

Essays in Political Economics*

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Abstract

This thesis, composed of three essays, looks at different aspects of voter behavior and its effects on economic policies. It aims to clarify economic policy "demand-side" behavior by answering the following questions: Why some groups of voters are more informed about policy issues while other groups remain relatively uninformed? Does the decline in voter participation lead to a lower discipline of politicians and thus to worse policies? Which of the political economy models linking political behavior of voters to economic policies are more empirically relevant? The general findings of the thesis are two. First, the difficulties in understanding of voting behavior are surmountable if we adopt a broader perspective for voters' motivation. Second, voter behavior is a key determinant of economic policies, in the policy conflict both between politicians and voters at large (more or less political rents) and between different voter groups (more or less redistribution).

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1 Introduction

The formation of economic policy is a key area of interest in economics. Since Downs's (1957) fundamental work, economists try to understand the making of economic policy by analyzing the interplay between the effect of policies on the well-being of citizens and the interests of policy-makers. The common ground of this large and growing literature is that economic policies are driven mainly by the incentives and interests of policy-makers, and elections serve to shape these incentives. This research program has been empirically successful, as Persson and Tabellini (2003) and Besley and Case (2003) testify.

The main line of research in this program has been the analysis of the incentives of policy-makers (constitutional rules, term limits, etc.), i.e. the policy supply side. Most of this research builds models that assume a very simple policy demand side: all eligible voters are assumed to vote and possess good information about policy choices, and the ideological motivation of voters is assumed constant. This choice has been mainly due to the difficulties in understanding voter behavior from the rational choice point of view.

This thesis tries to look more carefully at the policy demand side, i.e. voters' behavior. Chapter 2 looks at political information acquisition by voters in large elections. Chapter 3 looks at the effect of voter participation on the discipline of politicians. Chapter 4 compares different political economy models of public finance, concentrating in particular on the effect of ideological neutrality on policies.

The findings of the thesis can be succinctly summarized in a single phrase: policy demand side is a key determinant of economic policies and the difficulties of understanding voter behavior can be successfully surmounted if we look at

voters' motivation from a broader perspective.

2 Political Information Acquisition for Social Exchange

"One way of acquiring opinions in ... the personality-enriching manner is to give them definite shape only after they have passed through intense confrontation with other views, that is, through the process of democratic deliberation..." (Albert Hirschman (1989))

"For the citizens [of Denmark before the referendum on Maastricht Treaty] the incentives to be informed were greater, as the intense discussions ... transformed the fact of 'having a reasoned opinion' partly into a private good." (Matthias Benz and Alois Stutzer (2004))

2.1 Introduction

This chapter looks at citizens' political information acquisition in elections. Economists' interest in this question is threefold.

First, the recent positive models of local public finance show that regions where voters are more informed receive higher public spending. Thus, unequal distribution of political information across regions leads to an inefficient allocation of public expenditures. Besley and Burgess (2002) show, in a political agency model, that the regions with better informed citizens are able to monitor government performance better, and thus enjoy more responsive public policies. Testing the model on the panel data from Indian states, they find that the states with higher newspaper circulation receive a larger share in public food distribution and calamity relief expenditure. Stromberg (2004) shows that the

introduction of a new mass medium has two effects on local public spending: the direct effect of giving better information about the elected representatives' performance, and the indirect effect of inducing higher turnout. He then tests the model on the data from the New Deal relief programs in the U.S. in 1930s, and finds that the asymmetry in the expansion of radio across counties led, through both effects, to a strong bias in public spending towards counties with more informed voters.

Second, voters' information matters for the viability of political reforms. Surveys conducted by Boeri et al (2001) and Blinder and Krueger (2004) suggest that informing citizens about the payoffs from reforms might help to overcome broad opposition and create political support for reforming the welfare state.

Finally, understanding political information acquisition helps to shed light on the long-standing problem in political science - explaining voter participation. The recent survey by Feddersen (2004) concludes that the profession still lacks a rational choice model able to explain the main facts about voter turnout. The key difficulty is that in the standard pivotal-voter framework, the probability of being pivotal goes to zero very quickly as the size of the electorate grows. On the other hand, Lassen (2005) shows, based on a natural experiment from Copenhagen city districts, that more information leads to higher turnout. Given this, a promising step towards understanding turnout is to turn the question from "Why do citizens vote?" to "Why do citizens acquire costly political information?" In particular, can we explain variation in political information acquisition with variation in some observable individual or aggregate characteristics?

Understanding political information acquisition in large elections poses a

challenge: if information is costly, and the instrumental payoffs of getting informed are negligible (because the probability of being pivotal goes to zero), one cannot explain why so many citizens spend time getting informed. The U.S. National Elections Study of 2000 shows that about 30% of the respondents have followed in full at least one TV debate between Gore and Bush, and about 44% have read about the presidential election campaign in newspapers.

Everyday observation suggests, though, that campaign periods represent moments of heated political discussions among citizens, and having an informed opinion serves as a 'ticket' for entering such discussions. Benz and Stutzer (2002) state that "in the weeks preceding the vote [at the Swiss referendum on joining the EU in 1992], it was almost impossible not to get involved in the fierce discussions on the subject, and consequently, the incentives to be informed were high". This opens a promising alternative route to understanding information acquisition: citizens may spend time acquiring political information to form opinions that serve them in discussions and social interactions with other fellow citizens.

This chapter builds a model that explicitly incorporates social-interactions motive into voters' information acquisition decision. A citizen receives utility from exchanging political opinions with another citizen in a randomly formed match. Such social exchange, however, pays off only when both partners possess political information. Obtaining this information is costly. Thus, the information acquisition game exhibits a key strategic complementarity: a citizen deciding to get informed increases the likelihood that any other citizen will match an informed partner. This increases the expected benefit from acquiring information for any citizen.

Our game falls into the class of global games first analyzed by Carlsson and van Damme (1993). A key property of such games is that they have a unique equilibrium. In our model, the equilibrium depends on three parameters: the benefit of social exchange, the electoral salience, and the information cost. We present two main theoretical findings. First, citizens are more likely to get informed when the benefit of social exchange is higher. Second, as the variance in the perceptions about the electoral salience decreases, small changes in the salience may lead to large swings in the share of informed citizens. This is the so-called "tipping point" phenomenon.

We then test the first finding using the data from the 2000 U.S. National Elections Study. The data strongly supports our theoretical prediction. We find that the length of residence positively correlates with political information acquisition. Citizens that have resided longer in their current homes (and thus have a deeper social network and enjoy a higher benefit of social exchange) are more likely to pay strong attention to the electoral campaign, to follow political debates on TV, and to read about the campaign in newspapers.

Several papers have looked at this and related questions. Matsusaka (1995) builds a pivotal-voter model in a decision-theoretic framework with endogenous information acquisition to explain a set of basic facts about turnout. He shows that the inclusion of endogenous information helps to understand the facts about turnout. However, the model cannot explain why such a large share of the electorate gets informed. Similarly, Martinelli (2002) looks at information acquisition in a pivotal-voter model in a game-theoretic framework. He shows that as the size of electorate increases, individual political information acquisition goes to zero. The focus of his paper, though, is a normative one, and

he shows that under certain conditions, majority rule elections outcome corresponds to the interest of the majority, even with little aggregate information acquisition. From the positive point of view, though, the model suffers of the same difficulties of its predecessor.

The papers that looked at the supply side of information acquisition have had more empirical success. The aforementioned paper of Besley and Burgess (2002) finds that higher literacy increases newspaper circulation. Stromberg (2004) and Gentzkow (2003) look at two cases of the expansion of a new mass medium: radio and TV, respectively. The first paper finds that the expansion of radio increased turnout, while the second shows that the expansion of TV decreased it. Gentzkow (2003) explains the latter fact as caused by the lower information content of TV. Larcinese (2000) models information acquisition as private production with mass media and time devoted to their usage as inputs. He finds that higher quality-newspaper readership correlates with better information. Finally, Lassen (2005) shows that the direct experience of living in a region with a certain policy leads to more information about the policy.

Though useful to our understanding of political information acquisition, these supply-side models face a common difficulty. The arrival of a new medium (and supply-side changes, in general) is a rare event. Moreover, in advanced democracies the supply of political information is unlikely to be a serious constraint for information acquisition. So, the applicability of these models for understanding information acquisition in advanced democracies is limited.

A key empirical contribution is the paper by Benz and Stutzer (2002). They show that the political system significantly influences voters' information. In particular, the systems that confer more extended political participation rights

induce citizens to get informed better. The difference of our analysis from Benz and Stutzer (2002) is twofold: first, we build a formal theoretic model to lead empirical analysis, and second, we underline social determinants of political information acquisition (instead of the institutional ones).

Methodologically, our model makes part of the class of interaction-based models. Such models have been successfully applied to the analysis of economic problems. Zanella (2004) offers an illuminative survey of this literature. Our results also relate to the burgeoning literature on social capital, launched by Putnam (1993). One key empirical finding of this literature is that communities with higher social capital have better economic policies. However, the theoretical analysis behind this finding is still scarce. An important paper by Alesina and La Ferrara (2000) shows that heterogeneous communities have a lower stock of social capital. In this chapter, we help to clarify the next link - from social capital to voters' information. Thus, our analysis, together with the aforementioned papers on local public finance, completes the logical chain behind Putnam's finding.

The main contributions of this chapter are three. First, we propose a new promising route to understanding political information acquisition in large elections, and show its empirical relevance. Second, we clarify the missing theoretical link in the mechanism through which social capital affects economic policies. Finally, for the first time we introduce the promising interaction-based methodology into the analysis of political behavior.

The chapter has the following structure. Part 2.2 presents the model and theoretically analyzes the determinants of political information acquisition. Part 2.3 discusses the empirical strategy and the data that we use, potential empirical

problems, and the solutions that we find. Part 2.4 presents the estimation results, performs sensitivity analysis, provides support for our identification assumption, and tests our model against the pivotal-voter model. Part 2.5 discusses the implications of our findings, poses some further questions, and concludes.

2.2 Model

2.2.1 Setup

Consider a community populated with a unit-size continuum of atomistic citizens, indexed by i , $i \in [0, 1]$. The community holds the elections, to decide among a set of alternatives. The campaign precedes the elections, during which the citizens can acquire information about the alternatives.

The timing is as follows: (1) Citizens simultaneously decide whether to acquire information about the alternatives; (2) Nature randomly matches citizens into pairs; (3) Citizens engage in social exchange in pairs (and receive the payoffs).

At the information acquisition stage, citizen i decides whether to acquire one indivisible piece of information at a given cost C . Thus, she faces a binary choice: to acquire information or not.¹

Denote as θ the electoral salience. θ is an aggregate variable; however, we shall assume that citizens have idiosyncratic perceptions of the electoral salience. In particular, citizen i 's perception of electoral salience is

$$\theta_i = \theta + \varepsilon_i,$$

¹We can generalize this setup such that citizens decide how much information to acquire, using the model of Frankel et al. (2003), which is an extension of Carlsson and van Damme (1993) model that we use here. The key results are the same.

The individual component ε_i is drawn from a differentiable c.d.f. $F(\cdot)$ with the real line as support, has a zero mean: $E(\varepsilon_i) = 0$, and its distribution is symmetric: $F(0) = \frac{1}{2}$. It is independent across citizens and is drawn from the same distribution. Regarding the true salience θ , citizens have no a priori knowledge:

$$\theta \sim U(-a, a), \text{ with } a \rightarrow \infty.$$

Therefore, citizen i 's best estimate of the true salience, θ , is her own perception, θ_i . If a citizen gets informed, she receives the private consumption utility which is equal to θ_i .

At the social exchange stage, the nature randomly matches citizen i to a citizen j . If both of them are informed, they discuss politics, and i gets the additional utility of $\theta_i v$, while j gets the additional utility of $\theta_j v$, where v stands for the benefit of social exchange. Thus, discussing a more salient election gives higher utility, and the utility is higher for a citizen with a higher benefit of social exchange.²³

If some partner in the match is uninformed, the partners discuss some side subject. We normalize the payoff from such discussion to zero.

Figure 1 depicts the possible situations that arise at the social exchange stage, with resulting payoffs.

From the point of view of an informed citizen, there are two possible types of matches. If the nature matches her to an uninformed citizen, she gets no payoff from social exchange (we call this "a bad match"). If the nature matches

²In Appendix A we show that this benefit depends on social or economic distance between citizens in the community.

³The fact that the signal θ_i and the benefit of social exchange v are multiplicative is not essential. The theoretical findings are valid also in the case when the utility of social exchange is only the function of v .

her to an informed citizen, she gets a positive payoff from social exchange (we call this "a good match").

Thus, the payoff of citizen i that gets informed and faces a good match is $-C + \theta_i + \theta_i v$. She pays the cost C of getting informed, enjoys the private consumption utility θ_i , and gets utility from social exchange $\theta_i v$. The payoff of an informed citizen facing a bad match is $-C + \theta_i$, since she gets no utility from social exchange. Finally, the payoff of an uninformed citizen is 0.

2.2.2 Equilibrium Information Acquisition

At the information acquisition stage, citizen i knows her signal about electoral salience, θ_i , the benefit of social exchange v , and the information cost C . The strategy is a mapping from the individual signal θ_i into the set of actions $\{0, 1\}$. Following Morris and Shin (2003), we consider only the types of strategies where a citizen takes the risky action 1 only if she observes a private signal above some cutoff point H :

$$s(\theta_i) = \begin{cases} \text{get informed if } \theta_i \geq H \\ \text{do not get informed otherwise,} \end{cases}$$

We call each such strategy "a switching strategy around H ", and H "a switching point".

Let's define the equilibrium of the information acquisition game.

Definition 1 *A symmetric Nash equilibrium strategy of citizen i in the information acquisition game is a switching strategy around H_i that satisfies the following properties: (a) i plays 1 (acquires information), when the expected payoff of playing 1 exceeds the payoff of playing 0 (remaining uninformed), given the actions of other citizens; (b) i plays 0, when the expected payoff of getting informed is lower than the payoff of remaining uninformed, given the actions of*

other citizens; (c) $H_i = H$ for any i .

Let's analyze the possible situations at the social exchange stage.

An informed citizen i ends up either in a good match, or in a bad match. Her payoff in a good match is $-C + \theta_i + \theta_i v$. In a bad match, her payoff is $-C + \theta_i$.

Denote as p the share of informed citizens. Since the matching is random and the community is unit-size, p is also the probability of getting in a good match.

Then, the expected payoff for citizen i from acquiring information is:

$$\begin{aligned} E\pi_i &= p[-C + \theta_i + \theta_i v] + (1 - p)[-C + \theta_i] = \\ &= -C + \theta_i + p\theta_i v. \end{aligned}$$

An uninformed citizen gets payoff 0, regardless of a match she ends up in.

