

This paper has 9 pages
(Including this coversheet)

THE UNIVERSITY OF MELBOURNE
MELBOURNE BUSINESS SCHOOL

MANAGERIAL ECONOMICS

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Final Exam: December 2006

Exam Duration: 180 Minutes + 10 mins reading at the start

THIS IS A OPEN BOOK EXAMINATION

1. More marks will be awarded for answers that are brief and clear.
2. Answer the questions in the booklets provided. Use a separate booklet for each question.
3. Write your name on each booklet you want graded.
4. Candidates may not remove this exam from the examination venue.
5. Calculators and Laptops may be used during the examination.
6. Answer ALL questions.
7. The marks for each question are indicated. There are 180 points in this exam, use the points per question as a guide for how much time to spend on each question.
8. Show your working – this can earn you points even if the final answer is wrong.

Question 1 (Oligopoly):

The two canonical models of competition between two firms competing in the same industry are the Cournot and Bertrand models. The Cournot model has firms competing in quantities while the Bertrand model has firms competing in prices. What is startling is that the models have such different predictions for market outcomes. Discuss why they are different and two ways in which the Bertrand model can be enriched to yield a more nuanced view of market outcomes. (Appropriate use of diagrams is encouraged). (30 Points)

Question 2 (Information Economics):

(a) What is an adverse selection problem? (3 Points)

(b) At various points in the course we discussed auctions, which in the language of economics also include procurement procedures like sealed-bid competitive tenders. Economists refer to the typical sealed-bid competitive tender as a first-price sealed bid auction (or FPSB auction). Explain how a FPSB auction works (i.e. how the winner is determined, what they pay and how bids are submitted). (10 points)

(c) Explain, using the FPSB auction example, why an auction raises an adverse selection problem. (3 Points)

(d) Discuss the relationship between monopoly pricing under full information and an auction. (Hint: Think about price discrimination) (3 Points)

(e) The Indonesian government has decided to auction licenses that allow oil exploration firms to conduct exploratory drilling in specific areas of their coastal seabed. Each license gives exclusive drilling rights in a specified area. The Indonesians have asked you to advise them on whether they should conduct a FPSB auction or an open-outcry auction where everyone can see who is bidding (like in a house auction). Given that the government wants to generate as much money as possible, what is your advice? (11 Points)

Question 3 (Monopoly Pricing):

(a) Bob runs a monopoly selling cardboard boxes. Bob only produces one type of box and sets only one price in the market. Bob's demand curve is given by:

$$\text{Price} = 100 - (2 \times \text{Quantity})$$

Bob's Marginal Revenue curve is given by:

$$\text{MR} = 100 - (4 \times \text{Quantity})$$

Draw a graph of Bob's demand and MR curves with quantity on the horizontal axis. (5 Points)

(b) Why does the Marginal Revenue lie below the Demand curve in your diagram (use a diagram to explain this if you wish). (5 Points)

(c) If Bob's Marginal Cost is equal to \$20 per unit what is the optimal quantity for Bob to deliver to market? (5 Points)

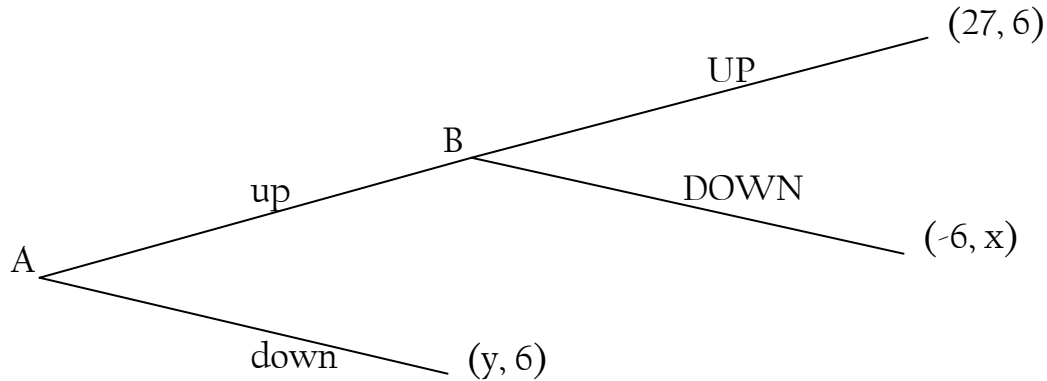
(d) Now imagine Bob has two types of customer: Businesses and Households. He can tell the difference between the two and knows that the demand elasticity of Households is higher (in absolute terms) than Businesses. Which group should Bob be receiving a higher margin from serving? (5 Points)

