

# Political Economy Models of Elections

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## Abstract

We review a large formal literature on economic models of voting and electoral politics. We discuss two broad classes of model: those focusing on preference aggregation and those that look at elections as mechanisms of information aggregation. We also explore the role of elections in situations of asymmetric information, where politicians take hidden actions or are otherwise better informed about policy than voters are, and examine the role of elections in selection and as incentive mechanisms. In the section on models of preference aggregation, we focus on the themes of exogenous candidacy, policy commitment, and the role of valence attributes. For information aggregation, we analyze how different aspects of the institutional environment affect aggregation, focusing on the structure of elections—whether simultaneous or sequential—and the number of choices, as well as the motivations of voters. Finally, in considering models of asymmetric information, we describe how these models shed new light on incumbency effects, campaign spending, and the policy choices of politicians.

## INTRODUCTION

Political economy is a burgeoning field with a pedigree dating back more than two centuries. In the modern era, economists and economically inclined political scientists have focused on political institutions and processes. These scholars have produced formal models of various political arrangements, including those surrounding voting, campaigning, and elections. In this review we summarize this electoral politics work, drawing on literature not only in standard political science journals but also in some of the leading economics journals. (The receptivity of economics journals to political models is a relatively recent development.) Of course we cannot provide an overview of each and every piece, but we cover some of the works that we feel are the most important in the area.

There are many ways to think of elections and to conceptualize political behavior within an election context. Formal models of election processes can provide some theoretical rigor to the analysis of voting behavior, the interaction between parties, and the interaction between voters and parties. Here we focus on formal models that capture the strategic aspects of electoral behavior. In any electoral contest, the payoff to a party, candidate, or voter depends not only on her own actions but also on those of her fellow citizens and candidates. In an electoral contest characterized by an electoral rule (proportional, first-past-the-post, etc.) and a system of competition (national, district-by-district, mixed), agents' payoffs are interdependent, so it is reasonable to assume that they will act strategically, anticipating how others will respond to the actions they take. Strategic agents (parties, candidates, voters, lobbyists, and interest groups) may have alternative motivations (office-seeking, policy preferences, etc.) and opportunities (run for office/don't run, vote/don't vote, contribute resources/don't contribute, policy positions, commitment, etc.). Is there some combination of strategies in which no agent has an incentive to switch away from an existing choice, given his or her objectives and the choices of others? If such an equilibrium set

of strategies exists, and it is unique, comparative statics analysis can yield implications (often interesting, often nonobvious) that constitute both explanations for electoral phenomena and sources of hypotheses that, in principle, may be tested empirically.

Our approach to elections is conceptual, emphasizing major lines of analysis rather than specific applications. The first main analytical aspect we discuss is depicting elections as aggregation mechanisms, which function to combine individual preferences and private beliefs into social choices. In the first section below we focus on preference aggregation, and the spatial model of electoral competition as its workhorse. In the second section we examine information aggregation, showing how work that started from the analysis of jury decisions has been extended to analyze strategic behavior in large elections. A third section then looks at the role of elections with regard to selection and in providing incentives, building on the earlier literature that sees elections as mechanisms for deselecting poorly performing incumbents. In focusing on these three roles that elections perform, we omit a vast literature that analyzes other important aspects of electoral politics—such as campaigning, interest groups, electoral rules, and term limits, for example—although we may touch on these issues in passing.

## THE SPATIAL MODEL

The canonical spatial model of elections has many moving parts. (We assume most readers are familiar with the basics, so we dispense with a great deal of detail.) In working through the moving parts in this section, we draw the reader's attention to recent theoretical developments.

In the beginning there was Downs (1957), although he owes his fundamental framework to Hotelling's (1929) famous paper on spatial competition among firms (Grosseclose 2001). Downs analogized political parties to Hotelling's firms. In particular, if voters care about policy and their preferences are

represented by single-peaked utility functions defined on a one-dimensional policy space, then Downs, drawing on Black's Median Voter Theorem (Black 1958), demonstrated that, like Hotelling's shops along Main Street competing to be closest to potential customers, office-seeking political parties competing to advocate policies closest to the preferred policies of as many citizens as possible will converge in their policy pronouncements toward each other and the most-preferred policy of the median voter. The moving parts of this model include the agents (voters, parties), the nature of competition, and the space of alternatives over which voters have preferences and parties make policy pronouncements.

Voters are assumed to be policy oriented and rational. They are able to organize their preferences over policies in general, and over the policy pronouncements of parties in particular, in order to vote in an instrumentally rational fashion. These preferences are exogenously given. Specifically, when policies are represented by the points along a line (say, a tax rate ranging from zero to one), each voter is assumed to possess a single-peaked preference function defined on this domain. In some versions of Downs, abstention is permitted, but in most applications it is assumed that everyone votes. Voting is sincere, i.e., a voter supports the political team (party or candidate) whose pronouncement he or she most prefers. The canonical Downsian model has two political parties, although extensions have examined multiparty competition as well. Parties are taken as exogenous, and each is treated as a team of candidates all of whom subscribe to the same policy pronouncement. Thus, the election is seen as an occasion to select a governing team from the two alternatives on offer in a winner-take-all contest. Of two policy pronouncements on the same side of the median voter's ideal point, the one closest to that ideal point secures the greater number of votes. If utility functions are symmetric, so that utility declines with distance from a voter's ideal policy, then in general the pronouncement closest to the ideal point of the

median voter prevails (whether located on the same side or opposite side of the median ideal).

These bare-bone elements, constituting the canonical Downsian spatial model, yield a party policy convergence theorem. Given parties, voters, and the nature of competition as just specified, and if in addition the number of voters is odd, then in equilibrium party policy pronouncements converge to the ideal policy of the median voter. (For even-numbered electorates, convergence is to a range of points between the ideals of the two middle voters.) These pronouncements, together with the rational voting rule of supporting the pronouncement closest to a voter's ideal (or voting arbitrarily when party positions are equidistant), constitute the unique Nash equilibrium of this electoral game: No agent has an incentive to defect from his or her choice, and no other set of choices has this property. If a party were to announce a different policy platform, all else the same, then it would lose votes (and the election). In equilibrium, if a voter were to defect from sincere voting by supporting a party other than the one whose pronouncement is closest to her ideal, then this would allow a less desirable party to win. The equilibrium is unique in party positions (for odd number of voters) because any other pair of policy pronouncements invites at least one of the agents to change behavior.

