CHAPTER 3

Two dimensions: Elusive equilibrium

The rights of men are in a sort of middle, incapable of definition, but not impossible to be discerned. . . . Political reason is a computing principle; adding, subtracting, multiplying, and dividing, morally and not metaphysically, or mathematically, true moral denominations.

(Edmund Burke, *Reflections on the Revolution in France,* 1790, Part IV)

Is Edmund Burke right? Is the "middle" in complex political choices really "incapable of definition, but not impossible to be discerned"? To answer, we must recognize that real political choices are more complex than the simple choice of one policy. Considering more than one policy also requires a description of voter priorities and candidate strategies.

In this chapter, we will present a verbal and graphical exposition of choice of two policies. All the important concepts and features of two-dimensional political choice will be introduced, but not covered in depth. The specialist reader, interested in the technical details, will want to skim the intuitive overview given in this chapter and then go on to Chapter 4. The reader seeing this material for the first time, however, should master the intuitive presentation before continuing.

The Appropriations Subcommittee

Let's return to the Appropriations Subcommittee from the last chapter. Suppose the members (our friends from the preceding chapter: A, B, C, D, and E) must also budget for a second project, currently slated for $40 million in spending. Suppose Mr. A (that liberal!) wants to increase the amount spent on Project 2 to $120 million, so that it can be finished more quickly. Ms. B also believes more money should be spent, but an increase as large as Mr. A wants is too dangerous a precedent for the many other projects the committee must vote on. Consequently, B favors an increase to only $70 million.

Mr. C is satisfied this is a good project, but thinks the current $40

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Table 3.1. *Subcommittee ideal points on two projects*

Member	Project 1 (millions of $)	Project 2 (millions of $)
Mr. A	150	120
Ms. B	100	70
Mr. C	50	40
Mr. D	10	200
Mr. E	80	60
Status quo	80	40

million budget is adequate. Mr. D (that conservative!) loves Project 2. He thinks it contributes to national security (because it creates employment in his district). Consequently, x_D = $200 million. Mr. E also likes the project, but favors an increase to only $60 million. The ideal positions for all five subcommittee members, on both Projects 1 and 2, are listed in Table 3.1.

Though it is not obvious at first, having two (or more) projects changes the voters' problem significantly. Members' priorities on the two projects may differ markedly. Further, preferences about spending levels for Projects 1 and 2 may be related, positively or negatively, and this relation may differ across members. The projects serve different groups of people or different national needs. For example, notice from Table 3.1 that Mr. D wants a *cut* in Project 1 and an *increase* in Project 2. The issues could be linked if the projects affect each other. Members could also want a constant total budget or seek avoidance of duplication. If one project affects another in any of these ways, we will call this a "complementarity"; complementarities can be either positive or negative.

The one-dimensional model of the preceding chapter can't handle this problem, unless the projects are genuinely separable. Separability requires more than just considering the project in different bills: *Preferences* themselves must be "separable." Consequently, we need a model that allows a joint preference rule for the two projects. We will continue to use capital letter subscripts to differentiate committee members. From now on, we will also use number subscripts to distinguish projects (here, Projects 1 and 2). For example, A's ideal point on Project 1 is $x_{A1} = 150$; D's ideal point on Project 2 is $x_{D2} = 200$. It is useful to think of the policy "space" as two-dimensional, with each dimension measuring the budget of one project. Some readers will recognize this two-dimensional space $\mathcal{P}$ as a Cartesian product:

$$\mathcal{P} = P_1 \times P_2.$$

Practically, what this means is that we can define budget proposals and member ideal points along both dimensions at the same time. Ms. B's ideal, for example, is $\mathbf{x}_B = (x_{B1}, x_{B2}) = (100, 70)$. (Note: The **bold** notation indicates that $\mathbf{x}_B$ is a "vector" with two elements: B's ideal point on Project 1 and her ideal point on Project 2.) Her ideal point is the element of $\mathcal{P}$ (the set of all possible budgets for Projects 1 and 2) that Ms. B likes best. Any other point is definitionally less preferred by B.

The key element in the spatial approach is the representation of preference as some weighted function of distance (Davis and Hinich, 1966; Davis, Hinich, and Ordeshook, 1970). Before we can go any further toward the concept of distance in more than one dimension, we must introduce three key concepts: salience, separable preferences, and equilibrium.

- *Salience:* The relative importance of different issues to the member. The more important an issue, the more "salient" for the member's decision about how to vote.
- *Separable preferences:* If preferences are "separable," the expected *level* of one project has no influence on *ideal points* of other projects. If preferences on two issues are not separable, the ideal point on each issue is, in effect, known only conditionally.
- *Equilibrium:* An equilibrium in political decision making is a status quo position in the policy space that cannot be defeated by another feasible position. In principle, such a position could either defeat (or tie) all other proposals. Another possibility is that the status quo is protected by rules or institutions that prevent consideration of proposals that would defeat it.

