Redistribution in a Model of Voting and Campaign Contributions*

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Abstract

This paper reassesses the relationship between inequality and redistribution, in the context of a model where individual political participation is endogenous and can take two distinct forms: voting and contributing to campaigns. This model, which embeds as a specific case the standard median-voter-based prediction that higher inequality leads to more redistribution, shows that the interaction between contributions and voting can explain why this prediction fails to hold: Higher inequality leads to an increase in the contributions of wealthier individuals relative to those of poor individuals, and this shifts the political system in favor of the former. In equilibrium, there is a non-monotonic relationship in which redistribution is initially increasing and eventually decreasing in inequality. The model also predicts how inequality will affect political participation. I present empirical evidence supporting those predictions, and hence the mechanism proposed, using data on campaign contributions and voting from US presidential elections.

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1 Introduction

A casual observer considering the relationship between inequality and redistribution would probably conjecture that high levels of the former are associated with low levels of the latter. After all, the United States displays both high levels of market-generated inequality and low levels of redistribution, relative to Western European countries: The Gini coefficient of the pre-tax income distribution in the US hovers around 0.40, whereas the European average tends to be under 0.30; and the US government spends around 15% of GDP on social programs, while the European average is above 25% and European social programs tend to be more redistributive (see Alesina and Glaeser 2004, ch. 2 and 3). Similarly, the evolution of inequality and redistribution within the US after the late 1960s has displayed both a marked increase in the former and a decrease in the latter: The Gini coefficient of the distribution of family income has gone from around 0.35 in the late 1960s to something close to 0.44 in 2003, a period of time over which taxes on income from capital, top marginal tax rates on income, and the estate tax have all gone down considerably (see McCarty, Poole and Rosenthal 2006, ch. 6).

That casual observer would not find support for her conclusion in the classic answer provided by the theoretical literature dealing with the question, which predicts a positive effect of inequality on the level of redistribution in equilibrium (Meltzer and Richard 1981).[1] This answer builds on a median-voter type of framework, in which higher levels of inequality – typically measured by the difference between mean and median income – translate into a poorer decisive agent in the political arena, who will then demand more redistribution. In light of its elegance and intuitive appeal, this result has been widely used in the literature ever since.[2] In spite of that, and perhaps unsurprisingly to that hypothetical casual observer, a consensus of sorts has emerged that the empirical evidence is by-and-large at odds with that result: As put by Persson and Tabellini (2000, p. 52), "it has been hard to find compelling empirical evidence supporting the predictions" of that standard framework linking inequality and redistribution.[3]

This paper's first main contribution is to propose a framework that tackles this puzzle and clarifies the relationship between inequality and redistribution, while maintaining the tractability of the median-voter framework. This framework builds on two cornerstones: Individuals' decisions

[1] Models that have preceded Meltzer and Richard (1981), along similar lines, are Romer (1975) and Roberts (1977).

[2] E.g. Alesina and Rodrik 1994, Persson and Tabellini 1994, Bolton and Roland 1997; see Persson and Tabellini 2000, ch. 6, for other examples.

[3] This is what is summarized, for instance, by Bénabou's (1996) or Perotti's (1996) surveys of the cross-country evidence on the relationship between inequality and redistribution. For some studies providing favorable evidence, see for instance Meltzer and Richard (1983) or Milanovic (2000).

on political participation are *endogenous*, and their participation can take different forms, namely *voting* and *contributing* money to campaigns, which interact with each other. In doing so, the paper's second main contribution is to provide an approach to incorporating these two features into an otherwise standard median-voter type of analysis.

I start from the idea that individuals rationally recognize that their individual vote and donation will almost certainly not be decisive for the outcomes. Instead, voting and contribution decisions are treated symmetrically, both being essentially driven by consumption motives.[4] As a result, the way in which contributions operate, in particular, is not by buying favorable policies, nor do they directly influence outcomes: In this model, as in reality, votes are what wins elections. Contributions, as in reality, can be used to influence voting behavior: Parties use them to build "get out the vote" operations, promote registration drives, advertise, in sum, to pay for things that increase the likelihood that their supporters will outnumber those of other parties in the polls (Rosenstone and Hansen 1996).

