

## Final Examination

Spring 2005

Please check that you have 23 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 or staple any additional paper to the exam (but be clear to the grader where the answer is). Make sure every piece of paper you hand in has your name written on it clearly.

This is a take home exam, so the amount of time you spend is up to you. My guess is that it should not take more than 4 hours and should take substantially less if you are well-prepared. During the week of the exam, any discussion of this exam with any person is prohibited. Of course, you are welcome to consult any notes or printed materials you wish.

If you are in the Thursday Class (Orange) your answers must be delivered to KMC 7-79 by 9:00pm Thursday, May 12. This deadline is hard: allow for a margin of error in your planning. If you need to fax it to me or Fed-Ex it, you must arrange this in advance.

If you are in the Monday Class (Yellow) your answers must be delivered to KMC 7-79 by 9:00pm Monday, May 16. This deadline is hard: allow for a margin of error in your planning. If you need to fax it to me or Fed-Ex it, you must arrange this in advance.

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

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(Name and Signature)

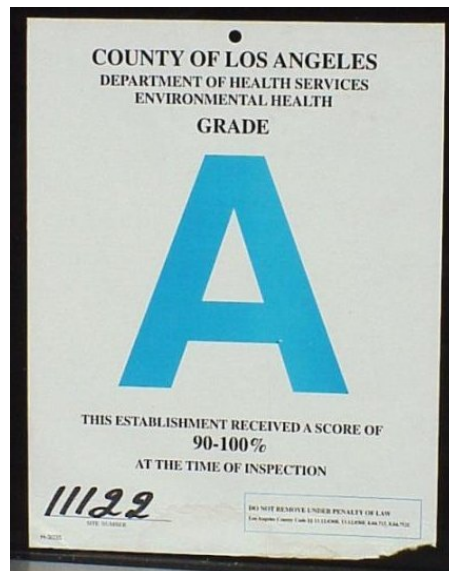
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## Question 1: Asymmetric Information (30 points)

- a. Consider restaurant hygiene. The manager of a restaurant knows how sanitary the restaurant is, but the customers do not. What kind of asymmetric information is this? Explain your answer. (5 points)
- b. Provide two other examples of where this type of asymmetric information problem may arise. Make sure to explain why these examples are appropriate. (6 points – 3 each)

In December 1997 the Los Angeles County government passed an ordinance requiring restaurants to publicly display grade cards resulting from Department of Health Services (DHS) hygiene inspections. Restaurants had been subject to hygiene inspections for many years prior to the change, but the new regulation required that the results of the inspections be revealed to consumers via a standard-format grade card to be prominently displayed in the window of each restaurant. A picture of a grade card is found below:



These grade cards gave the restaurant an A if it scored 90–100% on the inspection, B if it scored 80–89%, C if it scored 70–79%. Anything less results in a card that reports the actual score. Two consecutive scores less than 60% results in the restaurant closing down (as will a severe hygiene issue, such as an infestation).

