

FREE STUDY GUIDE ON PUBLIC-CHOICE ECONOMICS

Third Edition

G. Stolyarov II,

ASA, ACAS, MAAA, CPCU, AR_e, ARC, API, AIS, AIE, AIAF

First Edition Published in November 2008

Second Edition Published in April 2012

Third Edition Published in July 2014



Ceremonial plastic sword, awarded to Mr. Stolyarov in 2008 for receiving the highest grade in Professor Gary Wolfram's Public Choice Economics course at Hillsdale College.

Table of Contents

Section	Page
Section 1: Public Goods	3
Section 2: Externalities	5
Section 3: Pareto-Optimality and Related Concepts	8
Section 4: Social Welfare Functions	10
Section 5: Arrow's Impossibility Theorem and Related Ideas	13
Section 6: Wicksellian Unanimity and James Buchanan's and Gordon Tullock's Ideas on Optimal Majorities	15
Section 7: Logrolling	17
Section 8: Dynamics of Majority Rule and Alternative Voting Mechanisms	19
Section 9: Game Theory and Sequential Games	22
Section 10: Game Theory and Simultaneous Games	25
Section 11: The Prisoners' Dilemma	28
Section 12: The Hotelling-Downs and Smithies Models of Voting	30
Section 13: More Alternative Methods of Voting	32
Section 14: Proportional Representation	36
Section 15: Rent-Seeking	39
Section 16: Rational Ignorance	41
Section 17: Bureaucracy	45
Section 18: The Tiebout Model of Local Government	48
Section 19: The Theory of Clubs	50
Section 20: Democracies and Deficits	52
About Mr. Stolyarov	56

© 2008, 2012, 2014, G. Stolyarov II. This work is distributed under a [Creative Commons Attribution Share-Alike 3.0 Unported License](#).

Permission to reprint this work, in whole or in part, is granted, as long as full credit is given to the author by identification of the author's name, and no additional rights are claimed by the party reprinting the work, beyond the rights provided by the aforementioned Creative Commons License. In particular, no entity may claim the right to restrict other parties from obtaining copies of this work, or any derivative works created from it. Commercial use of this work is permitted, as long as the user does not claim any manner of exclusive rights arising from such use.

While not mandatory, notification to the author of any commercial use or derivative works would be appreciated. Such notification may be sent electronically to gennadystolyarovii@gmail.com.

Section 1

Public Goods

Question 1: What are the three defining characteristics of public goods?

Answer 1:

- 1) Public goods are *non-rival in consumption*. If one person has access to the good, this does not decrease how much access anyone else has to it.
- 2) Everyone who has access to a public good gets the same amount of the good.
- 3) It is difficult to exclude people from accessing the public good.

Question 2: According to many economists, what is the main problem with market provision of public goods?

Answer 2: Public goods are subject to the *free-rider problem*. People are likely to misreveal their preferences for the public goods, alleging that they do not want them when in fact they would gladly take advantage of the goods if they are provided and paid for by someone else. These people *free-ride* off the efforts of others in providing the public good.

It is often the case with a public good that the marginal cost of providing the good to another person is zero, even if the person did not contribute at all to paying for the good. So excluding that person from enjoying the public good would not be a Pareto-optimal state, because that person would be able to benefit from the good at no cost to anyone else. But if someone who does not pay for the public good is not excluded, then there would exist little incentive (aside from benevolence or personal pleasure) for *anyone* to pay the fixed cost of initially providing the good. Thus (according to the conventional argument) the public good is likely to be underprovided on a free market.

Question 3: Which economist introduced the concept of public goods?

Answer 3: Eric Lindahl introduced the concept of public goods in 1919.

Question 4: Give three examples of public goods.

Answer 4: One example of a public good is national defense over a particular territory. A person who lives in a defended territory will get the benefit of the defense effort, even if he fails to pay for it. Another example of a public good is television provision during the 1970s. Any television could receive the signals sent out by a TV station, as TV providers had not yet figured out a way to exclude non-paying customers from their service. Well-defined and well-enforced property rights are public goods from which everyone benefits. In a system where property rights are

fairly defined, everyone has the same basic rights to property that they legitimately acquire, and no person is unjustly excluded from the right to own property.

Question 5: Must all public goods be provided by the government? If so, explain why. If not, give three examples of public goods that have not been governmentally provided.

Answer 5: Not all public goods must be provided by the government. Ronald Coase performed a study on lighthouses, which have the characteristics of a classic public good, and showed that lighthouses have historically been provided on the private market almost ubiquitously. Moreover, television prior to the era of cable TV was provided on the private market, because TV companies were able to use advertising to fund their operations without charging the viewers. A third example of a privately provided public good is this study guide, which is non-rival in consumption and virtually impossible to exclude people from.

Question 6: What type of game (from game theory) does the emergence of a government to enforce property rights attempt to overcome?

Answer 6: The emergence of government to enforce property rights attempts to overcome a *prisoner's dilemma* game, in which any two parties would be better off if there existed no property rights violations (say, theft), but in any situation where no communication between the two parties is possible, each party would get a higher payoff from stealing than from not stealing, irrespective of what the other party does.

Question 7: Give some conditions in human societies when it might be easier to ensure cooperation in the provision of public goods, such as enforcement of property rights.

Answer 7: In many cases, smaller communities facilitate a greater degree of cooperation in providing public goods than large communities, because the transaction costs for people to get together and decide to cooperate are smaller when there are fewer people. Moreover, according to Russell Kirk, smaller communities are more likely to develop a cohesive culture wherein people experience internal displeasure from cheating or invading other members of the community. This implies that smaller communities tend to need fewer police forces per capita due to a lower incidence of violations.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. August-October 2008.

All lecture material is used with explicit permission.

Section 2

Externalities

Question 8: Define "externality." Distinguish a positive externality from a negative externality.

Answer 8: An externality occurs when the complete benefits and/or costs of a particular decision are not fully taken into account by the decision-maker, often because the price system does not reflect the costs and/or benefits that a decision imposes on parties external to that decision. A *positive* externality occurs when an action has benefits to people other than the actor, and these benefits are not captured by the actor. A *negative* externality occurs when an action imposes costs on people other than the actor, and these costs are not borne by the actor.

Question 9: Give an example of a negative externality.

Answer 9: A negative externality may occur when a widget-making factory pollutes the air around it and leads to illness or property damage on the part of nearby inhabitants. If the widget producer only considers the price he may be able to receive per widget on the market, then he will not take into account the external cost of the damage done to people in the vicinity by the air pollution. In this case, the widget producer will only think of his own marginal benefits and costs in deciding whether to produce the next widget. He will not think of the external costs.

Question 10: Give an example of a positive externality.

Answer 10: If a person makes conspicuous improvements to his house, this will raise the property value of his home, but it will also raise the property values of surrounding houses by smaller amounts. The owner of the house, however, often only captures the benefits of his own house's increase in value, while the benefits of neighboring houses increasing in value are captured by others who own them. Thus, the total marginal benefit from improving the house is greater than the marginal benefit to the house's owner.

Question 11: What solutions did A. C. Pigou propose for negative and positive externalities?

Answer 11: A. C. Pigou proposed imposing a *Pigovian tax* on actions entailing negative externalities. The Pigovian tax is supposed to equal the exact amount of the extra cost to others that the decision-maker originally did not take into account (the marginal external cost of the action). The Pigovian tax does not *redistribute* the tax revenue to the victims of the activity, as doing so would give the victims an incentive to artificially inflate his costs. Pigou also proposed subsidies for actions generating positive externalities, with the Pigovian subsidy ideally equal to the marginal external benefit generated by the actions.

Question 12: What political problem exists with Pigou's proposed solutions for negative and positive externalities?

Answer 12: There are no inherent characteristics of the political decision-making process to guarantee that government officials will agree to implement a Pigovian tax or Pigovian subsidy. Nothing in the mechanics of the legislative process will lead to Pigovian taxes and subsidies, nor even to a guarantee that they will be considered.

Question 13: State the Coase Theorem. Give an example where the Coase Theorem might work and an example where it might fail.

Answer 13: The Coase Theorem states that in the absence of transaction costs, bargaining will occur among the parties affected by externalities until a Pareto-optimal outcome is reached. It does not matter from a Pareto-efficiency standpoint who has the initial rights to engage in what activities, although this does matter from a distributional standpoint.

The Coase Theorem works whenever transaction costs are sufficiently low. For instance, residents of a neighborhood could agree explicitly or implicitly not to mow their lawns early in the morning because of the noise this action imposes on other residents who may still be asleep. There are few enough neighbors for them to meet and arrive at an explicit agreement if necessary.

The Coase Theorem might not work if air pollution from a factory adversely affects tens of thousands of people in the vicinity, who often cannot all conveniently organize into a unit that can bargain with the factory owner. The transaction costs of arranging for a negotiation are often prohibitively high in this case and may prevent the negotiation from occurring.

Question 14: How did Ronald Coase criticize Pigou's views on externalities?

Answer 14: Ronald Coase believed that Pigou's analysis neglects to consider the importance of establishing a property rights framework in addressing externalities and how well-defined property rights might lead to bargaining among parties affected by externalities. For instance, Pigou simply *assumed* that the owner of a polluting smokestack did not also have the right to pollute. If the smokestack owner did have that right, however, the victims of the pollution would need to pay him *not* to pollute. Although in the absence of transaction costs, it does not matter *who* has the initial rights, it is still important, according to Coase, to *establish* the property rights in the first place - which Pigou does not address.

Question 15: According to Coase, how does the idea of an *efficient law* address externalities in the presence of high transaction costs? What are possible problems with trying to make efficient laws?

Answer 15: In the presence of high transaction costs, the maker of an efficient law considers what would have happened *if there were no transaction costs*. In such a zero-transaction-cost world, if the parties affected by the externality met and negotiated, who would get which rights? Then, the efficient lawmaker assigns initial property rights based on what he considers to be the zero-transaction-cost outcome.

The difficulty with making efficient laws is that lobbyists for all parties will try to convince legislators that the distribution of property rights *their* clients favor will be the zero-transaction-cost outcome. This makes it difficult for legislators to make objective, impartial judgments regarding what the results of the hypothetical zero-transaction-cost-world bargaining would have been. In the real world, when efficient laws are attempted, whoever has the better lobbyist typically gets the property rights.

Question 16: Describe how *liability laws* might be used to overcome externalities.

Answer 16: Liability laws can make it possible for a party to engage in externality-causing behavior provided that this party pays fines in proportion to the external damage caused. For instance, the owner of a train that throws sparks onto a neighboring farm when it goes fast would still be legally permitted to go fast and throw the sparks, provided that he pays the legally stipulated fines when he does so. This arrangement ensures that the train owner will only run the train faster when the marginal benefit of the increase in speed exceeds the marginal cost of the increase in fines he has to face.

Question 17: How might private *restrictive covenants* be an effective way to address externalities? Are *zoning laws* likely to be as effective in solving externality problems?

Answer 17: Restrictive covenants made by private developers or homeowners' associations prohibit certain kinds of behavior within a particular community. For instance, in a gated community, the covenant might forbid people from operating a traditional business out of their houses. The covenant is made to prevent certain negative externalities, such as the inflow of traffic from nearby areas, from happening. Developers often use restrictive covenants to maximize the property value of each of the lots they seek to sell.

While a variety of private restrictive covenants can be made flexibly and with the consent of all parties, zoning laws are often subject to political processes that have little to do with the goal of reducing externality costs. A person seeking to enact a zoning law needs to get enough votes on the zoning commission, and whoever gets these votes will have his way implemented. The plan that gets majority support within the zoning commission is not necessarily the plan that will reduce externalities and may even increase them.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. August-October 2008.

All lecture material is used with explicit permission.

Section 3

Pareto-Optimality and Related Concepts

Question 18: Define a *Pareto-optimal* state of the world.

Answer 18: A Pareto-optimal state of the world is one in which no individual can be made better off without some other individual(s) being made worse off.

Question 19: State the First Fundamental Theorem of Welfare Economics.

Answer 19: All perfectly competitive markets end up in Pareto-optimal states.

Question 20: What are the three conditions for Pareto-optimality? How do perfectly competitive markets meet each of these three conditions?

