

Whither Political Economy? Theories, Facts and Issues*

Antonio Merlo[†]

First draft, July 2005

ABSTRACT

In this paper, I discuss recent developments in political economy. By focusing on the microeconomic side of the discipline, I present an overview of current research on four of the fundamental institutions of a political economy: voters, politicians, parties and governments. For each of these topics, I identify and discuss some of the salient questions that have been posed and addressed in the literature, present some stylized models and examples, and summarize the main theoretical findings. Furthermore, I describe the available data, review the relevant empirical evidence, and discuss some of the challenges for empirical research in political economy.

*Prepared for delivery in the symposium session on Political Economy at the 2005 World Congress of the Econometric Society, London, August 19-24, 2005. Financial support from National Science Foundation grant SES-0213755 is gratefully acknowledged. I thank Arianna Degan and Andrea Mattozzi for their help at various stages of this project, and George Mailath, Andy Postelwaite and Ken Wolpin for useful conversations.

[†]Department of Economics, University of Pennsylvania and CEPR <merloa@econ.upenn.edu>

1 Introduction

As a field, Political Economy has undergone a process of dramatic change over the years. This process, which spans over more than two centuries, has helped to define the boundaries of the field's domain, organize its subject matter, and establish an identity for modern political economy.

At the risk of trivializing, it might be useful to summarize some of the steps along the process that has characterized the evolution of the meaning of the term political economy. Starting from the late 1700s, when the work of Adam Smith and David Ricardo played a fundamental role in establishing economics as an autonomous discipline, political economy and economics were for a long time synonymous. A clear indication of the long-lasting lack of separation between political economy and economics is the fact that when in 1892, following the inception of the *Quarterly Journal of Economics* and the *Economic Journal*, the University of Chicago Press also started to publish a journal in economics, it titled it the *Journal of Political Economy*.¹

As a discipline, economics started to organize itself into fields at the beginning of the 20th century. However, while political economy clearly did not fit all of the subject matter of some of the fields, it did not define a separate field. In fact, it was not until the 1950s that the term political economy started to have a different, more precise meaning, separate from the generic notion that politics and government policy are intimately interrelated. The change of emphasis emerges quite clearly from Anthony Downs' 1957 book *An Economic Theory of Democracy* and James Buchanan and Gordon Tullock's 1962 book *The Calculus of Consent*.² At the same time, the publication of Kenneth Arrow's book *Social Choice and Individual*

¹The *Quarterly Journal of Economics* and the *Economic Journal* were established in 1886 and 1891, respectively.

²In the beginning of the book's preface, Buchanan and Tullock (1962; p. v) write: "This is a book about the political organization of a society of free men. Its methodology, its conceptual apparatus, and its analytics are derived, essentially, from the discipline that has as its subject the *economic* organization of such a society. Students and scholars in *politics* will share with us an interest in the central problem under consideration. Their colleagues in *economics* will share with us an interest in the construction of the argument. This work lies squarely along that mythical, and mystical, borderline between these two prodigal offsprings of political economy."

Values in 1951, marked the birth of social choice theory, which provided vital impetus for the development of analytical tools to study the (economic and political) outcomes of political processes.³

During the last twentyfive years, the systematic study of the interactions between political and economic factors has grown considerably within many fields in economics.⁴ At the same time, the increased interest in applications has been paralleled by a surge in theoretical research aimed at developing a common, rigorous language and a coherent class of models to analyze political institutions and outcomes as endogenous, equilibrium phenomena. It is the combination of the outcomes of these efforts that now defines political economy as a field.

As we progress into the 21st century, it seems legitimate at this juncture to try to assess some of the more recent developments in political economy and place them in perspective, with the hope of enhancing our understanding of the directions in which research in the field is moving. Rather than embarking in the impossible task of producing a comprehensive (or even partial) survey of the literature, however, I focus here on a (small) number of specific issues, and attempt to summarize the state of knowledge of these issues, both from a theoretical and an empirical point of view, as well as present my own take on the subjects.

One of the fundamental premises of political economy is that the actions of governments can be understood only as consequences of the political forces that enable governments to acquire and maintain power. Hence, a large fraction of the existing literature has focused on the role of different political institutions in shaping economic policy and their effects on the economy. This literature, which by and large characterizes the macroeconomic side of political economy, is well documented and surveyed in two excellent recent textbooks by Drazen (2000) and Persson and Tabellini (2000), and I do not touch upon it here.⁵

Another defining feature of current research in political economy is the attempt to fully integrate political actors and institutions with private decision-makers in a “general equilib-

³Another important book was Duncan Black’s *The Theory of Committees and Elections*, which was published in 1958.

⁴This voluminous body of research explains, for example, why it is now common practice for textbooks and handbooks in macroeconomics, public, international, and development economics, to name only a few subjects, to include chapters devoted to political economy issues.

⁵See also the recent monographs by Acemoglu and Robinson (2005) and Persson and Tabellini (2005).

rium theory” of the political economy. Much of the recent literature on the microeconomic side of political economy has been devoted to developing models where the set of individuals (or voters), their preferences, and the set of available technologies (which include all the technologies that pertain to the political process), are the only primitives, while politicians, political parties, legislatures, interest groups, governments, and, ultimately, policies and constitutions are equilibrium outcomes.⁶ While no general theory exists to date where all the variables of interest are simultaneously determined in equilibrium, substantial progress has been made to develop classes of models where each of these variables is treated as endogenous.

In this paper, I focus on four of the topics addressed by this literature, which correspond to four of the basic building blocks of political economy. In particular, I start by analyzing the behavior of voters in Section 2. In section 3, I then address the issue of endogenous politicians. Next, I discuss the role of political parties in Section 4. In Section 5, I analyze the formation and dissolution of coalition governments.⁷ For each of these topics I identify and discuss some of the salient questions that have been posed and addressed in the literature, present some stylized models and examples, and summarize the main theoretical findings. Furthermore, I describe the available data, review the relevant empirical evidence, and discuss some of the challenges for empirical research in political economy. Concluding remarks are contained in Section 6.

2 Voters

At a fundamental level, voting is a cornerstone of democracy and citizens’ participation and voting decisions in elections and referenda are fundamental inputs into the political process that shapes the policies adopted by democratic societies. Hence, understanding observed patterns of turnout and voting represents a fundamental step in the understanding of democratic institutions. Moreover, from a theoretical standpoint, voters are the most fundamental primitive of political economy models. Different assumptions about their be-

⁶Two excellent books by Austen-Smith and Banks (1999, 2005) provide systematic accounts of the social-choice and game theoretic foundations of this literature, respectively.

⁷The set of “players” which participate in the democratic policy-making process also include interest groups. For an excellent monograph that presents a coherent theoretical framework to analyze the role that special interest groups play in democratic politics, see Grossman and Helpman (2001).

havior are bound to have important consequences on the implications of these models and, more generally, on the equilibrium interpretation of the behavior of politicians, parties and governments they may induce.

These considerations raise the following two fundamental questions: (i) Why do citizens vote (or abstain from voting)? (ii) How do voters vote? In the remainder of this section, I address each of these two questions in turn.

2.1 Turnout

As pointed out in the Introduction, much of what is new in political economy is the application of modern methods of economic theory to problems that have been addressed for a long time. The issue of understanding citizens' participation in elections is one of these problems.⁸ There is considerable (cross-section and time-series) variation in turnout both within and across countries, as well as within and across types of elections.⁹ By and large, the fractions of eligible voters who participate or abstain in any election at any time in any modern democracy are both significant.¹⁰ Also, participation and abstention rates are in general not uniform in the population of eligible voters, but appear to be correlated with several demographic characteristics, such as, for example, age, education, gender and race.¹¹ Moreover, participation rates tend to increase with the importance of the election.¹² These are some of the most salient observations that emerge from the data.¹³

Can political economy explain these observations? The starting point of theoretical research on voter turnout is represented by the “calculus of voting” framework, originally

⁸Henceforth, I use the word election to refer to any situation where eligible voters are asked to express their opinion through voting. This also includes referenda.

⁹See, e.g., Blais (2000).

¹⁰In general, while various penalties for failing to vote exist in some countries, they tend to be rather minimal and abstention is a noticeable phenomenon even where voting is compulsory (see, e.g., Blais (2000)).

¹¹See, e.g., Wolfinger and Rosenstone (1980).

¹²For example, turnout is generally higher in national than in local elections and referenda, and in presidential elections than elections for other public offices (see, e.g., Blais (2000)).

¹³Official records of voter participation in elections are available at the aggregate level for most countries. Survey data at the individual level are also available for a limited number of countries, including Australia, Canada, the U.K. and the U.S. (see, e.g., Blais (2000)).

formulated by Downs (1957) and later developed by Tullock (1967) and Riker and Ordeshook (1968). According to this framework, given a citizenry of size N facing an election e where there are two alternatives (e.g., two candidates or two policy proposals), citizen $i \in N$ votes in the election if

$$p_i^e B_i^e + D_i^e \geq C_i^e$$

and abstains otherwise. Here, p_i^e is the probability that citizen i 's vote decides the election (i.e., her vote is pivotal), B_i^e is the (indirect) benefit to citizen i associated with inducing her desired electoral outcome, D_i^e is the (direct) benefit from voting in election e , which includes any benefit citizen i may derive from fulfilling her civic duty of voting, and C_i^e is citizen i 's cost of voting in election e . The terms $p_i^e B_i^e$ and D_i^e are often referred to as capturing the instrumental (or investment) and expressive (or consumption) value of voting, respectively.

In the original formulation of the calculus of voting model, B_i^e , D_i^e and C_i^e are specified as fundamental components of a citizen's preferences and are therefore treated as primitives. Also, as long as the size of the electorate N is large, p_i^e is typically thought of as being virtually equal to zero, thus making the term $p_i^e B_i^e$ negligible. Hence, to the extent that (the unobservable) D_i^e and C_i^e are heterogeneous in the citizenry and correlated with (observable) demographic characteristics, and their distributions (possibly conditional on location and election specific characteristics) differ across citizenries and elections, the model can potentially account for the patterns observed in the data. At the same time, however, since differences in behavior are mechanically induced by differences in preferences (which are both exogenous and unobservable), the model fails to provide a theory that can explain the evidence.

In light of this failure, most of the recent theoretical research on voter turnout has been focused on developing models where p_i^e , D_i^e and C_i^e are endogenous variables, derived in equilibrium from more fundamental primitives. It is useful to divide these models in three groups, depending on whether their main objective is to endogenize p_i^e , D_i^e or C_i^e , respectively. Pivotal-voter models (e.g., Borgers (2004), Ledyard (1984) and Palfrey and Rosenthal (1983, 1985)), endogenize the probability that a citizen's vote is decisive. Ethical-voter models (e.g., Coate and Conlin (2004), Feddersen and Sandroni (2002) and Harsanyi (1980)), endogenize the concept of civic-duty. Uncertain-voter models (e.g., Degan (2005), Degan

and Merlo (2004), Feddersen and Pesendorfer (1996, 1999) and Matsusaka (1995)), endogenize a component of the cost of voting. For each class of models I present a simple example that illustrates the main intuition and I discuss their general implications for interpreting the empirical evidence.¹⁴

Pivotal-voter models: Consider the following example based on Borgers (2004) and Palfrey and Rosenthal (1985). A society has to decide between two alternatives, a and b , in an election e . There are N citizens, where N is large but finite, indexed by $i \in \{1, \dots, N\}$. The citizenry is divided between supporters of a and supporters of b , where each citizen knows the alternative she supports. The probability that each citizen is either a supporter of a or b is equal to $1/2$. This probability is known by all citizens. However, citizens do not know the number of supporters of each alternative. If alternative $j \in \{a, b\}$ is implemented, each supporter of j receives a utility benefit equal to 1 while each supporter of the other alternative incurs a utility loss equal to -1 .

Citizens (simultaneously and independently) decide whether to vote or abstain. If they choose to vote, they vote in favor of the alternative they support. Voting is costly and citizens do not derive any direct benefit from voting (that is, $D_i^e = 0$ for all $i \in \{1, \dots, N\}$). Voting costs are independently and identically distributed in the citizenry according to a uniform distribution on the support $[0, 1]$. Each citizen i only knows her own voting cost C_i^e and the distribution of voting costs in the population.

Since the probability p_i^e that citizen i 's vote decides the election depends on the (endogenous) composition of the electorate, this situation describes a game of incomplete information, where the choice of whether or not to participate in the election is a strategic decision. Given the number of citizens who participate in the election, the alternative $j \in \{a, b\}$ that receives a majority of the votes is implemented. In the event of a tie, each alternative is implemented with probability $1/2$.

In the environment described here, the only motivation for voting is the possibility of affecting the electoral outcome. Since many citizens share the same preferences for one alternative over the other, and the electoral outcome is a public good, individuals may have

¹⁴For recent surveys on the literature on voter turnout see, e.g., Aldrich (1993), Feddersen (2004) and Dhillon and Peralta (2002).

an incentive to free-ride and abstain. On the other hand, however, there is an element of competition due to the fact that different groups of citizens prefer different alternatives. The existence of such conflict provides an incentive for people to participate in the election. The combination of these two opposing forces determines the equilibrium turnout and electoral outcome.

Following the literature we look for a symmetric Bayesian-Nash Equilibrium of the game, in which all citizens use the same cutoff strategy, that is each citizen chooses to vote if and only if her voting cost is below some critical level. Let C^* denote the equilibrium cutoff level. To characterize C^* , consider the decision of a generic citizen i and let v be the ex ante probability, before learning C_i^e , with which any individual votes given the equilibrium strategy. Suppose the remaining $N - 1$ citizens are playing according to the equilibrium strategy (that is, they vote if their cost is below C^*), and let σ denote the number of individuals other than i who choose to vote. Note that the distribution of the random variable σ is binomial with parameters $N - 1$ and v . Since in equilibrium $v = \Pr \{C_i^e \leq C^*\} = C^*$, when the other $N - 1$ citizens are playing according to the equilibrium strategy, the probability that $\sigma = s$, for any $s \in \{0, \dots, N - 1\}$, is

$$\binom{N - 1}{s} (C^*)^s (1 - C^*)^{N - 1 - s}.$$

Let $p_i^e(C^*)$ be the probability that citizen i 's vote is pivotal. Since alternative $j \in \{a, b\}$ is implemented for sure if a majority of the voters supports it and is implemented with probability $1/2$ in the event of a tie, citizen i 's vote is pivotal only if either her preferred alternative is behind by one vote or the number of votes for each alternative is equal. In either case, citizen i 's vote increases her expected utility by 1 . In no other circumstance, will her vote affect the electoral outcome and, consequently, her expected utility. Hence, $p_i^e(C^*)$ is the probability that the number of votes for i 's preferred alternative minus the number of votes for the other alternative is either -1 or 0 , and i 's expected benefit of voting is $p_i^e(C^*) B_i^e = p_i^e(C^*)$. Since citizen i will want to vote only if $p_i^e B_i^e$ exceeds her cost of voting C_i^e , we have that in equilibrium

$$p_i^e(C^*) = C^*.$$

To compute the equilibrium we need to know the function $p_i^e(C^*)$, where we know that

$p_i^e(0) = 1$ and $p_i^e(1) = 0$. Let $\pi_i^e(s)$ denote the probability that voter i is pivotal conditional on the number of other voters being s . Note that $\pi_i^e(0) = 1$ and $\pi_i^e(1) = \frac{1}{2}$. In general, if $s \geq 1$ and s is odd, then citizen i 's vote is pivotal only if the number of other votes for her preferred alternative is $\frac{s-1}{2}$ and the number of votes for the other alternative is $\frac{s+1}{2}$. This event occurs with probability

$$\begin{aligned}\pi_i^e(s) &= \binom{s}{\frac{s-1}{2}} \left(\frac{1}{2}\right)^{\frac{s-1}{2}} \left(\frac{1}{2}\right)^{\frac{s+1}{2}} \\ &= \binom{s}{\frac{s-1}{2}} \left(\frac{1}{2}\right)^s.\end{aligned}$$

Note that $\pi_i^e(s)$ is non-increasing in s . In fact, if s is odd

$$\begin{aligned}\pi_i^e(s+1) &= \binom{s+1}{\frac{s+1}{2}} \left(\frac{1}{2}\right)^{\frac{s+1}{2}} \left(\frac{1}{2}\right)^{\frac{s+1}{2}} \\ &= \binom{s}{\frac{s-1}{2}} \frac{s+1}{(s+1)/2} \left(\frac{1}{2}\right)^{s+1} = \pi_i^e(s),\end{aligned}$$

and

$$\begin{aligned}\pi_i^e(s+2) &= \binom{s+2}{\frac{s+1}{2}} \left(\frac{1}{2}\right)^{s+2} \\ &= \frac{s+2}{s+3} \pi(s+1) < \pi_i^e(s+1).\end{aligned}$$

We can now use $\pi_i^e(s)$ to compute $p_i^e(C^*)$. In particular, we have that

$$\begin{aligned}p_i^e(C^*) &= \sum_{s=0}^{N-1} \binom{N-1}{s} (C^*)^s (1-C^*)^{N-1-s} \pi_i^e(s) \\ &= \sum_{s=0}^{N-1} \binom{N-1}{s} (C^*)^s (1-C^*)^{N-1-s} \binom{s}{\frac{s-1}{2}} \left(\frac{1}{2}\right)^s,\end{aligned}$$

where $p_i^e(C^*)$ is strictly decreasing in C^* . The (strict) monotonicity of $p_i^e(C^*)$ derives from the fact that increasing C^* stochastically increases s (i.e., it increases the probability that the number of other voters is relatively large) and $\pi(s)$ is weakly decreasing in s .

Finally, let

$$Q(C^*) = p_i^e(C^*) - C^*.$$

Since

$$Q(1) = -1 < 0 < 1 = Q(0)$$

and

$$\frac{\partial Q(C^*)}{\partial C^*} = \frac{\partial p_i^e(C^*)}{\partial C^*} - 1 < 0,$$

there exists a unique $C^* \in (0, 1)$ such that

$$Q(C^*) = 0.$$

While a closed form expression for C^* as a function of N cannot be derived, the value of C^* can easily be computed numerically for different values of N . These calculations, reported here for values of N equal to 100, 500 and 5000, yield the following:

$$C^* = \begin{cases} 0.18 & \text{if } N = 100 \\ 0.11 & \text{if } N = 500 \\ 0.05 & \text{if } N = 5,000 \end{cases}$$

and as $N \rightarrow \infty$, $C^* \rightarrow 0$. Since C^* denotes the equilibrium cutoff level such that each citizen chooses to participate in the election if and only if her voting cost is below the cutoff, positive turnout occurs in equilibrium. However, as the size of the electorate becomes large, turnout decreases and in the limit everybody abstains.

While these results were obtained in the context of a very specific example, they extend to more general environments and are typical of pivotal-voter models.¹⁵ Hence, pivotal-voter models can in principle explain positive levels of participation in elections, but only when the number of eligible voters is relatively small. For large electorates, on the other hand, extending the calculus of voting framework by making p_i^e endogenous in a game-theoretic environment fails to provide a theory that can explain the empirical observations.

Empirical research has attempted to establish whether, holding everything else constant, voter turnout increases with the expected closeness of an election, which relates to the probability of being pivotal.¹⁶ By and large, evidence based on individual-level data shows that this is not the case in large elections.¹⁷ Regardless of whether or not one believes that this is a robust empirical finding, however, this is hardly a “test” of pivotal-voter models.

¹⁵See, e.g., Borgers (2004), Coate, Conlin and Moro (2004), Ledyard (1984) and Palfrey and Rosenthal (1985).

¹⁶See, e.g., Matsusaka and Palda (1999) for a survey.

¹⁷See, e.g., Ferejohn and Fiorina (1975), Matsusaka and Palda (1993) and Kirchgaessner and Schulz (2005).

Coate, Conlin and Moro (2004), on the other hand, directly address the question of whether this class of models can explain voter participation in small-scale elections. Their analysis, which is based on the structural estimation of a pivotal-voter model using data on local referenda in Texas, shows that while the model is capable of predicting observed levels of turnout quite well, at the same time it predicts closer electoral outcomes than they are in the data. In other words, the only way the theory behind pivotal-voter models can explain actual turnout, is if elections are very close, which makes their outcome very uncertain and hence individual votes more likely to be pivotal. These circumstances, however, are not consistent with what is observed in reality, thus leading to a rejection of this class of models as useful tools to interpret the evidence.