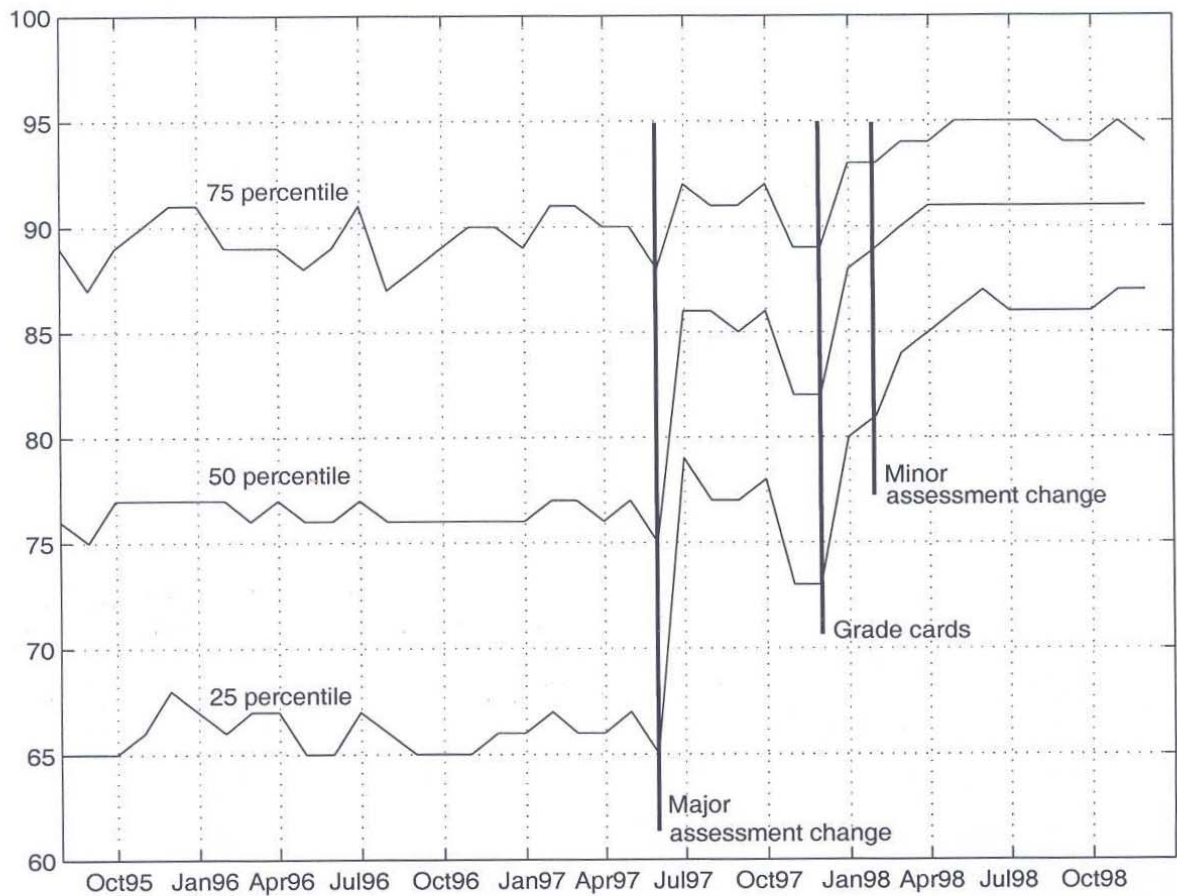


FIGURE I  
 QUARTILES OF HYGIENE QUALITY DISTRIBUTION OVER TIME

Notes:

Quartiles are computed based on all inspections in a given month.

The assessment changes took place on 7/1/1997 and 3/18/1998.

The grade cards began introduction on 1/16/1998.

Vertical lines for regime changes are located immediately prior to a change in order to emphasize subsequent impacts on the hygiene distribution.

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Until July 1, 1997, the inspections by the DHS included both an objective and a subjective element. The subjective aspect was the inclusion of an “ establishment status score” , intended to be the inspectors overall evaluation of the hygiene status of the restaurant. Since July 1, 1997, the subjective component of the assessment has been removed and inspections are now objective in nature. Beginning with a score of 100, pre-specified points are deducted for each violation. For example, a food temperature violation results in a 5 point deduction, evidence of roaches results in a 3 point deduction and a functioning but unclean toilet results in a 2 point deduction. A minor change in the inspection scoring was again made on March 18, 1998, to add a small number of additional potential violations.

Figure 1 shows how the hygiene scores changed after introduction of the new assessments and the grade cards. For the rest of this question just concentrate on the 50<sup>th</sup> percentile line. This shows the score of the middle restaurant in the sample. So if in September 1995, the 50<sup>th</sup> percentile is at 75, then half the restaurants had scores below 75 and half had scores above 75. The 50<sup>th</sup> percentile is also called the median. The graph represents results from 57% of all restaurants in LA, with selection into the sample occurring randomly.