Answer 20: The three conditions for Pareto-optimality are

1) MU_X^i/MU_Y^i is the same for any two goods X and Y for all individuals i. In other words, the *marginal rates of substitution* between goods X and Y are the same for all individuals.

2) MP_L^j/MP_K^j is the same for all producers j. In other words, the *marginal rate of technical substitution* between labor (L) and capital (K) is the same for all producers.

3) $MC_X/MC_Y = MU_X^i/MU_Y^i$ for all individuals i. In other words, the ratio of marginal costs for goods X and Y (the *marginal rate of transformation*) is the same as each individual's marginal rate of substitution between goods X and Y.

The following are reasons why the above conditions hold in perfectly competitive markets.

Condition 1) holds because of *utility maximization* by market participants. Each individual i trades goods until for any two goods X and Y, $MU_X^i/MU_Y^i = P_X/P_Y$ - that is, the ratio of marginal utilities of X and Y is equal to the ratio of prices of X and Y. Since *everyone* faces the same price ratio of X to Y in perfectly competitive markets, it follows that everyone's marginal rates of substitution are equal to that ratio and so are equal to one another.

Condition 2) holds because of *cost minimization* by producers. Every producer j will use quantities of capital and labor for which $MP_L^j/MP_K^j = P_L/P_K$ - that is, the marginal rate of technical substitution between capital and labor equals the ratio of prices of factors of production. If this were not the case, then it would be possible for a producer to further reduce costs by trading capital for labor or vice versa. Since every producer faces the same price ratio for factors of production in perfectly competitive markets, it follows that all of the MP_L^j/MP_K^j will be equal to one another.

Condition 3) holds because profit maximization in a perfectly competitive market requires sellers to set their prices equal to their marginal costs: $P = MC$. When this happens, $P_X = MC_X$ and $P_Y = MC_Y$. Thus,

$MC_X/MC_Y = P_X/P_Y$. But, because all individuals act to maximize their utility in perfectly competitive markets, we know that $P_X/P_Y = MU_X^i/MU_Y^i$ for all individuals i . Therefore, $MC_X/MC_Y = MU_X^i/MU_Y^i$ for all individuals i .

Question 21: Under what conditions would government-imposed sales taxes lead to a departure from Pareto-optimality?

Answer 21: If the government taxes different goods *unequally* there will be a departure from Pareto optimality. An equal tax of $t\%$ on all goods would still preserve Pareto-optimality because the prices of all goods would be multiplied by $(1 + t)$, and $(1+t)P_X/(1+t)P_Y = P_X/P_Y$ for all goods X and Y . But if a tax of $t\%$ were imposed on X and a tax of $g\%$, where $g \neq t$, were imposed on Y , then $(1+t)P_X/(1+g)P_Y$ would *not* be equal to P_X/P_Y .

Question 22: Give some instances in which Pareto-optimality does not hold.

Answer 22: When government policies lead to some people facing different price ratios than other people for the same goods, Pareto-optimality does not hold. Also, if goods are not infinitesimally divisible and only come in sizable increments, it may be possible for the ratios of marginal utilities between some two goods to not be the same for all consumers. Moreover, if there exists price discrimination in a market, then some people face different price ratios than others, meaning that Pareto-optimality does not hold.

Question 23: Give an expression for the slope of an *isoquant*.

Answer 23: The slope of an isoquant is equal to $-MP_L/MP_K$ or the negative of the marginal rate of technical substitution between labor and capital.

Question 24: Give an expression for the slope of an *indifference curve* between goods X and Y .

Answer 24: The slope of an indifference curve is equal to $-MU_X/MU_Y$ or the negative of the marginal rate of substitution between goods X and Y .

Question 25: Give an expression for the slope of a *production possibilities curve* between goods X and Y .

Answer 25: The slope of a production possibilities curve is equal to $-MC_X/MC_Y$, or the marginal rate of transformation between X and Y .

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. August-October 2008. All lecture material is used with explicit permission.

Section 4

Social Welfare Functions

Question 26: Which issue with regard to Pareto-optimality were social welfare functions (SWFs) developed to address?

Answer 26: There exist infinitely many possible Pareto-optimal states of the world, but some of them seem significantly less desirable than others. For instance, a situation in which one person owns everything and nobody else owns anything is Pareto-optimal, but most people do not like it. SWFs were developed with the intention of making comparisons among different Pareto-optimal states.

Question 27: What two questionable assumptions must be made in order to arrive at a Bergson-Samuelson SWF?

Answer 27:

Assumption 1) Cardinality - the ability to measure utility and assign numerical magnitudes describing the *amount* of utility gained or lost from a particular situation.

Assumption 2) Interpersonal comparisons of utility - the ability to relate the utilities of some people to those of others and to say, for instance, that it is possible for a given action to lead one person to gain more than another person loses.

Question 28: What form would a SWF based on the ideas of Jeremy Bentham have? Explain the meaning of this form.

Answer 28: A Benthamite SWF would have the form $W = a_1U_1 + a_2U_2 + \dots + a_nU_n$, where W is the total welfare from an action, and U_1 through U_n are the utilities from the action of the n individuals affected by it, where n is some positive number. The weights a_1 through a_n give the relative significance attached to the utilities of each affected individual. In Bentham's model, each of the weights a_1 through a_n are equal to 1, so it is possible to simply add up utilities among different individuals.

Question 29: What did Bentham use as a proxy for utility in his social welfare function?

Answer 29: Bentham used *income* as a proxy for utility, because utility is difficult, if not impossible, to measure directly. Thus, Bentham assumed that changes in income due to a policy were directly proportional to changes in utility.

Question 30: What is an *axiomatic* social welfare function?

Answer 30: An axiomatic social welfare function is one that can be derived from certain assumptions made beforehand regarding the state of the world and of human action. The nature of the function depends on and follows directly from these assumptions, and different assumptions might generate different SWFs.

Question 31: State the Second Fundamental Theorem of Welfare Economics.

Answer 31: It is possible to get any state of the world by changing people's initial endowments. This includes the ability to get any Pareto-optimal state of the world by means of competitive equilibrium after initial endowments are appropriately determined.

Question 32: What did Parks and Ng show regarding SWFs and cardinality?

Answer 32: Parks and Ng showed that a non-cardinal SWF is impossible.

Question 33: Explain the two assumptions behind Fleming's SWFs? What kind of SWF results from these assumptions?

Answer 33: The two assumptions behind Fleming's SWFs are

- 1) Selection of Pareto-optimal states by the SWF and
- 2) Elimination of indifferent individuals.

Elimination of indifferent individuals can be defined as follows. Let i and j be two different individuals, where i prefers state X over state Y and j prefers state Y over state X . Also, i is indifferent between states X and X' , and j is indifferent between states Y and Y' . Elimination of indifferent individuals requires that if the SWF picks state X over state Y , it must also pick state X' over state Y' .

Fleming SWFs result in a *kind* of additivity, whereby

$W = f(U_1, \dots, U_n) = f(U_1) + \dots + f(U_n)$. However, it is still possible for the function f to be defined so that the overall welfare function is multiplicative. For instance, if $f(x) = \ln(x)$, the result will be

$$W = f(\ln(U_1)) + \dots + f(\ln(U_n)) = f(\ln(U_1) \cdot \dots \cdot \ln(U_n)).$$

Question 34: Explain the assumption behind Harsanyi's SWFs. What kind of SWF does this assumption generate?

Answer 34: Harsanyi assumed that individuals satisfy Von Neumann's axiom of choice, that is, that individuals strive to maximize their *expected* utility from any state of the world. If each individual can use his capacity for empathy to imagine what it would be like to be any other individual in any other state and assign an equal probability to being in a state similar to that of

any other individual, then the resulting SWF is additive and has the Benthamite form $W = U_1 + U_2 + \dots + U_n$.

Question 35: What kind of SWF did Nash derive, and from which foundation?

Answer 35: Nash derived a multiplicative SWF from assuming that people engage in bargaining games.

Question 36: Explain the assumption behind Ng's SWFs. What kind of SWF does this assumption generate?

Answer 36: Ng assumed *finite sensibility* among individuals - namely, that individuals cannot tell among small differences in states of the world. This implies that an additive SWF can be generated by considering a *weak majority* of individual preferences regarding any issue. For instance, if everybody but some n individuals are indifferent between two outcomes, then the decision of the majority of the n non-indifferent individuals should prevail in deciding which outcome to pursue.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. August-October 2008.

All lecture material is used with explicit permission.

Section 5

Arrow's Impossibility Theorem and Related Ideas

Question 37: What five important conditions did Kenneth Arrow assign to the social welfare functions (SWFs) that he examined? What did he demonstrate with regard to these conditions?

Answer 37: The five conditions Arrow posited for SWFs are as follows.

- 1) **Completeness and transitivity.** A SWF should be able to decide among all possible states of the world, and if the SWF ranks alternatives x , y , and z such that $x \geq y$ and $y \geq z$, then the SWF ought to also produce $x \geq z$.
- 2) **Universality.** The SWF should handle all preferences of all individuals and not have to specify which preferences qualify as legitimate or illegitimate for inclusion in the SWF.
- 3) **Pareto-consistency.** Whatever states the SWF picks should be Pareto-optimal.
- 4) **Independence of irrelevant alternatives.** A person's preference of A or B should not depend on his preference for B over C. Independence of irrelevant alternatives needs to hold in order to prevent strategic voting and misrevealing of preferences.
- 5) **Non-dictatorial decision-making.** The preferences of just one person should not determine the outcome.

Arrow showed that it is impossible for a SWF to exhibit all five of these properties. If properties 1 through 4 are met, then the SWF will necessarily be subject to dictatorial decision-making. More generally, there is no rule for choosing among states of the world that satisfies all five of the above conditions. The implication of this is that "the common good" cannot be judged or determined objectively and that projects for doing so by philosophers such as Jean-Jacques Rousseau are necessarily doomed to failure. Arrow's Impossibility Theorem also implies that any conceivable voting mechanism will have some shortcoming with reference to the five conditions above.

Question 38: Explain Gibbard's criterion of *quasi-transitivity* of preferences. What kind of political system would implementation of this criterion lead to?

Answer 38: Quasi-transitivity implies that if a decision-making mechanism selects ranks alternatives x , y , and z such that $x > y$ and $y > z$, then $x > z$. The difference between quasi-transitivity and transitivity is that the inequalities under quasi-transitivity are *strict*, whereas under transitivity x might be equal to y and/or y might be equal to z . Implementation of quasi-transitivity would lead to an *oligarchy*.

Question 39: Which of Arrow's conditions does majority rule violate?

Answer 39: Majority rule violates the *transitivity* condition. It is possible for x to win over y and for y to win over z , but for z to win over x . This means that the order in which votes are taken

could affect the outcome that results and he who controls the order of the votes can control the outcome. Moreover, majority rule is non-universal, because the preferences of individuals in the losing minorities are not taken into account by the final decision.

Question 40: According to Duncan Black's theorem regarding majority rule, under which assumptions will majority rule be complete and transitive?

Answer 40: If the assumption of universality is dispensed with, majority rule will be complete and transitive if all preferences of individuals are single-peaked.

Single-peaked preferences imply two conditions.

- 1) There exists agreement among individuals regarding which states of the world are closer to and farther away from which others.
- 2) Individuals prefer states closer to their optimum to states that are farther away. There are no "all or nothing" preferences.

Question 41: How did Charles Plott extend Duncan Black's analysis of majority rule? What did he find?

Answer 41: Duncan Black analyzed majority rule when only a single issue was being decided on. Charles Plott examined situations in which more than one issue was being voted on at a time. Even if two issues are being voted on simultaneously, it is possible for all individuals to have single-peaked preferences and for majority rule to still not be transitive.

Question 42: What is the Hicks-Scitovsky compensation principle? What is absolutely bizarre about it? How is it supposed to be reflected in the real world?