Ethical-voter models: Consider the following example based on Coate and Conlin (2004). For consistency of exposition, I use a formulation that is similar to that of the previous example. A society has to decide between two alternatives, a and b , in an election e . There is a continuum of citizens of measure one, where i denotes a generic citizen. The citizenry is divided between supporters of a and supporters of b , where each citizen knows the alternative she supports, but does not know the actual fraction of supporters of each alternative in the population. From the point of view of a generic citizen i , the fraction of citizens who support alternative a is the realization of a random variable μ which has a uniform distribution on the support $[0, 1]$. Hence, the expected fraction of citizens supporting each alternative is equal to $1/2$. If alternative $j \in \{a, b\}$ is implemented, each supporter of j receives a utility benefit equal to 1 while each supporter of the other alternative incurs a utility loss equal to -1 .

Citizens have to decide whether to vote or abstain. If they choose to vote, they vote in favor of the alternative they support. Voting is costly and voting costs are independently and identically distributed in the citizenry according to a uniform distribution on the support $[0, 1]$. Each citizen i only knows her own voting cost C_i^e and the distribution of voting costs in the population. The electoral outcome is determined by majority rule, where alternative a is implemented if the fraction of votes in favor of a exceeds the fraction of votes in favor of b .¹⁸

¹⁸Since there is a continuum of voters, ties are a measure zero event and can therefore be ignored.

Citizens are ethical, in the sense that they are “group rule-utilitarians,” where a group is defined by which alternative a citizen prefers. More precisely, individuals follow the voting rule that, if followed by everybody else in their group, would maximize their group’s aggregate utility. Hence, each group’s optimal voting rule specifies a critical voting cost such that all individuals in the group whose voting cost is below the critical level should vote.

Let C_a and C_b denote the critical voting costs for the supporters of a and b , respectively. If citizen i is a supporter of alternative $j \in \{a, b\}$, she votes if $C_i^e < C_j$ and abstains otherwise. Hence, the ex ante probability, before learning C_i^e , that a generic supporter of alternative j votes is

$$\Pr \{C_i^e < C_j\} = C_j$$

and her expected voting cost is equal to

$$\int_0^{C_j} C_i^e dC = \frac{C_j^2}{2}.$$

Alternative a is therefore implemented if

$$\mu C_a > (1 - \mu) C_b$$

(that is, the fraction of supporters of a who vote exceeds the fraction of supporters of b who vote), or equivalently

$$\mu > \frac{C_b}{C_a + C_b}.$$

In the environment described here, since there is a continuum of voters, no single vote can ever be pivotal (that is, $p_i^e B_i^e = 0$ for all i). Hence, the only motivation for voting is to fulfill one’s civic duty to “do the right thing.” The contribution of ethical-voter models, is to make this notion precise and characterize equilibrium voter turnout in game-theoretic environments where citizens are rule utilitarians.¹⁹ In particular, the key innovation of this class of models is to assume that each citizen has an action (that is, either to participate in the election or abstain) that is optimal for her to take on moral or ethical grounds, and receives an additional payoff from taking this action. However, what is the ethical thing to do

¹⁹For thorough discussions of the general notion of rule-utilitarianism, see Harsanyi (1980) and Feddersen and Sandroni (2002).

for each citizen is not predetermined, but is instead endogenously derived as an equilibrium outcome of a game.

In the context of the example, an equilibrium is given by a pair of critical costs, C_a^* and C_b^* such that, for each $j, j' = a, b, j' \neq j$, C_j^* maximizes the aggregate expected utility of the group of supporters of alternative j given $C_{j'}$. To characterize the equilibrium, note that the aggregate expected utility of the group of citizens who support alternative a is given by

$$\begin{aligned} U_a(C_a, C_b) &= \int_0^{\frac{C_b}{C_a+C_b}} \mu \left(-1 - \frac{C_a^2}{2} \right) d\mu + \int_{\frac{C_b}{C_a+C_b}}^1 \mu \left(1 - \frac{C_a^2}{2} \right) d\mu \\ &= - \int_0^{\frac{C_b}{C_a+C_b}} \mu d\mu + \int_{\frac{C_b}{C_a+C_b}}^1 \mu d\mu - \int_0^1 \mu \frac{C_a^2}{2} d\mu = \frac{1}{2} - \left(\frac{C_b}{C_a + C_b} \right)^2 - \frac{C_a^2}{4} \end{aligned}$$

Similarly, the aggregate expected utility of the group of citizens who support alternative b is given by

$$\begin{aligned} U_b(C_a, C_b) &= \int_0^{\frac{C_b}{C_a+C_b}} (1 - \mu) \left(1 - \frac{C_b^2}{2} \right) d\mu + \int_{\frac{C_b}{C_a+C_b}}^1 (1 - \mu) \left(-1 - \frac{C_b^2}{2} \right) d\mu \\ &= \int_0^{\frac{C_b}{C_a+C_b}} (1 - \mu) d\mu - \int_{\frac{C_b}{C_a+C_b}}^1 (1 - \mu) d\mu - \int_0^1 (1 - \mu) \frac{C_b^2}{2} d\mu \\ &= 2 \left(\frac{C_b}{C_a + C_b} \right) - \frac{1}{2} - \left(\frac{C_b}{C_a + C_b} \right)^2 - \frac{C_b^2}{4} \end{aligned}$$

From the maximization of $U_a(C_a, C_b)$ with respect to $C_a \in [0, 1]$ and the maximization of $U_b(C_a^*, C_b)$ with respect to $C_b \in [0, 1]$, we obtain the following system of first-order conditions:

$$\begin{cases} \frac{2C_b^{*2}}{(C_a+C_b^*)^3} - \frac{C_a}{2} = 0 \\ \frac{2}{C_a+C_b} - \frac{4C_b}{(C_a^*+C_b)^2} + \frac{2C_b^2}{(C_a^*+C_b)^3} - \frac{C_b}{2} = 0 \end{cases}$$

Solving for C_a^* and C_b^* , we obtain that there exists a unique pair of (interior) equilibrium critical levels of voting costs

$$C_a^* = C_b^* = C^* = \frac{\sqrt{2}}{2} = 0.71$$

such that each citizen votes if her voting cost is below C^* and abstains otherwise. Hence, while a significant fraction of the population of eligible voters abstains in equilibrium, voter turnout may be substantial.

The main logic illustrated in the simple example also holds in more general environments, where different specifications of the benefits citizens derive from various alternatives, the distribution of the fraction of citizens who support them, and the distribution of voting costs in the population generate interesting additional predictions.²⁰ For instance, if in the example we replace the assumption that the fraction μ of citizens who support alternative a has a uniform distribution, with the alternative assumption that the density function of μ is equal to 2μ (which implies that the expected fraction of citizens supporting alternative a is equal to $2/3$ instead of $1/2$), we obtain that the equilibrium critical costs are $C_a^* = 0.68$ and $C_b^* = 0.85$. Hence, equilibrium turnout is higher among the “minority” (that is, the group with the smaller expected number of supporters).

These considerations suggest that ethical-voter models provide a promising framework to confront the empirical evidence. Not only do they provide a theory that can explain observed patterns of voter turnout, but they also place additional restrictions on the data that make the theory falsifiable (from a Popperian perspective). An excellent example of using this theory as a way to impose discipline on an empirical investigation of voter turnout in local referenda is the article by Coate and Conlin (2004), who specify a group rule-utilitarian model and structurally estimates it using data on local liquor referenda in Texas. Their analysis shows that the estimated model is capable of reproducing all of the important features of the data well and generates interesting implications for the interpretation of the evidence.

Uncertain-voter models: Consider the following example based on Degan and Merlo (2004). As in the two previous examples, a society has to decide between two alternatives, a and b , in an election e . To simplify exposition, it is convenient to formulate this example in a spatial context, where alternatives correspond to positions on a unidimensional ideological space (e.g., the liberal-conservative ideological spectrum), $[-1, 1]$. In particular, alternatives a and b are a pair of random variables which take values $(y_a, y_b) \in Y = Y_a \times Y_b$, where $Y_a = \{-1/2, -1/4, 0\}$ and $Y_b = \{0, 1/4, 1/2\}$. The joint distribution of (a, b) on the

²⁰See, e.g., Coate and Conlin (2004) and Feddersen and Sandroni (2002).

support Y , $P = \{p(y_a, y_b)\}_{(y_a, y_b) \in Y}$, is such that $p(0, 0) = 0$ and $p(y_a, y_b) = 1/8$ for all $(y_a, y_b) \neq (0, 0)$.

There is a continuum of citizens of measure one, where i denotes a generic citizen. Each citizen has a preferred ideology, or ideal point, $y_i \in [-1, 1]$, and evaluates alternative ideologies $y \in [-1, 1]$ according to the payoff function

$$u_i(y) = -(y_i - y)^2.$$

The distribution of preferred ideologies in the citizenry is uniform on the support $[-1, 1]$.

Citizens have to decide whether to vote or abstain, and if they vote, which alternative to support. Each citizen i derives a direct benefit from voting by fulfilling her civic duty, D_i^e . These benefits are distributed in the citizenry according to a uniform distribution on the support $[0, 1]$. Citizens do not know the realization (y_a, y_b) of the pair of alternatives (a, b) , but only know the distribution P . Clearly, because citizens are uncertain about the alternatives in the election, they may make “voting mistakes” or, equivalently, vote for the “wrong alternative.” This is what makes voting (potentially) costly in this framework.

Let

$$\begin{aligned} C_i(a) &= \sum_{(y_a, y_b) \in Y} 1\{u_i(y_a) < u_i(y_b)\} [(u_i(y_b) - u_i(y_a))p(y_a, y_b)] \\ &= \sum_{(y_a, y_b) \in Y} 1\{u_i(y_a) < u_i(y_b)\} [(-(y_b^2 - y_a^2) + 2y_i(y_b - y_a))p(y_a, y_b)] \end{aligned}$$

be the (expected) cost for citizen i of voting for alternative a , where $1\{\cdot\}$ is an indicator function that takes the value one if the expression within braces is true and zero otherwise. This cost corresponds to the expected utility loss for citizen i if she were to vote for candidate a in states of the world where the realizations (y_a, y_b) are such that she should instead vote for b . Analogously,

$$\begin{aligned} C_i(b) &= \sum_{(y_a, y_b) \in Y} 1\{u_i(y_a) > u_i(y_b)\} [(u_i(y_a) - u_i(y_b))p(y_a, y_b)] \\ &= \sum_{(y_a, y_b) \in Y} 1\{u_i(y_a) > u_i(y_b)\} [((y_b^2 - y_a^2) - 2y_i(y_b - y_a))p(y_a, y_b)] \end{aligned}$$

is the (expected) cost for citizen i of voting for alternative b .

Like in the previous example, since in the environment described here there is a continuum of voters, no single vote can ever be pivotal (that is, $p_i^e B_i^e = 0$ for all i).²¹ Hence, the only trade-off that is relevant in a citizen's decision to participate in an election is the comparison of the costs and benefits of voting. In uncertain-voter models, the emphasis is on deriving the cost of voting endogenously. In particular, voting may be costly because of citizens' uncertainty (or lack of information) about the alternatives they are facing in an election, which may lead them to make mistakes they may regret. The extent to which voting is costly for different citizens, and hence their propensity to participate in elections, will in general depend on their ideological preferences relative to the distribution of the possible alternatives they may be facing, as well as their degree of uncertainty.

Following Degan and Merlo (2004), the decision problem of each citizen can be formulated as a two-stage optimization problem, where in the first stage the citizen decides whether or not to participate in the election and, in the second stage, she decides who to vote for (conditional on voting). To solve this problem we work backwards, starting from the last stage. In the second stage, citizen i 's optimal voting rule is:

$$v_i^*(y_i) = \begin{cases} a & \text{if } C_i(b) > C_i(a) \\ b & \text{if } C_i(b) < C_i(a) \end{cases}$$

and in the event that $C_i(b) = C_i(a)$ citizen i randomizes between the two alternatives with equal probability. Here, $v_i^*(\cdot) = j$ indicates that if citizen i were to vote, she would vote for alternative $j \in \{a, b\}$. Using the expressions we derived above for $C_i(a)$ and $C_i(b)$, and the definition of Y and P , we obtain that

$$\begin{aligned} C_i(b) - C_i(a) &= \sum_{(y_a, y_b) \in Y} (y_b^2 - y_a^2) p(y_a, y_b) - 2y_i \sum_{(y_a, y_b) \in Y} (y_b - y_a) p(y_a, y_b) \\ &= -\frac{9}{8} y_i \end{aligned}$$

which implies that $C_i(b) < C_i(a)$ if and only if $y_i > 0$. Hence,

$$v_i^*(y_i) = \begin{cases} a & \text{if } y_i < 0 \\ b & \text{if } y_i > 0 \end{cases}$$

²¹In other uncertain-voter models, like for example Feddersen and Pesendorfer (1996, 1999), voters may be pivotal. However, as I explained before, my primary objective here is to isolate the distinctive characteristic of each class of models.

and citizens with ideal points equal to zero randomize between the two alternatives with equal probability.

This voting rule implies a cost for citizen i of participating in election e

$$C_i^e(y_i) = C_i(v_i^*(y_i)).$$

Hence, in the first stage, citizen i 's optimal participation rule is such that she participates if $C_i^e(\cdot) < D_i^e$ and abstains otherwise. To calculate the voting costs note that for each possible realization (y_a, y_b) of (a, b) , given the optimal voting rules of all citizens, we can determine if a citizen would be making a mistake or not if she were to vote, and calculate the cost associated with the mistake. If $(y_a, y_b) = (-1/2, 0)$, the cost is positive only for citizens with $-1/4 < y_i < 0$ (since they would vote for a but should instead vote for b), and is equal to $1/4 + y_i$. If $(y_a, y_b) = (-1/2, 1/4)$ the cost is positive only for citizens with $-1/8 < y_i < 0$ (since they would vote for a but should instead vote for b), and is equal to $3/16 + (3/2)y_i$. If $(y_a, y_b) = (-1/4, 0)$ the cost is positive only for citizens with $-1/8 < y_i < 0$ (since they would vote for a but should instead vote for b), and is equal to $1/16 + y_i/2$. The cost calculations for the remaining four possible realizations of (a, b) are the same except that they apply to citizens with positive ideal points (who could sometime be making mistakes by voting for b when they should instead vote for a). Hence, we obtain that

$$C_i^e(y_i) = \begin{cases} 0 & \text{if } y_i \in [-1, -\frac{1}{4}] \cup [\frac{1}{4}, 1] \\ \frac{1-4|y_i|}{32} & \text{if } y_i \in (-\frac{1}{4}, -\frac{1}{8}) \cup (\frac{1}{8}, \frac{1}{4}) \\ \frac{1-6|y_i|}{16} & \text{if } y_i \in [-\frac{1}{8}, \frac{1}{8}] \end{cases}$$

and citizens participate in the election if $C_i^e(\cdot) < D_i^e$ and abstain otherwise. Note that while citizens with relatively extreme ideal points always participate, all other groups of citizens abstain to various degrees. In particular, the more ‘‘moderate’’ a citizen, the higher the probability she will abstain.

Once again the results derived in this simple example generalize to more complicated environments, and uncertain-voter models offer a valid alternative to ethical-voter models as useful tools for interpreting the empirical evidence.²² In fact, the class of uncertain-voter

²²See, e.g., Degan (2005), Degan and Merlo (2004), Feddersen and Pesendorfer (1996, 1999) and Matsusaka (1995).

models provides theoretical explanations for much of the evidence on voter turnout, relates it to fundamentals, such as information and ideology, and places additional restrictions on the data that can be used to validate the models. Degan and Merlo (2004), for example, propose an uncertain-voter model to explain observed patterns of turnout and voting in U.S. presidential and congressional elections. They structurally estimate the model using individual-level data for the period 1970-2000, and use the estimated model to evaluate the effects of counterfactual experiments on electoral outcomes.

Their analysis implies a relationship between information and turnout (since uninformed citizens are more likely to make “voting mistakes” and hence have larger expected costs of voting, they abstain more than informed citizens), which can be quantified and related to demographic characteristics. It also provides an explanation for the fact that, in every presidential election year, we always observe more abstention in congressional elections than in the presidential election, and some selective abstention (where some citizens vote in one election, typically the one for president, but not in the other). Their estimates imply that the average expected cost of voting in the presidential election is always smaller than in a congressional election, which is due to the fact that, in general, there is more information, and hence less uncertainty, about presidential candidates than congressional candidates.

2.2 Voting

The second fundamental issue I address in this section of the paper has to do with the way voters vote. In particular, I am interested in the way the political economy literature has addressed the question of whether citizens vote “sincerely” or “strategically.” In order to even understand this question, we have to start by defining what sincere and strategic behavior mean in the context of voting. Consider a situation where a society of size N is facing an election e where there are $M \geq 2$ alternatives and each citizen $i = 1, \dots, N$ has a (strict) preference ranking of these alternatives. Putting aside the issue of abstention (e.g., think of a situation where $D_i^e > C_i^e$ for all $i \in \{1, \dots, N\}$), citizens vote sincerely if they cast their vote in favor of the alternative they most prefer, independently of what other citizens do. They vote strategically if their voting decision is a best-response to what other citizens do.

Clearly, the notion of strategic voting is intimately related to the (endogenous) probability that a vote is decisive (which I already touched upon in the context of pivotal-voter models, where abstention, rather than whom to vote for, is the strategic decision). Also, if citizen vote strategically, the characterization of the equilibria of a voting game depends on the voting rule which is used to determine the outcome of the election and on the equilibrium concept which is chosen to solve the game. Both of these aspects have been extensively addressed in the literature and I will not discuss them here.²³ Instead, I will briefly discuss the restrictions that sincere and strategic voting place on the data and their implications for interpreting the empirical evidence.

In the context of the situation described above, if we consider a single (isolated) election where there are only two alternatives, sincere and strategic voting are equivalent, since voting sincerely is the unique undominated decision for each citizen.²⁴ In other words, since sincere and strategic voting induce the same voting profiles, and hence the same outcomes, they are observationally equivalent. This implies that there are no restrictions coming from the theory that allow a researcher to use only data on how voters vote in a single election where there are only two alternatives to discriminate among alternative models. In such context, identification must rely on additional data. Also, the issue of model validation should not be addressed solely on the basis of within-sample fit, but should also rely on the comparison of the relative out-of-sample performance of alternative models.

The equivalence between sincere and strategic voting, however, breaks down as soon as there are more than two alternatives. This can be easily illustrated with a simple textbook example taken from Moulin (1986). Consider a situation where a society of size $N = 3$ is facing an election e where there are 3 alternatives, a , b and c , and citizens $i = 1, 2, 3$ have the following (strict) preference orderings. Citizen 1 prefers a to b to c ; citizen 2 prefers c to a to b ; and citizen 3 prefers b to c to a . All citizens vote and the alternative that receives the largest number of votes is implemented. In the event of a tie, the vote of citizen 1 determines the outcome of the election.

²³See, e.g., Austen-Smith and Banks (2005), Feddersen and Pesendorfer (1997), Myerson (1999, 2000, 2002), and Myerson and Weber (1993).

²⁴See, e.g., Austen-Smith and Banks (2005).

If voting is sincere, the votes of the three citizens are characterized by the vector (a, c, b) , where the i th component corresponds to the vote of citizen $i = 1, 2, 3$, and the electoral outcome is that alternative a is implemented. If, on the other hand, voters vote strategically, the game has 5 pure strategy Nash equilibria, where the equilibrium voting profiles are (a, c, c) , (a, a, a) , (a, a, b) , (b, b, b) , and (c, c, c) and the corresponding equilibrium electoral outcomes are c , a , a , b , and c , respectively. Note that the sincere voting profile (a, c, b) is not a Nash equilibrium. Also, only in two of the equilibria (i.e., (a, c, c) and (a, a, b)), no citizen is voting for her least preferred choice. Moreover, the only equilibrium that survives iterated deletion of weakly dominated strategies is (a, c, c) , where alternative c is implemented. To see that this is the case, notice that if citizens 2 and 3 vote for the same alternative, that alternative is implemented regardless of citizen 1's vote, while if they vote for different alternatives, citizen 1's vote determines the electoral outcome. Hence, to vote for a is a weakly dominant strategy for citizen 1. Next, notice that for citizen 2 it is a weakly dominated strategy to vote for her least preferred alternative, b , since by voting for either a or c she either does not affect the electoral outcome or induces an electoral outcome which is better for her than b . A similar argument implies that it is a weakly dominated strategy for citizen 3 to vote for her least preferred alternative, a . Therefore, we have that after the first round of deletion citizen 1 votes for a , citizen 2 votes for a or c , and citizen 3 votes for b or c . But given these possibilities, it is weakly dominated for citizen 3 to vote for b , since by doing so she would induce the electoral outcome that she least prefers, where alternative a is implemented. Hence, citizen 3 votes for alternative c and it is therefore optimal for citizen 2 also to vote for alternative c which is then implemented.