- c. Describe what happens over time to the median hygiene score. (3 points)
- d. Why do you think the first assessment change had the effect it did on scores? (2 points)
- e. What was the effect of the introduction of the grade cards on hygiene? (3 points)
- f. Did the introduction of the grade cards solve the asymmetric information problem you identified in part (a)? If so, explain how. If not, explain why not. Your answer should clearly describe the economic effect of the initial asymmetric information problem, the mechanism by which this effect arises and how the grade cards changed this mechanism (if at all) and how this lead to the final outcome. Be sure to discuss both the theory and the evidence. (11 points)

Answer all parts in the space below:









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## Question 2: Game Theory and Commitment

(25 points – unless otherwise indicated, answer in the space beneath each question)

a. What is meant by Nash Equilibrium? (1 point)

b. What is meant by a strategy? (1 point)

c. For each game represented below, describe any Nash Equilibria that exist. (3 points per game)

		Column Player	
		L	R
Row Player	U	2, 2	3, 3
	D	3, 3	4, 2

		Column Player		
		L	M	R
Row Player	U	3, 1	3, 3	3, 3
	M	3, 4	3, -1	2, 3
	D	3, 3	4, 2	3, 9

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d. Consider the following game:

		Column Player		
		L	M	R
Row Player	U	4	1	3
	M	7	2	2
	D	3	4	3

i. Does the Column Player have any dominated strategies? If so, what are they? (2 points)

ii. Does the Column Player have a dominant strategy? If so, what is it? (2 Points)

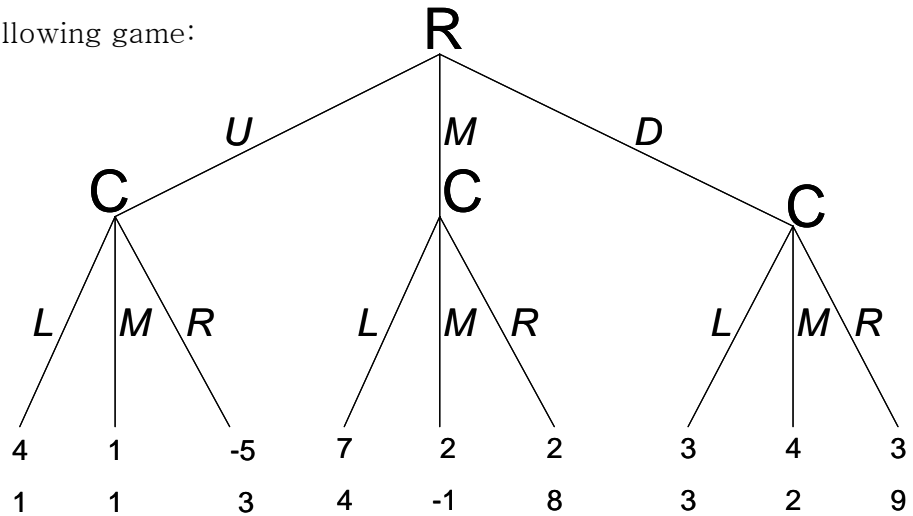
iii. Does the Row Player have any dominated strategies? If so, what are they? (2 Points)

iv. Does the Row Player have a dominant strategy? If so, what is it? (2 points)

v. What is the Nash Equilibrium in this game? (1 Point)

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e. Consider the following game:



i. Compare this game to the game considered in part d. How is it different? (3 points)

ii. Imagine R (for Row Player) can either commit to moving first or wait and make their move simultaneously with C (for Column Player). If R commits then she plays a game like that above, if she does not the game is as in part d. Is there anything to be gained by such a commitment? Carefully justify your answer. (5 points)

Answer i. and ii. in the space below:



