

Study Guide for Second Exam

This study guide provides a review of material from the both the first and second halves of the course. The exam, itself, will be focused primarily on material from the second half of the course, although a few questions are likely to be taken from ideas and diagrams covered in the first half.

For the most part, the ideas, models, and diagrams developed in the second half of the course have been grounded in those of the first half, so although a review of those ideas should be helpful, we have been using them throughout the second half of the course.

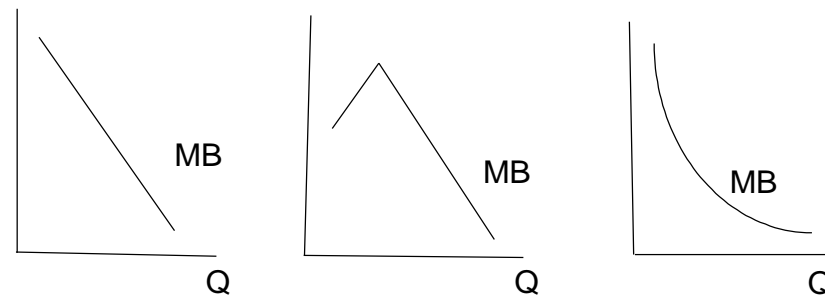
1. Define and discuss briefly the relevance of the following terms (2-3 very clear sentences):

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|--------------------------|-----------------------------|
| a. net benefit | m. monopolistic competition |
| b. marginal cost | n. antitrust law |
| c. consumer surplus | o. capital accumulation |
| d. average cost | p. innovation |
| e. supply curve | q. Robert Solow |
| f. demand curve | r. Joseph Schumpeter |
| g. normal good | s. Knightian uncertainty |
| h. Marshallian LR supply | t. Knightian risk |
| i. Ricardian LR supply | u. expected value |
| j. entry barrier | v. present value |
| k. price-making firm | w. Gary Becker |
| l. monopoly power | x. median voter |
| | y. externality |

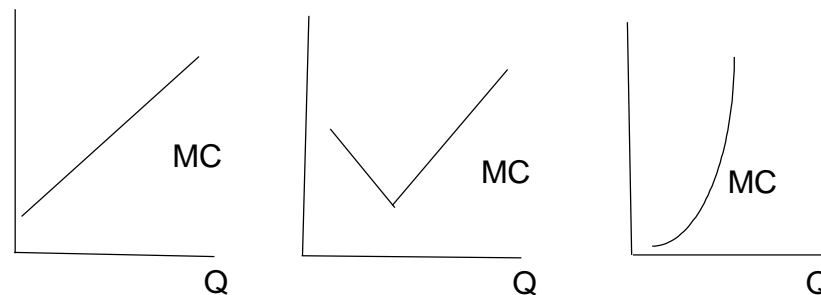
2. Given the MB curves below, derive the associated demand curves.

A. Briefly discuss the method used to derive the demand curves.

B. How are your demand curves different from the MB curves?



3. Given the MC curves below, derive the associated supply curves.
 - A. Briefly describe the method used to derive the supply curves.
 - B. Are these supply curves long run or short run curves? Why?
 - C. How are your supply curves different from the MC curves?



4. Draw diagrams for a market equilibrium, consumer choice, and firm choice. Assume that the market equilibrium is competitive—which is to say that firms and consumers are both price takers.
 - A. Show the adjustments made by markets, consumers, and firms when there is an increase in the cost of inputs for the firms in this industry. (Label all important details.)

