I.   Some Weaknesses of the Median Voter Model

A. To this point, we have tried to explain the logic and strengths of the median voter model.

   i.   This week, we will examine some of its weaknesses.

   ii.   The first several weaknesses that we focus on are really refinements or extensions of the median voter model to settings where voting, itself, and information about policies or candidates is costly.

II.   Should Anyone Vote?

A. Most of the above models have assumed that all eligible people will cast votes in elections. But we have not really examined whether or not this makes sense for the typical voter. *Should anyone vote*?

   i.   This largely depends upon the reasons why a voter casts votes.

   ii.   If voters cast votes simply in order to affect outcomes, the "rational" median voter model suggests that very few people will vote.

      a. Let C be the opportunity cost of voting. Let B be the benefit that a particular voter gets from having his program adopted or his preferred candidate in office.

      b. Let P be the probability that this particular voter will influence the outcome.

      c. *The expected net benefits of voting is just* $N = PB - C$

      d. *Note that the probability that a particular voter is decisive is very small!* (It is essentially the probability that the result would have been a tie without that person's vote.)

      e. Consider some numbers. Let C be fairly small, say $10, and let B be fairly large, say $20,000. The probability of a tie in a large election is pretty small, say 1/10,000. So the expected net benefit of voting in this cases is $N = (20,000)/(10,000) - 10 = -\$8$. This rational voter should not vote!

   iii. (Many in political science are surprised that so *few* people vote. Public choice theorists are surprised that *so many* people vote!)

   iv.   Evidently, voters cast votes for other reasons as well as to affect the outcome.

      a. They may vote because voting is regarded as a civic duty.

      b. They may also vote because they like expressing themselves (expressive voting) or because they like talking about who they voted for with their friends etc.

      c. It is still possible that that the various costs and benefits discussed above would affect how voters vote, and the may also somewhat affect turnout (the number of people who actually vote).

   v.   This voting problem is evidently reduced a bit in PR systems relative to plurality systems, because a single vote is more likely to matter (e.g. more likely to affect the number of seats held by one's preferred party).

      a. We do observe higher turnout in PR elections than in plurality elections.

      b. On the other hand, a single vote for minority parties is not likley to affect the policy choice of the government.

III. Rational Ignorance

A. Another problem with the median voter model developed to this point is that it has *ignored information costs* faced by all voters. We have implicitly assumed that voters know a good deal about public programs and use that information to decide how to vote.

   i.   If information is costly to gather and process, voter's will tend to be *rationally ignorant* of many details of public policy.

      a. That is to say, they will only gather information up to the point where the expected benefit of the information equals its marginal cost.

      b. [Diagram from lecture.]

   ii.   There are two notions of "rational ignorance."

      a. One assumes that rationally ignorant persons simply have relatively small samples but the data points are more or less complete.

b. In such cases, voters can make unbiased forecasts about the consequences of policy, and the median estimate will be very accurate (Congleton 2007).

c. Another concept of rational ignorance argues that voters do not collect data on all relevant dimensions of policies and so have biased estimates of the consequences of policy.

d. In this case, electoral results may generate many mistakes and the median voter may not get what actually is best for her (Congleton 2007).

iii. Rational ignorance of the "too few dimensions" type implies that voter have biased expectations. They remain completely unaware or uninformed about dimensions of policy that are actually important.

B. Fiscal Illusion occurs when voters systematically under or over estimate the benefits and/or costs of public policies.

i. Since voters have weak incentives to be well informed on policy issues, there is a chance that because of Rational Ignorance they will mis-estimate the costs and benefits of government programs.

a. As noted above, it is not the fact that voters economize on information that causes problems.

b. It is the fact that they do not collect "complete" information about all relevant details.

c. If voters all have just a bit of complete information and make good use of it, Condorcet's jury implies that majority rule tends to aggregate information in the sense that the median estimate is very accurate.

d. However, if rational ignorance generates bias, then elections can produce systematic mistakes.

ii. Both Anthony Downs and Gordon Tullock argued that **voters tend to have systematically biased expectation** about the costs and benefits of government programs (although they reach somewhat different conclusions).

a. Downs argues that the benefits of government programs are often fairly indirect and diffuse, so that people tend to under estimate the benefits of many programs.

b. Tullock argues that tax payments are similarly often indirect and difficult to assess (remember tax burden is not the same thing as direct tax payments). It is difficult for most voters to assess their true tax burden, and most times indirect taxation will cause voters to under estimate the cost of government services.

iii. The effects of fiscal illusion on voting can be represented with a diagram.

iv. Fiscal illusion causes voters to vote for overly large or overly small programs. Voters, thus, make mistakes and may vote against their own true interest.

v. In the end, the extent of this bias probably varies by program, insofar as the benefits and costs of particular programs are especially easy or hard to measure.

