Income, Information and the Extent of Redistribution

Jo Thori Lind[*]   Dominic Rohner[†]

University of Oslo   University of York

February 13, 2008

Draft - Comments are welcome

Abstract

Levels of redistribution are lower and occurs in other places than than those predicted by standard models of Downsian electoral competition. We introduce a new mechanism that can account for this "redistribution puzzle", based on an unequl distribution of political knowledge. The level of general education affects both the voters' income and their incentives to acquire political information. Poorer voters have on average lower levels of political knowledge and hence of electoral platforms. The resulting voting mistakes lower the political weight of poor voters and lead to parties converging to lower levels of redistribution than under complete information. The predictions of the formal model are tested empirically using US election survey data. We find that income and stated political viewpoints are more important in forming voting behavior for more informed voters than for less informed voters, hence confirming the theoretical model.

JEL Classification: D31, D72, D82, H53.

Keywords: Redistribution, Information, Income, Voting, Political Economics.

---

[*]Department of Economics, University of Oslo, Email: j.t.lind@econ.uio.no.
[†]Department of Economics, University of York, Email: dr527@york.ac.uk.

1 Introduction

In many countries the level of redistribution is relatively low, despite the fact that a coalition of the poor would have the power to impose higher levels of transfers. It is a robust empirical finding that redistribution levels are generally lower than predicted by standard models of Downsian electoral competition [1]. In the present work we give a solution to this redistribution puzzle, and explain why so little redistribution takes place, by focusing on the role of information. Standard models of Downsian electoral competition typically assume that the electoral platform of the parties can be perfectly observed. We relax this assumption and build a model where voters receive a noisy signal of electoral platforms. The higher the level of political knowledge of a given voter, the less noisy is her signal and the more accurately the electoral platforms of the parties are perceived. A more precise perception of the party platforms enables a voter to choose with a higher probability a party which implements policies that are in her best economic interest.

Our model further includes the feature that an underlying variable (i.e. education) both positively affects personal incomes and levels of political information. Hence, richer voters are better informed.

Through this channel redistribution levels are reduced below the levels predicted by standard median voter models of Downsian electoral competition under full information. Richer voters who favour lower taxes receive more accurate signals of party platforms and therefore select on average more often parties that are in their economic interest. This leads to an increased political weight of richer voters who can more often "get their way" in politics. Taking this into account, parties converge to a platform with less redistribution.

We test the model's predictions using data from the American National Election Studies. First, the assumption that voters with more education and higher incomes tend to be politically better informed, measured both by self reported interest in politics and by measures of following the political campaign in the media.

To explore the main predictions of the model, we follow two strategies. First, we study how the effect of income on voting depends on the level of information. It turns out that income is a better predictor of voting for the better informed voters whereas the less well informed voters votes more randomly. Second, we regress party choice on a battery of stated political opinions. We find that there is clear signs of heteroskedasticity in this model, with a lower variance for the better informed voters.

Our paper draws on several different literatures. First, the theoretical part builds on median voter models of Downsian electoral competition that focus on predicting the level of redistribution [2]. One of the main implications of these models is that higher levels of inequality should be reflected by larger redistribution. As mentioned earlier, these models are generally not supported by the empirical evidence and the observed level of redistribution is lower than the predicted one. This is often referred to as the "redistribution puzzle".

Various explanations and mechanisms have been advanced for explaining why redistribution levels are relatively low and why the poor do not expropriate the rich. They include the lower level of political participation of the poor (Harms and Zink, 2003), multi-dimensional issue spaces (Roemer, 1998), collective action problems of the poor and interest groups (Olson, 1965), the deadweight loss from taxation (Meltzer

---

[1]See for instance Perotti (1996) or Moene and Wallerstein (2001, 2003). Lind (2005) provides a survey of the literature.

[2]Downs (1957), Romer (1975), Roberts (1977), Meltzer and Richard (1981)

and Richard, 1981), the need for a social hierarchy (Corneo and Grüner, 2000), the dynamics of perceived social mobility (Piketty, 1995) and the prospects of upward mobility (Hirschman and Rothschild, 1973). In the present contribution we focus on an alternative mechanism, where in a framework of incomplete information poor voters relatively more often vote "incorrectly" and therefore are not able to fully exploit their group size.

Another related literature is the one on how information affects the voters' decisions. It is controversial up to which extent voting outcomes differ under full information and under incomplete information.

Many influential contributions in political science argue that the level of voter information does not matter for electoral outcomes and that uninformed voters can achieve a "full information equivalent" outcome through cues, information shortcuts and biases cancelling out in aggregation (McKelvey and Ordeshook, 1985; Wittman, 1989; Lupia, 1992). Also the pivotal voting literature usually predicts that uninformed voters balance the partisan bias or abstain, assuring in this way that the same outcome as under full information occurs (cf., for example, Austin-Smith and Banks, 1996; Feddersen and Pesendorfer, 1996, 1997). However, these papers do not consider redistribution issues in a framework where information levels vary among voters.

These theoretical contributions, however, contrast with the results of several empirical studies that have found that uninformed voters do on average not vote "correctly" (or according to their best interest), and that lack of information biases voting outcomes (Palfrey and Poole, 1987; Delli Carpini and Keeter, 1996; Bartels, 1996; Gilens, 2001). Related papers focus on the role of the mass media. Della Vigna and Kaplan (2007) find that media information biases voting outcomes, and Strömberg (2004) concludes that more informed voters, i.e. those who benefit from better media coverage, receive more favorable policies.