- B. Show the adjustments made by markets, consumers, and firms if there is a general increase in income for consumers in this market--other things being equal. (Label all important details.)
- A. Show the adjustments made by markets, consumers and firms, if there is a change in regulations that “forces” firms to use more costly methods of production for their products and services. (Label all important details.)
- B. Briefly discuss what happens to consumer surplus and profits in each case.
- C. Briefly explain what these diagrams imply about the mutual gains from trade.
5. Draw 2 diagrams for a market equilibrium, consumer choice, and firm choice. Assume that the firms are price makers (e.g. have some monopoly power) and that consumers are price takers.
- A. Show the adjustments made by markets, consumers, and the firm when there is an increase in the cost of inputs for the firms in this industry. (Label all important details.)
- B. Show the adjustments made by markets, consumers, and the firm if there is a general increase in income for consumers in this market--other things being equal. (Label all important details.)
- C. Show the adjustments made by markets, consumers and the firm, if there is a change in regulations that “forces” firms to use more costly methods of production for their products and services. (Label all important details.)
- D. Briefly discuss what happens to consumer surplus and profits in each case.
- E. Briefly explain what these diagrams imply about the mutual gains from trade.
6. Suppose that the market for gasoline is characterized by a nearly perfectly inelastic (almost vertical) supply curve in the short run and a fairly elastic (flatter but upward sloping) Ricardian supply curve in the long run. Suppose also that the demand for gasoline is more price sensitive in the long run than in the short run, although neither perfectly elastic (flat) nor perfectly inelastic (vertical).
- A. Use three diagrams to depict the market equilibrium for gasoline in LR equilibrium. Show: (a) the market equilibrium, (b) the output choice of a typical firm, and (c) the consumption choice of a typical consumer. (Label all important details.)
- B. Show the short run and long run effects of a permanent increase in the price of petroleum (a necessary input for the production of gasoline). (Label all important details.)
- C. Show the short run and long run effects of a permanent change in consumer tastes which reduces the long run demand for gasoline (as would be the case for if urban living were suddenly considered more desirable or if the "preferred" automobile size suddenly became smaller and hybrid). (Label all important details.)
7. Construct a table that represents a production function. (Hint the first two columns should be Q inputs and associated Q outputs.)
- A. In the next column, calculate the marginal product of the input used in production.
- B. In the next column, calculate the average product of the input used in production.
- C. In the next column calculate that marginal revenue product, assuming that the output sells for \$5.00/unit.
- D. In your illustration, what is the highest price that will cause the firm to use (hire) 5 units of the input?
8. Suppose that a new public policy requires everyone to purchase a minimum level of health insurance.
- A. Show the effect on the market for health care. (Label all important details.)
- B. Show the effects on the demand for doctors and their income. (Label all important details.)
9. Suppose that the market for doughnuts is characterized by an almost perfectly inelastic supply curve in the short run and a per-

fectly elastic (flat) Marshallian supply curve in the long run. Assume that the demand for doughnuts is more elastic (more price sensitive) in the long run than in the short run.

- A. Use three diagrams to depict the market for doughnuts in LR equilibrium” (a) the market equilibrium, (b) the output choice of a typical firm, and (c) the consumption choice of a consumer. (Label all important details.)
 - B. Show the short run and long run effects of a permanent increase in consumer income on the market equilibrium. Label all relevant details.
 - C. Briefly discuss the main difference between a Marshallian and Ricardian market in long run equilibrium.
10. Suppose that a city imposes price controls on the market for rental housing. Use supply and demand curves to depict the effects of that policy on the market for rental housing when consumer income increases in the community of interest. Label all important details.
 11. Suppose that an excise tax is imposed on the market for doughnuts. Show the effects of that tax on consumers and firms in that market. Label all important details, including the deadweight loss from the tax.
 12. Suppose that an entry barrier is imposed on the market for hair stylists. Suppose that current hair stylists are “grand fathered in” (do not have to attend hair styling school) but all new stylists have to attend a year of hair-styling school to gain a license. (a) Show the effect on the short and long run supply of hair stylists. (b) Show how the market responds to an increase in demand for haircuts (with and without the entry barrier). Label all important details.
 13. Adam Smith once wrote: “It is not from the benevolence of the butcher the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity, but to their self-love, and never talk to them of

our own necessities, but of their advantages. Nobody but a beggar chooses to depend chiefly upon the benevolence of his fellow-citizens. Even a beggar does not depend upon it entirely.”