The lesson we learn from this example is twofold. On the one hand, minimal deviations from the “canonical” environment where there is a single election with two alternatives are likely to generate situations where sincere voting and strategic voting are no longer observationally equivalent. In fact, this is in general true even when we consider elections with only two alternatives, but where either the same election is repeated through time (e.g., presidential elections in the U.S.), or there are multiple simultaneous elections that are interrelated (e.g., presidential and congressional elections in the U.S.). In all of these situations, strategic considerations are likely to induce voters to vote differently than what

would be predicted by sincere behavior, and may lead to different electoral outcomes. In principle, different theories may therefore impose different restrictions on the data, which can then be used to provide discipline in assessing the empirical relevance of various models.

On the other hand, however, by and large strategic-voting models have multiple equilibria, and their predictions often differ (sometime dramatically) across equilibria. In fact, the set of Nash equilibria of a voting game may include virtually all possible voting profiles and electoral outcomes. The multiplicity is more severe the larger the size of the electorate and is a common feature of large voting games regardless of the solution concept that is used. Moreover, as already pointed out with respect to the issue of abstention, the probability that a voter is pivotal becomes minuscule in large electorates, thus making strategic calculations less relevant. These considerations impose serious challenges on the use of strategic-voting models to explain the empirical evidence and severely limit the possibility of taking them to the data. Sincere-voting models, on the other hand, are typically very tractable and tend to generate sharp predictions that can be compared with the data. In order to evaluate the limitations of sincere-voting models, it seems therefore useful to try to assess the extent to which sincere-voting models may fail to explain certain aspects of the data

To address this issue, I present here a simple calculation, related to the work by Degan and Merlo (2004), aimed at assessing empirically the extent to which sincere voting can account for observed patterns of voting in an environment where strategic voting is typically thought of as being necessary to explain the evidence.

Consider the situation faced by U.S. voters in a presidential election year, where presidential and congressional elections occur simultaneously.²⁵ A prominent feature that emerges from the data is that often people vote a “split ticket” (that is, they vote for candidates of different parties for President and for Congress). The table below, which reports the distribution of observed voting profiles in presidential and congressional elections in each presidential election year between 1970 and 2000, documents this fact.²⁶ In the table, the

²⁵In the United States, citizens are called to participate in national elections to elect the President and the members of Congress. While congressional elections occur every two years, the time between presidential elections is four years.

²⁶The data comes from the American National Election Studies which contain individual-level information on how people vote in presidential and congressional elections for a representative (cross-section) sample of

first entry in the voting profile refers to the vote in the presidential election and the second to the vote in the congressional election, and a D (R) indicates voting for the Democratic (Republican) candidate.

Voting profiles	1972	1976	1980	1984	1988	1992	1996	2000
DD	0.31	0.39	0.30	0.34	0.41	0.49	0.44	0.45
DR	0.05	0.10	0.10	0.06	0.06	0.10	0.13	0.09
RD	0.21	0.15	0.17	0.18	0.15	0.11	0.04	0.07
RR	0.43	0.36	0.43	0.42	0.38	0.30	0.39	0.39

The sizeable presence of split-ticket voting in the data has been interpreted by many as direct evidence of strategic voting, and has led to the development of strategic-voting models that can explain some of the aggregate stylized facts.²⁷ However, before embracing the notion that in order to explain split-ticket voting one needs to resort to strategic voting, it is useful to ask whether this observed phenomenon can also be explained as the natural outcome of the aggregation of individual decisions of citizens with heterogeneous ideological preferences. In other words, the relevant empirical question is: To what extent can sincere voting account for split-ticket voting?

To answer this question, note that while the presidential election is nation-wide (that is, all citizens face the same set of candidates regardless of where they reside), congressional elections are held at the district level (that is, citizens residing in different congressional districts face different sets of candidates).²⁸ Suppose that the positions of all candidates can be represented as points in the unidimensional ideological space $[-1, 1]$, and that citizens have single-peaked (Euclidean) preferences over this space, with the peaks representing their ideal points. Hence, it is in principle possible that candidates' positions are such that some voters in some districts have ideal points that are closer to the candidate representing one

the American voting-age population.

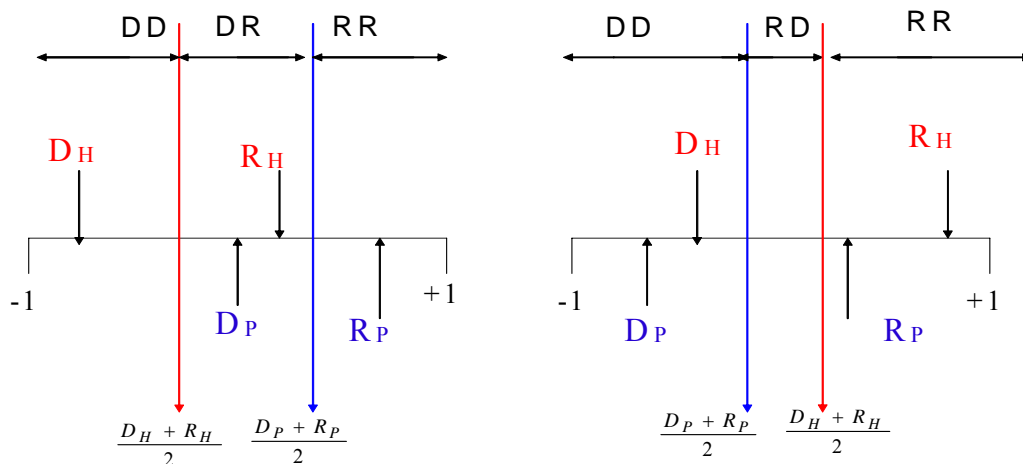
²⁷See, e.g., Alesina and Rosenthal (1995, 1996) and Chari, Jones and Marimon (1997).

²⁸Consistent with the existing literature on split-ticket voting, I restrict attention to House elections, which are held every election year for every district. Hence, each citizen faces both a presidential election as well as a House election. Senate elections, on the other hand, are staggered and only about a third of all states have a Senate election in any given election year.

party in one election and at the same time to the candidate representing the other party in the other election. Some citizens may therefore sincerely vote for the Republican candidate for President and the Democratic candidate for Congress or vice versa.

This argument is illustrated in the figure below for arbitrary candidates' positions, where D_H (R_H) and D_P (R_P) are the positions of the Democratic (Republican) candidate running for the House and the Presidency, respectively. Note, however, that for any configuration of candidates' positions sincere voting is consistent with only three of the four possible voting profiles (except for a measure zero event where the voters are indifferent between two profiles and therefore randomize). Hence, sincere voting can fail to account for some (or possibly all) of the instances of split-ticket voting observed in the data.

Sincere Split-ticket voting



To perform this calculation I use two sources of data: the American National Election Studies (NES) and the Poole and Rosenthal NOMINATE Common Space Scores.²⁹ For each relevant year (that is, 1972, 1976, 1980, 1984, 1988, 1992, 1996 and 2000), in addition to the individual voting decisions in presidential and congressional elections of a representative sample of the voting age population, the NES contains information on the congressional

²⁹Both data sets are available online at <http://www.umich.edu/~nes> and <http://voteview.uh.edu/basic.htm>, respectively.

district where each individual resides, the identity of the Democratic and the Republican candidate competing for election in his or her congressional district, and whether any of the candidates is an incumbent in that district.³⁰ Using data on roll call voting by each member of Congress and support to roll call votes by each President, Poole and Rosenthal developed a methodology to estimate the positions of all politicians who ever served either as Presidents or members of Congress, on the liberal-conservative ideological (common) space $[-1, 1]$.³¹ These estimates, which are comparable across politicians and across time, are contained in their NOMINATE Common Space Scores data set.³²

Given the two data sets, each voter in the NES sample for each presidential election year is matched with the positions of the candidates running in his or her congressional district that year. If one of the two candidates is an incumbent, his position is assumed to be known and is given by his NOMINATE score. For the challengers, on the other hand, I assume that their positions are not known but are drawn from populations of potential candidates whose distributions are known. In particular, I assume that the positions of challengers are drawn from the empirical distributions of the NOMINATE scores for Democratic and Republican members of Congress and I allow these distributions to differ across regions in the U.S.³³ In

³⁰For thorough discussions of potential limitations of the survey data in the NES see, e.g., Anderson and Silver (1986), Wolfinger and Rosenstone (1980) and Wright (1993). Note, however, that the NES represent the best and most widely used source of individual-level data on electoral participation and voting in the U.S.

³¹For a discussion of potential limitations of the methodology proposed by Poole and Rosenthal see, e.g., Heckman and Snyder (1997). For a comparison of alternative estimation procedures see Clinton, Jackman and Rivers (2001). Note, however, that none of the other procedures has been used to generate a comprehensive data set similar to the one by Poole and Rosenthal.

³²Details about the methodology and the data are available on-line at <http://voteview.uh.edu/basic.htm>. See also Poole and Rosenthal's "D-Nominate after 10-years: A Comparative Update to Congress: A Political Economic History of Roll Call Voting" at <http://voteview.uh.edu/prapsd99.pdf>. Note that the Poole and Rosenthal NOMINATE data set also contains estimates of the positions of politicians on a second dimension, which I do not use here. In fact, according to Poole and Rosenthal (1997), after 1970 the second dimension has become irrelevant and "roll call voting again became largely a matter of positioning on a single, liberal-conservative dimension" (p. 5).

³³Note that it would be unfeasible to characterize non-parametrically a separate distribution function for

addition, in each presidential election all voters face the same set of candidates and their positions are assumed to be known and given by their NOMINATE scores.

Given the positions of the candidates faced by each voter in the NES sample, I then calculate whether the observed voting profile of each voter is consistent with sincere voting. Since straight-ticket voting is always consistent with sincere voting, I only report the fraction of split-ticket voting that can be explained by sincere voting. The results of this calculation are reported in the following table.

Year	Fraction of split-ticket voters	% explained by sincere voting
1972	0.26	96%
1976	0.25	98%
1980	0.27	91%
1984	0.24	100%
1988	0.21	100%
1992	0.21	99%
1996	0.17	80%
2000	0.16	99%

As we can see from this table, sincere voting can explain virtually all of the individual-level observations on voting behavior in U.S. national elections in the data. Its worst “failure” amounts to the inability of accounting for 3% of the observations (i.e., 20% of 17% of the sample) in 1996. As “errors” of this magnitude are way within the margin of tolerance when one allows for sampling (or measurement) error, I conclude that a compelling case cannot be made on empirical grounds to dismiss a sincere-voting interpretation of split-ticket voting in favor of more complicated explanations that rely on strategic voting. More generally, I believe that strategic-voting models provide a coherent analytical framework to understand the potential effects of strategic interactions among citizens in a political economy, and their importance should not be evaluated based on their empirical performance. On the other hand, sincere-voting models, while perhaps less sophisticated, often provide a

each party in each state (let alone each district), since the number of representatives of either party in each state in any given year is small.

useful theoretical guide to analyze the data and interpret the evidence, and their empirical performance should be assessed first, before resorting to more sophisticated, but often less tractable, models.

3 Politicians

The very existence and functioning of representative democracy, where citizens delegate policy-making to elected representatives, hinges on the presence of politicians. In his famous 1918 lecture entitled *Politics as a Vocation*, Max Weber writes:

“Politics, just as economic pursuits, may be a man’s avocation or his vocation. [...] There are two ways of making politics one’s vocation: Either one lives ‘for’ politics or one lives ‘off’ politics. [...] He who lives ‘for’ politics makes politics his life, in an internal sense. Either he enjoys the naked possession of the power he exerts, or he nourishes his inner balance and self-feeling by the consciousness that his life has meaning in the service of a ‘cause.’ [...] He who strives to make politics a permanent source of income lives ‘off’ politics as a vocation.” [from Gerth and Mills (1946; pp. 83-84)]

The view expressed by Weber is indicative of the way in which early research in political economy approached the study of politicians. By taking the existence of politicians as given (that is, by treating them as a primitive), the main objective of this literature has been for a long time that of addressing the following question: What are the motivations of politicians?

Starting with Downs (1957), a long tradition in political economy builds on the assumption that the main objective of politicians is to win an election. Within this framework, known as the “downsian” paradigm, (office-concerned) opportunistic candidates shape their policy platforms to please the (policy-concerned) electorate, so as to maximize their probability of winning in order to collect the rents of public office. Several authors, however, have challenged this view by proposing alternative theories where politicians are assumed to be policy-motivated (e.g., Alesina (1988), Hibbs (1977) and Wittman (1977, 1983)). Within this framework, known as the “partisan” paradigm, candidates choose their policy platforms by trading-off their policy preferences with their desire to win the election in order to affect

policy outcomes.³⁴

A major turning point in the literature occurred when researchers started to challenge the basic assumption that the set of political candidates competing for public office is exogenous. This challenge defines most of the current political economy research on this topic and has generated an alternative approach to the study of politicians known as the “citizen-candidate” paradigm (e.g., Besley and Coate (1997) and Osborne and Slivinski (1996)). This framework removes the artificial distinction between citizens and politicians which is prevalent in the other approaches, by recognizing that elected officials are selected by the citizenry from those citizens who choose to become politicians and stand as candidates in an election in the first place. By doing so, this approach makes the question of what are the motivations of politicians moot. Since politicians are citizens, their preferences can no longer be specified in an ad hoc fashion, separately from the specification of the preferences of voters. In other words, the preferences of elected politicians must be represented in the citizenry. At the same time, the citizen-candidate framework poses two new important questions: (i) Who chooses to become a politician? (ii) What are the payoffs from becoming a politician?

In light of these considerations, in this section of the paper I first illustrate the logic of the citizen-candidate approach by presenting a simple example and discussing the implications of different assumptions about voters’ behavior. The assumption that voters vote strategically or sincerely constitutes in fact one of the main differences between the citizen-candidate environment considered by Besley and Coate (1997) and the one by Osborne and Slivinski (1996). I then address the empirical question of what are the returns to an individual from being a politician. Finally, I present the results of ongoing research on dynamic equilibrium models of political careers.³⁵

³⁴For a clear description of the two paradigms see, for example chapters 3 and 5 in Persson and Tabellini (2000).

³⁵Another important line of research which is not considered here concerns the behavior of elected politicians and the extent to which voters can discipline them in the context of an agency-theoretic framework with moral hazard and adverse selection. Important contributions to this literature include Banks and Sundaram (1993, 1998), Barro (1973), Ferejohn (1986) and Persson, Roland and Tabellini (1997). For an excellent survey of the recent literature see Besley (2005).

3.1 The Citizen-Candidate Framework

Consider the following example based on Besley and Coate (1997) and Osborne and Slivinski (1996). A society has to elect a representative to implement a policy y in the unidimensional policy space $Y = [-1, 1]$. There is a large, finite number of citizens, indexed by $i \in \{1, \dots, N\}$, which, for expositional convenience, can be approximated by a continuum of measure one.³⁶ Citizens evaluate alternative policies $y \in [-1, 1]$ and monetary payoffs $z \in \mathbb{R}$ according to the (indirect) utility function

$$U_i(y, z) = u_i(y) + z$$

where

$$u_i(y) = -(y_i - y)^2,$$

and $y_i \in [-1, 1]$ denotes citizen i 's most preferred policy. The distribution of ideal points in the citizenry, which is common knowledge, is uniform on the support $[-1, 1]$. This implies that the median ideal point is equal to 0.

Citizens (simultaneously and independently) decide whether to become candidates in the election. Running for public office entails a cost $C \in (0, 1/6]$. After all citizens have made their entry decision, the ideal point of each candidate is observed by all citizens. Since candidates cannot commit in advance to policy, a candidate's ideal point represents the policy he would implement if elected.

Given the set of candidates, all citizens (simultaneously and independently) vote for one of the candidates. The candidate who wins a plurality of the votes is elected and implements his most preferred policy. In addition, the elected politician receives a payoff $B \in [2C/3, 2C)$, which represents the rents from holding public office. In the event of a tie, a random draw among the tying candidates selects the winner. If nobody runs as a candidate every citizens gets a utility of -1 .

If a generic citizen i chooses to run for election, his payoff is equal to

$$u_i(y_i) + B - C = B - C$$

³⁶In particular, the probability that each vote is pivotal is non-zero (although potentially very small).

if he is elected and

$$u_i(y_j) - C = -(y_i - y_j)^2 - C$$

if another citizen j is elected. If, on the other hand, he chooses not to run, his payoff is equal to

$$u_i(y_j) = -(y_i - y_j)^2$$

if a citizen j is elected, or -1 in the event that no citizen runs for election.

We distinguish between two cases that correspond to two alternative assumptions about the behavior of voters. In the first case, citizens are assumed to vote sincerely (i.e., each citizen votes for his most preferred candidate, and if there are k candidates all with the same ideal point y , then each of these candidates receives a fraction $1/k$ of the votes of all citizens whose ideal points are closer to y than to the ideal points of any other candidate). In the second case, citizens vote strategically (i.e., each citizen's voting strategy is a best response to the voting strategies of all other citizens, and no citizen uses weakly dominated voting strategies).³⁷

While the model admits equilibria with different number of candidates, I focus on equilibria where only two citizens run for election.³⁸ Before considering the characterization of two-candidate equilibria in each of the two cases, recall that sincere and strategic voting are equivalent when there are only two alternatives. This implies that in all equilibria with two candidates, each citizen votes for his most preferred candidate (regardless of whether out of equilibrium voters vote sincerely or strategically). Since running for election is costly, it is also true that in any equilibrium no citizen ever runs unless either he has a positive probability of winning, or he affects the electoral outcome by running (regardless of the number of equilibrium candidates). The combination of these two results implies that in all two-candidate equilibria, each candidate must win with equal probability and, therefore, the

³⁷The first case is the one considered by Osborne and Slivinski (1996) and the second by Besley and Coate (1997).

³⁸Given the parameterization of the example, there also exist equilibria where only one candidate runs unopposed. However, equilibria with more than two candidates do not exist. They are instead possible in the general formulation of citizen-candidate models (see, Besley and Coate (1997) and Osborne and Slivinski (1996)).

ideal points of the citizens who run as candidates must be symmetric around the median of the distribution of ideal points in the citizenry, 0. It follows that, in all two-candidate equilibria, the ideal points of candidates, and hence the two possible policy outcomes, are described by a vector $(-y^*, y^*)$. Also, it follows from this discussion that any difference in the properties of two-candidate equilibria between the model with sincere voting and the one with strategic voting arises from differences in the out-of-equilibrium behavior of voters. In particular, in order to characterize two-candidate equilibria we must consider the deviation where a third citizen may decide to run as candidate, and the voters' response to this deviation is different in the two cases.

Sincere voting: When voters vote sincerely, the set of two-candidate equilibria is such that

$$y^* \in \left[\sqrt{\frac{2c-b}{4}}, \frac{2}{3} \right).$$

To see that this is the case, note that the lower bound on y^* is given by the fact that each candidate must find it optimal to run (and win with probability 1/2), rather than let their opponent run uncontested (and win for sure). Since running is costly, for a citizen to find it optimal to run, it must be that the ideal point of the other citizen running is far enough from his own ideal point. Otherwise, he may prefer to delegate the policy choice to his opponent. If a citizen with ideal point y^* runs against a citizen with ideal point $-y^*$, his payoff is equal to

$$\frac{1}{2}(B - C) + \frac{1}{2}(-(y^* - (-y^*))^2 - C) = -2y^{*2} + \frac{B}{2} - C,$$

while if he does not run and let his opponent win, his payoff is equal to

$$-(y^* - (-y^*))^2 = -4y^{*2}.$$

Hence, in equilibrium, it must be that³⁹

$$y^* \geq \sqrt{\frac{2C - B}{4}}.$$

The upper bound on y^* , on the other hand, derives from the fact that in all two-candidate equilibria each candidate must win with positive probability (in fact, with probability 1/2).

³⁹Assume that ties are broken in favor of running.