Some theoretical papers have taken these empirical findings into account and have built models of how incomplete information affects voting decisions.

Martinelli (2006) and Feddersen and Sandroni (2006) model the conditions under which rational voters would have incentives to acquire costly information. In contrast, Rohner (2007) takes the information level of voters as exogenous, and sets up a model with noisy signals, where in societies with a high proportion of uninformed voters candidates with a low level of "valence" (i.e. of honesty and competence) have an increased probability of getting elected into office. Gul and Pesendorfer (2006) emphasize a framework with ignorant voters, where candidates with a "preferred personality" can gain re-election despite implementing partisan policies that lead to lower expected payoffs for the electorate.

Contrary to our present contribution, however, these papers do not explicitly focus on the impact of the information structure of voters on the level of redistribution being implemented. Larcinese's (2005) paper is the closest related to our research topic. In his purely theoretical paper he also seeks to explain why so little redistribution occurs. However, the channel through which information matters is very different from ours, i.e. in his model lack of information leads to abstention rather than voting mistakes[3].

---

[3]In Larcinese's paper voters can only choose between being uninformed and abstaining or being informed and voting. The assumption of increasing returns to political information assures that rich voters are on average better informed and abstain less, and receive therefore a higher weight in the parties' optimization problem. In contrast, in our contribution there is an underlying factor, i.e. education, that affects both the (continuous) level of political information acquired and the income level of a given voter. The difference in noisiness of signals and the resulting "incorrect" decisions, rather than abstention, makes that poor voters "count less" in politics.

To sum up, the present paper contributes to the literature in the following ways. First, we build a formal model of redistribution under incomplete information. We derive a new mechanism of how information can affect electoral outcomes. This channel can account for the relatively low levels of redistribution observed in reality. Second, we present empirical evidence that is in line with the main assumptions and predictions of the theoretical model.

The remainder of our contribution is organized as follows. Section 2 presents a simple model, Section 3 analyses the empirical evidence and Section 4 concludes.

2 The Model

2.1 The Assumptions

The following assumptions are included:

General Framework

It is a game with two political parties P, the left-wing party L and the right-wing party R, $P \in \{L, R\}$, and n voters 1,2,...,i,...,n as players. The game lasts for two periods.

Timing

At the beginning of the first period the incumbent government announces the tax rate τ and the level of the public good g provided in the first period (these are taken as exogenous).

Then each voter i chooses her optimal investment level for the generation of political information, s^{i*}, and decides on her preferred level of public good provision, g^{i*}. Both s^{i*} and g^{i*} are stationary and independent of τ and g, as will be shown further below.

As a next step both L and R announce their electoral platforms for the second period, g^L and g^R.

At the end of the first period, the election takes place and either L or R are elected into office.

In the second period the (new) government implements the announced policies, the voters choose their optimal investment level for generating political information, s^{i*}, and the game ends.

Actions

The parties L and R choose $g^L \in [0, g^{\max}]$, respectively $g^R \in [0, g^{\max}]$, and the corresponding levels of τ^L and τ^R.

Each voter i chooses s^{i*}, and $g^{i*} \in [0, g^{\max}]$. She also chooses for which party to vote, $v \in \{l, r\}$.

Utility function of the voters

Each voter i has a utility function of the following form:

$$U^i = x^i + wd^i + H(g) \tag{1}$$

4

where x^i = amount of private good, w = relative social weight given to political knowledge, d^i = level of political knowledge, g = amount of public good. The function $H(\bullet)$ is concave and increasing. Thus, the derivatives $H_g > 0$, and $H_{gg} < 0$.

As in standard political economics models (cf., for example, Persson and Tabellini, 2002) the voters' utility depends positively on both the private and public goods consumed. Here we also include the level of political knowledge of the voter. In line with the empirical evidence on the probability of being pivotal being tiny (Gelman, King, and Boscardin, 1998; Fischer, 1999; Mulligan and Hunter, 2003), we assume that voters value political knowledge not for the sake of influencing political decisions, but rather for its "social consumption value". Being cultivated and able to participate in political debates is valued in society.

Budget constraint voters

The budget constraint of a given voter i is of the following form:

$$(1 - \tau)y^i = x^i + s^i \tag{2}$$

where y^i = voter i's income, s^i = units of income invested as input in knowledge generation (e.g. cost of buying books and magazines, the opportunity cost of watching the news etc).

The disposable income is spent for private goods and as input for the generation of political knowledge. The relative price of political knowledge is simply a scale effect that is incorporated in the function $F(\bullet)$, which is discussed below.

Production function voters

The following production function is included:

$$y^i = y^i(E^i, a^i) \tag{3}$$

where E = level of schooling/education, a = other factors. It is assumed that the derivative $y_E > 0$.

The income level depends positively on the level of education[4] and is also affected by other idiosyncratic factors (e.g. capital, talent etc), which can be assumed to be constant or to randomly vary across individuals. On average, more educated people have higher income levels. Both E^i and a^i are without loss of generality assumed to be stationary over the two periods.