The policy convergence theorem provides the microfoundations for the familiar comments about two-party competition providing little choice for voters (Tweedle Dum and Tweedle Dee, the same wine in differently labeled bottles, and so on). Many economic models of electoral politics in the recent literature vary one or more of the features of the canonical Downsian model. Here we highlight a number of important contributions belonging to the vast literature on the spatial model that build upon its central components. We focus on three key aspects: (a) the role of policy motivations and commitment; (b) the impact of candidates' nonpolicy attributes (valence) on the equilibrium of the spatial model; and (c) endogenous entry either by third parties or citizen-candidates.

## Policy-Motivated Candidates and Commitment

Voters care about policy, but that may not be all they care about. From the behavioral literature on voting that stretches back more than half a century, it is evident that voters have partisan preferences that may be independent of policy preferences, and these can be incorporated into the spatial framework (Fiorina 1990). For candidates, in the standard spatial model, office-seeking motivations and full policy commitment are two sides of the same coin. If a candidate cares only about office, and all policy pronouncements are means toward that end, then all policy pronouncements are equally credible. But what if candidates care about policies in the same way that voters do, so that each candidate has some ideal policy she or he would like to see implemented?

Calvert (1985) shows that commitment is the critical assumption: Allowing parties to have policy preferences, and to commit to implementing any policy, leads to Downsian convergence. Specifically Calvert supposes that electoral contestants care about policy and enter electoral contests to produce the policies they prefer; they are indifferent about the identity of the winner. If the two parties' most-preferred policies lie on opposite sides of the median ideal, then a nonobvious result obtains. Calvert shows that, with perfect information, the Downsian equilibrium is robust in this case. The contestants converge to the median voter's most-preferred policy. To see the intuition, suppose two parties have not converged to the median voter's ideal but have announced their own ideal policies instead. One of them—the one whose ideal lies closer to the median—will win, but the other contestant, by moving in from her ideal slightly closer to the median ideal, can win with a policy she prefers more. Repeating this exercise in fictitious play, it is easy to see that both parties will converge from their respective sides to the ideal policy of the median voter, just as in the Downsian case.<sup>1</sup>

<sup>1</sup>This is no longer the case when candidates are uncertain about the preferences of the median voter, for then it pays

If it appears evident that elections involve some strategic spatial positioning, the idea that policy-motivated parties can fully commit to implementing any policy, as in Calvert's analysis, seems far-fetched. The question then arises as to which mechanisms allow parties to commit to their policies. This was first taken up by Alesina (1988), who showed that parties with policy preferences and an inability to commit to announcements will be expected by voters, whatever parties announce, to implement their preferred policies if elected. He uses the folk theorem to show that parties can develop a reputation for following policies that appeal to the median, and that strategic party interaction can support such reputations. If any party deviates from implementing a median policy, then voters anticipate that all parties will do so in the future, and this mitigates any incentive to undercut implicit agreements between parties and voters.

Ellman & Wantchekon (2000) take a novel approach to the problem of credibility. They consider a situation in which one of the parties, as may be the case in a developing democracy, has access to extraelectoral capabilities to impose social costs—for example, Party A may possess a paramilitary wing that can engage in damaging protest or even violence. Surprisingly, the mere possession of this resource by Party A gives Party B the capacity to commit. The threat of A's outside agitation will compel B to announce a specific policy different from its most-preferred, one sufficiently attractive to A so as not to incite the use of the latter's extraelectoral resource. That is, Party B may now make a credible announcement different from its ideal policy, since it cannot deviate without inviting a costly response.

## Valence

The spatial model is well suited to exploring how politicians' characteristics affect equilibria in party competition. This issue enters the

them to diverge. The degree of divergence increases with the level of uncertainty.

spatial canon via the concept of valence, which incorporates the idea that a candidate (or party) possesses nonpolicy characteristics that are, in effect, universally desirable—such as competence, trustworthiness, charisma, courage, imagination, and intelligence.

A straightforward insight is that a candidate with a commonly known valence advantage would win the election with certainty (and unanimously) if he or she simply mimicked the opponent's policy positions. But then, if there were even slight uncertainty about voter preferences, a nonadvantaged candidate would wish to distinguish herself by adopting a different policy. If she does, there is some chance that she may win the election. Thus, there can be no pure-strategy Nash equilibrium in such a setting.

Aragones & Palfrey (2002, 2004) provide analysis of a situation in which voters vote for the valence-advantaged candidate when indifferent between candidates' policies, and they vote for the candidate whose policy is closest to their ideal otherwise. Existence of a mixed strategy equilibrium requires that neither candidate has a valence advantage too large. When this is so, then both candidates randomize among a set of policies that are close to the center of the policy space; on average, the valence-advantaged candidate moves relatively closer to the (expected) center of the voter distribution. (This is consistent with the empirical observation that incumbents tend to be more centrist than their challengers.)

Groseclose (2001) generalizes earlier models in which candidates have policy-seeking as well as office-seeking preferences, compete for office in a one-dimensional policy space, are uncertain about the voter distribution, and possess valence attributes. He shows the existence of pure-strategy equilibria and provides comparative static results showing how policy choice depends on valence advantage. Starting from a position of zero valence advantage, a small increase in the valence advantage of a candidate leads to the valence-advantaged candidate moving toward the center while the other candidate moves away from the center. The intuition is

similar to that provided already: By moderating on policy, a valence-advantaged candidate magnifies her advantage, but her valence advantage provides incentives for her opponent to differentiate herself on policy. Groseclose's result overturns previous analysis with the opposite comparative static predictions. In particular, Gersbach (1995) showed that in a model with policy-seeking candidates and voter certainty, a valence-disadvantaged candidate moves toward the center. The valence-advantaged candidate adopts a noncentrist policy but moves only as far from the center as her relative valence advantage allows. Serra (2010) develops a similar model with perfect information in which candidates can make costly investments to enhance their valence. When candidates can choose policy and invest in valence, then relatively extreme candidates invest more in the latter. The marginal costs of policy moderation are higher for such candidates.

Schofield (2007) describes how in a canonical quantal response model—in which players choose the best-response pure-strategy profiles probabilistically—standard convergence seems to occur in most circumstances (although to the electoral mean rather than median). He introduces valence in the form of an asymmetric assessment of party leaders. In this context, he nevertheless provides a necessary condition for convergence as a local Nash equilibrium. When the necessary condition fails, it is the valence-disadvantaged party that deviates to the periphery while the advantaged party remains centrist.

A general feature of models that incorporate valence concerns is that if one party has a large enough valence advantage, then it will have considerable freedom in terms of where it can locate and still leave its opponent with no winning location. Ansolabehere & Snyder (2000) develop this argument in a multidimensional spatial context where, ordinarily, there is no pure-strategy equilibrium pair of locations for parties. In fact they show that an equilibrium exists if and only if the valence difference is large relative to the radius of the "yolk" (a measure of the asymmetry in the distribution of ideal points). Thus, "valence politics and positional

politics are inextricably linked” (Ansola-behere & Snyder 2000, p. 333).