I add these two cornerstones to an otherwise standard model in the spirit of Meltzer and Richard (1981), where individuals differ in their levels of initial wealth, and where redistribution is determined as the outcome of an electoral political process. Quite importantly, no inherent distinction in terms of political behavior is assumed to separate individuals with different wealth levels. This model nests the usual prediction of higher inequality leading to more redistribution as a special case, where contributions do not affect voters' turnout. In the general case, however, the model displays an *endogenous* "wealth bias" in the political process: the decisive agent to which parties' platforms will cater will be wealthier than the median, in order to generate more contributions. In addition, an increase in inequality will lead the parties to move their platforms closer to the preferred positions of wealthier individuals, who have an even greater advantage in providing them with contributions. This will tend to shift the political system in favor of less redistribution, which goes in the opposite direction of the usual median voter effect. When this new "endogenous turnout" effect is taken into account, a non-monotonic relationship emerges in equilibrium: Redistribution will be decreasing in inequality when inequality is high, and decreasing in the opposite end of the spectrum.

Quite crucially, the focus on individual campaign contributions enables me to take advantage of the very good data available on such contributions in the US – vastly underexploited in the literature, to the best of my knowledge – that can be obtained from the Federal Election Commission (FEC). In fact, the model makes specific predictions about the mechanism through which the non-monotonic

[4] On this topic, see Ansolabehere, Figueiredo and Snyder (2003), and also the discussion in Section 2.

relationship arises, concerning the impact of inequality on total contributions, and its different effects on contributions by individuals according to their wealth, and on contributions amassed by parties according to their relative position on redistribution. I take these specific predictions to the data, identifying the impact of inequality out of cross-county variation in the context of the 2000 US presidential election, and they are indeed supported by the evidence. First, the impact of inequality on the level of contributions is positive, as predicted by the model. Second, the data show that inequality, despite increasing the *amount* that is contributed, decreases the *number* of contributions being made, consistent with a situation where the rich are contributing more, and the poor are donating less. This point is made stronger by the observation that the positive impact of inequality on the level of contributions is much larger in relatively wealthy counties. Finally, there is a strong positive effect of inequality on the contributions amassed by the Republicans, but a negative effect of inequality on the contributions gathered by the Democrats.

This paper relates directly to the large literature that has tried to tackle the discomfort generated by the perceived lack of empirical support for the standard median voter prediction. The first alternative, in that literature, is to consider the very natural possibility that political influence is related to economic resources: Inequality could fail to lead to more redistribution because the rich are disproportionately influential in the political arena.[5] This possibility has been explored in models such as Rodríguez (2004), where the lobbying power of the rich keeps redistribution in check by allowing them the possibility of buying political favors. Other models, such as Bénabou (2000), have directly assumed that the decisive agent is someone wealthier than the median, in light of the evidence that political participation is positively correlated with wealth and income.[6] This could easily lead to a reversion of the standard prediction. Along similar lines, empirical evidence from the political science literature (e.g. Solt 2005) has suggested that inequality disproportionately depresses political engagement of poorer individuals. In contrast with this literature, this paper proposes a clear mechanism through which economic resources translate into political influence, namely individual campaign contributions, instead of directly assuming in reduced form that money *is* political power, or that money buys favorable policies in a somewhat mechanical way. Because of that, I am able to draw on a very clear and specific empirical counterpart on which data are available.

[5] Glaeser (2005) also raises the possibility that reverse causality may be behind the observation: redistribution may reduce inequality. Bénabou (2000) explores the possibility of multiple equilibria raised by the interaction of these two avenues of causality.

[6] See Lijphart (1997) for a survey of the overwhelming evidence linking income and different forms of political participation.

Others have tried to deal with the empirical difficulties of the standard model by departing more sharply from it. Some examples are Lee and Roemer (2005) (preferences over redistribution mediated by preferences over labor market regimes), Iversen and Soskice (2006) (multidimensional redistribution and differences between electoral systems), and Roemer (1998) (multidimensional policy). Unlike this paper, they do not focus on endogenous political participation nor on campaign contributions, and precisely due to their being starker departures, they are not able to keep the tractability and the intuitive appeal that are major strengths of the standard framework.[7]

By focusing on endogenous political participation, this paper also relates to a long line of inquiry – early examples of which are Downs (1957) and Riker and Ordeshook (1968), and which is nicely surveyed by Feddersen (2004) – that has dealt with the rational determinants of the decision to vote. It also relates to a literature that has stressed the relationship between inequality and political participation (e.g. Rosenstone and Hansen 1996, Lijphart 1997; Solt 2005 and references therein). This literature, however, has typically fallen short of providing a satisfactory account of the mechanisms through which this relationship would emerge.[8]

Finally, the paper is also linked to the literature on modelling campaign contributions. This literature has indeed pointed out that campaign contributions can lead to departures from the median voter's preferred policies, and from those of non-contributors to the benefit of contributors (e.g. Austen-Smith 1987, Prat 2002, Coate 2004). Roemer (2006) has modeled a two-party system where, similarly to this paper, private campaign contributions can be used to affect electoral outcomes, and end up generating an endogenous "right-wing" bias, although he does not investigate the effects of changes in inequality on policy outcomes. This literature focuses on campaign contributions as an investment in "buying policy", whereas my model provides a framework where voting and contributions are treated symmetrically as resulting from the decisions of rational, politically-motivated individuals who recognize that their actions will have a negligible impact on aggregate outcomes.