Generation of political knowledge voters

We can represent political knowledge generation with an equation $d^i = F(s^i)$, where $F(\bullet)$ maps the input for "studying political processes" s^i to the political knowledge achieved, d^i.

As for many economic commodities, the marginal benefit of investments in political knowledge can be assumed to be decreasing, where the derivatives $F_s > 0$, $F_{ss} < 0$.

---

[4]We take here education as exogenous. It would be straightforward to endogenize E, and make the choice of acquiring schooling depend on the cost of effort (talent) and the returns to effort (the quality of the school, which might depend on the neighborhood and the family background etc).

Further, it is also reasonable to assume that more educated people find it easier to acquire political knowledge. This can be incorporated in different ways in the function $F(\bullet)$. For simplicity, we can introduce the particular form below:

$$d = \alpha(E)s^{\mu(E)} \tag{4}$$

where α = parameter, μ = parameter, with $\alpha > 0$ and $0 < \mu < 1$, and the derivatives $\alpha_E > 0$, $\mu_E > 0$.

Education increases the level of political knowledge achieved for a given level of input s.

Budget constraint government
This can be expressed as follows:

$$\tau y = g \tag{5}$$

where y = average income level.

Utility functions parties
Parties are assumed to only care about (re-)election. L and R have the following utility functions:

$$U^L = \left\{ \begin{array}{c} (\pi \mid v^L > v^R) \\ (\pi/2 \mid v^L = v^R) \\ (0 \mid v^L < v^R) \end{array} \right\} ; U^R = \left\{ \begin{array}{c} (\pi \mid v^R > v^L) \\ (\pi/2 \mid v^R = v^L) \\ (0 \mid v^R < v^L) \end{array} \right\} \tag{6}$$

where π = rents from office, v^L = vote share party L, v^R = vote share party R.

Information
Voters have imperfect information about the positions of the parties' platforms. The perceived level of public good provision of the parties' platforms corresponds to:

$$\widehat{g}^P = g^P + \varepsilon \tag{7}$$

where ε = random noise, $P \in \{L, R\}$.

The random noise has support $\varepsilon \in [-\min(g, g^{\max} - g), +\min(g, g^{\max} - g)]$, and has a mean of zero, $E(\varepsilon) = 0$. The variance is $Var(\varepsilon) = \sigma^2$. By assumption the noise is smaller for voters with higher levels of political knowledge. Thus, the derivative $\sigma_d < 0$.

2.2   The Equilibrium under Full Information

First, we shall derive the optimal choices of s^{i*} and g^{i*} of the citizens at the beginning of the first period. These choices are independent of what happens in the remainder of the game.

Introducing the equations (2), (4) and (5) in equation (1), we obtain the objective function for the citizens to optimize:

$$U^i = (y - g)\frac{y^i}{y} + w\alpha^i(s^i)^{\mu^i} - s^i + H(g) \tag{8}$$

The first order conditions with respect to s^i lead to lemma 1. The second order conditions hold.

Lemma 1 *More educated citizens have more incentives to invest income in the generation of political knowledge, i.e. they have a higher s^i. They acquire higher levels of political knowledge than less educated citizens, i.e. they achieve a higher d^i.*

Proof. We have the derivative $U^i_{s^i} = \mu^i w\alpha^i(s^i)^{\mu^i-1} - 1 = 0$, which implies after reformulation, $s^i = (\mu^i(E)w\alpha^i(E))^{\frac{1}{1-\mu^i(E)}}$. Given that the derivatives $\alpha_E > 0$, $\mu_E > 0 \Rightarrow s^i_E > 0 \Rightarrow d^i_E > 0$. ∎

Thus, more general education and schooling in our model does not only increase income, but also results in higher levels of political knowledge acquired.

Furthermore, we can compute the preferred level of g^{i*} for a citizen i. Taking the first derivative U^i_g of the objective function, we obtain:

$$g^{i*} = H_g^{-1}(\frac{y^i}{y}) \tag{9}$$

Lemma 2 *Richer citizens (i.e. with higher y^i) prefer lower levels of the public good (i.e. lower g^{i*}).*

Proof. The concavity of $H(\bullet)$ implies that equation (9) directly leads to this result. Cf. Persson and Tabellini (2002) for a further discussion. ∎

After this first stage of period 1, L and R announce their electoral platforms for the second period, g^L and g^R, and then the election takes place. For these remaining two stages of period 1 we will proceed through backward induction, and first derive the voting decision of the citizens, before treating the platform setting of the parties.

If there is full information on the parties' platforms (i.e. $\sigma^2 = 0$), as assumed in the present subsection, the equilibrium is the same as in a standard median voter model.

Lemma 3 *There exists a level of public good provision g^M, which is the preferred level of the voter with median income y^M. Under full information about the parties' platforms all voters i with $y^i > y^M$ will prefer any level of $g < g^M$ to g^M, while all voters i with $y^i < y^M$ will prefer any level of $g > g^M$ to g^M.*

Proof. Follows from lemma 2. ∎

Lemma 2 implies that whenever one party were to choose a platform $g^P > g^M$, the other party could win the election by choosing some level of $g^{P'}$ marginally below g^P. Similarly, for $g^P < g^M$, the other party could win the election by choosing some level of $g^{P'}$ marginally above g^P. This leads to lemma 3 that summarizes the well-known Downsian policy convergence result.

