Econ5026 – Strategic Business Relationships.

Midterm – 20 September 2017 - Solutions

Answer all questions in the answer booklets provided..

Time allowed: 1 hour 20 minutes (80 minutes).

Students are allowed to use non-programmable calculators.

Written answers should be done in pen, however diagrams may be drawn in pencil.

In your answers please show all working.

NOTE THAT THE EXAM IS WORTH 50 MARKS IN TOTAL. TAKE CARE TO NOTE HOW MANY MARKS ARE ALLOCATED FOR EACH QUESTION AND ALLOCATE YOUR TIME ACCORDINGLY.

Name: _____

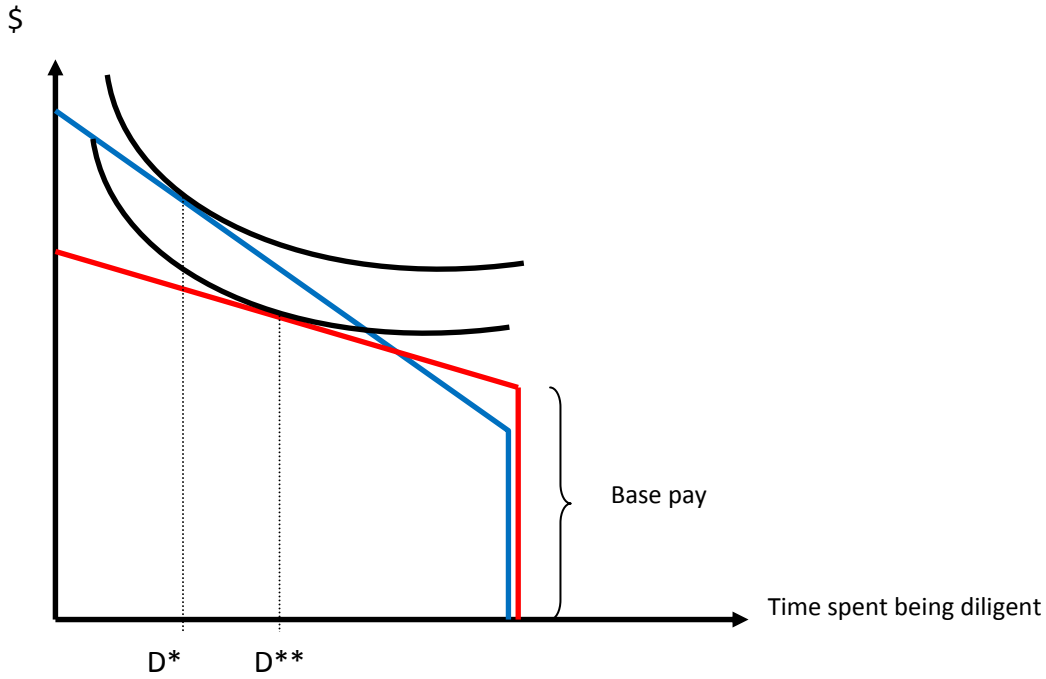
Student number: _____

Signature: _____

1. 5 marks

(i) The economic approach highlights the importance of incentives. Using a diagram, explain how individual's response to monetary incentives might be used to alter how careful financial advisers are when they give advice. (5 marks)

Solution: Here what I was looking for was a diagram like the following:



The budget constraint defines the choices that are available to the individual. They can spend their time making sales and increasing the $s earnt, or, spend time being diligent in their work. The blue budget line shows the choice for an individual who faces a low base pay and a high commission rate. The red budget line shows the choices available to someone who faces a high base pay and low commission rate. The black lines show the indifference curves of the individuals. As a general rule individuals wish to move to the highest possible indifference curve subject to the budget constraint.

Hence an individual facing the blue budget line spends more time making money and only D time being diligent. The person facing the red budget line chooses to spend time D** in diligence. Effectively, when the base rate of pay is increased and the commission rate lowered, it becomes 'cheaper' (the opportunity cost is lower) to spend time being diligent. Hence, a change in the remuneration arrangement (the monetary incentives) can be used to encourage individuals to take more care or be more diligent.*

As an aside, note that this is very similar to question 4 in tutorial 1 but without the algebra.