Answer 42: The Hicks-Scitovsky compensation principle states that a state of the world A is desirable over the status quo if the combined gains to the winners from A are sufficient to compensate the combined losses to the losers from A. The bizarre part of the principle is that it is used to justify the move to state A, and then no compensation of the losers happens, even though the ability to compensate the losers was the initial justification for the move. This criterion is supposed to be reflected in the real world since if only those policies for which the gains to the winners exceed the losses to the losers are picked and there is no systematic bias regarding who wins or who loses, then on average any given person can expect to find himself better off after a number of implementations of such policies.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. August-October 2008.

All lecture material is used with explicit permission.

Section 6

Wicksellian Unanimity and James Buchanan's and Gordon Tullock's Ideas on Optimal Majorities

Question 43: Which economist originated the *unanimity rule* for governmental and parliamentary decision-making?

Answer 43: Knut Wicksell in the 1890s.

Question 44: According to Knut Wicksell, in which possible sphere of human activity does the unanimity rule always hold? In what spheres of human activity does the unanimity rule often *not* hold?

Answer 44: In the free-market economic system, the unanimity rule always holds because all exchanges in markets are voluntary and so all transactions have the unanimous consent of all parties engaged in them. In *political* decision-making, the unanimity rule often does not hold. The decision of a dictator or a majority will force certain actions on the part of people who voted or would have voted against that decision.

Question 45: Which two facets of a given policy that are currently decided on separately did Wicksell wish to combine into packages to be decided on unanimously?

Answer 45: Wicksell wanted *taxation* and *spending* to be combined into packages and for each government measure to be accompanied by the tax used to fund it. Then votes would be taken on various tax/spending packages until one was found that attained unanimous consent.

Question 46: Give two possible problems that might occur with applying the unanimity rule to political decision-making. What pragmatic concession did Wicksell make as a result of these problems?

Answer 46: 1) The unanimity rule biases the political world toward the status quo, because of often prohibitively high *transaction costs* in getting unanimous agreement on any measure that alters the status quo.

2) Under the unanimity rule, there exists a strong incentive for some people to try to *hold out* for as long as possible from agreeing to a given decision that has overwhelming approval, even though they plan to ultimately vote in favor of that decision. By their action, the hold-outs would try to capture as much of the consumer and producer surplus resulting from the decision as possible.

As a result of these problems, Wicksell recommended pursuing some kind of *supermajority* rule in real-world decision-making instead of unanimity.

Question 47: In *The Calculus of Consent*, what notion did James Buchanan and Gordon Tullock reject regarding the nature of "society"?

Answer 47: Buchanan and Tullock rejected the idea that "society" is an actor that can think or behave rationally. Rather, "society" is simply an aggregate of individuals. Moreover, Buchanan and Tullock rejected the idea of "social welfare" and the project entailed in social welfare functions. Rather, they simply focused on the most desirable way to make decisions within a group setting, without reifying society.

Question 48: What two kinds of costs pertaining to group decision-making did Buchanan and Tullock point out? In which cases is each of these kinds of costs greatest? What approach did Buchanan and Tullock recommend regarding these costs?

Answer 48: Buchanan and Tullock distinguished between *transaction costs* and *externality costs*. Transaction costs occur in trying to get the decision to be discussed and agreed on by whatever number of people is deemed sufficient to enact it. Transaction costs are highest when unanimous consent is required and are zero when a dictator makes the decision. Externality costs occur when those who did not prefer a particular selected outcome suffer as a result of that outcome. Externality costs are zero under unanimous decision-making and are at their maximum when a dictator imposes a decision on everyone else. Buchanan and Tullock recommended minimizing the *sum* of transaction costs and externality costs.

Question 49: What is the implication of Buchanan's and Tullock's recommended approach to costs for the determination of decision-making rules?

Answer 49: The minimization of the sum of transaction costs and externality costs means that different situations and different kinds of decisions will entail different optimal majorities. For instance, in a small family, where transaction costs are low, it is more feasible to make decisions by unanimous consent. Likewise, where externality costs are high relative to transaction costs - such as with the imposition of taxes or the death penalty - a sizable supermajority or unanimity should be required for decision-making. Where transaction costs are high relative to externality costs, however, a simple majority will often be a more effective decision-making rule.

Question 50: What problem exists with decision-making rules that require less than a majority for a measure to pass?

Answer 50: The *cycling* problem exists with decision-making rules that require less than a majority for a measure to pass, because it is possible for both the measure and its antithesis to receive the required proportion of votes. For instance, if 30% of the vote is the benchmark for a measure to pass, and 40% of the population support measure A, while 40% of the population support measure (not A), then either A or (not A) will pass, depending on which is put to the vote, and if A is voted on today, A will pass, and if (not A) is voted on the next day, then (not A) will pass and A will be repealed.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. August-October 2008. All lecture material is used with explicit permission.

Section 7

Logrolling

Question 51: What is logrolling?

Answer 51: Logrolling is the swapping of votes by politicians. If politician A wants policy X and politician B wants policy Y, then A agrees to vote for Y in exchange for B voting for X.

Question 52: Which outcome would one expect to see if logrolling were allowed compared to the contrary?

Answer 52: More legislation would be passed if logrolling were allowed than would pass if logrolling were not allowed.

Question 53: Assuming a Benthamite social welfare function, what is a sufficient condition for logrolling to lead to an improvement in welfare?

Answer 53: The *equal stakes* condition is sufficient for logging to improve welfare. This condition holds when the sum of everyone's utilities across all possible outcomes associated with each proposed piece of legislation is the same and positive. Then passing the package of legislation makes everyone better off by the same amount. For this criterion to hold, it is necessary that no parties win from the package of legislation by significantly larger amounts than other parties.

Question 54: What is a *tie-bar*? What is its relation to logrolling?

Answer 54: A tie-bar is a package of legislation in which different and often unrelated bills are tied together and voted on as a unit. A tie-bar is a mechanism designed to facilitate logrolling and prevent non-compliance by individuals involved in it.

Question 55: How are term limits on government officials likely to affect the frequency of logrolling?

Answer 55: Term limits are likely to *reduce* the frequency of logrolling, because a politician whose term is about to expire and who cannot get reelected has little incentive to cooperate with a logrolling effort. If his optimal strategy is to cheat on his last vote, then other politicians may try to cheat him on his second-to-last vote, and this reasoning can be extrapolated indefinitely - often resulting in non-cooperation on *present* logrolling efforts.

Question 56: Discuss a significant problem with using logrolling as a decision-making mechanism that is supposed to reflect people's preferences.

Answer 56: The outcome under logrolling is affected by the order in which coalitions form. Depending on who decides to trade votes with whom first, different pieces of legislation might pass. Thus, logrolling generates an outcome dependent on factors other than people's preferences - namely, the order in which voting blocs come about. This renders logrolling highly susceptible to the influence of lobbyists, who try to put the coalitions together in certain ways.

Question 57: What is a possibility for formalizing the logrolling process and simultaneously somewhat limiting the scope of voting blocs that can form under it?

Answer 57: If every voter is given a fixed number of votes to allocate among the issues that he sees fit, this would formalize the logrolling process and allow for a limited trading of votes - but only so long as individuals have votes remaining to trade. This formalization would prevent indefinitely large voting blocs from forming, and it would also lead to a tradeoff between individuals investing all their votes into *their* preferred issue and trying to garner other votes by devoting their own votes to other issues.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. August-October 2008.

All lecture material is used with explicit permission.

Section 8

Dynamics of Majority Rule and Alternative Voting Mechanisms

Question 58: Suppose there are two groups of people - A and B - each with different interests and no benevolence whatsoever toward the other group. A vote is held on the provision of a public good which will expand the Pareto-optimal frontier. Consider a graph of the Pareto-optimal frontier where the utility to group A is on the horizontal axis and the utility to group B is on the vertical axis. Assume that the status quo is some point E on the current Pareto-optimal frontier P, and the public good leads P to expand to P'. Where will the new point E' on P' be if (a) unanimity is required, (b) majority rule will decide and group A is the majority, and (c) majority rule will decide and group B is in the majority?

Answer 58:

(a) Under unanimity, E' will be *up and to the right* of E, because unanimous consent will only occur if the public good is so provided as to make members of both A and B at least somewhat better off.

(b) Under majority rule by group A, E' will be *down and to the right* of E, because group A will vote to make itself better off at B's expense. The public good will be provided, and then wealth will be redistributed from B to A along the new Pareto-optimal frontier.

(c) Under majority rule by group B, E' will be *up and to the left* of E, because group B will vote to make itself better off at A's expense. The public good will be provided, and then wealth will be redistributed from A to B along the new Pareto-optimal frontier.

Question 59: Discuss Riker's contributions to the analysis of majority rule and the size of coalitions under majority rule.

Answer 59: Riker analyzed majority rule as a zero-sum game in which the majority sought to distribute to itself the wealth of the minority. This situation tends to lead to the *minimum winning coalition*, so that the group that wins has as many victims as possible among the losers. Thus, coalitions under majority rule will tend to approach 50% plus one person in size.

Question 60: What problem with majority rule was the Condorcet method of voting intended to solve?

Answer 60: The Condorcet method of voting was intended to solve the *intransitivity* of majority rule - which implies that whoever under majority rule chooses the order in which votes are taken can often determine the outcome of the process.

Question 61: Explain the Condorcet method of voting.

Answer 61: In the Condorcet method of voting, every option is compared to every other option in separate votes between any two options. Only an option that has beaten *all* the other options becomes the Condorcet winner.

Question 62: What is a shortcoming of the Condorcet method of voting?

Answer 62: The Condorcet method is not *complete*. Under some situations, it is possible that *no* single alternative beats all of the others, in which case the Condorcet method does not generate a winner.

Question 63: According to Duncan Black, what conditions under majority rule can prevent cycling? If these conditions are met, what decides the outcome under majority rule?

Answer 63: In a single issue space, if all preferences are single-peaked and there is an odd number of voters, then there will be no cycling under majority rule. In that case, the preference of the *median* voter - who will be a single individual if the number of voters is odd - will decide the outcome.

Question 64: Explain the Borda method of voting.

Answer 64: The Borda method of voting assigns $(n - 1)(n - 2)/2$ points to each voter to allocate among the n alternatives being decided on. Then the voter allocates $n - 1$ points to his most preferred option,

$n - 2$ points to this second-most preferred option, and $n - k$ points to his k th most preferred option. The points assigned by all the voters are added up for each option, and the option with the highest number of points becomes the Borda winner.

Question 65: What is a shortcoming of the Borda method of voting?

Answer 65: The Borda method of voting does not exhibit *independence of irrelevant alternatives* and gives voters incentives to misreveal their preferences. For instance, if person X ranks A first, B second, and C third but thinks that B might win if he votes according to his true preferences, then, in order to get A to win, X might vote for A first, C second, and B third. The manner in which X votes might not be a genuine indication of his preference ordering.

Question 66: What is another shortcoming of the Borda method of voting? Who suggested a way to correct it?

Answer 66: The Borda method of voting does not allow for voters to demonstrate their *intensity* of preference among the alternatives they rank. Rather, irrespective of how *greatly* they prefer a given alternative to their next-ranked alternative they must allocate points in a decreasing sequence with a difference of 1 between each term.

Pierre-Simon Laplace proposed an alternative system of voting in which every voter has a fixed number of points to allocate among the alternatives *however he wishes*. He can allocate all of his points to only one options or distribute them with approximate equality among all the options, or do anything in between. With enough points given to each voter, this allows for a reasonable reflection of the intensity of each voter's preferences.

Question 67: Under which conditions is misrevealing of voter preferences less likely?

Answer 67: Under conditions of highly *imperfect information*, misrevealing of voter preferences is less likely, because voters do not know who will win in the absence of their votes and thus cannot strategize for how to use their vote to affect an outcome that they have little ability to anticipate.

Question 68: Name a 19th-century thinker who independently reproduced the work of Borda and Condorcet on voting theory.

Answer 68: Charles Dodgson, a.k.a. Lewis Carroll.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. August-October 2008.

All lecture material is used with explicit permission.

Section 9

Game Theory and Sequential Games

Question 69: What kind of situation can be described as the problem of "belling the cat"? That is, why might large groups of people fail to reach a mutually advantageous outcome?

Answer 69: Certain situations, such as orchestrating a revolt among concentration camp prisoners, require simultaneous mass action to be effective. Otherwise, the first few people who decide to engage in the desirable action will incur extremely high costs, such as getting shot, and the remainder will be cowed into compliance with the sub-optimal status quo.

