

Midterm Examination
Fall, 2007

Please check that you have 16 pages in your copy of this exam. Answer each question in the space provided. If you need more space, please use the back of each page (but be clear to the grader where the answer is). You may consult one side of a single page of notes. Calculators are permitted.

There are 75 points to be gained in this examination. Since the examination will last 75 minutes, you should use the points allocated to each question as an indication of how much time to spend answering it.

If you need more paper then let me know. Put your name on every piece of paper you want to be graded on (don't trust the staple...)

I understand that the honor code applies: *I will not lie, cheat, or steal to gain an academic advantage, or tolerate those who do.*

(Name and Signature)

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1. [31 points] The table below shows the global market for the mineral sand, zircon. It shows the world price and the quantity of zircon bought for each year from 1992 to 1996. Because zircon is resistant to corrosion and heat, it is used in engines, electronics, spacecraft and the ceramics industry. Zircon products are also used in computer disc drives, for lightweight warmth and protection in clothing, and in many domestic products such as ballpoint pens. The market works by miners extracting Zircon and then selling it on the open market to producers who make various products out of it. The global zircon market is perfectly competitive.

	World Price (\$ per ton)	Quantity Traded (thousand tons)
1992	17	1,000
1993	34	750
1994	35	770
1995	45	1,155
1996	47	1,156

You are managing a team trying to work out how responsive the demand for zircon was to price changes during this period. During your research you find out the following:

- a. The US government tripled expenditure on military electronics components in the first quarter of 1995. Military applications of electronic systems require large amounts of zircon to make them robust to extreme conditions.
- b. Indigenous Australians gained a form of legal title to huge areas of remote Australia in 1993, where over 50% of the world's mineral sands are mined. This form of legal title has allowed indigenous Australians to restrict mining activity in their traditional tribal areas.

Answer the following questions, using a diagram if appropriate [7 points each]:

- (a) Account for the price and quantity movements from 1992 to 1994
- (b) Account for the price and quantity movements from 1994 to 1996

Now do the following:

A rival team at another firm computed the demand elasticity for zircon using data from 1994 and 1995 only.

- (c) [5 points] Using the data in the table, derive what their estimated elasticity was.
 - (d) [5 points] Does this number make sense? Why/Why not?
 - (e) [7 points] Using the data in the graph, pick the price and quantity from two years and use them to compute an elasticity of demand. Explain why your estimate is better than the rival teams. (2 bonus points if you use the analysis in parts (a) and/or (b) in your explanation in a convincing way).
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2. [26 points]

The table below shows the own-price and cross-price elasticities of demand for four products: A, B, C and D. Two of these products are game consoles (like the Playstation or Xbox), and two of the products are the games that play on these games consoles. There is no point having a game consol without having games to play on it. Similarly, there is no point having a game without a game consol that can load it. Lastly, if a game can load on one type of game consol it follows that it cannot load on any other (i.e. the games that you can play using an Xbox can only be played on an Xbox).

The data on cross-price elasticities is missing the signs. This ambiguity is indicated by a (+/-) meaning that the data does not make a clear indication of the sign of the elasticity.

For each game consol there are many games that can be loaded on it. This led one consol manufacturer to say “consumers are much more price sensitive when buying games than when buying consoles – that’s good news for us, bad for software providers”.

Change Of Price in:

	A	B	C	D
A	- 4.6	0	0	(+/-) 0.7
B	0	- 1.5	(+/-) 0.1	(+/-) 0.7
C	0	(+/-) 0.6	- 4.6	0
D	(+/-) 0.2	(+/-) 0.6	0	-1.2

Change in Quantity Of

- [4 Points] Which of A, B, C and D are the two game consoles? Why?
- [4 Points] Which of A, B, C and D are the games? Why?
- [2 Points] Would you expect games and consoles to be substitutes or complements?
- In the table below indicate the correct sign of the cross-price elasticities (i.e. put in a “+” or “-” sign in the empty boxes.) [12 Points: 2 points for each]

Change Of Price in:

	A	B	C	D
A	- 4.6	0	0	
B	0	- 1.5		
C	0		- 4.6	0
D			0	-1.2

Change in Quantity Of

- [2 Points] Justify your choice of sign for the cross-price elasticity of D with respect to A
- [2 Points] Justify your choice of sign for the cross-price elasticity of D with respect to B

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3. [18 points] Gazcom has a monopoly on gasoline sales in Moscow.

Gasoline demand in Moscow is given by a demand curve with a constant elasticity of -2

The cost function of Gazcom supplying the Moscow market is

$$C(q) = 800 + 6q$$

Assume that the fixed cost of 800 is NOT sunk.

- (a) [6 points] Derive the average and marginal cost functions
- (b) [4 points] What is the optimal price for Gazcom to charge in the Moscow market? Show your working.
- (c) [4 points] What is the marginal revenue at this price? Show your working.
- (d) [4 points] Suppose Gazcom can sell 100 units of gasoline at the optimal price. Should Gazcom be in this market?

[Bonus Points !!] Now consider the wider Russian market:

- (e) [4 Bonus points !!] In the wider market Gazcom and Total have a 50% market share each. They are considering a merger. If Russia were to adopt the same antitrust regulations as the USA, what do you think the response of the Russian competition authority would be to their merger application? In your answer comment on the HHI.

