MICROECONOMICS – 2
Part 2

Методические рекомендации
для студентов, обучающихся по специальностям:
080101 Экономическая теория;
080100 Экономика

Составитель:
Е.О. Вострикова

Издательский дом «Астраханский университет»
2009
Рекомендовано к печати редакционно-издательским советом Астраханского государственного университета

Рецензент:
кандидат экономических наук, доцент,
заведующая кафедрой экономической теории
Астраханского государственного технического университета
И.И. Потапова


Составлены на английском языке и включают теоретико-методические преамбулы, вопросы типа «верно-неверно», ключевые термины и библиографический список.
Предназначены для студентов II курса, обучающихся по специальностям «Экономическая теория» и «Экономика».

©Издательский дом
«Астраханский университет», 2009
© Е. О. Вострикова, составление, 2009
ПОЯСНИТЕЛЬНАЯ ЗАПИСКА

Настоящие методические рекомендации «Микроэкономика – 2» на английском языке охватывают стандартную проблематику курса микроэкономики промежуточного уровня, предназначены для студентов 2-го года обучения по специальности «Экономическая теория» и «Экономика» и представляют собой дальнейшее развитие курса экономической теории, предусмотренного государственным стандартом.

Целью курса «Микроэкономика – 2» является расширение и углубление знаний студентов в области микроэкономического анализа со значительным использованием математического аппарата.

В курсе изучаются базовые микроэкономические модели, с помощью которых анализируются результаты принимаемых рациональными экономическими агентами решений, условия равновесия на различных типах рынков, а также условия максимизации фирмами своих целевых функций в соответствии с данной структурой рынка.

Курс знакомит с закономерностями формирования и функционирования различных рыночных структур, основными принципами и проблемами стратегического взаимодействия фирм на рынках, последствиями такого поведения для деятельности экономики в целом, а также вариантами политики государства.

Данные методические рекомендации включают основные положения по каждой из предложенных микроэкономических тем, задания для самопроверки, которые представлены в виде вопросов типа «верно-неверно» (true-false tests), а также списка ключевых терминов, которыми должен оперировать грамотный экономист. В заключении методических рекомендаций предложен библиографический список.

Методические рекомендации «Микроэкономика – 2» подготовлены в рамках проводимого в Астраханском государственном университете эксперимента по преподаванию дисциплин учебного плана на английском языке в целях совершенствования подготовки специалистов и повышения их конкурентоспособности на региональном, национальном и мировом рынках труда.

Настоящие методические рекомендации издаются в двух частях. В первой части изложены вопросы потребительского выбора, как в условиях определенности, так и в условиях неопределенности и риска. Вторая часть методических рекомендаций посвящена поведению фирм, типам рыночных структур, общему равновесию и провалам рынка.
CHAPTER 1. TECHNOLOGY

The technological constraints of the firm are described by the production set, which depicts all the technologically feasible combinations of inputs and outputs, and by the production function, which gives the maximum amount of output associated with a given amount of the inputs.

Another way to describe the technological constraints facing a firm is through the use of isoquants – curves that indicate all the combinations of inputs capable of producing a given level of output.

We generally assume that isoquants are convex and monotonic, just like well-behaved preferences.

The marginal product measures the extra output per extra unit of an input, holding all other inputs fixed. We typically assume that the marginal product of an input diminishes as we use more and more of that input.

The technical rate of substitution (TRS) measures the slope of an iso-quant. We generally assume that the TRS diminishes as we move out along an isoquant – which is another way of saying that the isoquant has a convex shape.

In the short run some inputs are fixed, while in the long run all inputs are variable.

Returns to scale refers to the way that output changes as we change the scale of production. If we scale all inputs up by some amount \( t \) and output goes up by the same factor, then we have constant returns to scale. If output scales up by more than \( t \), we have increasing returns to scale; and if it scales up by less than \( t \), we have decreasing returns to scale.

**Terms**

<table>
<thead>
<tr>
<th>Factors of production</th>
<th>Production function</th>
<th>Monotonic technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free disposal property</td>
<td>Isoquant</td>
<td>Convexity</td>
</tr>
<tr>
<td>Technological constraints</td>
<td>Cobb-Douglas production function</td>
<td>Technical rate of substitution (TRS)</td>
</tr>
<tr>
<td>Production set</td>
<td>Marginal product</td>
<td>Short run</td>
</tr>
<tr>
<td>Law of diminishing marginal product</td>
<td>Diminishing technical rate of substitution</td>
<td>Long run</td>
</tr>
<tr>
<td>Decreasing returns to scale</td>
<td>Constant returns to scale</td>
<td>Increasing returns to scale</td>
</tr>
</tbody>
</table>

**True-False**

1. The production set of a firm is the set of all products the firm can produce ________________.

2. A production isoquant is a locus of combinations of inputs that are equally profitable ________________.
3. If there are constant returns to scale, then doubling the amount of any input will exactly double the amount of output ____________________.

4. The economist’s distinction between long and short run captures the idea that quantities of some factor inputs can be varied in the short run but not in the long run ____________________.

5. If the production function is \( f(x, y) = \min \{2x + y, x + 2y\} \), then there are constant returns to scale ____________________.