C. As noted above, rational ignorance by itself does not necessarily imply that voters have fiscal illusion.

i. Voters could base their expectations (estimates) of the consequences of government policies on unbiased samples of information and so on average predict the right thing.

ii. In the "too few data points" case, "Condorcet's Jury Theorem" suggests that even if voters each make decisions based on very little data, the electoral choice can be very "well-informed."

iii. This follows because the **median estimate is extremely accurate** even if it is based on limited (but complete) information.

D. Rational ignorance of the "too few dimensions" variety may generate systematic electoral mistakes and also opens the door to interest groups and the bureaucracy who may manipulate voters by appropriately subsidizing various kinds of information to induce the "right" biased expectations.

i. Rational ignorance allows representatives and bureaucrats to "cheat" and escape detection or punishment.

a. This problem of monitoring what government really does may be substantial.

b. Because of this, rational ignorance indirectly encourages malfeasance (what many call agency costs) on the part of elected and unelected government officials which would be unlikely to be detected by rationally ignorant voters.

c. These "agents" of the electorate (median voter) will have more freedom to act than pure election models seem to imply. (That is they can do a few things that do not advance the median voter's interest without losing the next election or being fired.)

ii. [Many of the effects of special interest group/rent-seeking in polities with open and competitive elections require informational problems of these kinds.]

E. Fortunately, the rational ignorance problem is reduced by both the Condorcet Jury Theorem and the fact that voters have many private reasons to be well informed about public policy.

i. For example, voters may collect information about public programs not only so that they can vote for the right candidates, but also because electoral outcomes affec policies that affect their own private plans.

a. A new road or train station may affect decisions to purchase a new car.

b. A person's stock portfolio might be adjusted if a new airport or building program is to be subsidized, etc.

ii. People also enjoy talking about politics with their friends, which provides social support for being well informed (or at least as well informed as their friends).

IV. The Voting Paradox-Cyclic : A Median Voter Does Not Always Exist

A. There is one nearly devastating *theoretical* weakness to the median voter model, namely "the median voter" does not always exist in even an analytical sense.

i. Duncan Black is the modern (re) discoverer of the idea of electoral cycles in one dimensioned policy spaces.

ii. He demonstrated that in some, fairly unlikely, one dimensional arrays of voter preferences, the majority rule preference ordering may be non-transitive and no median voter would exist.

iii. Kenneth Arrow generalized this point in his well known Impossibility Theorem.

B. A Stable Majoritarian Equilibrium

i. **Consider** the following matrix of preferences (utilities) over issues:

Voter Preferences

Issues \ Voters	Al	Bernd	Chris
I	1	3	2
II	2	2	1
III	3	1	3

ii. Note that in this case,

a. Policy I is majority preferred to policy II, (II gets Bernd and Chris's votes)

b. Policy III is majority preferred to policy II, (III gets Al and Chris's votes)

c. Policy III is also majority preferred to policy I. (III gets Al and Chris's votes).

iii. Policy III is the Condorcet winner, it can defeat any other policy in a pairwise election.

iv. In this case, as in the median voter case, there are no cycles, and political outcomes will tend to gravitate toward the policy III.

v. As Black pointed out, *Single peaked* preferences are sufficient to guarantee the existence of a median voter in one-dimensional issue spaces, but not in two dimensional issue spaces.

a. It bears noting that spatial voters always have single peaked preferences. (Why?)

b. In such cases, a median voter always exists and the median voter's ideal point is the Condorcet winner. It can beat any other alternative in a pairwise vote.

C. An Stable Majoritarian Equilibrium: Majority Cycles.

i. Now consider a slightly different matrix of voter preferences.

Voter Preferences

Issues\Voters	Al	Bernd	Chris
I	1	3	2
II	3	2	1
III	2	1	3

ii. In this case,

a. Policy I is majority preferred to policy II (it gets Bernd and Chris's votes)

b. Policy II is majority preferred to policy III (it gets Al and Bernd'svotes)

c. But, policy III is majority preferred to policy I (it gets Al and Chris's votes)

iii. In this case, the preferences are not all single peaked, and there is no Condorcet winner.

a. Every policy can gain majority support against some other policy!

iv. Moreover, there **can be a cycle** among "winners" that never ends.

a. That is to say, majority rule may fail to make a decision!

b. It can also be said to be irrational in this case, insofar as "majority preferences" are not transitive-- internally consistant.