This requires that the ideal points of the two candidates cannot be too far apart from each other. Otherwise, a citizen with the median ideal point would find it profitable to run and win the election for sure. In fact, if a citizen with ideal point equal to 0 enters and wins, his payoff is equal to $B - C$. If, on the other hand, he does not run against the pair of candidates with ideal points $(-y^*, y^*)$, his payoff is equal to

$$\frac{1}{2}(-(-y^*)^2) + \frac{1}{2}(-(y^*)^2) = -y^{*2}.$$

Hence, since $y^* \geq \sqrt{(2C - B)/4}$, and $b \in [2C/3, 2C)$, it is always true that $-y^{*2} \leq B - C$, which implies that the citizen with median ideal point would always want to run if he could be sure of victory. However, if he were a sure loser, it would never be profitable for him to run (since he would not affect the policy outcome and would have to pay the cost of running).⁴⁰

Hence, the upper bound on y^* is derived by finding the value \bar{y} such that a candidate with ideal point equal to 0 would receive 1/3 of the votes if he were to run against a pair of candidates with ideal points $(-\bar{y}, \bar{y})$. Since the density of ideal points in the citizenry is equal to 1/2 on the support $[-1, 1]$, this condition can be written as

$$\frac{1}{2}(1 - \bar{y}) + \frac{1}{2} \left[\frac{1}{2} - \frac{1}{2}(1 - \bar{y}) \right] = \frac{1}{3}$$

which implies that $\bar{y} = 2/3$. Finally, note that if a citizen with ideal point equal to 0 were to run against a pair of candidates with ideal points $(-2/3, 2/3)$, the outcome of the election would be a three-way tie. Since the citizen would find it profitable to run, it follows that $y^* < 2/3$.⁴¹

Strategic voting: When voters vote strategically, the set of two-candidate equilibria is

⁴⁰Note that it is also true that no other citizen with ideal point between $-y^*$ and y^* would want to run as a sure loser. In fact, if his ideal point is closer to y^* ($-y^*$), his decision to run would induce the policy outcome $-y^*$ (y^*), which is always worse for him than the lottery between $-y^*$ and y^* .

⁴¹Note that the payoff from running is equal to

$$\frac{1}{3}(B - C) + \frac{2}{3} \left(-\frac{4}{9} - C \right) = \frac{B}{3} - C - \frac{8}{27}$$

which, for all $C \in (0, 1/6]$ and $B \in [2C/3, 2C)$, is always larger than the payoff from staying out, $-4/9$.

such that

$$y^* \in \left[\sqrt{\frac{2C - B}{4}}, 1 \right].$$

The lower bound on y^* is obtained from the same argument that was used above, which does not depend on how citizens vote. In order to explain why, if citizens vote strategically, it is also an equilibrium for two citizens with ideal points $(-y^*, y^*)$ such that $y^* \in [\bar{y}, 1]$ to run, consider the following argument. Suppose that $y^* = \bar{y}$, and consider the possible deviation where a citizen with ideal point equal to 0 decides to run as a candidate. Would enough citizens strategically vote for the new candidate to make it profitable for him to run? Not necessarily. In fact, recall that with only two candidates, the voting population splits their vote 50/50 between the two candidates with ideal points $(-\bar{y}, \bar{y})$ and each voter votes for the candidate he most prefers. Then, if no citizen uses weakly dominated voting strategies, it is a Nash equilibrium for the voters to continue to split their vote 50/50 between the two candidates with ideal points $(-\bar{y}, \bar{y})$. In this equilibrium, the candidate with ideal point 0 does not receive any vote and hence chooses not to run, thus supporting the two-candidate equilibrium where $y^* = \bar{y}$. To see that this is the case, note that it is a weakly dominated strategy for any citizen whose ideal point is closer to 0 than to either $-\bar{y}$ or \bar{y} to switch his vote and vote for the candidate with ideal point 0 instead.⁴² By doing so, since the ideal point of such switching voter must be between $-\bar{y}$ and \bar{y} , the voter would change the electoral outcome against the candidate he was supporting before the switch, and would therefore be worse off.⁴³ Clearly, no citizen with ideal point outside the interval $(-\bar{y}, \bar{y})$ would want to switch his vote either. Similar arguments also apply for all $y^* \in [\bar{y}, 1]$.

While citizens with relatively extreme ideal points cannot be elected (and therefore never run), if citizens vote sincerely, a situation where two candidates whose policy preferences are at the opposite ends of the spectrum compete for election may be an equilibrium if citizens vote strategically. The set of two-candidate equilibria under sincere and strategic voting, however, also share some common features. In particular, to the extent that running for office is costly, no two candidates will share the same ideal point, and the higher the cost

⁴²Note that this is what sincere voting would prescribe.

⁴³The “weak” qualifier derives from the fact that all citizens with ideal point equal to 0 are indifferent between $-\bar{y}$ and \bar{y} and would therefore remain indifferent after breaking the tie.

relative to the benefit the larger the minimum distance between the two candidates.

The simple parametric example considered here illustrates some of the appealing features of the citizen-candidate framework. By treating electoral candidates as endogenous equilibrium objects, citizen-candidate models provide useful theoretical foundations for addressing the question of who becomes a politician. In particular, the “type” of citizens who choose to run for public office in equilibrium, and hence the characteristics of elected representatives, are a function of the relative costs and benefits of becoming a politician, as well as the preferences of the citizenry. While in the original specification proposed by Besley and Coate (1997) and Osborne and Slivinski (1996) citizens only differ with respect to their policy preferences, the basic structure can also be extended to richer environments which encompass additional dimensions of heterogeneity.⁴⁴ More generally, the citizen-candidate framework represents a useful analytical tool that is both flexible and tractable, and can be generalized to address a number of interesting issues in political economy.⁴⁵

3.2 Private Returns to Political Experience

The previous discussion highlighted the importance of the relative costs and benefits of electoral success to analyze the incentives of politicians, and raises a fundamental question: What are the returns to an individual from a career in politics? The benefits of public office include both instantaneous payoffs (which are realized upon electoral success), as well as future payoffs (which accrue over time and depend on current and future decisions). Also, these payoffs have a monetary (observable) component (e.g., the salary while in office or future wages in other occupations), and a non-pecuniary (unobservable) component (e.g., the benefit from participating in the policy-making process and possibly affecting policy outcomes).

In order to focus attention on the dynamic aspects of the career decisions of politicians, consider the situation faced by an elected representative in his first term in office. At the

⁴⁴See, e.g., Caselli and Morelli (2004), Messner and Polborn (2004) and Poutvaara and Takalo (2003).

⁴⁵Several models based on the citizen-candidate approach have already been proposed in the literature to study a variety of issues including, for example, lobbying (e.g., Besley and Coate (2001) and Felli and Merlo (2004)), parties (e.g., Levy (2004) and Morelli (2004)), coalition governments (e.g., Bandyopadhyay and Oak (2004)), and inefficient public policy (e.g., Besley and Coate (1998)).

risk of oversimplifying, consider a simple example where the horizon of the dynamic decision problem is two periods. In the first period, the politician has to decide whether to run for reelection. In the second (and last) period, if he is still in office, in addition to rerunning for his office the politician has also the opportunity of running for a higher office. If the politician leaves politics (either voluntarily or via electoral defeat), he works in the private sector for the remainder of the time.

The political office currently occupied by the politician pays a per-period salary S and generates a per-period benefit B . Moreover, if the politician is successful in implementing his most preferred policy, he receives an additional benefit P . Similarly, the payoffs in the higher office are $S' > S$, $B' > B$, and $P' > P$. The cost of running for election, C , is normalized to zero. Private sector wages increase with political experience. Let $e \in \{1, 2\}$ denote an individual's political experience (i.e., the number of periods he has served in a political office), and W_e his per-period wage in the private sector, where $S < B + S < W_1 < B' + S' < W_2 < B + S + P < B' + S' + P' = 2(B + S + P)$, and $(W_2 - W_1) > (W_1 - (B + S))$. Suppose there is no discounting.

Politicians differ with respect to their electoral skills, which affect their probability of winning an election. Let $j \in \{b, g\}$ denote the individual's electoral type, π_j his probability of being reelected, and π'_j his probability of winning an electoral bid for higher office, where $0 = \pi'_b < \pi_b = \frac{1}{2} = \pi'_g < \pi_g = 1$. Politicians also differ with respect to their policy skills, which affect their probability of successfully implementing their most preferred policy. Let $k \in \{l, h\}$ denote the individual's policy type and p_k the per-period probability of implementing his most preferred policy while in office, where $0 = p_l < p_h = 1$. Hence, there are four possible types of politicians denoted by $\tau = (j, k) \in \{(b, l), (b, h), (g, l), (g, h)\}$.

To analyze the politicians's dynamic optimization problem, consider first the decision he faces in the last period (i.e., $t = 2$). If the politician decides to run for reelection, his expected payoff is equal to

$$\pi_j (S + B + p_k P) + (1 - \pi_j) W_2,$$

while if he decides to run for higher office it is equal to

$$\pi'_j (S' + B' + p_k P') + (1 - \pi'_j) W_2,$$

and to W_2 if he decides to voluntarily leave office. Clearly, the politician's optimal decision depends on his type τ . If $\tau = ((g, h))$ the politician runs for higher office (since $(S' + B' + P')/2 + W_2/2 > S + B + P > W_2$); if $\tau = ((b, h))$ he runs for reelection (since $S + B + P > W_2$); and if $\tau = ((b, l))$ or $\tau = ((g, l))$ he exits politics (since $S + B < W_2$). Let $V_2(\tau)$ denote the expected continuation payoff of an individual of type τ given his optimal period-2 decision. We have that

$$V_3(\tau) = \begin{cases} \frac{1}{2}(S' + B' + P') + \frac{1}{2}W_2 & \text{if } \tau = ((g, h)) \\ \frac{1}{2}(S + B + P) + \frac{1}{2}W_2 & \text{if } \tau = ((b, h)) \\ W_2 & \text{if } \tau = ((b, l)) \\ W_2 & \text{if } \tau = ((g, l)) \end{cases}$$

Consider now the decision problem of the politician when $t = 1$. His expected payoff is equal to

$$\pi_j(S + B + p_k P + V_2(\tau)) + (1 - \pi_j)2W_1$$

if he runs for reelection, and $2W_1$ if he exits. Note that, since $(W_2 - W_1) > (W_1 - (B + S))$, the politician always runs for reelection, independently of his type. Let $V_1(\tau)$ denote the expected payoff of an individual of type τ at the time of his election to public office given his optimal period-1 decision. We have that

$$V_1(\tau) = \begin{cases} (S + B + P) + \frac{1}{2}(S' + B' + P') + \frac{1}{2}W_2 & \text{if } \tau = ((g, h)) \\ \frac{1}{2}(S + B + P + \frac{1}{2}(S + B + P) + \frac{1}{2}W_2) + W_1 & \text{if } \tau = ((b, h)) \\ \frac{1}{2}(S + B + W_2) + W_1 & \text{if } \tau = ((b, l)) \\ S + B + W_2 & \text{if } \tau = ((g, l)) \end{cases}$$

It may therefore be optimal for a politician to remain in a particular office for a while and then either attempt to get elected to a higher office or leave politics altogether.

As illustrated in this simple example, current and future benefits from public office are likely to affect the behavior of politicians. However, the effects will in general be different depending on what are the relative magnitudes of the various components of the returns to an individual from a career in politics. Also, different components are likely to affect different politicians in different ways, depending on their (observable and unobservable) characteristics. These considerations suggest that in order to improve our understanding of

the career decisions of politicians it is important to quantify the private returns to political experience.

This empirical question is the focus of the work by Diermeier, Keane and Merlo (2005), who specify a dynamic model of career decisions of a member of the U.S. Congress, and estimate this model using a newly collected data set that contains detailed information on all members of Congress in the post-war period.⁴⁶ A novel feature of the data is that it incorporates information about post-congressional employment and salaries when members exit Congress, which allows them to estimate the returns to congressional experience in post-congressional employment. The framework they propose also allows estimation of the relative importance of the utility politicians derive from being in office and the monetary returns to a career in Congress. Using data on important legislative achievements by members of Congress, they relate part of the non-pecuniary rewards from serving in Congress to the desire for policy accomplishments. Using the estimated model, they also investigate the extent to which politicians' career choices respond to wage incentives.

As in the simple example illustrated above, the model of Diermeier, Keane and Merlo (2005) takes into account that the decision of a member of Congress to seek reelection is likely to depend not only on current payoffs, which depend, in turn, on the probability of winning today, but also on the option value of holding the seat. This option value may depend, among other things, on the probability of being named to a committee, as well as the probability of winning a bid for higher office in the future (e.g., a member of the House may run for a seat in the Senate). Their empirical framework also incorporates politicians' unobserved heterogeneity (both with respect to their electoral ability and policy effectiveness), and observed characteristics (like, for example, their age, state of birth, educational background, family background, party affiliation, and prior political experience), into the analysis of their career choices.

For the purpose of the discussion in this section of the paper, there are two main empirical findings of Diermeier, Keane and Merlo (2005) that are important. First, congressional experience significantly increases post-congressional wages in the private sector. In particular, they find that, holding everything else constant, winning reelection in the House (Senate)

⁴⁶For a detailed description of the data see Diermeier, Keane and Merlo (2004).

for the first time increases post-congressional wages in the private sector by 4.4% (16.7%). However, the marginal effect of congressional experience on post-congressional wages diminishes quite rapidly with additional experience: averaging over members' actual experience levels, the marginal effect on post-congressional wages of an additional term in the House (Senate) is equal to 2.4% (5.2%).

Second, the non-pecuniary rewards from being in Congress are rather large (especially in the Senate). They find that general non-pecuniary rewards amount to over \$200,000 per year for a senator and about \$30,000 per year for a representative (in 1995 constant dollars).⁴⁷ In addition, non-pecuniary rewards from achieving an important legislative accomplishment are comparable for representatives and senators and are both quite large (i.e., about \$350,000 and \$400,000, respectively). These findings suggest that policy motivations and benefits of office play important roles in the career decisions of politicians. In particular, monetary returns alone (that is, wages in Congress and post-congressional payoffs), cannot explain the observed behavior of politicians, and the effect of the congressional wage on their behavior is quite modest.

3.3 Political Careers

An interesting feature of the data analyzed by Diermeier, Keane and Merlo (2005) is that a significant fraction of the members of the U.S. Congress leaves office voluntarily and becomes employed in the private sector. At the same time, many senators and representatives remain in Congress until retirement. Out of all the members who entered Congress after 1945 and left by 1994, 47% left voluntarily. Of these, 42% took a job in the private sector, while the remaining 58% either moved to a different political office (35%), or retired (23%).⁴⁸ Furthermore, the politicians who exit Congress voluntarily and leave politics altogether for another occupation tend to have successful careers in the private sector. For example, average annual earnings of these individuals in the above sample are equal to \$254,207 (in 1995 constant dollars).

⁴⁷To provide a term of comparison, note that the average annual salary of a member of Congress in 1995 dollars over their sample period (i.e., 1947-1994), is equal to \$120,378.

⁴⁸Of the 53% who left Congress because of electoral defeat, 61% took a job in the private sector, 35% took another political job, and 4% retired.

These observations are not unique to Congress or the United States.⁴⁹ By and large, there are two main career paths that are prevalent among politicians: there are career politicians (i.e., individuals who spend their entire working life in politics), and political careers (i.e., there are politicians who eventually leave politics and work in the market sector).⁵⁰ What explains these different career paths?

In order to explore this issue, consider the following example based on Mattozzi and Merlo (2005a). Consider a political economy where there are two sectors: a market sector and a political sector. In every period $t = 0, 1, \dots$ a large, finite number of citizens is born, which, for convenience of exposition, can be approximated by a continuum of measure one. Each individual lives for two periods.

Individuals are heterogeneous with respect to their market ability m and their political skills p . We let $m \in \{l, h\}$, where $m = l$ ($m = h$) denotes an individual with low (high) market ability. A measure $(1 - \phi) \in [3/4, 1)$ of the population is high market ability with probability $\alpha = 1/4$ and has no political skills, that is $p = 0$. A measure $\phi \in (0, 1/4]$ of the population is heterogeneous with respect to their political skills $p \in [0, 1]$, which are distributed according to a uniform distribution. The probability of being high market ability $\pi(p)$ is positively correlated with political skills and is equal to

$$\pi(p) = \alpha + \frac{p}{2} = \frac{1}{4} + \frac{p}{2},$$

where $\pi(p) \in [1/4, 3/4]$. Hence, the fraction of individuals with high market ability conditional on having political skills is equal to $1/2$ while the fraction of individuals with high market ability in the overall population is $(1 + \phi)/4 \leq 5/16$. We assume that each individual only knows his own political skills, and does not know his market ability. Also, ϕ , $\pi(p)$, and the distribution of political skills in the citizenry are all common knowledge.

In each period of life, an individual can either work in the market sector or be a politician. Political skills have no direct value in the (perfectly competitive) market sector. Let $w_l = 0$ and $w_h = w \geq 1$ denote the competitive market wages associated with each ability level. If

⁴⁹See, e.g., Best and Cotta (2000).

⁵⁰A third possible career path is to start in the private sector and then move into politics. While there are several recent examples of this phenomenon (e.g., Silvio Berlusconi in Italy or Michael Bloomberg in the United States), this is still a relatively rare occurrence.

an individual works in the market sector, during his first period of employment his ability is revealed with probability 1/2 (while with probability 1/2 it remains unknown).

The political sector is characterized by a single political office that pays a politician a per-period salary s , where $s \in (w/5, w/4)$. While in office, a politician with political skills p performs a public service which benefits all citizens and generates a per-capita payoff which depends on his political skills, $B(p) = p$.

There is a single infinitely-lived political party that in each period when the political office is vacant can nominate an individual for the political office. While in office, a “partisan” politician (that is, a politician nominated by the political party) generates private benefits to the political party which depend on the politician’s political skills and political experience and are denoted by:⁵¹

$$z^P(p, e) = \begin{cases} 0 & \text{if } e = 1 \\ \frac{\sqrt{p}}{2} & \text{if } e = 2 \end{cases}$$

where e denotes a politician’s number of terms in office or political experience.⁵²

An individual may also become a politician and serve in the political office without being nominated by the party (that is, an individual may become an “independent” politician). While in office, an independent politician generates private benefits for himself denoted by $z^I(p, e) = z^P(p, e)$.⁵³

If in any given period the political party nominates an individual who serves in the political office, the party’s per-period payoff is $z^P(p^o, e^o) - \tau^P$, where p^o and e^o denote the political skills and experience of the politician in office, respectively, and $\tau^P \geq 0$ denotes the (equilibrium) transfer (if any) the political party makes to the politician in that period. Otherwise, the party’s payoff in that period is equal to zero. Let $\delta \in (0, 1)$ be the party’s discount factor.

⁵¹For example, the politician engages in fund-raising activities on behalf of the political party. Alternatively, while in office the politician has access to graft and corruption opportunities that generate revenues for the political party.

⁵²A politician may need time to establish himself and become known (fund-raised) or powerful (corruption). Obviously, the more skilled the politician the higher the revenues he generates for his party.

⁵³Like a partisan politician, an independent politician may have access to opportunities to raise money in a variety of ways, but may need time to establish himself.

If a politician with skills p^o is in office, regardless of whether the politician is a partisan or an independent, the per-period payoff of a generic individual is $c + p^o$, where c denotes the individual's consumption in a given period. If in a period there is no politician in office, then the payoff of a generic individual in that period is equal to c .

There is no borrowing or saving. If in any given period an individual works in the market sector, his consumption in that period is equal to his market wage. If, on the other hand, an individual is a politician in office, his consumption in that period is equal to $s + \tau^P$ if he is a partisan, and $s + z^I(p^o, e^o)$ if he is an independent. Also, the no borrowing constraint implies that $\tau^P \leq z^P(p^o, e^o)$. Since $z^P(p^o, 1) = 0$ it follows immediately that the party cannot offer any transfer to a first-term politician.

The political mechanism that determines the appointment (and possible re-appointment) of an individual to the political office and the timing of the model are as follows.⁵⁴ Consider first a situation where no politician is in office (that is, the political office is vacant). Individuals can enter into politics only in their first period of life. Then at the beginning of the period all individuals born in that period (simultaneously and independently) decide whether or not to apply to become a partisan politician. If the pool of applicants is non empty, the party observes the political skills of a randomly drawn individual from this pool.⁵⁵ After observing the political skills of the selected applicant, the party decides whether to nominate that individual for the political office, or reject the selected applicant and forgo the opportunity of nominating somebody for the political office for that period.

If the party nominates a politician, then the party's nominee is either approved or not

⁵⁴Note that the specific political mechanism considered here is not meant to resemble any particular electoral or appointment rule observed in a specific democracy. Rather it is intended to capture some general features of such rules. For example, in many democracies political representatives are elected according to closed list PR, where individuals vote for a party and not an individual candidate. Even in political systems where politicians are elected according to plurality rule in single-member districts (like the U.S.), many seats are often "safe" for a political party regardless of the identity of the candidate. Also, several political offices are filled by appointment (e.g., state supreme court judges), where a party's nomination can either be confirmed or rejected by the voters.