Voting one issue at a time with separable preferences

To start with, assume that *preferences are separable* for all committee members. Then we can graph the committee's decision problem in Fig-

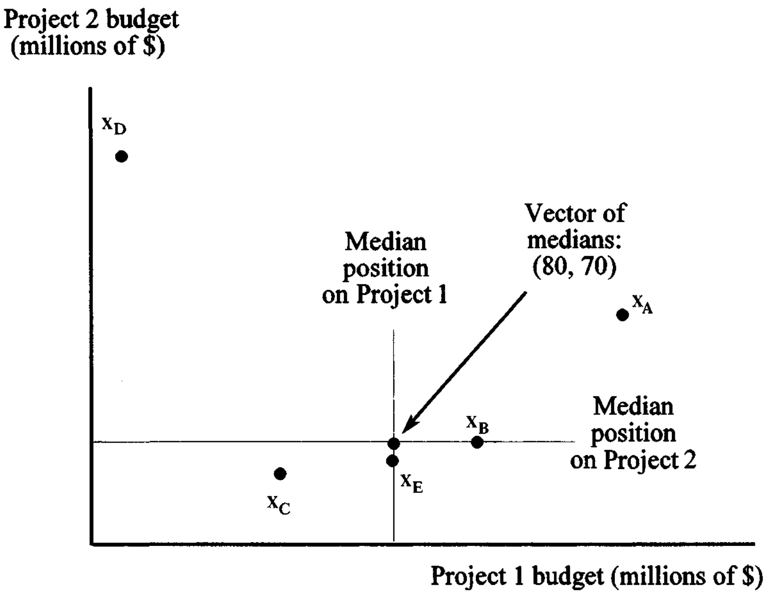

Figure 3.1. Ideal points of committee members and the results of voting one issue at a time.

ure 3.1, which depicts the ideal points of each committee member in a two-dimensional policy space. The fact that there are two dimensions suggests a natural starting point: Let each issue be voted on separately. Committee members may differ on the *relative* importance of budgets on Projects 1 and 2. One member may care mostly about Project 1, and another is concerned more about Project 2. A third member could easily consider the two projects equally salient.

Salience does not matter in the "one-issue-at-a time" vote, however, if on each separate issue all members' preferences are symmetric and single-peaked (Kadane, 1972; Kramer, 1972). Under these assumptions, the corollary to the MVT proved in the preceding chapter applies. Specifically, suppose that preferences are symmetric and single-peaked in each dimension, as well as separable between the dimensions. Applying the corollary to the MVT, we know that simple closeness determines choice on each of the two budgets. Since there is an odd number of members in our example, the median in each dimension is

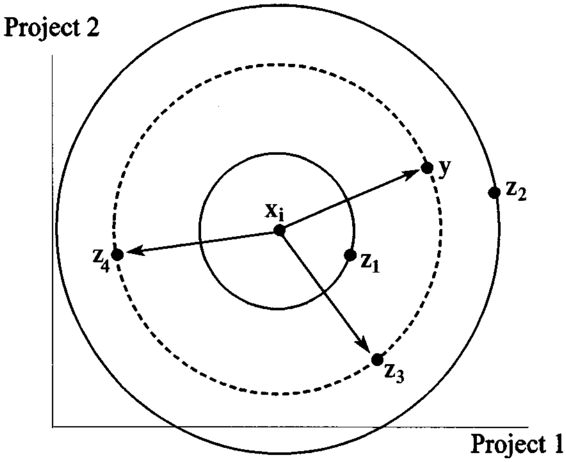

Figure 3.2. If issues are equally salient and preferences are separable, indifference curves are circles.

unique. Assuming free proposal power for all members, the collection of medians in each dimension will be the outcome. The median position on Project 1 is \$80 million (x_{E1}), and the median on Project 2 is \$60 million (x_{B2}). Thus, the committee will report out two bills, and the vector of median points (\$80 million, \$60 million) will be an equilibrium, regardless of the order in which the issues are considered.

In Chapter 2, we defined preference and indifference in spatial preferences. Indifference required (for symmetric preferences) that two budgets be equally far away from the member's ideal budget. In a two-dimensional policy space, where every point represents both a Project 1 budget and a Project 2 budget, indifference is more complicated. Given a budget **y**, there are *many* budgets the member likes equally well. We will call each set of points that give the member the same level of satisfaction an *indifference curve.* There are three basic cases to consider.

Case 1. *Preferences are separable, and issues have equal salience.*

In this case, indifference curves are *circles.* This case, illustrated in Figure 3.2, is intuitively the closest to the definition of indifference with symmetric preferences in one dimension. A circle has the property that all the points are equally far from the center, or ideal point of the member. Thus, the member is comparing other proposals with budget **y** based on their "distance" from his ideal point $\mathbf{x}_i$. The member likes budget $\mathbf{z}_1$ better, because it is closer than proposed budget **y**. He likes budget $\mathbf{z}_2$ less, since it is farther away. He likes budgets $\mathbf{z}_3$, $\mathbf{z}_4$, and **y** the same, because they are all the same distance from $\mathbf{x}_i$.

Case 2. *Preferences are separable, and issues have different salience.*

In this case, indifference curves have an oblong, or *elliptical,* shape. The indifference curves still join the set of budgets that a member likes equally, but they look different, as Figure 3.3 shows. If preferences are separable, differences in salience simply mean that the indifference curves are "stretched out," because one issue is more important to the member:

- If the horizontal issue is more salient, the indifference curves are "tall."
- If the vertical issue is more salient, the indifference curves are "wide."

The intuition behind these differences is very plausible. The more important an issue is to the member, the more small changes in budget affect satisfaction. In panel (a) of Figure 3.3, it looks as if the circular indifference curves from Case 1 (above) had been squeezed from the sides. In general, if the horizontal issue is more important, then the difference in preference level between any two curves is larger in the horizontal direction. This means that the curves themselves appear closer together, just as lines close together on a topological map indicate a steep slope. In panel (b), the compression is in the vertical direction, reflecting the greater importance of the vertical issue.

Case 3. *Preferences are not separable, issues have the same or different salience.*

This case is very complex. The reader should recognize that nonseparability makes interpretation of preferences much more difficult. Allowing simultaneous consideration of both issues, with nonseparable preferences, it is possible to draw indifference curves, but their shape can take many different forms.