Therefore, citizen i gets informed if

$$E\pi_i \geq 0,$$

that is, if her signal, θ_i , exceeds a threshold level:

$$\theta_i \geq \frac{C}{1 + pv}. \quad (1)$$

Note that the information acquisition decision exhibits strategic complementarity. A citizen deciding to get informed increases any potential partner's expected payoff from acquiring information, because she decreases the threshold and increases the probability that a potential partner ends up in a good match. Given the assumptions on the random payoff structure, this game falls into the class of global games, first analyzed in Carlsson and van Damme (1993) and further

generalized by Morris and Shin (2003). The key property of a global game is the uniqueness of equilibrium.

The following proposition determines the unique equilibrium of the game.

Proposition 2 *The information acquisition game has a unique symmetric Nash equilibrium. The equilibrium strategy for every citizen i is*

$$\begin{cases} \text{get informed if } \theta_i \geq \frac{2C}{2+v} \\ \text{do not get informed otherwise.} \end{cases} \quad (2)$$

Proof. Let citizen i observe θ_i and let her think that any potential partner j follows a switching strategy around H . The probability that j has a signal θ_j higher than H , given i 's signal θ_i , is:

$$\begin{aligned} \Pr\{\theta_j > H|\theta_i\} &= \Pr\{\theta + \varepsilon_j > H|\theta_i\} = \\ &= \Pr\{\theta_i + \varepsilon_j > H\} = \Pr\{\varepsilon_j > H - \theta_i\} = 1 - F(H - \theta_i) \end{aligned}$$

Thus, from (1), citizen i gets informed if

$$\theta_i \geq \frac{C}{1 + v[1 - F(H - \theta_i)]}$$

Let now her signal θ_i be equal to H . Then, her rule becomes

$$v_i \geq \frac{2C}{2+v}.$$

By symmetry, citizen i also follows the switching strategy around H . Thus,

$$H = \frac{2C}{2+v},$$

and any citizen follows the strategy (2). ■

The intuition behind this proposition is as follows. The expected benefit of getting informed is higher the bigger is the probability of matching with

an informed partner, i.e. that any potential partner also acquires information. When the signals about θ (and therefore expected payoffs) are identical, the game has the following equilibria:

- If $\theta > C$, the unique equilibrium is that every citizen gets informed.
- If $\theta < \frac{C}{1+v}$, the unique equilibrium is that nobody gets informed.
- If $\theta \in [\frac{C}{1+v}, C]$, the game has two pure strategy Nash equilibria: everybody gets informed, or nobody gets informed.

However, given a slight asymmetry in the signals about θ (and thus slightly asymmetric payoffs), the multiplicity of equilibria disappears. Only the citizens having a sufficiently high signal θ , decide to acquire information. This occurs because their estimate of the average signal is high and thus their estimate of the probability that any given partner will be informed is high.

Figure 2 shows graphically the equilibrium strategy of players.

Given the Nash equilibrium strategies, we can easily find probability that any citizen gets informed, which is also the share of informed citizens in the population.

Corollary 3 The equilibrium share of informed citizens is

$$p = 1 - F\left(\frac{2C}{2+v} - \theta\right). \quad (3)$$

Corollary 3 lends us several insights about the determinants of information acquisition. First, citizens get informed more when the benefit of social exchange is higher:

$$\frac{\partial p}{\partial v} > 0. \quad (4)$$

A higher benefit of social exchange decreases the threshold in the cutoff strategy. Thus, a citizen i 's estimate of the share of informed citizens increases, and she is more likely to get informed.

Second, citizens get informed less if the information cost is higher:

$$\frac{\partial p}{\partial C} < 0. \quad (5)$$

A higher cost increases the threshold in the cutoff strategy; thus, a citizen i 's estimate of the share of informed citizens decreases, and she is less likely to get informed.

Finally, citizens get informed more when the elections are more salient:

$$\frac{\partial p}{\partial \theta} > 0. \quad (6)$$

A higher salience moves the whole distribution up. Thus, there are more citizens for whom the threshold condition (2) is satisfied.

2.2.3 Social Interactions and the Variance of Information Acquisition

One key insight of social interactions literature is that in presence of strategic complementarities, small changes in fundamentals may lead to big changes in aggregate variables.⁴ This occurs because small changes have two effects on the behavior of agents. First, they enter their decision-making problem directly. However, the effect of a small change through this direct channel is also small. The second effect comes from the fact that the agent knows that other agents also face the same change. When strategic complementarities are present, such small change serves as a coordination device, thus reinforcing and multiplying the direct effect.

⁴See Glaeser, Sacerdote, and Scheinkman (1996) and Morris and Shin (2003).

We can apply this reasoning to our model. Let's assume that the c.d.f. of θ_i signals is a normal distribution with variance σ^2 . Then, expression (3) becomes

$$p = 1 - \Phi\left[\frac{1}{\sigma}\left(\frac{2C}{2+v} - \theta\right)\right], \quad (7)$$

where $\Phi[\cdot]$ is the Gaussian normal c.d.f.

The effect of a small change in salience, $d\theta$, is

$$\frac{dp}{d\theta} = \Phi'\left[\frac{1}{\sigma}\left(\frac{2C}{2+v} - \theta\right)\right]\frac{1}{\sigma}$$

Note that the size of this effect crucially depends on standard deviation σ . As $\sigma \rightarrow \infty$, the distribution approaches the uniform and the effect of a change in θ on p is the same in any point. Instead, as $\sigma \rightarrow 0$, $\frac{dp}{d\theta}$ increases around the point where $\frac{2C}{2+v} = \theta$, and decreases everywhere else. This means that with a small variance in signals, we have the situations where a small increase in the salience of elections leads to a large sudden increase in aggregate information acquisition.

2.3 Empirical Strategy and Data

2.3.1 Identification Strategy

Our theoretical model predicts that citizens are more likely to acquire political information when the benefit of social exchange is higher. In the rest of the chapter, we bring this prediction to the data.

Our identification assumption is as follows. We assume that people engage in social exchange in the neighborhood area where they live. Assume also that developing a social network requires time. Then, people who have recently moved (and, consequently, have not yet developed a social network) face lower incentives to acquire political information than citizens that live in the area for a long time.

We assume that the benefit from information acquisition for a citizen i living in state j can be modeled as

$$U_{ij} = a_0'X_{ij} + a_1M_{ij} + a_2I_j + \varepsilon_{ij}, \quad (8)$$

where X_{ij} is the vector of individual characteristics (age, education, income, marital status, and home-ownership), M_{ij} is the benefit of social exchange for citizen i , proxied by the length of residence, I_j is an indicator variable capturing state characteristics, and ε_{ij} is the error term distributed normally with mean 0 and variance V_j^2 .

We do not observe the latent variable U_{ij} . Instead, we observe whether or not a citizen spends effort to acquire political information. This takes value 1 if U_{ij} is sufficiently high and 0 otherwise:

$$\begin{aligned} P_{ij} &= 1 \text{ if } U_{ij} > \bar{U}_{ij} \\ P_{ij} &= 0 \text{ if } U_{ij} \leq \bar{U}_{ij} \end{aligned} \quad (9)$$

There are three potential problems with our specification. First, both the individual benefit of social exchange and political information acquisition may be driven by some third individual-level political variable, such as political activeness. For instance, politically active citizens may tend to have a higher density of social interactions, as well as acquire more political information than politically inactive citizens. To resolve this problem, we add citizens' past political behavior (turnout in the previous presidential elections) into the matrix of controls X_{ij} .

Second and similarly, both the individual benefit of social exchange and political information acquisition may be driven by some third individual-level social variable, such as skills in accumulating social capital. Citizens more skillful in

building social capital may tend both to get higher utility from social interactions and to acquire more political information. To account for this problem, we add individual social characteristics (trust in other people, membership in organizations, and attendance of a religious service) into the matrix of controls X_{ij} .

Finally, most US states require new movers to register anew before voting. Thus, a positive correlation between the intensity of social interactions and the effort in acquiring political information may be simply because new movers face an additional hurdle to voting, and thus tend to acquire less political information. This explanation does not involve any social network effects.

We tackle this issue using the fact that seven out of 50 US states have voting-day registration or no registration requirement at all. In this states, new movers should face no additional voting hurdle than citizens living in the state for a longer time period. Furthermore, eight other states have a short deadline for registration (less than 16 days before the elections). In these states, the registration hurdle should be less important than in the states with the regular registration requirement. We thus estimate our model on two sub-samples: states with voting-day registration, no registration, or short-deadline registration on one hand, and states with the regular registration rule, on the other. Thus, if registration requirement indeed serves as an additional hurdle for political information acquisition, we should see that the gap in information acquisition between long-time residents and recent movers in states with voting-day, no registration or a short-deadline registration should be smaller than in the states with the regular registration procedure.

We estimate the Probit model (8)-(9) using individual-level and state-level

data from the United States.

2.3.2 Data and Variables

The main source of data is the 2000 National Elections Study of the United States. It was conducted several weeks after the November 2000 presidential elections (some questions were asked before the elections). This survey interviews 1807 individuals; however, because some data (especially on income) is missing, we concentrate our analysis on 1250-1280 observations.

The key features of the survey are detailed questions about political behavior of citizens and several social questions, such as trust, membership in organizations, and length of residence in the community and in the current dwelling.

State-level institutional variables come from Besley and Case (2003) dataset and Federal Election Commission website. All variables are described in detail in Appendix B.

Our endogenous variables of interest are: the attention paid to 2000 campaigns, the attention paid to the presidential election campaign news, following TV debates between presidential candidates (Gore and Bush), and reading about the campaign in newspapers. All four variables serve as proxies for political information acquisition.

The first group of exogenous variables comprises individual demographic and socioeconomic characteristics. These are: age, education, income, gender, marital status, presence of children under 18 in the household, and home-ownership.

The second group of regressors comprises variables describing individual political and social behavior. The proxy for our key variable in the theoretical model, the benefit of social exchange, is the length of residence at current address. We describe it with a set of dummy variables taking value 1 if the

respondent has lived in her current home (or in her community) for x years, and 0 otherwise. x takes the following values: 0-1 years, 2-5 years, 6-9 years, and 10+ years. Other variables in this group are: turnout in 1996 presidential elections, trust in other people, membership in an organization, and attending religious services regularly.

The third group of regressors includes state-level variables. These are dummies for states with voting-day registration or no registration and for states with short-deadline registration.

Table 1 presents the summary statistics for the key variables. 69% of the sample responded that they have followed at least a part of a TV debate between Gore and Bush, and 29% said that they followed at least one debate in full. 78% responded that they paid at least some attention to the campaign, while 29% stated that they paid strong attention to the campaign. 44% of the sample said that they read about the campaign in newspapers. 76% reported that they voted in the 2000 presidential elections, and 70% reported their participation in 1996 elections.

22% of the sample lives in their current home for less than 2 years. The fraction of the sample that has lived in the current home for 2-5 years, 6-9 years, and 10+ years is 27%, 12%, and 39%, respectively. Note that only 9% reports that they live in the *community* for less than 2 years, while two-thirds of the sample report that they have lived in the same community for more than 10 years. This means that a considerable fraction of new movers move within the same the community. About half of the sample resides in a rural area.

Slightly more than a half of the sample said that they trust other people, and 41% reported their membership in at least one organization. About 38%

of the sample reported attending religious services once a week or almost once a week.

About 10% of the sample lives in a state with voting-day registration or no registration. 20% lives in a state with a short-deadline registration.

2.4 Econometric Evidence

2.4.1 Basic Regressions

What does our testable hypothesis say about the expected signs of the coefficients in the econometric model? If the data are in line with our theoretical model, we should see that the length of residence should be positively correlated with paying attention to the campaign, following TV debates, and reading about the campaign in newspapers. In other words, we expect a positive and significant coefficient α_1 .

If this correlation is not driven by the registration requirement, we should see that the gap in information acquisition between long-term residents and recent movers in the states with voting-day registration, no registration, or short-deadline registration is not significantly different from the gap in the other states. In other words, we expect non-significant coefficients on interacted terms of registration rule and the length of residence.

Table 2 shows our basic probit regression using the NES dataset and including all the controls except the length of residence. The dependent variables are: strong attention to the presidential campaign (takes value 1 if the respondent said that she paid strong attention to the campaign, and 0 otherwise), following a TV debate between Gore and Bush in full (takes value 1 if the respondent has followed at least one debate in full, and 0 otherwise), and reading about the campaign in newspapers (takes value 1 if the respondent has read anything

about the campaign in newspapers over the week preceding the interview, and 0 otherwise). The regressors include the individual characteristics that, in our model, may affect the information cost, the benefit of social exchange, and the average taste for discussing politics.

The numbers in cells of Table 2 are the marginal probit coefficients calculated at the means. The numbers in brackets are standard errors corrected for heteroskedasticity. All the specifications include state fixed effects to control for unobservable state-level heterogeneity in citizens' political behavior.

Elder people are more likely to pay strong attention to the campaign, at a decreasing rate. However, this attention does not go together with a higher likelihood of following a TV debate or reading about the campaign in a newspaper. This suggests that elder citizens pay more symbolic attention to the electoral campaign, though they do not actively acquire more political information than younger citizens.

Education and income are both overall strongly correlated with political information acquisition. More educated people obviously face lower cost of learning about politics. Richer citizens may acquire more political information because political discussions are more salient among rich people than among poor ones.

We find that women acquire somewhat less information than men. We do not find that married people acquire more information than singles. This may mean that spending more discussion time with a spouse crowds out discussion time spent with friends or neighbors. We find that citizens with children under 18 acquire less information, perhaps because they face a higher opportunity cost of time. Surprisingly, we find that citizens living in a dwelling owned

by the household are less likely to pay strong attention to the campaign than people living in rented housing. However, this finding is not confirmed when the dependent variable is following TV debates or reading about the campaign.

Social capital positively correlates with information acquisition in most specifications. Though people who trust others more are likely to acquire political information only weakly, membership in organizations and attending religious services regularly both are strongly positively correlated with political information acquisition in 2 out of 3 specifications. Note that although this finding goes in line with our model, we cannot interpret it as a credible support of our theory, because this correlation can be driven by an unobservable individual characteristic (e.g., people who are more curious are more likely both to acquire political information and to be a member of an organization).

We include all these controls in all the further specifications. However, to economize on space, we do not report them.

Table 3 presents the results of the estimation of our econometric model (8)-(9). Along with all the controls used in the previous estimation, we add turnout in 1996 elections, to control for an unobserved individual heterogeneity in political activity.

Our key independent variables are the dummies for the length of residence in the current home. These variables take value 1 if the respondent has lived 0-1 years (2-5 years, 6-9 years, 10+ years) in her current home, and 0 otherwise. We do not use simply the length of residence, since the relationship between the regressor and the dependent variable is likely to be non-linear.

All the coefficients on the length of residence dummies have the predicted sign and almost all are statistically significant in all the specifications. A citizen

that has lived in her current home at least for 2 years is more likely to pay strong attention to campaigns, to pay attention to presidential campaign news, to follow at least one full TV debate between Gore and Bush, and to read about the campaign in newspapers than a recent mover. This is in line with our theory that predicts citizens with a higher benefit of social exchange are more likely to acquire political information.