6. It is possible to have decreasing marginal products for all inputs, and yet have increasing returns to scale ____________________.

7. If there is one input used in production and if there are decreasing returns to scale, then the marginal product for the input will be diminishing ____________________.

8. If the marginal product of each factor decreases as the amount of that factor used increases, then there must be decreasing returns to scale ________.

CHAPTER 2. PROFIT MAXIMIZATION

Profits are the difference between revenues and costs. In this definition it is important that all costs be measured using the appropriate market prices.

Fixed factors are factors whose amount is independent of the level of output; variable factors are factors whose amount used changes as the level of output changes.

In the short run, some factors must be used in predetermined amounts. In the long run, all factors are free to vary.

If the firm is maximizing profits, then the value of the marginal product of each factor that it is free to vary must equal its factor price.

The logic of profit maximization implies that the supply function of a competitive firm must be an increasing function of the price of output and that each factor demand function must be a decreasing function of its price.

If a competitive firm exhibits constant returns to scale, then its long-run maximum profits must be zero.

Terms

| Profit                  | Opportunity costs | Rental rate
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietorship</td>
<td>Partnership</td>
<td>Corporation</td>
</tr>
<tr>
<td>Present value of the firm</td>
<td>Stock market</td>
<td>Fixed factor</td>
</tr>
<tr>
<td>Variable factor</td>
<td>Quasi-fixed factors</td>
<td>Isoprofit line</td>
</tr>
<tr>
<td>Comparative statics</td>
<td>Factor demand curve</td>
<td>Inverse factor demand curve</td>
</tr>
</tbody>
</table>
**True-False**

1. If the value of the marginal product of labor exceeds the wage rate, then a competitive profit maximizing firm would want to hire less labor______.
2. A fixed factor is a factor of production that is used in fixed proportion to the level of output_______________________________.
3. The marginal product of a factor is just the derivative of the production function with respect to the amount of this factor, holding the amounts of other factor inputs constant_______________________________.
4. If the value of the marginal product of factor $x$ increases as the quantity of $x$ increases, and the value of the marginal product of $x$ is equal to the wage rate, then the profit maximizing amount of $x$ is being used__________.
5. If the price of the output of a profit-maximizing, competitive firm rises and all other prices stay constant, then the firm's output cannot fall___________.
6. If a profit-maximizing competitive firm has constant returns to scale, then its long run profits must be zero_______________.

**CHAPTER 3. COST MINIMIZATION**

The cost function, $C (w_1, w_2, y)$, measures the minimum costs of producing a given level of output at given factor prices.

Cost-minimizing behavior imposes observable restrictions on choices that firms make. In particular, conditional factor demand functions will be negatively sloped.

There is an intimate relationship between the returns to scale exhibited by the technology and the behavior of the cost function. Increasing returns to scale implies decreasing average cost, decreasing returns to scale implies increasing average cost, and constant returns to scale implies constant average cost.

Sunk costs are costs that are not recoverable.

**Terms**

<table>
<thead>
<tr>
<th>Isocost line</th>
<th>Condition factor demand function</th>
<th>Derived factor demand function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak Axiom of Cost Minimization (WACM)</td>
<td>Unit cost function</td>
<td>Short-run cost function</td>
</tr>
<tr>
<td>Long-run cost function</td>
<td>Fixed costs</td>
<td>Quasi-fixed costs</td>
</tr>
</tbody>
</table>

**True-False**

1. Quasi-fixed costs are those costs that can be avoided if and only if a firm produces zero output________________________.
2. If there are increasing returns to scale, then average costs are a decreasing function of output.

3. If there are increasing returns to scale, then costs per unit of output decrease as you move downward and to the right along an isocost line.

4. A competitive, cost-minimizing firm has the production function \( f(x, y) = x + 2y \) and uses positive amounts of both inputs. If the price of \( x \) doubles and the price of \( y \) triples, then the cost of production will more than double.

5. The total cost function \( c(w_1, w_2, y) \) expresses the cost per unit of output as a function of input prices and output.

6. The conditional factor demand function for factor 1 is a function \( x_1(W_1, W_2, y) \) that tells the ratio of price to output for an optimal factor choice of the firm.

CHAPTER 4. COST CURVES

Average costs are composed of average variable costs plus average fixed costs. Average fixed costs always decline with output, while average variable costs tend to increase. The net result is a U-shaped average cost curve.

The marginal cost curve lies below the average cost curve when average costs are decreasing, and above when they are increasing. Thus marginal costs must equal average costs at the point of minimum average costs.

The area under the marginal cost curve measures the variable costs.

The long-run average cost curve is the lower envelope of the short-run average cost curves.

**Terms**

<table>
<thead>
<tr>
<th>Cost curve</th>
<th>Average cost function</th>
<th>Average variable cost function</th>
<th>Average fixed cost function</th>
<th>Marginal cost curve</th>
<th>Long-run average cost curve</th>
</tr>
</thead>
</table>

**True-False**

1. The average variable cost curve must always be U shaped.
2. The marginal cost curve passes through the minimum point of the average fixed cost curve.
3. If the average cost curve is U shaped, then the marginal cost curve must cross the average cost curve at the bottom of the U.
4. The cost function \( c(y) = 10 + 3y \) has marginal cost less than average cost for all levels of output.
5. The cost function \( c(y) = 100 + 3y^2 \) has marginal cost less than average cost for all positive levels of output.