Recall from the definition given earlier that nonseparability means

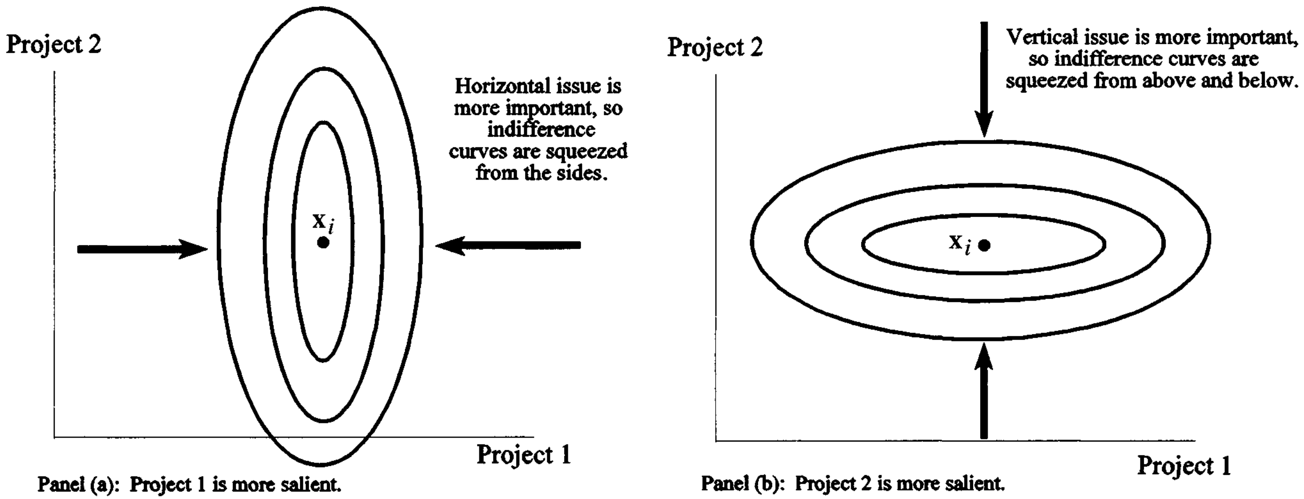

Figure 3.3. If preferences are separable, but projects have different salience, indifference curves are ellipses.

that the *ideal level* on one policy depends on the *expected level* of another policy. Two important kinds of nonseparability can be characterized as positive and negative complementarities. The simplest indifference curves associated with each type of nonseparability are presented in Figure 3.4. Panel (a) depicts "negative complementarity," and panel (b) depicts "positive complementarity." The best way to understand the meaning of negative and positive complementarity is to give an example of each:

Negative complementarity. A city council member may have goals for garbage and parks budgets for next year. But suppose the entire council selects a parks budget that is larger than councilperson *i*'s ideal. How will she react? Suppose she doesn't want to raise taxes, but cares strongly about a balanced budget. The result might very well be that she calls for cuts in garbage collection budgets. In fact, these cuts might be below her "ideal" level. If she could, the councilperson would like to take some money spent on parks and increase money spent on garbage collection. This may not be an option, either for parliamentary reasons or because other members would oppose her. Similarly, if a court order (based on a sanitation complaint from residents) requires more money for garbage collection, *every* council member may favor cuts below his or her package ideal point on parks. In general, if complementarity is negative, having to accept more of one project means the member wants less of the other project (compared with the most preferred budget if he or she could choose on both dimensions simultaneously).

Positive complementarity. A school board member has to decide how many new teachers to hire and how much money will be spent on buying new computers. Suppose the member believes that each teacher who has a classroom also needs a computer to be effective. Imagine that the school board as a group has already decided to hire more teachers than our board member thinks prudent. He disagrees with the decision, but accepts that this choice has been made. He might then vote to support a proposal to buy each of the new teachers a computer. The conditional ideal represents more computers than his package ideal, because (from his perspective) too many teachers have been hired.

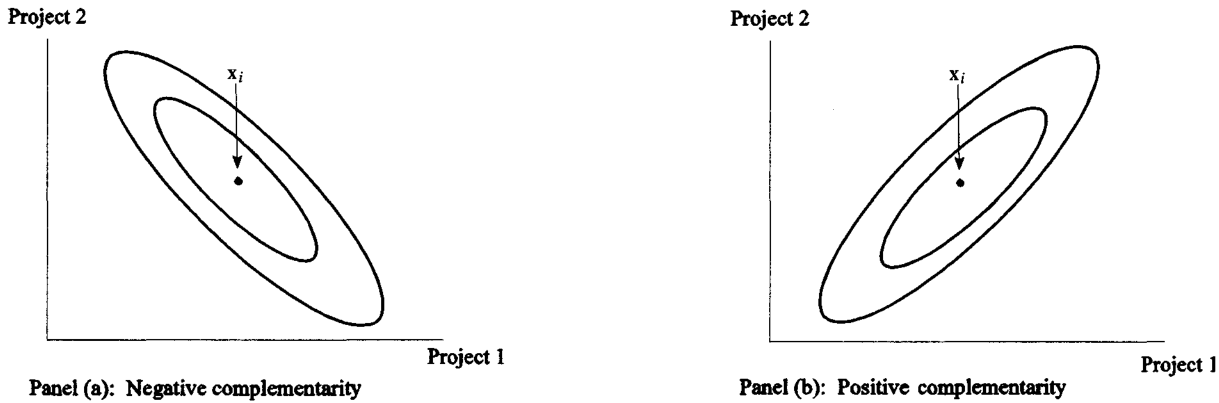

Figure 3.4. Negative and positive complementarity.