2. 10 marks in total

(i) The Ramrods are a small music band that sells music over the internet to two different types of consumers. The demand curve for each type of consumer is set out below.

Type A consumer: $p = 30 - Q$

Type B consumer: $p = 20 - Q$

Assume that the band has come up with a new pricing strategy which means that they offer buyers one of two options/ packages.

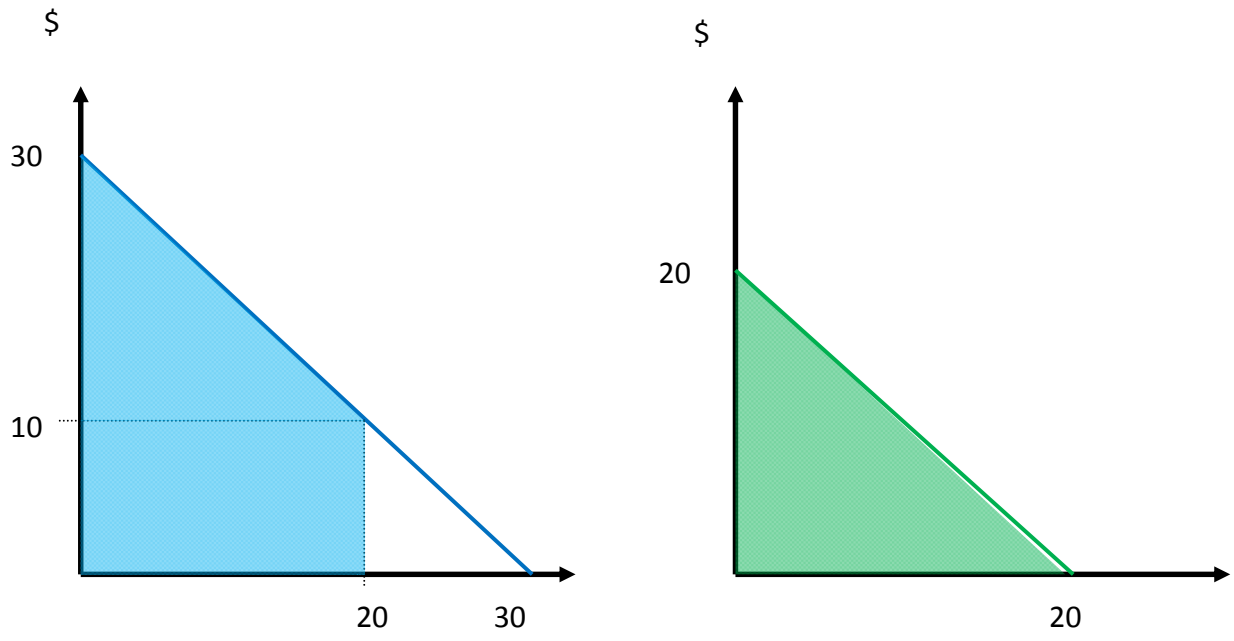
Basic: 20 songs at a total price of 200.
Premium: 30 songs at a total price of 450.

With these options/ packages, what will each type of purchaser buy? Note you should assume that each buyer buys one package and they choose the one that maximizes surplus.

If they continue to sell the Basic package, what is the maximum price they can charge for the premium package to maximize profit? (7 marks)

(ii) Discuss using a diagram how a firm might extract consumer surplus using block pricing (3 marks)

Solution: Here what you need to do is to start by drawing some diagrams as follows:



So what we need to identify is:

For person A (on the left hand side) willingness to pay for 20 songs. This is given by the blue shaded area in the diagram. You should be able to show that this is:

$wtp_{20} = (10)(20) + 0.5(20)(20) = 400$
$wtp_{30} = 0.5(30)(30) = 450$

For the person on the right hand side, we want to know willingness to pay for 20 songs. This is given by:

