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Chapter 4

Information and Economic Voting¹

4.1 Introduction

During the 1992 U.S. presidential campaign, one of the key arguments by the Clinton campaign was that President George H. W. Bush had not handled the economy well. To that end, Clinton campaign strategist James Carville used a white board in the campaign headquarters to remind staffers to stay on message. The list read:

1. Change vs. more of the same
2. The economy, stupid
3. Don't forget health care

While economic conditions had surely mattered in previous elections, it was Carville's catch phrase that has inspired bumper stickers, political cartoons, and commentary over the past two decades and is likely to do so for many years to come. Of course, in any particular election, especially at the national level, there is a multitude of salient issues. Yet, whether there is a war or domestic social movement, whether the electorate is polarized or unified, the state of the economy is always a pertinent campaign issue to at least one of the major parties. However, while the idea that the economy matters now borders on conventional wisdom, the definitions of 'the economy' used both in popular and academic literature vary widely.

Following the "Responsibility Hypothesis" (e.g. Lewis-Beck & Paldam 2000), it is understood in the literature that voters hold the government responsible for 'the economy'. Two common interpretations tend to dominate the discussion. First are national economic conditions, namely whether the country is in a state of recession or expansion, with voters traditionally looking upon the former with disfavor. While any given leader can only have limited influence over growth or decline, responsibility for such conditions

¹This chapter is based on joint work with Jon Rogers (Florida State University).

is often attributed to officials, particularly presidents and/or prime ministers. The second common interpretation of ‘the economy’ is that voters reward or punish leaders for personal financial circumstances. The choices of politicians rarely result in the direct gain or loss of employment for an individual, but it would not be a stretch to categorize the unemployed as frustrated and to speculate that such frustration would be directed at elected officials.

Still, there are many other potential economic issues to be considered. For one, economic conditions are not uniformly distributed across geographic areas. Regional or local declines could have a similar effect as a national recession. As an example, while much of the United States experienced relatively strong growth during the 1990’s and early 2000’s, the economies of the traditional steel and manufacturing regions of the Midwest (including cities like Detroit and Cleveland) declined along with their industries. Thus, while voters in much of the U.S. may have been pleased with economic conditions during the 1996 presidential campaign, those in regions directly harmed by expanded free trade policies may have been far less so. For these voters, local economic conditions may have outweighed national level interests.

Economic voting has received much academic consideration as well, and while a formal literature review is left for the next section, suffice it to say that there is no consensus on the extent to and level at which the economy matters in vote choice. While the topic has been frequently studied, observational studies are limited in their explanatory power, due to the complexity of national level campaigns. The solution we offer is to take the question into the laboratory. To this end, we offer what we believe to be the first laboratory experiment to investigate what level of economic information voters seek and how that information translates into vote choice. Our experimental data provide evidence that even where egotropic (self-interested) motives prevail, non-trivial levels of sociotropic behavior persist. The evidence also points out that voters seek mostly national level information and once the complexity of their environment increases, they seek less information and rely on simpler strategies. The data indicate that, relatively, richer voters react more to national level indicators while poorer voters react more to the community level. Finally, we observe voters voicing more ‘extreme’ social preferences in approval than in voting rounds.

After the literature review in the next section, we develop a theoretical background on the connection between economic voting and information search (section 4.3). Section 4.4 presents the experimental design, which is followed by a set of predictions (section 4.5) to be tested. Sections 4.6 and 4.7 present and then discuss the results of our experiment on economic voting.

4.2 Literature

In the long and storied study of voting, economic voting has taken on several different meanings. These include pocketbook (egotropic) voting and sociotropic; each can occur in either a retrospective or prospective manner.

Egotropic voting refers to a voter's own economic experience while sociotropic voting refers to the rewarding or punishing of politicians based on the performance of the macro economy (Nannestad & Paldam 1994). From the perspective of egotropic voting, voters attribute improvements in personal finances (Fiorina 1978), loss of employment (or inability to find a job) (Grafstein 2005), or outstanding debt problems to the current administration. As may seem obvious, improved conditions are associated with greater levels of support for leaders. At the opposite end of the spectrum, a sociotropic voting perspective would argue that voters prefer politicians under whose leadership the nation enjoys higher rates of economic growth (Lewis-Beck & Rice 1984, Lewis-Beck & Tien 1996), lower rates of inflation (Norpoth 1996), lower consumer prices (Arcelus & Meltzer 1975, Lepper 1974), or an otherwise stronger economy according to leading economic indicators (Wlezien & Erikson 1996). Kinder & Kiewiet (1979) further argue that voters may have preconceptions as to which party is better suited to handle national economic problems. Whatever the problems in question may be, the argument is sociotropic in nature.

As pointed out by Nannestad & Paldam (1994), the voting-popularity function literature also struggles with the egotropic vs. sociotropic debate in its goal to build micro foundations. The macro voting-popularity function is an aggregation of the micro voting-popularity functions. Aggregating the micro functions into the macro under an assumption of egotropic voting requires a different process than under sociotropic voting. As the authors explain, assuming egotropic voting, this aggregation should be done in the same way as macro aggregations are done from individual variables. However, under sociotropic voting, this aggregation requires an extra layer of averaging, namely the perception of each individual about the macro economy. The voting-popularity function usually takes two main variables, one reflecting unemployment and another reflecting growth/inflation. Nannestad & Paldam (1994) highlight that whereas the individual experience of growth/inflation should be very similar to the macro experience, since these variables are *per se* an average, the individual experience of unemployment is certainly not. Thus the assumption of egotropic or sociotropic voting would lead to different versions of the macro voting-popularity function. The authors also highlight how this interacts with the retrospective (past experiences) or prospective (expectations) assumptions. While the previous distinction is clear under retrospective voting, in prospective voting past experience can only enter as an indication of the future, and thus the distinction between an egotropic or sociotropic aggregation becomes less clear and more complex.

It is also not clear how voters perceive the national economic conditions. Duch, Palmer & Anderson (2000) argue that perceptions of the national economy are conditioned by local conditions, personal finances, political attitudes, and demographics. That is, voters believe that they are voting sociotropically, but have a biased perception of the true state of the macro economy. As such, there is really a mix of both sociotropic and egotropic voting and one can not truly be isolated from the other. Hetherington (1996) finds that negative media coverage influenced voters' retrospective assessment of the macro economy prior to the 1992 election.

Even accepting an understanding of what is meant by 'the economy', there is no consensus about how it will affect a voter's choice. For example, some see an asymmetry between the opposition and those in power. Duch & Stevenson (2011) find, among other things, that opposition groups can successfully hurt public perception of economic conditions, but the incumbent cannot do the opposite. Bloom & Price (1975) argue that congressional members of the president's party are punished during economic bad times, but not rewarded during good times. Further, there is disagreement as to whether voters are rewarding presidents for past behavior or attempting to forecast future economic conditions. As MacKuen, Erikson & Stimson (1992) termed it, are voters 'peasants,' voting retrospectively or 'bankers' voting prospectively? These authors find that the electorate votes as if anticipating future economic events and raises or lowers its approval preemptively. Swank (1990) points out that bad economic conditions can turn out to be good for leaders if voters perceive them as more capable of handling the problems than the the opponents.

In a sophisticated treatment of economic voting, Gomez and Wilson (2001, 2007) assert a theory of heterogeneous attribution. In their theory, low sophisticates assume that the national economy is under the control of the president. They attribute both good and bad economic conditions to the performance of the president and reward/punish accordingly. Thus low sophisticates vote sociotropically. High sophisticates, in contrast, understand that the economy is incredibly complex and that there is little connection between the president's actions and the national economy. These high sophisticates do however, recognize connections between policies set by the national government and personal economic circumstances. Thus high sophisticates are more likely to vote egotropically.

While the economic voting literature has generally considered sociotropic and egotropic motives, there is an additional possibility, often addressed in the legislative politics literature. This is a preference for pork barrel (or redistributive) policies (Lowi 1964). Traditionally, electorally motivated legislators responsible to a particular district are argued to engage in credit claiming (Mayhew 1974) in order to reap the rewards of 'bringing home the bacon.' Yet, there may be reason to believe that the executive, not just local representative, receives credit or blame for local conditions. It has been shown that citizens have certain expectations as to a federal government response to natural disasters

(Chamlee-Wright 2010) and blame for a lack of short or long term (local) economic recovery may be attributed to the president, rather than only to the relevant legislator(s). For example, as mentioned earlier, the manufacturing areas of the Midwestern United States suffered higher unemployment after the ratification of the North American Free Trade Agreement (NAFTA) than other U.S. regions. As this is likely to have reduced approval rates among those who lost their jobs, this may also have affected the opinions of those who saw colleagues, friends, and neighbors harmed by the policy. Thus a degree of empathy, in-group solidarity, or preferences for community strength may result in a level of economic voting that is neither egotropic nor sociotropic, but ‘communitropic’.