Lemma 4 *Given the anticipated voters' behavior described in lemma 3, both parties converge to a platform $g^L = g^R = g^M$.*

Proof. Follows from the discussion above. ■

2.3 The Equilibrium under Incomplete Information

How does the equilibrium behavior change when the platforms of the parties are not perfectly observable?

The first stage of period 1, where s^{i*} and g^{i*} are chosen, remains the same as before, and the lemmas 1 and 2 still apply to the present subsection.

As far as the voters' choice is concerned, the analysis is identical besides that now the reference point of the voters are the perceived party platforms $\widehat{g}^P$ rather than than the actual ones, g^P. The following corollary to lemma 3 holds.

Corollary 1 *There exists a perceived level of public good provision $\widehat{g}^M$, which is the preferred level of the voter with median income y^M. Under full information about the parties' platforms all voters i with $y^i > y^M$ will prefer any level of $\widehat{g} < \widehat{g}^M$ to $\widehat{g}^M$, while all voters i with $y^i < y^M$ will prefer any level of $\widehat{g} > \widehat{g}^M$ to $\widehat{g}^M$.*

Proof. Follows directly from the proof of lemma 3. ■

Given that income is correlated with political knowledge (through the underlying education variable), richer voters have on average lower levels of noise, σ^2. This results in the following theorem, which is the main prediction of the present model.

Theorem 1 *When party platforms are imperfectly observable, and the amount of noise is negatively correlated with income, parties converge to a level of public good provision of $g^L = g^R = g^*$ that is smaller than the convergence level of public good provision under full information, g^M, i.e. $g^L = g^R = g^* < g^M$.*

Proof. This proof has two parts.

Proof for convergence (by contradiction): Assume parties do not converge to some level g^*. This implies that the party with the higher (lower) level of g^P could increase its vote share by marginally decreasing (increasing) its g^P. When a party receives less or the equal number of votes than the opponent it would have incentives to do so. At least one of the parties is in this position. Thus, we cannot have $g^L \neq g^R$ in equilibrium.

Proof for $g^* < g^M$ (by contradiction): Assume that $g^* = g^L = g^R = g^M$. Half of the population has $y^i > y^M$ and would prefer $g^{i*} < g^M$, while the other half of the population has $y^i < y^M$ and would prefer $g^{i*} > g^M$.

Image that, by construction, one party, say R, chooses a platform of $\widetilde{g}^R = g^M - \eta$, where $\eta = $ a small positive number. Under full information, R would receive marginally less than half of the votes, and would be supported by all voters with $y^i > y^M + \frac{\eta}{2}$. In contrast, party L would be supported by all voters with $y^i < y^M + \frac{\eta}{2}$.

Under incomplete information the situation is different, as voters receive a noisy signal of the party positions. Thus, some small proportion ϕ_{Rich} of voters with $y^i > y^M + \frac{\eta}{2}$ would receive signals $\widehat{g}^L$ and $\widehat{g}^R$ such that $E(U^i \mid g = \widehat{g}^L) > E(U^i \mid g = \widehat{g}^R)$ and would support L (E refers here to the expected value).

Similarly, some proportion ϕ_{Poor} of voters with $y^i < y^M + \frac{\eta}{2}$ would receive signals $\hat{g}^L$ and $\hat{g}^R$ such that $E(U^i \mid g = \hat{g}^L) < E(U^i \mid g = \hat{g}^R)$ and would support R.

The noise σ^2 is larger for poor citizens. Accordingly, $\phi_{Rich} < \phi_{Poor}$. Thus, for the difference in noise being substantial and η being small, R would win the election by deviating from g^M to $\tilde{g}^R$. Thus, we cannot have $g^* = g^M$. The argument is similar for $g^* > g^M$. Thus, $g^* < g^M$ has to hold. ■

Theorem 1 implies that under imperfect information on party platforms we have less redistribution than would be predicted under full information. This is due to poorer voters lacking the political knowledge to fully exploit their political weight and them voting (on average) more frequently for the political party that suits less well their economic interests.

Thus, for situations when party convergence is not complete[5], our framework predicts that rich voters tend on average to vote for right-wing parties, and the more so the better their political knowledge is. Poor voters are predicted to support predominantly left-wing parties, and the more so the better their political knowledge is.

3 Empirical test

3.1 Data

To test the predictions of the model we use data from the American National Election Studies, where we have data for individual interviews from 1960 to 2004. We first use a number of indicators of how well informed the respondent is about public policy in general and the electoral campaign in particular. We have 3-points and 4-points scales on how interested the respondent is in the election and in public affairs in general and binary variables on whether he followed the campaign on TV, on radio, and in the newspapers. A factor analysis of these indicators reveals that there is a single very strong factor, so there should be scope for data reduction. Therefore, we use a principal component analysis to reduce the five indicators to a single indicator of how informed the respondent is, which is the main indicator of information used in the analysis.

To measure political behavior we mostly rely on voting in presidential elections as this is perfectly comparable across states, although we also analyze voting in congressional elections in some robustness checks. We only consider voting for the two major parties in order to assure comparability over time. Further, we also have data on the respondent's stand on a number of policy issues as well as the usual vector of background variables. Table 1 gives some descriptive statistics. A full description of the data is provided in the Appendix (to be done).

