Economics 384 – A1

Intermediate Microeconomics II

Review Questions 1

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The following questions are intended to help you review the course material as well as to give you some rough idea of the types of questions I may ask on the mid-term exam and the final exam. While some of these questions are more complicated than I would expect you to be able to answer during a time constrained exam, the concepts behind all the questions are potentially relevant for the exams. These examples are not intended to be comprehensive. The exams may include questions that do not appear here or that relate to topics that are not covered here. In thinking about answers to these questions, try to employ the methods and concepts that have been covered in class. The type of answer expected will vary depending on the question. Some answers will involve words only, some will involve words and diagrams, and others may involve simple calculations or algebraic manipulation. Answers should not be overly long and should be to the point. These questions cover sections 1 through 3 of the reading list.

I am happy to discuss any of the questions with you, but I would like you to attempt the questions on your own before coming to see me.

Notes:

a) P&R is an abbreviation for the textbook by Pindyck and Rubinfeld.

b) You may not want to spend a huge amount of time working out all the calculations in the questions below, but you should be sure that you understand the concepts and processes involved in solving the questions.

Risk and Uncertainty

1. Consider two investments:

   Investment A has outcomes 0 and 10 with probabilities .1 and .9, respectively.

   Investment B has outcomes 2 and 8, both with probability .5.

   a) Which investment will a risk neutral investor choose?

   b) Which investment will a risk averse investor choose?

2. How do we define risk aversion and risk neutrality? What is the intuition behind these definitions?

3. Use words, a diagram and the concept of expected utility to illustrate when an individual would prefer a risky choice to a certain outcome.

4. Define a fair bet?

5. a) Using words and a diagram, explain whether risk averse and risk neutral individuals will ever take a fair bet.

   b) Will these individuals ever take a bet that is better than a fair bet? Explain using words and diagrams.

6. Define full insurance?

7. Using words and a diagram, illustrate the maximum amount that risk averse and risk neutral individuals would pay for full insurance if the only choice was between full insurance and no insurance.

8. What is meant by the risk premium? Use words and a diagram to explain. How does the risk premium vary between risk averse and risk neutral individuals?

9. Suppose a $100 investment in a safe bond pays an interest rate of 5% and a $100 investment in a risky bond pays an interest rate of 7% unless the issuer of the bond defaults, in which case the investor loses their entire investment (both the interest and the $100 invested). If investors are risk neutral, what is the probability of default?

10. Suppose workers are all risk averse and have the same degree of risk aversion and the same utility functions. If the probability of layoff (P) is known, how much will workers have to be paid to take a risky job rather than a safe job that pays Y? Explain using words and a diagram.

11. Suppose there are two jobs, one pays a certain income of 40 and the other pays 60 if employed and 20 if unemployed. Explain whether the workers who take the job with an uncertain income are necessarily risk lovers. Use words and a diagram.

12. Is it true that a risk lover will never choose a certain income over an uncertain income? Use words and a diagram in your explanation.

13. Consider the net returns from two investments of $5:

Investment A has possible outcomes 0 and 10.

Investment B has possible outcomes 2 and 8.

The probability of each individual outcome is .5.

a) Would diversification always reduce risk relative to the risk level associated with an individual choice?

b) If the outcomes of the two investments are perfectly negatively correlated, can diversification eliminate all risk?

14. Suppose an insurance company has no other costs than the payouts it makes in the event of a loss. Why can the insurance company avoid negative profits if it offers insurance equivalent to a fair bet and would individuals purchase this insurance. Explain using words and a diagram.

15. Suppose an investor has the choice of dividing their wealth between two types of assets, a risk free asset (one with a certain yield) and a risky asset (an asset with an uncertain yield, but the investor knows the expected value and variance of the returns associated with this asset).

a) Derive the risk-return trade-off and illustrate this trade-off in a diagram. Label you diagram completely and carefully.

b) Illustrate one possible set of indifference curves for the investor and explain the shape of these indifference curves.

c) Illustrate one possible utility maximizing choice of the investor.

d) If the return on the risk free asset falls, what might happen to the fraction of wealth that the investor allocates to this asset? Explain in words (provide intuition) and illustrate in a diagram.

16. Suppose that risk averse workers can take a safe job that pays income Y_0 with certainty or a risky job that pays income Y_G with probability .5 and an income of zero (due to lay off) with probability .5. All workers have the same risk preferences and have no other sources of income.

a) If the expected income of the risky job is greater than the income of the safe job, will a worker take the risky job? Explain using words and a diagram.

b) If the government introduces an unemployment insurance program which pays benefits of Y_B ($Y_B<Y_0$) when a worker is laid off, will the wage being offered by the firm that employs workers in the risky job rise, fall or stay the same? Explain using words and a diagram.

17. An investor is considering two investments and can only invest in one of the two investments. The payoff of investment 1 in a boom is 20, but it is only 4 in a recession. The payoffs of investment 2 are 12 and 8 in a boom and recession, respectively. The investor believes that the probability of a recession is .5.

a) If an individual is risk neutral, would they choose investment 1 or investment 2? Explain.

b) If an individual is risk averse, would they make the same decision? Explain using words and a diagram.

c) If a risk neutral investor could purchase information that would let them know with certainty whether there would be a recession or a boom, what is the maximum they would be willing to pay for this information?