Though the question of the influence of economic conditions on vote choice has received much attention, little has been resolved. It is now generally considered to be common knowledge that the economy matters, but no consensus exists regarding what level of information (personal, community, or national) is most relevant, if there is heterogeneity in type of economic voting across various circumstances, and whether any such voting is occurring retrospectively or prospectively. While these are all important questions, a complete coverage is beyond the scope of this chapter. We will focus on one particular issue, i.e., the question of what level of information is most relevant.

Part of the trouble in the literature may be that all previous studies have been conducted using observational data. While the endeavor to study behavior in actual elections is laudable, campaigns are long, complex, and revolve around myriad issues. The economy is only one of many (allegedly) salient campaign issues. Further, there are many potential indicators of economic conditions at each level: employment, income, inflation, GDP, inequality, debt, and so forth. A finding or non-finding may be entirely contingent upon which measure is employed in the analysis and at what point in the campaign.

As a further complication, any claim of economic voting at the various levels assumes that voters are aware of the state of the economy. The key distinction here is that voters must be aware of the true state and vote accordingly, rather than based on biased perceptions of economic conditions. Duch, Palmer & Anderson (2000) find that perceptions of the state of the national economy are conditioned by a number of factors, including political attitudes. One could argue that voters with such biased attitudes are not attempting to reward or punish incumbents for economic performance, but rather have already decided upon a vote choice and are attempting to justify their preference. In this sense, it is difficult to gage the actual effect of the economy.

Due to the complexities of modern presidential campaigns which almost certainly lead to omitted variable bias in observational studies, it is useful to turn to laboratory experimentation in order to isolate a society from all considerations except those of economic conditions at the various levels. This is the contribution made in the present chapter. In a setting without parties, personalities, scandals, or social, foreign, and defense policies, it is possible to directly examine what level of economic information is relevant in vote

choice. Indeed only in the laboratory, where all else is controlled, is it possible to have confidence in causation.

It is also important to take account of the information voters actively seek in the course of elections. Lau & Redlawsk (2006), in their use of dynamic information boards, took an important step towards helping us understand information processing during political campaigns. While these experiments were carried out with hypothetical candidates and non-incentivized subjects, they do show subjects choosing what information they wish to view. Nevertheless, economic policies were only a small subset of the potentially salient issues in determining vote choice. In order to test theories of economic voting in as clean an environment as possible, further isolation is required.

4.3 Economic Voting and Information Search

Assuming, for a moment, that the economy truly does matter in determining vote choice, what level of information is relevant and what causes a voter to seek information at one level as opposed to another? That is, once all social and political considerations are controlled for and only economic factors remain, what causes economic conditions at the personal, community, or national level to become most salient in approval decisions and vote choice? To gain purchase on economic voting, we must understand how the actions of politicians affect the economy.

While in the voting-popularity function literature (for a review see, e.g., Nannestad & Paldam 1994), unemployment, along with growth and inflation are the most important economic variables, in a more basic model, politicians choose two things that directly affect these variable as well as other economic conditions: tax rates and redistributive policies. Taxes directly remove income from all voters and redistributive policies (e.g. welfare programs, public works, and pork barrel programs) directly benefit a subset of voters. Effectively, politicians are choosing how much to tax society and to whom tax revenues should be reallocated.

Voters, on the other hand, are not homogeneous. Some possess greater financial resources than others. Typically, voter income is not distributed uniformly within or between communities. Some areas have a high concentration of poor voters and only a few rich voters. Others have a more even distribution, while relatively few have a high concentration of rich voters, with few poor voters. Voters in these different areas may prefer distinct policies.

We first consider egotropic considerations, i.e., voters that care only about their own direct economic welfare. In order to evaluate a politician's performance at this level, the voter needs only to know her net benefits from the policies (how much better or worse off she is, after taxation and redistribution). For example, although typically poor (rich) voters tend to support higher (lower) taxes, under purely personal considerations, it does

not matter to a voter if a change in welfare comes primarily from changes in taxation or redistribution, nor the effects of these policy changes on other voters and/or communities in the nation.

Moving to the community level, beyond personal considerations, some voters may prefer policies that provide the greatest net benefit to members of their community, even if they personally do not receive the greatest possible benefits. For example, a single wealthy voter in a predominantly low income community may tolerate higher taxes, knowing that her neighbors will benefit or that the community will otherwise improve. As an example, while a rich voter might not use public transit, she might want the government to provide it, to the benefit of her many neighbors who would. She could not and would not provide public transit by herself, but she accepts higher taxes because everyone pays them and her own contribution to the public good is a relatively small portion of the total. Such pro-social preferences may induce voters to vote in a manner contrary to their personal incentives, to the benefit of their neighbors. This ‘communitropic’ voting would require knowledge of how much better or worse off a set of policies makes the average member of the community. At this level however, the pro-social behavior does not extend beyond the own community. A purely communitropic voter cares only about the welfare of her own community, not directly for her own or for the welfare of the nation.

At the ‘highest’ level is the potential for sociotropic voting, where voters care not about their personal conditions or those of neighbors, but rather about what is best for the country as a whole. Such voters believe that their community is just one of many and that the welfare of the country is more important than what matters to a particular community or individual. Certain policies tend to be associated with stronger economic growth, which is good for all. While such policies may not be the best for a particular individual or community, they are good for the country as a whole and do the greatest good for the greatest number of people. In this sense, the sociotropic voter would need to know how much better or worse off the average voter is made by a set of policies.

It is one thing to say that egotropic, communitropic, and sociotropic voting reflect the behavior of latent classes of voter. However, what induces such behavior and where might we see voters seeking certain types of information? If all voters were equally wealthy, then all would be equally affected by taxes. Assuming that politicians can target only communities and not individual voters, this would make egotropic and communitropic voting equivalent and almost impossible to differentiate. However, society is not homogeneous. All communities, no matter how similar neighbors are to one another, have some degree of heterogeneity. There is also a significant degree of heterogeneity between communities. This inter- and intra-community heterogeneity may explain preferences across the various levels and therefore also the degree and type of information search.

As the income distribution within a community becomes more heterogeneous, an individual voter’s personal financial circumstances tell her less and less about the conditions

faced by her neighbors. In the purely homogeneous case, if she is pleased with her finances, then she could assume that her compatriots are equally well off. Notwithstanding, where there is a greater degree of dispersion, voters would need a greater amount of information if they are to assess how well or badly off neighbors are made by a set of policies.

In a similar respect, where communities are precisely equal to one another, economic conditions in one community are informative about conditions in other communities, but not in the same way as with intra-community homogeneity. If government policies are having a negative effect in one community, but a positive effect overall, then they are benefiting some other set of communities. Where there is some degree of inter-community heterogeneity, voters would need to seek much information in order to make this sort of assessment. However, in a very complex environment, attaining and processing such information would be quite difficult, suggesting that a voter might instead revert to a more simple strategy. Since the simplest strategy is based on the most convenient information (personal circumstances), high degrees of heterogeneity might lead to greater levels of egotropic voting or simply uninformed voting. In the end, whether this occurs is an empirical question that we aim at clarifying on further sections of this chapter.

This raises, however, another interesting point. There is a meaningful difference between uninformed voting and informed egotropic voting. Some voters will only care about the end result of government policies. Are they net beneficiaries of the policies or not? They do not need to know what exactly the government is doing to know whether or not they are happy about their personal conditions. On the other hand, informed egotropic voters care not only about their net benefits or losses, but also about their potential benefits or losses. Such voters need a great deal of information, not only about national policies, but also about how the government is treating other communities. Even if a voter is a net beneficiary of a set of policies, she might receive fewer benefits than members of other communities, and become jealous. The welfare of other communities might become a point of reference against which to compare her own welfare.