Question 70: What kinds of problems can arise from ad hoc decision-making?

Answer 70: Making decisions on an ad hoc basis can often lead one to make other decisions and ultimately to establish a general principle or predictable pattern of behavior that one would never have adopted at the onset. Every step in this game reduces the number of available options and constrains the players to behave in ways they would not have chosen freely and would have considered undesirable at the onset of the game.

Question 71: What does game theory have to say about "looking before you leap" with regard to making commitments?

Answer 71: Once a party has committed to a decision, its bargaining position is weakened and it is able to demand less in future instances of bargaining. Not having made a firm commitment from which it is costly to escape places one in a better bargaining position. Moreover, having credible alternatives to the current situation reduces the cost of failing to get one's way during the bargaining. A person bargaining with his employer for a raise has greater chances of success if he can show that he has another job offer with a higher salary waiting for him.

Question 72: What is the general decision-making rule for sequential games?

Answer 72: Look forward, reason backward. Anticipate all the possible final outcomes and work backward through the decision tree to see which intermediate outcomes will be selected as a result.

Question 73: Vercingetorix and Bob are two children in a playground with no adults, no rules, and no outside punishments. Vercingetorix is a bully and is considering attacking Bob. If he does not attack Bob, the payoffs to both of them will be zero. Bob has two kinds of weapons - a fly swatter and a metal baseball bat - and Bob only fights in self-defense. If Vercingetorix attacks and Bob retaliates with a fly swatter, Vercingetorix will beat up Bob and the payoffs will be +2 for Vercingetorix and -2 for Bob. If Vercingetorix attacks and Bob retaliates with a metal baseball bat, Vercingetorix will begin to hurl rocks at Bob and will damage him severely. The

payoffs to both parties will be -40. What should Bob do to prevent Vercingetorix from attacking him?

Answer 73: Bob should throw away his fly swatter or even give it to Vercingetorix. If Vercingetorix attacks and Bob has the fly swatter, Bob would prefer to retaliate with the fly swatter to get a payoff of -2 rather than -40. Vercingetorix will therefore choose a payoff of +2 from attacking rather than a payoff of 0 from not attacking. However, if Bob only has the baseball bat option, then he will have to use it if Vercingetorix attacks, so Vercingetorix's payoffs will be -40 if he attacks and 0 if he does not attack, and Vercingetorix will not attack.

Question 74: What kinds of sequential games always have an answer?

Answer 74: Any sequential game with a finite number of moves always has an answer. Provided that it is humanly possible to examine all possible payoffs at the end of the game and reason backward from them, it is possible to devise an optimal strategy for a sequential game.

Question 75: What is one way to reduce the problem of figuring out the consequences of every move in sequential games?

Answer 75: If symmetries exist in sequential games, then many different moves might have identical consequences and payoffs. This reduces the number of options one has to examine.

Question 76: What information do you need to know about payoffs in order to play a sequential game to your greatest advantage?

Answer 76: You need to know not only your own payoffs from each outcome, but also the other side's perceived payoffs from each outcome, which might differ from yours.

Question 77: Which economist examined bargaining over the course of a finite number of rounds, with a disappearing prize, as an instance of sequential games?

Answer 77: Thomas Schelling.

Question 78: In a bargaining situation where two sides alternate in giving their offers and the prize being bargained over diminishes at a uniform rate and completely disappears over the course of an even number of turns, what is the most advantageous offer that can be made by the party making the initial offer?

Answer 78: The party making the initial offer should offer the other party $1/2$ of the prize.

Question 79: In a bargaining situation where two sides alternate in giving their offers and the prize being bargained over diminishes at a uniform rate and completely disappears over the course of an odd number of turns, what is the most advantageous offer that can be made by the party making the initial offer?

Answer 79: The party making the initial offer should offer the other party $(n-1)/(2n)$ of the prize, where n is the number of turns over the course of which the prize completely disappears. Thus, the party making the initial offer has a slight advantage, in that it can get $(n + 1)/(2n)$ of the prize.

Question 80: In a bargaining situation where two sides alternate in giving their offers and the prize being bargained over never disappears, what is the most advantageous offer that can be made by the party making the initial offer?

Answer 80: The party making the initial offer should offer the other party $1/2$ of the prize. This is the limit of $(n-1)/(2n)$ as n increases without bound. If such a first offer is made, it will be accepted.

Question 81: What are some advantages to having an arbitrator in sequential bargaining games?

Answer 81: There can exist uncertainty over how large the prize being bargained over is; this uncertainty may prevent the optimal solution for both parties from arising, unless some independent third party is present to prevent the bargainers from misconstruing one another's intentions, perceptions, and offers. An arbitrator may help bring about the kind of mutual confidence that is necessary for successful bargaining to occur.

Question 82: Barack, John, and Ralph are involved in a mud-slinging contest, where they throw mud at one another. Ralph is a poor shot, and the mud he throws only hits its target 30% of the time. Barack's mud hits its target 80% of the time, and John, due to his extensive prior mud-slinging experience, hits his target 100% of time. Ralph gets to throw mud first, followed by Barack, followed by John. Once a person gets hit with mud, his impeccable suit needs to be dry-cleaned, so he must forfeit the contest. What should Ralph do on his first move?

Answer 82: Ralph should throw his mud so that it deliberately misses both Barack and John. If Ralph eliminated Barack with his mud, then John would eliminate Ralph during his turn. If Ralph eliminated John, then Barack would have an 80% chance of eliminating Ralph. If Ralph did not eliminate either Barack or John, then Barack would throw his mud at John (and likely eliminate him - as seems to have happened). Either Barack or John would be eliminated before Ralph's next turn came about, and Ralph would be guaranteed at least one more turn.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. October - November 2008.

All lecture material is used with explicit permission.

Section 10

Game Theory and Simultaneous Games

Question 83: What conditions define a simultaneous game?

Answer 83: In a simultaneous game, all players either move at the same time and/or are unaware of one another's moves in deciding their own.

Question 84: What is a dominant strategy?

Answer 84: A dominant strategy is a strategy that makes the player following it the best off, irrespective of what any other player does.

Question 85: What is a dominated strategy?

Answer 85: A dominated strategy is a strategy that makes the player following it the worst off, irrespective of what any other player does.

Question 86: What is the sequence of steps to be taken in analyzing a simultaneous game?

Answer 86: 1. Look for a dominant strategy from any player's perspective. If a player has a dominant strategy, he can be expected to follow that strategy, and other players' decisions can be expected to anticipate this.

2. If there is no dominant strategy, look for a dominated strategy from any player's perspective and eliminate it. No player will play his dominated strategy.

3. After eliminating a dominated strategy, look for dominant strategies again; if none exist, look for dominated strategies again, and so on indefinitely until either a solution is reached or no more of either kind of strategy exists.

4. If no more dominant or dominated strategies can be found, then there may exist a mixed-strategy equilibrium if the game is played repeatedly.

Question 87: Questions 87-90 all apply to the following situation. A certain monopolistic meal service provider at a certain publicly funded university serves two kinds of food, artichokes (A) and broccoli (B). If students actually eat the food they anticipated having on any given day, they would become happy, and the monopolistic meal service provider cannot have that. The following is the payoff matrix from each of the possible four outcomes, with the payoff from each outcome represented as (a, b), where a is the payoff for the meal service and b is the payoff for students.

.....Students anticipate.....A.....B

Meal service provides A.....(-120, 120).....(70, -70)

Meal service provides B.....(60, -60).....(-140, 140)

Both the students and the meal service encounter this situation repeatedly and are trying to maximize their expected payoff.

Let x be the fraction of the time the meal service provides artichokes. Find x .

Answer 87: If the students anticipate A, then their expected payoff will be

$$120x + (-60)(1-x) = 180x - 60.$$

If the students anticipate B, then their expected payoff will be

$$-70x + 140(1-x) = 140 - 210x.$$

Since the students want to maximize their minimum payoff, their optimal strategy will be to set these two expected payoffs equal to one another.

Thus, $180x - 60 = 140 - 210x$ and $390x = 200$, so $x = \mathbf{20/39}$.

Another way to solve this problem is to take the difference of the meal service's payoffs in the first row $(70 - (-120)) = 190$ and the difference of its payoffs in the second row $(60 - (-140)) = 200$.

Then the probability that the meal service will choose A is the *second* row difference divided by the sum of the two row differences, or $200/(200 + 190) = 20/39$.

Question 88: What is the anticipated payoff for the students in this situation?

Answer 88: The anticipated payoff for the students in this situation is $180x - 60 = 180(20/39) - 60 = 140 - 210x = 140 - 210(20/39) = \mathbf{\text{about } 32.30769231}$.

Question 89: Let y be the fraction of the time the students anticipate artichokes. Find y .

Answer 89: If the meal service provides artichokes, its expected payoff will be

$$-120y + 70(1 - y) = 70 - 190y.$$

If the meal service provides broccoli, its expected payoff will be

$$60y + (-140)(1 - y) = 200y - 140.$$

Since the meal service wants to maximize its minimum payoff, its optimal strategy will be to set these two expected payoffs equal to one another.

$$70 - 190y = 200y - 140 \rightarrow 390y = 210 \rightarrow y = 21/39 = y = \mathbf{7/13}.$$

Alternatively, $y = (70 - (-140))/((70 - (-140)) + (60 - (-120))) = 7/13.$

Question 90: What is the anticipated payoff for the meal service in this situation?

Answer 90: The anticipated payoff for the meal service in this situation is $70 - 190y = 70 - 190(7/13) = 200y - 140 = 200(7/13) - 140 = \mathbf{about -32.30769231}.$

(Note that this is *exactly the same* as a positive student payoff of 32.30769231, since the meal service's valuations are precisely the opposite of those of the students.)

Question 91: State the Von Neumann-Morgenstern minimax theorem.

Answer 91: In a simultaneous game between two players and having a mixed-strategy equilibrium, the maximum of the minimum payoff for one of the players is the same as the minimum of the maximum payoff for the other player (where one player considers higher payoffs more desirable than lower ones, and the other player considers lower payoffs more desirable than higher ones).

Question 92: There are two players in a simultaneous repeated game with a mixed-strategy equilibrium. Each player can pick option H or option J. The Row Player's payoff matrix is given below, and the Column Player's payoffs are the opposite of those of the Row Player.

.....Column Player picks.....	H.....	J.....
Row Player picks H.....	A.....	B.....
Row Player picks J.....	C.....	D.....

Let x be the fraction of the time that the column player picks option H. Give a formula for x.

Answer 92:

Consider what happens if the Row Player picks H; this will result in the expected payoff $Ax + B(1-x)$. Likewise, if the Row Player picks J, this will result in the expected payoff $Cx + D(1 - x)$.

By the Von Neumann-Morgenstern minimax theorem, set $Ax + B(1-x) = Cx + D(1 - x)$ and solve to get $x = \mathbf{(D - B)/((A - C) + (D - B))}.$

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. October - November 2008. All lecture material is used with explicit permission.

Section 11

The Prisoners' Dilemma

Question 93: Define a prisoners' dilemma.

Answer 93: A prisoners' dilemma is a situation in which the best outcome from the standpoint of all parties involved is an outcome where all parties cooperate, but the

dominant strategy of each party is to cheat. Unless some kind of coordination mechanism exists to prevent cheating, a prisoners' dilemma situation will result in mutual cheating and thus a sub-optimal outcome.

Question 94: Are prisoners' dilemmas zero-sum games?

Answer 94: No. It is possible to benefit all parties by achieving a cooperative solution as opposed to letting each party pursue its dominant strategy.

Question 95: What are the two conditions that must hold in order to enforce a cooperative solution to a prisoners' dilemma situation?

Answer 95: 1. It must be possible to reliably detect cheating.

2. It must be possible to create a credible threat of punishing cheating.

Question 96: What factors may help overcome a prisoners' dilemma situation and produce cooperation?

Answer 96: Culture, customs, traditions, and one's own negative thoughts and feelings arising from non-cooperation can all help overcome a prisoners' dilemma situation.