D. In 2-dimensional cases, however, even single peaked preferences will not guarentee a stable majoritarian equilibrium.

E. A median voter exists ONLY in cases in which voter preferences over policies are very symmetrically arrayed (see Plott, 1969).

i. For example, median voter outcomes can occur in two or more dimensions (with spatial voting) if:

a. All voter ideal points all lie along a single straight line,

b. or if voter ideal points are symmetrically distributed around a single voter in the middle of the distribution of preferences, as with "5" on most typical dice.

ii. In most other plausible looking 2-D or higher policy space diagrams, cycles occur even if voter preferences are single peaked!

a. Consider for example the case in which voter preferences form a triangle.

b. In a two dimensional diagram over "guns and butter," a voter's ideal platform is a specific combination of "guns and butter" which can be represented as a single point.

c. The indifference curves of spatial voters are concentric circles.

[Student puzzle: explain why?]

d. Note that in the three person case in which voter ideal points are at the corners of a triangle, every policy has a non-empty win set, even when all voters have single peaked preferences.

iii. **Def: The win set** of policy "z" is the set of policies which could beat "z" in a majority rule election or referendum.

In a three person diagram, these are the policies that can make two of the three person better off than at "z."

F. "Dividing the Pie" games (redistributive politics) always produce preferences without an equilibrium if voters are mostly self interested.

i. Note that for three voters (a, b, c) divisions of 3 units of output or prizes generates a cycle.

ii. (1.5, 1.5, 0) beats (1, 1, 1) because both a and b are better off.

iii. (2.5, 0 , 0.5) beats (1.5, 1.5, 0) because both a and c are better off.

    iv. (1, 1, 1) beats (2.5, 0, 0.5) because both b and c are better off,

    v. etc.

G. The possibility of majoritarian cycles is widely regarded as a problem, because it implies that there may be no majority decision, and/or if there is one, the result is arbitrary.

    i. James Buchanan, however, has argued that "cycling" can, perhaps surprisingly, be a good property of majority rule systems insofar as it promotes equity.

    ii. With cycling, everyone eventually gets to be a member of the majority coalition at some point and so will not be perpetually exploited.

    iii. Buchanan and Congleton (1998) argue that rules such as a generality rule may be necessary to escape from such cycles and to make majority rule a feasible way of selecting public policies.

V. **Fortunately for those who like simple models of the world, there is a large body of empirical evidence that suggests that public policies reflect median voter interests and change when median voter interests and circumstances change.**

    i. For example, the median voter model has a good empirical track record in Public Finance as a model of government program size across states and through time.

    ii. Although the theory is said to require "unlikely" assumptions about the distribution of voter preference, estimated median demand functions for public service can account for a good deal of the observed variation in actual public services.

    iii. It is also possible that institutions or other norms limit the range of alternatives to ones where equilibria are likely.

    iv. Policies in Western democracies are surprisingly stable, given how easy it is to come up with multi-dimensional examples with cycling.

    i. In the US, there is actually evidence that the distribution of voter preferences is largely one-dimensional.

        a. The work of Poole and Daniels (APSR, 1985) suggests that the distribution of policy preferences tend to be fundamentally "linear" and stable.

        b. Using an enormous data set of roll call voting from the American Congress, they demonstrate that **a single dimension** (the left-right political spectrum) predicts more than **80% the votes cast by representatives in the US Congress** (over all recorded votes). [See also Poole and Rosenthal 1997.]

        c. Perhaps the "one-dimensional left-right debates" of political activists and philosophers tend to "create" voter preferences over public policies that are also essentially one dimensional

        d. The **emergence of two party or two coalition political systems** (as with Duverger's 1959 theory of parties, which we will discuss later) also tends to reduce the dimensionality of the voting space insofar as a straight line through any two party platforms tends to be generate a "one dimensional" of policy alternatives, essentially those between the main party platforms. In 2-dimensional policy space, the cycling problem is far more likely.

H. In general, however, a median voter exists ONLY in cases where voter tastes are symmetrically arrayed (see Plott, 1969).

    i. In most plausible looking 2D policy space diagrams, cycles are endemic even if voter preferences are single peaked!

    ii. See class notes for an illustration where, every policy has a non-empty win set.

        a. (Def: The win set of policy z is the set of policies which could beat z in a majority rule election or referendum)

        b. Recall that in a 2-dimensional spatial voting model each voter's indifference curves are perfect circles centered on their ideal policies.

    i. If ideology is not very important, it is also possible that voter preferences for goods and services are fairly similar, and the observed variation in preferences over policies simply reflects differences in income, as in the model developed in class.

    a. In such cases, as noted in lecture, voters will tend to have single peaked preferences and behave like spatial voters.

    b. When there are just two major candidates, the political spectrum is essentially one dimensional: the line between their policy positions (platforms or manefestos).

iii. As an exercise:

    a. Show a two dimensional issue space where cycling is a problem.

    b. Then show a distribution of voter preferences in which cycling is not a problem (reduces to single dimension).