The remainder of the paper is organized as follows: Section 2 presents some background on campaign contributions, especially in the context of US politics; Section 3 introduces the model; Section 4 contains the empirical analysis; and Section 5 concludes.

[7] There are other examples in a similar vein, in the sense of introducing starker departures from the basic framework, such as Bénabou and Ok (2001), who focus on individuals' expectations of upward mobility. For a recent survey, see Lind (2005).

[8] According to the American Political Science Association (APSA) Task Force on Inequality and American Democracy, "we know little about the connections between changing economic inequality and changes in political behavior." (APSA, 2004, p. 661) McCarty, Poole and Rosenthal (2006) propose an explanation, for the specific case of the US, based on immigration – since immigrants are typically poorer and barred from many forms of political participation. While I do not focus on this issue, this mechanism can certainly be viewed as complementary to the one I highlight.

2 Some Background on Campaign Contributions

Since the model I propose focuses on the role of campaign contributions as a distinctive form of individual political participation, it is useful to start with a few words on what characterizes these contributions in practice, as well as on the existing literature on the topic. This will help determine the modeling choices, and also provide some background for the empirical analysis that follows.

First of all, my analysis will focus on campaign contributions *by individuals*. On their survey on the role of money in US politics, Ansolabehere, de Figueiredo and Snyder (2003) emphasize that such individual contributions are the most important kind of political contributions in the US, and hence should be the focus of research on the topic. They correspond to most of the contribution money, and also to the "marginal" dollar, in the sense that whenever candidates face the greatest need to increase their funds, they tend to pursue them disproportionately. In addition, as argued by McCarty, Poole and Rosenthal (2006, ch. 5), the relative importance of individual contributions has increased over time, as donations by political action committees (PACs) have been increasingly restricted.[9]

As will be made clear in the description of the data I use, these contributions are typically very small, well below the legally imposed limits: My sample on individual contributions to candidates and national party committees in the 2000 US presidential elections has a median contribution of $500 for candidate committees, where the legal limit was $1,000, and $300 for party committees, on which limits were $20,000.[10] It is thus exceedingly unlikely that an individual contribution will make any difference in outcomes. As a result, strategic motives for contributing, as in "buying policy", are probably not the most appropriate way to think about these contributions. Besides the logical difficulty of explaining contributions as an investment given that they are so small in practice, the very fact that they are so small is also a puzzle if one thinks of them as such: if so much is at stake in terms of the value of government policies, why so little is contributed?[11]

The political science literature has recognized this feature, which largely parallels the well-known difficulties in explaining "rational" turnout (see Aldrich 1993). As a result, authors such as Ansolabehere, Figueiredo and Snyder (2003) or Poiré (2006) explicitly advocate an approach that

[9] Limits on donations by PACs have been kept constant, even without inflation adjustment, since 1974 (McCarty, Poole and Rosenthal 2006, p. 145).

[10] These numbers exclude the so-called "soft money", which was still allowed in the 2000 election, and was not subject to any limit. Including "soft money", the overall median is still $500. More on these definitions will come later, in the data description.

[11] This is precisely the point Ansolabehere, Figueiredo and Snyder (2003) raise, based on Tullock (1972), turning the common perception on its head: why is there so *little* money in US politics? In addition, they show that other empirical predictions of such an approach – e.g., contributions should grow as the role of government in the economy expands – are not borne out by the data.

recognizes that contributions should not be viewed as an investment only, but rather as a form of political participation which, as most other forms (including turnout), are largely driven by consumption motives. Quite unsurprisingly in such a setup, the same authors highlight the importance of income as a predictor of the likelihood of contributing, and of the size of contributions. In addition, the evidence clearly suggests that contributions are mostly given by individuals with relatively high income, and particularly motivated with respect to politics and specific political causes. For instance, it is well understood that people who contribute money to politics are disproportionately likely to vote, and vice versa.[12]