The valence approach to electoral politics also provides some insights into party formation, quite distinct from those discussed thus far. Castanheira et al. (2008) analyze valence and divergence, viewing the latter as a “branding” effect by national parties. If attractive to a local constituency, then it helps that party’s candidate. But, partially to compensate for an unattractive brand, candidates compete in primaries in order to reveal attractive valence properties. National parties cede authority over candidate selection to a local primary in order to facilitate valence revelation.

### Endogenous Entry

In the conventional Downsian model and its progeny, the contestants, whether parties or candidates, are taken as exogenous. Several lines of development have sought to relax this. One line of work has stayed with parties as the strategic actors but has analyzed entry as a strategic choice, asking whether a party will choose to enter a particular contest. There are many models of firms entering competitive markets (see Shepsle 1991, chs. 2 and 4, for a review). The earliest political model of this sort comes from Palfrey (1984), who supposes there are two (exogenously given) “established” parties and a potential entrant competing in a one-dimensional policy space. Voters support the party whose policy is closest to their ideal point. The party receiving the most votes wins the contest. Palfrey assumes the third party definitely enters so that the only issue is what policy it will announce. The established parties play Cournot against one another but are Stackelberg leaders for the entrant. The game, that is, involves the established parties simultaneously choosing their policy positions, followed by the entrant then choosing its policy position. The established parties take on board *ex ante* the fact that the entrant will subsequently optimize against their choices. The subgame perfect equilibrium involves the two established parties choosing

policies that are not only best responses to each other but also best responses anticipating the subsequent policy choice of the challenger. Palfrey shows that there is no equilibrium in which the established parties converge to the ideal policy of the median voter. If they did, then an entrant could win by adopting a position just to the left or just to the right of their common median position. To protect their respective flanks, and thus prevent the entrant from winning, the established parties must diverge. But how much? If they separate too much, then an entrant can enter between them and win. Assuming a symmetric voter distribution, in equilibrium they diverge to the locations where the distribution of voters cumulates to 1/4 and 3/4, respectively. The optimal policy of the entrant (given that it must enter in Palfrey’s model) is at 1/2. If voters are distributed uniformly, the established parties each collect 3/8 of the vote while the entrant obtains 1/4. In effect, the established parties finish ahead of the entrant and thus may be assumed to alternate randomly in power from election to election while the entrant always loses.

That the entrant always enters and always loses in equilibrium is a source of irrationality in Palfrey’s seminal contribution. Why would a potential entrant bother to enter at all in these circumstances? Greenberg & Shepsle (1987) offer a different perspective on the entry decision in order to remove this defect. They posit two types of political party: established parties and parties that wish to become established (challengers). Two established parties, as in the Palfrey equilibrium, will alternate in power. The challenger cannot win, but may enter in order to replace one of the established parties, thereby becoming established itself and thus in a position to alternate in power. (The experience of the British Labor Party early in the twentieth century, seeking to replace the Liberal Party as the main opposition to the Tories, illustrates the thinking.) The challenger aims to win the election or finish at least second, and will enter if and only if it can do one or the other. In this sense Greenberg &



Shepsle remove the entrant irrationality of the Palfrey model. The established parties can deter entry by locating so as to make it irrational for a challenger to enter. Greenberg & Shepsle develop an equilibrium in which the established parties, as in Palfrey's model, do not converge, but, in contrast to Palfrey, the challenger does not enter. In fact, because they seek to deter not only a victory-oriented entrant but also one that would settle for second place, the established parties diverge slightly more than in Palfrey, but this difference between the two equilibrium ideas disappears as the voter distribution becomes more concentrated around its mode. (Precise calculations can be found in Shepsle & Cohen 1990.) In effect, third-party entry is deterred in equilibrium and only occurs if one of the established parties blunders.

In an especially compelling recent contribution, Callander (2005) proposes a model with multiple districts that differ in terms of their respective preference distributions. The two parties, each maximizing its share of districts won, are constrained to offer a common platform on which their candidates compete in separate first-past-the-post elections. The two major parties engage in Cournot competition against each other in each district but are Stackelberg leaders vis-à-vis a prospective third-party entrant. Callander observes that median convergence in one district is asymmetric convergence in others (given the common policy platform for all candidates of the same party). Convergence in any form, and median convergence in particular, opens up opportunities for new entrants. Callander provides conditions for an entry-detering Nash equilibrium of national party positions that entail noncentrist, nonconverging platforms. When these conditions—involving a limit on district heterogeneity—are satisfied, the seats gained by movement toward an opponent are balanced by those lost through the inducement of third-party entrance. Callander's paper thus squares the strong incentives for convergence in the canonical Downsian two-party model with the empirical pattern of frequent divergence.

## Citizen-Candidates

The most dramatic departure from the canonical spatial model seeks to endogenize candidacies comprehensively, analyzing the supply of candidates as a consequence of an entry calculation by prospective electoral politicians. The citizen-candidate models seek to break down the arbitrary distinction between the electorate and the political class it elects. In these models, politicians are simply citizens who have announced their availability as candidates for office. Feddersen et al. (1990) provided the earliest model of this type. Assuming that candidates could commit to their policies, they showed that the only equilibrium involved all candidates who run choosing the median policy. The costs of candidacy placed an upper bound on the number of candidates who run. Feddersen et al.'s model was a precursor to the citizen-candidate approach developed independently by Besley & Coate (1997) and Osbourne & Slivinski (1996), in which there is no explicit policy commitment, and no substitute commitment technologies like those already mentioned. So, if a citizen throws her hat in the ring, she effectively offers her ideal point as one of the options available for voters to select. The strategic action in citizen-candidate models is captured entirely by the decision to enter. There is no spatial mobility as is the case with Downsian candidates, owing to the lack of a commitment capacity. Strategic calculation on whether or not to enter, however, does determine the electorate's choice set. Once a set of candidates has entered, then voting occurs, and each candidate is supported by voters whose own ideal policies lie closest to hers.

Spatial competition among citizen-candidates with no commitment can yield a rich set of equilibria with characteristics different from those of the Downsian model. For example, in the one-dimensional case, when costs of entry are low, there is a one-candidate equilibrium with the candidate entering at the median voter's ideal; if the median voter has entered as a candidate, then no other will enter. A two-candidate equilibrium in one

dimension, contra Downs and Feddersen, does not entail median convergence. If it did, then, following the logic discussed above, an alternative candidate could enter and win the election, thereby obtaining a higher payoff than were she to stay out. Following this logic, the equilibrium involves candidates whose ideal policies are equidistant from (but not equal to) the preference of the median. In this equilibrium, there can be no third candidate who can enter and win (if so, then such a candidate would surely do so), and there is no incentive for a losing candidate to enter either—this can lead to the victory of her least preferred of the two other candidates. Interestingly, however, there can also be  $n > 2$  citizen-candidates in which each candidate has the same chance of winning, and this lottery is preferred by all candidates to the lottery between the remaining candidates should they exit.