2.4.2 Sensitivity Analysis

We perform three types of sensitivity analysis. First, we use "attention to the campaign" instead of "strong attention to campaign" as the dependent variable. This allows us to see what kind of information the social exchange influences. Second, we restrict our sample to regular newspaper readers, when using reading about the campaign. This way we account for the fact that not every citizen in the population reads newspapers regularly, and there may be a bias in our estimates if residence positively correlates with newspaper readership. Finally, we repeat our estimation with "strong attention to campaign" as the dependent variable, while excluding turnout in 1996 elections from the set of regressors. If turnout in 1996 captures only a part of the unobservable individual political heterogeneity, we should see that the coefficients on the length of residence are highly sensitive to the inclusion of past turnout. If this is true, the model might be mis-specified, because it accounts too little for individual heterogeneity.

Table 4 presents the results of our analysis. Column 1 shows the estimates when the dependent variable is "attention to campaign"; that is, the dependent variable takes value 1 if the respondent has paid at least some attention to the campaign, and 0 otherwise. The length of residence no longer correlates with the dependent variable. This suggests that most citizens possess some minimum

degree of interest in elections, and the incentives to acquire information for social exchange purposes kick in at a more complex level of political information. For instance, whether the new President will be a Republican or a Democrat interests most citizens, and the social network plays no role in determining this interest. Instead, the social network plays a role in inducing people to learn about the positions of the candidates with regards to particular policy issues. People enjoying a higher benefit from social exchange may decide to learn about such positions, while people with low benefit of social exchange (such as recent movers) may find spending time getting informed too cumbersome.

Column 2 reports the estimates with "reading about the campaign in newspapers" as dependent variable, on the sub-sample of effective newspaper readers. Comparing with results in the last column of Table 3, we see that little change in the coefficients. This suggests that our full-sample estimates are not biased because of the correlation between the length of residence and newspaper readership.

Columns 3 and 4 compare the specifications with and without past turnout. The coefficients on the length of residence are not sensitive to the inclusion of turnout in 1996 elections. This implies that our model captures the unobservable individual political heterogeneity relatively well, and thus does not suffer from mis-specification on this ground.

2.4.3 Community Residence and Rural-Urban Differences

We do not know where do recent movers move from. Thus, possibly our sample contains cases of recent movers that have moved "next door", thus fully conserving their social network. If the number of such cases is large, and there is an alternative explanation why recent movers acquire less information, we are

mistakenly attributing to our model the explanatory power that belongs to the alternative model.

How do we control for this potential problem? The survey contains a question about the length of residence in the community. However, the definition of a community includes large cities, small towns, and rural counties. Thus we need to match this information with the size of the place where the respondent lives. So, we look at a sub-sample with citizens living in metropolitan areas (including suburbs) with less than 2,000,000 inhabitants (357 observations).

Table 5 presents the results of our estimation. We find that the length of residence in the community does not significantly increase information acquisition in the full sample. Instead, the length of community residence has a large and significant effect on information acquisition in rural areas. This is in line with our model: citizens moving within a large city still reside in the same community, but we do not expect them to preserve their social networks. Instead, citizens that move within a smaller metropolitan area are likely to maintain the links with friends and neighbors at the old address. Thus, long-term residents in a smaller community do not lose incentives to acquire information, while this is not true for long-term residents in a large metropolitan area.

2.4.4 Testing Against the Pivotal-Voter Model

We next empirically confront our model with the pivotal-voter model. Pivotal-voter model predicts that voters are more likely to acquire information if the probability of being pivotal is larger. Thus, voters should acquire more information in states with less inhabitants and in states with a higher expected closeness of the electoral race.

We thus add the state population (in millions) and the intensity of campaign

visits to a state by Gore and Bush. The latter variable comes from Stromberg (2002), and serves as a proxy for the expected closeness of the race: candidates pay more campaign attention to "swing" states.

Table 6 presents our findings. We see both variables have tiny coefficients, and neither is significant. Instead, the length of residence remains significant, and the size of coefficients does not decline overall. We thus conclude that our model describes information acquisition much better than the standard pivotal-voter model.

2.4.5 Information Acquisition and Registration Requirement

All the empirical findings above face the following critique. Electoral system in the US requires that in all the states (except North Dakota), voters must register until several weeks before elections. In most states, the deadline for registration closes about 30 days before the election day. Thus, the new residents (i.e., recent movers) face an additional cost to voting: they have to register anew, even if they have already registered at their old address. Therefore, some of the new movers may get discouraged from voting by this additional hurdle. If voting is purely instrumental, they also get discouraged from acquiring political information. We then observe the correlation found above, even without any social exchange motive.

To control for this possibility, we use the fact that six states (Maine, Minnesota, Wisconsin, Wyoming, New Hampshire, and Idaho) allow registration on the election day, and North Dakota does not require registration at all.

Similarly, eight other states (Alabama, California, Connecticut, Iowa, Kansas, South Dakota, Vermont, and Washington) close the registration less than 16 days before the election day.

If registration indeed acts as a disincentive to political information acquisition, we should see that the residence gap in information acquisition should be smaller in the easy-registration states and short-deadline registration states than in the states with the usual registration procedure.

We split the sample into two parts: citizens living in the easy registration and short-deadline registration states, and those living in the states with the usual registration.

Table 7 presents the results of our estimation for the two sub-samples. We see that, contrary to the expectation, the information acquisition gap between long-term residents and recent movers is bigger in the first sub-sample. This suggests that the registration requirement does not serve as a disincentive for political information acquisition. Instead, this result can be driven by the possibility that in the easy-registration states, the salience of the elections for voters may be higher than in regular-registration states.

2.5 Conclusion

This chapter builds a theory of political information acquisition based on social exchange. We build our model on the assumption that informed citizens enjoy discussing politics with other informed citizens. We find that information acquisition depends on three parameters: the benefit of social exchange, the salience of elections, and the information cost. We find that in communities with a higher benefit of social exchange, citizens are more likely to get informed about politics. We also find that when the variance in the perception of salience in the population is small, we can observe the "tipping point" phenomenon; i.e. that a small change in salience leads to a large swing in political information acquisition.

We test the predictions of the model on the data from the 2000 National Elections Study of the United States. The data are in line with our theoretical model. Political information acquisition in the form of paying attention to the electoral campaign, following TV debates, and reading about the campaign in newspapers strongly positively correlates with the length of residence. This effect cannot be attributed to the registration requirement that usually affects recent movers.

We also compare the performance of our model with respect to the standard pivotal-voter model of information acquisition. Our model performs better than the pivotal-voter model: size of state population and closeness of the electoral race do not correlate with information acquisition, while the regression coefficient on the length of residence remains significant.

Our model sheds light on the causal mechanism behind the effect of turnout on economic policies at local level. Neighborhoods and regions with less heterogeneity in terms of racial or ethnic composition induce more trust among neighbors, as Alesina and La Ferrara (2002) show. In such neighborhoods, the benefit of social exchange is higher. This increases information acquisition and turnout in such regions and makes them more attractive electoral targets to politicians. Consequently, the politicians respond more to the citizens' needs in these regions and provide more local spending.

More generally, the strategic complementarity in action is not the feature unique to voter participation. Our approach of linking social neighborhood characteristics and individual actions can be applied to other forms of political participation, such as strikes, citizen protests, and lobbies.

What remains to be done? Our model does not address the normative

question dating back to Condorcet whether elections aggregate information efficiently. Feddersen and Pesendorfer (1997) have answered this question positively. In their model, however, information is exogenously provided to a fraction of citizens. In our model, instead, information acquisition is endogenous. This may alter the conclusions, and analyzing this issue seems an inviting question.

Overall, we hope that the change of the point of view on political information acquisition and participation that this chapter proposes is a useful step towards understanding variations in individual political behavior. We believe that looking at social interactions is crucial for understanding political phenomena in large electorates.

Appendix A. Social Network Formation

In this appendix we show that the benefit of social exchange, v , depends on social or economic distance between citizens in the community. Let each citizen live infinitely, and time be discrete: $t = 0, 1, 2, \dots$. Let us introduce a notion of distance between citizens in the community. This may be ethnic or racial distance, linguistic distance, or a distance based on income differences. Assume a perfectly symmetric setup: all citizens are located in equal distance from each other, and denote this distance with d , $d \in R_{++}$.

The timing of events is as follows: in period 0, citizens can establish a social network, and in periods 1, 2, ..., they interact within the network. Forming a network is a decentralized decision.

For citizen i , forming a link with every other citizen costs $\lambda(d, s)$, where s denotes the density of the network (the strength of links), $s \in R_{++}$. This cost

increases both with density and with distance:

$$\frac{\partial \lambda}{\partial s} > 0, \quad \frac{\partial \lambda}{\partial d} > 0,$$

and the marginal cost of a higher-density link increases with distance: $\frac{\partial \lambda}{\partial s}$ is increasing in d . This means that it is more costly for a citizen to strengthen links with other citizens when they are located further away from her.

A citizen's utility from private leisure is linear in her time. While the cost is paid once and for all, the benefits of the social network accrue every period. Given the network of density s , a citizen can spend her time endowment (in part or fully) for social exchange within the network, getting utility $v(s)$ per unit of time. A more dense network gives higher utility:

$$v'(s) > 0,$$

and social exchange gives more utility than private leisure, even when the network is least dense:

$$\lim_{s \rightarrow 0} v(s) \geq 1.$$

Thus, in period 0, an individual citizen's problem is:

$$\begin{aligned} \max_s \quad & \sum_{t=0}^{\infty} \delta^{t-1} v(s) + l_0, \\ \text{subject to} \quad & l_0 + \lambda(s, d) = 1. \end{aligned} \tag{10}$$

Here, l_0 denotes period 0 private leisure and $\delta < 1$ is the subjective discount factor.

The following proposition holds:

Proposition 4 *Equilibrium density of social network, s^* , decreases with distance d .*

Proof. The first-order condition for problem (10) is

$$\frac{1}{1-\delta}v'(s) = \frac{\partial \lambda(s, d)}{\partial s} \quad (11)$$

Assuming an interior solution, (11) implicitly determines the equilibrium density s^* . Marginal benefit of a more dense network, given by the left-hand side, is independent of distance d , while the marginal cost (the right-hand side) increases in d , by assumption. Thus, the equilibrium density decreases with distance. ■

Therefore, the equilibrium benefit of social exchange, $v(s^*)$, also decreases with distance d .

Appendix B. Data and Variables

The following is the list of variables that we use in the empirical part of the chapter. All individual-level data come from the 2000 National Elections Study of the United States. State-level institutional variables come from Besley and Case (2003) and the Federal Election Commission website (http://www.fec.gov/votregis/state_voter_reg_deadlines02.htm).

Attention to the campaign. Survey question: "Some people don't pay much attention to political campaigns. Would you say that you have been very much interested, somewhat interested or not much interested in the political campaigns so far this year?" 0 = "not much interested", 1 = "somewhat interested" or "very much interested".

Strong attention to the campaign. Same question as above. 0 = "not much interested" or "somewhat interested", 1 = "very much interested".

Attention to the presidential campaign news. Survey question: "How much attention did you pay to news about the presidential election campaign?"

0 = "none" or "not much", 1 = "much" and "very much".

Following a TV debate between Gore and Bush. Survey question: "Did you watch a televised presidential debate between Al Gore and George W. Bush?" 0 = no, 1 = yes.

Following at least one TV debate in full. Survey question: "Did you watch a debate between Gore and Bush, in full?" 0 = no (includes watch no debate and watch debate in part), 1 = yes.

Reading about the campaign in newspapers. Survey question: "Did you read about the presidential campaign in any newspaper?" 0 = no, 1 = yes.

Turnout in the 2000 presidential elections. Survey question: "Did you vote for President in 2000 November elections?" 0 = no, 1 = yes.

Turnout in the 1996 presidential elections. Survey question: "In 1996 Bill Clinton ran on the Democratic ticket against Bob Dole for the Republicans, and Ross Perot as an independent candidate. Do you remember for sure whether or not you voted in that election?" 0 = "no, didn't vote", 1 = "yes, voted".

Age. Respondent's age

Education. Respondent's education category (from 1 to 7).

Household income. Respondent's household income category (from 1 to 22).

Gender. Respondent's gender, 0 = male, 1 = female.

Marital status. Respondent's marital status, 0 = not married, 1 = married or living as married.

Children under 18 in the household. 0 if there are no children under 18 living in the household, 1 otherwise.

Household owns the dwelling. A dummy denoting whether the resident's

household owns the housing it lives in or not. 0 = no, 1 = yes.

Residence in the current home. Respondent's length of residence in the current home, in years.

Residence in the current home 0-1 years. 1 if residence in the current home is 0 or 1 years, 0 otherwise.

Residence in the current home 2-5 years. 1 if residence in the current home is 2-5 years, 0 otherwise.

Residence in the current home 6-9 years. 1 if residence in the current home is 6-9 years, 0 otherwise.

Residence in the current home 10+ years. 1 if residence in the current home is 10+ years, 0 otherwise.

Residence in the community. Respondent's length of residence in the community, in years.

Residence in the community 0-1 years. 1 if residence in the community is 0 or 1 years, 0 otherwise.

Residence in the community 2-5 years. 1 if residence in the community is 2-5 years, 0 otherwise.

Residence in the community 6-9 years. 1 if residence in the community is 6-9 years, 0 otherwise.

Residence in the community 10+ years. 1 if residence in the community is 10+ years, 0 otherwise.

Residence in rural area. 1 if the resident lives in a city (including suburbs) with more than 2,000,000 inhabitants, 0 otherwise.

Trust in other people. Survey question: "Would you say that most people can be trusted, or that you can't be too careful in dealing with people?" 0 =

"you can't be too careful with people", 1 = "most people can be trusted".

Membership in organizations. Survey question: "Are currently a member of any organization?" 0 = no, 1 = yes.

Attending a religious service. 1 if the respondent attends a religious service every week or almost every week, 0 otherwise.

State. State identifier using the ICSPR codification.

State with voting-day registration or no registration. A dummy denoting whether the resident lives in the state that has voting-day registration (Idaho, Maine, Minnesota, New Hampshire, Wisconsin, and Wyoming) or no registration (North Dakota), 0 = no, 1 = yes.

State with short deadline registration. A dummy denoting whether the resident lives in the state that has registration deadline closing less than 16 days before the election day (Alabama, California, Connecticut, Iowa, Kansas, South Dakota, Vermont, Washington), 0 = no, 1 = yes.

3 Voter Turnout and Political Rents: Theory and Evidence

3.1 Introduction

Governments in democracies have large economic decision-making power. They set tax rates on incomes of citizens. This tax serves to finance public services provided by governments; however, politicians can divert a part of the tax revenue towards their private consumption. In economic literature, this activity bears the name of "rent extraction". Journalistic evidence and recent political scandals involving top policy-makers in various OECD countries suggest that even mature democracies suffer from rent extraction.

Recent research in political economy has addressed, both empirically and theoretically, the determinants of political rents and corruption. Mauro (1995), Ades and Di Tella (1999), Fisman and Gatti (2002), Persson, Tabellini, and Trebbi (2003), and Adsera, Boix, and Payne (2003) have established empirical links between political and socio-economic variables and the extent of corruption.