Apart from the determinants and motivations behind individual campaign contributions, a second set of questions regards their uses: How do they influence outcomes? One first possibility is that they are used to influence potential voters' opinions: Contributions could be used to fund political advertising that would convince some individuals to vote for a given party, when they would otherwise have voted for other parties. While this may well be part of the story, it is most likely not the main one: As Rosenstone and Hansen (1996, p. 163) argue, parties, "like political scientists, know that mobilization can increase participation, but it rarely changes preferences." In fact, parties focus their resources on making sure that voters who are likely to support them actually turn out to vote, via get-out-the-vote operations and related efforts. Such efforts do so, in sum, "because they offset some of the costs of participation and exploit social relationships to create social rewards for participation." (Rosenstone and Hansen, 1996, p. 8) In other words, campaign contributions matter mostly because they are used by parties to increase the likelihood of turnout by their supporters.

In sum, a few distinctive features seem to characterize political contributions by individuals in practice: (i) They are typically very small, and unlikely to make a difference in outcomes; (ii) They are strongly related with personal income; (iii) There is a strong correlation between contributions and other forms of political participation, such as turnout, at the individual level. These features will inform my model of endogenous voting and contributing behavior, to which I now turn.

3 Inequality, Campaign Contributions and Voting Behavior: A Model

3.1 Basic Setup

Let us consider the interaction between inequality, different forms of political participation, and redistribution outcomes in a simple model where political participation is endogenous. I start

[12] See Ansolabehere, Figueiredo and Snyder (2003), Rosenstone and Hansen (1996), and Verba, Schlozman and Brady (1995).

with a population of individuals (potential voters) in a continuum of length 1. These individuals are identical, except for their initial wealth level, denoted by w_i, and initial wealth is distributed according to a Pareto distribution. The cdf of the wealth distribution is thus given by:

$$F(w) = 1 - \left(\frac{w_{\min}}{w}\right)^{\frac{1}{\sigma}} \tag{1}$$

where $w_{\min}$ is the location parameter (minimum level of wealth in the distribution) and $\sigma \in (0,1)$ is the shape parameter.[13]

The basic results of the paper do not depend on the Pareto distribution: Appendix B shows how they obtain with a generic $F(w)$, under very mild conditions. (In fact, the key condition is that the distribution be skewed to the right, so that median wealth is smaller than mean wealth. This is also a crucial condition in the standard median-voter framework, and a well-established feature of existing wealth distributions.) However, in order to fully characterize the results, one needs to specify more precisely what is meant by changes in inequality – especially because, unlike in the standard median-voter framework, the relative wealth of the median individual will no longer be sufficient in this setup.

The Pareto distribution has a series of attractive properties that make it the natural choice in this setup. First of all, it is usually thought to be a good approximation of actual wealth and income distributions.[14] Second, it is rather convenient to parameterize changes in inequality in the Pareto distribution, in a way that directly maps onto the variables that will be used in the empirical analysis, using the parameter σ. In fact, it can be shown that the Gini coefficient, which will be used to measure inequality in the data, is in a one-to-one correspondence with σ: Gini is equal to $\frac{\sigma}{2-\sigma}$. In addition, similarly increasing relationships with respect to σ hold for other measures of inequality, such as the difference between the mean and the median. I will thus think of an increase in inequality simply as an increase in σ. (Since we are interested in changes in inequality keeping average income constant, and since the mean level of wealth, $\overline{w}$, is given by $\frac{1}{1-\sigma}w_{\min}$, our changes in σ will be accompanied by changes in $w_{\min}$ such that $\overline{w}$ remains constant. In other words, we set $w_{\min} = (1-\sigma)\,\overline{w}$.) Note, in particular, that the limit case $\sigma = 0$ corresponds to a situation of "perfect equality", where all individuals have the same wealth, and the other limit case $\sigma = 1$ corresponds to the polar opposite in which a single individual (of measure zero) holds all the wealth

[13] The assumption $\sigma < 1$ is needed so that the expected value exists. See Johnson, Kotz, and Balakrishnan (1994).

[14] See for instance Pareto's (1896) and Champernowne's (1953) seminal contributions. The approximation is very good especially for the top tails of distributions, which is where most of the action concerning campaign contributions is. In addition, Benhabib and Bisin (2006) obtain a Pareto distribution, endogenously, as the stationary distribution in an overlapping-generation model with bequest motives and redistributive taxation.

in the economy. Last but not least, assuming a Pareto distribution will prove to be analytically convenient.