For some voters, engaging in zero information search may be rational. Those unlikely to benefit from any set of policies have less incentive to expend time and effort seeking information. But with observational studies, there is no way to determine with any degree of certainty how well informed any individual is about economic conditions, how much information was sought, and what information was attained freely (i.e., information attained through every day life, like whether or not one has a job). Surveys, which generally seek to study many political concepts, are logically limited in the number of questions that can be asked. For that reason, it is useful to seek the control offered by a laboratory environment, the design of which we explain in the following section. We then combine the theoretical considerations discussed here with the experimental design and present specific predictions.

4.4 Experimental Design

The experimental design creates a stylized democratic society, capturing the essential elements introduced in the previous sections. It consists of 3 communities of 5 voters each and 2 politicians. Voters are randomly assigned to a community and endowment, with both remaining fixed throughout the experiment. Endowments can be low (100 ECUs) or high (500 ECUs). This composition allows for enough variation within and between communities allowing us to verify the impact of income distribution on the search patterns for information. Initially, one of the politicians is randomly selected to be in office and the other is assigned to be a candidate seeking to replace the incumbent. The incumbent receives a fixed salary of 500 ECUs while the candidate receives a salary of 100 ECUs. Experimental points are converted at the rate of 500 ECUs per US\$.

The incumbent's initial task is to select a tax rate. Due to the public good nature of government expenditure there is an efficiency gain, g . However, due to other aspects such as deadweight losses and government inefficiencies there is also an efficiency loss, l . Specifically, tax revenues are given by $TaxRevenue = (w * t) * [(1 + g) - t * l]$, where w is the nation's aggregate endowment (i.e., tax base) and t the tax rate. Tax revenues are thus generated following a format similar to a Laffer Curve. In the experimental design g is set to 0.40, implying a 40% efficiency gain over the collected taxes, and l is set to 1, implying an inefficiency effect that increases in proportion to the increase in the tax rate. Table 4.1 illustrate the tax revenue functions for the various treatments, to be described in the following subsection. Note that at 20% the net welfare is maximized and at 40% it breaks even. At 70% the politician maximizes the tax revenue under her control.

The incumbent must then divide the tax revenue among the 3 communities. Within each community, the amount provided is shared equally among its members. The incumbent's plan is (partially) seen and implemented.

The candidate's task is to simultaneously present a hypothetical alternative plan: a tax rate and a division proposal. This hypothetical plan is (partially) seen but not implemented.

Every third period, there is an election decided by majority vote. The newly elected politician comes into office and the losing one becomes the candidate. In the periods without election there is an approval survey on the job performance of the incumbent. Results are always publicly announced. There are sixteen periods, with the exact number of periods not announced, in order to avoid end-game effects.

The different levels of economic information that could influence voting behavior are the individual, the community and the national levels. Understanding which information voters look for in order to support their voting and approval decision is the main goal of this chapter. In order to directly observe which levels are relevant for a given subject, information is provided in a costly way. This choice is motivated by the following

Table 4.1: Impact of Tax Rates Across Treatments

Tax Rate	Tax Burden	Tax Revenue	Difference
0%	0	0	0
10%	390	507	117
20%	780	936	156
30%	1170	1287	117
40%	1560	1560	0
50%	1950	1755	-195
60%	2340	1872	-468
70%	2730	1911	-819
80%	3120	1872	-1248
90%	3510	1755	-1755
100%	3900	1560	-2340

(a) Treatments: *Baseline, Clustered, and Heterogeneous*

Tax Rate	Tax Burden	Tax Revenue	Difference
0%	0	0	0
10%	270	351	81
20%	540	648	108
30%	810	891	81
40%	1080	1080	0
50%	1350	1215	-135
60%	1620	1296	-324
70%	1890	1323	-567
80%	2160	1296	-864
90%	2430	1215	-1215
100%	2700	1080	-1620

(b) Treatment: *Poor*

Notes. Tables show the tax rates and how they relate to values of Tax Burden and Revenue in the different treatments (cf. section 4.4.1). The fourth column shows the difference between burden and revenue, where positive values reflect a net benefit to society. Bold highlights the optimal level (20%), the break-even level (40%) and the maximum revenue level (70%).

factors. First, it provides a direct mechanism to experimentally observe the information requested by subjects. Second, the politicians policies are likely to be functions of the information provided to voters. By providing voters with the same available information across treatments, we avoid confounding effects of (free) information with different policies and (initial) economic conditions. Finally, since demand for information has been shown to have a discontinuity at zero (see, e.g., Schram & Sonnemans 2011), subjects face a small but positive cost, set to 2 ECUs per item. We believe this induces a more careful consideration of the pieces of information, allowing us to better understand their search patterns.

Voters are always informed about their endowment and final payoff. They are also informed about the initial economic conditions of each community and whole nation. They can, additionally purchase information about the tax rate and on the welfare change of their own community, other communities and the whole nation. Voters can see the same information (including purchased information) for both politicians. That means, if a voter purchases a piece of information, she will have access to that piece of information about both politicians. Politicians are also informed about initial economic conditions. Additionally, they are informed about average welfare change caused by their policy for the low and high endowed voters in each community separately and for the average voter in a given community and nation. They can also see the past policy decisions of the other politician.

A full copy of the instructions can be found in Appendix 4.A. After reading the instructions, understanding of the experimental environment, as described in the previous paragraphs, was ensured by requiring subjects to take a quiz. Incorrect answers were met by an automatic prompt, informing the subject of the error. After the experiment was over and before receiving their payment, subjects were asked to provide an answer to the question “Can you describe how you made your decisions and/or used the information provided?”.

All experimental sessions were run between November 2010 and February 2011 in the Experimental Social Sciences Cluster (xs/fs) laboratory at Florida State University². For the sixteen sessions, a total of 272 subjects were recruited (17 per session) via the ORSEE (Greiner 2004) online recruiting system. All subjects who arrived on time, regardless of whether or not they were used, were paid a \$10 show up fee. Total per subject payments averaged \$18.07 and sessions typically lasted between 75 and 90 minutes. The experiment was programmed and conducted with the software z-Tree (Fischbacher 2007).

²Information about the laboratory and members of the cluster can be found at <http://www.xsfs.fsu.edu>

4.4.1 Treatments

Since the income distribution is expected to affect the demand for information (cf. section 4.3), the treatment variable is the income compositions of the three communities. Our baseline composition is the homogeneous income distribution in which each community contains 3 low endowed and 2 high endowed voters. We refer to this distribution as *baseline*: (3,2); (3,2); (3,2). This presents a total of 9 low endowed and 6 high endowed voters, and thus a total national endowment of 3900 ECUs.

In order to test the effect of the *intra*-community heterogeneity in the information decision while keeping the national distribution constant, we introduce the income distribution *clustered*: (1,4); (4,1); (4,1). This distribution differs from the baseline, however, also on the degree of *inter*-community heterogeneity. To disentangle these effects, we look additionally at the distribution *poor*: (4,1); (4,1); (4,1), which has the same degree of inter-community heterogeneity as the *baseline* (i.e., homogeneous) and the same degree of intra-community heterogeneity as *clustered*. This comes at the cost of changing the national endowment and national income distribution (now 12 low endowed and 3 high endowed voters, and thus a national endowment of 2700 ECUs).

In order to complete the picture a final income distribution is needed: *heterogeneous*: (2,3); (3,2); (4,1). This distribution has the same national endowment as *baseline*, with a higher degree of inter community heterogeneity.

Table 4.2 summarizes the design highlighting how the different distributions can be compared.

Table 4.2: Experimental Treatments

Distribution	National Distribution	Intra-Community Heterogeneity	Inter-Community Heterogeneity
<i>baseline</i> :	{(3, 2), (3, 2), (3, 2)}	9,6	base
<i>clustered</i> :	{(1, 4), (4, 1), (4, 1)}	9,6	increased
<i>poor</i> :	{(4, 1), (4, 1), (4, 1)}	12,3	base
<i>heterogeneous</i> :	{(2, 3), (3, 2), (4, 1)}	9,6	(3,2): base; (4,1): increased

4.5 Predictions

Based on the theories discussed in sections 4.2 and 4.3 and the experimental environment, it is possible to make predictions as to what will be observed in the laboratory. What we predict depends, however, on both the preferences of voters and on the beliefs of politicians regarding those preferences. Since the preferences of voters are what we seek to examine in this chapter, making clear predictions becomes difficult. So in an attempt

at clarity, we distinguish between two sets of predictions, one assuming that voters have selfish preferences, the other allowing for other-regarding preferences. The set assuming selfish preferences provides the null hypotheses while the alternatives are derived assuming other-regarding preferences.