- A. In what ways are the models of supply and demand developed in this course consistent with Smith’s description of self interest in markets?
 - B. In what ways are Smith’s comments consistent with your own dealings in markets?
 - C. Are there any exceptions to that perspective in your experience? (Hint: how might internalized norms affect your interpretation of the quote from Smith? Need “interests” be narrowly self-oriented?)
14. Draw a diagram of an evenly rotating economy. Label all relevant details.
 - A. Describe in words the nature of such an equilibrium, being sure to mention rates of capital accumulation and innovation.
 - B. Discuss why this was a reasonable characterization of markets in “the West” before 1700, but not afterwards.
 15. Draw diagrams for a market equilibrium, consumer choice, and firm choice. Assume that the firms are price takers (e.g. have no or little price setting power) and that consumers are also price takers.
 - A. Show the adjustments made by markets, consumers, and the firm when there is a reduction in the cost of capital on the output and prices for the product sold. (Label all important details.)
 - B. In a separate diagram, show the market for savings and loans. Assume that the supply of savings (loans) increases. Discuss why this may induce a lower cost for a firm’s capital goods. (Label all important details.)
 - C. Discuss why an increase in savings can promote capital accumulations if firm expect future demands to be higher than current demands. Does it matter whether firms are price takers or price makers for this effect to occur? (Hint, keep in mind that capital

must pay for itself to be worth the investment by individual firms and that this is a present discounted value calculation.)

16. Draw two diagrams of price making firms. Suppose that the two firms produce similar products, although not identical ones. What happens if a significant innovation occurs in firm 1 which reduces its production costs relative to firm 2.
 - A. Show the effect of this production break through and change in price on both firms. (Hint: in this case, reducing the price of firm 1's product may shift the demand curve of its competitor.)
 - B. Show the effects on both firm's profits and outputs, and on consumer surplus.
 - C. Discuss why such effects usually imply that innovation tends to increase social net benefits.
17. Draw two diagrams of price making firms (e.g. firms with a bit of monopoly power) that make products that are good substitutes for one another. Suppose that a significant innovation occurs in firm 1 which increases the quality of its product (as consumers conceive it) relative to firm 2.
 - A. Show the effect of this production break through and change in price on both firms. (Hint: in this case, reducing the price of firm 1's product may shift its demand curve and also that of its competitor.)
 - B. Show the effects on both firm's profits and outputs, and on consumer surplus.
 - C. Discuss why such effects provide imply that innovation tends to increase social net benefits.
18. Schumpeter argues that the "gale of competition" helps to induce innovation and increase its rates. Explain why rivals to innovative firms may be induced to innovate if they plan to survive—given the analysis of the previous two problems.

19. Draw a diagram that illustrates the choice setting of a price making firm with probabilistic demand curve. Suppose that the probability of a high demand is 0.5 and that of a low demand is also 0.5. Assume that the firm is risk neutral and attempts to maximize its expected profits.
 - A. Characterize its output level and average price.
 - B. What price does it sell its output for in the low demand case?
 - C. In separate diagrams, show the effects on output and profits of the high and low demand years.
 - D. What is the firm's average profit per year?
 - E. It can be argued that this is exactly the setting faced by producers of electric vehicles such as Tesla. Discuss the relevance of this model for Tesla's pricing decisions over the past two years.
20. Draw a diagram of a price taking firm that has random costs for some of its inputs. Suppose there are just two kinds of years—high marginal cost and low marginal cost. Assume that the firm is risk neutral.
 - A. Draw a diagram that illustrates the firm's expected profit maximizing output (in a setting where it does not know whether the costs will be high or low until the year is well under way).
 - B. What is the firm's expected profit?
 - C. What is the firm's actual profit if it is a low-cost year?
 - D. Discuss the relevance of this model for the market for air travel. (Keep in mind that fuel is a major cost of air travel.)
21. The annual cost of an out of state student at WVU is approximately \$42,000/year. Assume that the interest rate is 5% and that the student will graduate in 4 years. The present discounted value of the cost of his or her degree when enrolling at WVU for the first time is approximately what amount? (Write down the relevant formula and then substitute into that formula and calculate the answer. Be sure to show all work, not just the answer.)