18. Suppose that risk averse workers must choose between two jobs. The firms offering these two jobs will definitely hire workers and all workers are identical. Both jobs may involve workers being laid off and the income of a laid off worker is zero. However, the probability of being laid off from Job 1 is smaller than the probability of being laid off from Job 2. Suppose the income from Job 1, when employed, is Y_1. In a diagram illustrate and explain how the income from Job 2, when employed, must relate to the income of Job 1.

19. Explain, using words and a diagram, why jobs that are more risky (in terms of income, for example) will tend to attract less risk averse workers.

20. "What does it mean to say that a person is risk averse?" (P&R, 2005, page 183.)

21. "Question for Review" number 3, P&R, page 183.

22. "Question for Review" number 5, P&R, page 184.

23. "Question for Review" number 6, P&R, page 184.

24. "Question for Review" number 7, P&R, page 184.

25. Exercise 1, P&R, page 184.

26. Exercise 4, P&R, page 184.

27. Exercise 7, P&R, page 185.

28. Exercise 11, P&R, page 185.

Imperfect Competition

29. a) Using words and diagrams, illustrate and explain the determination of firm level output as well as the equilibrium market price and quantity under perfect competition in the short run. Assume all firms are identical, that there are no fixed costs and that each firm has standard U-shaped cost curves.

    b) Explain, and show diagrammatically, how firm output and the equilibrium market price and output are determined in the long run.

30. a) Using words and diagrams, illustrate and explain the determination of price and output in a market with a monopoly producer.

    b) Monopoly is "inefficient". Is this because they do not produce at the minimum of the average cost curve? Explain using words and a diagram.

31. a) Illustrate and explain the short run determination of firm price and quantity under monopolistic competition.

    b) Illustrate and explain the long run determination of firm price and quantity under monopolistic competition.

    c) Is the price charged by the firm likely to be higher or lower in the long run than in the short run? Explain using words and a diagram.

    d) How do the short run and long run equilibria under monopolistic competition differ from the equilibria under perfect competition?

    e) Why is monopolistic competition "inefficient"? While this inefficiency might reduce welfare, what characteristic of monopolistic competition might actually increase welfare? Explain.

32. Consider a market with two firms. These firms act as Cournot duopolists and have identical constant marginal costs.

a) Graphically derive the reaction function of one of the firms and carefully explain the method of derivation.

b) Suppose that there is an increase in the marginal cost of one of the firms. Using words and a diagram(s), show and explain why both firms would continue to produce.

33. Explain why firms would prefer to collude than to produce the non-cooperative Cournot-Nash equilibrium output level. Explain why there is an incentive to cheat in the collusive equilibrium.

34. Exercise 3, parts a – d, P&R, page 469.

35. Exercise 4, P&R, page 469.

36. Exercise 5, P&R, page 469.

37. Exercise 6, P&R, page 469.

38. Exercise 8, P&R, page 469.

Game Theory

39. Define a dominant strategy.

40. Consider the following payoff matrix:

		Player 1 H	Player 1 L
Player 2	H	2,4	4,2
	L	3,5	5,3

a) Does either player have a dominant strategy? Explain.

b) Is there a Nash equilibrium to this game? Explain. Is there more than one? Explain.

41. Consider the following payoff matrix:

		Player 1 H	Player 1 L
Player 2	H	2,4	4,2
	L	5,3	3,5

a) Does either player have a dominant strategy? Explain.

b) Is there a Nash equilibrium to this game? Explain. Is there more than one? Explain.

c) Assume player 1 moves first in a sequential game. Does this change the equilibrium? Explain. What happens if player 2 moves first? Explain.

42. Consider the following payoff matrix:

		Player 1 H	Player 1 L
Player 2	H	2,1	4,2
	L	5,3	3,1

a) Does either player have a dominant strategy? Explain.

b) Is there a Nash equilibrium to this game? Explain. Is there more than one? Explain.

43. Consider the following payoff matrix:

		Player 1 H	Player 1 L
Player 2	H	2,1	3,2
	L	5,3	4,1

a) Does either player have a dominant strategy? Explain.

b) Is there a Nash equilibrium to this game? Explain. Is there more than one? Explain.

44. Consider the following payoff matrix:

		Firm 1 P	Firm 1 NP
Firm 2	P	-10,-10	120,0
	NP	0,120	0,0

This is the payoff matrix for two publishers each of which is considering whether they should publish (P) or not publish (NP) a public finance textbook.

a) Is there an equilibrium to this game? If so, what is it? Explain.

b) If these are the payoffs for two duopolist firms, would they benefit from merging? Explain.

c) Suppose that publisher 1 decided whether or not to publish and then firm 2 made its publishing decision after observing what firm 1 had decided to do. What would the equilibrium be? Explain.

d) Assume both firms choose their action simultaneously. What would happen if both firms followed a maximin strategy?

45. Consider the following payoff matrix:

		Player 1		
		H	M	L
Player 2	H	1,3	2,2	1,2
	M	3,5	1,4	2,4
	L	1,1	0,7	7,6

a) Does either player have a dominant strategy? Explain.

b) Is there a Nash equilibrium to this game? Explain. Is there more than one? Explain.

c) Could the two players both do better by colluding? Explain. If there is a collusive outcome that is better than the Nash equilibrium, is either player likely to want to cheat on the collusive agreement? Explain.