3.2 Who are informed?

Lemma 1 and equation (3) imply that more educated agents and agents with higher income will be more informed about politics than those with less education and lower income. To test this, Table 2 shows the results from estimations where the indicators of being politically informed are regressed on income as well as

---

[5]As discussed in Grofman (2004), in reality policy convergence is rarely complete. For simplicity we do not model the factors preventing full policy convergence explicitly.

Table 1: Descriptive statistics

	All				Democrat		Republican	
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Mean	Std. Dev.
Age	45.76	17.15	17	99	46.70	16.51	47.30	16.32
Age squared	2388	1718	289	9801	2453	1664	2503	1657
Female	0.56	0.50	0	1	0.57	0.50	0.53	0.50
African American	0.11	0.31	0	1	0.17	0.37	0.02	0.13
Other non-whie race	0.06	0.24	0	1	0.06	0.23	0.04	0.19
Income								
Group 1	0.17	0.38	0	1	0.15	0.35	0.10	0.30
Group 2	0.17	0.37	0	1	0.18	0.38	0.14	0.35
Group 3	0.32	0.47	0	1	0.33	0.47	0.31	0.46
Group 4	0.28	0.45	0	1	0.30	0.46	0.35	0.48
Group 5	0.06	0.23	0	1	0.04	0.21	0.10	0.30
Education								
8 grades or less	0.16	0.37	0	1	0.16	0.37	0.11	0.32
9-12 grades	0.14	0.35	0	1	0.14	0.34	0.11	0.31
12 grades + diploma	0.25	0.43	0	1	0.24	0.43	0.22	0.41
12 grades, diploma, and training	0.08	0.28	0	1	0.09	0.29	0.11	0.31
Some college	0.19	0.39	0	1	0.18	0.38	0.21	0.41
BA	0.13	0.33	0	1	0.13	0.34	0.18	0.38
Advanced degree	0.05	0.21	0	1	0.06	0.24	0.05	0.23
Interest in the election	2.04	0.75	1	3	2.26	0.71	2.27	0.70
Interest in public affairs	2.78	1.02	1	4	2.94	0.94	3.03	0.92
Followed campaign on TV	0.77	0.42	0	1	0.87	0.34	0.86	0.35
Followed campaign on radio	0.44	0.50	0	1	0.47	0.50	0.50	0.50
Followed campaign in newspapers	0.69	0.46	0	1	0.77	0.42	0.79	0.41
Informed	0.00	1.46	-3.56	2.08	0.38	1.26	0.47	1.22
Voted republican for Congress	0.44	0.50	0	1	0.14	0.35	0.74	0.44
Voted republican for President	0.52	0.50	0	1				

on a vector of explanatory variables and year and state dummies. We first use the five individual indicators of being informed, then the composite measure from the principal component analysis with and without state fixed effects.

For all specifications we get the expected result that agents with higher income and agents with more education tend to be more informed. These results are in most cases significant at the 1% level. Going from the lowest to the highest level of education increases the level of information by 1.07 standard deviations whereas an increase from the lowest to the highest income category increases information by 0.37 standard deviations.[6]

3.3 Income and voting

Our theory features that the noisiness of signals is negatively correlated with political information. Thus, certain background variables, such as income, should be more important for more informed voters than for less informed voters. A simple way to test this is to regress voting behavior on a vector of background variables, and interact the variable of interest, income, with the level of information. Results from this estimation are shown in Table 3. Columns (1) and (2) display the results from a probit model without and with state fixed effects and Columns (3) the results from an ordinary regression on a binary outcome variable. All three methods confirm that an increase in income increases the probability of voting republican, and this effect is stronger for the more informed than for the less informed voters. Going from the 25th to the 75th

---

[6]Both results are found using the numbers in Column (7) of Table 2.