The citizen-candidate and the spatial model offer two different approaches to the study of elections. The difference between them is one of assumptions, and it is hard to discern on this basis which approach is better. On the one hand, the spatial model assumes full commitment, whereas the citizen-candidate model allows for none. The assumption of full commitment is strong; the assumption of no commitment seems equally implausible. The approaches also distinguish different modeling choices: In the spatial model, as the name suggests, the action is in the spatial mobility of parties, whereas in the citizen-candidate model it is in the entry of the candidates. As theoretical exercises, both provide valuable insights. Which set of assumptions and modeling choices provides a more accurate reflection of electoral circumstances is largely an empirical question (explored by Lee et al. 2004).

The citizen-candidate approach does, however, have some discernible advantages. Unlike the spatial model, it can easily be adapted to consider issues of strategic voting with more than two candidates. And, unlike the spatial model, there are equilibria even when the

policy space is multidimensional. More substantively, the citizen-candidate model provides a framework for thinking about issues not easily explored in the standard spatial framework. For example, we can think about the distinction between parties and candidates as the active agents announcing policy positions in an electoral game. In some contexts, a common party announcement applies in each and every electoral race (in districts, for example); the particular candidates are of little consequence except as conduits through which parties compete. In other cases, it is the candidate who is the relevant strategic agent; he or she can formulate an individualized electoral strategy keyed to the circumstance of his or her specific race and may possess individual characteristics not necessarily shared by copartisans in other races. Many models blur this distinction, but recent contributions to the citizen-candidate literature have made some headway in exploring the key differences between parties and candidates. Levy (2004) and Morelli (2004) view parties as commitment devices. While individual candidates may not be trusted to implement policies other than those they prefer, they may be able to “tie their hands” by associating with political parties that have policy reputations. The view of Levy and Morelli differs from that of Alesina (1988), who shows that such reputations can emerge from participation in repeated elections by long-lived organizations. Affiliating with a party, therefore, is a form of commitment device not available to independent candidates.

A further set of questions concerns how strategic entry relates to politicians’ types as well as to changes in the institutional environment. Understanding the entry into politics can help shed light on differentials in performance between countries that may be related to the quality of the political class. For example, Caselli & Morelli (2004), Messner & Polborn (2004), and Mattozzi & Merlo (2008), among others, use the citizen-candidate framework to analyze how entrants of different quality respond to incentives of office-holding. These papers focus in particular on the impact



of salaries on candidate qualities. The citizen-candidate model is also very flexible in analyzing the impact of different voting rules on strategic candidacy as explored in the original paper by Besley & Coate (1997) and more recently by Dutta et al. (2001).

Roemer (2001) provides a very thorough and nicely organized treatment of many of the issues in this section. Roemer treats both unidimensional and multidimensional spatial party competition under certainty and uncertainty. As well, he examines factions within parties and devotes four chapters to political economy applications (taxation, expropriation, class politics, and American politics).

## ELECTIONS AND INFORMATION

A standard view of an election, captured by the Downsian model of party competition and its variants already discussed, is that it aggregates preferences and, in its convergent versions, selects representative policies. This is not the only function an election performs. Although voters may know their own preferences, elections are also characterized by uncertainty, for example over which candidate is the higher-quality candidate and over which policies are the most desirable given the social and economic situation. Moreover, information about such matters is typically dispersed, though not necessarily equally, among the population. An election is an aggregation mechanism not only of individual preferences but also of different pieces of information that individuals hold. Here we provide a brief overview of some of the main results in this literature.

### Elections as Information Aggregation

An abstract way of capturing the view of elections as information aggregation mechanisms is to envisage a world where individual voters observe private and possibly noisy signals of a “true” state of the world that is unknown to any one individual. They cast their votes conditional on the information available to them, and votes are then aggregated under

some decision rule in the usual way. This view is particularly useful when analyzing elections in which people are fundamentally in agreement over objectives: for example, electing the best candidate or implementing the best policy. Adopting the parlance of the economics literature on auctions, we can analyze such elections as “common-value” situations. A common-value situation is one in which, conditional on receiving all of the relevant information—who was the best candidate, or which the best policy—all participants would agree on the best outcome rather than being divided by their private tastes. In some cases, particularly those not involving distributional concerns, these models can prove useful—although, as we shall see, these models have also been adapted to allow for private tastes.

As in other electoral contests, outcomes depend on the aggregate vote choices of individuals, and so we might think that voters will, in casting their votes, attempt to anticipate what others will do. Some questions are immediate: How much weight will an individual place on her own information when casting her vote? Will she reveal her information sincerely, or does the fact of group decision making affect the ballot she casts? Moreover, whatever voting strategies are adopted, how likely is it that groups aggregate their private signals into the correct decision? And what is the effect of the institutional environment on voting behavior?

The idea of viewing elections as aggregation mechanisms goes back to Condorcet and his famous Jury Theorem. He supposed that  $n$  individuals independently receive a private signal of a binary (but unknown) state of the world where each signal is correct with probability greater than one half. A democratic procedure for aggregating information is as follows: Each individual reveals her own private signal, these signals are aggregated, and a winner is decided if some proportion greater than or equal to one half is in accord. Condorcet showed that, under majority rule, the probability that the truth is revealed goes to one as the electorate grows large without bound. The strong implication

that emerges then is that the best outcomes obtain when individuals aggregate their views under majority rule.

Condorcet, much in the vein of a modern political scientist, was also interested in exploring how changes to the election rule affect outcomes. In the case of a trial that determines a defendant's guilt or innocence—a typical example of a common-value situation—a requirement of unanimity for conviction ensures that an innocent defendant will almost never be found guilty. That outcome can arise only when all receive the wrong signal; the probability of this event goes to zero in the limit as the electorate grows large.

In his Jury Theorem, Condorcet assumed that individual voters would wish to reveal their privately held information. Of course, the fact that the decision is made by a group can influence whether voters choose to reveal their information. The key insight from the literature that builds on Condorcet, starting with Austen-Smith & Banks (1996), is that fully revealing privately held information need not conform with optimal strategic behavior by individuals. To understand why, note that when an individual's expected payoff depends only on the realized outcome, then the only situation where her payoff depends on her action is when she is pivotal. Consequently, when considering her optimal action, this is the only event she need consider. Moreover, and this is the critical point, a rational individual will consider all relevant information when taking her action.