In addition to the individuals, there are two parties, whose preferences and decision-making will be described later, and who compete in an election where the crucial decision is on redistribution. Each party will propose a given redistribution rate as its campaign platform and, in keeping with the Downsian tradition, they are able to commit to defending their proposed rate after the election. There are two forms of political participation that individuals can undertake: Voting and contributing resources to the parties. Votes are what decides the political outcome, but the parties can use campaign contributions in order to boost the turnout of their own supporters.[15]

Within this general setup, I will now focus on the decisions made by individuals and parties.

3.2 Individuals

Individuals in the model face two crucial decisions: The decision on whether to vote or not and the decision on whether to contribute or not – and, conditional on contributing, the amount to be given away in contributions, which will naturally detract from the individual's private consumption. In addition, after these decisions are taken, an individual who has chosen to vote and/or to contribute will decide in favor of which party she will cast her ballot and direct her contribution. I will consider these three dimensions separately.

3.2.1 Voting

I start with a very simple model of endogenous rational turnout. Consider rational individuals who recognize that the impact of his vote or contribution in final outcomes is negligible, but derives some "individual utility" from voting.[16] I denote this utility by δ_i, and I assume that it is orthogonal to the distribution of wealth, so that it is not imposed exogenously that richer individuals have an inherent tendency to vote relatively more than poorer individuals. I also assume for simplicity that this individual utility is uniformly distributed over the interval $[0, 1]$. Each individual also faces an individual cost $c_i \in [0, 1]$ of voting, which includes the actual cost of going to the polls, and also the costs associated with information gathering and the like. An individual i will choose to vote if and only if $\delta_i > c_i$.

[15] For simplicity, I will not consider the possibility that parties use their resources to create obstacles to the turnout of their opponent's supporters.

[16] This model thus essentially adapts the classic formulation by Riker and Ordeshook (1968), by including the idea that the probability of an individual vote affecting the outcome is negligible. See Abrams, Iversen and Soskice (2005).

3.2.2 Contributions

The individuals' decision on contributions comprises two steps: First individuals decide whether to contribute, and then those who contribute decide how much they will donate. Regarding the first step, I assume that only the more politically motivated individuals will choose to contribute. Individual political motivation is measured by the same parameter δ_i, so that an individual will contribute if and only if $\delta_i > \overline{\delta}$, where $\overline{\delta}$ is an exogenous threshold. This assumption is consistent with the stylized fact, described in the previous section, that individuals that are more likely to contribute are also more likely to vote.

On the second step, I start from the recognition that every individual understands that his own contribution is too small to make a difference in the outcome of the election. In light of that, individuals contribute for the same reason they vote: Because they derive utility from doing so. On the other hand, resources devoted to contributions are made unavailable for consumption, and individuals thus face a trade-off between these two competing uses.

I start with a very simple assumption that individuals derive utility from contributions and consumption according to a Cobb-Douglas specification:

$$\begin{aligned} u(z_i, x_i) &= z_i^{\lambda} x_i{}^{1-\lambda} \\ \text{s.t. } z_i + x_i &\leq w_i \end{aligned} \tag{2}$$

where z_i is the individual contribution, and x_i is consumption. This formulation naturally leads to a result where those individuals who contribute will donate the same fixed fraction of their wealth, regardless of their position in the wealth distribution:

$$z_i = \lambda w_i \tag{3}$$

While this simple assumption helps in clarifying the essence of what drives the main results, I will later extend the model to consider the more realistic possibility that contributions are a luxury good.

3.2.3 Preferences over Redistribution

Individuals rationally decide whether to vote or contribute, as described above. Once they have decided to do so, they will favor the party whose platform is closer to their own interests. In other words, I maintain the assumption that individuals vote according to their economic interests, as in the standard median voter framework, and the same goes for contributions. One thus needs to specify the individual's preferred redistribution rate.

Still with the aim of building the model as close as possible to the usual median voter framework, as described for example in Persson and Tabellini (2000), redistribution is described by a linear tax on wealth, at rate τ, the proceeds of which are redistributed in lump-sum manner to all individuals. However, there is a convex cost of taxation, $\phi(\tau)$, which for analytical simplicity I assume to be quadratic (as in Bolton and Roland 1997): $\phi(\tau) = \frac{\tau^2}{2}\overline{w}$. Each individual will have a preferred tax rate, depending on his or her position on the wealth distribution – I also assume, for simplicity, that the preferred tax rate does not take into account political contributions.[17] In sum, an individual will want to maximize his disposable wealth, which is given by:

$$w_i^d = (1-\tau)w_i + T \tag{4}$$

where $T = \tau\overline{w} - \phi(\tau)$. Using the expression for $\phi(\cdot)$, this implies that individual i's preferred tax rate is:[18]

$$\tau_i = \begin{cases} \frac{\overline{w} - w_i}{\overline{w}}, \text{ if } w_i < \overline{w} \\ 0, \text{ otherwise} \end{cases} \tag{5}$$

The result is quite intuitive: wealthier individuals will prefer lower tax rates, implying less redistribution. In particular, anyone whose wealth is above the mean level will prefer that there be no redistribution whatsoever.