Table 2: The determinants of being informed

	(1) Interest in campaign	(2) Interest in public affairs	(3) Followed campaign on TV	(4) Followed campaign on radio	(5) Followed campaign in newspapers	(6) Informed	(7) Informed
Age	0.0250***	0.0317***	0.0229***	0.0102***	0.0337***	0.0505***	0.0513***
	(12.24)	(14.70)	(7.30)	(3.58)	(11.38)	(15.00)	(15.23)
Age squared	-0.000117***	-0.000159***	-0.000122***	-0.0000354	-0.000163***	-0.000284***	-0.000292***
	(-5.62)	(-7.28)	(-3.80)	(-1.22)	(-5.41)	(-8.29)	(-8.52)
Female	-0.147***	-0.347***	-0.0535***	-0.210***	-0.219***	-0.333***	-0.334***
	(-12.52)	(-27.40)	(-2.90)	(-12.84)	(-12.51)	(-17.14)	(-17.20)
African American	0.166***	0.0781***	0.0140	0.194***	-0.0728**	0.151***	0.144***
	(8.27)	(3.66)	(0.45)	(6.96)	(-2.55)	(4.66)	(4.28)
Other non-white race	-0.0444*	-0.0685***	-0.116***	-0.0584	-0.110***	-0.140***	-0.153***
	(-1.74)	(-2.64)	(-3.00)	(-1.62)	(-3.03)	(-3.40)	(-3.61)
Income	0.0801***	0.0675***	0.110***	0.0175**	0.119***	0.106***	0.108***
	(13.16)	(10.36)	(11.58)	(2.06)	(13.23)	(10.65)	(10.69)
Education: 9-12 grades	0.259***	0.404***	0.253***	-0.0217	0.530***	0.463***	0.467***
	(11.85)	(16.23)	(7.60)	(-0.70)	(16.89)	(11.89)	(11.95)
Education: 12 grades + diploma	0.479***	0.610***	0.297***	-0.0654**	0.803***	0.737***	0.742***
	(22.66)	(25.58)	(9.10)	(-2.18)	(25.87)	(19.85)	(19.86)
Education: 12 grades, diploma, and training	0.641***	0.818***	0.377***	0.167***	0.954***	1.044***	1.042***
	(24.12)	(27.52)	(9.32)	(4.57)	(24.39)	(24.16)	(23.98)
Education: Some college	0.799***	0.963***	0.432***	0.215***	1.122***	1.265***	1.261***
	(34.51)	(37.45)	(12.04)	(6.65)	(32.53)	(32.22)	(31.82)
Education: BA	0.961***	1.193***	0.462***	0.351***	1.386***	1.540***	1.535***
	(37.47)	(42.00)	(11.48)	(9.89)	(34.78)	(35.82)	(35.46)
Education: Advanced degree	0.980***	1.312***	0.405***	0.422***	1.545***	1.576***	1.570***
	(28.80)	(36.26)	(7.50)	(9.18)	(27.53)	(29.70)	(29.42)
Observations	38704	31513	26887	25568	27297	18690	18689

Equations (1) and (2) are ordered probits, (3), (4), and (5) are probits, and (6) and (7) are ordinary regressions. All specifications include year fixed effects and all but (6) state fixed effects. t-values are in parentheses, and *, **, and *** denotes significant at the 10%, 5%, and 1% levels.

Table 3: The effect of income and being informed on voting for republicans

	President			Congress
	(1)	(2)	(3)	(4)
Income	0.0943***	0.106***	0.0371***	0.0999***
	(6.28)	(6.92)	(6.93)	(6.94)
Informed	-0.103***	-0.0951***	-0.0335***	-0.0638**
	(-3.26)	(-2.99)	(-3.06)	(-2.10)
Income×Informed	0.0278***	0.0245**	0.00861**	0.0171*
	(2.83)	(2.46)	(2.51)	(1.84)
Observations	9723	9715	9722	11139

Equations (1), (2) and (4) are probit estimations, equation (3) an ordinary regression. All specifications include age, age squared, sex, 7 dummies on educational level, and year dummies. Specifications (1), (3) and (4) also have state fixed effects. t-values are in parentheses, and *, **, and *** denotes significant at the 10%, 5%, and 1% levels.

percentile on the level of information increases the coefficient on income in the specification in Column (2) from 0.138 to 0.171, which corresponds to about a 24% increase in the impact. The results for voting for Congress reported in Column (4) are somewhat less strong but similar in sign and magnitude.

3.4 Taste variation and the level of information

Now we perform a test of our main mechanism underlying Theorem 1. The theoretical framework will be operationalized below and slightly extended. To test whether, for a given policy position, more informed voters are more able to cast their votes in relation to their interest, we assume that voter i and the two parties A and B are located in a policy space equipped with a metric $\|\cdot\|$.[7] The voters position is g_i and the parties are at g^A and g^B. Voter i will vote for party A if

$$\left\|g_i - g^A\right\| + \sigma_i \varepsilon_i^A < \left\|g_i - g^B\right\| + \sigma_i \varepsilon_i^B. \tag{10}$$

When $\varepsilon_i^A - \varepsilon_i^B$ has a cumulative density function F, the probability of voting A is then

$$\Pr\left(\text{Vote } A\right) = F\left(\frac{\left\|g_i - g^B\right\| - \left\|g_i - g^A\right\|}{\sigma_i}\right), \tag{11}$$

which indicates that the position is more important if σ_i is low, which we interpret as the level of information being high. To test this, we approximate the numerator by

$$\left\|g_i - g^B\right\| - \left\|g_i - g^A\right\| = \beta_t' g_i \tag{12}$$

where β_t is a time specific vector incorporating the relevant position of the parties. The variance is modeled as

$$\ln \sigma_i^2 = \gamma I_i \tag{13}$$

---

[7]Notice that this is not necessarily an Euclidean metric. Particularly, it may be reasonable to put more emphasis on distance in some dimensions than in others.

where I_i corresponds to i's level of information. Assuming that $\varepsilon_i^A - \varepsilon_i^B \sim N(0,1)$, we can estimate the parameters of the model using a heteroskedastic probit model.

Table 4 shows the results from year by year estimation for this relationship. The first panel shows the estimates of the effect of own policy position (the βs) and the second panel the variance component (γ). As we would expect, policy positions generally have a large impact on voting behavior, suggesting that voting is to a certain extent determined by political position. However, we notice that in most years $\gamma < 0$, so the variance σ_i^2 is decreasing in the level of information. Hence policy position has a more consistent impact on voting behavior for the more informed voters than for the less informed voters, which is in line with Theorem 1.

