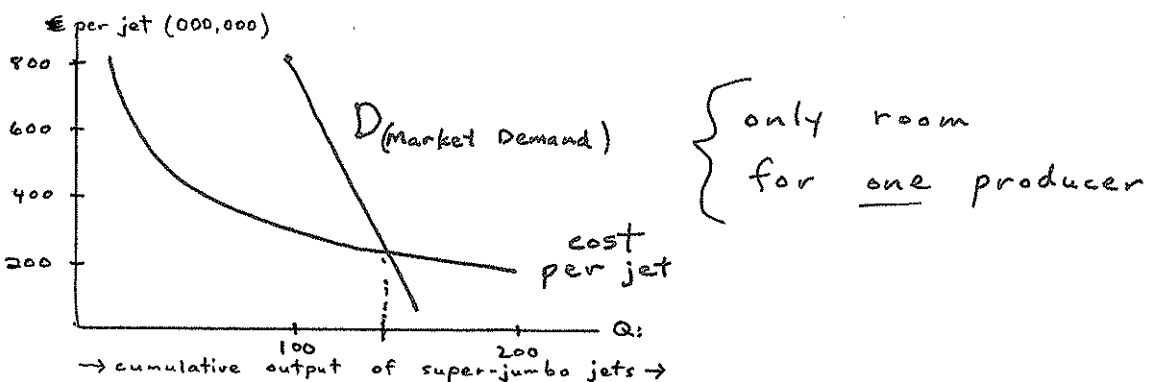
10. (8 pts.) List the factors which make it easy or difficult for firms in an industry to tacitly collude. Knowing what you do about the market for passenger jet airplanes, which of these factors will make cooperation more likely and which will make cooperation less likely in this industry?

- number and size distribution of sellers
- number and size distribution of buyers
- symmetric vs asymmetric costs
- homogeneous vs. differentiated product
- innovative vs. static technology
- stable vs. uncertain demand
- ease or difficulty of entering the industry
- elastic vs. inelastic market demand
- availability of information about rivals' prices and costs

Passenger jet market:

2 sellers, many buyers, symmetric costs, fairly homogeneous product, difficult to enter, but innovative technology and sometimes uncertain demand.

11. (8 pts.) Airbus and Boeing both agree that there is only room for one efficient-sized producer in the market for super-jumbo jets. For smaller jets like the Boeing 737 and Airbus A320, there is room for both firms to efficiently compete. Draw the learning curve and market demand curve for super-jumbo jets that are consistent with the market only supporting one producer. Then draw the learning curve and market demand for smaller jets that are consistent with two efficient-sized firms.

€ per jet (000,000)

D (Market Demand)

cost per jet

→ cumulative output of super-jumbo jets →

{ only room for one producer

€ per jet (000,000)

D (MARKET DEMAND)

COST PER JET

→ cumulative output of smaller jets →

{ room for multiple producers

12. (12 pts.) The production of filberts (also called hazelnuts) is characterized by many small producers, a homogeneous product, and insignificant barriers to entry. The industry is currently in long-run equilibrium with price equal to 10€ per kilogram. A typical filbert grower produces 10,000 kg per year. Total industry output is Q_0.

a) Illustrate the current situation in the diagrams below. Label these answers (a).

filbert Market

typical filbert grower
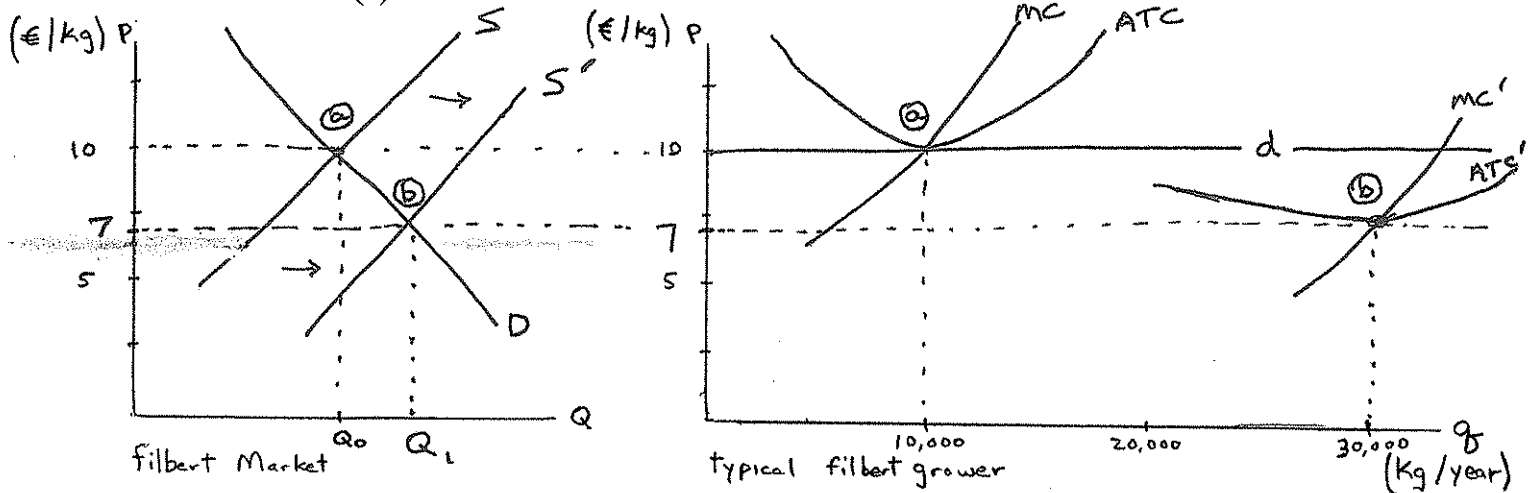
b) Technological progress in the form of mechanical harvesting equipment occurs in the industry. LRAC shifts downward by 30% and to the right, with the new minimum efficient scale for a filbert grower equal to 30,000 kg per year. Illustrate the new long-run equilibrium in the filbert industry and label these answers (b). Be sure to explain what you think will happen to market price, market output, each individual firm's output, and the overall number of firms after the market finally reaches the new long-run equilibrium.