⁵⁵Since the number of individuals is finite, given the pool of applicants, the probability that each applicant is selected is always positive (although potentially very small).

approved by the voters according to majority rule. Only individuals in their second period of life vote. If the politician nominated by the party is approved by a majority of the voters, he is then in office for that period, while all other individuals become employed in the market sector. If, on the other hand, the politician nominated by the party does not receive the approval of a majority of the voters, or the party does not propose a nomination, then all individuals in their first period of life (simultaneously and independently) decide whether or not to run for the political office as independents. If the set of candidates running as independents is non empty, a random draw then determines who will be in office for that period, while all other individuals become employed in the market sector.⁵⁶ If nobody runs, then the political office remains vacant for a period.

During a politician's first term in office, his political skills become publicly observable (and hence are observed by the voters and also by the market sector). At the beginning of the next period, the voters then decide by majority rule whether or not to confirm the incumbent politician for a second term in office. The incumbent politician also receives an offer of employment from the market sector at a competitive wage conditional on his observed political skills. If the incumbent politician is not confirmed by the voters, he accepts employment in the market sector and all individuals born in that period (simultaneously and independently) decide whether or not to run for the political office as independents. If the set of candidates running as independents is non empty, a random draw then determines who will be in office for that period, while all other individuals become employed in the market sector. If nobody runs, then the political office remains vacant for a period.

If, on the other hand, the incumbent politician is confirmed by the voters, he then decides whether to remain in the political office or accept employment in the market sector. If the incumbent politician is a partisan, the party can offer him a transfer for remaining in the political office for a second term. If a confirmed politician chooses to remain in office for a second (and last) term, all other individuals (including all of the members of the new

⁵⁶Note that since political skills are private information, all individuals running as independents are *ex ante* identical from the point of view of the voters. Also, since the number of individuals is finite, given the set of individuals who run as independent, the probability that each one of them is selected is always positive (although potentially very small).

generation born in that period) work in the market sector. If, on the other hand, a confirmed politician chooses to leave the political office and accept employment in the market sector, the political office becomes vacant and the party can then propose a new nominee for the political office in that period.

Following Mattozzi and Merlo (2005a), we characterize the unique Markov Perfect Equilibrium of this game where the party adopts a cutoff strategy (that is, the party nominates applicant politicians if their political skills are above a threshold). To characterize the equilibrium, first note that, since the market sector is competitive, it pays each individual according to his expected market ability. If an individual with political skills p chooses to work in the market sector, his first-period earnings are equal to

$$\frac{1 + \phi}{4}w_h + \left(1 - \frac{1 + \phi}{4}\right)w_l = \frac{(1 + \phi)w}{4}$$

(since political skills are not observed by the market and the fraction of individuals with high market ability in the overall population is $(1 + \phi)/4$), and his expected second-period earnings are equal to

$$\left(\frac{1}{2}\left(\frac{1 + \phi}{4}\right) + \frac{1}{2}\pi(p)\right)w$$

(since his market ability is revealed after one period of employment with probability $1/2$). Hence, the expected (lifetime) earnings of an individual with political skills p who chooses a career in the market sector are equal to

$$\left(\frac{1}{2} + \frac{3}{8}\phi + \frac{p}{4}\right)w.$$

If an individual with political skills p is nominated by the party and approved by the voter, his first-period earnings in the political sector are equal to s (since he receives no first-period transfer from the party). His second-period earnings, regardless of whether or not he remains a politician, are instead equal to $\pi(p)w$. This follows from the fact that, since during a politician's first term in office his political skills become observable, he could then work in the market sector at a wage equal to $\pi(p)w$. Hence, conditional on being confirmed by the voters, he will be willing to remain in politics only if his second-period earnings in the political sector, $s + \tau^P$, are at least as large as $\pi(p)w$. It follows that the optimal strategy of the party is to either offer the politician $\tau^P = \pi(p)w - s$, if the politician is confirmed by the

voters and $z^P(p, 2) - (\pi(p)w - s) > 0$, or $\tau^P = 0$ otherwise. Hence, the expected (lifetime) earnings of an individual with political skills p who becomes a partisan politician (and may either be a career politician or have a political career), are equal to

$$s + \left(\frac{1}{4} + \frac{p}{2}\right) w.$$

It follows that an individual with political skills p would like to be nominated by the party (as long as he is approved by the voters) if and only if

$$s + \left(\frac{1}{4} + \frac{p}{2}\right) w > \left(\frac{1}{2} + \frac{3}{8}\phi + \frac{p}{4}\right) w$$

that is

$$p \geq p^* = 1 + \frac{3}{2}\phi - \frac{4s}{w},$$

where $p^* \in (0, 1)$.

The condition on the party's optimal strategy with respect to the retention of an incumbent politician (i.e., $z^P(p, 2) - (\pi(p)w - s) > 0$), can be rewritten as

$$\frac{\sqrt{p}}{2} - \left(\left(\frac{1}{4} + \frac{p}{2}\right) w - s\right) > 0,$$

which implies that, conditional on being confirmed by the voters, partisan politicians will serve two terms in office if and only if $p \in (p', p'')$, where

$$p' = \frac{1}{2w^2} \left(1 + w(4s - w) - \sqrt{1 + 2w(4s - w)}\right)$$

and

$$p'' = \frac{1}{2w^2} \left(1 + w(4s - w) + \sqrt{1 + 2w(4s - w)}\right).$$

Note that $0 < p' < p^* < p'' < 1$.

Now consider the decision faced by an individual with political skills p when there is an opportunity to run for the political office as an independent. If the individual becomes an independent politician, his first-period earnings are equal to s . If he is then confirmed by the voters, his second-period earnings are equal to $s + z^I(p, 2)$ if he remains a politician, and $\pi(p)w$ if he leaves the political sector and works in the market sector instead. His second-period earnings are also equal to $\pi(p)w$ if he is not confirmed by the voters. Since

$z^I(p, 2) = z^P(p, 2)$, it follows from our earlier calculations that, if offered the opportunity, all individuals with $p \geq p^*$ would like to run as independent regardless of whether or not they serve for two terms. On the other hand, all individuals with $p \in [p', p^*)$ would like to do so only if they are then confirmed by the voters to a second term. Once in office, only independent politicians with political skills $p < p''$ would be willing to serve for a second term rather than work in the market sector.

Turning attention to the equilibrium strategy of voters when deciding whether to confirm an incumbent politician, note first that when the voters vote, they know the politician's skills. Also, they know that if they choose not to confirm the incumbent, they can fill the political office with a random draw from the set of individuals who would be willing to run as independents. Hence, voters will never confirm an incumbent politician whose political skills are below the skills of an average independent politician. Given the argument above, this implies that if an individual with political skills p' were to run as independent, he would not be reappointed. In fact, this is true for all individuals with political skills $p < (1 + p')/2$. Therefore, the only individuals who would be willing to run as independent are those with political skills $p \in [p^*, 1]$, who would do so in order to reveal their political skills, independently of whether or not they could serve in office for two terms. This implies that in equilibrium, voters will confirm incumbent politicians only if their political skills are greater than or equal to

$$\tilde{p} = \frac{1 + p^*}{2} = 1 + \frac{3}{4}\phi - \frac{2s}{w}.$$

Note that $0 < p' < p^* < \tilde{p} < p'' < 1$.

With respect to the equilibrium strategy of voters when deciding whether to approve a candidate nominated by the party, note that when the voters vote, they do not know the nominee's skills. Hence, they will vote in favor of the party's nominee only if their equilibrium beliefs (which of course depend on the equilibrium strategy followed by the party), are such that his expected political skills are greater than or equal to \tilde{p} .

We can now characterize the equilibrium nomination strategy of the party. Recall that the party observes the political skills of a random draw from the set of individuals who apply to the party and has to decide whether to nominate that individual for the political office, or reject the selected applicant and forgo the opportunity of nominating somebody for the

political office for that period. Let ρ denote the cutoff nomination rule used by the party (i.e., the lowest political skills of an applicant such that the party nominates him for the political office), and V^I (V^P) be the party's equilibrium continuation payoff in the subgame starting with a first-term independent (partisan) politician in office. We show that in equilibrium $\rho = \tilde{p}$. This implies that

$$V^I = \delta \left(\frac{1 - p''}{1 - p^*} V^P + \frac{p'' - \tilde{p}}{1 - p^*} \delta V^P + \frac{\tilde{p} - p^*}{1 - p^*} V^I \right),$$

or equivalently,⁵⁷

$$V^I = \delta \left(\frac{1 - p'' + \delta(p'' - \tilde{p})}{1 - p^* - \delta(\tilde{p} - p^*)} \right) V^P < \delta V^P.$$

First recall that no individual with political skills $p < p^*$ would want to become a politician. Next, note that if the applicant's political skills are $p \in [p^*, \tilde{p})$, if the party deviates from the candidate equilibrium strategy and chooses to nominate him, the party's payoff is equal to δV^I . This follows from the fact that, given the equilibrium strategies of the voters, the partisan nominee would be approved and hence serve a first term in office (which generates a payoff equal to $z^P(p, 1) = 0$). The partisan incumbent, however, would not be confirmed for a second term, thus leading to the appointment of an independent. If, on the other hand, the party chooses not to nominate the applicant, its payoff is equal to $V^I > \delta V^I$ (for any δ).

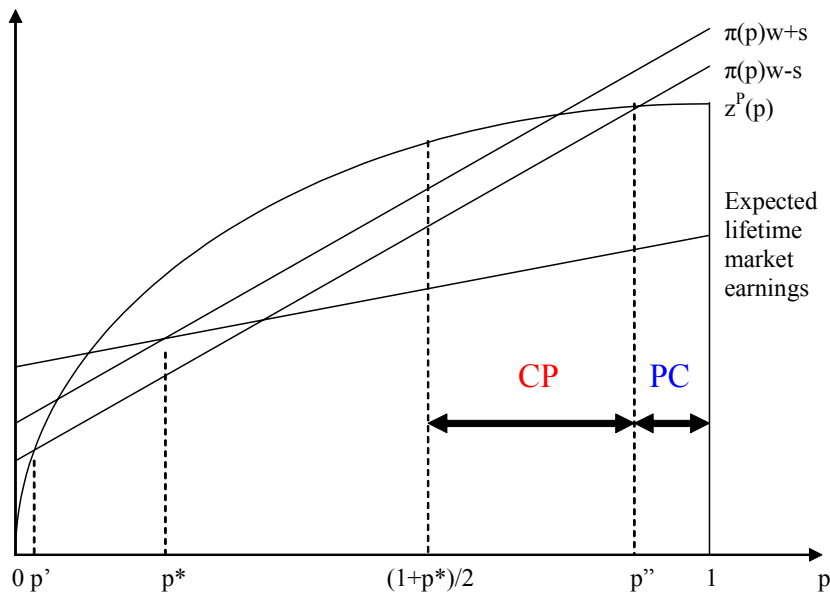
Suppose now that the applicant's political skills are $p \in [\tilde{p}, p'')$. If the party deviates from the candidate equilibrium strategy and chooses not to nominate him, the party's payoff is equal to V^I . If, on the other hand, the party chooses to nominate the applicant, he would serve two terms in office, and the party's payoff is equal to $\delta(z^P(p, 2) - (w\pi(p) - s)) + \delta^2 V^P > V^I$ (for δ large).

Finally, consider the case where the applicant's political skills are $p \in [p'', 1]$. If the party deviates from the candidate equilibrium strategy and chooses not to nominate him, the party's payoff is equal to V^I . If, on the other hand, the party chooses to nominate the

⁵⁷This expression follows from observing that after an independent is in office, the party has a chance of proposing a new nominee in the next period only if the independent leaves office voluntarily (an event which occurs with probability $(1 - p'')/(1 - p^*)$), or in the period after that if the independent politician serves for two terms (which happens with probability $(p'' - \tilde{p})/(1 - p^*)$).

applicant, he would serve for one term and then voluntarily leave office to work in the market sector, and the party's payoff is equal to $\delta V^P > V^I$ (for any δ).

In equilibrium, it is therefore the case that only individuals with political skills $p \in [\tilde{p}, 1]$ apply to become partisan politicians, and the party always nominates a randomly selected applicant for the political office. Partisan nominees are always approved by the voters to a first term in office and confirmed to a second term. All partisan politicians with political skills $p \in [\tilde{p}, p'']$ are career politicians (i.e., they spend their entire life working in the political sector), while if $p \in [p'', 1]$ they have political careers (i.e., they start off by working in the political sector but then switch to the market sector). An illustration of the equilibrium is depicted in the figure below, where CP denotes career politicians and PC political careers.



A few remarks about the interpretation of the equilibrium are in order. Politicians are valuable to the party only if they are approved and confirmed by the voters. If their political skills are between \tilde{p} and p'' they are valuable because in their second term in office they generate rents for the party. If their political skills are above p'' they are valuable because they allow the party to maintain control of the political office (in spite of the fact that they do not generate any rents for the party). Hence, individuals with relatively high political skills use the party to reveal their skills and obtain high market wages. At the same time, the party is happy to nominate them since they enhance the party's reputation with the

voters. This reputation effect emerges from the following equilibrium mechanism. On the one hand, voters want politicians with political skills as high as possible. On the other hand, the party wants politicians who generate positive rents for the party. In equilibrium, the party performs a valuable service to the voters by preventing politicians with relatively low political skills from getting in office (although they would still generate rents for the political party if they could get confirmed to a second term),⁵⁸ and by supporting the nomination of politicians with relatively high political skills (although they don't generate any rents for the party). In exchange, the voters reappoint partisan politicians with average political skills who generate rents for the party.

Let

$$\hat{p} = \frac{1 + \tilde{p}}{2} = 1 + \frac{3}{8}\phi - \frac{s}{w}$$

denote the average skills of a first-term politician and

$$\hat{p}_{CP} = \frac{\tilde{p} + p''}{2} = \frac{1}{4} + \frac{3}{8}\phi + \frac{1}{4w^2} \left(1 + \sqrt{1 + 2w(4s - w)} \right)$$

the average skills of a career politician, in equilibrium. Note that increasing the salary of office holders, s , decreases the average quality of politicians, but increases the average quality of career politicians and decreases turnover in office. On the other hand, an increase in the market wage for individuals with high market ability, w , increases the average quality of politicians, but decreases the average quality of career politicians and increases turnover in office.

The first set of results derives from the fact that when the political salary increases, politics becomes relatively more attractive an option for all levels of political skills, thus lowering the quality of the worst politician. At the same time, however, the party can now afford to retain relatively better politicians, since the additional amount it has to pay to keep them in office for each level of political skills is now lower. This increases the quality of the best career politician and decreases turnover. An increase in the market wage also has two effects. First, it makes the signalling motive for individuals with relatively higher political skills (and hence higher expected market ability) stronger. In other words, it makes

⁵⁸Note that politicians with political skills $p \in [p^*, \tilde{p})$ would receive the voters' approval and hence serve one term in office if the party were to nominate them.

it more valuable for individuals with relatively higher political skills to reveal them, and for individuals with relatively lower political skills not to do so, thus increasing the quality of the worst politician. At the same time, however, it makes the market sector relatively more appealing for all levels of political skills, thus making it more difficult for the party to retain politicians with high skills. This decreases the quality of the best career politician and increases turnover.⁵⁹

To conclude this section of the paper, note that the framework proposed by Mattozzi and Merlo (2005a) also provides a rationale for the existence and survival of political parties, to which I turn attention next.

4 Parties

Political parties represent another fundamental institution of representative democracy, and have long been recognized as key players by the political economy literature (see, e.g., Downs (1957)). However, the question “what is a party?” in political economy is as difficult and elusive as the question “what is a firm?” in industrial organization. The boundaries between political parties and interest groups or other citizens’ organizations, for example, are rather blurry, and it is conceptually difficult to discriminate among alternative definitions of parties. It should therefore not be surprising that not much progress has been done to date to provide a compelling answer to this important question. In fact, as compared to the other topics discussed in this paper, the study of political parties as endogenous equilibrium institutions is still in its infancy.

Most of the recent political economy literature on parties has tried to “unbundle” these institutions by focusing on specific purposes parties serve, thus providing alternative (complementary) rationales for their existence. Among all the possible purposes of parties that have been considered in the literature, I focus here on three that are closely related to the topics of the previous sections of the paper. These are the mobilization of voters (e.g., Herrera and Martinelli (2004), Morton (1991), Shachar and Nalebuff (1999) and Uhlaner

⁵⁹Using different models, Besley (2004), Caselli and Morelli (2004) and Messner and Polborn (2004) also consider the effects of an increase in the compensation of elected officials on their average quality. While both Besley and Caselli and Morelli find that when politicians are paid better their average quality necessarily increases, Messner and Polborn find that it may either increase or decrease.

(1989)), the choice of policy platforms (e.g., Levy (2004), Morelli (2004) and Testa (2004)), and the selection of politicians and the choice of electoral candidates (e.g., Caillaud and Tirole (2002), Carrillo and Mariotti (2001), Mattozzi and Merlo (2005a, 2005b) and Snyder and Ting (2002)).⁶⁰ For each of these issues, I present a simple example based on a model drawn from the literature to illustrate possible ways of modelling the role of parties. Since it is not clear what kind of empirical evidence is most relevant to study political parties, I do not attempt here to relate theoretical and empirical research on this topic, or to emphasize specific features of the data.⁶¹

4.1 Voter Mobilization

Before elections, parties are often observed to engage in costly activities aimed at “bringing out their base.” To explore the role of parties vis-a-vis the mobilization of voters, consider the following example based on the model by Shachar and Nalebuff (1999). A society has to decide between two alternatives, a and b , in an election e . There is a continuum of citizens of measure one, where i denotes a generic citizen. The citizenry is divided between supporters of a and supporters of b , where the fraction of citizens who support alternative a is the (unknown) realization of a random variable μ which has a uniform distribution on the support $[0, 1]$. Hence, the expected fraction of citizens supporting each alternative is equal to $1/2$.

Citizens have to decide whether to vote or abstain. If they choose to vote, they vote in favor of the alternative they support. Voting is costly and voting costs are independently and identically distributed in the citizenry according to a uniform distribution on the support

⁶⁰Other functions performed by parties include the organization and coordination of electoral campaigns (e.g., Osborne and Tourky (2004)), the formation of bargaining coalitions in the legislature (e.g., Jackson and Moselle (2002)), and disciplining the behavior of elected representatives (e.g., Alesina and Spear (1988) and Harrington (1992)).

⁶¹Most of the empirical literature on parties has tried to assess whether parties affect the roll-call voting behavior of senators and representatives in the U.S. Congress (see, e.g., Cox and McCubbins (1993), Cox and Poole (2002) and Poole and Rosenthal (1997)) Stylized facts about political parties concern for the most part their relative number across different political systems (see, e.g., Lijphart (1999)). Note that there is also a large theoretical literature on the equilibrium number of parties (originated by the work of Duverger (1954)), which I do not consider in this paper. See, e.g., Cox (1997) for an excellent overview of this literature and of the empirical evidence.

$[0, 1]$, where C_i^e denotes the voting cost of a generic citizen i . The electoral outcome is determined by majority rule, where alternative a is implemented if the fraction of votes in favor of a exceeds the fraction of votes in favor of b .⁶²

There are two parties, P_a and P_b , where party P_j , $j \in \{a, b\}$, supports alternative j . If alternative j is implemented, party P_j obtains a benefit equal to $B \in (0, 1]$ and 0 otherwise. Parties can spend effort (or, equivalently, invest resources) to motivate citizens to vote. If party P_j , $j \in \{a, b\}$, invests I_j to try to convince j 's supporters to vote, the benefit to a generic citizen i who supports alternative j from participating in the election (and voting for alternative j), is equal to

$$B_i^e = \exp(I_j + D_j^e - 2),$$

where $D_j^e \in (0, 1]$ is the (publicly known) direct benefit to a citizen supporting alternative j from voting in election e . Hence, citizen i will vote in election e if

$$C_i^e \leq \exp(I_j + D_j^e - 2)$$

and abstain otherwise. The cost to party P_j of investment I_j is equal to $C(I_j) = I_j^2/2$.

This implies that, given the parties' investments I_a and I_b , the expected fraction of the supporters of alternative $j \in \{a, b\}$ who vote is equal to

$$\Pr\{C_i^e \leq \exp(I_j + D_j^e - 2)\} = \exp(I_j + D_j^e - 2)$$

and the probability that alternative a is implemented is equal to

$$\begin{aligned} \pi_a(I_a, I_b) &= \Pr\{\mu \exp(I_a + D_a^e - 2) > (1 - \mu) \exp(I_b + D_b^e - 2)\} \\ &= \Pr\left\{\mu > \frac{\exp(I_b + D_b^e)}{\exp(I_a + D_a^e) + \exp(I_b + D_b^e)}\right\} \\ &= 1 - \frac{\exp(I_b + D_b^e)}{\exp(I_a + D_a^e) + \exp(I_b + D_b^e)} \\ &= \frac{\exp(I_a + D_a^e)}{\exp(I_a + D_a^e) + \exp(I_b + D_b^e)} \end{aligned}$$

which is increasing in party P_a 's investment I_a , and decreasing in party P_b 's investment I_b .