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## Question 3: Perfect Competition and Monopoly

(25 points)

- a. With the aid of a supply and demand diagram, discuss the impact of:  
(5 points each)
- i. A rise in the price of pesticide on the market for agricultural land.
  - ii. The release of Kung Fu Hustle (a martial arts movie) on the market for martial arts classes.
  - iii. An increase in demand for MBA degrees (as often happens in a recession) on the market for business school professors.
- b. Most governments have enacted laws that seek to limit the extent of monopoly power in the economy. In the USA these are called Antitrust Laws. Explain the basic economic rationale for why a government might prefer markets to be competitive rather than a monopoly. Where appropriate, the use of diagrams is encouraged. (10 points)

Answer all parts in the space below:







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## Question 4: Pre-emption, Predatory Pricing, Learning-by-doing and Cost Curves

(25 points)

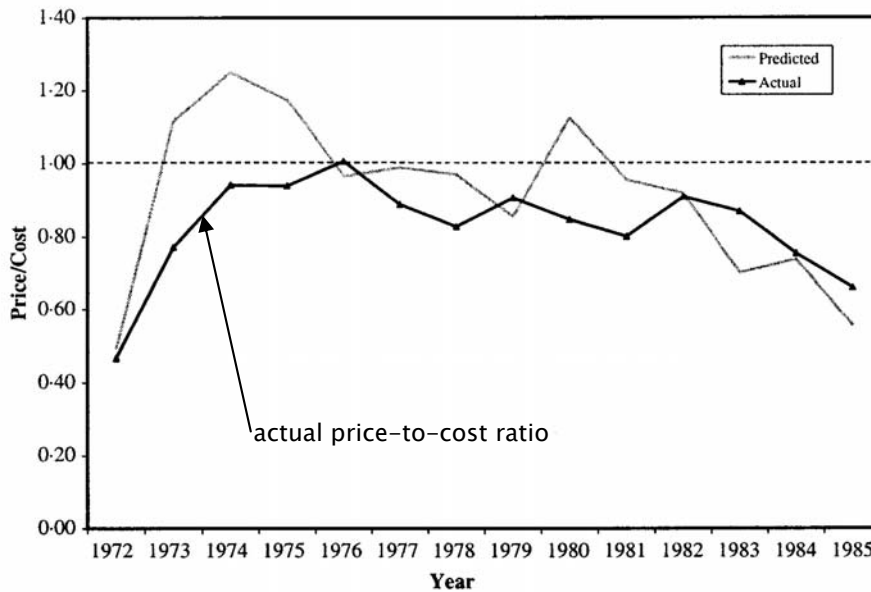


FIGURE 2  
Predicted vs. actual price/cost ratio for L-1011: 1972–1985

Figure 2 shows the actual price-to-cost ratio (that is, Price divided by Marginal Cost) of the L-1011 aircraft introduced by Lockheed in 1972 and produced for the next 14 years. The figure also shows a predicted price: ignore this, it is not relevant.

a. Describe the evolution of the price-to-cost ratio over the 14 years the L-1011 was produced. (1 point)

Now examine figure 3. Figure three shows the man-hours per unit required to produce each L-1011. It also shows how many L-1011's were built in the calendar year each L-1011 was made. So in the year that the 75<sup>th</sup> L-1011 was made, 42 other L-1011's were made. Further the 75<sup>th</sup> L-1011 required about 300 thousand man-hours of labor input.

b. Describe the evolution of the man-hours per unit and relate it to the number of unit made per year. Do you see evidence of learning by doing? Justify your answer. (2 points)

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c. It seems reasonable to imagine that if workers are not doing a job that often they forget the best ways to do things. Is there any evidence of this in the data? Justify your answer. (2 points)