6. Average cost can never rise while marginal costs are declining.

7. The area under the marginal cost curve measures total fixed costs.

8. If marginal costs increase as output increases then the average fixed cost curve will be U-shaped.

CHAPTER 5. FIRM SUPPLY

The relationship between the price a firm charges and the output that it sells is known as the demand curve facing the firm. By definition, a competitive firm faces a horizontal demand curve whose height is determined by the market price—the price charged by the other firms in the market.

The (short-run) supply curve of a competitive firm is that portion of its (short-run) marginal cost curve that is upward sloping and lies above the average variable cost curve.

The change in producer's surplus when the market price changes from \( P_1 \) to \( P_2 \) is the area to the left of the marginal cost curve between \( P_1 \) and \( P_2 \)—It also measures the firm's change in profits.

The long-run supply curve of a firm is that portion of its long-run marginal cost curve that is upward sloping and that lies above its long-run average cost curve.

Terms

- Technological constraints
- Market constraint
- Market environment
- Pure competition
- Price taker
- Shutdown condition
- Producer’s surplus

True-False

1. A competitive firm realizes that the demand curve it confronts has a significant negative slope.
2. In a perfectly competitive industry, the demand curve for the total output of the industry may be downward sloping.
3. Price equals marginal cost is a sufficient condition for profit maximization.
4. The area under the marginal cost curve measures total variable costs.
5. Average fixed costs never increase with output.
6. If the long run supply curve of a competitive firm is \( q = 3p \), then it cannot have constant returns to scale ____________________.

7. The change in producer’s surplus when the market price changes from \( p_1 \) to \( p_2 \) is the half of the area to the left of the marginal cost curve between \( p_1 \) and \( p_2 \) ________________________________.

**CHAPTER 6. INDUSTRY SUPPLY**

The short-run supply curve of an industry is just the horizontal sum of the supply curves of the individual firms in that industry.

The long-run supply curve of an industry must take into account the exit and entry of firms in the industry.

If there is free entry and exit, then the long-run equilibrium will involve the maximum number of firms consistent with nonnegative profits. This means that the long-run supply curve will be essentially horizontal at a price equal to the minimum average cost.

If there are forces preventing the entry of firms into a profitable industry, the factors that prevent entry will earn economic rents. The rent earned is determined by the price of the output of the industry.

**Terms**

<table>
<thead>
<tr>
<th>Industry supply curve</th>
<th>Market supply curve</th>
<th>Free entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers to entry</td>
<td>Economic rent</td>
<td>Rent seeking</td>
</tr>
</tbody>
</table>

**True-False**

1. The short run industry supply curve can be found by horizontally summing the short run supply curves of all the individual firms in the industry ______________._

2. It is possible to have an industry in which all firms make zero economic profits in long run equilibrium ________________.

3. If there are constant returns to scale in a competitive industry then the long run industry supply curve for that industry is horizontal ___.

4. The possibility of more firms entering an industry in the long run tends to make long run industry supply more elastic than short run industry supply ________________.

5. If both demand and supply curve are linear, then a per unit tax of $5 will generate exactly the same deadweight loss as a per unit subsidy of $5 ____. 

9
CHAPTER 7. MONOPOLY

When there is only a single firm in an industry, we say that it is a monopoly.

A monopolist operates at a point where marginal revenue equals marginal cost. Hence a monopolist charges a price that is a markup on marginal cost, where the size of the markup depends on the elasticity of demand.

Since a monopolist charges a price in excess of marginal cost, it will produce an inefficient amount of output. The size of the inefficiency can be measured by the deadweight loss – the net loss of consumers' and the producer's surplus.

A natural monopoly occurs when a firm cannot operate at an efficient level of output without losing money. Many public utilities are natural monopolies of this sort and are therefore regulated by the government.

Whether an industry is competitive or monopolized depends in part on the nature of technology. If the minimum efficient scale is large relative to demand, then the market is likely to be monopolized. But if the minimum efficient scale is small relative to demand, there is room for many firms in the industry, and there is a hope for a competitive market structure.

Terms

<table>
<thead>
<tr>
<th>Monopoly</th>
<th>Infrah marginal unit</th>
<th>Patent</th>
</tr>
</thead>
<tbody>
<tr>
<td>markup</td>
<td>Deadweight loss</td>
<td>Natural monopoly</td>
</tr>
<tr>
<td>Minimum efficient scale</td>
<td>Cartel</td>
<td></td>
</tr>
</tbody>
</table>

**True-False**

1. Since a monopoly charges a price higher than marginal cost, it will produce an inefficient amount of output ________.

2. If the interest rate is 10%, a monopolist will choose a markup of price over marginal cost of at least 10%______________.

3. A natural monopoly occurs when a firm gains ownership of the entire stock of some natural resource and thus is able to exclude other producers________.