Individual i, in case she decides to vote and/or contribute, will thus do so in favor of the party whose platform is closest to τ_i.

3.3 Parties

The next step is to describe the positions of the parties with respect to redistribution. As described above, each party will propose a given redistribution rate as its campaign platform, and the assumption is that the parties are committed to defending their proposed rate after the election.

3.3.1 Choosing a Platform

How do the two parties choose their campaign platforms? Just as in the Downsian framework from which the standard median voter predictions emerge, I assume that parties care about being in

[17] This assumption does not interfere with any of the comparative statics results I am interested in. Suppose an individual computes her preferred tax rate taking into account her wealth after contributions. Considering that the probability of contributing is independent of wealth, the individual's "expected" wealth after contributions is given by $\left[1 - \left(1 - \overline{\delta}\right)\lambda\right] w_i$. It is straightforward to check that this will lead to the same result as in (5), only multiplied by this constant $\left[1 - \left(1 - \overline{\delta}\right)\lambda\right]$. This will leave the comparative statics unaffected.

[18] One could assume in principle that wealthier individuals would be in favor of a negative tax rate, i.e. a linear income subsidy financed by a lump-sum tax. I believe this possibility is not very interesting empirically, so I leave it out in what follows.

power. However, in order to generate the different preferences over redistribution, I assume that parties care about the equilibrium level of redistribution as well. Following Alesina and Rosenthal (1995), I introduce these features by having a utility function where parties derive some utility $\widehat{u}$ from winning the election, and that also increases as equilibrium redistribution approaches the party's ideal rate. As a result, Party j has the following preferences:

$$U_j = (1-\theta)u\left(\tau, \widehat{\tau}_j\right) + \theta \widehat{u} I(\pi_j \geq \pi_{-j}) \tag{6}$$

where τ is equilibrium redistribution, $\widehat{\tau}_j$ is Party j's ideal rate of redistribution, I is the indicator function, and $\theta \in [0,1]$. The maintained assumptions are that $u(\cdot)$ is decreasing in the absolute value of $\tau - \widehat{\tau}_j$, and concave. I also set $\widehat{\tau}_R = 0$ and $\widehat{\tau}_D = 1$: Party R (for "rich") wants as little redistribution as possible, while Party D (for "destitute") wants as much of it as it can get away with. Finally, θ measures the degree to which parties are motivated by getting to office; in that sense θ can be interpreted as measuring how close to the Downsian framework the model is.

3.3.2 Campaign Spending

Once parties announce their platforms, each individual who decides to vote and/or to contribute will do so, in equilibrium, for the party whose platform is closest to his or her preferred rate of redistribution. Each party will in turn direct its resources to increasing the turnout of its potential supporters: I assume that parties are able to discern who their likely supporters are, since the individuals' preferences over the two parties depend only on their wealth, which is assumed to be observable. The link between voting and contributions comes from the aforementioned assumption that parties will use contributions in order to increase turnout by their supporters. In words, a party uses the resources it is able to collect to build get-out-the-vote operations and to "mobilize its base", and that is how contributions can affect electoral outcomes. More precisely, we assume that the individual cost of voting is a function of the amount of contributions collected by the party that targets the group of which the individual is a member: $c_i = c(Z_j)$, where Z_j denotes that total amount, and $c'(\cdot) < 0$.[19] I also assume that $c''(\cdot) > 0$, implying that there are decreasing returns to the investment of campaign resources, and that $\lim_{Z\to\infty} c(Z) = 1$, meaning that no voter will turnout in the absence of spending.[20]

[19] Other approaches to contributions in the literature focus on its role in providing information or pure advertisement, which would affect individuals' preferences over candidates. (See for instance Austen-Smith (1987), Prat (2002), Coate (2004).) As argued above, I emphasize the role of contributions in promoting the turnout of potential supporters.

[20] In fact, it suffices that turnout be sufficiently small in that situation. However, this assumption simplifies the algebra considerably.