Technological change shifts ATC curve downward and to the right, to ATC'. Firms that adopt the new technology will be larger and have lower costs. They will make economic profits in the short run. In the long run:

- Market price will fall from 10€ to 7€.

- Market output will increase from Q_0 to Q_1.

- Some farmers will expand and produce 30,000 kg per year. Other farmers will exit the industry. Small farms (10,000 kg/yr) will not survive.

- There will be fewer (but larger) producers after the industry shakeout.

13. (15 pts.) Lake Cumberland is a large man-made lake in central Kentucky. Two firms compete in the summertime dinner cruise market on Lake Cumberland. They must commit dinner cruise ships to the various markets they serve months in advance of the summertime dinner cruise season. One firm is Royal Mediterranean (RM) and the other is Circus Lines (CL). The marketing department of each firm has worked out the following profit matrix depending on the capacity choice of each firm. Each firm typically puts one dinner cruise boat on Lake Cumberland every summer, and the boats owned by each firm have seating capacities of 30, 40, or 60 people. RM's profits are shown as the first entry in each pair, and CL's profits are the second entry:

		CL's Capacity Choice		
		30 seats	40 seats	60 seats
RM's Capacity choice	30 seats	18,18	15,20	9,18
	40 seats	20,15	16,16	8,12
	60 seats	18,9	12,8	0,0

a) What do you predict will be the outcome of this game if the two firms set prices simultaneously? Explain your reasoning as well as the solution concept you use to solve this game.

For the row player RM the strategy choice of 60 is dominated by 40, so it can be eliminated. For the column player CL the strategy choice of 60 is dominated by 40, so it can be eliminated. In the remaining 2×2 game matrix RM has a dominant strategy of 40 and CL has a dominant strategy of 40 as well. The strategy pair (40,40) is a Nash equilibrium, because neither player has ex post regret.

b) Suppose that Royal Mediterranean must choose its capacity first and stick with it, since its boats come from farther away. Then Circus Lines is free to respond as it chooses to Royal Mediterranean's choice of a boat. Draw the game tree and predict the outcome of this sequential move game.
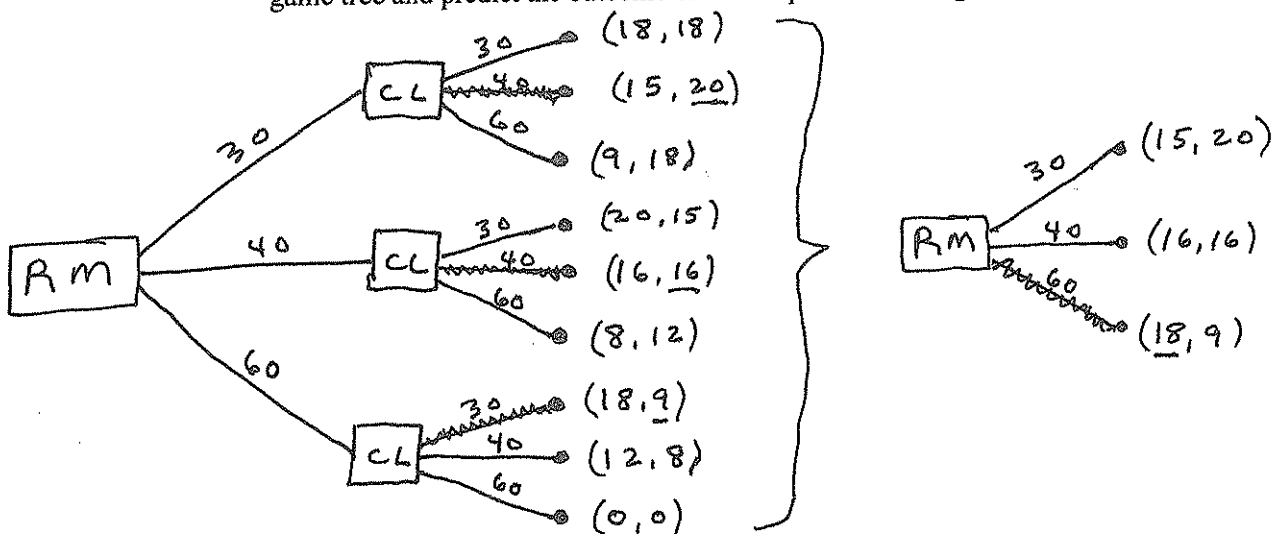
So RM will choose capacity of 60, and CL will choose capacity of 30 in response. RM will earn 18 and CL will earn 9. RM looks ahead and reasons backward.