4.5.1 Case 1: Pure self interest

First, assume that voters are purely self interested. That is, they care only about their personal net benefits/losses from the policies set by the incumbent. If that is the case, information purchase will be close to 0 in all treatments and across all types because voters know their own income without having to purchase information. Moreover, under pure self interest there should be no treatment effects in information purchase or voting and approval strategies. Thus, changes in the income distribution within and between communities should have no effect on information search and voters will vote and approve whichever politician gives them the highest net income. Additionally, if politicians know that voters are self-interested they will target two communities and try simply to maximize vote share without any distributional concerns, since these cannot possibly be known by uninformed voters.

This leads to a set of predictions, that will serve as null hypotheses for the tests to be conducted when analyzing the results.

P1: Politicians will chose the maximum tax revenue tax rate (70%).

P2: Politicians will target two communities.

P3: Information purchase will be 0.

P4: There will be no treatment effects, i.e., the information purchase level will be indistinguishable across treatments.

P5: Voters' support will not be influenced by community, national nor distributional concerns.

4.5.2 Case 2: Other-regarding preferences

To derive alternative predictions assume some degree of other-regarding preferences among voters. That is, voters care not only about their own personal welfare, but also about the welfare of neighbors and members of other communities. First of all, information purchase must be higher than in the case of purely self-interested voters because other-regarding voters need information about policies' welfare consequences for other voters. Therefore we predict significantly positive level of information purchase. How this increase takes place, however, depends on whether voters care about the whole nation and/or

about the community level. If voters have mainly national concerns we should expect no difference across treatments, with most of the information demand about national level indicators. If voters have specific community level concerns, more information is needed as income distribution heterogeneity increases. This follows from the fact that to better understand how the policies affect different communities, more information must be acquired. Finally, community and/or national concerns must also be reflected in voting and approval behavior, i.e., voters will support politicians that provide higher income for the nation and/or communities.

If politicians anticipate this voter behavior, they must also act differently than in the self-interested case. We assume here national and distributional concerns and predict behavior anticipating only own community level concerns to be somewhere in between these and behavior anticipating pure self interest. First of all tax rate will be set at or near the optimal tax rate of 20%, since this is where national welfare is maximized. Further, the tax revenue will be distributed in a relatively even manner across communities, with any particular community rarely bearing more than its fair share of the burden. That is, where communities begin as equal to one another, they will remain more or less equal after taxation and redistribution.

Following this reasoning, we present the following set of alternative predictions:

- P1_A**: Politicians will choose the ‘optimal’ tax rate (20%).
- P2_A**: Politicians will redistribute revenue proportionally in all treatments.
- P3_A**: Information purchase will be significantly higher than 0.
- P4_A**: Information purchase will increase as inequalities within and between communities increase. Specifically, information purchase will increase in the following order: *baseline, poor, clustered, heterogeneous*.
- P5_A**: Voters’ support will be influenced by community, national and distributional concerns.

4.6 Results

Since the focus of this chapter is the behavior of voters, the central analysis will focus on their choices. We start this section, however, by providing a description of the politicians’ behavior.

4.6.1 Politicians’ Behavior

Table 4.3 shows the average tax rate chosen by politicians while incumbent or candidates, by treatment and in total. As it illustrates, both incumbent and candidate select, on

average, a tax rate close to the optimal (20%). As for redistributive policies, figure 4.1 shows triplots of the percentage of the after tax national endowment given to each community. This shows that politicians structure tax returns such that they do not heavily modify the initial distributions. This is revealed by the clustering of points near the center of the triangle. Combined, this suggests that differences between the incumbent and candidate are more about specific values than about the structure of the policies. If politicians are electorally motivated (Mayhew 1974, Fenno 1978), then this behavior would be consistent with expecting voters to behave in line with other-regarding preferences as presented in the previous section. The data thus reject predictions P1 and P2 in favor of P1_A and P2_A, respectively³.

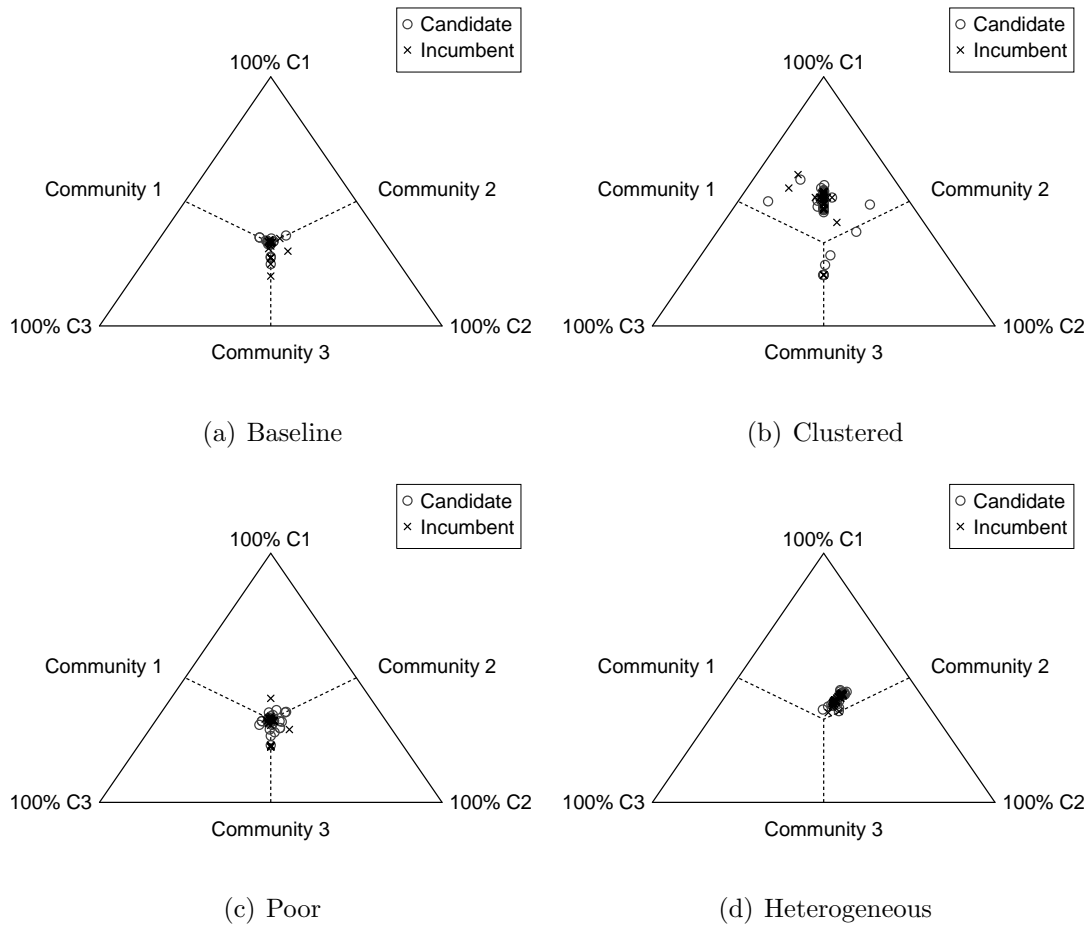
Table 4.3: Politicians' Average Choice

Treatment	Tax Rate
Baseline	
Incumbent	23.75
Candidate	21.72
Clustered	
Incumbent	27.19
Candidate	30.31
Poor	
Incumbent	24.38
Candidate	27.81
Heterogeneous	
Incumbent	22.97
Candidate	23.59
Total	
Incumbent	24.57
Candidate	25.86

Notes. The second column shows the average tax rate chosen by the Incumbent and Candidate. The average is across all rounds and groups within each treatment.