On the other hand, one of the reasons of alarm about declining turnout in various OECD countries has been the danger of a weaker discipline of politicians, and, thus, increasing corruption. However, despite the plausibility of this hypothesis, no research has addressed it formally. Thus, the goal of this chapter is to analyze the link between turnout and political rent extraction. We want to answer three questions: What is the mechanism through which higher turnout leads to lower political rents? Is this mechanism empirically important? What measures can countries take to exploit this mechanism to reduce corruption?

To answer these questions, we build a model of two-party electoral competition with three groups of voters. Two groups (rich and poor) have strong ideological preferences, are not sensitive to candidates' announced policies, and always participate in the elections. On the other hand, voters in the middle-income group care both about policy and ideology of candidates, and have to decide whether to vote or not. For these citizens, learning their preferences over ideology comes at a political-information cost. The higher is this cost, the more likely are these voters to abstain. Lower turnout makes electoral competition less intense (since the number of mobile voters decreases) and thus increases equilibrium rents that the candidates can grab.

We then test the predictions of the model on the cross-section data from a

set of 49 democracies. Our identifying assumption is that higher education level affects corruption only via its effect on turnout. The results of the regression support our theoretical findings, and the instrument validity tests confirm the soundness of our identifying assumption. Countries with higher turnout exhibit lower corruption. The quantitative effect of turnout is large: one standard deviation increase in turnout decreases corruption by $\frac{1}{3}$ of standard deviation.

The chapter has the following organization. Section 3.2 present the theoretical model. Section 3.3 states the empirical implications of the model. Section 3.4 presents the data and empirical evidence. Section 3.5 discusses the robustness of our theoretical and empirical results. Section 3.6 concludes.

3.2 Model

3.2.1 Economic Setup

We build the model along the lines of Persson and Tabellini (2000, Ch. 4.2). Consider a unit-size population of atomistic citizens, consisting of three groups. Let's index the groups by J , $J \in \{P, M, R\}$. Each citizen in groups J has an endowment of y^J , and $y^P < y^M < y^R$. The sizes of three groups are $\frac{1}{2} - \frac{d}{2}$, d , and $\frac{1}{2} - \frac{d}{2}$, respectively. Thus, d measures income inequality in the population: a higher d means that the middle-income citizens constitute a larger share of the population. Let's assume, for simplicity, that $y^M - y^P = y^R - y^M$, so the middle group's income equals to the average income in the population. Denote this average with y .

The preferences of citizens comprise consumption of a private good and a public good, and are quasi-linear:

$$w^J = c^J + H(g),$$

where c^J denotes the consumption of the private good by a citizen in group J , g denotes the amount of the public good, and $H(\cdot)$ is concave.

Public good is financed by non-targeted tax on income. Government also can consume rents. Thus, government budget constraint is

$$\tau y = g + \tau,$$

where τ denotes the tax rate and τ denotes rents. The resulting policy preferences of citizens in group J are

$$W^J(g, \tau) = (y - (g + \tau)) \frac{y^J}{y} + H(g)$$

and, thus, their preferred policy vector is

$$(g^{J*}, \tau^{J*}) = (H_g^{-1}(\frac{y^J}{y}), 0).$$

Groups differ in their preference over the public good (richer citizens prefer less of a public good). However, all groups prefer zero rents.

3.2.2 Political Setup

The community holds the elections. Two candidates run for office, L and C . Candidates are purely office-motivated. Denote the probability of L winning the elections as p_L . Then, candidate L 's expected utility is

$$E(v_L) = p_L(R + \mu\tau_L), \tag{12}$$

where R are exogenous ego-rents from holding office, τ_L are endogenous rents entering government budget constraint, and μ denotes transaction costs associated with rent appropriation. The expected utility of candidate C is analogous:

$$E(v_C) = (1 - p_L)(R + \mu\tau_C).$$

The timing of events is as follows: (1) both candidates simultaneously announce their policies $q_L = (g_L, r_L), q_C = (g_C, r_C)$; (2) there is an unobservable shock to candidates' relative popularity, δ ; (3) citizens vote; (4) winning candidate's policy is implemented. We thus assume perfect commitment to campaign announcements. We also assume that the popularity shock δ has the uniform distribution on $[-1, 1]$ interval:

$$\delta \sim U[-1, 1].$$

Here, positive δ means that the popularity of C is higher than that of L .

Three groups of voters differ in their preferences over candidates' ideology and their announced policies. Groups P and R are outright partisan: conditional on shock δ , all citizens in P prefer L and all citizens in R prefer C . Group M is less ideological, and its citizens care both about policy and ideology. Citizen i in group M prefers candidate L if

$$W^M(q_L) > W^M(q_C) + \sigma^i, \quad (13)$$

where σ^i is an idiosyncratic preference shock with uniform distribution over the interval $[-\frac{1}{2\phi}, \frac{1}{2\phi}]$:

$$\sigma^i \sim U[-\frac{1}{2\phi}, \frac{1}{2\phi}].$$

Thus, ϕ denotes the ideological dispersion of the middle-income group. Higher ϕ means that middle-income citizens are ideologically more homogeneous, and, therefore, more sensitive to candidates' policies.

3.2.3 Participation Decision

Group M differs from the other two groups in another crucial way: citizens in P and R know their ideological preferences, while citizens in M do not know

them, but can learn them (as well as the policy announcements of candidates) at a cost.

Citizen i in group M participates in the elections if the net benefit of participating exceeds the net benefit of non-participation:

$$B_i - c \geq 0 - \xi.$$

Here, B_i denotes the expressive (or civic duty) benefit from voting, c denotes the cost of voting, and ξ stands for the cost of non-voting. This latter cost is positive if there is compulsory voting (e.g., a fine is imposed on non-voters). Note that we assume away completely the instrumental "pivotal-voter" motivation for voting. This means that any voter regards her probability of casting a pivotal vote as negligible.

The middle-income citizen that decides to participate learns her ideological preference σ^i and the policy announcements q_L and q_C .

The cost of voting consists of two parts: the information cost and the travel cost. We normalize the latter to zero. The information cost decreases with the education level. For simplicity, we assume that it equals the inverse of the education level:

$$c = \frac{1}{E}.$$

Given these assumptions, the voting decision becomes: vote if

$$B_i \geq \frac{1}{E} - \xi.$$

Let the expressive benefit of voting be a random variable, independent across citizens, and drawn from a c.d.f. $F(\cdot)$. Then, the turnout in the middle-income

group (which we denote as T) is:

$$T = \Pr(B_i \geq \frac{1}{E} - \xi) = 1 - F(\frac{1}{E} - \xi).$$

Note that the turnout in the middle-income group (and, thus, the overall turnout) increases with education and with the cost of non-voting:

$$\frac{\partial T}{\partial E} > 0, \quad \frac{\partial T}{\partial \xi} > 0.$$

3.2.4 Equilibrium Policy

Let's find the expected vote shares of the candidates. The swing voter in group M , i.e. the voter that is indifferent between L and C is the one with ideological preference equal to

$$\sigma^M \equiv W^M(q_L) - W^M(q_C).$$

Thus, L 's share of votes (prior to shock δ) among voting citizens in group M is

$$\Pr(\sigma^i < \sigma^M) = \frac{1}{2} + \phi[W^M(q_L) - W^M(q_C)].$$

L 's total votes among all voters (prior to shock δ) is

$$\tilde{\pi}_L = (\frac{1}{2} - \frac{d}{2}) + dT(\frac{1}{2} + \phi[W^M(q_L) - W^M(q_C)]).$$

The term in first brackets represents the poor group's votes, while the last term is the number of votes that L gets in the middle-income group.

Given the shock δ , the expected number of votes of candidate L are

$$\pi_L = (\frac{1}{2} - \frac{d}{2}) + dT(\frac{1}{2} + \phi[W^M(q_L) - W^M(q_C)]) - \delta.$$

The probability that L wins the elections is the probability that the number

of votes in her favor exceed 50% of the total votes:

$$\begin{aligned} p_L &= \Pr_{\delta}(\pi_L > \frac{1}{2}(1-d+dT)) = \\ &= \Pr_{\delta}(\delta < dT(\frac{1}{2} + \phi[W^M(q_L) - W^M(q_C)]) - \frac{1}{2}dT) \end{aligned}$$

The last line says that the probability that L wins the elections equals to the probability that the popularity shock is smaller than the difference between her votes in middle income group and $\frac{1}{2}$ of votes of that group. Given our assumption about the distribution of the popularity shock, this probability is

$$p_L = \frac{1}{2} + \frac{1}{2}\phi dT[W^M(q_L) - W^M(q_C)]. \quad (14)$$

Now we calculate equilibrium policies that candidates announce at stage 1. They take into account the uncertainty arising from the popularity shock at stage 2 and voters' behavior at stage 3. Candidate L 's problem is to maximize (12) by choosing the policy vector q_L . Candidate C 's problem is analogous and symmetric to that of L . Therefore, in equilibrium, both candidates announce the same policy.

The first-order conditions of candidate L 's problem are:

$$\begin{aligned} \frac{dE(v_L)}{dg_L} &= (R + \mu r_L) \frac{\partial p_L}{\partial g_L} = 0 \\ \frac{dE(v_L)}{dr_L} &= (R + \mu r_L) \frac{\partial p_L}{\partial r_L} + \mu p_L = 0 \end{aligned}$$

From the first expression and deriving (14) with respect to g_L , we find

$$\frac{1}{2}(R + \mu r_L)\phi dT \frac{\partial W^M(g_L)}{\partial g_L} = 0.$$

Given that $W^M_{gr} = 0$, in equilibrium, candidate L proposes the amount of public good preferred by middle-income citizens.

Note that in equilibrium $p_L = p_C = \frac{1}{2}$. Then, from the second expression, we get

$$(R + \mu r_L) * \left(-\frac{1}{2}\phi dT\right) + \frac{1}{2}\mu = 0$$

Therefore, equilibrium rents are (taking into account the possibility of a corner solution):

$$r^* = \max\left[\frac{1}{\phi dT} - \frac{R}{\mu}, 0\right]. \quad (15)$$

Rents are not driven to zero in equilibrium because a small decrease in announced rents increases the probability of winning only by a finite amount. This happens because voters care about both policy and ideology. The degree to which the pool of voters cares about the ideology, though, affects the size of equilibrium rents. If the partisan groups (poor and rich) are smaller (i.e., d is larger), rents are decreased, because the middle-income voters, who care also about policy, constitute a larger share of the electorate. If middle-income voters are ideologically more homogeneous (higher ϕ), they are more sensitive to policies, and the politicians' marginal cost of extra rent is higher. This leads to lower rents in equilibrium. The effect of a higher exogenous value of holding office and a higher transaction cost of rent extraction (lower μ) is similar.

Note the role of voter turnout as a disciplining device on politicians. Higher turnout (here, of middle-income voters, since the other two groups vote always) increases the middle-income voters' share in the overall pool of voters and makes the electoral competition more intense. This decreases equilibrium rents. Thus, parameters driving turnout affect also politicians' rent-seeking behavior. In other words, higher education level of citizens and the presence of compulsory voting (higher non-voting costs) lead to higher turnout and lower

rents in equilibrium.

3.3 Empirical Implications

The basic idea of our model is that a higher education level of citizens and a higher non-voting cost induces a higher turnout among ideologically mobile voters, and thus makes the electoral competition more intense. This, in turn, drives down the equilibrium rents of politicians. From here, we derive the main empirical predictions of our model.

Prediction 1 (education - turnout). Countries with higher education level exhibit higher turnout and have lower corruption level.

Prediction 2 (compulsory voting - turnout). Countries with compulsory voting have higher turnout and lower corruption level.

Income inequality also has a key role in our model. Higher income inequality means that there are less middle-income voters, which are more mobile. Therefore, the electoral competition becomes less intense and this leads to higher equilibrium political rents.

Prediction 3 (income inequality). Countries with higher income inequality have higher corruption.

In the remainder of the chapter, we confront these predictions with cross-country data from a set of 49 democracies.

3.4 Evidence

3.4.1 Data

As an empirical counterpart to politicians' rents, we use three variables which were originally constructed to measure the extent of corruption. All three variables come from the data appendix to Persson and Tabellini (2003). The

first measure is the Corruption Perception Index of Transparency International. These measures are issued every year, and we take the average for years 1995 to 2000. We shall denote the variable as *Corr_CPI* (it corresponds to variable *Cpi9500* in the Persson-Tabellini dataset). The second measure is *Corr_K1*, constructed by Kaufmann, Kraay, and Zoido-Lobaton (1999). It measures the degree to which a country has created an environment with fair and predictable rules for economic activity (in the dataset, it corresponds to the variable *Graft*). The third measure, *Corr_K2*, comes from the same source as the second, and measures the perceptions of the quality of the public sector provision of a country, the quality of the bureaucracy, the competence of civil employees, and their independence from political pressure (it corresponds to variable *Govef* in the dataset). In all three measures, higher score means more corruption.

As a measure of turnout, we use the average turnout in national elections for 1960-2000, from Lundell and Karvonen (2003). The dataset comprises several other political variables. All variables, unless otherwise specified, come from Persson and Tabellini (2003). The dataset includes the index of democracy (*PolityIV*), dummy for presidential democracy (*Pres*), the average size of voting districts (*Magn*), and the proportion of legislators elected by plurality rule via a vote on individuals as opposed to party lists (*Pind*). Persson, Tabellini, and Trebbi (2003) have found that these political variables significantly affect corruption measures. We also include a dummy for federalism (*Federal*). Fisman and Gatti (2002) find that a decentralized political structure is negatively correlated with corruption.

We include in our analysis other social and economic variables that have been found to affect corruption. *Lpop* measures the log of population in mil-

lions. *Avelf* is the average ethno-linguistic fractionalization. Mauro (1995) has found the significant effect of these variables on corruption. Treisman (2000) finds that religious beliefs and the legal system affect corruption, so we include variables *Prot80* and *Catho80* (the shares of country's Protestant and Catholic population in 1980), *Confu* (a dummy for Confucian dominance in the country), *Legor_Uk*, *Legor_Fr*, and *Legor_Ger* (dummy for country's legal system being based on Anglo-Saxon common law tradition, French civil law tradition, or German civil law tradition). Ades and di Tella (1999) find that openness to trade significantly reduces corruption, so we include a measure of openness to trade (*Trade*) to our analysis. We also add the log of income per capita (*Lyp*) in our regressions, to control for the level of economic development.

Our model predicts that democracies with a higher income inequality have higher political rent extraction, so we include the average of the Gini index of income inequality between 1980 and 1990 (*Gini*). It is difficult to find a more recent reliable measure of income inequality. However, since the corruption variables are quite stable across time, this lack of more recent data should not affect the quality of our empirical analysis. *Edu* measures the education level in a country. *Comp* measures compulsory voting, i.e. the presence of sanctions on non-voters. This measure comes from the International Institute for Democracy and Electoral Assistance (www.idea.int).

Table 8 presents the list of countries in the dataset. Appendix C at the end of the chapter presents the full description of variables.