In each of these examples, it appears that preferences are not really "fixed."[1] The reason is that a member's goals for one policy depend on what he or she expects to happen in another budget area. It is important to recognize, however, that the preferences are *fixed.* All that is changing is the context, which modifies the contingent ideal point of the member. It is worth exploring at some length the seeming paradox in preference stability caused by nonseparability.

The paradox of nonseparability

Allowing preferences to be nonseparable makes the process of modeling vote choice much more complex, but also more realistic. One way of stating the "paradox" of nonseparability is:

The paradox. Suppose a voter has an unconditional "package" ideal point $\mathbf{x}_i$, and that preferences are nonseparable. Now, imagine that the position of the committee on issue 1 is fixed at some level $\tilde{x}_1$. The voter prefers movements *away from* x_{i2}.

How could nonseparability make a member vote against his own ideal point?

Nonseparability has a deceptively simple definition: The value the voter places on changes in the budget for Project 1 depends on the level of budget expected for Project 2, and vice versa. To put it another way, nonseparability requires that the member (we will drop the *i* subscript, for simplicity) consider *all* issue positions before choosing *any.* We can summarize the specific impact of nonseparability in three statements about the voter's conditional preferences.

1. *Positive complementarity:* Let the committee's position on issue 1 be fixed for some reason at $\tilde{x}_1 > x_1$ (i.e., more budget is allocated to issue 1 than the member would like). Then the member's conditional ideal on issue 2 will be *larger* than her ideal budget (assuming separability) x_2. If the position on issue 1 is fixed at $\tilde{x}_1 < x_1$, then the conditional ideal on issue 2 will be *smaller* than x_2.
2. *Negative complementarity:* Again, suppose the budget for issue 1 is fixed at $\tilde{x}_1 > x_1$. Then the conditional ideal on issue 2 will be *smaller* than x_2. If the position on issue 1 is fixed at $\tilde{x}_1 < x_1$, then the conditional ideal on issue 2 will be *larger* than x_2.

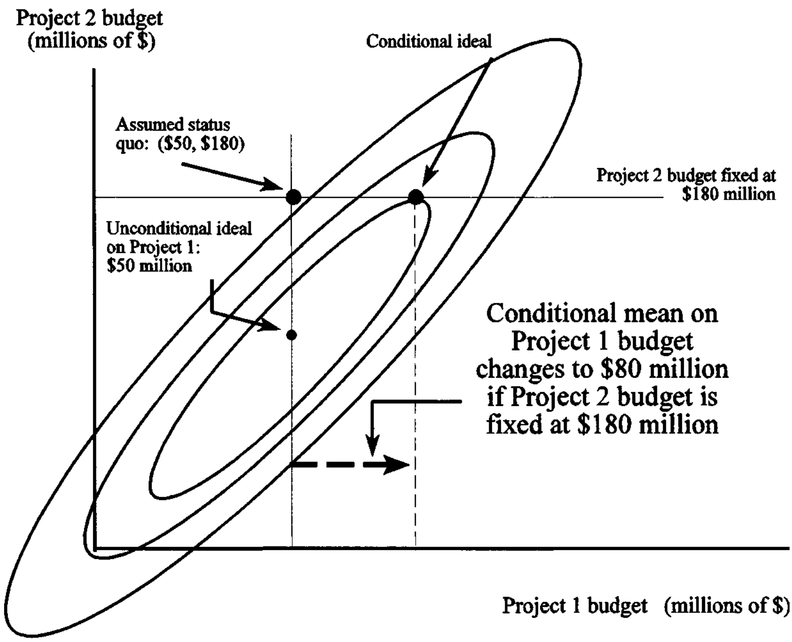

Figure 3.5. The paradox of nonseparable preferences. In this example, negative complementarity is assumed. The case for positive complementarity is analogous.

3. *Separability doesn't matter at the ideal point:* No matter what the form of the complementarity between projects, if $\tilde{x}_1 = x_1$ (the position on issue 1 is fixed at the voter's ideal point), the conditional ideal point is x_2.

If preferences are nonseparable, it must mean that there is some complementarity across budget categories. If the budget on any dimension is fixed at a level different from that most preferred by the voter, all the other "ideal" budgets of the voter change. The direction of the change depends on whether the voter perceives the complementarities in the activities as positive or negative.

The paradox is illustrated in Figure 3.5 for projects exhibiting positive complementarity. As the figure shows, the voter can approve of movements *away from* his one-dimensional ideal if preferences are not separable. In the example in Figure 3.5, the voter's ideal level of spending for Project 1 is the status quo. But the budget for Project 2 is fixed at a level different from his ideal point. He votes for an increase in the Project 1 budget, away from his ideal point.

The resolution of the apparent paradox lies in recognizing that nonseparable preferences are conditional on context, though the preference function itself is consistent and unchanging. Though there is a package ideal, there is no unique "best" issue-by-issue ideal point. Consequently, the order in which issues are decided may determine the decision.

In the next section we return to the simplifying assumption of separable preferences and consider decision making on two issues. Accounting for nonseparability is very difficult, though it may be important for understanding the nature of real-world voting and decisions, and even survey responses (Lacy, 1996a). For the rest of this chapter, we will seek simply to illustrate the most basic model of two-dimensional collective choice using majority rule.

Lost in two-space: Voting on packages

Kadane (1972) and Kramer (1972) demonstrated an intuitive but important result: If (1) preferences are separable, and (2) issues are voted one at a time, voting sequence is irrelevant.[2] The outcome of such collective decision processes will always be the collection of median positions. But what happens if this extreme "germaneness" rule is relaxed, so that proposals can reflect changes in both projects simultaneously?