³Using average behavior per electorate, t-tests reject the null hypothesis that the tax rate is 70% both for the incumbent and candidate ($p \leq 0.01$, $N = 16$). Likewise, they can only marginally reject that the hypothesized value is 20% ($p = 0.0534$, $N = 16$ for the incumbent and $p = 0.0150$, $N = 16$ for the candidate). Regarding redistributive policies, the average standard deviation of the fractions for each community is 0.0645 (with a 95% CI of [0.0318; .0971]) for the incumbent and 0.0638 (with a 95% CI of [0.0309; 0.0967]) for the candidate. Notice that a policy in line with targeting (on the limit, 50% for a community, 50% for another and 0% for the remaining one), would result in a standard deviation of 0.2886

Figure 4.1: Politicians' After Policy Dispersion



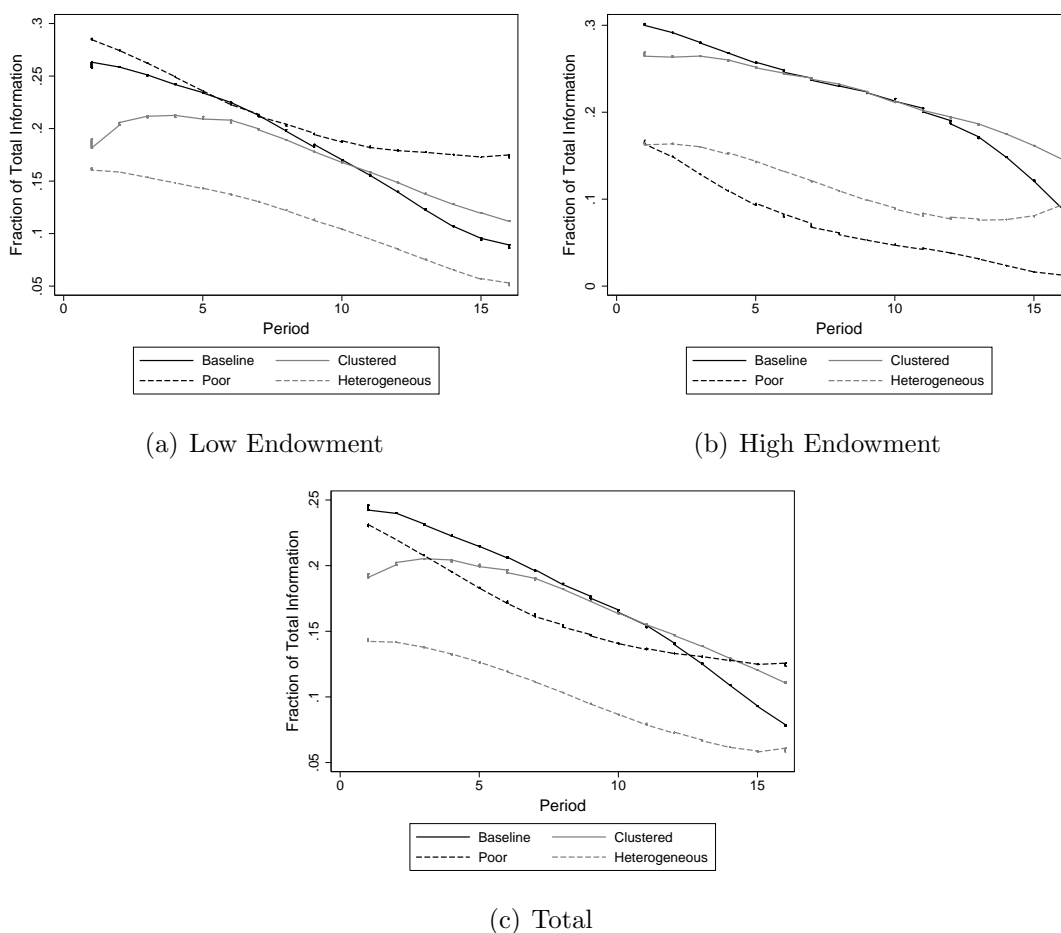
Notes. Triplots show the percentage of the after tax national endowment allocated by politicians (either incumbent or candidate) to each community. Each panel shows data from all rounds in a given treatment (cf. section 4.4.1). The triplot is an equilateral triangle in which the top, bottom right and bottom left corners indicate an allocation of 100% to communities 1, 2 and 3, respectively. The 'Y' in the center divides the triangle into regions in which two communities receive the same percentage, with the crossing of the 3 lines indicating an equal split (i.e., one-third to each community).

4.6.2 Voters' Behavior

In order to understand voters' behavior we consider two aspects of the experimental data. We start by looking at the information demand and then move into voting and approval behavior.

Figure 4.2 presents lowest curves of the proportion of information purchased over time for each treatment, in total and by endowment.

Figure 4.2: Total Information Demand



Notes. The figures show lowest curves of the proportion of information purchased over time. Panel (a) presents information purchase for low endowment voters, panel (b) presents the same for high endowment voters, and panel (c) shows information demand for all voters together.

Eyeballing figure 4.2 suggests that information demand is significantly positive, rejecting prediction P3 in favor of the alternative P3_A. This suggestion is indeed confirmed by a one-sided truncated t-test ($p \leq 0.001$, $N = 16$)⁴, for total (0.1718), low (0.1709) and high (0.1554) endowed voters, where the number in parentheses indicate the average proportion of information purchased in each group. This is in line with other-regarding

⁴This test uses average information purchase per electorate as independent observations.

preferences, and reveals some degree of sociotropic behavior. In order to test prediction P4 we compare across treatments. First, notice that among high endowment voters, average information purchase was lowest in the *poor* treatment, i.e., where there was only one high endowment voter in each community and in the *heterogeneous* treatment, where there was the greatest degree of complexity. Taken together, the high endowed voters demand for information in these two treatments is statistically lower than in joint *baseline* and *clustered* treatments ($p = 0.0457$, Rank-Sum Mann-Whitney test, $N = 16$). Moreover, information purchase was at the lowest in the *heterogeneous* treatment, for low endowed voters alone ($p = 0.0522$, Rank-Sum Mann-Whitney test, $N = 16$) and when low and high endowment voters are combined ($p = 0.0391$, Rank-Sum Mann-Whitney test, $N = 16$)⁵. Therefore, evidence is against P4, which predicts no differences across treatments. However it does not support P4_A either because this alternative predicts the highest level of information purchase for the *heterogeneous* treatment. What the evidence suggests is that the more complex environment induces a more simple strategy for all voters, with *less* information demand. A possible explanation is that in a most complex environment, obtaining and processing all information might be more difficult, leading to a point in which voters revert to a strategy that exploits mostly the most convenient and available information.

At a more disaggregate level, table 4.4 shows similar data per type of information, averaged across all periods and further broken down by high and low endowment voters. This shows that most of the information purchased is about the National level⁶, followed by Own Community. Overall, table 4.4 reinforces the patterns observed in Figure 4.2, with particular attention to be paid to the *poor* and *heterogeneous* treatments. In the *poor* treatment, high endowment voters almost never purchased information about other communities. The average demand for this piece of information is not only lower than for any other type of information, but it is also not statistically significantly greater than zero (one sided truncated t-test, $N = 4$, $p = 0.2125$). The *heterogeneous* treatment again follows the previously described pattern, however with the average purchase of information about other communities significantly greater than zero (one sided truncated t-test, $N = 4$, $p = 0.002$). With all voters combined, purchase of each type of information is lowest in the *heterogeneous* treatment.

⁵In these tests we use each electorate as an independent observation and test whether a sub-group of sessions/treatments were different from the remaining ones.

⁶The piece of information purchased most often is ‘Tax Rate’. If combined with information about the average voter on the nation (column 4 of table 4.4), it reaches an average of 0.31.

Table 4.4: Proportion of Information Purchased

	Own Community	Other Communities	Aggregate	Tax Rate
Baseline	0.24	0.15	0.18	0.27
Low Endowment	0.22	0.14	0.17	0.25
High Endowment	0.26	0.17	0.19	0.32
Clustered	0.21	0.15	0.17	0.30
Low Endowment	0.18	0.14	0.15	0.27
High Endowment	0.25	0.16	0.19	0.35
Poor	0.25	0.12	0.13	0.30
Low Endowment	0.29	0.14	0.15	0.32
High Endowment	0.05	0.02	0.04	0.21
Heterogeneous	0.13	0.06	0.11	0.20
Low Endowment	0.13	0.06	0.10	0.21
High Endowment	0.13	0.06	0.12	0.20
Total	0.21	0.12	0.14	0.27
Low Endowment	0.21	0.12	0.14	0.27
High Endowment	0.19	0.11	0.15	0.28

Notes. Cells show, for each type of information, the proportion of the available information purchased. For ‘Other Communities’ we aggregate the two communities to which the voter does not belong. ‘Aggregate’ refers to information about the average voter in the nation.