Question 97: Describe the tit-for-tat strategy.

Answer 97: The tit-for-tat strategy is played in games with many rounds. The tit-for-tat strategy starts by cooperating and then cooperates in response to the other player's cooperation and defects in response to the other player's defection.

Question 98: What are some advantages of the tit-for-tat strategy?

Answer 98: 1. Two players who are each using the tit-for-tat strategy will always cooperate reliably (given the impossibility of mistaking cooperation for defection).

2. It is easy for the other player to figure out that one is using the tit-for-tat strategy. The other player knows that his cooperation will be rewarded and his defection will be punished. In this way, the strategy is transparent.

3. The tit-for-tat strategy permits one to neither be exploited systematically nor to forgo the advantages of cooperation when the other party is willing to cooperate.

Question 99: What is a requirement for cooperation to be sustainable in a simultaneous game played over many rounds? Give an example of this as applied to the political arena.

Answer 99: The number of rounds in the game must be unknown. If the number of rounds were reliably known, then one of the parties could cheat in the last round in an attempt to get even greater overall benefits than could be obtained from cooperation. The other party would then anticipate this and cheat in the next-to-the-last round, and this pattern would recur for all the previous rounds. This cascade of mutual second-guessing could result in cheating in the present. This is why successful efforts at logrolling and other political cooperation are more difficult to attain when legislators' terms are limited by law. If it is known that a legislator will not be able to run for office again, he has an incentive to cheat on any cooperative effort shortly before leaving office, and other legislators have an incentive to anticipate his cheating and preempt it with their own.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. October - November 2008.

All lecture material is used with explicit permission.

Section 12

The Hotelling-Downs and Smithies Models of Voting

Question 100: There is a beach with people uniformly distributed along it. Two vendors selling orange pies are trying to locate along the beach, knowing that each person would choose to patronize the closest vendor. Where, according to Harold Hotelling, could the vendors be expected to locate? What is the problem with this outcome?

Answer 100: The vendors could be expected to locate in the center of the beach, as the result of each vendor trying to have exclusive access to as many customers as possible. Any people to the right of the rightmost vendor will patronize the rightmost vendor, and likewise with the leftmost vendor, and the only way for either vendor starting at any location to retain half of the market is to move to the middle as his competitor moves to the middle. This outcome is problematic, because it is not the outcome that minimizes walking distance for customers. Rather, if the beach could be represented as the interval $[0, 1]$ and one vendor were located at the point $\frac{1}{4}$, while the other were located at the point $\frac{3}{4}$, walking distance would be minimized, and each vendor would still get half of the market.

Question 101: How did Anthony Downs apply Hotelling's analysis to politics?

Answer 101: If there exists only a single issue-space, then all political parties have an incentive to move their positions toward those of the median voter and to claim that their policies represent the middle range of opinion, while characterizing the other side as being to either extreme. It is difficult for third parties to exist in this situation, because any side of the issue-space that has more than one party will have all of its parties defeated if the other side of the issue-space has only one party.

Question 102: In what kind of issue-space might third parties be politically viable?

Answer 102: In a multi-dimensional issue-space, third parties might be politically viable, especially if both major parties drift to one side of any particular issue. The presence of the third party on the other side of that issue will often pull the major parties back toward the median of that issue.

Question 103: How do winner-take-all systems differ from systems of proportional representation with respect to the viability of third parties?

Answer 103: Under a winner-take-all system, the party that wins claims a total victory irrespective of the percentages obtained by each side. Thus, any coalitions that are formed tend to be created before the election takes place. By contrast, under proportional representation, parties are represented in proportion to the votes they obtained. Under proportional

representation, third parties are more viable, and coalitions are formed after the election is over and the results are known.

Question 104: Describe Arthur Smithies's idea of voter alienation.

Answer 104: Voter alienation implies that voters will not vote for a party that drifts too far away from their preferences. In an election, people will only vote if the marginal benefit to them of voting exceeds the considerable marginal costs of waiting in line and foregone time. If a party's principles are no longer appealing to a voter from that party's base, then that voter will prefer to stay home. This is what has been happening, for instance, with the Republican Party in the United States, which has increasingly failed to "get out its base."

Question 105: In what cases and how does introducing voter alienation change the outcome of a political process in a single issue-space?

Answer 105: In a unimodal, symmetric distribution of voters, the two parties will still appeal to the median voter. However, if the mode of the distribution is different from the median (i.e., in an asymmetric, unimodal distribution), then, as a result of alienation, both parties will drift toward the mode, because each will gain more voters from approaching the mode than are lost from alienation. In a multimodal distribution, it is possible for each party to try to reach a different mode. In a bimodal distribution, for instance, the two major parties might capture each of the modes, alienating the voters in between them. There is therefore room for a third party to come in and appeal to the voters in the center between the two modes; such a third party might even win the election, although this is not a foregone conclusion. This kind of distribution of voters is also conducive to parties being substantively different in their positions on the issue.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. October - November 2008.

All lecture material is used with explicit permission.

Section 13

More Alternative Methods of Voting

Question 106: How might the electoral college hinder third parties?

Answer 106: A third-party candidate (such as Ross Perot in 1992, who got 18.9% of the popular vote and no electoral votes) whose votes are spread out geographically might get a substantial percentage of the popular vote and yet zero electoral votes, rendering him politically unviable even though many people support him. Eliminating the electoral college and having proportional representation based on a popular vote gives third parties a greater chance of winning and influencing the election.

Question 107: Let the distribution of political preferences be normal. Let p be the percentage the winning candidate in an election would get. Let n be the size of a sample of voters. The z be the standard error and E be the acceptable error. Give a formula for n . What value of p maximizes n ?

Answer 107: The formula for n is $n = p(1-p)/(E | z)^2$. The value of p that maximizes n is $p = 1/2$.

Question 108: What controversial procedure might be able to reduce the total costs of voting to voters?

Answer 108: Based on the formula in the previous answer, it is possible to receive an extremely close approximation of p , the winning candidate's percentage of votes, if a sufficiently large sample of voters is selected. Thus, by randomly selecting a large fraction of the population (several tens of millions of people, for instance) and only allowing these people to vote, a virtually indistinguishable outcome might be reached compared to the outcome obtained if everyone voted. But the people who do not vote would not incur the costs associated with voting. (However, it is extremely difficult to select a truly random sample of voters, so this is not a viable real-world procedure.)

Question 109: There are three groups of voters, A, B, and C, each with the same number of voters and with the following preferences.

A: Slightly for religious freedom; strongly against economic freedom.

B: For both religious and economic freedom.

C: Slightly for economic freedom; strongly against religious freedom.

Candidate X supports both religious freedom and economic freedom. Candidate Y opposes both kinds of freedom. Who will win the election? Why is this disturbing from the standpoint of majority rule?

Answer 109: Candidate Y will win the election. The A voters will overlook his opposition to religious freedom, because they strongly agree with his opposition to economic freedom. Likewise, the C voters will overlook Y's opposition to economic freedom, because they strongly agree with his opposition to religious freedom. Only the B voters will vote for X, and therefore Y will win, even though Y has the minority preference on all issues.

This means that a candidate can win despite not being aligned with the majority on any one issue.

Question 110: How does logrolling relate to the intensity of political preferences among various groups?

Answer 110: Logrolling works because of a differential in the distribution and intensity of preferences among voters who engage in logrolling. None of the proposals that are packaged together would have passed in isolation from one another, but each party supporting its respective proposal favors it much more strongly than it dislikes any of the other proposals. Therefore, it is willing to take small losses on all the other issues in order to get a large gain on its own issue.

Question 111: How does the single-vote plurality method of voting work?

Answer 111: Each voter gets one vote, and the candidate or option that receives the largest number of votes compared to all the other candidates or options wins the election.

Question 112: Name a major shortcoming of the single-vote plurality method.

Answer 112: Under the single-vote plurality method, it is possible for the candidate that is least preferred by the majority of voters to win. For instance, if A is ranked last by 80% of the voters and first by 20% of the voters, and the other five candidates - B, C, D, E, and F - are each ranked first by 16% of the voters, then A will win the election with 20% of the vote, even though 80% of the voters would have preferred anyone other than A to win. Moreover, the single-vote plurality method does not take account of the whole preference ordering, nor of the intensity of preferences among voters.

Question 113: Describe the method of holding a single-vote primary, followed by a general election.

Answer 113: All the candidates compete against each other in the primary, and then the top two vote-getters compete only against one another in the general election.

Question 114: What is the monotonicity paradox?

Answer 114: The monotonicity paradox occurs whenever it is possible for a candidate or option to move up in the preference rankings among some group of voters and lose the election as a result of such upward movement.

Question 115: Describe one advantage and one disadvantage of the method of holding a single-vote primary, followed by a general election.

Answer 115: Advantages of this method include the impossibility of a candidate who is least preferred by the majority winning. However, a major disadvantage of this method is its vulnerability to the monotonicity paradox. If a group of voters switches preferences in favor of a particular candidate, it is possible for that candidate to lose as a result of that switch.

Question 116: Describe the method of the alternative vote.

Answer 116: Under the alternative vote, all voters rank-order their preferences on their ballots. Then the first preferences of all voters are considered. If one of the options gets more than 50% of the first preferences, that option wins. If this does not happen, then the option with the fewest number of first rankings gets discarded and the remaining options are considered to see if any of them has more than 50% of the first preferences. (The voters who ranked the discarded candidate first now have their second ranking counted as their first.) This process continues until a winner is selected.

Question 117: What are some shortcomings of the alternative vote?

Answer 117: The alternative vote will discard the option that is ranked second by everyone, but first by no one. Moreover, an option that is ranked highest on average might be discarded under an alternative vote for failing to receive enough first rankings. The alternative vote is also vulnerable to voters' strategic misrevealing of their preferences.

Question 118: How did Gordon Tullock suggest reforming the election of members of a legislature?

Answer 118: Tullock suggested that, in every district, any person should be permitted to run for office. Then, any person would be permitted to attend the meetings of the legislature and would have a number of votes proportional to the number of votes this person received in the election. This is akin to proxy voting, in that individual citizens may delegate their votes to a single person who they believe will represent them, or they may appear at the legislative meetings and cast their own votes.

Question 119: Describe the exhaustive primary method of voting.

Answer 119: In the exhaustive primary, every person gets $(n-1)$ votes to allocate among n candidates, with one vote allowed per candidate. The candidate with the fewest votes at the end of the round gets discarded, and the next round occurs, where every person gets $(n-2)$ votes to allocate among the remaining $(n-1)$ candidates. The candidate with the fewest votes gets discarded at the end of each round, until there is one candidate remaining.

Question 120: What are some advantages of the exhaustive primary method of voting?

Answer 120: The exhaustive primary method of voting uses the whole preference ordering and will not elect candidates that are not favored by the majority. If there exist stable preferences and independence of irrelevant alternatives, then the results of exhaustive primaries can be tabulated by computers after receiving the preference orderings of all voters.

Question 121: Describe the method of the single transferable vote in electing delegates to a legislature from multi-member districts.

Answer 121: The method of the single transferable vote first figures out how many votes are needed to win a seat to the legislature. This number is $(\text{Votes cast})/(\text{Number of seats to be chosen}) + 1$; it is also called the Droop quota. Any candidate who gets this number of votes or more is elected to the legislature. The surplus votes cast for those candidates are allocated among the other candidates based on the voters' preference orderings. If, after this happens, no candidates meet the Droop quota, then the candidate with the fewest votes is discarded, and his votes are allocated among the others.

Question 122: What are some advantages and disadvantages of the single transferable vote?

Answer 122: The single transferable vote uses the entire preference ordering, which is desirable. However, it is also subject to the monotonicity paradox, and there is no theoretical reason why it should always lead to desirable results.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. October - November 2008.

All lecture material is used with explicit permission.

Section 14

Proportional Representation

Question 123. State an advantage of proportional representation.

Answer 123. Under proportional representation, smaller parties that consistently get a non-plurality fraction of the vote will be given some amount of representation in the governmental body to which members are being elected. For instance, a third party which always receives 10% of the votes might (under ideal proportional representation) get 10% of the seats from the district in question.