$wtp_{20} = 0.5(20)(20) = 200$

Recall that I said that the price of the basic package with 20 songs is 200. Hence, both are willing to buy the basic package. Moreover, for person A they get consumer surplus of 200 from the basic package and zero consumer surplus from the premium package, hence they buy the basic package. The Ramrods then sell two basic packages. To get the type A buyer to purchase the premium package it must offer at least as much consumer surplus as the basic package. Given type A buyers have a willingness to pay of 450 for the premium package, if they are charged 250 for the premium package it will give them 200 surplus and they will purchase it. Note, in saying this we implicitly assume that if both packages give equal consumer surplus they buy the higher priced one. You might charge slightly less than 250 for the premium so that the type A buyer is strictly better buying it rather than the basic package.

The second part of the question asked about block pricing. One way to think about block pricing is that it is charging in a way that offers quantity discounts. See slides 15 and 16 in lecture 5. In slide 16 I use a diagram to show how block pricing works.

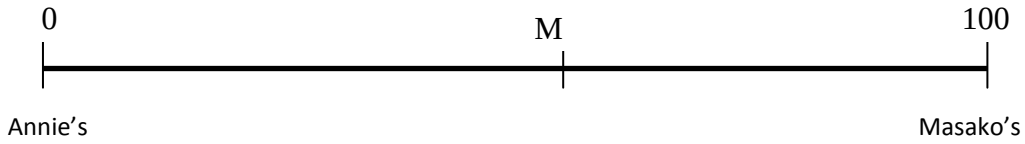
3. 3 marks.

Suppose that we have two restaurants located at either end of a road that is 100 kilometers long. Annie's German restaurant is located at kilometer zero, and Masako's Sushi Bar is located at kilometer 100. In each case the location of the firm is fixed and the only choice they have is over price. There are 100 consumers spaced equally along the road. Assume that the cost of travelling each kilometer is $1.

If meals at Annie's cost $25, and meals at Masako's cost $45, where will the marginal consumer be located?

Assume that the cost of preparing a meal costs $25 at both restaurants. Does this outcome represent a Nash equilibrium? Why or why not? *Hint: Ask yourself if Annie has any incentive to change her behaviour given that Masako does not change their behaviour.*

Solution: Here note that the problem is very similar to that of Esme and Jose (slide 18 of lecture 6). Think about the following diagram:



The indifferent consumer is located at kilometer M. For that person, the cost of going to Annie's or Masako's should be equal. That person will have to travel M kilometres to go to Annie's and (100-M) kilometres to go to Masako's. Hence, the following expression should hold given the price of a meal at both restaurants:

$$25 + M = 45 + (100-M)$$

$$M = 60$$

Hence, the indifferent consumer is located at kilometer 60.

*Is this a NE? The short answer is no. To see this note what happens in Annie increases her price by $2. As a result she will lose one customer so the marginal customer is now at kilometer 59. However, her total revenue which was originally 1500 (=60*25) is now 1593 (=27*59). Hence her revenue has increased while her costs will have decreased because she now makes one less meal. Hence her profits will be higher. Clearly, Annie has an incentive to increase her price if Masako does not change her behavior, in which case the current set of prices cannot be a Nash Equilibrium.*

4. 2 marks.

Very briefly (in a short paragraph), explain what is meant by preemption.

Solution: All I was looking for here was a short statement to the effect that preemption means that firms/ businesses seek to fill up the product space with a variety of products and thereby dissuade other firms from entering. See slide 35 of lecture 6 and the discussion that follows on subsequent slides.