22. Suppose that annual benefit of a college degree from the business school at WVU is approximately \$35,000/year. Assume that the interest rate is 5% and that the student's career will last 40 years. The present discounted value of his or her 4-year degree when enrolling at WVU for the first time is approximately what amount? (Write down the relevant formula and then substitute into that formula and calculate the answer. Be sure to show all work, not just the answer.) (Hint, remember that the income doesn't start until 4 years after you start college.)
23. Suppose instead that the annual benefit of a college degree from the business school at WVU varies. Suppose that the probability of a \$20,000 increment is 1/3, the probability of a \$40,000 increment is also 1/3 and that the probability of an 80,000 increment is also 1/3. Assume that the interest rate is 5% and that the student's career will last 40 years. The expected present discounted value of his or her 4-year degree when enrolling at WVU for the first time is approximately what amount? (Write down the relevant formula and then substitute into that formula and calculate the answer. Be sure to show all work, not just the answer.)
24. Calculate the expected present value of the net benefits from purchasing a lottery ticket with a prize of 80K per year for 20 years if you win. The ticket costs \$1 and there is a 1/million chance of winning. Assume that the interest rate is 7%/year.
25. Draw a diagram that characterizes the rational criminal's choice of crime rate, where he or she has a predictable marginal revenue curve that is fairly flat, but a random marginal cost curve that increase as the number of crimes undertaken increases.
- Assume that the criminal is risk neutral and undertakes the net-revenue maximizing level of crime.
 - Suppose that the penalty if caught is 10 years in jail, which has an opportunity cost of \$35000/year and what might be called a "freedom cost" of \$45000/year. Explain how the criminal's discount rate influences his or her calculation in part A.
 - Suppose that the probability that an individual is caught, convicted, and penalized is $(1/100) \cdot N^2$ where N is the number of thefts undertaken. Discuss how the individual's degree of risk aversion affects his or her choice of the number of crimes to undertake.
- D. Draw a diagram that reflects all of this above information that characterizes an "honest" person's calculations. Explain why that person undertakes no crime, even if he or she has no normative inhibitions regarding crime.
- E. Draw a diagram that illustrates why normative dispositions that favor honesty over crime tend to reduce crime rates.
- F. Discuss why local crime rates tend to decrease economic activity. To motivate your discussion, draw a diagram that shows why the risk of theft tends to reduce firm profits and output levels when crime increases.
26. According to the median voter model of policy choices in a democracy, the median voter's preferences (expected present value of the net benefits) determine which long-term policies are adopted.
- Draw a diagram that characterizes a voter's demand for highways, where his or her marginal cost reflects his or her marginal tax payments (and/or tolls) used to pay for additional highways.
 - Discuss why the voter's expected highway use affects his or her expected marginal benefits from highway construction.
 - Discuss why their income may affect both their marginal benefits (willingness to pay for additional highways) and their marginal costs (through the tax system). Is it always the case that an increase in income increases his or her MB or demand for highway construction?
27. Characterize the median voter's demand for expenditures on police that tend to reduce the probability of crime. (Hint: expenditures on police can be thought of as reducing the marginal expected losses from crime—which can be considered his or her direct marginal benefits from such expenditures. In addition, by reducing the crime rate, expenditures may also broaden markets

which may be thought of as indirect marginal benefits from such expenditures.) The cost of those efforts is from this or her tax payments.

- A. Draw a diagram that illustrates a voter's preferred level of police expenditures. Label all details.
- B. An uptick in crime rates can be said to increase the typical voter's marginal benefits from expenditures on law enforcement. Show how this effect tends to affect the median voter's demand for such expenditures.
- C. Now consider that effect of a voter's internalized norms on his or her preferred expenditure level. If crime is regarded to be "bad" or "evil" and the voter wants to reduce badness or evil in his community. How will this affect his or her preferred level of expenditures? Illustrate this in a diagram and label all relevant details. Contrast this with what happens if tolerance for property crimes such as shop lifting increases.