Question 124. For proportional representation to work, what must be true about districts from which representatives of some government body are selected?

Answer 124. The districts must be multi-member districts, where more than one person among those running can be elected to office.

Question 125. How does the closed party list method of proportional representation work?

Answer 125. Each party lists its candidates on the ballot, but voters vote for parties, rather than individual candidates. The parties decide which of their candidates receive which rankings on the ballot, and the persons ranked first by each party have the highest probability of winning an office.

Question 126. How does the open party list method of proportional representation work?

Answer 126. Voters vote for individual candidates within parties, and the candidates with the most votes get elected. However, parties receive the votes that a candidate receives beyond the vote quota (which is sometimes a Droop quota) and allocate these votes to other party candidates.

Question 127. Describe the d'Hondt Rule for allocating votes in elections based on proportional representation.

Answer 127. The d'Hondt Rule assigns seats to parties based on the highest average number of votes per seat. Each time a seat is allocated, a quotient or average is calculated for each party, equal to $V/(s + 1)$, where V is the number of votes the party received and s is the number of seats that have been allocated to that party already. The party with the highest value of the quotient will receive the seat in question.

Question 128. There are four parties in an election which uses proportional representation and the d'Hondt Rule. Party A received 35,000 votes; Party B received 28,000 votes; Party C

received 24,000 votes; Party D received 13,000 votes. Five seats are being allocated. How many seats will each party get according to the d'Hondt Rule?

Answer 128. The values of V for each party are given. The value of s for each party is initially zero.

The first seat goes to A, since A has a quotient of $35000/(0 + 1) = 35000$, which is the largest quotient of the four.

In the second round, A has a quotient of $35000/(1 + 1) = 17500$;

B has a quotient of $28000/(0 + 1) = 28000$; C has 24000; D has 13000. So B gets the second seat.

In the third round, the following quotients apply to each party:

A: 17500; B: $28000/(1+1) = 14000$; C = 24000; D = 13000 - so C gets the third seat.

In the fourth round, the following quotients apply to each party:

A: 17500; B: 14000; C = $24000/(1+1) = 12000$; D = 13000 - so A gets the fourth seat.

In the fifth round, the following quotients apply to each party:

A: $35000/(2+1) = \text{about } 11666.67$; B: 14000; C = 12000; D = 13000 - so B gets the fifth seat.

The total seats obtained per party are **A:2; B:2; C:1; D:0.**

Question 129. Describe the greatest remainder method for allocating votes in elections based on proportional representation.

Answer 129. The greatest remainder method divides the total votes cast by the available seats to determine the vote quota. Then the method gives one seat to each party that gets a number of votes larger than the quota. The remaining seats are allocated to parties that have the largest remainder of votes after the number of votes equal to the quota has been subtracted from each party that has already obtained a seat (and this subtraction is done for every seat obtained).

Question 130. There are four parties in an election which uses proportional representation and the greatest remainder method. Party A received 35,000 votes; Party B received 28,000 votes; Party C received 24,000 votes; Party D received 13,000 votes. Five seats are being allocated. How many seats will each party get according to the greatest remainder method?

Answer 130. The total number of votes is 100000. Since there are 5 seats, the vote quote is $100000/5 = 20000$. Thus, A, B, and C each receive 1 seat, as they have votes in excess of the quota. 2 seats remain to be allocated. A has a vote remainder of $35000-20000 = 15000$. B has a vote remainder of $28000-20000 = 8000$. C has a vote remainder of $24000-20000 = 4000$. D has a vote remainder of 13000, since it obtained no seats as of yet. So the remaining two seats go to

the parties with the greatest remainders, i.e. A and D. The total seats obtained per party are **A:2; B:1; C:1; D:1.**

Question 131. Does proportional representation necessarily produce outcomes in line with the opinions of the median voter?

Answer 131. No. Nothing about proportional representation requires outcomes to conform to the median voter's wishes. Some candidates selected could be in the middle of the distribution of political preferences, while others might be at the extremes.

Sources

["d'Hondt Method."](#) (2008). Wikipedia, the Free Encyclopedia.

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. November - December 2008.

All lecture material is used with explicit permission.

Section 15

Rent-Seeking

Question 132. What is "rent" in economic jargon?

Answer 132. "Rent" is the return to any fixed factor of production.

Question 133. How does "rent" pertain to government-granted monopolies, quotas, and other barriers to entry?

Answer 133. The imposition of such barriers imply that the producers who are favored by them (such as the company that is given a monopoly or domestic manufacturers who face reduced competition because of import quotas) can earn more economic rent without needing to improve the quality of their products or their service. Rent-seeking is precisely the attempt by some producers to obtain these government favors at the expense of others. Some producers (typically the less competent ones) benefit by rent-seeking when entry into the market is restricted. Rent-seeking can also pertain to attempting to redistribute income, impose tariffs, obtain tax breaks, and coerce others into behaving in certain ways.

Question 134. Describe one problem with rent-seeking, as pertains to Pareto-optimality.

Answer 134. Rent-seeking necessarily implies economic inefficiency of the resulting arrangement. The special privileges granted to successful rent-seeker raise the price those rent-seekers can charge above their marginal revenue, so that $P > MR$. Since marginal revenue is equal to marginal cost ($MR = MC$), the successful rent-seekers can charge a price greater than marginal cost ($P > MC$), which is not a Pareto-optimal state of affairs.

Question 135. Describe another problem with rent-seeking, as discussed by Gordon Tullock.

Answer 135. Resources are spent in seeking the rent. Only a few producers will get the special favors from the government, but everybody who wants those favors must expend money and other resources on hiring lobbyists and other expensive advocacy work. Other groups that oppose the imposition of government restrictions will expend resources advocating that the proposed restrictions be rejected. If the option to engage in rent-seeking were not available, these wasted resources might have been used to create products that consumers would have found beneficial.

Question 136. How is innovation in a given line of business affected by rent-seeking?

Answer 136. Successful rent-seeking reduces innovation in the given line of business, because new firms with possibly promising ideas cannot easily enter and compete with incumbent producers.

Question 137. Is rent-seeking a zero-sum game?

Answer 137. No. Rent-seeking is a negative-sum game, where resources are being used up by various parties trying to either get special favors or prevent those favors from being distributed. Rent-seeking dissipates resources on net, and fewer resources are available to produce actual goods.

Question 138. What are the two factors that firms seeking to lobby for or against a given economic restriction take into consideration?

Answer 139. The two factors are (1) the size of the possible economic rent or the gain from the restriction not being imposed (r) and (2) the probability of the effort's success (p). A firm should be willing to spend up to $p*r$ in the lobbying effort.

Question 140. Augustus the Widget-Maker wishes to restrict entry into the widget market by having the government allow only people named Augustus to produce widgets. The extra revenue Augustus can expect to gain from this restriction is \$150000. The probability that his effort will succeed has been estimated at $(1/3)$. What is the maximum amount of money Augustus will be willing to spend on lobbying for the restriction to be imposed?

Answer 140. The maximum amount of money Augustus will be willing to spend is $p*r = (1/3)150000 = \mathbf{\$50,000}$.

Question 141. Give an example of real-world rent-seeking. Who, in this example, supports the barriers to entry into the market and who opposes them?

Answer 141. Sugar quotas imposed by the U. S. Federal Government artificially restrict the supply of sugar and so raise its price, leading U. S. sugar producers to earn more revenue than they would have earned otherwise. The sugar producers support the quota, along with producers of high-fructose corn syrup, which is currently less expensive than sugar on account of the sugar quotas and is therefore frequently used as a (highly unhealthy) substitute for sugar. Soft drink companies, cereal companies, and other users of sugar as an input oppose the sugar quotas, because the quotas lead to higher input prices for such firms.

Question 142. What did Frederic Bastiat have to say about rent-seeking?

Answer 142. Although Bastiat wrote before the term "rent-seeking" was coined, Bastiat did extensively discuss legalized plunder and its effects, including the expenditure of resources by interest groups in either upholding the economic interventions or combating them and the expenditure of resources by the plundered classes in an attempt to get into power. Bastiat also warned that the plundered classes might undertake a revolution to overthrow a regime that overly restricted and expropriated them.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. November - December 2008. All lecture material is used with explicit permission.

Section 16

Rational Ignorance

Question 143. What is the economic criterion for a person deciding to engage in any action?

Answer 143. A person decides to engage in any action if the perceived marginal benefit of doing so is at least the same as the perceived marginal cost of doing so ($MB \geq MC$).

Question 144. If all a given individual cares about (in the realm of voting and politics) is affecting the outcome of an election, what two considerations go into determining the marginal benefit of voting for the individual?

Answer 144. The marginal benefit of voting can be determined by computing the value of the desired outcome to the individual (call it V) and the probability that his vote will affect the outcome (call it p). Then the marginal benefit of voting for that individual is $p \cdot V$. V in this case is the difference between the voter's expected utility if his option of choice wins and the voter's expected utility if his option of choice does not win.

Question 145. In a typical election in which many voters participate and there are single-peaked preferences, how are the two considerations that go into determining the marginal benefit of voting for individuals who only care about the outcome affected?

Answer 145. Under single-peaked preferences, candidates tend to drift toward the median of the preference distribution (Black's Theorem and the Hotelling-Downs model), so the difference between the expected outcomes if different candidates are elected can be expected to be small. Therefore, V is small. If there are many people voting, then the probability that a single voter will affect the outcome is tiny. Therefore, p is small. Thus, $p \cdot V$ is small and, correspondingly, the marginal benefit of voting is extremely small for an individual who only cares about determining the election's outcome.

Question 146. What factors affect the probability of an individual's vote determining the outcome of an election?

Answer 146. The factors that affect the probability of an individual's vote determining the outcome of an election are as follows:

1. The number of votes cast. As this number increases, p decreases.
2. The distribution of preferences. If one's own preferences are in the minority, one is less likely to affect the outcome, since others will cast contrary votes.

3. The number of alternatives. The more alternatives exist, the lower the probability that any given alternative wins and the fewer votes is required for a plurality. Thus, as the number of alternatives increases, p increases.

4. The differences among the alternatives. If the alternatives are farther apart in the outcomes they entail, more people will be motivated to vote. A large voter turnout can typically be observed in elections where there is a wide range of candidates.

Question 147. Under the Hotelling-Downs model, where the probability of affecting the outcome through one's vote is extremely small, why might many people vote anyway?

Answer 147. There are several possibilities:

1. People might simply enjoy the act of voting, irrespective of its consequences.
2. People might perceive themselves as having a civic duty to vote and would feel bad if they did not.
3. Some people want to vote in order to argue later that it is legitimate for them to criticize the election's outcome, since they participated in the electoral process and did what they could to prevent the undesirable result.

Question 148. What is the implication of voting purely for entertainment purposes with regard to the amount of information voters amass about the options in an election?

Answer 148. If people vote solely for entertainment purposes, then they incur little to no marginal cost for their votes being ill-informed. They therefore see no reason to become informed about the options. This is the root of rational ignorance. Whenever voters learn about the political system, they do so purely for fun and often do not pursue the subject with the level of thoroughness that is needed to make an informed decision.

Question 149. If rationally ignorant voters are interested about certain political issues, where do they typically get their information?

Answer 149. Such voters typically get their information from special interest groups devoted to advocating some side of a given issue. Such groups reduce the marginal costs of voters learning about particular issues, but may also bias voters' opinions about those issues. The special interest groups also bring blocs of voters to an election and so actually have some power to affect the election's outcome. For that reason, political candidates are much more likely to communicate with interest groups than with ordinary voters.

Question 150. How is voting for candidates and policies different from shopping for a product on a free market?

Answer 150. When one shops for a product on the free market, one gets exactly what one pays for and pays the full cost of the product. In elections, neither is the case. The candidate or policy

one votes for might not win, and even if he/she/it wins, the outcome might be only partially desirable to the voter or not desirable at all (if the candidate misled the voters, for instance). It is often quite likely that voters will need to pick among candidates who each

have some undesirable attributes and that voters will need to content themselves with picking the fewest or least undesirable attributes rather than getting exactly what they wanted. The more issues exist that are affected by voting, the lower the probability that voters will get exactly what they wanted when they cast their votes. This implies the desirability of subjecting as few issues as possible to voting processes and leaving as many issues as possible in the private realm.