Imagine that there are two projects and three committee members with circular indifference curves (preferences are separable, and projects have equal salience for everyone). Further, let us introduce some concepts for evaluating outcomes.[3]

Pareto set *(named after the Italian economist and sociologist, Vilfredo Pareto, 1848–1923).* The smallest set of points that contains all ideal points, and the line segments connecting them. These line segments are called "contract curves," because they represent the boundaries of the set of possible unanimous agreements. "Pareto optimality" requires that decision processes select outcomes for which it is impossible to make changes that benefit all participants. For points inside the Pareto set, any change makes at least one member worse off. Status quo points outside the Pareto set are *unanimously* inferior to at least one point in the Pareto set.

Condorcet winner *(named after the French mathematician and social scientist, Marie Jean Antoine Nicolas Caritat, Marquis de Condorcet, 1743–1794).* A policy position that beats or ties any other alternative in majority rule contests. We have already seen one example of a Condorcet winner: the median position in one dimension when preferences are single-peaked.

Win set *(Black and Newing, 1951, Section II).* The "win set" of an alternative $\mathbf{z}$ (written $W(\mathbf{z})$) is the set of alternatives that will garner more votes than $\mathbf{z}$ in a pairwise majority rule election. More formally, let $R_i(\mathbf{z})$ be the set of alternatives that member i likes at least as well as $\mathbf{z}$. Then $W(\mathbf{z})$ is the set of points in the intersection of (at least) a majority of the members' $R_i(\mathbf{z})$ sets. It is quite possible that $W(\mathbf{z})$ is empty (contains no points) for many configurations of $\mathbf{x}_i$, since there is no guarantee that a majority of members prefers any point to $\mathbf{z}$. If $W(\mathbf{z})$ is empty, $\mathbf{z}$ is an equilibrium.

One possible configuration of ideal points for the three voters (A, B, and C) is given in Figure 3.6. In addition to the ideal points, Figure 3.6 highlights the set of unidimensional medians ($50 million, $120 million), the Pareto set (the set of alternatives enclosed by the contract curves), and $W(\mathbf{x}_{med})$, the win set of the intersection of the unidimensional medians, $\mathbf{x}_{med}$. The win set of any point $\mathbf{x}$ is simply the intersection of the sets of alternatives prefered by a majority of members to $\mathbf{x}$. In this case, with three members, we start by drawing each member's indifference curve through the presumed status quo, $\mathbf{x}_{med}$. Then $W(\mathbf{x}_{med})$ is the set of all alternatives where two (or more) of the indifference curves intersect or overlap.

Is $\mathbf{x}_{med}$ a Condorcet winner when both issues are voted on simultaneously? No, not in this example and not in most examples. The reason is that $W(\mathbf{x}_{med})$ is not empty for most possible configurations of ideal points. Since *any* point in $W(\mathbf{x}_{med})$ beats $\mathbf{x}_{med}$ by definition, $\mathbf{x}_{med}$ is not a Condorcet winner.

One is led to ask whether there is any Condorcet winner in spaces of more than one dimension, even assuming that preferences are sepa-

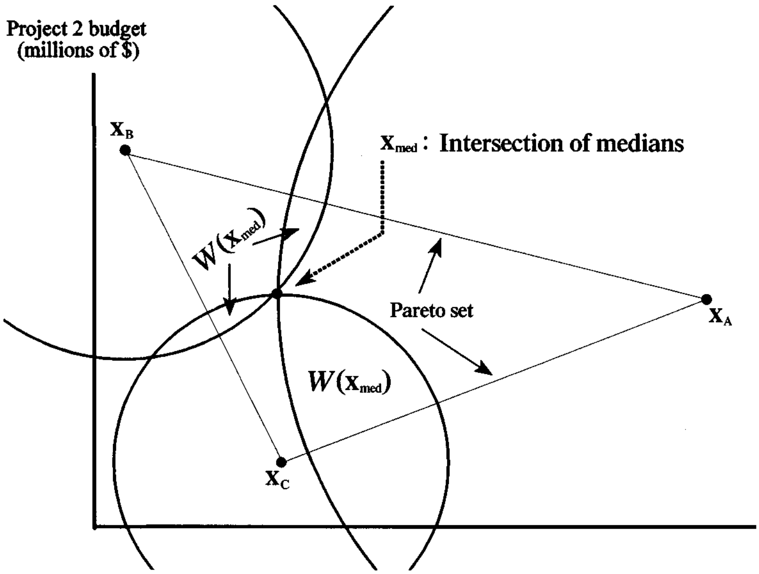

Figure 3.6. The win set of the intersection of unidimensional medians is not empty.

rable and single-peaked. Again, the answer is generally no. As Plott (1967), McKelvey (1986), and Cox (1987), among others, have shown, in the absence of (1) restrictions on the configuration of ideal points or (2) institutions that restrict the sequence of proposals (such as germaneness rules that require members to vote one issue at a time), majority rule processes are chaotic.

This result is substantively important, as we discussed in the previous chapters. From the perspective of the kind of democratic theory Aristotle tried to create, *there is not necessarily a "middle"* we can depend on to lend stability to democracy: Majority rule processes can be arbitrary.[4] On the other hand, we can say something about the circumstances under which majority rule leads to a stable outcome. Further, the "Pareto set" gives us some guidance about the extent of variation in likely outcomes.[5] Edmund Burke's "computing principle" seems to have some merit.