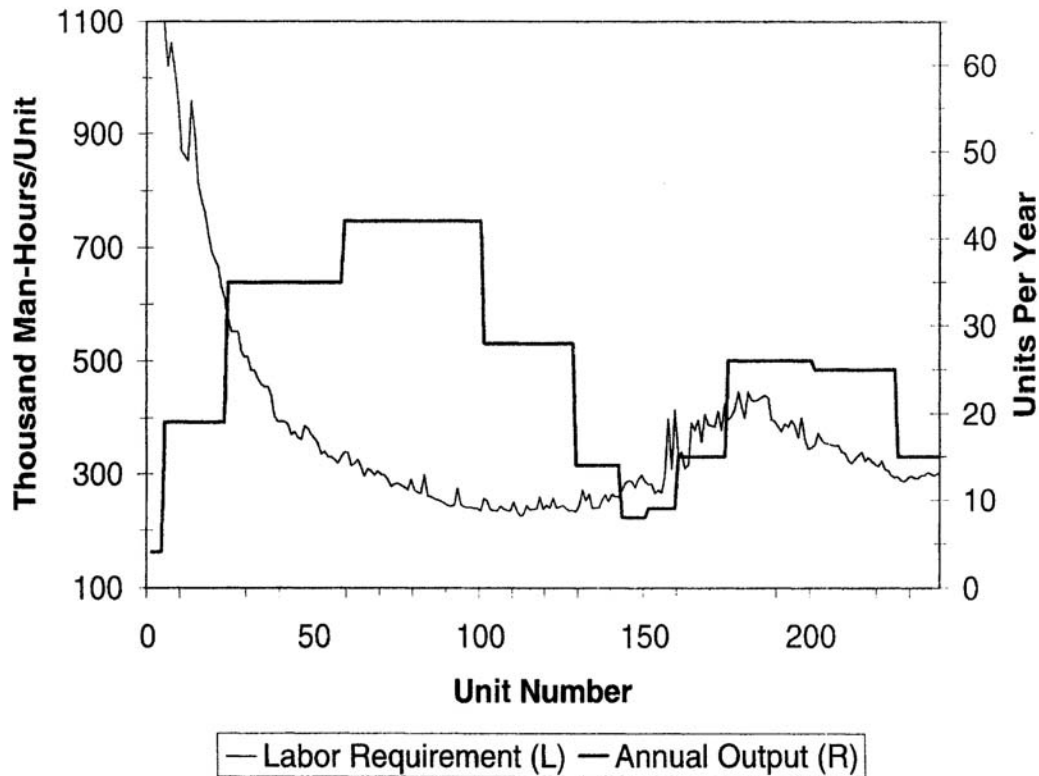


Figure 3: Man-Hours per Unit and Units per Year for the L-1011

d. When Lockheed introduced the L-1011, they knew that they would be facing tough competition from McDonnell-Douglas, Boeing and Airbus in the years to come. All these firms had aircraft due to be released soon after the release of the L-1011 that would be in competition with it. Lockheed was faced with a tough pricing decision. They could either price high while competition was fairly light or price low and pre-empt the entry of their competitors. The very low price-to-cost ratio in 1972 (see figure 2) reflects the fact that Lockheed chose to pre-empt.

- i. Using the evidence presented in figures 2 and 3 explain why this strategic choice made sense for Lockheed. (5 points)
- ii. In what sense does pricing low pre-empt the entry of competing aircraft? (5 points)

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e. Many economists immediately think that pricing below marginal cost must be predatory pricing.

- i. What is predatory pricing? (1 point)
- ii. Give an (real or hypothetical) example of how predatory pricing can lead to an anti-competitive outcome. (3 points)
- iii. Do you think the pricing patterns of the L-1011 raise concerns about anti-competitive effects? Explain your response. (3 points)

f. Lockheed faced continual entry by competing aircraft designs during the course of production of the L-1011. In light of this, does it surprise you that the price of the L-1011 never got above marginal cost (see figure 2)? Explain your response. (3 points)

Answer all parts in the space below:







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