To illustrate, imagine a common-value situation, such as that analyzed by Condorcet, in which all jurors vote sincerely, and a qualified majority  $k$  is required to convict the defendant. A juror is pivotal in securing a conviction only in the event that  $k-1$  have voted to convict, but this means that  $k-1$  voters must have received signals indicating that the defendant is in fact guilty. The fact that a juror knows she is pivotal thus conveys useful information to her and can provide a strategic incentive that conflicts with informative voting.

A further insight is that even subtle changes to the decision-making environment can

influence strategic voting decisions. Imagine for example that, conditional on the true state of the world, a private signal indicating the defendant's guilt is less likely than one indicating his innocence, so that, if all vote sincerely, the decision is biased against conviction. Now consider a juror who privately observes an "innocent" signal. As above, she has the casting vote when exactly  $k-1$  jurors have voted to convict, but then it must be the case that  $k-1$  jurors believe the defendant to be guilty despite the fact that a guilty signal is less likely. This presents stronger evidence against the juror's own signal of innocence. The important point is that changes in the strategic environment, for example, in the quality of individual signals, or indeed in the institutions of voting, can affect the inferences individuals draw in the event where they are pivotal. This strand has been picked up in several important contributions to the study of elections, which show that electoral institutions can affect optimal behavior—and in surprising ways.

For example, Feddersen & Pesendorfer (1998) challenge the widely held and intuitive view, formalized by Condorcet, that larger qualified majorities would protect innocent defendants from wrongful conviction. Consider, for example, the case where a defendant can be convicted only if jurors' support for conviction is unanimous. This means that a juror is pivotal only when all other jurors have voted to convict. Conditional on all information available to her in the event that she is pivotal, namely that all others have voted guilty, a juror faces a strong incentive to cast a guilty vote even when such a vote conflicts with her private assessment of the case.

If, as indicated, individuals do not condition their actions on their information, then the information-aggregation properties of elections would appear to be undermined. But, as noted by Austen-Smith & Banks (1996), strategic voting can adjust for perceived bias and so may lead to more information being aggregated. In an important contribution, Feddersen & Pesendorfer (1999) show that majority voting rules can lead to "full

information equivalence”: The outcome that prevails under an election with incomplete information is equivalent to one that would have been chosen if all private information were common knowledge. They analyze a situation with two possible outcomes, in which voters have uniformly distributed private preferences and their expected payoff also depends on an unknown shock from a known distribution. Individuals thus face uncertainty over their own payoffs and over the number of voters for each option. With these conditions, the authors show that (when some technical requirements are satisfied) there is a unique fully revealing equilibrium in which those with a strong preference for one of the two outcomes vote for that outcome while those without strong personal preferences vote informatively. This suffices for there to be a full information equilibrium. Although the fraction of the population that votes informatively is small, in the limit, as the population grows large, this fraction is large enough for full information revelation. Why? In a large electorate, the pivotal voter is moderate, and, moreover, can infer the (true) state conditional on being pivotal. Thus, she casts her vote as she would if fully informed.

### Information Aggregation and Coordination

The key logic—that any biases or differences in the decision-making environment, whether institutional or otherwise, generate an endogenous reaction in the actions taken—carries over to a situation with three alternatives. The existence of third candidates produces a fundamental coordination problem as voters no longer condition on two pivotal events. Dewan & Myatt (2007) analyze a voting situation where players choose between two options that are unanimously preferred by a significant group of voters to a status quo, but the payoffs of these options are uncertain. In particular, the payoffs depend on unobserved “fundamentals.” The status quo is replaced if and only if a qualified majority of the voting population coordinates

behind one of the two options. In their common-value setting, players receive private messages about the payoffs associated with each of the alternatives. They assess threshold rules: Players choose an alternative if and only if their message is above (below) some threshold. They show that the endogenous threshold responds to changes in the institutional environment. In particular, increasing the requisite majority required for one alternative biases players in favor of that alternative.

Bouton & Castanheira (2010) analyze information aggregation and coordination in a similar three-alternative environment. The majority is divided between two alternatives; the minority backs a third alternative, which the majority views as strictly inferior to the other alternatives. The authors’ key contribution is in highlighting the role of the electoral system with regard to the selection of the alternative preferred by the majority under perfect information. They show the superiority of approval voting (AV) in different scenarios involving both common and private values. In the latter, the AV procedure produces full information and coordination equivalence if and only if the fraction of partisan voters (i.e., voters who have a fixed preference ordering over candidates) does not exceed a precise threshold, which is decreasing in the size of the minority. A sufficient condition is that information may (even with arbitrarily small probability) affect the majority voters’ preference ordering.

The authors combine a common view about the coordinating role of double-ballot procedures—AV allows voters to vote for their most preferred alternative *and* lend support to their second choice when the minority candidate becomes a threat—with an information rationale. A common-value motive materializes because majority voters understand that their private signal is imperfect; but majority voters do not want to double-vote excessively either. The results show that there is only one strategy that balances these three motives; it implies that full information and coordination equivalence must hold in equilibrium under AV.

## Sequential Voting

Do differences in the basic institutions of voting produce different results? In particular, does it matter whether all voters cast their ballots at the same time or whether voting is staged, as it is, for example, in primary elections? Sequential voting raises the possibility that information aggregation may be more effective. Later voters learn from those who voted previously, and rational voters anticipate how future voters will respond to their actions. Of course, sequential voting also raises the possibility that later voters ignore their own signals and follow the actions of those who go before. Essentially, later voters can free-ride on earlier voters by casting their votes in the same way. This latter prospect raises the possibility of “herding” on previous, perhaps uninformed, actions. When individuals ignore their private signals and follow the inferences they make from previous votes, then the ability of a society to learn through aggregation of private information is limited. Although there is a large literature on such effects in financial markets, there is no direct analogy in electoral markets. In financial markets, individuals receive a direct return on their investments. In elections, individuals receive the outcome that is determined by the joint actions taken by the group under the voting rule in place.