⁶²Since there is a continuum of voters, ties are a measure zero event and can therefore be ignored.

Hence, each party chooses its optimal investment in voter mobilization taking into account the behavior of the other party. In particular, party P_a chooses I_a^* to maximize

$$\pi_a(I_a, I_b^*) B - C(I_a) = \left(\frac{\exp(I_a + D_a^e)}{\exp(I_a + D_a^e) + \exp(I_b^* + D_b^e)} \right) B - \frac{I_a^2}{2}$$

given I_b^* , and party P_b chooses I_b^* to maximize

$$(1 - \pi_a(I_a^*, I_b)) B - C(I_b) = \left(\frac{\exp(I_b + D_b^e)}{\exp(I_a^* + D_a^e) + \exp(I_b + D_b^e)} \right) B - \frac{I_b^2}{2}$$

given I_a^* , from which we obtain the following system of first-order conditions:

$$\begin{cases} \left(\frac{\exp(I_a^* + D_a^e + I_b^* + D_b^e)}{(\exp(I_a^* + D_a^e) + \exp(I_b^* + D_b^e))^2} \right) B - I_a^* = 0 \\ \left(\frac{\exp(I_a^* + D_a^e + I_b^* + D_b^e)}{(\exp(I_a^* + D_a^e) + \exp(I_b^* + D_b^e))^2} \right) B - I_b^* = 0 \end{cases}$$

Solving, for I_a^* and I_b^* , we obtain that the unique Nash equilibrium is characterized by the optimal investment levels

$$I_a^* = I_b^* = \frac{\exp(D_a^e - D_b^e)}{(1 + \exp(D_a^e - D_b^e))^2} B$$

where $0 < I_a^* = I_b^* < B$. Clearly, the more parties care about the outcome of the election (i.e., the higher B), the more resources they will invest in trying to convince citizens who share their views to vote. More interestingly, the more similar the extent to which supporters of the two alternatives care about the outcome of the election (i.e., the smaller $|D_a^e - D_b^e|$), the more parties will invest resources to mobilize voters. The intuition for this result is that, at the margin, the return to the investment is higher the closer the election, since the probability of swinging the election in the desired direction is higher. Since in equilibrium both parties behave the same way, however, the efforts by the two parties offset each other and do not affect the electoral outcome.

4.2 Policy Platforms

At a very basic level, parties are groups of politicians. While members of the same party are in general more likely to share similar views than members of different parties, these groups are by no means homogeneous. It is therefore legitimate to wonder whether parties matter, in the ex ante sense of imposing some discipline on the policy platforms of their

representatives, or their existence can simply be rationalized as an ex post agglomeration of like-minded politicians. In order to explore this issue, consider the following example taken from Levy (2004).

A society has to elect a representative to implement a policy (y_1, y_2) in the two-dimensional policy space $Y = Y_1 \times Y_2$, $Y_1 = Y_2 = [-1, 1]$. There is a continuum of citizens of mass one divided into three separate groups of equal size (i.e., each group contains $1/3$ of the citizenry), where $j \in \{a, b, c\}$ denotes a generic group of citizens. All citizens within the same group have the same preferences, and citizens in group $j \in \{a, b, c\}$ evaluate alternative policies $(y_1, y_2) \in Y$ according to the (indirect) utility function

$$u_j(y) = - (y_1^j - y_1)^2 - (y_2^j - y_2)^2,$$

where $y^j = (y_1^j, y_2^j) \in Y$ denotes group j 's most preferred policy, or ideal point, and $y^a = (-1, -1)$, $y^b = (1, 1)$, and $y^c = (-1, 1)$.

One citizen in each group is a politician (with the same preferences as all other citizens in the group). Hence, let $j \in \{a, b, c\}$ also denote the politician from group j . The three politicians are organized into parties, and the five possible party configurations are: $(\{a\}, \{b\}, \{c\})$ (which denotes that each politician is in a separate party), $(\{a, b\}, \{c\})$ (which denotes that politicians a and b are in the same party, while politician c is in a separate party), $(\{a\}, \{b, c\})$, $(\{a, c\}, \{b\})$, and $(\{a, b, c\})$.

Parties (simultaneously and independently) choose whether or not to compete in the election and, if so, which policy platform to propose. Decisions within each party are made by unanimity rule. If all the members of a party are indifferent between running and not running, the party does not run. If a party competes in the election a partisan politician runs as its representative. Since there are no direct benefits from holding office and, if elected, a politician implements his party's platform, the choice of the party's representative is inconsequential.

The set of policy platforms a party can propose is represented by its Pareto set (i.e., the set of feasible policies that are efficient from the point of view of the party). Hence, the role of parties here is to expand the set of policies politicians can offer when they run for office. Recall that in the citizen-candidate framework, politicians cannot commit to implement

any policy other than their ideal point. In this environment, on the other hand, parties can commit to implement any policy, as long as it is efficient for its members (and hence enforceable after the election). Let $k \in \{\{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}\}$ denote a generic party and P^k its Pareto set. We have that $P^{\{a\}} = (-1, -1)$, $P^{\{b\}} = (1, 1)$, $P^{\{c\}} = (-1, 1)$, $P^{\{a,b\}} = \{(y_1, y_2) : y_1 = y_2 \in [-1, 1]\}$, $P^{\{a,c\}} = \{(-1, y_2) : y_2 \in [-1, 1]\}$, $P^{\{b,c\}} = \{(y_1, 1) : y_1 \in [-1, 1]\}$, and $P^{\{a,b,c\}} = \{(y_1, y_2) : y_1, y_2 \in [-1, 1], y_1 \geq y_2\}$.

Given the set of parties running for election and their policy platforms, citizens vote sincerely (i.e., they vote for the platform they most prefer, and if they are indifferent they vote for the party which includes their politician). The platform that receives the largest number of votes is then implemented by the elected representative of the party proposing the platform.

Following Levy (2004), the equilibrium characterization proceeds in two steps: (i) for any given party configuration, solve for the pure-strategy Nash equilibria of the platform game and determine which policy platforms are implemented; (ii) derive the set of equilibrium party configurations, where a party configuration is an equilibrium if it is stable (i.e., it is such that no politician, or group of politicians wants to quit its party and form a smaller one, thus inducing a different equilibrium policy outcome).

Equilibrium platforms: Suppose the party configuration is $(\{a\}, \{b\}, \{c\})$. Hence, if party $\{j\}$, $j \in \{a, b, c\}$, runs its policy platform is y^j . Note that the citizens in group a strictly prefer y^c to y^b (since $u_a(-1, 1) = -4 > u_a(1, 1) = -8$), and similarly, the citizens in group b strictly prefer y^c to y^b . Therefore, in equilibrium the politician in party $\{c\}$ runs unopposed and the policy platform $(-1, 1)$ is implemented.

Next, suppose the party configuration is $(\{a, b\}, \{c\})$. Hence, if party $\{a, b\}$ runs it can offer policy platforms in the set $\{(y_1, y_2) : y_1 = y_2 \in [-1, 1]\}$, while if party $\{c\}$ runs its policy platform is $(-1, 1)$. Note that if party $\{a, b\}$ offers a policy platform (y, y) such that $y \in [-1, \sqrt{2} - 1)$, the citizens in group a strictly prefer such policy to $(-1, 1)$ (since $u_a(y, y) = -2(-1 - y)^2 > u_a(-1, 1) = -4$), and if it offers a policy platform (y, y) such that $y \in (1 - \sqrt{2}, 1]$, the citizens in group b strictly prefer such policy to $(-1, 1)$ (since $u_b(y, y) = -2(1 - y)^2 > u_b(-1, 1) = -4$). Therefore, in equilibrium one of the two politicians in party $\{a, b\}$ runs unopposed and offers a policy platform $y \in (1 - \sqrt{2}, \sqrt{2} - 1)$, which is

implemented.

Consider now the case where the party configuration is $(\{a, c\}, \{b\})$. Note that if party $\{a, c\}$ offers any policy platform in its Pareto set $\{(-1, y_2) : y_2 \in [-1, 1]\}$, the citizens in groups a and c strictly prefer such policy to $(1, 1)$ (the preference is weak for citizens in groups c if $y_2 = -1$). Therefore, in equilibrium one of the two politicians in party $\{a, c\}$ runs unopposed and offers a policy platform $(-1, y_2)$, where $y_2 \in [-1, 1]$, which is implemented. Similarly, if the party configuration is $(\{b, c\}, \{a\})$, in equilibrium one of the two politicians in party $\{b, c\}$ runs unopposed and offers a policy platform $(y_1, 1)$, where $y_1 \in [-1, 1]$, which is implemented. Finally, if the only party is $\{a, b, c\}$, then any policy platform in $P^{\{a, b, c\}}$ can be offered and implemented in equilibrium.

Equilibrium party configurations: Party configuration $(\{a\}, \{b\}, \{c\})$ is stable by definition. Party configuration $(\{a, b\}, \{c\})$ is stable, since neither politician a nor politician b can gain by leaving party $\{a, b\}$ and forming their own parties; the break-up of the party would in fact lead to the policy outcome $(-1, 1)$. Party configurations $(\{a, c\}, \{b\})$ and $(\{b, c\}, \{a\})$ are stable only if the platform that is offered is $(-1, 1)$; otherwise, in either case politician c would find it profitable to leave its party and form his own party, thus inducing the policy outcome $(-1, 1)$. Finally, party configuration $\{a, b, c\}$ is stable only if the platform that is offered is $(0, 0)$, which is the only platform that prevents either politicians a and b to form a party together or c to form his own party (note that $(0, 0)$ is the platform in the set of equilibrium policies of party $\{a, b\}$ that maximizes the utility of politician c).

The main conclusion we draw from this insightful example (which extends to the general environment considered by Levy (2004)), is that parties may matter. By imposing discipline on the policy platforms that are offered by their politicians in an election, parties may affect equilibrium policy outcomes. In particular, the partisan policy platforms that are implemented may differ from any of the ideal points of the politicians, which are the only possible policy outcomes in the absence of parties.

4.3 Political Recruitment

As already discussed in section 3.3, parties play an important role in the selection of candidates for a variety of public offices. However, as pointed out by Diermeier, Keane and

Merlo (2005) in the context of legislative careers in the United States and, more generally, by Best and Cotta (2000) and Norris (1997) for many other countries, the involvement of individuals in politics often begins quite early in their adult life. Moreover, relatively few individuals start off their political careers by running for a public office. More frequently, they “test” their political aspirations by holding positions within party organizations, which represent “breeding grounds” from which many successful politicians are eventually drawn.

Since political recruitment is an important activity parties engage in and its outcome affects the “pool” of potential candidates running for election, a significant issue concerns the (endogenous) quality of the set of individuals who are recruited by parties. Also, while intra-party competition for potential recruits may exist, at a more general level the political sector competes with other sectors of the economy for talent.⁶³

To explore these issues, consider the following example based on Mattozzi and Merlo (2005b). A political party, who is defined as a collection of politicians, has to recruit new members. Opportunities to recruit new members arrive randomly, and when an opportunity materializes the party has to decide whether or not to pursue it. The party can recruit as many new members as it likes (i.e., adding a new member does not preclude the possibility of recruiting additional members). Hence, each recruiting decision can be analyzed independently.

There exists a set of individuals of measure one who are potentially interested in becoming politicians. The alternative is to work in the (perfectly competitive) market sector. Individuals are heterogeneous with respect to their political skills $p \in [0, 1]$, and their labor market productivity $m \in [0, 1]$. The marginal distributions of political skills and labor market productivity are both uniform on the support $[0, 1]$. Political skills are either perfectly correlated with labor market productivity, or they are orthogonal. Each individual knows his political skills, but does not know his labor market productivity. Hence, he does not know whether his political skills and labor market productivity are correlated. He only knows that the probability they are correlated is equal to $\theta \in (2/3, 1)$.⁶⁴

⁶³In general, intra-party competition for potential recruits is likely to be of secondary importance, as ideological preferences are more likely to draw individuals toward any particular party.

⁶⁴Alternatively, think of a market environment where a fraction θ of the firms value political skills while

Consider the situation where the party has the opportunity to recruit a generic individual with political skills p and has to decide whether or not to pursue it. The party observes the political skills of the potential recruit, but not his labor market productivity.⁶⁵ The labor market does not observe either, but knows whether or not they are correlated. Moreover, if the party makes an offer to the potential recruit, the labor market knows that an offer is made, although it does not observe the content of the offer.

If the party offers the individual the possibility of becoming a politician, with probability $\mu \in (1/2, 1)$ the offer generates a signal that reveals p to the labor market, while with the complementary probability $1 - \mu$ the labor market only observes that the individual received the offer. However, if the individual receives an offer to join the party, he must decide whether or not to take it before he can consider alternative employment opportunities in the labor market.

If the individual joins the party, he generates a benefit to the party equal to

$$z(p) = \frac{3p(2-p)}{4}$$

and the party pays the individual a wage $w^P(p)$, where $w^P(p)$ is an endogenous (equilibrium) wage. Hence, if the party recruits him, the party's payoff is equal to $z(p) - w^P(p)$ and the individual's payoff is equal to $w^P(p)$; if the party does not recruit him, the party's payoff is equal to 0 and the individual's payoff is equal to its wage in the labor market. What will the party do?

To answer this question, let P denote the event that the party makes an offer to the perspective recruit with political skills p . Then, his expected labor market wage is equal to:

$$w^M(p) = \theta(\mu p + (1 - \mu) E_M[p|P]) + (1 - \theta) \frac{1}{2}$$

where $E_M[\cdot]$ denotes the updated beliefs of the labor market about the individual's political skills, conditional on observing the party making an offer to him but not observing a signal of his skills.

the remaining $1 - \theta$ does not and an individual does not know which firm has an opening.

⁶⁵Hence, the party also does not know whether his political skills and labor market productivity are correlated, but only knows that the probability they are correlated is equal to $\theta \in (2/3, 1)$.

It follows that the party will make an offer if and only if

$$z(p) - w^M(p) \geq 0$$

and

$$w^M(p) = \theta(\mu p + (1 - \mu) E_M[p|P^*]) + (1 - \theta) \frac{1}{2},$$

where P^* is the equilibrium recruiting strategy of the party.

To solve for an equilibrium, suppose that the party is a collection of politicians with political skills $p^P \in [p', p'']$, and its recruiting strategy is to make an offer to a prospective party member with political skills p only if $p \in [p', p'']$. Hence, by concavity of the benefit function $z(p)$, the equilibrium conditions for p' and p'' are

$$\begin{cases} \frac{3p'(2-p')}{4} = \left(\frac{1-\theta}{2} + \theta \left((1-\mu) \frac{p'+p''}{2} + \mu p' \right) \right) \\ \frac{3p''(2-p'')}{4} = \left(\frac{1-\theta}{2} + \theta \left((1-\mu) \frac{p'+p''}{2} + \mu p'' \right) \right) \end{cases}$$

where it must be the case that $p'' > p'$. Solving for p' and p'' we obtain that in equilibrium

$$p' = 1 - \frac{2}{3}\theta\mu - \frac{1}{3}\sqrt{3 - 2\theta(3 - 2\theta\mu(2 - \mu))}$$

and

$$p'' = 1 - \frac{2}{3}\theta\mu + \frac{1}{3}\sqrt{3 - 2\theta(3 - 2\theta\mu(2 - \mu))}$$

where, for $\theta \in (2/3, 1)$ and $\mu \in (1/2, 1)$, we have that $0 < p' < p'' < 1$. This characterizes the unique equilibrium recruiting strategy for the party and hence the party's composition.

Several interesting observations emerge from these results. First, the party recruits “mediocre” politicians: it neither pursues the very best, nor the worst political talent available. The intuition for this result is that the equilibrium selection rule used by the party conveys potentially useful information to the labor market about the productivity of party members. This affects the equilibrium wages the party has to pay to its members. Politicians with relatively higher skills induce a positive externality on party wages and make all party members more expensive, thus forcing the party to forego the opportunity of recruiting the very best politicians. At the same time, this externality makes individuals with relatively low political skills, who generate relatively low benefits to the party, “too expensive” thus

making it not worthwhile for the party to recruit individuals at the bottom of the distribution of political skills.

Second, let

$$\bar{p}^P = \frac{p' + p''}{2} = 1 - \frac{2}{3}\theta\mu$$

be the average quality of a partisan politician. Note that \bar{p}^P is decreasing in μ and θ . This implies that as the transparency of the political system increases (i.e., as μ goes up), the average quality of partisan politicians decreases. Average quality also decreases if the extent to which the labor market cares about political skills increases (i.e., θ goes up). The intuition for these results is that an increase in either μ or θ increases competition between the party and the labor market for scarce talent, thus making politicians with relatively high skills too expensive for the party.

5 Governments

The last topic of this paper concerns the executive, or government, which is ultimately responsible for implementing policy. As it was the case for each of the other topics I addressed in the three previous sections of the paper, the government represents a fundamental institution of democracy, and the study of government has always been at the forefront of research in political economy. Like with the analyses of politicians and parties, however, the major turning point that characterizes the current approach to the analysis of government in the political economy literature was defined by addressing the issue of the endogeneity of government.

In presidential democracy, the executive (i.e., the President) is directly elected by the citizens. Hence, the analysis of the government as an endogenous equilibrium institution is derivative of the analyses of voters, politicians, and parties. In parliamentary democracy, on the other hand, the executive (i.e., the cabinet) derives its mandate from and is responsible to the legislature. This implies that who forms the government is not determined by an election alone, but is the outcome of a negotiation among the elected members of the legislature.⁶⁶ Furthermore, it implies that the government may terminate at any time before the expiration of a parliamentary term if it loses the confidence of the legislature. Given these

⁶⁶See, e.g., Riker (1962) for an early attempt to formalize this idea.

considerations, most of the modern political economy literature on the endogenous formation and dissolution of governments focuses on parliamentary democracy, and views governments as equilibrium outcomes of a multilateral bargaining game among the parties represented in parliament.⁶⁷

Multiparty parliamentary democracy is the predominant regime in Western Europe, and a number of interesting observations emerge from data on governments in West European countries in the post-war period (e.g., Diermeier, Eraslan and Merlo (2003) and Laver and Schofield (1990)).⁶⁸ Since several parties typically compete and win seats in parliamentary elections, single-party majority governments (where one party controls the majority of parliament and hence forms the government), are extremely rare. Coalition governments are instead the norm, and minority (i.e., coalitions that control less than 50% of the parliamentary seats), minimum-winning (i.e., coalitions that control at least 50% of the parliamentary seats and are such that each party in the coalition is essential to retain majority status), and surplus governments (i.e., coalitions that control more than 50% of the parliamentary seats and are such that there is at least one party in the coalition which is not necessary to have majority status), are all prevalent in the data. Governments frequently terminate before the end of the legislature, and reshuffles (i.e., a situation where a government is replaced by an identical coalition, but with a different allocation of cabinet positions), are a common phenomenon. Moreover, minority governments are, on average, less stable than either minimum-winning or surplus governments.

These empirical regularities provide the motivation for developing models that can explain the evidence. Non-cooperative bargaining theory typically represents the fundamental building block of these models.⁶⁹ While some of the models only focus on government forma-

⁶⁷While the vast majority of contributions in this area treat parties as primitives, several models have been proposed where voters are the only primitive while representatives, parties and governments are all equilibrium outcomes. See, e.g., Austen-Smith and Banks (1988), Bandyopadhyay and Oak (2004), Baron and Diermeier (2001), and Persson, Roland and Tabellini (2003).

⁶⁸Additional data on coalition governments are contained in Muller and Strom (2000) and Woldendorp, Keman and Budge (2000).

⁶⁹Some models, however, build on cooperative game theory (see, e.g., Austen-Smith and Banks (1990) and Laver and Shepsle (1990, 1996)).

tion (e.g., Baron (1991, 1993), Baron and Ferejohn (1989), Bandyopadhyay and Oak (2005) and Morelli (1999)), others study environments where the composition and the duration of coalition governments are both determined in equilibrium (e.g., Baron (1998), Diermeier, Eraslan and Merlo (2002, 2003), Diermeier and Feddersen (1998), Diermeier and Merlo (2000), Lupia and Strom (1995) and Merlo (1997)).