Question 151. Why are voter turnout rates important for candidates in elections to know?

Answer 151. Not every demographic or special interest group turns out voters at the same rate. Even though the distribution of preferences among the general population might be a certain way, the distribution of preferences among active voters might be quite different. In order to win elections, candidates must have some idea of what the distribution of preferences among active voters is. For instance, in the United States, older citizens tend to turn out to vote in far greater numbers than younger citizens. Thus, Social Security and other subsidies to retirees are virtually politically impregnable today.

Question 152. Summarize the results of rational ignorance with regard to the role of special interest groups in elections.

Answer 152. Special interest groups

- (i) lower the marginal costs of becoming informed about an issue;
- (ii) bring blocs of rationally ignorant voters to vote a certain way;
- (iii) tend to become narrowly focused on extremely specific issues - for instance, the right to life, support or opposition of teachers' unions, or sugar subsidies.

Question 153. How does the existence of rational ignorance affect the role of the media in elections?

Answer 153. The media have a powerful influence on rationally ignorant voters, as they are able to cheaply spread information and therefore lower the marginal costs of obtaining that particular information (which is often incomplete and simplistic). If media personnel as a group have a political bias or a bias on what issues are important, this will affect the views of the general public. In the last several years, this has changed due to the Internet and increased competition among media providers. Now it is easier for individuals seeking to become informed to obtain detailed, accurate information on a variety of issues and to become exposed to a wide variety of perspectives. Thus, the "mainstream" media no longer have an oligopoly on information, although they still reduce the transaction costs of getting certain kinds of information.

Question 154. How does the existence of rational ignorance affect the role of advertising in elections?

Answer 154. Because many voters are rationally ignorant and candidates only have a limited time to advertise, they mostly do not go into specifics of policy proposals and serious issue analysis. Rather, they make many vague, generic statements, engage in character assassination of their opponents, and attempt to accentuate the personal aspects of their lives.

Question 155. There are two candidates, who are legally allowed to give money to voters. Decimus the Dictator decides to give \$100 to each person who votes for him. Francis the Freedom Fighter can only give \$50 to each person who votes for him. If all voters are rationally ignorant, who can be expected to win the election?

Answer 155. Decimus the Dictator can be expected to win, because rationally ignorant voters - who know little to nothing about the issues but can perceive immediate gains - will choose the candidate who hands out the most money. For them, it is as if they were choosing between personally receiving \$100 and \$50, without any other considerations being relevant, since the probability of anyone who prefers Francis the Freedom Fighter affecting the election is virtually zero.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. November - December 2008.

All lecture material is used with explicit permission.

Section 17

Bureaucracy

Question 156. With which of the three branches of government is bureaucracy typically associated?

Answer 156. Bureaucracy is typically associated with the executive branch.

Question 157. What are bureaucracies? (Describe what they do and what distinguishes them from corporations and other private businesses.)

Answer 157. Bureaucracies are organizations that produce goods and services that nobody pays for directly and that are not sold on the market. Government bureaucracies are typically funded from taxes and not from the direct sale of those bureaucracies' products. Private bureaucracies are typically funded from revenues that actually profitable activities generate.

Question 158. How did Ludwig von Mises contrast bureaucracies in the private sector and government bureaucracies?

Answer 158. According to Mises, bureaucracies in the private sector function differently from government bureaucracies, because in the private sector, there are objective ways to figure out whether the bureaucrats are doing the best they can and are using resources as wisely as possible - as a well-functioning private bureaucracy contributes to the overall success of the firm. Government bureaucracies, however, are not subject to any kind of market test and thus do not have any signals that tell them what an optimal allocation of resources might be.

Question 159. In his analysis of bureaucracy, what did William Niskanen assume about the goals of the heads of bureaucratic agencies?

Answer 159. Niskanen assumed that the heads of bureaucratic agencies try to maximize the size of their agencies. The budget of the bureaucratic agency was assumed by Niskanen to be a proxy for its size.

Question 160. What difficulties exist with rewarding the heads of bureaucratic agencies for trying to reduce, rather than increase, the size of their agencies?

Answer 160. When voters are rationally ignorant, they see little reason to reduce the size of agencies about which they know virtually nothing. Thus, rationally ignorant voters are unlikely to vote for politicians that give bureaucrats incentives to keep agency size down. On the contrary, many special interest groups are interested in enlarging certain governmental organizations so as to receive special favors from those agencies. These special interest groups tend to wield much more clout in elections than ordinary voters.

Question 161. What are some irresolvable problems with regard to compensation for government bureaucrats?

Answer 161. Since government bureaucracies do not face a profit-or-loss test, compensation for government bureaucrats cannot be related to any kind of market profit. Substitute forms of incentives tend not to work nearly as well. Soviet central planners tried rewarding bureaucrats based on the number of units of output produced or the mass of output produced; each of these incentive schemes distorted the kind and quality of products that were made.

Question 162. What perverse incentive exists for non-profit entities that end up actually making money?

Answer 162. Because these entities are supposed to operate on a non-profit basis, they have an incentive to turn any genuine profits into compensation for their officers so as to seem to still operate on a non-profit basis. In other instances, the profit of these entities can be turned into another kind of cost. (This happens, for instance, if the non-profit organization purchases luxury furniture or fine art for its offices.)

Question 163. Suppose the federal government decides to subsidize college students. Describe some perverse consequences that might result from this.

Answer 163. The subsidy to college students shifts out the demand curve for college educations. Some colleges, faced with increased demand but a similar amount of supply, simply raise the price of a college education, and so tuition increases and the effect of the subsidy is nullified. In other cases, private or state-level sources of funding to colleges dwindle as the providers of these funds come to think that the government is already fulfilling that role and that their own resources could be better directed elsewhere.

Question 164. In Niskanen's model of bureaucracy, what kind of relationship exists between the bureaucratic agencies and the legislature? What is the implication of this relationship?

Answer 164. Each bureaucratic agency is a monopoly provider of a certain service which it sells to the legislature in exchange for tax revenues. There exists asymmetric information; the bureaucrats know more than the legislators about what it genuinely costs to provide the services in question. The bureaucrats also have a good idea of what the legislators' demand curve for the services is. It is thus possible for the bureaucracy to appropriate some of what would have been the legislature's consumer surplus had the legislature's optimum amount of goods been produced. The legislature does desire a large number of services, but at a lower price, so that tax revenues are not spent excessively so as to displease the legislators' constituents. The bureaucracy promises to provide more services than would have been optimal for the legislature. Provided that the legislature still gets some consumer surplus from the proposed higher quantity of bureaucratic services, the legislators should still agree to the service package. Thus, the bureaucrats are able to push the size of the overall government budget past the Pareto-optimal point where the price of government services is equal to those services' marginal cost ($P = MC$).

Question 165. What bias do bureaucracies have with regard to public goods?

Answer 165. Bureaucracies exhibit a bias toward overproduction of public goods.

Question 166. What issues did Richard Wagner have with Niskanen's model of bureaucracy?

Answer 166. Wagner thought that it would be relatively easy for legislators to find out the genuine costs of particular government services by contracting those services out to private agencies that are subject to the incentives of the market. If this is a genuine possibility, why do legislators not take advantage of it and permit themselves to be systematically fooled by the bureaucrats? Wagner believed that the legislators, like the bureaucrats, also wanted to maximize the size of the government's budget. Legislators, according to Wagner, prefer to be able to give out lucrative government jobs and offices, of which there are more if the government is larger and has a more extensive role. Moreover, the people who chair committees pertaining to particular areas of government tend to be people who are more interested in expanding the government's role in those areas.

Question 167. Why does a greater incentive to expand the government's budget exist at the federal level as opposed to the state level?

Answer 167. Virtually all states in the U. S. are constitutionally required to run balanced budgets, whereas the federal government is not. Thus, it is possible for federal politicians to chronically spend more than the federal government takes in. Therefore, it is much more difficult to cut the size of the federal government, as the balanced-budget constraint on size does not exist.

Question 168. What aspects of service provision do government bureaus tend to focus on?

Answer 168. Government bureaus tend to focus on easily measurable aspects of service provision, such as how many people are served or how much money is spent, because it is much easier to observe these aspects than the genuine output or quality of service, which is difficult to measure. In the free market, quality is rewarded, because satisfied consumers will continue to patronize a business while unsatisfied customers will go elsewhere. No such incentive exists for government bureaucracies.

Question 169. Name three other economists who wrote about the workings of bureaucracies.

Answer 169.

1. Ludwig von Mises: "Bureaucracy" (1944)
2. Gordon Tullock: "The Politics of Bureaucracy" (1965)
3. Anthony Downs: "Inside Bureaucracy" (1967)

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. November - December 2008. All lecture material is used with explicit permission.

Section 18

The Tiebout Model of Local Government

Question 170. In general, what is the optimal quantity of public goods to be provided?

Answer 170. The optimal quantity of public goods is the one at which the sum of the marginal benefits to all individuals from an additional unit of the public good is equal to the marginal cost of producing that good ($\Sigma MB = MC$).

Question 171. In "The Pure Theory of Local Government Expenditures" (1956), what does Charles Tiebout assume about local governments?

Answer 171. Local governments provide services (public goods) to all people under their jurisdiction and charge a price for these services in the form of taxes.

Question 172. What option do individuals have in the Tiebout model if they are displeased with their local government and the kind/amount of public goods it provides as well as the level of taxation?

Answer 172. Individuals have the option to "vote with their feet," i.e., to commit external exit, i.e., to move to another jurisdiction if they believe that the costs of moving are lower than the costs of staying and either enduring or fixing the local government. This means that city or village governments that set taxes too high and produce public goods inefficiently risk the exit of many of their constituents. On the other hand, efficient governments attract constituents. The Tiebout model assumes that individuals can live in a variety of places while continuing to work at the same place. This assumption reduces the costs and uncertainties associated with moving.

Question 173. What are two implications of the Tiebout model?

Answer 173. 1. Cities that are inefficient at producing public goods dwindle in size; cities that are efficient at producing public goods increase in size.

2. People sort themselves into communities based on their demand for public goods and services. This results in more homogeneous populations in each community, for which it is easier for the local government to provide the optimal amount of public goods.

Question 174. Give a real-world example of the Tiebout model working.

Answer 174. The city of Detroit used to have approximately 2 million inhabitants in the 1950s. Now it has fewer than 800,000. High taxes and inefficient provision of public goods encouraged many people to move elsewhere.

Question 175. Why is the movement to establish regional and metropolitan governments and to consolidate existing local governments and school districts contrary to the insights contained in the Tiebout model?

Answer 175. Consolidating governments implies leaving fewer choices for individuals about which government to live under and raising the costs of moving from one jurisdiction to another - since it is costlier to move farther away, especially if one wishes to work at one's present job. If the scope of existing city governments expanded, then moving away from the city would not reduce one's tax burden to that city government. According to the Tiebout model, more local governments and more school districts will result in greater efficiency of public (and non-public) goods provision.

Question 176. How can economies of scale among schools be taken advantage of without consolidating many school districts into one?

Answer 176. It is possible to have contracting among schools for the joint provision of services where economies of scale exist without having the schools consolidate into a single district. Several distinct school districts, for instance, could jointly order supplies so as to receive a lower per-unit price. This can be done without each school district losing its autonomy.

Question 177. There has existed a trend toward consolidation of school districts throughout the United States. However, what is a development that goes against this trend?

Answer 177. The institution of charter schools goes against the trend of school district consolidation. Charter schools are single-school districts without any geographic boundaries. They cannot issue taxes and must fund all of their expenditures via state grants. The existence of charter schools introduces a new element of competition among school districts.

Question 178. Wallace Oates tested the Tiebout model empirically. What did he find?

Answer 178. Oates found evidence to confirm the Tiebout model. As the taxes and services provided by city governments changed, people either left or came to the cities in question, depending on whether the changes were preferable to residents or not.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. November - December 2008.

All lecture material is used with explicit permission.

Section 19

The Theory of Clubs

Question 179. What kinds of goods did James Buchanan examine in his analysis of clubs? Give some examples of such goods.