The first study of these effects (Morton & Williams 1999) indeed showed theoretically, and in the lab, that those taking later decisions were often influenced by the aggregate outcomes of earlier stages. Callander (2007) shows herding in a model where later voters payoffs depend positively on coordinating with earlier voters. Dekel & Piccione (2000), however, use sequential rationality to show that the symmetric full information equilibrium (involving strategies where all voters choose the same actions conditional on receiving the same information) in the simultaneous voting game is also an equilibrium of any sequential voting game. Thus, there is an equilibrium in which voters’ strategies are independent of the history of play and that has the same information aggregation properties as those described above. The

intuition for this result is straightforward: Because voters condition on the same event, namely that of being being pivotal, it makes no difference whether they cast their votes sooner or later.<sup>2</sup>

An interesting question arises when voting for an alternative is costly. Persico (2004) studies committee voting with common values where members can make costly investments to identify the best alternatives. Persico explores how such investments depend on the institutional environment, and in particular on the size of the qualified majority required for a decision to be reached. In a sequential structure, the fact that a vote is costly provides more information to subsequent voters: It means that a later voter might place more weight on the votes of those who voted previously. But there is a countervailing effect. In Dekel & Piccione’s (2000) result, informative voting by earlier and nonpivotal voters is part of an equilibrium given the assumption of zero costs. When voting is costly, it may be optimal for such voters to abstain rather than vote informatively. In fact Battaglini (2005) shows that, when allowing for costly voting and abstention, the equilibrium in which the informational gains from simultaneous voting are realized under sequential voting falls away—the set of equilibria of the simultaneous and sequential games are disjoint.

## Information Aggregation and Strategic Signaling

We end this section by pointing to an interesting field that develops and explores a richer set of motives to be taken into consideration when exploring the optimal strategies of voters. If we

<sup>2</sup>Suppose votes are cast sequentially with one vote cast at each time, as in roll-call voting. In this situation, as previous votes are observed, each voter is perfectly informed about the actions taken by others and, if voters vote informatively, about the private signals observed by them. In equilibrium, all those whose votes are cast early (and so do not directly determine the outcome) vote sincerely, and the individual with the casting vote conditions her vote on the set of observed actions.

take the view that elections aggregate information, then it is natural to think that politicians will draw inferences from election outcomes concerning the preferences of voters. This in turn suggests an additional strategic element to voting. A voter may wish to use her vote to communicate her preferences to a policy maker. These ideas are explored in a number of recent papers. Piketty (2000) explores a three-way contest in which a Party A supporter can, by not voting for A this time, communicate her preference for A to offer something different next time, thereby highlighting a more subtle distinction between “strategic” and “sincere” voting than is typically acknowledged in the literature. Shotts (2006) explores communication via abstention in the first round of a two-round voting procedure. Meirowitz & Tucker (2007) explore a situation where voting in earlier (less important) rounds is used to strategically communicate information to candidates in later rounds. Both Razin (2003) and Dutta et al. (2002) explore a tension in voter motives between what they would do as pivotal voters and what they do if they are not pivotal. Even when a vote does not determine the outcome, it can be influential if it provides information that policy makers act upon. Razin explores two (ex post) responsive candidates, one left-wing and one right-wing, competing on a unidimensional policy space with a common shock to voters’ preferences about which each voter is imperfectly and privately informed. After the election, the winning politician will try to extract information about this common shock from the election returns in order to craft policy appropriate to his or her objectives. When allowing for these conflicting motives, Razin finds equilibria in which voters with signals that would normally lead them to vote for the left-wing candidate, vote for the right-wing candidate instead. Meirowitz & Shotts (2008) develop similar intuitions in a model where voters have private information about their preferences. An important implication, not yet fully explored, is that strategic signaling can counteract the effect of elections as aggregation mechanisms.

## Summary and Empirical Implications

The main insight that emerges from the literature on information aggregation is that voters will respond strategically to aspects of their institutional environment. The key insight is that the only event a voter need consider when casting her vote is the event where she is pivotal in determining the outcome; in all other cases, she should be strictly indifferent between her choices of action. As we have seen, different aspects of the institutional environment affect the inferences players draw about the world in the event where they are pivotal. The robustness of these findings to different model specifications presents solid evidence that such strategic tensions are likely to figure in the voter’s calculus, but identifying these effects in an election situation, where there are many confounding factors, is problematic. A large experimental literature, too large to cover here, has focused on isolating these strategic incentives in a laboratory setting (see Palfrey 2009). Overall, the results provide strong evidence for the theories of strategic voting.

Perhaps more surprisingly, there is evidence to support the view that strategic voting will adapt to subtle biases in the decision-making environment. For example, a recent set of experiments tests extensions of Feddersen & Pesendorfer’s (1996a,b) work, where information is asymmetric so that some voters are better informed than others. This complicates the strategic calculus. Imagine a common-value scenario where some portion of the voting population is perfectly informed about the true state of the world, whereas other voters rely on possibly incorrect private information. A vote by an uninformed voter can have two impacts on the outcome: It can break a tie, and it can lead to a tie when prior to voting one candidate leads by a single vote. This is known as the “swing voter’s curse” because of the close analogy with the “winner’s curse” in auction theory: A rational uninformed voter may worry that casting her (uninformed) vote will cancel that of a more informed voter, and so she should rationally abstain. The situation is more



complicated, however, when partisans who always vote in a particular manner are brought into the picture. Then an uninformed but non-partisan voter may wish to cast her vote to even out the playing field, thus counteracting the bias of partisan voters. Battaglini et al. (2008a,b) present evidence supportive of such complicated strategic rationality in a laboratory setting.

## ELECTIONS AS ACCOUNTABILITY MECHANISMS

In the literature discussed thus far, elections serve to aggregate either preferences or information. Another view of elections, however, is that they serve to hold politicians to account. In principle, competitive elections should lead to better policy outcomes, aligning political outcomes with the preferences of citizens.

An effect of elections on performance can arise via two distinct mechanisms. Elections can allow citizens to select between politicians of different types; and elections can provide incentives to politicians, in that voters can sanction the performance of incumbents.

### Elections as Incentive Mechanisms

Voters can retrospectively punish incumbents if, for example, they do not implement the policies they promised to deliver (Austen-Smith & Banks 1989), or they fail to implement preferred policies. The classic example of sanctioning is provided by Ferejohn's (1986) model. In each period an incumbent chooses a (costly) level of effort, and voters use retrospective voting strategies to evaluate her performance.<sup>3</sup> Voters observe a noisy signal of the incumbent's performance that is positively correlated with her effort and reelect the incumbent if the signal exceeds an endogenously chosen threshold. If the threshold is set too high, then an incumbent will deliver zero performance as she will not

be reelected. The optimal threshold leaves the incumbent indifferent between putting in the optimal effort and being reelected and putting in zero effort (and being replaced).

In Ferejohn's model, incumbents share the same preferences and are of the same quality, and citizens' preferences are perfectly aligned. The model captures, in a very pure form, the sanctioning aspect of elections. Voters use their votes to sanction moral hazard, and Ferejohn is able to show the conditions under which such electoral control is effective. Revisiting the conditions of the model raises interesting questions. Since Riker, political scientists have generally viewed elections as either aggregation mechanisms or instruments of control. Ferejohn's analysis suggests the distinction is not so clear cut, for the electorate must agree on the threshold that the politician must surpass in order to be reelected. A single agent, or a mass of like-minded agents, would be able to induce effective performance from the incumbent; but with a heterogenous electorate, and in particular where there are multiple dimensions on which performance might be judged, there may be no effective control.