To illustrate the extent to which this class of models can account for some of the stylized facts, consider the following example of a two-period model of government formation and termination in a parliamentary democracy based on Diermeier and Merlo (2000). A parliament has to form a government to implement a policy $y = (y_1, y_2)$ in the two-dimensional policy space \mathbb{R}^2 . There are three parties, $N = \{a, b, c\}$, and two periods, $t = 1, 2$. Each party $i \in N$ evaluates alternative policies $y \in \mathbb{R}^2$ and distributive benefits $z \in \mathbb{R}$ according to the (per-period) payoff function

$$U_i(y, z) = u_i(y) + z$$

where

$$u_i(y) = - (y_1^i - y_1)^2 - (y_2^i - y_2)^2,$$

and $y^i = (y_1^i, y_2^i) \in \mathbb{R}^2$ denotes party i 's most preferred policy, or ideal point, where $y^a = (0, 0)$, $y^b = (1, 0)$, and $y^c = (1/2, \sqrt{3}/2)$. Aggregate transfers are normalized to 0 in each period (i.e., $z_a + z_b + z_c = 0$), and parties discount future payoffs with a common discount factor $\delta \in [0, 1]$. Each party $i \in \{a, b, c\}$ controls a fraction π_i of parliamentary seats, where $\pi_a = 5/11$, $\pi_b = \pi_c = 3/11$.

In period $t = 1$ there is a default policy $q \in \{y^a, y^b, y^c\}$, which is implemented if no government forms in that period. If $q = y^i$, i is the party favored by the the default policy. At the beginning of period $t = 1$ party a is the formateur (i.e., the party in charge of conducting negotiations to form the government).⁷⁰ The formateur chooses the proto-coalition $D \in \Delta_a = \{\{a\}, \{a, b\}, \{a, c\}, \{a, b, c\}\}$, where D represents the set of parties that agree to talk to each other about forming a government together.

After the proto-coalition is chosen, D selects a set of non-negative transfers to parties

⁷⁰For an empirical investigation of formateur selection in government formation see Diermeier and Merlo (2004).

outside the proto-coalition, $T(D, q) = (T_j(D, q))_{j \in N \setminus D} \in \mathbb{R}_+^{|N \setminus D|}$, which are payments to non-coalition parties that may be necessary to sustain the proposed government coalition.⁷¹ Given D and T , the parliament votes to approve the formateur's proposal under majority rule. If the proposal is defeated, the default policy is implemented and each party $i \in N$ receives a period-1 payoff of $U_i(q, 0)$.

If the formateur's proposal is accepted, the members of D bargain over a policy $y(D, q) \in \mathbb{R}^2$ and benefits to coalition members $B(D, q) = (B_j(D, q))_{j \in D} \in \mathbb{R}^{|D|}$.⁷² The bargaining procedure takes no real time and is such that for as long as no agreement is reached, each party in D is independently selected to make a proposal with probability $1/|D|$. An agreement entails unanimous approval of the proto-coalition members. If the members of D do not reach an agreement on a common policy and vector of transfers, then the government formation attempt fails and each party $i \in N$ receives a period-1 payoff of $U_i(q, 0)$. If instead an agreement is reached, then D forms the government and each party $i \in D$ receives a period-1 payoff of $U_i(y(D, q), B_i(D, q))$, while each party $j \notin D$ receives a period-1 payoff of $U_j(y(D, q), T_j(D, q))$.

At the beginning of period $t = 2$ a new default policy $q' \in \{y^a, y^b, y^c\}$ is realized with probabilities $(1/3, 1/3, 1/3)$. If a government formed in period $t = 1$, then after observing q' the incumbent government can renegotiate its agreement. Renegotiation is similar to government formation, except for the fact that the coalition is fixed and given by the incumbent government. Hence, first the government may choose a set of period-2 transfers to the parties outside the government coalition, $T'(D, q') = (T'_j(D, q'))_{j \in N \setminus D} \in \mathbb{R}_+^{|N \setminus D|}$. Given $T'(D, q')$, a vote is then taken to determine whether the incumbent government retains the confidence of a parliamentary majority to continue its mandate. If the government retains the confidence of the parliament, it then bargains over a policy $y'(D, q')$ and benefits to its members $B(D, q') = (B'_j(D, q'))_{j \in D} \in \mathbb{R}^{|D|}$ for period $t = 2$. If an agreement is reached, then D continues as a government and period-2 payoffs to the parties are determined as a

⁷¹These can be thought of as government posts other than cabinet ministries that can be allocated to opposition parties.

⁷²These can be thought of as ministerial positions, that can only be allocated to parties within the government coalition.

function of $y'(D, q')$, $B'(D, q')$ and $T'(D, q')$. If D fails to reach an agreement or loses the confidence of the parliament, then D terminates.

If the incumbent government terminates or no government formed in period $t = 1$, then a new government formation process begins in period $t = 2$ with the selection of a formateur $k \in \{a, b, c\}$, where the probability each party i is chosen to be the formateur is equal to π_i . Like in period $t = 1$, the outcome of the government formation process determines the period-2 payoffs to the parties. In particular, if a government $D' \in \Delta_k$ forms, then each party $i \in D'$ receives a period-2 payoff of $U_i(y'(D', q'), B'_i(D', q'))$ while each party $j \notin D'$ receives a period-2 payoff of $U_j(y'(D', q'), T'_j(D', q'))$. If instead no government forms, then each party $i \in N$ receives a period-2 payoff of $U_i(q', 0)$.

Following Diermeier and Merlo (2000), we characterize the unique subgame perfect equilibrium of the game using backwards induction. Suppose first that a new government formation process begins in period $t = 2$ and D' is chosen as the proto-coalition. Then D' forms the government, which implements policy

$$y'(D', q') = \frac{1}{|D'|} \sum_{i \in D'} y^i.$$

Furthermore, equilibrium benefits and transfers are equal to

$$B'_i(D', q') = -\frac{1}{|D'|} \sum_{j \in D', j \neq i} u_j(q') + \frac{|D'| - 1}{|D'|} u_i(q'), \quad i \in D'$$

and

$$T'_j(D', q') = 0, \quad j \in N \setminus D'.$$

To see that this is the case, note first that if D' contains either 2 or 3 parties (i.e., it is a majority), it does not need any support from outside the coalition to be approved by parliament. Hence, $T'_j(D', q') = 0$. If instead D' contains only one party (i.e., it is a minority), it may need the support of another party to be approved by parliament. But in this case the formateur party would want to implement its most preferred policy, and since the locations of the three parties' ideal points are symmetric, and the payoff function $u_i(y)$ has circular indifference curves, there will always be at least a party other than the formateur who is indifferent between the default policy q' and the policy most preferred by

the formateur. Hence, there will always be (at least) an additional party willing to support a minority government for free. It follows that $T'_j(D', q') = 0$ for all D' and q' .

Next, note that efficient bargaining within the proto-coalition implies that the policy chosen is the one that maximizes the sum of the payoffs of the parties in the coalition. Given the quadratic specification of $u_i(y)$ this policy is given by the average of the ideal points of the parties in the coalition, independent of the default policy q' . Since in the event of disagreement the policy outcome is q' , the default policy affects however the allocation of benefits. In particular, the “cake” $C(D', q')$ that is available for distribution to the proto-coalition is equal to the sum of the differences in the payoffs of the parties within the coalition evaluated at $y'(D', q')$ and q' :

$$C(D', q') = \sum_{i \in D'} \left[u_i \left(\frac{1}{|D'|} \sum_{i \in D'} y^i \right) - u_i(q') \right] \geq 0$$

This represents the total increment in the payoffs of the coalition partners from implementing the optimal policy $y'(D', q')$ rather than q' . Given the structure of the bargaining game, the parties within the proto-coalition unanimously agree to a split of the cake where each party receives a fraction $1/|D'|$. Hence, each party $i \in D'$ receives a payoff equal to

$$u_i(q') + \frac{1}{|D'|} C(D', q')$$

or equivalently,

$$u_i \left(\frac{1}{|D'|} \sum_{i \in D'} y^i \right) + B'_i(D', q'),$$

where $B'_i(D', q')$ is given in the expression above.

Hence, we have that for all $q' \in \{y^a, y^b, y^c\}$

$$y'(D', q') = \begin{cases} (0, 0) & \text{if } D' = \{a\} \\ (1, 0) & \text{if } D' = \{b\} \\ (1/2, \sqrt{3}/2) & \text{if } D' = \{c\} \\ (1/2, 0) & \text{if } D' = \{a, b\} \\ (1/4, \sqrt{3}/4) & \text{if } D' = \{a, c\} \\ (3/4, \sqrt{3}/4) & \text{if } D' = \{b, c\} \\ (1/2, \sqrt{3}/6) & \text{if } D' = \{a, b, c\} \end{cases}$$

and for $q' = y^i$ and $i, j, l \in \{a, b, c\}$, $i \neq j \neq l$,

$$C(D', y^i) = \begin{cases} 0 & \text{if } D' = \{i\} \\ 1 & \text{if } D' = \{j\} \\ 1 & \text{if } D' = \{l\} \\ 1/2 & \text{if } D' = \{i, j\} \\ 1/2 & \text{if } D' = \{i, l\} \\ 3/2 & \text{if } D' = \{j, l\} \\ 1 & \text{if } D' = \{a, b, c\} \end{cases}$$

The formateur party k then chooses the proto-coalition that maximizes its payoff. Since each party $i \in D'$ receives a payoff equal to $u_i(q') + C(D', q')/|D'|$ and $u_i(y^i) = 0$ and $u_i(y^j) = -1$, for all $i, j \in \{a, b, c\}$, $i \neq j$, it follows that if $q' = y^k$, then k chooses $D' = \{a, b, c\}$, while if $q' \neq y^k$, then k chooses $D' = \{k\}$. This implies that the payoff to the formateur party k is equal to $1/3$ if $q' = y^k$ and 0 if $q' \neq y^k$ while the payoff to a party i that is not the formateur is equal to -1 if $q' \neq y^k$ and $-2/3$ if $q' = y^k$.

Let $V_i(q')$ denote party i 's expected continuation payoff if a new government needs to be formed in period $t = 2$ when the default policy is q' . Note that, for all $i, j \in \{a, b, c\}$, $i \neq j$,

$$V_i(q') = \begin{cases} \frac{4}{3}\pi_i - 1 & \text{if } q' = y^i \\ \pi_i + \frac{1}{3}\pi_j - 1 & \text{if } q' = y^j \end{cases},$$

which implies that if $q' = y^a$, $V_a(y^a) = -13/33$ and $V_b(y^a) = V_a(y^a) = -19/33$, while if $q' \neq y^a$, $V_a(q') = -5/11$ and $V_b(q') = V_b(q') = -7/11$.

Consider now the renegotiation problem faced by an incumbent government D after the realization of q' . Recall that since party a is the formateur in period $t = 1$, it must be the case that $D \in \Delta_a = \{\{a\}, \{a, b\}, \{a, c\}, \{a, b, c\}\}$. Since renegotiation is similar to proto-coalition bargaining, except that failure to reach agreement leads to an expected payoff of $V_i(q')$ instead of $u_i(q')$, it follows that if the incumbent government D is a majority (i.e., $D \neq \{a\}$), then D remains in power in period $t = 2$ and implements policy $y'(D, q')$ equal to the average of the ideal points of the parties in the government coalition. The expression for the benefits to the coalition partners is also similar to the one derived above, but where $V_i(q')$ replaces $u_i(q')$, and transfers to parties outside the government coalition are equal to zero.

If, on the other hand $D = \{a\}$ (i.e., it is a minority government), then if $q' = y^a$ the government terminates; while if $q' \neq y^a$ the minority government remains in power with the external support of one of the other parties, implements policy y^a , and makes a transfer equal to $4/11$ with equal probability either to party b or to party c (and no transfer to the other party). The result follows immediately from the fact that if $q' = y^a$, the payoff gain to party a from staying in power is equal to $13/33$ and either one of the other parties would need a transfer of $14/33$ to support the government; while if $q' \neq y^a$ the payoff gain to party a from staying in power is equal to $5/11$ and either one of the other parties would only need a transfer of $4/11$ to support the government.

Let $V'_i(D)$ be party i 's expected continuation payoff at the beginning of period $t = 2$, prior to the realization of q' , if government D is in power. Since each realization of q' is equally likely, we have that for party a

$$V'_a(D) = \begin{cases} -\frac{37}{99} & \text{if } D = \{a\} \\ -\frac{7}{44} & \text{if } D = \{a, b\} \\ -\frac{7}{44} & \text{if } D = \{a, c\} \\ -\frac{7}{33} & \text{if } D = \{a, b, c\} \end{cases},$$

while for parties $i, j \in \{b, c\}$, $i \neq j$,

$$V'_i(D) = \begin{cases} -\frac{73}{99} & \text{if } D = \{a\} \\ -\frac{15}{44} & \text{if } D = \{a, i\} \\ -\frac{3}{4} & \text{if } D = \{a, j\} \\ -\frac{13}{33} & \text{if } D = \{a, b, c\} \end{cases}.$$

The last step of the equilibrium characterization involves solving for D . Since proto-coalition bargaining in period $t = 1$ is similar to the bargaining problems analyzed before, simply note that if D is chosen as the proto-coalition it forms the government. If D is a majority (i.e., $D \neq \{a\}$), then again it implements policy $y(D, q)$ equal to the average of the ideal points of the parties in the proto-coalition. The expression for the benefits to the coalition partners is also the same as the one derived above, except that $u_i(q)$ replaces $u_i(q')$, and transfers to parties outside the government coalition are equal to zero.

If, on the other hand $D = \{a\}$ (i.e., it is a minority), then it implements policy y^a , and makes a transfer equal to $\delta(4/33)$ to the party that is not favored by the default policy q

(or, if neither party is favored, to either party with equal probability), in order to obtain its external support. This result follows from the fact that if both parties were to vote against $D = \{a\}$, then q would be implemented in period $t = 1$, and a new government negotiation would follow in period $t = 2$ yielding the party that is not favored by the default policy q an expected payoff equal to

$$-1 + \delta \left(\frac{2}{3} \left(-\frac{7}{11} \right) + \frac{1}{3} \left(-\frac{19}{33} \right) \right) = -1 - \delta \frac{61}{99}$$

as opposed to

$$-1 + \delta \left(\frac{2}{3} \left(\frac{1}{2} \left(-\frac{7}{11} \right) + \frac{1}{2} (-1) \right) + \frac{1}{3} \left(-\frac{19}{33} \right) \right) = -1 - \delta \frac{73}{99}.$$

These calculations imply that if $q = y^a$, the payoffs to the formateur party a from choosing proto-coalition D are

$$W_a(D; q = y^a) = \begin{cases} -\delta \frac{49}{99} & \text{if } D = \{a\} \\ \frac{1}{4} - \delta \frac{7}{44} & \text{if } D = \{a, b\} \\ \frac{1}{4} - \delta \frac{7}{44} & \text{if } D = \{a, c\} \\ \frac{1}{3} - \delta \frac{7}{33} & \text{if } D = \{a, b, c\} \end{cases}$$

while if $q = y^i$, $i, j \in \{a, b\}$, $i \neq j$, they are equal to

$$W_a(D; q = y^i) = \begin{cases} -\delta \frac{49}{99} & \text{if } D = \{a\} \\ -\frac{3}{4} - \delta \frac{7}{44} & \text{if } D = \{a, i\} \\ -\frac{1}{4} - \delta \frac{7}{44} & \text{if } D = \{a, j\} \\ -\frac{2}{3} - \delta \frac{7}{33} & \text{if } D = \{a, b, c\} \end{cases}.$$

Given the default policy q , the formateur party a chooses the government that maximizes its payoff. Hence, if $q = y^a$, the government that forms in period $t = 1$ is the surplus coalition $\{a, b, c\}$, which remains in power for two periods. If, on the other hand $q \neq a$, then if $\delta < 3/4$, the minority government $\{a\}$ forms in period $t = 1$ and terminates in period $t = 2$ with probability $1/3$; while if $\delta > 3/4$ the government that forms in period $t = 1$ is the minimum-winning coalition between party a and the other party that is not favored by the default policy. If it forms, the minimum-winning government lasts until the end of the second period. Regardless of whether the surplus or the minimum-winning government forms

in period $t = 1$, in period $t = 2$ majority coalitions reshuffle the allocation of distributive benefits to their members with probability $1/3$ (i.e., when $q' \neq q$), but do not change their policy.

Several interesting observations emerge from the analysis. The general framework illustrated here through a simple example provides an equilibrium interpretation for all of the prominent empirical regularities listed above. In particular, it explains the occurrence of minority and surplus governments. This is in sharp contrast with standard models of bargaining where only minimum-winning coalitions can form in equilibrium (e.g., Baron and Ferejohn (1989) and Eraslan (2002)).

Furthermore, the analysis indicates that the stability and the relative occurrence of different types of governments are closely connected, and highlights the importance an equilibrium trade-off. When choosing a government coalition, a formateur faces a fundamental trade-off between “control” and “durability”. On the one hand, relatively larger coalitions may be associated with longer expected durations and hence relatively larger cakes. On the other hand, because of proto-coalition bargaining, by including additional parties in its coalition the formateur party would receive a smaller share of the cake, and share the power to choose policy. The equilibrium coalition choice, and hence the stability of government, depend on the terms of this trade-off, which in general will depend on characteristics of the environment where government negotiations take place. These considerations raise a challenge for empirical research aimed at assessing the effects of constitutional features of representative democracy on government stability.⁷³ Since the choice of the government coalition is endogenous, changes in the institutional environment are likely to induce an “equilibrium” replacement effect, where governments that are optimally chosen in equilibrium in a particular environment, may be replaced by different coalitions in response to changes in the underlying environment.

These issues are addressed by Diermeier, Eraslan and Merlo (2002, 2003), who propose a structural approach to the empirical study of the effects of constitutions on coalition gov-

⁷³For a recent overview of the large empirical literature on government termination see, e.g., Warwick (1994).

ernments based on the estimation of bargaining models.⁷⁴ Parliamentary democracies differ with respect to the specific rules in their constitutions that prescribe how their governments form and terminate. They also differ systematically with respect to the observed duration of their government formation processes, the type (i.e., minority, minimum-winning, or surplus) and size of the government coalitions that result from these processes, and the relative durability of their governments. These observations raise the following important questions: Can constitutional features account for these observed differences? And, if so, which institutions are quantitatively most important for the type and the stability of coalition governments?

To address these questions, Diermeier, Eraslan and Merlo (2003, 2004) develop an equilibrium framework to assess quantitatively the role played by specific institutions in the formation and dissolution of coalition governments in parliamentary democracy. They specify a general stochastic bargaining model, estimate the model's parameters using data from nine West European countries over the period 1947–1999, assess the ability of the model to account for key features of the data, and then use the estimated structural model to conduct experiments of comparative constitutional design.⁷⁵ Their analysis accounts for many of the empirical regularities identified by the existing literature and interprets them in the context of an equilibrium model which fits the data well. Moreover, they assess the propensity of different political systems to generate government coalitions of different types, sizes and durations, and evaluate the effects of changes in the length of time between elections or the formateur selection process on the formation and duration of governments.

6 Conclusion

In this paper, I have focused on some of the recent developments that have characterized research in political economy from a microeconomic perspective over the last twenty years. In spite of the obvious differences due to the specific nature of each topic, there is a key element of commonality in this research which has contributed to define modern political economy as a field. It is the use of a common language (a consistent set of analytical tools), and a coherent class of models that allow us to analyze political institutions and outcomes

⁷⁴See also Diermeier, Eraslan and Merlo (2004) for a non-technical overview.

⁷⁵For a general theory of stochastic bargaining, see Eraslan and Merlo (2002) and Merlo and Wilson (1995, 1998).

as endogenous, equilibrium phenomena.

The path traced by the work of a large number of economists and political scientists over more than two centuries started from a situation where political institutions could not fit in the precise definition of an economy. Since voters, politicians, parties, bureaucrats, interest groups, governments were not considered as part of the primitives that describe an economy, these scholars made them primitives of a political economy. Much of the research in this area over the last fifty years has been devoted to taking the analysis of political institutions to a deeper, more fundamental level. This path has led to a more precise notion of what the primitives of a political economy are, and how to model political institutions as endogenous objects which depend on such primitives.

This does not mean that the field of political economy has reached maturity or the status of “normal science.” In fact, much effort is currently being devoted to confront the difficult challenges that arise from the notion that constitutions and the rules of democracy are themselves equilibrium phenomena. But the set of tools developed in the recent past for the specific purpose of analyzing political institutions can only help to push the discipline further in this exciting direction.

The fundamental notion that political institutions are endogenous, also raises an important challenge for empirical research in economics. Empirical work in several fields of economics constantly relies on differences in institutions as providing a fundamental source of exogenous variation to address many different questions with important policy implications. Recognizing that political institutions are equilibrium outcomes may severely limit the usefulness of several common approaches to empirical research. However, theoretical developments in political economy provide a better understanding of the equilibrium relationships between primitives and institutions, and offer important insights for analyzing the data and interpreting what we observe. These developments will hopefully prove beneficial to further empirical research on these important topics.