5. 6 marks

Consider two competitors (Springvale and Eauclear) that are considering working together to set a higher prices and thereby increase profits. After reaching an agreement the firms can choose to cooperate or cheat. The payoffs from cooperating and cheating are presented below:

		Springvale	
		Cooperate	Cheat
Eauclear	*Cooperate*	(*250*, **165**)	(*85*, **450**)
	Cheat	(*450*, **35**)	(*100*, **65**)

Is there a pure strategy Nash Equilibrium in this game if the players make their choices simultaneously? If so identify it and describe what is meant by a Nash Equilibrium (2 marks)

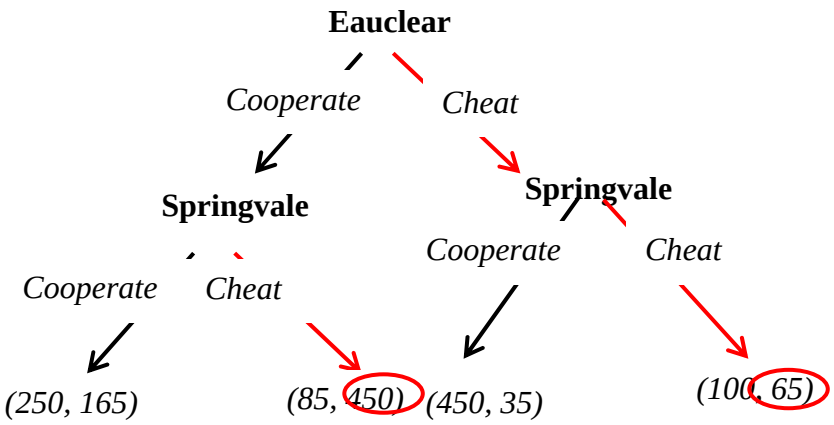
Draw a game tree for this game if Eauclear makes a decision and then Springvale makes its decision. Find the equilibrium outcome of the game.

Suppose that Eauclear and Springvale actually interact repeatedly. Describe how a cooperative outcome might be achieved? (2 marks)

Solution: Nash Equilibrium simply requires that neither player has any unilateral incentive to change their behaviour. The best responses are circled in the payoff matrix below when choices are made simultaneously. The NE is for both firms to cheat.

		Springvale	
		Cooperate	Cheat
Eauclear	*Cooperate*	(*250*, **165**)	(*85*, **450**)
	Cheat	(*450*, **35**)	(*100*, **65**)

If choices are made sequentially, then we need to draw the tree diagram or extensive form of the game.



Note that I have circled the best response on the part of Springvale . Given their best response, the best strategy for Eauclear will be to choose 'cheat'. Hence the outcome of the game will still be cheat; cheat.

The final part of the question here asked about how an outcome where they continued to cooperate could be sustained. The key here is that by continued interaction, it becomes possible to punish another player if they cheat. There are a couple of issues with this. First, ideally you want to be playing the game repeatedly and not knowing when (or if) the game will end. If the game is being played a finite number of times then it is really just like playing it once and both players will cheat. Second, for the punishment or threat of punishment to work you need to ensure that it is credible. If called on you will actually impose the punishment. Finally, for it to work then it must be better for cooperation on a continued basis to give you a better outcome then cheating and getting punished.

6. Essay question (24 marks) – Answer one of the following two questions.

(a) Market structure is an important determinant of market outcomes. In some market structures barriers to entry are particularly important to understanding market outcomes. Describe what is meant by barriers to entry. Discuss the differences in the US and German beer markets and why such differences might exist.

(b) Describe what is meant by first, second and third degree price discrimination. Discuss how the internet may have changed the pricing behavior of firms and whether we would expect to see more or less price dispersion over time.

Solution: In each case the marks for the essay were split into two parts.

(a) 8 marks for a discussion of barriers to entry. These include incumbent advantages such as:

- *Precommitment contracts that incumbents might have.*
- *Licenses and patents.*
- *Pioneering brand advantages that create switching costs.*
- *Learning curve effects.*

There might also be responses on the part of incumbents or actions associated with:

- *Specific assets and how they are employed.*
- *Scale economies that provide an advantage to incumbents if entrants cannot achieve minimum efficient scale.*
- *Incumbents may have already filled the product space.*

This is not an exhaustive list and there is a discussion in McAfee about the various types of advantages that incumbents might possess that provide an advantage over entrants. Ideally there would have been a short description (one or two lines) of a few of these.