4. If he produces anything at all, a profit-maximizing monopolist with some fixed costs and no variable costs will set price and output so as to maximize revenue __________.

5. For a monopolist who faces a downward sloping demand curve, marginal revenue is less than price whenever quantity sold is positive ________.

6. A monopolist will always equate marginal revenue and marginal cost when maximizing profit________________.
7. Dead weight loss due to the monopoly provides a measure of how much worse off people are paying the monopoly price than paying competitive price ________________.

CHAPTER 8. MONOPOLY BEHAVIOR

There will typically be an incentive for a monopolist to engage in price discrimination of some sort.

Perfect price discrimination involves charging each customer a different take-it-or-leave-it price. This will result in an efficient level of output.

If a firm can charge different prices in two different markets, it will tend to charge the lower price in the market with the more elastic demand.

If a firm can set a two-part tariff, and consumers are identical, then it will generally want to set price equal to marginal cost and make all of its profits from the entry fee.

The industry structure known as monopolistic competition refers to a situation in which there is product differentiation, so each firm has some degree of monopoly power, but there is also free entry so that profits are driven to zero.

Monopolistic competition can result in too much or too little product differentiation in general.

Terms

<table>
<thead>
<tr>
<th>Price discrimination</th>
<th>Non-linear pricing</th>
<th>Inverse elasticity rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-degree price discrimination</td>
<td>Second-degree price discrimination</td>
<td>Third-degree price discrimination</td>
</tr>
<tr>
<td>Two-part tariff</td>
<td>Monopolistic competition</td>
<td>Product differentiation</td>
</tr>
</tbody>
</table>

True-False

1. Third degree price discrimination occurs when a monopolist sells output to different people at different prices, but every unit that an individual buys costs the same amount ____________.

2. A monopolist who is able to practice third degree price discrimination will make greater profits than a monopolist who is able to practice first degree price discrimination ____________.

3. A monopolist who is able to charge different prices in different markets will charge a higher price in the market where demand is greater _____.

4. In a monopolistically competitive industry with zero profits, each firm will produce less than the amount that minimizes average costs ________.
5. A profit-maximizing monopolist who is able to practice first degree price discrimination might choose to sell a quantity \( x \), such that the demand curve for his product is inelastic at the quantity \( x \) ______________.

6. In order to maximize his profits, a monopolist who practices third degree price discrimination with two or more markets should charge higher prices in markets with more inelastic demand functions ____________.

7. The purpose of quality discrimination is to make worse off to the consumer with low willingness to pay ________________.

**CHAPTER 9. FACTOR MARKETS**

A profit-maximizing firm always wants to set the marginal revenue of each action it takes equal to the marginal cost of that action.

In the case of a monopolist, the marginal revenue associated with an increase in the employment of a factor is called the marginal revenue product.

For a monopolist, the marginal revenue product will always be smaller than the value of the marginal product due to the fact that the marginal revenue from increasing output is always less than price.

Just as a monopoly consists of a market with a single seller, a monopsony consists of a market with a single buyer.

For a monopsonist the marginal cost curve associated with a factor will be steeper than the supply curve of that factor.

Hence a monopsonist will hire an inefficiently small amount of the factor of production.

If an upstream monopolist sells a factor to a downstream monopolist, then the final price of output will be too high due to the double markup phenomenon.

**Terms**

<table>
<thead>
<tr>
<th>Marginal revenue product</th>
<th>Value of marginal product</th>
<th>Monopsony</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream monopoly</td>
<td>Downstream monopoly</td>
<td>Double markup</td>
</tr>
</tbody>
</table>

**True-False**

1. The good example of the second-degree price discrimination is the discounts to the students and retiree _______________.

2. Price discrimination is more desirable for society than single pricing when it opens new markets ________. 

3. A monopsony occurs when two previously competing firms reach an agreement to collude on price ________.

4. For a monopsonist the supply curve of a factor of production is less steep than the marginal cost curve ___________.

12
5. A monopolist who faces a horizontal labor supply curve will demand less labor than he would if he acted competitively__________.

6. If an upstream monopolist sells to a downstream monopolist, the price to consumers will be higher than the competitive price, but not so high as it would be if the downstream monopolist took control of the upstream monopolist's business and ran both the upstream and downstream markets to maximize total profits_____________________.

CHAPTER 10. OLIGOPOLY

An oligopoly is characterized by a market with a few firms that recognize their strategic interdependence. There are several possible ways for oligopolies to behave depending on the exact nature of their interaction.

In the quantity-leader (Stackelberg) model one firm leads by setting its output, and the other firm follows. When the leader chooses an output, it will take into account how the follower will respond.

In the price-leader model, one firm sets its price, and the other firm chooses how much it wants to supply at that price. Again the leader has to take into account the behavior of the follower when it makes its decision.

In the Cournot model, each firm chooses its output so as to maximize its profits given its beliefs about the other firm's choice. In equilibrium each firm finds that its expectation about the other firm's choice is confirmed.

A Cournot equilibrium in which each firm has a small market share implies that price will be very close to marginal cost – that is, the industry will be nearly competitive.