3.4.2 Descriptive Statistics

Table 9 presents the summary statistics for the all the variables in our analysis. We have observations on *Corr_CPI* for 44 countries and observations for the

other two measures of corruption for a slightly large set of countries (49 countries). All the three measures are on 0-10 scale. Corruption measured by CPI has a slightly higher average (4.21 against 3.77 and 3.74) and a larger standard deviation (2.53 against 1.77 and 2.01) than the other two measures.

The average turnout in the 49 countries in our sample is around 75%. The variation in turnout across countries is large: the standard deviation is 12% with the highest turnout above 95% and the lowest below 45%. About a half of the countries have some form of compulsory voting.

3.4.3 Cross-Country Regressions

The identifying assumption of our model is that education affects corruption only via its effect on turnout. We estimate the following equations:

$$\begin{aligned} Corr &= \alpha_0 + \alpha_1 Turnout + \alpha_2 Gini + \alpha_3 x + u \\ Turnout &= \beta_0 + \beta_1 Edu + \beta_2 Comp + \beta_3 x + e \end{aligned}$$

Here, *Corr* is one of the measures of corruption (*Corr_CPI*, *Corr_K1*, and *Corr_K2*), *x* is the vector of other determinants of corruption mentioned above, and *u* and *e* are error terms.

Estimating these equations separately would lead to inconsistent estimates on corruption equation, so we use the two-stage least squares method, with *Edu* and *Comp* as instruments in the first stage regression. Another reason for using two-stage estimator is a possible reverse causality: higher corruption creates cynicism among voters, and leads to lower turnout in future elections.

The signs on the coefficients predicted by the theory are: $\alpha_1 < 0$, $\alpha_2 > 0$, $\beta_1 > 0$, $\beta_2 > 0$.

Table 10 presents regression results. Columns (1) and (2) report the results

of the first- and second-stage regressions using *Corr_CPI* as the measure of corruption. In this regression we have observations for 44 countries. Columns (3) and (4), and (3) and (5) report the results of similar regressions using, respectively, *Corr_K1* and *Corr_K2* as the measure of corruption. In these regressions, we have observations for 49 democracies.

In all the three regressions, we find that *Turnout* has a negative and significant coefficient, in line with our theoretical model. Countries with higher turnout exhibit lower corruption level. *Gini* has a positive coefficient, as predicted by our model, but it is not significant in neither regression. We also see that our instruments (*Edu* and *Comp*) are valid and relevant. The over-identifying restrictions test has a *p*-value between 0.45 and 0.81 (so the test cannot reject the validity of instruments), and the instruments jointly explain slightly less than $\frac{1}{3}$ of variation in turnout.

Thus, the data supports our empirical predictions 1 and 2, and does not lend support for prediction 3. Perhaps, this is because in countries with higher income inequality, the ideological dispersion among the middle-income voters is also higher (which corresponds to a lower ϕ in our model), so we cannot distinguish the two effects in the data.

The quantitative effect of turnout on corruption is large. For example, one standard deviation increase in turnout (11.9%) reduces corruption - as measured with *Corr_CPI* - by 0.85 points (about $\frac{1}{3}$ of the standard deviation).

3.5 Discussion

In this section we discuss the key assumptions of our model. Our objective is to show that the main results of the model are robust to alternative setups and to provide some empirical evidence to support our modelling strategy.

Our model assumes perfect commitment of candidates' to their announced policies. A model with an incumbent politician and backward-looking voters who care both about ideology and policy would give the same results as in our model. The key point is that the ideologically mobile voters are also the ones with a higher informational cost of voting. This is because they need to collect information about candidates in order to assess their policies (or performance, in the case of backward-looking voters), while ideological voters do not have to bear this cost.

The key assumption of the model is that the variation in corruption is driven by the variation in turnout among mobile voters. This requires some empirical support. We thus look at the survey data from the Comparative Study of Electoral Systems (CSES, www.umich.edu/~cses/), which has individual-level data from recent elections in 35 democracies. We calculate the average turnout (by country) among voters that declare themselves ideologically neutral and among those that declare themselves ideologically motivated. Table 11 presents the results of our computations. Turnout among neutral voters is both lower and considerably more volatile than turnout among ideological voters. This gives good support to our modelling choice.

3.6 Conclusion

This chapter has built and tested a theory of electoral competition with political rents and endogenous turnout. Turnout is determined by political-information cost that citizens face and the extent of compulsory voting. The model rests on two key assumptions. First, the mobility of voters is asymmetric across income groups: middle-income voters are less ideological than the poor and the rich. Second, less ideological voters face a positive cost of information about their

ideological preferences. Given these assumptions, we find that higher education level and higher non-voting costs lead to higher turnout of mobile voters, and thus make electoral competition more intense. This, in turn, reduces equilibrium rents for politicians.

The cross-country data for 49 democracies support the predictions of the model. We find that higher education level of citizens and the presence of compulsory voting lead to higher turnout, and higher turnout is associated with lower corruption.

Our findings help to shed light on recent debates about the effect of declining turnout in Western democracies on the quality of democratic outcomes. Our results suggest that if decline in turnout is due to higher political information costs, politicians have opportunities to exploit the resulting less intense electoral competition and appropriate higher rents. On the other hand, if decline in turnout is due to an increase in the number of ideologically neutral voters, then the electoral competition becomes more intense and, thus, politicians can grab less rents.

Appendix C. Description of Variables

AVELF: index of ethno-linguistic fractionalization, approximating the level of lack of ethnic and linguistic cohesion within a country. Ranges from 0 (homogeneous) to 1 (strongly fractionalized). Sources: La Porta et al. (1999), Mauro (1995).

CATHO80: percentage of a country's population belonging to the Roman Catholic religion in 1980. Source: La Porta et al. (1999).

COMP: compulsory voting dummy variable, equal to 1 if a country imposes

some sanction on non-voters and 0 otherwise. Source: International Institute for Democracy and Electoral Assistance (www.idea.int).

CONFU: dummy variable for the religious tradition in a country, equal to 1 if the majority of the country's population is Confucian/Buddhist/Zen, 0 otherwise. Source: Wacziarg (1996).

CORR_CPI: corruption perceptions index, measuring perceptions of abuse of power by public officials. Average, over 1995-2000, of the CPI, which ranges from 0 to 10, with higher values denoting more corruption. Sources: Transparency International (www.transparency.de) and Internet Center for Corruption Research (www.gwdg.de/~uwww).

CORR_K1: point estimate of "Graft", the sixth cluster of Kaufmann et al.'s (1999) governance indicators, focusing on perceptions of corruption. Ranges from 0 to 10 (lower values correspond to better outcome). Source: Kaufmann et al. (1999).

CORR_K2: point estimate of "government effectiveness" the third cluster of Kaufmann et al.'s (1999) governance indicators, focusing on perceptions of the quality of public service provision the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from political pressures, and the credibility of the government's commitment to policies into a single grouping. Ranges from 0 to 10 (lower values correspond to better outcome). Source: Kaufmann et al. (1999).

EDU: total enrollment in primary and secondary education in a country, as a percentage of the relevant age group in the country's population. Computed by dividing the number of pupils (or students enrolled) in a given level of education (regardless of age) by the population of the age group that officially corre-

sponds to the given level of education and multiplying the result by 100. Source: UNESCO-Education Indicator-Category Participation (www.unesco.org).

FEDERAL: dummy variable, equal to 1 if a country has a federal political structure. 0 otherwise. Source: Adsera, Boix, and Payne (2003).

GINI: Gini index of income distribution, computed as the average of two data points: the observation closest to 1980 and the observation closest to 1990. When data for only one of the two years are available, only that year is included. Source: Deininger and Squire (1996).

LEGOR_UK, LEGOR_FR, LEGOR_GE: dummy variables for the origin of the legal system in the country, classifying a country's legal system as having its origin in Anglo-Saxon common law (UK), French civil law (FR), or German civil law (GE). Source: La Porta et al. (1998).

LPOP: natural logarithm of total population (in millions). Source: World Bank (2000).

LYP: natural logarithm of real GDP per capita in constant dollars (chain index) expressed in international prices, base year 1985. Average over 1990-1998. Source: Penn World Tables, mark 5.6 (<http://datatcentre2.chass.utoronto.ca/pwt/docs/topic.html>), World Bank, World Development Indicators (www.worldbank.org).

MAGN: inverse of district magnitude, defined as number of electoral districts in a country, divided by number of seats in lower (or single) chamber for the latest legislature. Source: International Institute for Democracy and Electoral Assistance (www.idea.int), Quain (1999), Kurian (1998), and national sources.

PIND: measure of proportion of legislators elected by plurality rule via a vote on individuals as opposed to party lists. Computed as 1 minus the fraction of lower house legislators elected through party list systems over the number of

seats in lower chamber for the latest legislature. Source: Cox (1997), International Institute for Democracy and Electoral Assistance (www.idea.int), Quain (1999), Kurian (1998), and national sources.

POLITYIV: score for democracy, ranging from +10 (strongly democratic) to -10 (strongly autocratic). Source: Polity IV project (www.cidcm.umd.edu/inscr/polity/index.htm).

PRES: dummy variable for forms of government, equal to 1 in presidential regimes, 0 otherwise. Sources: Shugart and Carey (1992) and national sources.

PROT80: percentage of population in a country professing the Protestant religion in 1980. Source: La Porta et al. (1998).

TRADE: measure of openness to trade, computed as the sum of exports and imports of goods and services divided by the GDP. Source: World Bank (2000).

TURNOUT: average turnout in national elections in 1960-2000. Source: Lundell and Karvonen (2003).

4 Which Political Economy Model for Public Finance?

4.1 Introduction

Political economics approach - explaining economic policies as determined by politics - presents three competing theories of the determination of broad economic policies (e.g., government spending and income taxes): median voter, probabilistic voting, and partisan politicians. In this chapter, I test these models using the data from the U.S. states for the years 1984-2000. I construct a measure of ideological neutrality of two income groups of voters (poor and rich), and match these measures with data on state-level fiscal policies.

Understanding the empirical relevance of political-economic theories is cru-

cial for the design of political reforms. Will the change in electoral rules affect the government size? Will the limits on campaign spending lead to a more generous welfare state? Also, this understanding is key for evaluating the impact of broad macroeconomic and political trends on government policies. Will the increase in inequality map into a larger public sector, and if so, how strong will this effect be? What will be the impact of the ideological swing in the electorate on state spending?

The median voter theory (Meltzer and Richard (1981)) links government size to income distribution in the population. In a two-candidate election, if candidates only care about winning the elections and voters care only about policies, and electoral promises are binding, both candidates announce the preferred policy of the voter with median income. Any unilateral deviation from this strategy makes the deviating politician lose the election with probability one, since the number of votes that she gains are less than the number of votes that she loses. Thus, as the income distribution becomes more unequal, i.e. the poorer is the median voter, the larger will be the government spending.

In the probabilistic voting model (Lindbeck and Weibull (1987)), voters care about policies and ideological positions of the candidates. Voter groups may also differ in terms of their mobility (the relative number of ideologically neutral voters). The groups that are more mobile become then more attractive targets for candidates, since such groups are more responsive to policy changes. Both candidates announce policies biased towards the preferred policies of more mobile groups of voters. If, for instance, rich voters become more ideologically neutral, we should observe a decrease in the government spending.

Models with partisan politicians (Alesina (1988), Besley and Coate (1997))

typically assume that candidates have policy preferences and electoral promises are not binding. The median voter is still decisive. However, the equilibrium policy is not her preferred point, but that of the candidate whose preferred point is closest to that of the median voter. This implies that the shifts in ideological stance of the median voter systematically affect the size of government: a more left-wing electorate implies larger public spending, while a more right-wing oriented electorate implies a smaller government.

To test these models, I construct a measure of ideological neutrality of voters in two income groups (the poorest 1/3 and the richest 1/3) in each state. For the test of the first hypothesis, I use the median real household income (taken from U.S. Census), controlling for the average real per capita income (from the Statistical Abstract of the United States). To test the second hypothesis, I build a measure of ideological neutrality of different voter groups by calculating the income-group average ideological neutrality for each state, based on individual-level surveys of the National Elections Studies in the United States. Finally, I use the Berry et al. (1998) measure of citizen ideology to test the third hypothesis.

To my knowledge, it is the first analysis that implements a horse-race test of the three competing political economy models of public finance.

We find that the real median income does not significantly correlate with fiscal policy measures. This gives no empirical support for the median voter model.

Secondly, we find that the citizen liberalism score consistently significantly correlates with both tax policies and expenditure policies. This finding strongly supports partisan politician models.

Finally, we find that the ideological neutrality of the rich decreases state taxes and has no effect on state transfers. On the other hand, the neutrality of the poor increases state transfers and has no effect on state tax policies. We suggest a plausible explanation of this asymmetry: the neutrality of the poor matters for transfers because the poor voters's stake in this policy is the highest. Similarly, the neutrality of the rich matters for tax policy because the stakes of the rich voters in tax policy is the highest. These findings suggest good support for the probabilistic voting model.

We also find that the quantitative effect of the citizen liberalism is several times larger than that of the ideological neutrality.

The rest of the chapter has the following structure. Section 4.2 reviews the three competing political economy theories of public finance. Section 4.3 discusses the existing empirical evidence in favor of (or against) the three models. Section 4.4 describes the data that I use, explains the construction of proxy variables, and presents some summary statistics. Section 4.5 discusses the econometric results. Section 4.6 suggests questions for further analysis and concludes.

4.2 Political-Economic Theories of Public Finance

In this section, we briefly review the three models of public finance and discuss their empirical implications. For an extended theoretical analysis of these models, see chapters 3 and 5 of Persson and Tabellini (2000).

4.2.1 Median Voter Model

The median voter model, first developed by Downs (1957) and later applied to public finance by Meltzer and Richard (1981), argues that the income inequality

drives the size of government. This two-candidate elections model builds on four main assumptions. First, candidates are fully opportunistic - they have no policy preferences and care only about winning the elections (for some ego-rents that the office gives). Second, voters have one-dimensional preferences: they care only about the utility that they receive from the policy that gets implemented. In particular, they do not care about the identity of the candidate in office. Third, candidates can fully commit to the platforms announced at the campaign stage. Finally, policy is represented by a single public good financed with the proportional tax on income.

Voters with higher income prefer less of the public good, since they have to pay more for it. The Nash equilibrium of the game in policy platforms is: both candidates announce the preferred policy of the voter with median income. Any unilateral deviation from this strategy makes the deviating politician lose the election with probability one, since the number of votes that she gains are less than the number of votes that she loses, by definition of the median.

The model makes two key predictions. First, we should observe full policy convergence, i.e. the government size does not correlate with the identity of the politician in office. Second, as income distribution becomes more unequal, i.e. the poorer is the median voter, the government size increases.