3.4 Equilibrium

Having described the behavior of individuals and parties, one can now characterize the equilibrium. First of all, instead of imposing a "winner-takes-all" assumption whereby whichever party gets a majority of votes manages to impose its preferred policies, I draw upon Alesina and Rosenthal (1995) in postulating the following "non-majoritarian" approach:

$$\tau = \frac{\pi_D \tau_D + \pi_R \tau_R}{\pi_D + \pi_R} \tag{7}$$

where π_j is the number of votes obtained by Party j, and τ_j is the redistribution rate proposed by Party j. In words, equilibrium redistribution is given by a convex combination of the preferred rates of each party, where the weights are given by the number of votes the party obtains. This captures the idea that a party is able to influence equilibrium policies according to its electoral strength, which is realistic in a context where policy emerges from the combined actions of the executive and legislative branches.[21] In addition, this assumption rules out the discontinuities that emerge from a "winner-takes-all" setup, thus keeping the model analytically simpler without otherwise affecting the results.[22] This formulation is also consistent with the idea that it is optimal for individual i to vote for Party j if and only if $|\tau_i - \tau_j| < |\tau_i - \tau_{-j}|$. We can thus define:

Definition 1 *An equilibrium is defined by* $(\Omega_D^T, \Omega_R^T, \Omega_D^Z, \Omega_R^Z, \tau_D, \tau_R, Z_D, Z_R)$ *such that:*

1. $\Omega_D^T = \{i|\delta_i > c(Z_D) \text{ and } |\tau_i - \tau_D| < |\tau_i - \tau_R|\}$, *and* $\Omega_R^T = \{i|\delta_i > c(Z_R) \text{ and } |\tau_i - \tau_R| < |\tau_i - \tau_D|\}$.

2. $\Omega_D^Z = \left\{i|\delta_i > \overline{\delta} \text{ and } |\tau_i - \tau_D| < |\tau_i - \tau_R|\right\}$, *and* $\Omega_R^Z = \left\{i|\delta_i > \overline{\delta} \text{ and } |\tau_i - \tau_R| < |\tau_i - \tau_D|\right\}$

3. $\tau_j \in \arg\max_\tau \{U_j\}$, $j = D, R$, *and* U *described by (6).*

4. $Z_j = \int_{i \in \Omega_j^Z} z_i$, $j = D, R$, *and* z_i *described by (3).*

5. τ *is described by (7).*

In words, the equilibrium is defined as follows: Let Party j propose a redistribution platform τ_j, then the set Ω_j^Z defines the set of individuals who contribute to Party j, respectively. They will be those individuals such that the platform τ_j is closer to their preferred redistribution rate – which depends on the individual's wealth according to (5) – than the other party's platform, and such that their political motivation δ_i is sufficiently strong to get them to spend money in politics (Part 2).

[21] See the discussion in Alesina and Rosenthal (1995, p. 45-47).

[22] More precisely, as discussed in Alesina and Rosenthal (1995, p. 27), a "winner-takes-all" assumption would generate policy convergence, since we are in a setup without uncertainty about voters' preferences. Since I want to be able to differentiate between parties, full convergence would be unappealing.

Given this set of individuals, Party j's volume of resources (Part 4) is able to induce a given level of turnout among their possible supporters, who are once again those individuals who prefer Party j's platform over the other party's. This level of turnout translates into the set Ω_j^T (Part 1), which comprises the individuals who vote for Party j, and the number of votes each party obtains will in turn determine the equilibrium τ, as described by (7) (Part 5). Finally, equilibrium requires that, taking into account the redistribution rate that will emerge from this political process, the platforms that the parties had proposed to begin with are optimal for them, given their utility function (6) (Part 3).

One can now start characterizing equilibrium more precisely by stating a series of lemmas:

Lemma 1 *In equilibrium, it must be the case that* $\tau_D \geq \tau_R$.

Proof. *All proofs are in the Appendix A.* ■

The interpretation of this lemma is very simple: In equilibrium, the party that likes redistribution will propose a higher rate than the party that dislikes it. As a result of this, and given the monotonicity of (5), we know that in equilibrium voters and contributors who are relatively poor will favor Party D, since this party pushes for more redistribution. Given this lemma, the Pareto distribution of wealth, and the uniform distribution of δ_i, we also have the following:

Lemma 2 *In equilibrium, it must be the case that:*

1. $\Omega_D^T, \Omega_D^Z \subset [0, p^*]$, *and* $\Omega_R^T, \Omega_R^Z \subset (p^*, 1]$.
   where $p^* = 1 - \left[\frac{2(1-\sigma)}{2-(\tau_D+\tau_R)}\right]^{\frac{1}{\sigma}}$ *is the "decisive" percentile – the one at which an individual is indifferent between Party D and Party R.*