Suppose one point **y** in $W(\mathbf{x}_{med})$ is selected as the new status quo for the committee depicted in Figure 3.6. If we redraw the indifference

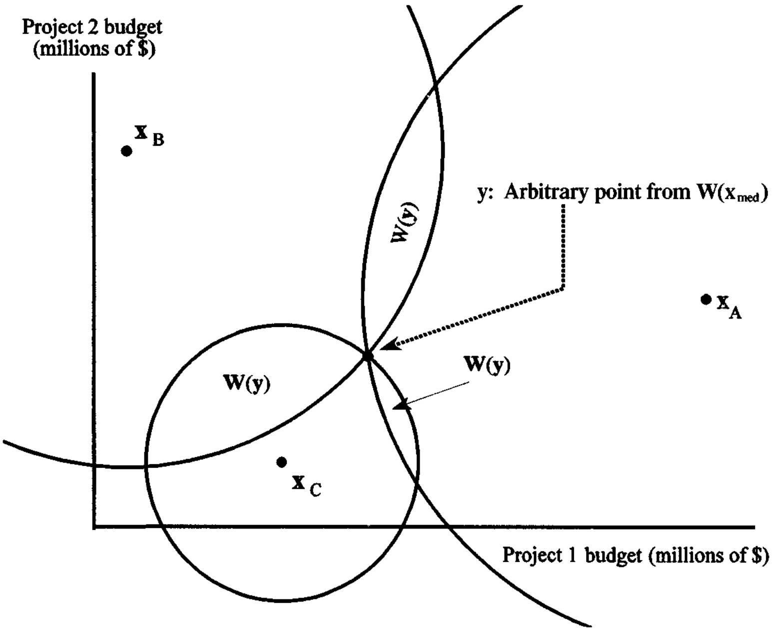

Figure 3.7. The win set of almost any arbitrary point is not empty.

curves and recalculate the win set of the new status quo, we will once again find (as in Figure 3.7) that $W(\mathbf{y})$ is not empty. This process, for most arbitrarily selected sets of ideal points, can continue endlessly.

Furthermore, as is obvious from Figures 3.6 and 3.7, there is no guarantee that the outcomes that are selected as a result of such a chaotic process satisfy even the most basic requirements of value: $W(\mathbf{x}_{med})$ and $W(\mathbf{y})$ may contain points that are not elements of the Pareto set! To put it another way, majority rule may lead to an outcome that the entire society, *unanimously,* thinks is worse than other feasible alternatives.

Stability in two-dimensional space: The median in all directions

There are at least two ways out of this predicament. The first is to ask if there are plausible restrictions that can be placed on preferences that make the existence of a Condorcet winner more likely. The second is to ask if institutions of the decision process itself can prevent either endless wandering or manipulation by strategic actors, as has been suggested by Shepsle (1979) and Shepsle and Weingast (1981).[6]

Plott (1967) demonstrated that conditions sufficient to guarantee the existence of equilibrium do exist, but these conditions are highly restrictive. Later work, including that of Davis, DeGroot, and Hinich (1972) and Enelow and Hinich (1983a, 1984b), expanded the set of ideal point configurations for which a Condorcet winner exists, but the conditions are still highly restrictive. The sufficient conditions, sometimes called the "Plott conditions," require an ordinal pairwise symmetry of all voters along any vector passing through the status quo. One configuration of preferences for which there is a Condorcet winner is depicted in Figure 3.8, panel (a). As the reader can see, for each voter whose ideal point $\mathbf{x}_i$ is different from the dominant point (Condorcet winner) $\mathbf{y}$, there is another voter j whose ideal point $\mathbf{x}_j$ lies on the same line through $\mathbf{x}_i$ and $\mathbf{y}$, and lies the same distance as $\mathbf{x}_i$ on the opposite side of $\mathbf{y}$.

In panel (b) of Figure 3.8, we see an illustration of a configuration of ideal points that do not satisfy Plott's symmetry conditions, but do imply the existence of a Condorcet winner. Obviously, the "Plott conditions" don't tell the full story. But then just what is the general principle that determines whether a given committee, represented by a set of ideal points in a multidimensional policy space, will come to a unique and determinate outcome by other than arbitrary means?

The answer is best summarized as follows: *An alternative* $\mathbf{y}$ *is a Condorcet winner in a society if, and only if, it is a "median in all directions."* We have already seen from Figure 3.6 that the intersection of unidimensional medians is not generally an equilibrium. So the median in all directions must be something different. What is it? The definition, first given definitively by Enelow and Hinich (1983a) is this: An alternative is a median in all directions if *every* line drawn through it, at all angles, divides the ideal points of all members so that at least half are on either side of the line, including those members whose ideal points are on the line in both groups.[7]

As the reader can easily see, Plott's pairwise symmetry condition is *sufficient* to guarantee the existence of a median in all directions. The condition is too strong, however, to qualify as a *necessary* condition.