4.2.2 Probabilistic Voting Model

An alternative model was first introduced into political science by Hinich, Ledyard, and Ordeshook (1972), and later applied to the questions of public finance by Lindbeck and Weibull (1987). This model relaxes the assumption that voters care only about policy, while preserving all the other assumptions of the median voter model. Candidates, thus, differ in two dimensions: they have fixed ideol-

ogy positions and the policy platforms that they choose at the campaign stage. In their turn, voters have both policy preferences and ideological preferences about the candidates. In particular, voter i prefers candidate L if

$$W^i(g_L) > W^i(g_R) + \sigma^i + \eta,$$

where $W^i(g_J)$ is the utility that voter i gets under the policy of candidate J , σ^i is (random) idiosyncratic ideological preference of voter i for party R , and η is the electoral uncertainty.

Voter groups differ in terms of their mobility, i.e. the relative number of ideologically neutral voters (the variance of σ^i). The groups that are more mobile become then more attractive targets for candidates, since such groups are more responsive to policy changes.

The model thus makes two predictions. As in the median voter model, we should observe policy convergence, since both candidates announce the same policies in (Nash) equilibrium. Thus, we should see no correlation between politician's identity and the size of government.

Second, and crucially different from the median-voter model, the equilibrium policy is biased towards the preferred policies of more mobile groups of voters. What matters is not income inequality, but the relative ideological neutrality of a given group. Thus, *ceteris paribus*, when rich voters are relatively more ideologically neutral, we should observe a smaller government, and when poor voters are relatively more ideologically neutral, the government should be bigger.

4.2.3 Models with Partisan Politicians

The third class of models includes those of Alesina (1988) and Besley and Coate (1997). These models do away with the strong assumption of full commitment

to policy platforms. Instead, they assume that policy platforms are not credible and the winning politician has full discretion to choose policies, once in office. Moreover, they assume that politicians are not purely opportunistic, but have policy preferences.

Voters understand that the absence of commitment implies that once in office, the winning candidate will implement her preferred policy. Thus, electing the left-party politician into office implies higher government spending, while the right-party candidate in office will choose smaller spending. Knowing this, voters strategically vote for the candidate whose policy preference is closer to theirs.

In these models, the median voter is still decisive. However, the equilibrium policy is not her preferred point, but that of the candidate whose preferred point is closest to that of the median voter.

The main empirical prediction of this class of models is the policy divergence. This contrasts these models with the median-voter and probabilistic-voting models. The ideology of the winning party systematically affects government size. In particular, shifts in the ideological stance of the median voter to the left imply that a more leftist party gets into office and the public spending increases. On the contrary, a more right-wing oriented electorate elects a rightist party, which implies a smaller government spending.

4.3 What Do We Know Already?

The general state of empirical knowledge about these models can be described as follows. The support for the median-voter model is mixed. Partisan politician models, on the other hand, seem to have robust support in the data, using different countries and periods. Finally, the knowledge about the validity of the

probabilistic model is also mixed, though very few papers have looked at the empirical predictions of this model. No paper has ever tried to do a horse-race test of the models.

Lindert (1994, 1996) finds that income distribution can explain a good deal of the cross-country variation in government size. However, the attempts to use the model to explain also the time variation in government spending have lead to much less success. As noted by Persson and Tabellini (2000, Ch. 6.1), the decades of the highest expansion in government size, 1960s and 1970s, were also the decades with falling income inequality. On the contrary, the decades when the income inequality was on the rise (1980s and 1990s) were also the decades when government spending grew slower. However, Husted and Kenny (1997) find that the drop in the income of the median voter caused by the extension of voting franchise to poorer voters (elimination of the poll tax and of the literacy test for voting) has led to a larger welfare spending.

On the other hand, several recent papers have provided ample support for the partisan-politician models. Besley and Case (2003) find, using the data from the U.S. states, that the fraction of Democrats in the lower house of the state strongly positively affects total state spending per capita. Using the randomized change in the party strength in the U.S. House, Lee, Moretti, and Butler (2004) find that the candidates with an exogenously stronger electoral support do not choose systematically different policies with respect to the candidates with a weaker electoral support. Finally, Pettersson-Lindbom (2003), using the similar regression-discontinuity approach on the data from Swedish municipalities, finds that the identity of the party in office significantly affects government spending, with left-wing parties spending on average 2.5% more than the right-wing

parties.

Two papers test some form of a probabilistic-voting model. Stromberg (2002) looks at the presidential campaign spending allocation in the U.S. He finds that the states that are likely to be decisive in the Electoral College and have close state elections receive disproportionately more campaign spending. Ansolabehere and Snyder (2003) analyze the distribution of intergovernmental transfers across U.S. counties in 1957-1997 period. They find no support for the hypothesis that governing party transfers more to the counties with a higher level of electoral volatility.

4.4 Data and Summary Statistics

The data that we use comes from different sources. For fiscal policy measures, we use the data from Besley and Case (2003). This is annual state-level data, for all states except Alaska and Hawaii. Though the data is available from 1950 to 2000, we have to perform our analysis on the subset running from 1984 till 2000, given that some regressors that we use are available only starting from 1984.

The fiscal variables include: total real state taxes per capita and real per capita income taxes, total real state transfers per capita, and real per capita targeted transfers (family assistance, worker compensation, and unemployment insurance). We also look at the composition of taxes and transfers, i.e. the share of income tax in total taxes and the share of targeted transfers in total transfers.

Our set of controls also comes from the same dataset. These include: state population and population squared, the fraction of citizens aged over 65 and the fraction of the population aged 5 to 17, state income per capita, and the

indicators for states with constitutional tax and expenditure limitations, states allowing for citizen initiatives on fiscal issues, and the states with the supermajority requirement for amending state fiscal policy.

The (annual) measure of real median household income comes from the U.S. Census website. The measure of citizen ideology (liberal-conservative) comes from Berry et al. (1998). This is a score on 0 to 100 scale, with higher values denoting more liberal citizenry.

We construct a measure of ideological mobility for rich and poor voters in each state, using the National Election Studies cumulative dataset (1948-2000). It is a dataset that includes surveys conducted every two years starting in 1948. Each cohort of the survey includes about 1000-1200 observations. Among other variables, the survey contains information on citizen's ideological stance (on 0 to 7 scale), the strength of the ideological stance (from 0 to -1), the state of residence, and the income category (the poorest 1/3, the middle 1/3, or the richest 1/3). If s_{ijkl} denotes the strength of the ideological stance of a respondent i of cohort t , belonging to the income group j , and living in the state k , our index $NEUT_POOR_{kt}$ that denotes the ideological mobility (neutrality) of poor voters in state k and year t is:

$$NEUT_POOR_{kt} = \frac{1}{N_{jkt}} \sum_i (4 - s_{ijkl}),$$

for $j = POOR$, and N denoting the number of respondents belonging to the poorest 1/3 in state k and cohort t . Similarly, our index $NEUT_RICH_{kt}$ that denotes the ideological mobility (neutrality) of rich voters in state k and year t is

$$NEUT_RICH_{kt} = \frac{1}{N_{jkt}} \sum_i (4 - s_{ijkl}),$$

for $j = RICH$, and N denoting the number of respondents belonging to the richest 1/3 in state k and cohort t .

Table 12 presents summary statistics of the variables that we use in our econometric analysis, as well as the correlations between the regressors of interest. On average, a citizen paid 737\$ (in real 1982 dollars) as state taxes annually, of which about 1/3 was income tax. An average citizen received 1830\$ (in real terms) of state transfers per year, of which about 7% were targeted transfers. we also note that all the fiscal variables have quite a large standard deviations.

Turning to our regressors, median real household income was on average around 41,000 dollars, with standard deviation of about 7,000 dollars. Rich and poor voters were on average almost equally neutral (1.18 and 1.19, respectively, on 0 to 3 point score). These neutrality measures vary a lot, having, respectively standard deviations of 0.41 and 0.37 points. Finally, the U.S. states are on average slightly liberal (54 on 100 point score, with 50 corresponding to perfect ideological neutrality). This measure also varies a lot: its standard deviation is 14 points.

Note, from the Section II of the Table 12, that the correlation between the regressors of interests is not high. Only three out of 6 correlation coefficients differ significantly from zero (at 5% level), and the highest coefficient is 0.37.

4.5 Econometric Analysis

In this section, we present the estimation results of the following set of equations:

$$\begin{aligned}
 FISC_{kt} = & \alpha_t + \beta_1 * MEDIAN_{kt} + \beta_2 * NEUT_POOR_{kt} + \\
 & + \beta_3 * NEUT_RICH_{kt} + \beta_4 * LIBERAL_{kt} + \gamma' X_{kt} + \varepsilon_{kt},
 \end{aligned}$$

where $FISC_{kt}$ denotes the fiscal policy measure in state k in year t , α_t is the fixed year effect that captures the unobservable time variation, $MEDIAN_{kt}$ is the median household income, $NEUT_POOR_{kt}$ and $NEUT_RICH_{kt}$ denote the ideological neutrality of the poor and the rich voters in state k in year t , respectively, $LIBERAL_{kt}$ is the citizen liberalism score, and X_{kt} is the set of controls that include state population and population squared, fraction of aged citizens in the population, fraction of population aged 5-17, real income per capita, and the institutional variables (tax and expenditure limitations, citizen initiatives, and the supermajority requirement).

What does the theory say about the expected signs of the coefficients? Median-voter model predicts that the coefficient β_1 is negative: richer median voter implies a smaller government. The probabilistic voting model predicts that β_2 is positive, while β_3 is negative: more ideologically neutral poor (rich) voters become a more attractive electoral target for the candidates and thus induce a larger (smaller) government size. Finally, partisan politician models predict a positive coefficient β_4 : a more liberal-leaning electorate votes into power a left-wing party and this implies a larger government.

Table 13 presents the results of the estimation with tax policy measures as dependent variables. The first column reports the estimation with total real per capita state taxes as the dependent variable. Neither the median income nor the neutrality of the poor significantly correlate with total taxes. The coefficient on the neutrality of the rich, on the other hand, is negative and significant at 1 per cent. One point score increase in the neutrality of the rich decreases total state taxes per capita by about 93 dollars. This is in line with the prediction of the probabilistic voting model. Next, the coefficient on the citizen liberalism

score is positive and significant at 1 per cent, as predicted by partisan politician models. One point increase in the citizen liberalism increases total taxes per capita by about 7 dollars.

The columns 2 and 3 report the estimation results with income taxes and income taxes as a percentage of total taxes. The results are very similar: median income and the neutrality of the poor do not correlate with the dependent variable, while the coefficients on the neutrality of the rich and the citizen liberalism score are significant at 1 per cent level.

What about the relative importance of the two latter variables? One standard deviation increase in the neutrality of the rich (0.37 points) decreases total taxes per capita by $0.37 * 92.63 = 34.27$ dollars. On the other hand, one standard deviation decrease in citizen liberalism score (14 points) decreases total taxes per capita by $14 * 6.92 = 96.88$ dollars. The effect of the one standard-deviation change in the citizen liberalism score is almost 3 times larger than a similar change in the index of the neutrality of the rich (in the case of income taxes as a percentage of the total taxes, this difference reduces to 2 times).

Next, we turn to the expenditure side. Table 14 reports the results of the estimation with transfers as dependent variables. Column 1 presents the results with total real state transfers per capita as dependent variable. This time, the coefficient on median income is negative and significant, which is in line with the median voter model. On the contrary, the neutrality of the rich does not correlate with total transfers. On the other hand, the coefficient on the neutrality of the poor is positive and significant at 5 per cent. This is in line with the probabilistic voting model. One point increase in the neutrality of the poor increases total transfers per capita by 49 dollars. As in the previous table, the coefficient on the

citizen liberalism score is positive and significant: one point increase in citizen liberalism increases total transfers per capita by about 10 dollars.

Let's look at the relative importance of the neutrality of the poor and the citizen liberalism. One standard deviation increase in the neutrality of the poor increases total transfers per capita by $0.41 * 49.17 = 20.16$ dollars. On the other hand, one standard deviation increase in citizen liberalism increases total transfers per capita by $14 * 10.04 = 140.56$ dollars. This is 5 times larger than the effect of a similar increase in the neutrality of the poor.

The columns 2 and 3 report the results with targeted transfers per capita and targeted transfers as a percentage of total transfers as dependent variables. The picture is similar, with the only exception being that in column 2 the coefficient on the median income is not significant any more, while in column 3 this coefficient turns positive (and weakly significant). This implies that we do not find a coherent evidence in favor of the median voter model.

Instead, the predictions of partisan politician models are widely confirmed, both on tax policy side and expenditure policy side. More liberal states seem to systematically impose heavier taxes and extend more transfers to their citizens.

On the other hand, we see that the ideological neutrality of the rich matters for the tax policy side, but not for the expenditure policy side. Instead, the neutrality of the poor matters for the transfers, but not for the taxes. Thus, there is an asymmetry in the effect of the ideological neutrality of the rich and the poor on fiscal policies.

How can one explain this asymmetry? In our view, an extremely plausible explanation is the following one. The rich voters are the ones that bear the most of the tax burden, under proportional taxation. Thus, their stakes in the

determination of the tax policy are the highest. On the other hand, the poor voters are typically the biggest beneficiaries of the transfers. Therefore, the stakes of the poor voters are the highest in the determination of the expenditure policy. Then, the rich voters care mostly about the tax policy, while the poor voter care mainly about transfers. Given this, from the politicians' point of view, rich voters' ideological neutrality should matter disproportionately more than that of the poor voters, when setting tax policies. Instead, the neutrality of the poor voters weighs for the politicians disproportionately heavier than that of the rich voters when setting expenditure-side policies.

4.6 Sensitivity Analysis

We perform four types of sensitivity analysis (for total taxes and total transfers). First, we have estimated the econometric model on the time-average values of the variables in the dataset. Table 15 presents the results of this cross-section estimation.

The results for total taxes are similar to those described in the previous section. Citizen liberalism score and the ideological neutrality of the rich both significantly correlate with total state taxes. The results for total transfers, though, are somewhat different. First, the coefficient on median income is negative and significant (in line with the median voter model). Second, the neutrality of the poor does not significantly affect total state transfers. Finally, and similar to our previous findings, citizen liberalism score is an important determinant of total transfers.

Secondly, we look at total state taxes and transfers as a percentage of state income (instead of per capita values). This allows us to account for the potential presence of state-level time trends. Table 16 presents the results of the estima-

tion. Note first that both total taxes and total transfers significantly correlate with the median income. The regression coefficient is negative, in line with the median voter model. However, this correlation is not driven by the mechanism of the model, but by the fact that median and mean incomes are usually positively correlated. Beyond this, we see that in both regressions, citizen liberalism score positively correlates with dependent variables, in confirmation of our previous findings. Finally, the ideological neutrality of the rich is correlated with total taxes, but that of the poor does not significantly correlate with total transfers. Thus, we again see that our main findings are more robust for tax policies than for transfers.

Next, we analyze the possibility that some state-level factors (other than the institutional characteristics that we have included in our main regressions) may regularly affect fiscal policies. To do so, we drop the institutional characteristics and include state fixed effects in our regressions. Table 17 presents the results of these regressions.