### Selecting Politicians

When agents are of different types, then selection comes into play. Elections allow voters to distinguish between candidate types, electing "good" politicians over "bad," competent over incompetent, and so on. The question then arises whether the electorate can simultaneously use its votes to both select good types and sanction poor performance. In an influential article, Fearon (1999) illustrated the logical inconsistency in the claim that voters can in fact do so. The ability of voters to sanction performance implies that, conditional upon performance, they must be strictly indifferent between different candidates. Conversely, if voters have an *ex ante* preference for one candidate over another, then they would be unable to commit to a sanctioning mechanism. The reason is that then in the final period the preferred candidate, whether an incumbent or a

<sup>3</sup>The model offers a dynamic extension to an earlier model by Barro (1973).



challenger, is elected for sure. But then the incumbent's prospects of election are not conditional on past performance; the incumbent's incentive scheme will unravel. Fearon's argument is often cited as evidence that elections serve best as screening mechanisms, and there is empirical evidence to support this view (Galasso & Nannicini 2009, Gagliarducci & Nannicini 2010).

The argument that accountability is enhanced via elections as selection mechanisms is intuitive, yet elections may still fail to produce a political class that can govern effectively. Arguably, effective governance requires that those best able to govern are willing to do so and that voters can coordinate on voting such politicians into office. Besley & Coate (1997) explore situations where voters will fail to so coordinate. Caselli & Morelli (2004), by contrast, focus on the supply side. Their key insight is that in the political arena, "rewards do not adjust to elicit an increase in the supply of the scarce resource," the scarce resource being in this case high-quality politicians. They analyze a citizen-candidate world in which agents of heterogeneous ability decide whether to enter politics (and, if elected, receive a rent) or to accept a market wage. Caselli & Morelli (2004) show that if the value of political rents is set endogenously by the existing class of politicians, then there can be a "bad equilibrium" in which the least competent agents are selected for office. Caselli & Morelli's analysis of adverse selection in political markets raises an interesting empirical perspective: Variation in the cross-section of politics according to performance may be driven by variation in the quality of the political class in different countries. The problem then is not selecting those fit to govern, but providing an environment in which the talented are willing to serve; for then strategic complementarities exist that entice other talented agents to step forward also.

### Electoral Incentives to Pander

A recent and related literature focuses on the role of selection in the policies pursued by office holders under asymmetric information. This

literature raises the possibility that a politician's desire for retention, which arises because of his office-seeking motive, can hinder performance. This paradox is due to strategic incentives to avoid disclosure of information that may hinder a politician's reelection chances even though it would benefit the public if disclosed. A situation of particular interest arises when politicians hold privileged information that, in the absence of a reelection motive, would lead them to pursue a policy that is in the public interest despite being unpopular. In these situations, office-seeking politicians have incentive to pander to popular opinion. A recent literature explores how such incentives are affected by democratic procedures and helps fine-tune our understanding of accountability in liberal democracy. In particular, it shows that accountability mechanisms are not immune to populist pressures and so may operate imperfectly.

As a simple example, suppose that there are two possible states of the world  $A$  and  $B$  and two possible policies  $A'$  and  $B'$ . The "best" policy is one that matches the state. Suppose a politician knows the true state to be  $B$  (perhaps she has received a strong signal that this is the case), but the public believes the state to be  $A$  and so believes  $A'$  best serves its interest. The politician's strategic concern for reelection may then sway her to offer  $A'$  even though her private information suggests  $B'$  is the policy that matches the true state of the world and would better serve the public.

A simple way to explore the role of elections is to look at policy choice in a situation where one agent has an electoral incentive not faced by another. Maskin & Tirole (2004) compare outcomes in a situation where the policy is determined by a permanent official (the judge) and one where the decision is made by an official with a reelection concern. They show that an elected official may sometimes pander to perceived wisdom rather than implement a policy she believes is in the better interests of society—and in such situations, delegation to an expert is preferable. Here, then, elections induce undesired behavior by officials that would not arise in the absence of such institutions.

The stark contrast between an elected and unelected official in Maskin & Tirole's analysis raises the question as to how the motive to pander is affected by different features of the competitive process. In particular, what happens when voters can select between different candidates? Canes-Wrone et al. (2001) assess the competitive elements of an election with two candidates, both of whom have office-seeking preferences but who otherwise have identical preferences to those of the voting public. Candidates are distinguished by their quality—defined as their ability to judge the correct policy—and their quality is known only to contestants (voters are uninformed). Canes-Wrone et al. (2001) show that in a two-period model, when office seekers also have policy concerns, the pandering occurs only when the quality gap between a challenger and the incumbent is small. The intuition is that because politicians share voters' concerns, they will pander in order to be reelected only when the fact of their incumbency does not have a large negative effect on public welfare.

What are the policy effects of pandering motives? In contrast to Canes-Wrone et al. (2001), Fox (2007) analyzes a world where politicians' and voters' policy preferences are not aligned. Some politicians have policy biases such that they would implement a particular policy in any state of the world. Voters take such biases into consideration when casting their votes. Fox finds that a politician may sometimes pander so that voters do not perceive her to be such an "ideologue." The effect, in equilibrium, may then be toward policy moderation even when this is not in voters' interests. Related work by Canes-Wrone & Shotts (2007) extends their earlier framework to consider a world where both incumbents and voters may have policy biases. Politicians are ideologues in the sense used by Fox (2007), whereas others are moderates who implement the policy that accords with their private signal. Similarly, some voters are ideologues—they vote for a candidate if and only if he implements a particular alternative irrespective of his private information—whereas others are moderates in that they would

like candidates to respond to their private information. They analyze two distinct forms of behavior: "information-based moderation" occurs when some officials who prefer a particular policy nevertheless choose the alternative that their private information suggests is the best policy; "ideological rigidity" occurs when incumbents who would prefer to be responsive to their private signals nevertheless respond to electoral pressure in choosing policies that conflict with their privately held information. Here ideological rigidity, which stems from a lack of voter information about politicians' types, is a particular form of pandering. Combined, then, these papers provide a rich and nuanced understanding of the way in which election and selection mechanisms affect policy outcomes.

Finally, Kartik & McAfee (2007) relate the concept of pandering to valence, providing yet another instance in which the Median Voter Theorem fails because of a valence effect. In their model, some proportion of candidates (unknown to voters) have "character," which causes them to be committed to their campaign platforms; candidates without character do what they think voters want. Voters have policy preferences, but they will trade away some policy congruence for character. It is easy to see why convergence need not hold at the median. Voters infer that the farther a candidate locates from the median, the higher the posterior probability that that candidate has character. A candidate with character would locate at the median only if that were the position in which the candidate believed. In the Kartik-McAfee model, the candidate without character randomizes in a manner biased toward centrist positions and dependent on the position of the candidate with character. Even though the Median Voter Theorem does not in general hold, there is a tendency toward centrist outcomes. Nevertheless, the idea of valence here is an antidote to pandering and is clearly valuable to the candidate.