4   Conclusion

In the present contribution we have introduced a new channel that can explain why the levels of redistribution observed in reality are lower than those predicted by standard models of Downsian electoral competition. In the first part we have set up a formal model in which education leads both to a higher income and to stronger incentives for acquiring political knowledge. Poor voters are on average less informed about political issues and observe the parties' platforms with more "noise". We have shown that in such a framework parties put a lower weight on the redistribution preferences of poor voters and that the parties converge to a platform with lower redistribution levels than under complete information.

In the empirical part we have analyzed US data for presidential and congressional elections since 1960. It has first been shown that richer and more educated voters are more likely to be informed. Further, we have found that rich voters have a higher propensity to vote republican the more informed they are, which is in line with our theory. Last, there is evidence that information reduces the variance component of electoral decisions.

The present contribution has succeeded in presenting a realistic mechanism for solving the "redistribution puzzle". The empirical evidence is in line with the predictions of the theory. However, further research on this topic is needed. In particular, it would be promising to assess empirically if the results also hold for other countries than the USA.

References

Austen-Smith, David and Jeffrey Banks, 1996, "Information Aggregation, Rationality and the Condorcet Jury Theorem", *American Political Science Review* 90: 34-45.

Bartels, Larry, 1996, "Uninformed Votes: Information Effects in Presidential Elections", *American Journal of Political Science* 40: 194-230.

Corneo, Giacomo and Hans Peter Grüner, 2000, "Social limits to redistribution", *American Economic Review* 90: 1491-1507.

Table 4: Political position and voting in a model of individual-specific variances

	1960	1964	1968	1972	1976	1980	1984	1992	1996	2000	2004
Party of Pres Vote- 2 Major Parties											
Should Govt Support Health Care	0.809***	1.143***	0.724***								
	(5.00)	(6.22)	(3.91)								
Should Govt Guarantee Jobs	0.365***	0.332*	0.286								
	(2.63)	(1.84)	(1.55)								
Level of U.S. Concern for World Pro	-0.185		-0.00397	0.208	0.538***	0.166	0.220	1.145***	-0.218		0.294
	(-1.22)		(-0.02)	(0.69)	(2.92)	(0.62)	(0.69)	(3.30)	(-1.03)		(1.29)
Does Civil Rights Push Too Fast		0.336**		0.159	0.109	0.138	0.537**	-0.000374			
		(2.07)		(0.96)	(1.08)	(1.16)	(2.23)	(-0.00)			
Does R Favor Segregation		0.196	-0.0440	-0.152	-0.334***						
		(1.49)	(-0.34)	(-0.93)	(-2.70)						
Should Govt Ensure School Integrati		-0.209	0.101	0.487**	0.495***			0.394*		-0.828*	
		(-1.19)	(0.58)	(2.36)	(3.24)			(1.92)		(-1.89)	
Is the Govt in Washington Too Stron		1.172***	0.577***		0.206*	0.369*		0.541**		0.325	
		(6.15)	(3.55)		(1.74)	(1.93)		(2.48)		(0.88)	
R Position 7pt Urban Unrest Scale			0.138***		0.0121		0.0296	0.0424			
			(2.82)		(0.38)		(0.18)	(0.79)			
Liberal-Conservative 7pt Scale				0.370***	0.235***	0.479***	0.338**	0.420***	0.629***		0.733***
				(3.97)	(3.48)	(5.10)	(2.02)	(3.96)	(7.98)		(6.93)
R Position 7pt Govt Health Insuranc				0.166***	0.0192		0.0931**	0.256***	0.144***	0.0217	0.0832
				(3.61)	(0.74)		(2.11)	(3.49)	(2.78)	(0.21)	(1.61)
R Position 7pt Govt Guaranteed Jobs				0.0903	0.0977***	-0.00513	0.224**	0.0726	0.173***	0.459***	0.247***
				(1.63)	(2.42)	(-0.10)	(2.37)	(1.03)	(2.97)	(3.02)	(4.47)
R Position 7pt School Busing Scale				0.128*	-0.104**	0.202***	-0.139**				
				(1.79)	(-2.48)	(3.17)	(-2.55)				
Should Govt Cut Military Spending				0.606***	0.333**						
				(3.15)	(2.31)						
R Position 7pt Rights of Accused Sc				0.0286	0.00723						
				(0.61)	(0.23)						
R Position 7pt Womens Equal Role Sc				-0.00856	-0.0325	-0.00491	0.0191	-0.0320	-0.0579	0.0319	-0.0234
				(-0.18)	(-0.97)	(-0.11)	(0.40)	(-0.49)	(-0.98)	(0.27)	(-0.33)
When Should Abortion Be Allowed				-0.162	0.0180	0.179					
				(-1.59)	(0.30)	(1.47)					
When Should Abortion Be Allowed by						-0.0763	-0.198**	-0.244**	-0.331***	-0.147	-0.268***
						(-0.67)	(-2.15)	(-2.34)	(-3.77)	(-0.81)	(-2.92)
R Position 7pt Govt Services/Spendi							-0.0398	-0.154*	-0.247***	-1.001***	-0.189***
							(-0.36)	(-1.83)	(-3.71)	(-3.52)	(-2.94)
R Position 7pt Environmental Regula									0.122**	0.152	
									(2.07)	(1.24)	
ln σ^2											
Informed	-0.0769	-0.191*	-0.111	-0.124	-0.517***	-0.322*	-0.620	-0.283*	0.0142	-0.693	-0.184
	(-0.57)	(-1.90)	(-0.67)	(-1.04)	(-2.96)	(-1.92)	(-1.34)	(-1.83)	(0.20)	(-1.08)	(-1.57)
Observations	515	414	343	322	338	341	263	299	537	152	478

All estimations are probits, and all specifications includes year and state fixed effects. t-values are in parentheses, and *, **, and *** denotes significant at the 10%, 5%, and 1% levels.