The second part of the discussion should have discussed the article by Adams discussed in tutorial 2. The marks allocated for this was 16.

A number of things about this. First, there should have been a discussion that clearly identified the puzzle of interest, namely that the US beer market is much more concentrated than the German one. The paper sought to identify why this is the case.

In the paper they discuss various explanations relating to the economies of scale that do or do not exist in the production/ brewing, packaging and distribution of beer. Technological advances mean that there are economies of scale in the packaging and distribution of beer. In terms of packaging, there are economies of scale in the packaging of cans that are used more extensively in the US than in Germany. this might help explain the large firms that exist in the US. Transport is a tricky one. Germany doesn't allow preservatives which means that beer has a shorter shelf life and therefore is less likely to be transported across large distances are it is subject to greater spoilage. Alternatively, it may be the case that Germans have more nuanced ort local preferences for beer. this has facilitated the continued existence of local brewers at the expense of

large national brewers – the evidence is mixed on this. If anything this seems to be less important now than it was in the past.

The key to the puzzle actually appears to lie in television. There is a nice discussion in the article, but you should note that national TV stations that broadcast across the US allowed brewers to reach large audiences and develop national brands. This is only beginning to happen in Germany now. Hence, this seems to be an important part of the explanation why large brewers do not dominate the German market.

Finally, there are a bunch of other reasons that are discussed albeit briefly in the article. These include the ability of firms to horizontally or vertically integrate in both countries which might have led to large scale brewers tying up distribution and retail networks. In terms of horizontal mergers, these do seem to provide an explanation for differences in the US and Germany as in both countries it was dissuaded by authorities. Ironically, vertical integration is not allowed (in general) in the US, but it has effectively been achieved by exclusive dealing contracts. In Germany it is allowed which you might think provides opportunities for large brewers to gain economies of scale and grow. However, what seems to have helped small brewers in Germany is their ability to tie up retailers.

Other issues that are given limited space in the article related to whether the profit motive differs in Germany and the US (this doesn't really appear to be the case); or differences in taxes. Again this does not seem to explain the differences in the markets.

Ideally you would have set out a well-structured discussion that addressed many if not all of the points discussed above. One thing that did not receive high marks was a verbatim recital of the notes that I had posted about the article.

(b) 9 marks for a discussion of price discrimination, with three marks for a discussion of each of the following:

- *First degree PD.*
- *Second degree PD.*
- *Third degree PD.*

Note that this required that there be a short description of what each involved, whether it was feasible and what requirements had to be met for it to be put in place (for example with third degree PD you need to be able to distinguish between different types of buyers and prevent resale).

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The final 15 marks required a discussion of the Daripa article. The question asks about price dispersion. In the article there is a discussion about what the internet promised and what potentially it might deliver. For example, in some dimensions you might think that the internet will have eliminated price discrimination. It allows for rapid price comparisons to be made and therefore you might think that customers search out for the lowest price, eliminating price differences. This might particularly be the case for goods that are truly homogenous such as music or books. Moreover, it may depend on the nature of the industry and whether there was freedom of entry and exit

On the other hand the internet provides opportunities for firms to fudge price comparisons and thereby create additional price dispersion. For example, posted prices

might not actually be directly comparable as it will depend on whether they include delivery costs etc. Other reasons that the internet might not eliminate price dispersion include:

- *Competitors can now observe prices of rivals and this may create opportunities for price cycles in which price dispersion is generated.*
- *Tracking information can be collected (e.g. cookies) that allow personalized prices to be developed by firms.*
- *Switching costs might be created by internet sellers which create opportunities for price dispersion to be greater.*
- *It is also true that internet sales of goods such as music and software create opportunities for bundling and menu pricing (versioning) that could lead to greater price dispersion.*
- *finally, the greater use of auctions on the internet is likely to result in greater price dispersion.*

Ideally you would have set out a well-structured discussion that addressed many if not all of the points discussed above. One thing that did not receive high marks was a verbatim recital of the notes that I had posted about the article.