Moving next to voting and approval behavior, we can examine the effect of economic conditions at the various levels on vote choice. To start with an intuitive approach, we examine conflicting situations, those where personal conditions are bad but national conditions are good (figure 4.3(a)), or where personal conditions are good but national conditions are bad (figure 4.3(b)).

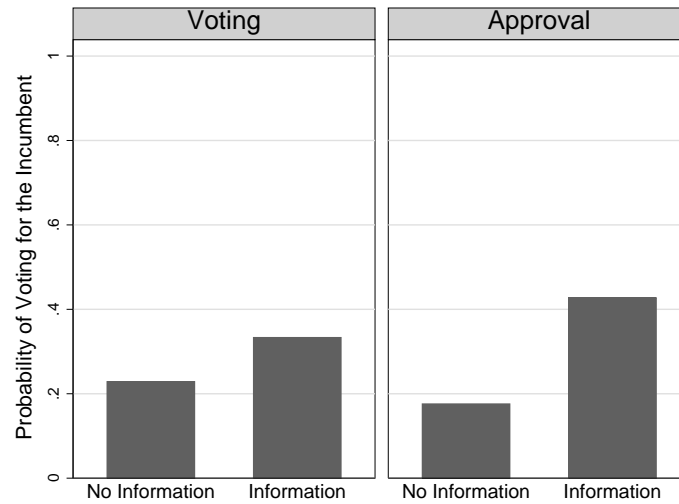
Here voters are split into two groups: those who purchased national level information (tax rate and/or average voter in the nation) and those who did not (see figure 4.3). First, in both the voting and approval rounds, we see the same patterns. The informed are more likely to vote against their personal interests. For instance, figure 4.3(a) depicts voters in the situation where, compared to the candidate, the incumbent had made the voter worse off but had improved the economy as a whole. Those who were aware of a positive change in national economic conditions were more supportive of the incumbent than those who were only aware of the personal negative conditions. While it is tempting to say that the informed are more sociotropic (which they are), there is perhaps a selection effect. There may simply be types of voters that a simple informed versus uninformed comparison cannot reveal while uninformed voters can obviously not behave more sociotropically than informed voters. What can be said is that this supports the assumption in our design that sociotropic behavior is correlated with higher information demand. An attempt to measure how *more* sociotropic these voters are is presented further below.

Next, we compare voting rounds to approval rounds. While the graph suggests little difference between voting and approval rounds for uninformed voters, it does suggest differences for informed voters. Specifically, informed voters appear more likely to approve sociotropically (i.e., report approving of an incumbent who is good for the nation at the expense of individuals and disapprove of an incumbent who is good for individuals at the expense of the nation) than they are to vote sociotropically. In this sense, informed voters may be using cheap talk, voicing a preference for improved national conditions, when they really prefer better personal conditions. Or more simply, the informed may aspire to vote sociotropically, but given a potentially costly decision (vote choice) they revert to egotropic reasoning.

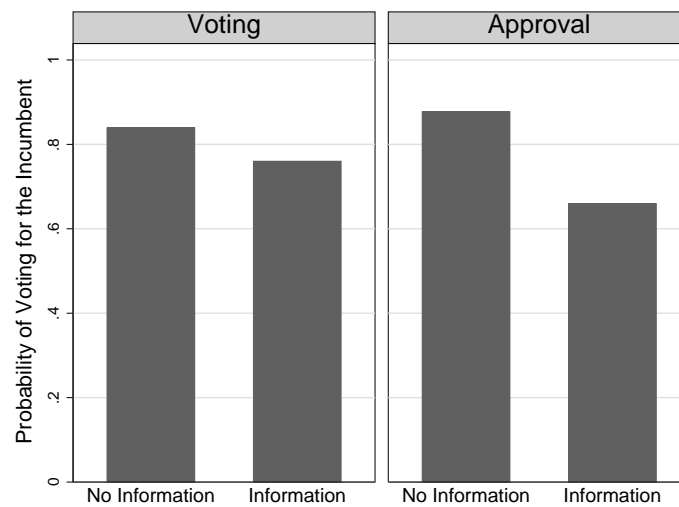
To generalize the previous analysis, tables 4.5 and 4.6 show marginal effects after random effects probit estimations. The dependent variable is the probability of voting for (table 4.5) or approving of (table 4.6) the incumbent. The models present results of aggregate behavior, further decomposed into low and high endowment voters.

In the regressions on tables 4.5 and 4.6 the first variable ('Self Indicator') is an indicator with value 1 if the Incumbent offers the highest net after policy welfare to a voter, -1 if the Candidate does and 0 in case of a tie. The next three variables present interaction effects of this indicator with whether or not the voter purchased information concerning her own community, at least one of the other communities and national level indicators (average voter in the nation or tax rate), respectively. All voters are expected to react

Figure 4.3: Voting and Approval Behavior Conditional on Conflicting Situation



(a) Negative Personal Welfare vs. Positive National Welfare



(b) Positive Personal Welfare vs. Negative National Welfare

Notes. Shown are the probabilities of voting for or approving of the incumbent under conflicting situations. Panel (a) shows situations in which the incumbent offers less personal net after policy welfare but more national net after policy welfare than the candidate, while panel (b) shows the opposite case, i.e., situations in which the incumbent offers more personal net after policy welfare but less national net after policy welfare than the candidate. 'No information' refer to voters that, in that particular round, did not purchase national information. 'Information' indicates that the voter purchased tax rate information and/or information about the average voter in the nation.

Table 4.5: Voting Behavior, Marginal Effects

	Total b(se)	Low Endowment b(se)	High Endowment b(se)
Prediction at zero	0.550	0.663	0.410
Self indicator	0.407** (0.025)	0.443** (0.055)	0.318** (0.042)
Self x own community information	-0.148* (0.061)	-0.152* (0.077)	-0.193+ (0.099)
Self x other communities information	-0.018 (0.064)	-0.007 (0.077)	-0.089 (0.110)
Self x national information	-0.060 (0.046)	-0.096+ (0.057)	0.033 (0.077)
(known) own community indicator	0.167** (0.043)	0.184** (0.055)	0.146+ (0.075)
(known) fairness indicator	0.203** (0.048)	0.224** (0.062)	0.131 (0.083)
(known) national indicator	0.028 (0.042)	-0.024 (0.053)	0.148* (0.071)
N	1200	780	420

Notes. Cells show marginal effects and standard errors of a probit panel regression with random effects at the individual level and session fixed effects (not reported). The dependent variable is a dummy indicating whether or not a voter voted for the incumbent. ‘Self Indicator’ is an indicator variable if value 1 if the Incumbent provides a voter with more net after policy income than the Candidate, -1 on the opposite case and 0 on an tie. The next three variables are interaction effects with a dummy variable indicating whether or not a voter purchased information about her own community, any of the other communities or national indicators (tax rate or average voter in the nation). The final three variables are indicator variables defined similarly to ‘Self Indicator’ interacting with the dummies presented before, respectively. They, thus, compare the known differences in net after policy income for a voter’s own community, (negative of the) dispersion across communities and national welfare.

(+), (*) and (**) denotes statistical significance at the 10%-, 5%- and 1%-level.

Table 4.6: Approval Behavior, Marginal Effects

	Total b(se)	Low Endowment b(se)	High Endowment b(se)
Prediction at zero	0.621	0.596	0.684
Self indicator	0.429** (0.028)	0.451** (0.031)	0.385** (0.060)
Self x own community information	-0.122** (0.043)	-0.105+ (0.054)	-0.171* (0.073)
Self x other communities information	-0.056 (0.044)	-0.114* (0.053)	0.078 (0.079)
Self x national information	-0.128** (0.031)	-0.150** (0.040)	-0.094+ (0.050)
(known) own community indicator	0.122** (0.030)	0.108** (0.039)	0.171** (0.053)
(known) fairness indicator	0.059+ (0.031)	0.055 (0.038)	0.109+ (0.060)
(known) national indicator	0.080** (0.027)	0.014 (0.034)	0.168** (0.049)
N	2640.000	1716.000	924.000

Notes. Cells show the marginal effects and standard errors of a probit panel regression with random effects at the individual level and session fixed effects (not reported). The dependent variable is a dummy indicating whether or not a voter approved of the incumbent. Remarks concerning the dependent variables are as in table 4.5.