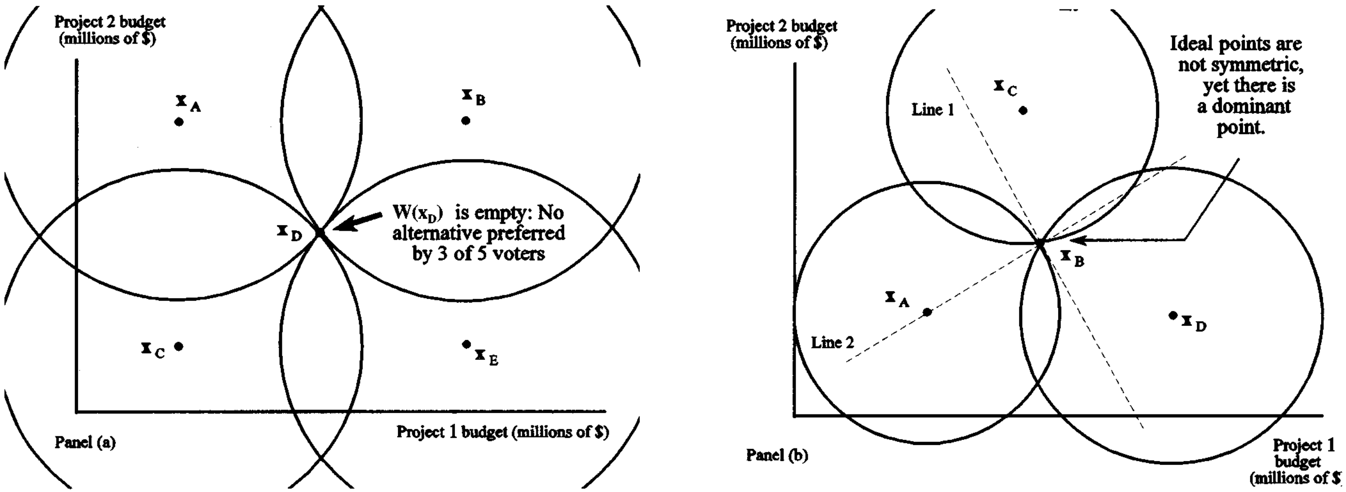

Figure 3.8. Two examples of ideal point configurations that imply Condorcet winners, with and without ideal point symmetry.

As Figure 3.8, panel (b), shows, there exist configurations of ideal points that violate the pairwise symmetry condition, yet yield a Condorcet winner.

The median in all directions, in two dimensions, represents an *exact* analogue to the definition of a median position in one dimension. There, we divided voters into two groups: (1) those whose ideal points were less than or equal to the proposal and (2) those whose ideal points were greater than or equal to the proposal. The difference is that for two or more dimensions, this condition must hold for lines drawn through the median at any angle.

We can't draw all possible lines, but the nature of the median in all directions can be illustrated by looking at lines 1 and 2 in panel (b) of Figure 3.8. There are three ideal points on or to the right of line 1 ($\mathbf{x}_B$, $\mathbf{x}_C$, and $\mathbf{x}_D$), and two ideal points on or to the left ($\mathbf{x}_A$ and $\mathbf{x}_B$). Similarly, for line 2: There are three ideal points on or above line 2 ($\mathbf{x}_A$, $\mathbf{x}_B$, and $\mathbf{x}_C$), and three ideal points on or below it ($\mathbf{x}_A$, $\mathbf{x}_B$, and $\mathbf{x}_D$).

Dynamic politics: "New" issues and stability

We have seen that in a single-dimensional world, majority rule leads to a stable policy at a median position if preferences are single-peaked. Even in a multidimensional world, we expect stability if issues are voted one at a time and preferences are separable, as Kramer (1972) showed. Yet if alternatives can be changed in more than one dimension, we have seen that stability and predictability may be rare. We should touch briefly on two sets of issues about the dynamics of politics. We cannot cover the basic research on these questions very deeply, but we can offer some guideposts to the reader. The first set of issues involves the (arguable) ability of institutions to prevent instability. The second is the introduction of "new" issues to change the political space itself.

Institutions and equilibrium

A number of authors have wondered why, in the face of pervasively pessimistic predictions about stability in majority rule decisions, many real-world political processes look stable. In many cases, the answers these authors have given relied on some form of "institution," or what Douglass North (1990) has called the "humanly devised rules of the game," to restrict or prevent instability in majority rule. We will discuss institutions more in Chapter 8, but for now will simply note that the rules that govern the aggregation of preferences may affect policy outcomes, even holding preferences constant. This is exactly the prediction of Plott's "fundamental equation," discussed in Chapter 1 of this book.

One important set of answers was offered by Buchanan and Tullock (1962) and Tullock (1981), who claimed that "logrolling" (vote trading) was the means by which stability could be ensured. Logrolling would allow voters to register the intensity of their preferences by trading votes on issues they care little about for the votes of others on issues about which the vote traders care deeply. Yet "trades" can restrict instability only when such agreements can be enforced.

Another kind of answer was offered by Kadane (1972), Kramer (1972, 1973), and others. Democracy is stable if complex packages of issues are broken apart and considered separately. If (1) preferences are separable and (2) issues are voted on one at a time in a fixed sequence (and no side payments are allowed), the vector of unidimensional medians beats any other alternative.

We are left to wonder, however, how democracies facing complex decisions avoid linkages across issues, either because preferences are nonseparable or because of vote trading. Legislative "germaneness" rules do have something like this effect by preventing "riders" (resolutions dealing with another issue) from being attached to bills. But we are led again to look for institutional arrangements, not to some characteristic of the decision process itself, as the guarantor of stability.

The most explicit statement of the importance of institutions in fostering stability is the "structure-induced equilibrium" theory of Shepsle (1979) and Shepsle and Weingast (1981). "Structure" is taken to mean explicit rules, or binding norms, of political decision-making bodies that preserve stability. Examples include a legislative committee system, with disjoint monopoly jurisdiction over policy dimensions and a system of reciprocity (an enforced, but open ended, logroll) among committees to avoid each other's turf. Other rules (e.g., requiring that the amendment face the status quo last) ensure that many proposals die in committee or in floor debate, rather than being enacted and then modified over and over.[8]

Most recently, Alesina and Rosenthal (1995) have pointed out that votes may reflect a desire to "balance" opposing ideological positions in government. If this explanation is correct, then it need not be true that *parties* move to the center. Instead, voters can achieve a centrist *policy* outcome (in systems with divided government, like the U.S. system with the Congress and a president) by putting one party in control of one branch and the other party in control of other branches. This is a fundamentally institutionalist perspective, with something like stability built in through voter balancing of relatively extreme positions by parties.