## Incumbency and Evaluation

In the standard accountability literature discussed above, voters compare the performance

of an incumbent with the expected performance of a challenger. Their expectations about the challenger are formed independently of any aspect of the political campaign. This is a weakness that is addressed by Gordon et al. (2007). They assess how voters' retrospective evaluations of incumbents and challengers are based on the entry decision of the latter. The paper contributes insights to a well-recognized empirical difficulty, namely that estimates of incumbency advantage may be biased owing to the lack of serious challengers to high-quality incumbents. The key point highlighted by these authors is that the fact of a costly challenge provides relevant information to voters: "A serious and costly challenge can suggest to voters that the candidate believes he has a good chance of winning, in part because an incumbent politician is not all that she appears to be" (Gordon et al. 2007, p. 304). Although the advantage of incumbents in electoral contests is perhaps one of the best-documented empirical regularities in politics, Gordon et al. (2007) uncover a previously ignored subtlety underlying this advantage. A high-quality incumbent is likely to remain unchallenged by a serious contender, but when an incumbent of high perceived quality is challenged, voters tend toward giving the benefit of the doubt to the challenger. Of course in equilibrium some poor-quality candidates may then be tempted into the ring. Gordon et al. show how the equilibrium outcomes respond to differences in the benefits of office versus the cost of entry and the willingness of citizens to invest in finding out the quality of those who stand for office. The work leads to a reevaluation of incumbency advantage and the sources of that advantage, and indeed raises the possibility of incumbency as a source of electoral disadvantage.

A more general insight of Gordon et al. (2007) is that when some participants in the campaign (in this case the contestants) are better informed than voters, then voters will condition their behavior on the actions taken by these actors. A similar mechanism operates in Prat's (2002) analysis of campaign spending. In his model, campaign spending is indirectly

informative in that it constitutes a signal of a politician's valence (such as competence) that is not well known to voters otherwise. These attributes are known to lobbyists, who are in a position to transfer things of value that may be transformed into campaign assets. They thus influence the likelihood of reelection, but do so in return for favors. Prat's theoretical work shows that the ability to raise funds is associated with individual and constituency traits, and so a causal relation between spending and outcomes is hard to identify. Erikson & Palfrey (2000) provide further theoretical and empirical evidence, showing that equilibrium spending levels are related to the perceived quality gap between incumbent and challenger.

Ashworth (2006) follows a similar track, analyzing a model in which candidates observe their own policy preferences (whether moderate and in line with the views of voters, or extreme) but rely on costly access to media to advertise their views. As in Prat (2002), this creates a distortion, in that raising money to run a media campaign comes at the cost of transfers to lobbyists. Prat's results show that the level of campaign spending by the incumbent is nonmonotonic in the electorate's belief that the candidate's views correlate with their own. Straightforwardly, if a candidate has a well-established reputation for following moderate policies desired by the electorate, then she is unwilling to forgo a loss in reputation by taking money from lobbyists. An implication is that campaign spending is correlated with electoral success only for candidates with less moderate reputations. Naive regressions of electoral success on spending, which do not control for these reputation effects, will conflate the impact of contributions with these unobserved (by the analyst) traits of politicians. Moreover, this insight serves as a basis for evaluating the likely policy effects of banning campaign contributions and of public financing of campaigns, which Ashworth (2006) does.

## CONCLUSION

Political economy uses the tools of economics to explore outcomes that arise under political

procedures rather than market allocation. Often political procedures are invoked when markets fail, perhaps due to lack of economic competition or incomplete information. The result is externalities, under- or oversupplied public goods, coordination failures, overutilization of common pool resources, etc. The large literature on political economy generally, and the political economy of elections that we have surveyed here in particular, helps us appreciate that similar problems arise when political “solutions” are employed. When competition is restricted or information incomplete, then political failure is, arguably, a problem of a

magnitude comparable to that of market failure. To be sure, our survey of political economy models of elections has not been comprehensive. We have not treated the literature on voting behavior, campaigning, campaign finance, the media, or election law, for example. Nor have we devoted space to the internal lives of parties and other political organizations. Nevertheless, in underscoring the properties of electoral equilibria in various political circumstances, we hope to have persuaded the reader that political institutions are at best a partial cure to market diseases and that sometimes the cure may be worse than the disease.

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# Contents

A Life in Political Science <i>Sidney Verba</i> .....	i
Leadership: What It Means, What It Does, and What We Want to Know About It <i>John S. Ablquist and Margaret Levi</i> .....	1
Examining the Electoral Connection Across Time <i>Jamie L. Carson and Jeffery A. Jenkins</i> .....	25
Presidential Appointments and Personnel <i>David E. Lewis</i> .....	47
Understanding the 2007–2008 Global Financial Crisis: Lessons for Scholars of International Political Economy <i>Eric Helleiner</i> .....	67
Presidential Power in War <i>William G. Howell</i> .....	89
The Politics of Regulation: From New Institutionalism to New Governance <i>Christopher Carrigan and Cary Coglianese</i> .....	107
The New Judicial Politics of Legal Doctrine <i>Jeffrey R. Lax</i> .....	131
The Rhetoric Revival in Political Theory <i>Bryan Garsten</i> .....	159
The Rhetoric of the Economy and the Polity <i>Deirdre Nansen McCloskey</i> .....	181
The Contribution of Behavioral Economics to Political Science <i>Rick K. Wilson</i> .....	201
The Causes of Nuclear Weapons Proliferation <i>Scott D. Sagan</i> .....	225
Network Analysis and Political Science <i>Michael D. Ward, Katherine Stovel, and Audrey Sacks</i> .....	245

The Big Five Personality Traits in the Political Arena <i>Alan S. Gerber, Gregory A. Huber, David Doherty, and Conor M. Dowling</i> .....	265
Clientelism <i>Allen Hicken</i> .....	289
Political Economy Models of Elections <i>Torun Dewan and Kenneth A. Shepsle</i> .....	311
Modeling Dynamics in Time-Series–Cross-Section Political Economy Data <i>Nathaniel Beck and Jonathan N. Katz</i> .....	331
Voting Technologies <i>Charles Stewart III</i> .....	353

## Indexes

Cumulative Index of Contributing Authors, Volumes 10–14 .....	379
Cumulative Index of Chapter Titles, Volumes 10–14 .....	381

## Errata

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