We find that the results are quite different from our main findings. First, the sign on the coefficient of citizen liberalism turns negative (and significant for total transfers). This would mean that as a state ideology turns more liberal, total transfers per capita decrease. This goes against the citizen-candidate model's prediction. Second, and in line with the predictions of the median voter model, median income negatively (and significantly) correlates with both total taxes and total transfers. Finally, the ideological neutrality of both income groups (rich and poor) does not significantly correlate with total taxes, but does correlate with total transfers. However, the coefficient sign for poor voters is in line with the predictions of the probabilistic voting model, while that for rich voters

goes against the model's predictions.

How can we explain such a sharp difference between these results and our baseline findings? A plausible suggestion is that most variation in the ideological neutrality and the citizen ideology score in our dataset occurs across states, while the similar variation across time is minimal. Thus, the inclusion of state fixed effects in the regression basically leaves us with a minimal variation in these main regressors, and the estimation results are then unreliable.

To check this suggestion more carefully, we add lagged dependent variable in the regression, and estimate our (modified) model with the Arellano-Bond dynamic panel data estimator. We include two lags of the dependent variable to the regressors.

Table 18 presents the results of these regressions. Note first that both taxes and transfers are autocorrelated (with a larger autocorrelation coefficient for transfers). Second, the only statistically significant coefficient among our main regressors is on the median income for total state transfers per capita. Neither the ideological neutrality nor the citizen ideology score correlate with economic policy measures. This goes in line with our suggestion above.

4.7 Conclusion

This chapter has jointly tested three political economy models of public finance - the median voter model, the probabilistic voting model, and partisan politicians model. We have used the U.S. state-level fiscal policy data from 1984 to 2000. We have built an index of ideological neutrality of poor and rich voters in each state, for every two years since 1984, using the survey data from the National Elections Studies.

We have found that the real median income does not significantly correlate

with fiscal policy measures. This gives no empirical support for the median voter model.

We also have found that the citizen liberalism score consistently significantly correlates with both tax policies and expenditure policies. This finding strongly supports partisan politician models.

Finally, we have found that the ideological neutrality of the rich decreases state taxes and has no effect on state transfers. On the other hand, the neutrality of the poor increases state transfers and has no effect on state tax policies. We have suggested a plausible explanation of this asymmetry: the neutrality of the group of voters whose stakes are higher in the determination of a given policy should matter disproportionately more. These findings suggest good support for the probabilistic voting model.

Notably, we have found that the quantitative effect of the citizen liberalism is several times larger than that of ideological neutrality.

Our findings suggest the key role of the combination of both policy supply side and policy demand side for fiscal policy determination. On the supply side, given the ample support for the partisan politician models, the role of political institutions is key. The change in the institutions that increases the likelihood of the election of left-wing or right-wing parties into power will crucially affect fiscal policies. On the demand side, given the good support for the probabilistic voting model, the role of party affiliation and voter information is important. The factors that lead to a decline in party affiliation (such as the decreasing importance of the trade unions and the resulting fall in union membership) and those that affect voters' information about the candidates' economic policies are likely to affect fiscal policies as well.

What remains to be done? Our findings about the asymmetric effect of ideological neutrality and the explanation that we have proposed in this chapter call for the further investigation of this phenomenon. In particular, introducing voters' information into the model seems an attractive extension. If information acquisition about policies is costly, different groups of voters are likely to get informed about the policies where their stakes are higher. In such model, the ideological neutrality of a group of voters will matter for a given economics policy only insofar as these voters are informed about the policy. Building and testing such a model seems a natural extension to the research presented in the current chapter.

5 Conclusion

This thesis, composed of three papers, looks at different aspects of voter behavior and its effects on economic policies. It aims to clarify economic policy "demand-side" behavior by answering the following questions:

- Why some groups of voters are more informed about policy issues while other groups remain relatively uninformed?
- Does the decline in voter participation lead to a lower discipline of politicians and thus to worse policies?
- Which of the political economy models linking political behavior of voters to economic policies are more empirically relevant?

The first paper has analyzed the political information acquisition of voters in large elections, where the probability of being pivotal is negligible. Having proposed a novel motivation for information acquisition based on social exchange,

it has built a simple game-theoretic model, and has analyzed the properties of the unique equilibrium of the game (with strategic complementarities). The key prediction is that political information acquisition is higher when the benefit of social exchange is larger. The paper then tests this prediction using the 2000 U.S. National Election Study. The main finding is that recent movers (thus having a less developed social network and a lower benefit of social exchange) acquire significantly less political information than long-term residents.

The second paper has analyzed the link between voter turnout and political rents. It has built a model of electoral competition with endogenous voter turnout. The key idea of the model is that the cost of voting is higher for non-ideological voters, and thus a lower turnout reflects a weaker electoral competition. The empirical prediction of the model is that lower turnout is associated with higher political rents. The paper then tests this prediction using a cross-country dataset for 49 democracies. The empirical finding is that a higher education level and the presence of compulsory voting are correlated with a higher turnout, which in turn correlates with lower corruption.

The third paper runs a horse-race test of three key political economy models of public finance: median-voter, probabilistic-voting, and citizen-candidate. It uses the state-level data for the U.S. for period 1984-2000. The main finding is that the predictions of the probabilistic voting model and of the citizen candidate model fit the data, while that of the median voter model are not in line with the data. It also finds that this result is mainly driven by the cross-section (and not time-series) variation.

Overall, the general findings of the thesis are two. First, the difficulties in understanding of voting behavior are surmountable if we adopt a broader

perspective for voters' motivation. Second, voter behavior is a key determinant of economic policies, in the policy conflict both between politicians and voters at large (more or less political rents) and between different voter groups (more or less redistribution).

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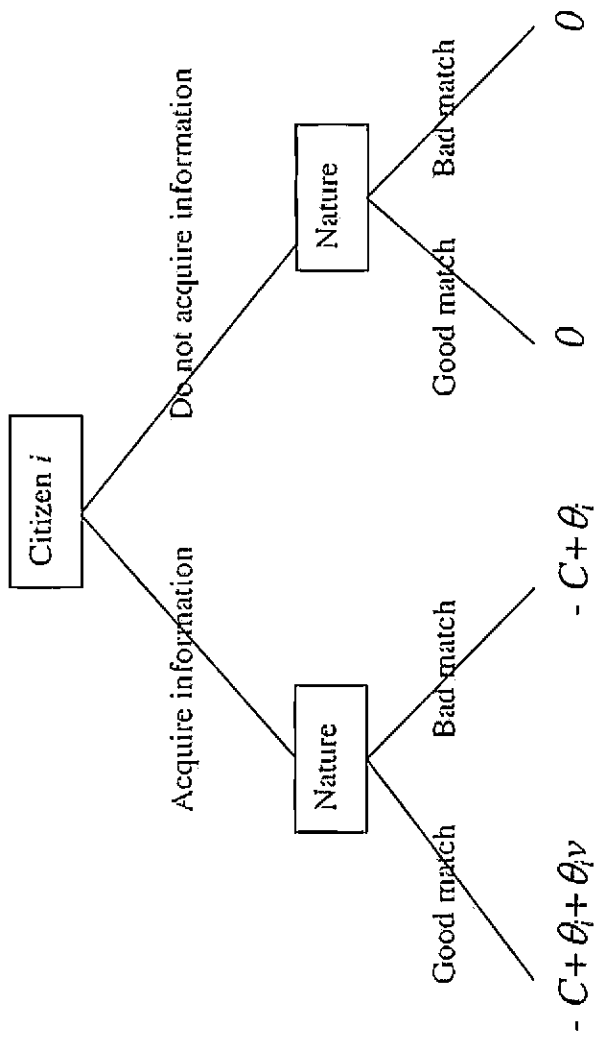


Figure 1. Social exchange

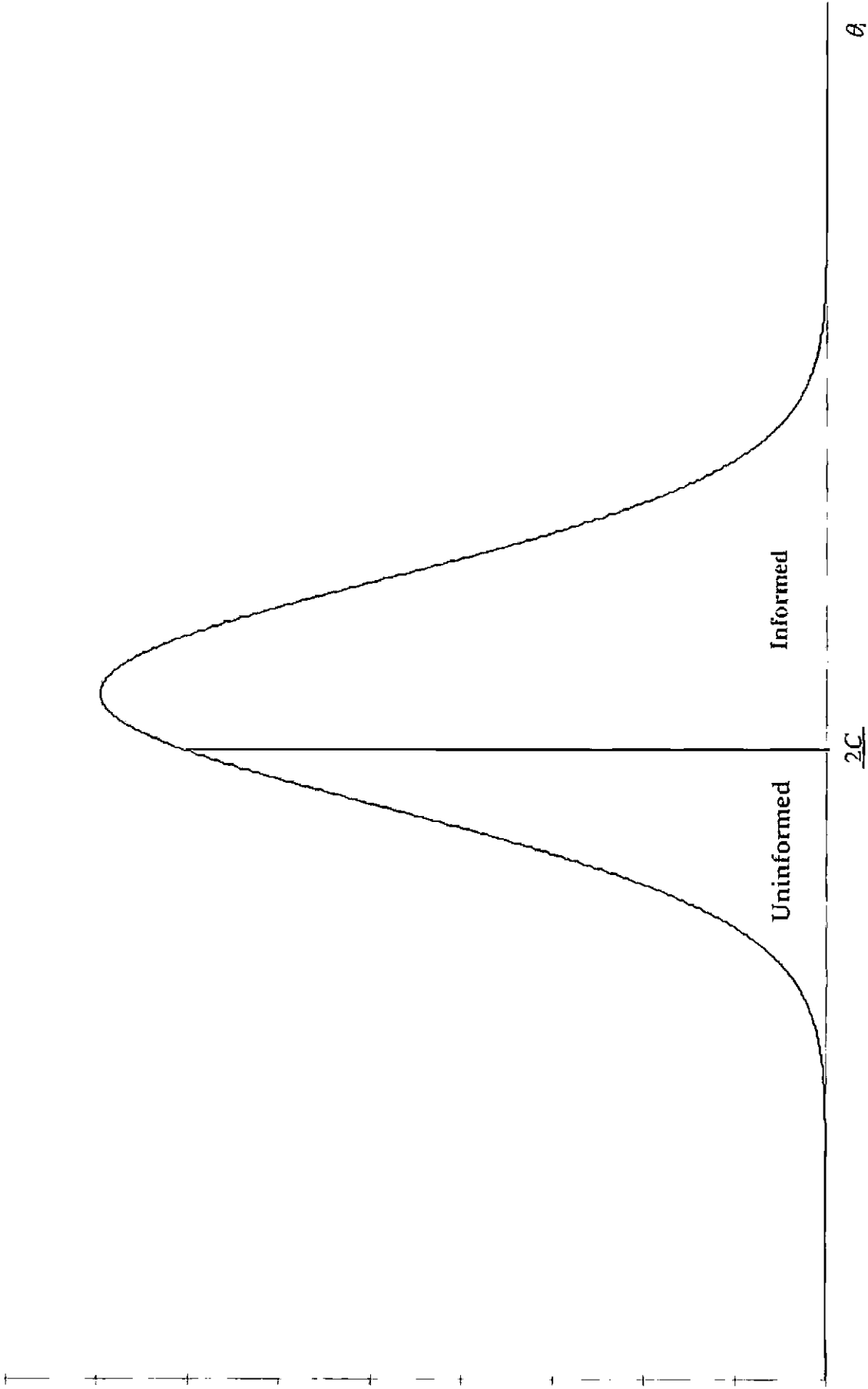


Figure 2. Equilibrium Strategy

Table 1. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Political Behavior Variables</i>					
Some attention to the presidential election campaign	1807	0.78	0.41	0	1
Strong attention to the campaign	1807	0.29	0.45	0	1
Attention to news about the presidential election campaign	1551	0.47	0.50	0	1
Following a TV debate between Gore and Bush	1549	0.69	0.46	0	1
Following at least one TV debate in full	1549	0.29	0.46	0	1
Reading about the campaign in a newspaper	1806	0.44	0.50	0	1
Turnout in the 2000 presidential elections	1554	0.76	0.43	0	1
Turnout in 1996 presidential elections	1794	0.70	0.46	0	1
<i>Individual Socio-Economic Characteristics</i>					
Age of the respondent	1798	47.21	16.96	18	97
Education (in categories) of the respondent	1800	4.29	1.62	1	7
Household income (in categories)	1515	6.76	3.75	1	22
Marital status of the respondent	1793	0.52	0.50	0	1
Presence of children aged under 18 living in the household	1800	0.36	0.48	0	1
Gender of the respondent	1807	0.56	0.50	0	1
The household owns the house it lives in	1792	0.67	0.47	0	1
<i>Social Behavior Variables</i>					
Trust in other people	1544	0.53	0.50	0	1
Membership in an organization	1555	0.41	0.49	0	1
Attending a religious service once a week or almost once a week	1789	0.38	0.49	0	1
<i>Residence Variables</i>					
Residence in the current home 0-1 years	1807	0.22	0.42	0	1
Residence in the current home 2-5 years	1807	0.27	0.44	0	1
Residence in the current home 6-9 years	1807	0.12	0.33	0	1
Residence in the current home 10 years or more	1807	0.39	0.49	0	1
Residence in the community 0-1 years	1807	0.09	0.28	0	1
Residence in the community 2-5 years	1807	0.16	0.37	0	1
Residence in the community 6-9 years	1807	0.09	0.29	0	1
Residence in the community 10 years or more	1807	0.66	0.47	0	1
Residence in rural area	1006	0.49	0.50	0	1
<i>Aggregate variables</i>					
State population (in millions)	1798	11.63	9.51	0.49	33.87
Campaign visits to the state by Gore and Bush	1799	1.96	1.89	0	5
State with voting-day or no registration	1807	0.10	0.29	0	1
State with registration deadline closing less than 16 days before elections	1807	0.20	0.40	0	1
State with regular registration deadline	1807	0.70	0.46	0	1

Table 2. Determinants of information acquisition

	Strong attention to campaign	Attention to news of pres. camp.	Following a TV debate in full	Reading about campaign in a paper
Age	0.016 (0.005)***	0.004 (0.005)	-0.006 (0.005)	0.006 (0.006)
Age squared / 1000	-0.081 (0.047)*	0.015 (0.052)	0.103 (0.044)**	0.013 (0.035)
Education - category 2	0.079 (0.113)	0.050 (0.101)	0.016 (0.091)	0.151 (0.109)
Education - category 3	0.113 (0.091)	0.052 (0.086)	0.009 (0.076)	0.254 (0.088)***
Education - category 4	0.244 (0.098)***	0.138 (0.088)	0.096 (0.084)	0.339 (0.084)***
Education - category 5	0.230 (0.109)**	0.172 (0.092)*	0.095 (0.093)	0.430 (0.068)***
Education - category 6	0.314 (0.100)***	0.193 (0.089)**	0.088 (0.087)	0.406 (0.079)***
Education - category 7	0.343 (0.109)***	0.195 (0.095)**	0.163 (0.100)*	0.459 (0.067)***
Household income	0.014 (0.004)***	0.017 (0.005)***	0.012 (0.004)***	0.015 (0.005)***
Gender	-0.061 (0.027)**	-0.132 (0.030)***	-0.054 (0.027)**	-0.139 (0.030)***
Marital status	-0.010 (0.031)	0.006 (0.034)	0.031 (0.029)	-0.032 (0.034)
Household owns the dwelling	-0.092 (0.034)***	-0.024 (0.036)	-0.001 (0.032)	0.026 (0.037)
Kids under 18 in household	-0.071 (0.031)**	-0.042 (0.035)	-0.035 (0.031)	-0.080 (0.035)**
Trust in other people	0.003 (0.028)	0.004 (0.033)	0.050 (0.028)*	-0.001 (0.033)
Membership in an organization	0.056 (0.028)**	0.087 (0.032)***	0.034 (0.028)	0.107 (0.032)***
Attending religious services	0.102 (0.029)***	0.076 (0.032)**	0.088 (0.029)***	0.037 (0.032)
State fixed effects	Yes	Yes	Yes	Yes
No. obs.	1274	1278	1264	1283
Pseudo R2	0.14	0.10	0.11	0.15
Observed P	0.30	0.46	0.29	0.45
Predicted P	0.27	0.46	0.27	0.45

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level.