New issues and dynamic equilibrium

The notion that the dynamics of party competition can be described by the introduction of new issues or by the realignment of coalitions around issues in particular elections is, of course, a venerable one (Key, 1955; Burnham, 1970; Sundquist, 1973; Sartori, 1976; Kramer, 1977; Aldrich, 1983a, 1983b; Riker, 1986). Of these, only Riker's model and Aldrich's extensions relying on party activists explicitly assume that change comes from professional politicians. The older view is that changes in the preferences of the mass electorate transform the basic "rationale" of political debate (see, e.g., Sundquist, 1973, p. 37).

More recently, several scholars have rethought the relations between political agendas and models of politics. Riker (1990) raised a fundamental challenge:

> What are the moving parts in the spatial model of politics? . . . As far as I know, the candidates (or parties) and their platforms or, alternatively, the motions, are all that anyone has proposed as moving parts. But nothing inherent in the model prevents other parts from moving. . . . [Candidates or voters] might change the space itself, distorting it by adding or subtracting dimensions or by expanding dimensions as if they were elastic or elastic in certain distances. . . . *In two dimensions [this] can easily affect the relative location of the center of the distribution.* (p. 46; emphasis added)

Riker (1982, 1986) himself offered the classic example of how the strategic introduction of an issue can change the political world. We can present only a highly simplified version of Riker's account. From the election of 1828 and the accession of Andrew Jackson in 1829 until the realignment of the mid-1850s, the issues that organized political debate were clear: Northeastern states favored high tariffs and tight credit; southern and western states favored low tariffs and relatively easy credit.

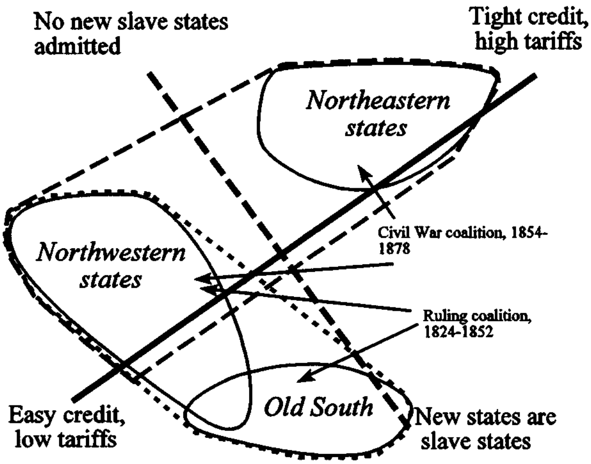

Figure 3.9. A new issue splits the coalition of northwestern and southern states (adapted from Riker, 1982).

As the issue of slavery or (more accurately) the extension of slavery to the western territories became more important, it divided the previously unbeatable coalition of South and West, leading to a political victory by the northeast (and leading to the U.S. Civil War).[9] In Figure 3.9, the prevailing dimension dividing political alternatives is the solid line; the "new" issue, slavery, is the dotted line. The consideration of the strategic addition of new issues makes the implied game dynamic and potentially unstable. What are the implications for political strategy?

Remember, majority rule election processes always have a determinate Condorcet winner at the ideal point of the median voter, provided the relevant strategy set is one-dimensional and voter preferences are single-peaked. While one might quarrel with the assumption of single-peakedness, the obvious problem lies with the assumption of unidimensionality, particularly when we allow for *strategic* introduction of new dimensions. Since there is generally no median position when the number of issues is greater than one, introducing a "new" issue changes everything.

To sum up, the "successful" introduction of a new issue may be a victory for the disgruntled or out-of-power coalition that introduces it, but the victory may be Pyrrhic. Introducing a genuinely "new" issue does not usually mean there will be an orderly transformation or realignment. Rather, the effect is to release the genie of chaos from its bottle.[10] The more complex space gives more room for maneuver and strategic action, it is true, but maneuvering is now possible for *all* sides in the conflict. In the higher-dimensional space, and with the collapse of the gatekeeping institutions designed to keep order in one dimension, anything can happen.

Conclusions

A key difficulty with all the structure-induced equilibrium theories is the presumption of separable preferences. As we will see in Chapter 8, equilibrium breaks down if preferences are nonseparable. At a minimum, the nature of equilibrium becomes dependent on the order in which alternatives are decided (or even are expected to be decided), which creates crippling opportunities for strategic manipulation.

Even more fundamentally, there is a difficulty with all the institutionally oriented answers to Tullock's famous "Why so much stability?" question. Even if institutions serve the roles claimed, where do they come from? Why do some institutions disappear, and others survive? These hard questions have been posed in different forms by Riker (1980) and North (1981, 1990). We don't yet have very good answers for them. But the answers, when they come, will tell us much about how some human societies change and grow, while others wither and die. Though in some ways we have come far from Aristotle's ancient speculation about the existence of the "middle" and its implications for the good society, these basic questions remain the heart of the matter.

EXERCISES

3.1. Suppose that there are three committee members, A, B, and C, with ideal points in a two-dimensional policy space (issues 1 and 2) as follows: $\mathbf{x}_A = (4, 16)$, $\mathbf{x}_B = (5, 10)$, and $\mathbf{x}_C = (6, 4)$. Suppose the status quo policy is $\mathbf{z} = (6, 16)$. Draw a graph depicting the decision problem, including circular indifference curves through the status quo point. Is $\mathbf{z}$ a Condorcet winner?

3.2. For the same set of members and ideal points as in Exercise 3.1, imagine that the issues are voted on one at a time, starting with issue 1. What will be the resulting vector of policies?

3.3. Again, for the same set of preferences as in Exercises 3.1 and 3.2, what will be the outcome if two-dimensional alternatives can be proposed? Is there a Condorcet winner? Is there a median in all directions?