(+), (*) and (**) denotes statistical significance at the 10%-, 5%- and 1%-level.

somewhat positively to gains on own income, but sociotropic preferences, signaled by the purchase of information, should reduce this effect if voters have some form of other-regarding preferences. The next three variables are also indicators comparing incumbent's and candidate's policies with respect to their effects in, respectively, net after policy welfare for the voter's own community; differences across communities and national welfare. These variables enter the regression only when known, i.e., only when the voter purchased information on the level concerned. The coefficients for these three variables are expected to be positive if voters have other-regarding preferences.

Several interesting observations can be made. We start at the aggregate level ('Total'). First, as expected, improvement of the own conditions positively increases the voting and approval probabilities. Other things equal, receiving a higher income from one of the politicians increases the probability of voting for (by 40.7 percentage points) and approving of (by 42.9 percentage points) this politician compared to the case where both offer the same. Rejecting P5 in favor of P5_A, informed voters are less sensitive to personal gains, however. This can be seen by the negative interaction effects on 'Self Indicator', which in both regressions is significant in at least one of the three cases. The last three indicators show that knowledge of positive (negative) community, distributional and national conditions also favor the incumbent (candidate). This also sheds light on the meaningful difference between uninformed voting and informed egotropic voting, introduced in section 4.3. Informed egotropic voting would be revealed if the interaction terms on 'Self Indicator' would be zero, which would indicate that acquisition of information leads to no change in behavior. If information is used to make a social comparisons that serves as a benchmark for one's own personal economic welfare, negative estimates for the last three variables would indicate acquisition of information and a voting/approval behavior against others' best interest. Neither are observed, which supports the argument that the purchase of information reveals communitropic and/or sociotropic behavior.

As indicated previously by figure 4.3, voters seem to be more 'extreme' in approval rounds than in voting rounds (the combined effects are larger and statistically stronger in approval rounds). Specifically, national conditions seem to matter more in approval rounds. Distributional concerns seem to be very relevant in voting rounds, however.

When comparing endowment types, the general patterns are in line with the aggregate analysis. For example, both react positively to higher own income and are more 'extreme' in approval rounds than in voting rounds. Important differences emerge, however. In particular, while low endowed voters react mostly to community level information, high endowed voters are primarily concerned with national conditions. Moreover, low endowed voters seem to react quite strongly to distributional concerns in voting rounds when, in contrast, high endowed voters are only mildly affected by this indicator in approval rounds.

All analyses presented here considered average behavior, only accounting for differences

across endowments. It may well be, however, that voters are heterogeneous in their preferences and that individual differences in behavior might explain (better) the observed patterns. While an in-depth heterogeneity analysis is beyond the scope of this chapter, some observations can be made. For example, we do observe that 58 voters (24.2% of the sample) never buy a single piece of information, while 3 voters (1.25%) buy all information available. Likewise, while 66 voters (27.5%) never purchase national level indicators, 16 (6.67%) do so in every single round. Reading the post-experiment questionnaire, we can classify 177 (74%) voters' explanation of their decision making process as presenting selfish motives⁷ and 55 (23%) with sociotropic motives⁸.

4.6.3 Summary of Results

All in all, data supports most of the alternative hypotheses, indicating presence of other-regarding preferences instead of pure egotropic voting. As presented in section 4.6.1, the first two null hypotheses are rejected in favor of the alternatives. Specifically, politicians choose tax levels close to the 'optimal' tax rate of 20% and do not heavily alter the initial income distributions. Section 4.6.2 provided strong evidence that information purchase is significantly positive, thus rejecting the third null hypothesis in favor of the alternative. The fourth null hypothesis is also rejected, as this predicted no treatment effects in information purchase. However, as the alternative predicted the highest information purchase at the *heterogeneous* treatment, this is not supported either. Finally, the fifth null hypothesis is rejected. It predicted that voter behavior would not be influenced by community, national nor distributional concerns. The evidence suggests that informed voters are less sensitive to own income changes and that once aware of improved community or national conditions tend to favor these politicians, even if it comes at their own income costs.

The data also suggests that voters are more 'extreme' in approval rounds, specially regarding national indicators. Across endowment types, differences are also observed. More specifically, high endowed voters react mostly to national conditions while low endowed voters seem more concerned with the community level and distributional indicators. We now discuss these results.

4.7 Discussion

We highlight some of our main findings. First, there is evidence of sociotropic (or other-regarding) voting, even though there was no direct financial incentive to do so. While there is no monetary incentive to engage in anything much more sophisticated than unin-

⁷Statements such as "I voted for the candidate that best helped me".

⁸Statements such as "I chose whichever candidate was offering the fairest tax rates and incomes".

formed egotropic voting, information purchase remains non-trivial and sociotropic voting occurs at significant levels.

Second, voters are responsive to economic conditions at the various levels, when they are aware of incumbent performance. That is, voters respond to changes in both tax and redistribution policies in a systematic manner. Specifically, high endowment voters demonstrate more sensitivity to national conditions while low endowment voter react more to community level indicators.

Third, politicians rarely engage in targeting specific communities. While it would always have been feasible for politicians to set taxes and redistribution in a manner that would have maximized profit to two communities at the expense of the third, this is not observed. This structure of redistribution combined with the choice of the ‘optimal’ tax rate possibly reflects a belief that voters may have preferred more egalitarian and socially maximizing outcomes.

Finally, there is evidence that some informed voters are engaging in cheap talk, signaling that they will vote sociotropically but then voting (more) egotropically. This may suggest that the considerations involved in the approval choice are not necessarily the same as those that induce vote choice.

In sum, this chapter has presented a novel experimental investigation of information search and economic voting. While there is significant potential for further innovation, with modification of this design, this chapter has contributed insight into the mechanisms underlying egotropic and sociotropic behavior. So, what information is relevant in economic voting? The answer depends not only on who the individual is, but also on where she lives and on her endowment.

Appendix 4.A Experimental Instructions

In this appendix we provide a transcript of the experimental instructions. Brackets indicate parts of the instruction that varied across treatments. The “Experimental Instructions” were given to all subjects (upon arrival) while the “Specific Instructions” were sealed in an envelope and given to the specified roles only. Instructions were also provided on screen. In addition to the instructions, subjects also received a version of table 4.1(a) or 4.1(b), according to treatment, without the last column and highlights.

Experimental Instructions

Welcome to today’s experiment. Over the next two hours, you will be engaged in an activity for which you will be paid by check upon completion. Just for arriving on time and agreeing to participate, you will be paid a show up fee of \$10. Additional money will be earned through the course of the experiment, depending on your choices and the choices made by other participants. During the experiment, all the money you earn will be listed in experimental currency units (ECUs). When the experiment is complete, these will be converted to dollars at a rate of one dollar for every 500 ECUs.

From this point on, you may not speak or attempt to communicate with any of the other participants. Turn OFF, not just to silent, any phones or electronic devices and keep them off for the duration of the experiment. Violation of these policies will result in first a warning and then dismissal from the experiment without payment (but with no further penalty). If you have a question, please raise your hand and an experimenter will come to you to answer your question.

Roles

At the beginning of the experiment, all participants are assigned to be either a Politician or a Voter. Each participant has the same chance of being assigned to one of the two roles. You will remain in the same role for the entire duration of the experiment.

Politicians (2): Two participants will be randomly chosen to be politicians. Of these two, one will be randomly chosen to start as the Incumbent, while the other will be the Candidate seeking to replace the Incumbent. The Incumbent will receive a salary of 500 ECUs per period, while the Candidate will receive a salary of 100 ECUs per period.

Voters (15): The remaining fifteen participants will comprise a nation of voters, randomly split into three communities of five. Once assigned to a community, a voter will remain in that community for the rest of the experiment.

Each voter will also be randomly assigned to receive either a high endowment of 500 ECUs

or a low endowment of 100 ECUs per period. This too will remain constant throughout the experiment. [*baseline*: There will be 3 low endowment and 2 high endowment voters in each community.][*clustered*: There will be 2 communities of 4 low endowment voters and 1 high endowment voter and 1 community of 1 low endowment and 4 high endowment voters.][*poor*: There will be 4 low endowment and 1 high endowment voter in each community.][*heterogeneous*: There will be a community of 4 low endowment and 1 high endowment voters, a community of 3 low endowment and 2 high endowment voters and a community of 2 low endowment and 3 high endowment voters.]