(e) Regardless of the level of marginal cost, what is the relationship between the marginal revenue received from serving Business customers and Household customers? Give a clear explanation of your answer. (5 points)

(f) When Bob sells to Household consumers he does not allow any customer to buy more than 7 boxes at a time. Why might he do this? (5 Points)

Question 4 (Game Theory):

Consider the following sequential move game



- If $x = 1$ and $y = 0$, what is the equilibrium of this game? (4 Points)
- If $a = 7$ and $y = 0$, what is the equilibrium of this game? (4 Points)
- If $a = 7$, what is the minimum value of y needed to induce player A to play “down” in equilibrium? Explain why. (4 Points)

Consider the following normal form game:

		Player C	
		Left	Right
Player R	Up	2,1	0,0
	Down	0,3	1,2

- Does Player R have a strictly dominant strategy? (4 Points)
- Does Player C have a strictly dominant strategy? (4 Points)
- What is the pure strategy Nash Equilibrium in this game? (4 Points)

(g) Now, let's introduce another player called Player G. Player G has two possible actions, IN and OUT.

If Player G plays IN the payoffs are given by:

		Player C	
		Left	Right
Player R	Player G plays IN: Up	2,1,2	0,0,2
	Down	0,3,5	1,2,4

Where the payoff for (Down, Left, IN) means Player R gets 0, Player C gets 3 and Player G gets 5.

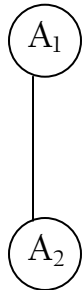
If Player G plays OUT the payoffs are given by:

		Player C	
		Left	Right
Player R	Player G plays OUT: Up	2,1,2	6,0,-1
	Down	9,3,4	1,2,3

What is the pure strategy Nash Equilibrium of this 3-person game? (6 Points)

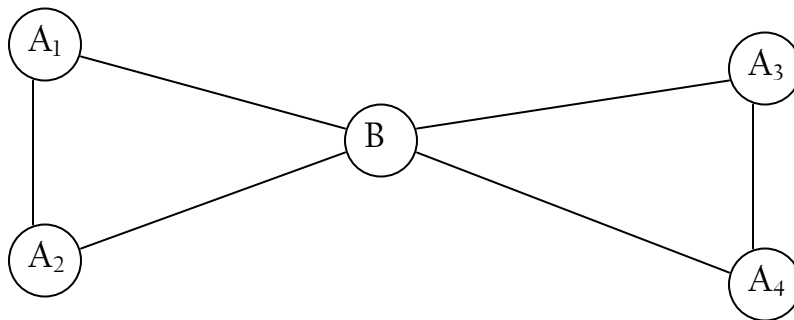
Question 5 (Added Value):

(a) Define the concept of value added. (6 Points)



(b) Consider the two agents A_1 and A_2 pictured above. A_1 and A_2 are looking to enter into a joint venture. If they work together on the joint venture they will collectively generate \$2 million in profit. If they do not work together they will each earn \$500,000 in profit.

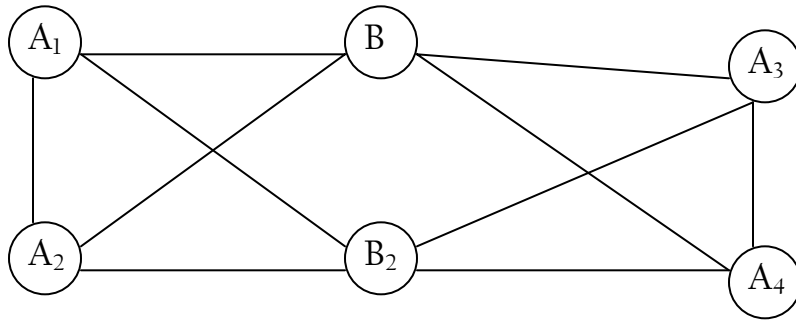
What is the value added of A_1 ? (6 Points)



(c) Now consider the network above. As before, A_1 and A_2 can either work together and get \$2 million in profit (collectively), or they can get \$500,000 each by working alone. A_3 and A_4 are in exactly the same position.

However, yet another option exists. A_1 , A_2 , A_3 and A_4 could all work together and generate \$8 million in profit. However the only way this will happen is if they get brought together by B, who is a broker. That is, for A_1 , A_2 , A_3 and A_4 to work together they must also be working with B.