In the Bertrand model each firm chooses its price given its beliefs about the price that the other firm will choose. The only equilibrium price is the competitive equilibrium.

A cartel consists of a number of firms colluding to restrict output and to maximize industry profit. A cartel will typically be unstable in the sense that each firm will be tempted to sell more than its agreed upon output if it believes that the other firms will not respond.

Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Term</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oligopoly</td>
<td>duopoly</td>
<td>Price leader</td>
</tr>
<tr>
<td>Price follower</td>
<td>Quantity leader</td>
<td>Quantity follower</td>
</tr>
<tr>
<td>Sequential game</td>
<td>Simultaneous game</td>
<td>collusion</td>
</tr>
<tr>
<td>Cooperative game</td>
<td>Stackelberg model</td>
<td>Reaction function</td>
</tr>
<tr>
<td>Residual demand curve</td>
<td>Cournot equilibrium</td>
<td>Stable equilibrium</td>
</tr>
<tr>
<td>Bertrand competition</td>
<td>Cartel</td>
<td>Punishment strategy</td>
</tr>
</tbody>
</table>
**True-False**

1. In Cournot equilibrium each firm chooses the quantity that maximizes its own profits assuming that the firm's rival will continue to sell at the same price as before __________________________.

2. In Bertrand competition between two firms, each firm believes that if it changes its output, the rival firm will change its output by the same amount ________________________.

3. Suppose that the demand curve for an industry's output is a downward sloping straight line and there is constant marginal cost. Then the larger the number of identical firms producing in Cournot equilibrium, the lower will be the price ________________________.

4. A Stackelberg leader chooses his actions on the assumption that his rival will adjust to the leader's actions in such a way as to maximize the rival's profits ____________________________.

5. Conjectural variation refers to the fact that in a single market there is variation among firms in their estimates of the demand function in future periods ________________________.

6. A duopoly in which two identical firms are engaged in Bertrand competition will not distort prices from their competitive levels__________________.

7. A Stackelberg leader will necessarily make at least as much profit as he would if he acted as a Cournot oligopolist ____________________________.

8. In the Cournot model, each firm chooses its actions on the assumption that its rivals will react by changing their quantities in such a way as to maximize their own profits ____________________________.

9. In the Bertrand model of duopoly, each firm sets its price, believing that the others price will not change. When both firms have identical production functions and produce with constant returns to scale, the Bertrand equilibrium price is equal to marginal cost ________________________.

**CHAPTER 11. GAME THEORY**

A game can be described by indicating the payoffs to each of the players for each configuration of strategic choices they make.

A dominant strategy equilibrium is a set of choices for which each player's choices are optimal regardless of what the other players choose.

A Nash equilibrium is a set of choices for which each player's choice is optimal, given the choices of the other players.

The prisoner's dilemma is a particular game in which the Pareto efficient outcome is strategically dominated by an inefficient outcome.

If a prisoner's dilemma is repeated an indefinite number of times, then it is possible that the Pareto efficient outcome may result from rational play.
In a sequential game, the time pattern of choices is important. In these games, it can often be advantageous to find a way to precommit to a particular line of play.

A player's best response function gives the optimal choice for him as a function of the choices the other player(s) might make.

A Nash equilibrium in a two-person game is a pair of strategies, one for each player, each of which is a best response to the other.

A mixed strategy Nash equilibrium involves randomizing among several strategies.

Common games of coordination are the battle of the sexes, where both players want to do the same thing rather than different things; the prisoner's dilemma, where the dominant strategy ends up hurting both players; the assurance game, where both players want to cooperate as long as they think the other will cooperate; and chicken, where players want to avoid doing the same thing.

A two-person zero-sum game is one where the payoffs to one player are the negative of the payoffs to the other.

Evolutionary games are concerned with outcomes that are stable under population reproduction.

In sequential games, players move in turn. Each player therefore has to reason about what the other will do in response to his or her choices.

In many sequential games, commitment is an important issue. Finding ways to force commitment to play particular strategies can be important.

**Terms**

<table>
<thead>
<tr>
<th>Game theory</th>
<th>Dominant strategy</th>
<th>Payoff matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nash equilibriu</td>
<td>Pure strategy</td>
<td>Mixed strategy</td>
</tr>
<tr>
<td>Prisoner’s dilemma</td>
<td>Repeated games</td>
<td>Tit-for-tat strategy</td>
</tr>
<tr>
<td>Sequential game</td>
<td>Extensive form of the game</td>
<td>Best responds curve</td>
</tr>
<tr>
<td>Coordination games</td>
<td>Focal point</td>
<td>Zero-sum games</td>
</tr>
<tr>
<td>Hawk-dove game</td>
<td>Battle of sexes</td>
<td>Evolutionarily stable strategy</td>
</tr>
<tr>
<td>Simultaneous moves</td>
<td>Sequential moves</td>
<td>Commitment</td>
</tr>
<tr>
<td>Hold up</td>
<td>Nash bargaining model</td>
<td>Rubinstein bargaining model</td>
</tr>
</tbody>
</table>

**True-False**

1. A situation where everyone is playing a dominant strategy must be a Nash equilibrium ____________

2. In a Nash equilibrium, everyone must be playing a dominant strategy __________________________.
3. In the prisoners' dilemma game, if each prisoner believed that the other prisoner would deny the crime, then both would deny the crime________.