REFERENCES

- [1] Acemoglu, Daron, and James A. Robinson, 2005. *Economic Origins of Dictatorship and Democracy*. Cambridge: MIT Press.
- [2] Aldrich, John H., 1993. "Rational Choice and Turnout," *American Journal of Political Science*, 37, 246-278.
- [3] Alesina, Alberto, 1988. "Credibility and Policy Convergence in a Two-Party System with Rational Voters," *American Economic Review*, 78, 796-806.
- [4] Alesina, Alberto, and Howard Rosenthal, 1995. *Partisan Politics, Divided Government, and the Economy*. Cambridge: Cambridge University Press.
- [5] Alesina, Alberto, and Howard Rosenthal, 1996. "A Theory of Divided Government," *Econometrica*, 64, 1311-1341.
- [6] Alesina, Alberto, and Stephen E. Spear, 1988. "An Overlapping Generations Model of Electoral Competition," *Journal of Public Economics*, 37, 359-379.
- [7] Anderson, Barbara A., and Brian D. Silver, 1986. "Measurement and Mismeasurement of the Validity of the Self-Reported Vote." *American Journal of Political Science*, 30: 771-785.
- [8] Arrow, Kenneth J., 1951. *Social Choice and Individual Values*. New Haven: Yale University Press.
- [9] Austen-Smith, David, and Jeffrey S. Banks, 1988. "Elections, Coalitions, and Legislative Outcomes," *American Political Science Review*, 82, 405-422.
- [10] Austen-Smith, David, and Jeffrey S. Banks, 1990. "Stable Governments and the Allocation of Policy Portfolios," *American Political Science Review*, 84, 891-906.
- [11] Austen-Smith, David, and Jeffrey S. Banks, 1999. *Positive Political Theory I: Collective Preferences*. Ann Arbor: University of Michigan Press.

- [12] Austen-Smith, David, and Jeffrey S. Banks, 2005. *Positive Political Theory II: Strategy and Structure*. Ann Arbor: University of Michigan Press.
- [13] Bandyopadhyay, Siddhartha, and Mandar Oak, 2004. "Party Formation and Coalition Bargaining in a Model of Proportional Representation," Working Paper, Department of Economics, University of Birmingham.
- [14] Bandyopadhyay, Siddhartha, and Mandar Oak, 2005. "Coalition Governments in a Model of Parliamentary Democracy," Working Paper, Department of Economics, University of Birmingham.
- [15] Banks, Jeffrey S., and Rangarajan K. Sundaram, 1993. "Adverse Selection and Moral Hazard in a Repeated Elections Model," ch. 12, pp. 295-311, in Barnett, W. A., Inich, M. J., Schofield, N. J. (eds.), *Political Economy: Institutions, Competition and Representation*. Cambridge: Cambridge University Press.
- [16] Banks, Jeffrey S., and Rangarajan K. Sundaram, 1998. "Optimal Retention in Agency Problems," *Journal of Economic Theory*, 82, 293-323.
- [17] Baron, David P., 1991. "A Spatial Bargaining Theory of Government Formation in Parliamentary Systems," *American Political Science Review*, 85, 137-164.
- [18] Baron, David P., 1993. "Government Formation and Endogenous Parties," *American Political Science Review*, 87, 34-47.
- [19] Baron, David P., 1998. "Comparative Dynamics of Parliamentary Governments," *American Political Science Review*, 92, 593-609.
- [20] Baron, David P. and Daniel Diermeier, 2001. "Elections, Governments, and Parliaments in Proportional Representation Systems," *Quarterly Journal of Economics*, 116, 933-967.
- [21] Baron, David P. and John A. Ferejohn, 1989. "Bargaining in Legislatures," *American Political Science Review*, 83, 1181-1206.

- [22] Barro, Robert J., 1973. "The Control of Politicians: An Economic Model," *Public Choice*, 14, 19-42.
- [23] Besley, Timothy, 2004. "Paying Politicians: Theory and Evidence." *Journal of the European Economic Association*, 2, 193-215.
- [24] Besley, Timothy, 2005. "Political Selection," *Journal of Economic Perspectives*, forthcoming.
- [25] Besley, Timothy, and Stephen Coate, 1997. "An Economic Model of Representative Democracy," *Quarterly Journal of Economics*, 112, 85-114.
- [26] Besley, Timothy, and Stephen Coate, 1998. "Sources of Inefficiency in a Representative Democracy: A Dynamic Analysis," *American Economic Review*, 88, 139-156.
- [27] Besley, Timothy, and Stephen Coate, 2001. "Lobbying and Welfare in a Representative Democracy," *Review of Economic Studies*, 68, 67-82.
- [28] Best, Heinrich, and Maurizio Cotta, 2000. *Parliamentary Representatives in Europe 1848-2000: Legislative Recruitment and Careers in Eleven European Countries*. Oxford: Oxford University Press.
- [29] Black, Duncan, 1958. *The Theory of Committees and Elections*. Cambridge: Cambridge University Press.
- [30] Blais, Andre, 2000. *To Vote or Not to Vote: The Merits and Limits of Rational Choice Theory*. Pittsburgh: University of Pittsburgh Press.
- [31] Borgers, Tilman, 2004. "Costly Voting," *American Economic Review*, 94, 57-66.
- [32] Buchanan, James M., and Gordon Tullock, 1962. *The Calculus of Consent: Logical Foundations of Constitutional Democracy*. Ann Arbor: University of Michigan Press.
- [33] Caillaud, Bernard, and Jean Tirole, 2002. "Parties as Political Intermediaries," *Quarterly Journal of Economics*, 117, 1453-1489.

- [34] Carrillo, Juan D., and Thomas Mariotti, 2001. “Electoral Competition and Political Turnover,” *European Economic Review*, 45, 1-25.
- [35] Caselli, Francesco, and Massimo Morelli, 2004. “Bad Politicians,” *Journal of Public Economics*, 88, 759-782.
- [36] Chari, V. V., Larry E. Jones, and Ramon Marimon, 1997. “The Economics of Split-Ticket Voting in Representative Democracies.” *American Economic Review*, 87, 957-976.
- [37] Clinton, Joshua, Jackman, Simon and Douglas Rivers, 2001. “The Statistical Analysis of Roll Call Data,” Working Paper, Department of Political Science, Stanford University.
- [38] Coate, Stephen, and Michael Conlin, 2004. “A Group Rule-Utilitarian Approach to Voter Turnout: Theory and Evidence,” *American Economic Review*, 94, 1476–1504.
- [39] Coate, Stephen, Conlin, Michael, and Andrea Moro, 2004. “The Performance of the Pivotal-Voter Model in Small-Scale Elections: Evidence from Texas Liquor Referenda,” Working Paper, Department of Economics, Cornell University.
- [40] Cox, Gary W., 1997. *Making Votes Count: Strategic Coordination in the World’s Electoral Systems*. New York: Cambridge University Press.
- [41] Cox, Gary W., and Mathew D. McCubbins, 1993. *Legislative Leviathan: Party Government in the House*. Berkeley: University of California Press.
- [42] Cox, Gary W., and Keith T. Poole, 2002. “On Measuring Partisanship in Roll-Call Voting: The U.S. House of Representatives, 1877-1999,” *American Journal of Political Science*, 46, 477-489.
- [43] Degan, Arianna, 2005. “Policy Positions, Information Acquisition, and Turnout,” Working Paper, Department of Economics, UQAM.

- [44] Degan, Arianna, and Antonio Merlo, 2004. “Do Citizens Vote Sincerely (If They Vote at All)? Theory and Evidence from U.S. National Elections,” PIER WP 04-14, Department of Economics, University of Pennsylvania.
- [45] Diermeier, Daniel, Eraslan, Hulya, and Antonio Merlo, 2002. “Bicameralism and Government Formation,” PIER WP 02-10, Department of Economics, University of Pennsylvania.
- [46] Diermeier, Daniel, Eraslan, Hulya, and Antonio Merlo, 2003. “A Structural Model of Government Formation,” *Econometrica*, 71, 27-70.
- [47] Diermeier, Daniel, Eraslan, Hulya, and Antonio Merlo, 2004. “The Effects of Constitutions on Coalition Governments in Parliamentary Democracies,” in R. D. Congleton, B. Swedenborg (eds.), *Democratic Constitutional Design and Public Policy: Analysis and Evidence*, Cambridge: MIT Press, forthcoming.
- [48] Diermeier, Daniel, and Timothy J. Feddersen, 1998. “Cohesion in Legislatures and the Vote of Confidence Procedure,” *American Political Science Review*, 92, 611-621.
- [49] Diermeier, Daniel, Keane, Michael, and Antonio Merlo, 2004. “A Political Economy Model of Congressional Careers: Supplementary Material,” PIER WP 04-38, Department of Economics, University of Pennsylvania.
- [50] Diermeier, Daniel, Keane, Michael, and Antonio Merlo, 2005. “A Political Economy Model of Congressional Careers,” *American Economic Review*, 95, 347-373.
- [51] Diermeier, Daniel, and Antonio Merlo, 2000. “Government Turnover in Parliamentary Democracies,” *Journal of Economic Theory*, 94, 46-79.
- [52] Diermeier, Daniel, and Antonio Merlo, 2004. “An Empirical Investigation of Coalitional Bargaining Procedures,” *Journal of Public Economics*, 88, 783-797.
- [53] Dhillon, Amrita, and Susana Peralta, 2002. “Economic Theories of Voter Turnout,” *Economic Journal*, 112, F332-F352.
- [54] Downs, Anthony, 1957. *An Economic Theory of Democracy*. New York: Harper Collins.

- [55] Duverger, Maurice, 1954. *Political Parties*. New York: Wiley.
- [56] Drazen, Allan, 2000. *Political Economy in Macroeconomics*. Princeton: Princeton University Press.
- [57] Eraslan, Hulya, 2002. "Uniqueness of Stationary Equilibrium Payoffs in the Baron-Ferejohn Model," *Journal of Economic Theory*, 103, 11-30.
- [58] Eraslan, Hulya, and Antonio Merlo, 2002. "Majority Rule in a Stochastic Model of Bargaining," *Journal of Economic Theory*, 103, 31-48.
- [59] Feddersen, Timothy J., 2004. "Rational Choice Theory and the Paradox of Not Voting," *Journal of Economic Perspectives*, 18, 99-112.
- [60] Feddersen, Timothy J., and Wolfgang Pesendorfer, 1996. "The Swing Voter's Curse," *American Economic Review*, 86, 408-424.
- [61] Feddersen, Timothy J., and Wolfgang Pesendorfer, 1997. "Voting Behavior and Information Aggregation in Elections with Private Information," *Econometrica*, 65, 1029-1058.
- [62] Feddersen, Timothy J., and Wolfgang Pesendorfer, 1999. "Abstention in Elections with Asymmetric Information and Diverse Preferences," *American Political Science Review*, 93, 381-398.
- [63] Feddersen, Timothy J., and Alvaro Sandroni, 2002. "A Theory of Participation in Elections," *American Economic Review*, forthcoming.
- [64] Felli, Leonardo, and Antonio Merlo, 2004. "Endogenous Lobbying," *Journal of the European Economic Association*, forthcoming.
- [65] Ferejohn, John A., 1986. "Incumbent Performance and Electoral Control," *Public Choice*, 50, 5-25.
- [66] Ferejohn, John A., and Morris P. Fiorina, 1975. "Closeness Counts Only in Horseshoes and Dancing," *American Political Science Review*, 69, 920-925.

- [67] Gerth, H. H., and C. Wright Mills, 1946. *From Max Weber: Essays in Sociology*. New York: Oxford University Press.
- [68] Grossman, Gene M., and Elhanan Helpman, 2001. *Special Interest Politics*. Cambridge: MIT Press.
- [69] Harrington, Joseph E. Jr., 1992. "The Role of Party Reputation in the Formation of Policy," *Journal of Public Economics*, 49, 107-121.
- [70] Harsanyi, John C., 1980. "Rule Utilitarianism, Rights, Obligations and the Theory of Rational Behavior," *Theory and Decision*, 12, 115-133.
- [71] Heckman, James J., and James M. Jr. Snyder, 1997. "Linear Probability Models of the Demand for Attributes with an Empirical Application to Estimating the Preferences of Legislators," *Rand Journal of Economics*, 28, 142-189.
- [72] Herrera, Helios, and Cesar Martinelli, 2004. "Group Formation and Voter Participation," Working Paper, Department of Economics, ITAM.
- [73] Hibbs, Douglas, 1977, "Political Parties and Macroeconomic Policy," *American Political Science Review*, 71, 1467-1487.
- [74] Jackson, Matthew O., and Boaz Moselle, 2002. "Coalition and Party Formation in a Legislative Voting Game," *Journal of Economic Theory*, 103, 49-87.
- [75] Kirchgaessner, Gebhard, and Tobias Schulz, 2005. "Expected Closeness or Mobilization: Why Do Voters Go to the Polls? Empirical Results for Switzerland, 1991-1999," CESifo WP 1387, Munich.
- [76] Laver, Michael, and Norman Schofield. 1990. *Multiparty Government: The Politics of Coalition in Europe*. Oxford: Oxford University Press.
- [77] Laver, Michael, and Kenneth A. Shepsle, 1990. "Coalitions and Cabinet Government," *American Political Science Review*, 84, 873-890.

- [78] Laver, Michael, and Kenneth A. Shepsle. 1996. *Making and Breaking Governments: Cabinets and Legislatures in Parliamentary Democracies*. Cambridge: Cambridge University Press.
- [79] Ledyard, John O., 1984. "The Pure Theory of Large Two-Candidate Elections," *Public Choice*, 44, 7-41.
- [80] Levy, Gilat, 2004. "A Model of Political Parties," *Journal of Economic Theory*, 115, 250-277.
- [81] Lijphart, Arend, 1999. *Patterns of Democracy: Government Forms and Performance in Thirty-Six Countries*. New Haven: Yale University Press.
- [82] Lupia, Arthur, and Kaare Strom. 1995. "Coalition Termination and the Strategic Timing of Parliamentary Elections," *American Political Science Review*, 89, 648-665.
- [83] Matsusaka, John G., 1995. "Explaining Voter Turnout Patterns: An Information Theory," *Public Choice*, 84, 91-117.
- [84] Matsusaka, John G., and Filip Palda, 1993. "The Downsian Voter Meets the Ecological Fallacy," *Public Choice*, 77, 855-878.
- [85] Matsusaka, John G., and Filip Palda, 1999. "Voter Turnout: How Much Can We Explain?" *Public Choice*, 98, 431-446.
- [86] Mattozzi, Andrea, and Antonio Merlo, (2005a). "Political Careers or Career Politicians?" Working Paper, Department of Economics, University of Pennsylvania.
- [87] Mattozzi, Andrea, and Antonio Merlo, (2005b). "Mediocracy" Working Paper, Department of Economics, University of Pennsylvania.
- [88] Merlo, Antonio, 1997. "Bargaining over Governments in a Stochastic Environment," *Journal of Political Economy*, 105, 101-131.
- [89] Merlo, Antonio, and Charles Wilson, 1995. "A Stochastic Model of Sequential Bargaining with Complete Information," *Econometrica*, 63, 371-399.

- [90] Merlo, Antonio, and Charles Wilson, 1998. "Efficient Delays in a Stochastic Model of Bargaining," *Economic Theory*, 11, 39-55.
- [91] Messner, Matthias, and Matthias Polborn, 2004. "Paying Politicians," *Journal of Public Economics*, 88, 2423-2445.
- [92] Morelli, Massimo, 1999. "Demand Competition and Policy Compromise in Legislative Bargaining," *American Political Science Review*, 93, 809-819.
- [93] Morelli, Massimo, 2004. "Party Formation and Policy Outcomes under Different Electoral Systems," *Review of Economic Studies*, 71, 829-853.
- [94] Morton, Rebecca B., 1991. "Groups in Rational Turnout Models," *American Journal of Political Science*, 35, 758-776.
- [95] Moulin, Herve, 1986. *Game Theory for the Social Sciences, Second and Revised Edition*. New York: New York University Press.
- [96] Muller, Wolfgang C., and Kaare Strom (eds.), 2000. *Coalition Governments in Western Europe*. Oxford: Oxford University Press.
- [97] Myerson, Roger B., 1999. "Theoretical Comparisons of Electoral Systems," *European Economic Review*, 43, 671-697.
- [98] Myerson, Roger B., 2000. "Large Poisson Games," *Journal of Economic Theory*, 94, 7-45.
- [99] Myerson, Roger B., 2002. "Comparison of Scoring Rules in Poisson Voting Games," *Journal of Economic Theory*, 103, 219-251.
- [100] Myerson, Roger B., and Robert J. Weber, 1993. "A Theory of Voting Equilibria," *American Political Science Review*, 87, 102-114.
- [101] Norris, Pippa (ed.), 1997. *Passages to Power: Legislative Recruitment in Advanced Democracies*. Cambridge: Cambridge University Press.

- [102] Osborne, Martin J., and Al Slivinski, 1996. "A Model of Political Competition with Citizen-Candidates," *Quarterly Journal of Economics*, 111, 65-96.
- [103] Osborne, Martin J., and Rabee Tourky, 2004. "Party Formation in Single-Issue Politics," Working Paper, Department of Economics, University of Toronto.
- [104] Palfrey, Thomas R., and Howard Rosenthal, 1983. "A Strategic Calculus of Voting," *Public Choice*, 41, 7-53.
- [105] Palfrey, Thomas R., and Howard Rosenthal, 1985. "Voters Participation and Strategic Uncertainty," *American Political Science Review*, 79, 62-78.
- [106] Persson, Torsten, Roland, Gerard, and Guido Tabellini, 1997. "Separation of Powers and Political Accountability," *Quarterly Journal of Economics*, 112, 1163-1202.
- [107] Persson, Torsten, Roland, Gerard, and Guido Tabellini, 2003. "How Do Electoral Rules Shape Party Structures, Government Coalitions, and Economic Policies?" Working Paper, IIES, Stockholm University.
- [108] Persson, Torsten and Guido Tabellini, 2000. *Political Economics: Explaining Economic Policy*. Cambridge: MIT Press.
- [109] Persson, Torsten and Guido Tabellini, 2005. *The Economic Effects of Constitutions*. Cambridge: MIT Press.
- [110] Poole, Keith T., and Howard Rosenthal, 1997. *Congress: A Political-Economic History of Roll Call Voting*. New York: Oxford University Press.
- [111] Poutvaara, Panu, and Tuomas Takalo, 2003. "Candidate Quality," CESifo WP 1106, Munich..
- [112] Riker, William H., 1962. *The Theory of Political Coalitions*. New Haven: Yale University Press.
- [113] Riker, William H., and Peter C. Ordeshook, 1968. "A Theory of the Calculus of Voting," *American Political Science Review*, 62, 25-42.

- [114] Shachar, Ron, and Barry Nalebuff, 1999. "Follow the Leader: Theory and Evidence on Political Participation," *American Economic Review*, 89, 525–547.
- [115] Snyder, James M. Jr., and Michael M. Ting, 2002. "An Informational Rationale for Political Parties," *American Journal of Political Science*, 46, 90-110.
- [116] Testa, Cecilia, 2004. "Party Polarization and Electoral Accountability," Working Paper, Department of Economics, Royal Holloway University of London.
- [117] Tullock, Gordon, 1967. *Toward a Mathematics of Politics*. Ann Arbor: University of Michigan Press.
- [118] Uhlaner, Carole J., 1989. "Rational Turnout: The Neglected Role of Groups," *American Journal of Political Science*, 33, 390-422.
- [119] Warwick, Paul V., 1994. *Government Survival in Parliamentary Democracies*. Cambridge: Cambridge University Press.
- [120] Wittman, Donald, 1977. "Candidates with Policy Preferences: A Dynamic Model," *Journal of Economic Theory*, 14, 180-189.
- [121] Wittman, Donald, 1983. "Candidate Motivation: A Synthesis of Alternative Theories," *American Political Science Review*, 77, 142-157.
- [122] Woldendorp, Jaap, Keman, Hans, and Ian Budge, 2000. *Party Government in 48 Democracies (1945-1998)*. Dordrecht: Kluwer Academic Publishers.
- [123] Wolfinger, Raymond E., and Steven J. Rosenstone, 1980. *Who Votes?* New Haven: Yale University Press.
- [124] Wright, Gerald C. 1993. "Errors in Measuring Vote Choice in the National Election Studies 1952-88," *American Journal of Political Science*, 37, 291-316.