What is the value added created by B's brokering role? (6 Points)

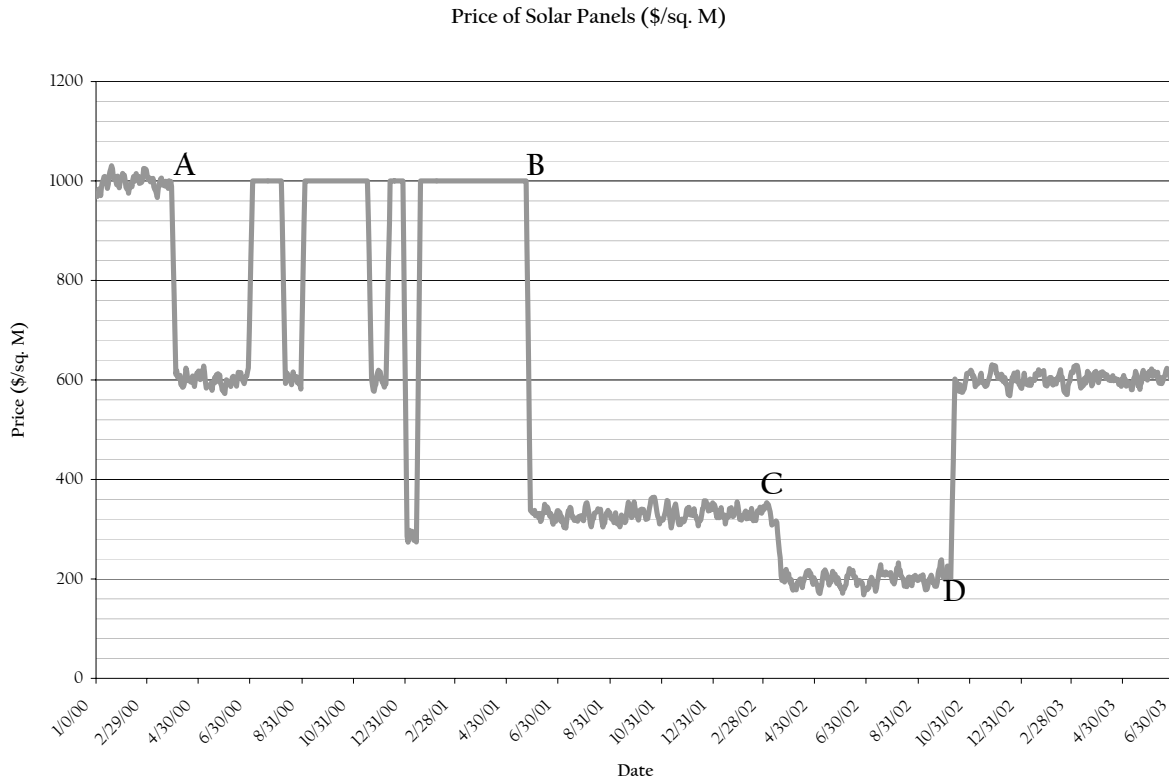


(d) Now consider the network above. Here there is a second broker B_2 . B_2 can broker the same deals B can. What is B 's value added now? (6 Points)

(e) Comment on the following statement: "Brokers should welcome competition – competition strengthens their position in the market by promoting the importance of the broker role in forming value enhancing business relationships." (6 Points)

Question 6 (Putting it all together...):

The graph below shows the price of solar panels for electrical generation in the fictional country of Japorea over a 3.5 year period. The price of solar panels is measured in dollars per square metre.



Here are some important facts:

- The market tends to work by a purchaser of panels ringing a supplier and requesting a quote. The supplier quotes a price and the customer decided whether to buy or not.
- At the start of the 3.5 year period there is only one company supplying solar panels to the Japorea market. This company is called Alpha Solar. Alpha solar has one small factory.
- At point A, Bravo Solar enters the market. Bravo enters with a factory the same size as Alpha's.
- At point B, a third firm, Charlie Solar, enters the market. Charlie enters with a huge factory.
- At point C, a patent on a low cost technology for manufacturing solar panels expires
- At point D, the Japorea Government announces that every school and hospital in Japorea will be powered by solar panels and starts to enter the market to acquire these panels.
- Throughout this period the solar panels sold by all firms are substantively the same.

- a) How would you describe the market structure prior to point A? (5 Points)
- b) What do you think the marginal cost level is before the introduction of low cost manufacturing technology at point C. Justify your answer. (5 Points)
- c) Explain the movements in price between points A and B. (5 Points)
- d) Why is the price drop after point B larger than after point A? (5 Points)
- e) What do you think the marginal cost level is after the introduction of low cost manufacturing technology at point C. Justify your answer. (5 Points)
- f) Why does the price jump at point D? (5 Points)