14

Della Vigna, Stefano and Ethan Kaplan, 2007, "The Fox News Effect: Media Bias and Voting", *Quarterly Journal of Economics* 122: 1187-1234.

Delli Carpini, Michael and Scott Keeter, 1996, *What Americans Know About Politics and Why It Matters*, New Haven, Yale University Press.

Downs, Anthony, 1957, *An Economic Theory of Democracy*, New York, Harper and Row.

Feddersen, Timothy and Wolfgang Pesendorfer, 1996, "The Swing Voter's Curse", *American Economic Review* 86: 408-24.

Feddersen, Timothy and Wolfgang Pesendorfer, 1997, "Voting Behavior and Information Aggregation in Elections with Private Information", *Econometrica* 65: 1029-58.

Feddersen, Timothy and Alvaro Sandroni, 2006, "Ethical Voters and Costly Information Acquisition", *Quarterly Journal of Political Science* 1: 287-311.

Fischer, Alastair J., 1999, "The probability of being decisive", *Public Choice* 101: 267-83.

Gelman, Andrew, Gary King and W. John Boscardin, 1998, "Estimating the probability of events that have never occurred: When is your vote decisive?", *Journal of the American Statistical Association* 93: 1-9.

Gilens, Martin, 2001, "Political Ignorance and Collective Policy Preferences", *American Political Science Review* 95: 379-96.

Gul, Faruk, and Wolfgang Pesendorfer, 2006, "Partisan Politics and Aggregation Failure with Ignorant Voters", mimeo, Princeton University.

Grofman, Bernard, 2004, "Downs and two-party convergence", *Annual Review of Political Science* 7: 25-46.

Harms, Philipp and Stefan Zink, 2003, "Limits to redistribution in a democracy: a survey", *European Journal of Political Economy* 19: 651-68.

Hirschman, Albert and Michael Rothschild, 1973, "The changing tolerance for income inequality in the course of economic development", *Quarterly Journal of Economics* 87: 544-66.

Larcinese, Valentino, 2005, "Electoral Competition and Redistribution with Rationally Informed Voters", *Contributions to Economic Analysis & Policy* 4: Issue 1, Article 4.

Lind, Jo Thori, 2005, "Why is there so little redistribution?", *Nordic Journal of Political Economy* 31: 111-25.

Lupia, Arthur, 1992, "Busy Voters, Agenda Control, and the Power of Information", *American Political Science Review* 86: 390-403.

Martinelli, César, 2006, "Would rational voters acquire costly information?", *Journal of Economic Theory* 129: 225-51.

McKelvey, Richard and Peter Ordeshook, 1985, "Elections with limited information: A fulfilled expectations model using contemporaneous poll and endorsement data as information sources", *Journal of Economic Theory* 36: 55-85.

Meltzer, Allan and Scott Richard, 1981, "A rational theory of the size of government", *Journal of Political Economy* 89: 914-27.

Moene, Karl Ove and Michael Wallerstein, 2001, "Inequality, social insurance, and redistribution", *American Political Science Review* 95: 859-74.

Moene, Karl Ove and Michael Wallerstein, 2003, "Earnings inequality and welfare spending: A disaggregated analysis", *World Politics* 55: 485-516.

Mulligan, Casey and Charles Hunter, 2003, "The empirical frequency of a pivotal vote", *Public Choice* 116: 31-54.

Olson, Mancur, 1965, *The Logic of Collective Action*, Cambridge MA, Harvard University Press.

Palfrey, Thomas and Keith Poole, 1987, "The Relationship between Information, Ideology, and Voting Behavior", *American Journal of Political Science* 31: 511-30.

Perotti, Roberto, 1996, "Growth, income distribution, and democracy: What the data say", *Journal of Economic Growth* 1: 149-87.

Persson, Torsten, and Guido Tabellini, 2002, *Political Economics: Explaining Economic Policy*, Cambridge MA, MIT Press.

Piketty, Thomas, 1995, "Social mobility and redistributive politics", *Quarterly Journal of Economics* 110: 551-84.

Roberts, Kevin, 1977, "Voting over income tax schedules", *Journal of Public Economics* 8: 329-40.

Roemer, John, 1998, "Why the poor do not expropriate the rich: an old argument in new garb", *Journal of Public Economics* 70: 399-424.

Rohner, Dominic, 2007, "Coup at the Polls: Information, Closeness of Elections and Bad Politicians", mimeo, University of Cambridge.

Romer, Thomas, 1975, "Individual welfare, majority voting and the properties of a linear income tax", *Journal of Public Economics* 4: 163-85.

Strömberg, David, 2004, "Radio's Impact on Public Spending", *Quarterly Journal of Economics* 119: 189-221.

Wittman, Donald, 1989, "Why Democracies Produce Efficient Results", *Journal of Political Economy* 97: 1395-424.