4. A general has the two possible pure strategies, sending all of his troops by land or all of his troops by sea. An example of a mixed strategy is where he sends 1/4 of his troops by land and 3/4 of his troops by sea________.

5. While game theory predicts noncooperative behavior for a single play of prisoners' dilemma, it would predict cooperative tit-for-tat behavior if the same people play prisoners' dilemma together for, say, 20 rounds________.

6. A two-person game in which each person has access to only two possible strategies can not have more than one Nash equilibrium________.

7. A dominant strategy equilibrium is a set of choices such that each player's choices are optimal regardless of what the other players choose_____.

8. A Nash equilibrium is a set of choices such that each player's strategy is optimal, given the choices of the other players__________.

9. If a game does not have an equilibrium in pure strategies, then it will not have an equilibrium in mixed strategies either__________.

CHAPTER 12. EXCHANGE

General equilibrium refers to the study of how the economy can adjust to have demand equal supply in all markets at the same time.

The Edgeworth box is a graphical tool to examine such a general equilibrium with 2 consumers and 2 goods.

A Pareto efficient allocation is one in which there is no feasible reallocation of the goods that would make all consumers at least as well-off and at least one consumer strictly better off.

Walras' law states that the value of aggregate excess demand is zero for all prices.

A general equilibrium allocation is one in which each agent chooses a most preferred bundle of goods from the set of goods that he or she can afford.

Only relative prices are determined in a general equilibrium system.

If the demand for each good varies continuously as prices vary, then there will always be some set of prices where demand equals supply in every market; that is, a competitive equilibrium.

The First Theorem of Welfare Economics states that a competitive equilibrium is Pareto efficient.

The Second Theorem of Welfare Economics states that as long as preferences are convex, then every Pareto efficient allocation can be supported as a competitive equilibrium.
Terms

<table>
<thead>
<tr>
<th>Partial equilibrium</th>
<th>General equilibrium</th>
<th>Edgeworth box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasible allocation</td>
<td>Initial endowment allocation</td>
<td>Pareto efficient allocation</td>
</tr>
<tr>
<td>Pareto set</td>
<td>Contract curve</td>
<td>Walrasian equilibrium</td>
</tr>
<tr>
<td>Aggregate excess demand function</td>
<td>Net demand</td>
<td>Existence of a competitive equilibrium</td>
</tr>
<tr>
<td>First Theorem of Welfare Economics</td>
<td>Price offer curve</td>
<td>Second Theorem of Welfare Economics</td>
</tr>
<tr>
<td>Consumption externality</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

True-False

1. Partial equilibrium analysis concerns only supply or only demand while general equilibrium analysis deals with supply and demand at the same time___________________________.

2. A pure exchange economy is an economy where goods are traded but there is no production______________________.

3. In general equilibrium analysis, an allocation is a feasible allocation if every consumer is consuming a bundle that costs no more than his or her income____________________________.

4. From Walras' law it follows that in a market with two goods, if demand equals supply in one market, then demand must equal supply in the other market________________________.

5. If the assumptions of the first theorem of welfare economics apply, and if the economy is in a competitive equilibrium, then any reallocation that benefits someone must harm someone else______________________________.

6. If there are consumption externalities, then a competitive equilibrium is not necessarily Pareto optimal________________________.

7. A competitive equilibrium allocation must be a feasible allocation__________________________.

8. The second welfare theorem states that if preferences are convex, then any Pareto optimal allocation could be achieved as a competitive equilibrium after some reallocation of initial endowments__________________________.

9. Every allocation on the contract curve is Pareto optimal__________.

10. If the initial endowment is on the contract curve, then there must always be a competitive equilibrium in which no trade takes place__________.

11. If two people have identical Cobb-Douglas utility functions, then in every Pareto optimal allocation, they must consume all goods in the same proportions as each other__________________________.

12. If two people have identical nomothetic preferences and if their indifference curves have diminishing marginal rate of substitution, then in an Edge-
worth box, the locus of Pareto optimal allocations between them is a diagonal straight line___________________________.

CHAPTER 13. PRODUCTION

The general equilibrium framework can be extended by allowing competitive, profit-maximizing firms to produce goods destined for exchange in the economy.

Under certain conditions there exists a set of prices for all of the input and output goods in the economy such that the profit-maximizing actions of firms along with the utility-maximizing behavior of individuals results in the demand for each good equaling the supply in all markets – that is, a competitive equilibrium exists.

Under certain conditions the resulting competitive equilibrium will be Pareto efficient: the First Welfare Theorem holds in an economy with production.

With the addition of convex production sets, the Second Welfare Theorem also holds in the case of production.

When goods are being produced as efficiently as possible, the marginal rate of transformation between two goods indicates the number of units of one good the economy must give up to obtain additional units of the other good.

Pareto efficiency requires that each individual's marginal rate of substitution be equal to the marginal rate of transformation.

The virtue of competitive markets is that they provide a way to achieve an efficient allocation of resources by decentralizing production and consumption decisions.