Answer 179. Buchanan examined congestible goods, i.e., quasi-public goods or goods that have public-good characteristics up to a point. For instance, in the middle of the night, a highway will not become less convenient to use if one additional car enters it. However, during rush hour, every additional car crowds the highway more and increases waiting time for everyone. Classroom education is another example of a congestible good. Up to a point, the addition of another student will not hinder the quality of the lecture or the amount of personal attention the teacher is able to devote to each student. Past a certain number of students, however, the teacher must reduce the amount of attention devoted to each individual student in order to confer a rudimentary level of education upon everyone.

Question 180. What are two ways to provide congestible goods using clubs (from the club owner's perspective)?

Answer 180. The club owner can either

- (i) Pick the optimal size of the club given some fixed amount of the good he wishes to produce or
- (ii) Pick the amount of the good to be produced given some fixed size of the club facilities.

Question 181. If there is a fixed size of the club facilities, what happens to total benefit per person and the total cost per person as the number of people in the club increases?

Answer 181. As the number of people in the club increases, the total benefit per person decreases at an increasing rate due to increased crowding of the congestible good. As the number of people in the club increases, the total cost per person decreases at a decreasing rate, since each of n people bears $1/n$ of the cost.

Question 182. What assumptions does Buchanan's model of clubs make regarding the division added costs and benefits of additional entry into the club?

Answer 182. Buchanan's model assumes that the cost reduction of additional entry is split equally among the club members and that the added loss in benefit resulting from additional entry is also evenly shared. That is, no one needs to pay a disproportionately large fraction of the costs, and different people do not have different levels of sensitivity to crowding.

Question 183. Until what point should a club under Buchanan's model admit more members?

Answer 183. A club under Buchanan's model should admit more members so as to maximize the difference between total benefits per person and total costs per person due to the club. That is, the club should admit more members so long as the reduction in costs per person is greater than the reduction in benefits per person due to increased costs of congestion.

Question 184. If some people impose more crowding than others, what solution can the club owner devise in order to allow those people entry into the club?

Answer 184. If some people crowd more than others, they can be charged more to compensate for the reduction of the benefits they bring about. If club owners are allowed to price-discriminate, they will not need to categorically exclude anyone from joining.

Question 185. If it is possible to vary the size of club facilities, up to what point should these facilities be increased?

Answer 185. The club facilities should be increased until the added marginal benefit per person is equal to the additional total cost of making the facility bigger.

Question 186. Explain how local governments can be seen as clubs.

Answer 186. Local governments often produce congestible goods. The taxes they charge can be seen as membership fees for the club. This holds particularly well if there are numerous local governments that compete with one another. In that case, the taxes levied by local governments do not have the same coercive nature (or at least the same degree of coerciveness) as taxes levied by a monopoly entity which one cannot escape. Sometimes local governments even try to limit the number of people in their jurisdiction in an (alleged) attempt to maximize the difference between benefits per person and costs per person. An example of this is certain town governments in California that deliberately attempt to restrict the town population by only issuing a limited number of permits for water hookups.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. November - December 2008.

All lecture material is used with explicit permission.

Section 20

Democracies and Deficits

Question 187. In "Democracy and Deficit: The Legacy of Lord Keynes," Richard Wagner and James Buchanan argued that John Maynard Keynes had a significant impact on public perception of desirable fiscal policy. What was that impact?

Answer 187. Prior to Keynes, a general public consensus existed that balanced government budgets were important. This was an unwritten constitutional norm. Adam Smith himself wrote that private virtue (i.e., frugality and freedom from net debt) could scarce be folly for a government institution. Keynes, however, argued that deficit spending was desirable in a recession or depression and recommended in such cases that the government reduce taxes and increase spending so as to "stimulate" the economy.

After Keynes, many ordinary people and politicians began to think of deficit spending as unobjectionable, and so federal government debt increased continually even during peacetime.

Question 188. What important issue regarding deficits did Keynes never address?

Answer 188. Keynes never addressed what would happen if the government ran a deficit over the long-term, that is, if $G - T$, the difference between government spending and taxes, were positive for many decades.

Question 189. How do government deficits violate Knut Wicksell's prescriptions for how a legislature should work.

Answer 189. Wicksell wanted the legislature to vote on packages of taxes and expenditures, without decoupling the two. In this situation, taxes would be chosen so as to match government spending and/or spending would be chosen so as to correspond to a particular tolerable level of taxation. With deficit spending, taxes and spending are necessarily unequal, so the packaging of taxes and spending in single measures, like Wicksell recommended, is impossible. Because of deficit spending, the services provided by government are necessarily disconnected from methods of gathering the money to pay for those services.

Question 190. What other disconnect exists when the government can chronically run deficits?

Answer 190. There is a disconnect between who benefits from spending the money being borrowed and who pays back the debt. The taxpayers who benefit in the present from additional government spending may not be the ones who will pay off the debt in the future. (Often, the future taxpayers have not been born yet.) This creates an incentive for politicians in the present to borrow and to receive support for the borrowing from taxpayers. No one would vote to give away thousands of dollars of his own money to bail out banks or automobile companies, for instance, but if there is no clear perception that the money must come out of present taxpayers'

individual pockets, the government will enact the bailouts anyway and fund them via additional issues of debt.

Question 191. Once Keynes's prescription of occasional deficit spending is accepted, does the government always act countercyclically, as Keynes recommended?

Answer 191. No. There is a systematic tendency for taxes to decline (to a point) and government spending to increase as a result of competition among politicians tending to reduce taxes and raise spending. Thus, governments will tend to act "countercyclically" during a recession/depression, but not during a boom, when Keynes would recommend increasing taxes and decreasing spending.

Question 192. The Phillips Curve model posits a tradeoff between which two factors? Which side of the tradeoff is government under a democracy and influenced by Keynesian principles most likely to embrace?

Answer 192. The Phillips Curve model posits a tradeoff between inflation and unemployment. Government under a democracy and influenced by Keynesian principles is most likely to embrace the inflation side of the tradeoff.

Question 193. According to Milton Friedman, what is the long-run shape of the Phillips curve? What is the implication of Friedman's insights with regard to unemployment in the long run?

Answer 193. According to Friedman, the long-run Phillips Curve is vertical. In the long run, policies that assume the existence of a stable tradeoff between inflation and unemployment have no effect on unemployment while systematically increasing inflation. Unemployment in the long run will remain at its natural rate, which is determined by the labor market equilibrium. In the short term, due to inflation, unemployment may decrease below the natural rate, but this only happens because people end up working for lower real wages without knowing it. Once expectations adjust to the inflation, prices for labor will increase, and the unemployment rate will return to the natural rate. Thus, the form of the Phillips Curve where any real tradeoff between inflation and unemployment exists is not a stable form.

Question 194. According to Buchanan and Wagner, as the federal government continues to issue increasing amounts of debt over the long term, what happens to interest rates? Is this a sustainable situation? What is its ultimate outcome?

Answer 194. Because the government continues to put more bonds out into the market, the price of each bond falls and interest rates rise correspondingly. This is because government borrowing artificially stimulates the demand for loanable funds to increase more than the supply of loanable funds. The increase in interest rates is unsustainable, because individual consumers and businesses begin to face a shortage of opportunities to borrow and complain to politicians. The Federal Reserve then begins to buy some of the bonds so as to reduce their supply. As a result of buying the bonds, the Federal Reserve injects additional money into the economy, which brings about inflation.

Question 195. Who recently revived the idea that balanced budgets are desirable in the United States? What happened to this revival?

Answer 195. Ross Perot ran for President in 1992 and spent a lot of money campaigning for balanced budgets. He changed public opinion sufficiently that the U. S. Federal Government actually ran fiscal surpluses in the late 1990s. However, after September 11, 2001, many politicians began once again to see deficit spending as justified on account of an alleged state of "war" and "national emergency."

Question 196. According to Buchanan and Wagner, which candidates in congressional races tend to win the competition for office?

Answer 196. Candidates that offer to increase government spending (and thus government provision of various goods) and reduce taxes tend to win the competition for office.

Question 197. According to Buchanan and Wagner, what difference in coercion exists with regard to deficit spending?

Answer 197. The people who lend money to the government can do so of their own free will by purchasing government bonds. However, the people who pay back this money are forced to do so through taxation.

Question 198. Why do democracies guided by Keynesian ideas continue to result in sustained low-grade inflation? That is, why do the people not put a stop to this trend?

Answer 198. Rationally ignorant voters do not see the inflation as ultimately caused by high levels of government spending; they lack the knowledge and education to follow Buchanan's and Wagner's line of reasoning as to why deficit spending leads to inflation in the long term.

Question 199. What is the PAYGO rule with regard to government spending?

Answer 199. The PAYGO rule ([see Wikipedia article here](#)) states that if spending is increased on one government program, it must be correspondingly reduced on other government programs in order for the government to remain within its budget.

Question 200. What solution did Buchanan and Wagner propose to the problem of deficit spending? What are some obstacles to implementing this remedy?

Answer 200. Buchanan and Wagner proposed a constitutional amendment requiring the federal government to run balanced budgets. Obstacles to implementing this remedy including the following:

(i) Rational ignorance among voters leads some people to want to receive more government services now, especially if they do not believe that they will have to pay higher taxes for them in the future and if they do not realize that inflation is a future consequence of current deficit spending;

(ii) There exist barriers to entry into the political process, and candidates who would support a balanced-budget amendment will find it difficult to obtain office, because incumbents and major parties have skewed the rules of the political process so as to keep out competitors with different ideas. For instance, the two major political parties in the United States make the rules regarding who can get on the ballot in elections and often impose requirements that are prohibitively difficult to meet.

Question 201. What disconnect exists between public approval ratings for Congress and the reelection rates of congressmen?

Answer 201. Public approval ratings for Congress (which are sometimes below 10%) are significantly lower than the reelection rates of congressmen (which are most often above 90%). This implies that there are few systematic tendencies in contemporary American democracy for getting rid of politicians who perform poorly.

Source

Wolfram, Gary. Lectures on Public Choice Economics. Hillsdale College. Hillsdale, MI. November - December 2008.

All lecture material is used with explicit permission.

About Mr. Stolyarov

Gennady Stolyarov II (G. Stolyarov II) is an actuary, science-fiction novelist, independent philosophical essayist, poet, amateur mathematician, composer, and Editor-in-Chief of [The Rational Argumentator](#), a magazine championing the principles of reason, rights, and progress.

In December 2013, Mr. Stolyarov published [Death is Wrong](#), an ambitious children's book on life extension illustrated by his wife Wendy. *Death is Wrong* can be found on Amazon in [paperback](#) and [Kindle](#) formats.

Mr. Stolyarov has contributed articles to the [Institute for Ethics and Emerging Technologies \(IEET\)](#), [The Wave Chronicle](#), [Le Quebecois Libre](#), [Brighter Brains Institute](#), [Immortal Life](#), [Enter Stage Right](#), [Rebirth of Reason](#), [The Liberal Institute](#), and the [Ludwig von Mises Institute](#). Mr. Stolyarov also published his articles on Associated Content (subsequently the Yahoo! Contributor Network) from 2007 until its closure in 2014, in an effort to assist the spread of rational ideas. He held the highest Clout Level (10) possible on the Yahoo! Contributor Network and was one of its Page View Millionaires, with over 3.1 million views.

Mr. Stolyarov holds the professional insurance designations of Associate of the Society of Actuaries (ASA), Associate of the Casualty Actuarial Society (ACAS), Member of the American Academy of Actuaries (MAAA), Chartered Property Casualty Underwriter (CPCU), Associate in Reinsurance (ARe), Associate in Regulation and Compliance (ARC), Associate in Personal Insurance (API), Associate in Insurance Services (AIS), Accredited Insurance Examiner (AIE), and Associate in Insurance Accounting and Finance (AIAF).

Mr. Stolyarov has written a science fiction novel, [Eden against the Colossus](#), a philosophical treatise, [A Rational Cosmology](#), a play, [Implied Consent](#), and a free self-help treatise, [The Best Self-Help is Free](#). You can watch his [YouTube Videos](#). Mr. Stolyarov can be contacted at gennadystolyarovii@yahoo.com.