Structure of the experiment

Stage 1: Politicians choose a tax rate and the tax returns

In the first stage, politicians make the following choices: the tax rate and the tax returns. The tax rate is the percentage of endowment collected from each voter. It can be a number between 0% and 100% in increments of 10%. The same tax rate t will apply to ALL communities and, thus, all voters. Each tax rate is associated with collected taxes and a tax revenue. These relationships can be seen in two ways. First, it is given by mathematical equations. [*baseline, clustered and heterogeneous*: Collected taxes are given by $(3900 * t)$, where 3900 is the total national endowment (everyone's endowment added up). Tax revenue is then given by $(3900 * t) * (1.40 - t)$.][*poor*: Collected taxes are given by $(2700 * t)$, where 2700 is the total national endowment (everyone's endowment added up). Tax revenue is then given by $(2700 * t) * (1.40 - t)$.] If you find this too hard to understand, there is no need to worry. In the accompanying table, we list for every possible t , the collected taxes and tax revenue that it generates.

Once the tax revenue has been determined, the politician has to decide on the tax returns. That is, how much of the tax revenue to return to each community. The total amount returned must be equal to the tax revenue. Within each community the tax return is equally divided among its voters. (Notice a politician can return different amounts to different communities but cannot affect how the tax return is distributed within a community).

The tax rate and tax returns chosen by the Incumbent will be implemented. The choices made by the Candidate are hypothetical proposals that can also be seen by the voters.

Stage 2: Voters observe information

Voters will be informed about their own endowment, their own income after taxes and tax returns, and how their own income has changed as a result of these choices.

Voters will have the opportunity to purchase additional information for 2 ECUs per piece. Voters can buy up to 5 pieces of information. The information relates to the tax rate and the Average

Income Change, that is, how much better or worse an average voter is compared to her initial endowment. The five pieces of information available are: tax rate, Average Income Change in the voter's own community, in each of the other two communities, and at the national level.

Voters can see the same information (including purchased information) for both politicians. That means, if a voter purchases a piece of information, s/he will have access to that piece of information about both politicians.

Stage 3: *Approval Poll / Election*

Voters will have the chance to say whether or not they are happy with the current Incumbent's policies. A question of the form "Do you approve of the job Politician X is doing as leader?" will be posed. Voters must select either yes or no. The results will be announced at the end of the period.

Every third period, instead of an approval question, there will be an election. Voters will have the choice to vote for either Politician 1 or Politician 2 to be the leader for the next three periods. The politician who receives the most votes wins. Results are announced at the end of the period.

Stage 4: *Summary*

At the end of each period, a screen will appear showing results of the *Approval Poll / Election*, income from that period, and cumulative earnings.

Ending Conditions

This procedure will be repeated a pre-determined number of times. When the experiment has been completed, you will be asked to fill out a short questionnaire. When everyone is finished, you will each be called individually to the back of the room to be paid privately.

Please press "Continue" on your screen once you finish reading this part. You will learn about your role (Politician or Voter) and receive further instructions about your screen.

Specific Instructions for Politicians:

As mentioned before, politicians make the following choices: the tax rate and the tax returns. The tax rate is set by moving the slider at the top of your screen from left to right. As you move the slider, you will see directly underneath, how the tax rate affects the tax revenue. The next choice to be made is the tax returns to each community. This has to be entered to each community individually on the left hand side of your screen.

To assist you in your decisions, below the tax revenue, there is an indication of the amount not yet distributed. There is also a calculator button on the rightmost side of the screen. You can click on this button to call a calculator in case you believe it may help you with the computations.

On the right side of your screen, you will see a column labeled “Total Income Change”. This refers to the amount your policies have given to or taken from certain voters. For example, total income change of 70.00 for Community 1 means that you have made that community 70 ECUs better off than it was before.

This view is called the “Aggregate Distribution View”. At the bottom of the screen, you will see a button labeled “Income Distribution View”. If you click this button, you will be shown how many low and high endowment voters are in each community and how your policy has affected the average voter in each group. Click “Aggregate Distribution View” to return to the previous view.

At anytime you can click the “Preview” button to see the effects of your current policy and to update the amount not yet distributed. Note: to preview a policy, the total amount returned to the communities must be no more than the tax revenue.

You will also see a button at the bottom of your screen labeled “History”. Click this button to see the policies chosen by you and by the other politician in previous periods. The buttons “Own History” and “Other Politician’s History” allow you to alternate views accordingly. The following information is provided on the history screen: Period, Status (Incumbent or Candidate), Tax Rate and Tax Returns for each community. (Note this will be empty in the first period). Click “Current Period” to return to current period’s view.

Once you are satisfied with a policy that completely distributes the tax revenue you can click “OK”. In the next period, this will be shown as the starting policy. You will, of course, be free to change it.

When both politicians have pressed “OK”, voters will be able to see the information and fill the Approval/ Election ballot. During this time, you will be shown a screen similar to your decision screen, which you can use to try different policies and test their effects. No values entered during

this stage will be implemented or recorded into the “History” screen.

Please press “Continue” on your screen once you finish reading this part. This concludes the instructions.

Specific Instructions for Voters:

Once both politicians have decided on their policies, you will see how their choices have translated into payoffs.

In the middle of the screen, you will see your endowment. Directly underneath, a table starts. This table presents a column associated with each Politician's policy. The first two rows indicate your income after taxes and tax returns, and how your income has changed. You have the opportunity to purchase up to 5 additional pieces of information for 2 ECUs per piece. The row below your income change holds the tax rate. Click on the button "Purchase Information" to reveal the tax rate. Next, there is a sub-table. The first columns indicate the number of low and high endowment voters, followed by the average income. The final columns refer to the Avg. Income Change. For this column, the first three options are Own Community, Other Community 1, and Other Community 2. If you click on one of the "Purchase Information" buttons, you will be told how much better or worse off the average member of that community is, compared to the initial endowment, due to the policy choices. The final row provides information about the whole nation, that is, the number of low and high endowment voters and the average endowment, and the possibility to "Purchase Information" about the Avg. Income Change in the nation as a whole.

At the bottom of the screen there are also two buttons labeled "History Politician 1" and "History Politician 2" which will show you information about previous periods. You will be shown the following information: Period, Status (Incumbent or Candidate), Own Income Change and, if purchased, Tax Rate, Average Income Change in your Own Community, Other Community 1, Other Community 2 and Nation. Notice it is not possible to purchase information regarding previous periods. Click "Current Period" to return to current period's view.

The ballot for approval or election will appear on the top of your screen. You must indicate if you approve or not of the job the current incumbent is doing as the leader, and in election periods (every third period), indicate instead, for whom you wish to vote.

Once you are done reviewing information and casting your vote, please click "OK" to continue, in the bottom right corner of the screen. The experiment cannot continue until all voters have done this, so please remember to click the button.

While the politicians are making their choices you will be shown the "History" screens. (Note this will be empty on the first period).

Please press "Continue" on your screen once you finish reading this part. This concludes the instructions.

Appendix 4.B Experimental Screen Shots

In this appendix we provide screen shots of the politicians (4.4(a)) and voters (4.4(b)) decision screens, in order to illustrate the interface used by subjects and the information possibility contained in their screens.

Figure 4.4: Experimental Screen Shots

Period 1

You are currently a **CANDIDATE** politician

Please indicate the tax rate: 0% 100%

tax rate (%): 0
 Tax Revenue: 0.00
 Amount not yet Distributed: 0.00

	Tax Return	Total Endowment	Total Income Change
Community 1	0.00	1300	0.00
Community 2	0.00	1300	0.00
Community 3	0.00	1300	0.00
Nation	0.00	3900	0.00

Current Period History Income Distribution view Aggregate Distribution view Preview OK

(a) Politicians

Period 1

The current Incumbent is Politician 1
 The current Candidate is Politician 2

Do you approve of the job Politician 1 is doing as leader? Yes No

Your endowment: 100

	Politician 1	Politician 2
Your Income after taxes and redistribution	150.00	140.00
Your Income Change	50.00	40.00

	Low Endowment	High Endowment	Avg. Endowment	
Own Community	3	2	260.00	Purchase Information
Other Community 1	3	2	260.00	Purchase Information
Other Community 2	3	2	260.00	Purchase Information
Nation	9	6	260.00	Purchase Information

History Politician 1 History Politician 2 Current Period OK

(b) Voters

Notes. The figure presents screen shots for the politicians (panel (a)) and voters ((b)). These are illustrative examples and not a taken from an actual session.