Terms

Robinson Crusoe economy Production function Production externalities
Consumption externalities Production possibility set Production possibility set
Marginal rate of transformation Comparative advantage

True-False

1. If there are constant returns to scale in an industry, then in competitive equilibrium, profits in that industry must necessarily be zero_____.
2. When there is production, a competitive equilibrium is not Pareto optimal unless there are increasing returns to scale__________________.
3. The marginal rate of transformation between two goods indicates the rate at which an efficient economy would have to give up one good to obtain more of the other__________.

4. There are two people and two goods, person A has comparative advantage in the production of good 1 if and only if it takes person A less time to produce good 1 than it takes person B______________________.

5. Pareto efficiency requires that each individual's marginal rate of substitution be equal to the marginal rate of transformation_______.

CHAPTER 14. WELFARE

Arrow's Impossibility Theorem shows that there is no ideal way to aggregate individual preferences into social preferences.

Nevertheless, economists often use welfare functions of one sort or another to represent distributional judgments about allocations.

As long as the welfare function is increasing in each individual's utility, a welfare maximum will be Pareto efficient. Furthermore, every Pareto efficient allocation can be thought of as maximizing some welfare function.

The idea of fair allocations provides an alternative way to make distributional judgments. This idea emphasizes the idea of symmetric treatment.

Even when the initial allocation is symmetric, arbitrary methods of trade will not necessarily produce a fair allocation. However, it turns out that the market mechanism will provide a fair allocation.

Terms

<table>
<thead>
<tr>
<th>Welfare function</th>
<th>Arrow’s Impossibility Theorem</th>
<th>Social welfare function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classical utilitarian or Benthamite welfare function</td>
<td>Minimax</td>
<td>Rawlsian social welfare function</td>
</tr>
<tr>
<td>Utility possibilities set</td>
<td>Isowelfare curves</td>
<td>Individualistic welfare function</td>
</tr>
<tr>
<td>Bergson-Samuelson welfare function</td>
<td>Fair allocation</td>
<td>Equitable allocation</td>
</tr>
</tbody>
</table>

True-False

1. According to Arrow's impossibility theorem, it is impossible to find a social ordering that is complete, reflexive and transitive__________________.

2. An allocation is fair if whenever one person envies another, the envied person does not envy the envier__________________.
3. In a pure exchange economy if the initial allocation is Pareto optimal, then competitive equilibrium is fair ____________________.
4. In a competitive equilibrium no matter how different their preferences may be, no two people with the same income will envy each other's consumption bundles ____________________.
5. An allocation which is worse for somebody than the initial allocation can not be Pareto optimal ____________________.
6. If allocation $x$ is Pareto optimal and allocation $y$ is not then everyone is at least as well off with $x$ as with $y$, and someone is better off with $x$ than with $y$ ____________________.
7. The utility possibilities frontier is the boundary of the production possibility set ____________________.
8. In a pure exchange economy, if an allocation is Pareto efficient, it is impossible to have two people who prefer each other's consumption bundles to their own ____________________.
9. If a social welfare function is an increasing function of each person's utility, then every allocation that maximizes this social welfare function must be a Pareto optimum ____________________.

CHAPTER 15. EXTERNALITIES

The First Theorem of Welfare Economics shows that a free, competitive market will provide an efficient outcome in the absence of externalities. However, if externalities are present, the outcome of a competitive market is unlikely to be Pareto efficient. However, in this case, the state can sometimes “mimic” the role of the market by using prices to provide correct signals about the social cost of individual actions.

More importantly, the legal system can ensure that property rights are well defined, so that efficiency-enhancing trades can be made.

If preferences are quasilinear, the efficient amount of a consumption externality will be independent of the assignment of property rights.

Cures for production externalities include the use of Pigouvian taxes, setting up a market for the externality, simply allowing firms to merge, or transferring property rights in other ways.

The tragedy of the commons refers to the tendency for common property to be overused. This is a particularly prevalent form of externality.

Terms

Consumption externality  Production externality  Coase Theorem
Internalization  Private cost  Pigouvian tax
Tragedy of the Commons  Social cost
True-False

1. If your consumption of toothpaste produces positive externalities for your neighbors (which you ignore), then you are consuming less toothpaste than is Pareto optimal_________________________.
2. A trade between two people is an example of an externality______.
3. The only known way to eliminate externalities is through taxes or subsidies________________________.
4. The efficient amount of air pollution is in general independent of whether polluters or pollutees pay to reduce pollution__________________.
5. A Pigouvian tax on pollution is designed to collect enough revenue to pay for pollution detection by the government__________________.
6. If there are negative externalities in production or consumption, competitive equilibrium is unlikely to be Pareto efficient, but positive externalities enhance the efficiency of the market_______________.
7. The “tragedy of the commons” refers to the tendency for common property to be overused_________________.
8. If preferences are quasi-linear, then the delineation of property rights has no distributional consequences__________________.

CHAPTER 16. PUBLIC GOODS

Public goods are goods for which everyone must “consume” the same amount, such as national defense, air pollution, and so on.