Marginal probit coefficients are calculated at the means.

In parentheses are standard errors corrected for heteroskedasticity.

Table 3. Length of residence and political information acquisition

	Strong att. to campaign	Attention to pres. camp. news	Following a TV debate in full	Reading about campaign
Has R lived in her current home for 2-5 years?	0.092 (0.044)**	0.071 (0.045)	0.087 (0.044)**	0.081 (0.047)*
Has R lived in her current home for 6-9 years?	0.176 (0.059)**	0.115 (0.057)**	0.077 (0.055)	0.104 (0.058)*
Has R lived in her current home for 10+ years?	0.096 (0.047)**	0.102 (0.050)**	0.050 (0.046)	0.094 (0.052)*
Turnout in 1996 elections	0.095 (0.032)**	0.167 (0.036)**	0.130 (0.031)**	0.146 (0.037)**
Controls	Yes	Yes	Yes	Yes
No. obs.	1264	1268	1254	1273
Pseudo R2	0.15	0.11	0.12	0.16
Observed P	0.30	0.46	0.29	0.45
Predicted P	0.27	0.46	0.26	0.44

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level.

Marginal probit coefficients are calculated at the means.

In parentheses are standard errors corrected for heteroskedasticity.

Controls mean all the regressors in Table 2 and state fixed effects.

Table 4. Sensitivity Analysis

	Some att. to campaign (full sample)	Reading about campaign (readers only)	Strong att. to camp. (full sample)	Strong att. to camp. (full sample)
Has R lived in her current home for 2-5 years?	-0.057 (0.036)	0.084 (0.051)*	0.092 (0.044)**	0.086 (0.043)**
Has R lived in her current home for 6-9 years?	-0.038 (0.046)	0.117 (0.061)*	0.176 (0.059)***	0.170 (0.059)***
Has R lived in her current home for 10+ years?	-0.004 (0.039)	0.053 (0.057)	0.096 (0.047)**	0.089 (0.046)*
Turnout in 1996 elections	0.237 (0.034)***	0.131 (0.048)	0.095 (0.032)***	
Controls	Yes	Yes	Yes	Yes
No. obs.	1263	955	1264	1274
Pseudo R2	0.15	0.15	0.15	0.14
Observed P	0.78	0.60	0.30	0.30
Predicted P	0.82	0.62	0.27	0.27

* denotes significance at the 10 percent level. ** at the 5 percent level. *** at the 1 percent level.

Marginal probit coefficients are calculated at the means.

In parentheses are standard errors corrected for heteroskedasticity.

Controls mean all the regressors in Table 2 and state fixed effects.

Table 5. Length of residence in the community and rural-urban differences

	Strong att. to camp. (full sample)	Strong att. to camp. (rural citizens only)	Following a TV debate in full (full sample)	Following a TV debate in full (rural citizens only)
Has R lived in the community for 2-5 years?	0.063 (0.064)	0.262 (0.157)*	0.033 (0.061)	0.248 (0.127)**
Has R lived in the community for 6-9 years?	0.102 (0.075)	0.363 (0.191)**	0.041 (0.068)	0.299 (0.151)**
Has R lived in the community for 10+ years?	0.090 (0.052)*	0.157 (0.092)	0.021 (0.052)	0.153 (0.086)*
Controls	Yes	Yes	Yes	Yes
No. obs.	1264	357	1254	367
Pseudo R2	0.14	0.21	0.12	0.15
Observed P	0.30	0.25	0.29	0.28
Predicted P	0.27	0.20	0.27	0.24

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level.

Marginal probit coefficients are calculated at the means.

In parentheses are standard errors corrected for heteroskedasticity.

Controls mean all the regressors in Table 2, state fixed effects, and turnout in 1996.

Table 6. Confronting with the pivotal voter model

	Strong att. to campaign	Following a TV debate in full
Campaign visits to the state	-0.004 (0.007)	0.002 (0.007)
State population (in millions)	-0.001 (0.001)	0.003 (0.001)**
Has R lived in her current home for 2-5 years?	0.090 (0.043)**	0.091 (0.042)**
Has R lived in her current home for 6-9 years?	0.148 (0.057)***	0.066 (0.053)
Has R lived in her current home for 10+ years?	0.081 (0.044)*	0.040 (0.043)
Controls	Yes	Yes
State fixed effects	No	No
No. obs.	1279	1274
Pseudo R2	0.12	0.10
Observed P	0.30	0.29
Predicted P	0.27	0.27

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level.

Marginal probit coefficients are calculated at the means.

In parentheses are standard errors corrected for heteroskedasticity.

Controls mean all the regressors in Table 2 and turnout 1996.

Table 7. Registration requirement

	Strong attention to campaign (voting-day, no reg., or short deadline)	Strong attention to campaign (regular registration states)
Has R lived in her current home for 2-5 years?	0.169 (0.087)**	0.059 (0.050)
Has R lived in her current home for 6-9 years?	0.272 (0.106)***	0.134 (0.071)**
Has R lived in her current home for 10+ years?	0.153 (0.085)*	0.073 (0.056)
Controls	Yes	Yes
No. obs.	395	869
Pseudo R2	0.15	0.17
Observed P	0.32	0.30
Predicted P	0.28	0.26

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level.

Marginal probit coefficients are calculated at the means.

Standard errors are corrected for heteroskedasticity.

Controls mean all the regressors in Table 2, state fixed effects, and turnout in 1996 elections.

Table 8. The list of countries

Australia	Germany	Peru
Austria	Greece	Philippines
Belgium	Guatemala	Portugal
Bolivia	Honduras	Spain
Botswana	India	Sri Lanka
Brazil	Ireland	Sweden
Canada	Israel	Switzerland
Chile	Italy	Thailand
Colombia	Japan	Trinidad&Tobago
Costa Rica	Luxembourg	Turkey
Denmark	Malaysia	USA
Dominican Republic	Mauritius	UK
Ecuador	Mexico	Venezuela
El Salvador	Netherlands	
Fiji	New Zeland	
Finland	Nicaragua	
France	Norway	
Gambia	Paraguay	

Table 9. Summary Statistics

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
corr_CPI	44	4.206	2.534	0.268	8.250
corr_K1	49	3.768	1.766	0.940	7.200
corr_K2	49	3.738	2.011	0.742	6.917
turnout	49	75.361	11.906	44.100	95.100
edu	49	91.991	15.529	48.150	117.114
comp	49	0.490	0.505	0	1
gini	49	40.176	8.999	25.500	58.690
pres	49	0.408	0.497	0	1
pind	49	0.393	0.456	0	1
magn	49	0.406	0.364	0.007	1
federal	49	0.224	0.422	0	1
trade	49	70.839	36.854	17.562	188.989
avell	49	0.244	0.232	0.003	0.800
prot80	49	15.882	26.254	0	97.800
catho80	49	52.594	40.988	0.100	96.900
confu	49	0.061	0.242	0	1
polityIV	49	8.356	2.341	0.222	10
ipop	49	2.546	1.584	-0.908	6.812
lyp	49	8.710	0.896	6.638	9.942
legor_uk	49	0.306	0.466	0	1
legor_fr	49	0.531	0.504	0	1
legor_gc	49	0.082	0.277	0	1

Table 10
 Estimation Results (Instrumental Variables)

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	Turnout	Corr_CPI	Turnout	Corr_K1	Corr_K2
Edu	0.478 (0.203)**		0.564 (0.189)***		
Comp	7.581 (3.875)*		6.601 (3.730)*		
Turnout		-0.071 (0.030)**		-0.056 (0.021)***	-0.048 (0.021)**
Gini		0.032 (0.035)		0.031 (0.025)	0.033 (0.026)
Partial R ²	0.29		0.29		
Hansen J-stat.		0.575		0.206	0.056
P-value		0.45		0.65	0.81
Observations	44	44	49	49	49
Adj. R-squared	0.32	0.85	0.27	0.84	0.77

Note: Robust standard errors in parentheses; *** significant at 1%, ** significant at 5%, * significant at 10%.
 Partial R² reports how much variation in Turnout the two instruments explain jointly. Hansen J-stat.: the test of over-identifying restrictions, distributed like Chi² with 1 degree of freedom (critical value at 5% confidence is 3.84)

Table 11. Comparing Turnout across Voter Groups

	<i>Mean</i>	<i>Stan.Dev.</i>
Turnout among all voters	85%	11%
Turnout among ideological voters	91%	7%
Turnout among neutral voters	79%	15%

Table 12. Summary Statistics and Correlations

Section I. Summary Statistics

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Total taxes (per capita, in 1982 dollars)	738	184	292	1379
Income taxes	255	157	0	705
Income taxes as a fraction of total	0,32	0,17	0	0,79
Total transfers	1830	359	993	3082
Family asst. + Worker comp. + Unempl. ins.	122	66	29	408
FWU as a fraction of total transfers	0,07	0,03	0,01	0,23
Median (real) household income (in 1000 \$)	41	7	26	62
Ideol. neutrality of the poor 1/3 of voters	1,19	0,41	0	3
Ideol. neutrality of the rich 1/3 of voters	1,18	0,37	0	3
Citizen liberalism score (COPE)	54	14	19	97
State has tax and expenditure limitations	0,46	0,50	0	1
State allows citizen initiatives	0,47	0,50	0	1
State has a supermajority requirement	0,19	0,39	0	1

Section II. Correlations

	Median income	Neutrality of poor	Neutrality of rich	Citizen liberalism
Median income	1			
Neutrality of poor	-0.03	1		
Neutrality of rich	0.10*	0.09*	1	
Citizen liberalism	0.37*	0.04	0.04	1

* denotes the significance at 5% level

Table 13. Determinants of tax policies

	Total taxes	Income taxes	Income t. / total
Median income	-0.002 (0.003)	0.002 (0.003)	0.0006 (0.0004)
Neutrality of poor	-12.32 (20.92)	2.45 (22.13)	-0.06 (2.76)
Neutrality of rich	-92.6 (24.2)***	-73.0 (25.6)***	-9.1 (3.2)***
Citizen liberalism	6.9 (0.7)***	5.5 (0.8)***	0.5 (0.1)***
Controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. obs.	308	308	308
R squared	0.53	0.27	0.16

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level. Standard errors in parentheses.

Controls are: state population and population squared, fraction of aged citizens in the population, fraction of population aged 5-17, real income per capita, and the institutional variables (tax and expenditure limitations, citizen initiatives, and the supermajority requirement).

Table 14. Determinants of expenditure policies

	Total transfers	Targeted transfers	Targeted t. / total
Median income	-11.2 (3.4)***	0.001 (0.001)	0.12 (0.06)*
Neutrality of poor	49.2 (21.9)**	17.7 (8.2)**	0.78 (0.40)*
Neutrality of rich	7.52 (25.27)	-7.82 (9.43)	-0.41 (0.46)
Citizen liberalism	10.0 (0.8)***	2.5 (0.3)***	0.10 (0.01)***
Controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. obs.	308	308	308
R squared	0.60	0.39	0.45

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level.

Standard errors in parentheses.

Controls are: state population and population squared, fraction of aged citizens in the population.

fraction of population aged 5-17, real income per capita, and the institutional variables

(tax and expenditure limitations, citizen initiatives, and the supermajority requirement).

Table 15. Time-average determinants of economic policies

	Total taxes	Total transfers
Median income	0.006 (0.011)	-0.0028 (0.001)***
Neutrality of poor	60.27 (56.80)	5.87 (5.05)
Neutrality of rich	-152.57 (77.99)*	-2.63 (6.93)
Citizen liberalism	8.38 (2.40)***	1.31 (0.21)***
Controls	Yes	Yes
No. obs.	43	43
R squared	0.36	0.81

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level. Standard errors in parentheses.

Controls are: state population and population squared, fraction of aged citizens in the population, fraction of population aged 5-17, real income per capita, and the institutional variables (tax and expenditure limitations, citizen initiatives, and the supermajority requirement).

Table 16. Taxes and transfers as a percentage of state income

	Total taxes	Total transfers
Median income	-0.00005 (0.00001)***	-0.000028 (0.000017)***
Neutrality of poor	-0.14 (0.15)	0.00025 (0.0002)
Neutrality of rich	-0.78 (0.18)***	-0.00029 (0.00023)
Citizen liberalism	0.05 (0.01)***	0.000084 (0.000069)***
Controls	Yes	Yes
Year fixed effects	Yes	Yes
No. obs.	308	308
R squared	0.33	0.73

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level.

Standard errors in parentheses.

Controls are: state population and population squared, fraction of aged citizens in the population,

fraction of population aged 5-17, and the institutional variables

(tax and expenditure limitations, citizen initiatives, and the supermajority requirement).

Table 17. Controlling for unobserved state heterogeneity

	Total taxes	Total transfers
Median income	-0.005 (0.001)***	-0.0005 (0.0002)**
Neutrality of poor	-2.11 (7.43)	2.10 (1.11)*
Neutrality of rich	-9.39 (8.40)	3.33 (1.26)***
Citizen liberalism	-0.20 (0.53)	-0.16 (0.08)**
Controls	Yes	Yes
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
No. obs.	308	308
R squared	0.22	0.23

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level. Standard errors in parentheses.

Controls are: state population and population squared, fraction of aged citizens in the population, state income per capita, and the fraction of population aged 5-17

Table 18. Estimation with the Arellano-Bond estimator

	Total taxes	Total transfers
y(-1)	0.16 (0.08)**	0.78 (0.07)***
y(-2)	-0.07 (0.09)	-0.26 (0.15)*
Median income	-0.0007 (0.002)	-0.00001 (0.000003)***
Neutrality of poor	10.77 (11.03)	-0.004 (0.007)
Neutrality of rich	1.39 (10.84)	0.005 (0.007)
Citizen liberalism	0.06 (0.44)	-0.0005 (0.0005)
Controls	Yes	Yes
Year fixed effects	Yes	Yes
No. obs.	242	242

* denotes significance at the 10 percent level, ** at the 5 percent level, *** at the 1 percent level.

Robust standard errors in parentheses.

Controls are: state population and population squared, fraction of aged citizens in the population, state income per capita, and the fraction of population aged 5-17