If a public good is to be provided in some fixed amount or not provided at all, then a necessary and sufficient condition for provision to be Pareto efficient is that the sum of the willingnesses to pay (the reservation prices) exceeds the cost of the public good.

If a public good can be provided in a variable amount, then the necessary condition for a given amount to be Pareto efficient is that the sum of the marginal willingnesses to pay (the marginal rates of substitution) should equal the marginal cost.

The free rider problem refers to the temptation of individuals to let others provide the public goods. In general, purely individualistic mechanisms will not generate the optimal amount of a public good because of the free rider problem.

Various collective decision methods have been proposed to determine the supply of a public good. Such methods include the command mechanism, voting, and the Clarke tax.

Terms

<table>
<thead>
<tr>
<th>Public good</th>
<th>Pareto improvement</th>
<th>Free riding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private good</td>
<td>Command mechanism</td>
<td>Voting system</td>
</tr>
<tr>
<td>Single-peaked preferences</td>
<td>Median expenditure</td>
<td>Pivotal agent</td>
</tr>
<tr>
<td>Groves-Clark tax</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**True-False**

1. Economists define public goods to be those goods that are supplied by the government and private goods to be those goods that are supplied by the private sector. ____________.

2. To say that preferences are single peaked means that everybody either prefers more public goods to less or everybody prefers less public goods to more. ____________.

3. If the supply of public goods is determined by majority vote, then the outcome must be Pareto optimal. ____________.

4. If preferences are single peaked, then pairwise majority voting among alternative options will not lead to voting cycles. ____________.

5. If preferences are single-peaked, then everyone will agree about the right amount of public goods to be supplied. ____________.

6. A tax imposed on polluters to give them an incentive to make an efficient reduction in pollution is called a Clarke tax. ____________.

7. If a pure public good is provided by voluntary contributions, economic theory predicts that in general too little will be supplied. ____________.

8. A Pareto optimal amount of public goods is shown on a graph (with quantities of public goods on the s axis) by the point at which the horizontal sum of the marginal rate of substitution curves meets the marginal cost curve. ____________.

9. One of the problems with the Clarke tax mechanism is that when it is used, people have an incentive to lie about their preferences. ____________.

**CHAPTER 17. ASYMMETRIC INFORMATION**

Imperfect and asymmetric information can lead to drastic differences in the nature of market equilibrium.

Adverse selection refers to situations where the type of the agents is not observable so that one side of the market has to guess the type or quality of a product based on the behavior of the other side of the market.

In markets involving adverse selection too little trade may take place. In this case it is possible that everyone can be made better off by forcing them to transact.

Moral hazard refers to a situation where one side of the market can't observe the actions of the other side.

Signaling refers to the fact that when adverse selection or moral hazard are present some agents will want to invest in signals that will differentiate them from other agents.

Investment in signals may be privately beneficial but publically wasteful. On the other hand, investment in signals may help to solve problems due to asymmetric information.
Efficient incentive schemes (with perfect observability of effort) leave the worker as the residual claimant. This means that the worker will equate marginal benefits and marginal costs.

But if information is imperfect this is no longer true. In general, an incentive scheme that shares risks as well as providing incentives will be appropriate.

**Terms**

<table>
<thead>
<tr>
<th>Asymmetric information</th>
<th>Market for lemons</th>
<th>Adverse selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moral hazard</td>
<td>Hidden information</td>
<td>Hidden action</td>
</tr>
<tr>
<td>Signaling</td>
<td>Warranty</td>
<td>Separating equilibriu</td>
</tr>
<tr>
<td>Pooling equilibrium</td>
<td>Incentive system</td>
<td>Participation constraint</td>
</tr>
<tr>
<td>Incentive compatibility</td>
<td>Residual claimant</td>
<td></td>
</tr>
</tbody>
</table>

**True-False**

1. An insurance company must be concerned about the possibility that someone will buy fire insurance on a building and then set fire to it. This is an example of moral hazard______________________.

2. A life insurance company must be concerned about the possibility that the people who buy life insurance may tend to be less healthy than those who do not. This is an example of adverse selection__________________.

3. In a market where there is signaling, a separating equilibrium occurs when economic agents separate their actions as consumers from their actions as producers______________________.

4. In a market where there is a separating equilibrium, different types of agents make different choices of actions__________________.

5. In a market where there is a pooling equilibrium, different types of agents choose the same action__________________.

6. The incentive compatibility constraint requires that incentives be consistent with a consumer's budget constraint__________________.

7. An example of adverse selection is where someone chooses a car that is not as good as it is claimed to be__________________.
REFERENCES


MICROECONOMICS-2
Part 2

Методические рекомендации

Составитель:
Екатерина Олеговна Вострикова

Редактор М.В. Смолькова
Компьютерная правка и верстка А.Т. Мукашевой

Заказ № 1734. Тираж 200 экз. (первый завод – 50 экз.)
Уч.-изд. л. 1,4. Усл. печ. л. 1,3.
Издательский дом «Астраханский университет»
414056, г. Астрахань, ул. Татищева, 20
тел. (8512) 61-09-07 (отдел маркетинга), 54-01-87; тел./факс (8512) 54-01-89
E-mail: asupress@yandex.ru