2. *The total contributions gathered by Party D and Party R are given by:*

$$Z_D = \lambda \left(1 - \overline{\delta}\right) \left(1 - (1 - p^*)^{1-\sigma}\right) \overline{w} \tag{8}$$

$$Z_R = \lambda \left(1 - \overline{\delta}\right) (1 - p^*)^{1-\sigma} \overline{w} \tag{9}$$

Proof. *See Appendix A.* ■

The first part of this lemma follows immediately from Lemma 1: The supporters of Party D will be poorer than those of Party R. As a result, Parts 1 and 2 of Definition 1 can be summarized, for our purposes, by a single number p^* – the decisive percentile in equilibrium. The second part holds because the total amount of contributions gathered by Party D is a share $\lambda\left(1 - \overline{\delta}\right)$ of the total wealth held by the population of its potential supporters, who are the individuals below the p^* percentile. Party R collects the same share of the wealth held by the remaining individuals, who constitute its potential supporters. Given these contribution totals, we have the following values for the number of votes each party obtains, once again using the uniformity of δ_i:

$$\pi_D = \left(1 - c\left(\lambda\left(1-\overline{\delta}\right)\left(1-(1-p^*)^{1-\sigma}\right)\overline{w}\right)\right)p^* \tag{10}$$

$$\pi_R = \left(1 - c\left(\lambda\left(1-\overline{\delta}\right)(1-p^*)^{1-\sigma}\,\overline{w}\right)\right)(1-p^*) \tag{11}$$

Finally, it is possible to state the following:

Lemma 3 *For any $\theta \in [0,1]$, in equilibrium $\pi_D = \pi_R$: Parties obtain the same number of votes.*

Proof. *See Appendix A.* ■

Note that this result is valid for any value of θ, which means that it holds regardless of whether there is policy convergence (in the sense of $\tau_D = \tau_R$). If $\theta = 1$, there will be policy convergence just as in the Downsian framework, since the parties are identical; on the other hand, if $\theta = 0$ and parties are purely ideological, it is easy to show that full convergence cannot be an equilibrium.[23]

Using these three lemmas, I can now characterize the equilibrium of the model. Lemmas 2 and 3, and equations (10) and (11), together imply that in equilibrium the following will hold:

Proposition 1 ***(Equilibrium)*** *An equilibrium exists, and it will be characterized by a unique (p^*, τ) such that:*

$$p^* = \frac{(1-c(Z_R))}{(1-c(Z_R)) + (1-c(Z_D))} \tag{12}$$

$$\tau = \max\{1-(1-\sigma)(1-p^*)^{-\sigma}, 0\} \tag{13}$$

Proof. *See Appendix A.* ■

Proposition 1 can be understood with the help of Figure 1, which plots the RHS of equation (12).[24] The equilibrium p^* is given by a fixed point of this expression, which exists and is unique,

[23] To see this, note that $\tau_D = \tau_R$ implies that $\frac{\partial \tau}{\partial \tau_j} > 0$. This means that Party D will have an incentive to decrease its proposed rate, while Party R will have an incentive to increase its rate.

[24] Figure 1 is constructed using the functional form $c(Z) = \frac{1}{1+Z}$, and the following parameter values: $\lambda = 0.1$, $\overline{\delta} = 0.1$, $\overline{w} = 10$, $\sigma = \frac{1}{3}$.

given that there is continuity and monotonicity.[25] Equation (13) then describes the equilibrium redistribution rate that corresponds to this p^*. Note in particular, from (5), that this rate is precisely the one that is desired by the p^* agent in the distribution, which justifies its designation as the "decisive" agent in the political process. If the value of p^* yielded by (12) happens to be at or above the percentile at which an individual holds exactly $\overline{w}$, which is defined as $\overline{p}(\sigma) \equiv 1-(1-\sigma)^{\frac{1}{\sigma}}$, then the equilibrium tax rate will be equal to zero, since negative tax rates have been ruled out.

[FIGURE 1 HERE]

The equilibrium follows the same logic of the median voter theorem: In equilibrium, as shown by Lemma 3, parties will split the distribution of actual voters right down the middle – otherwise one of the parties could improve its position. As a result, the equilibrium policy will be the median voter's preferred rate. The key difference is that here the median *voter* is not necessarily the median *agent*, but rather the agent at the p^* percentile, and this p^* is determined endogenously.

3.5 Discussion

Now it is possible to analyze the impact of inequality on the endogenous variables, namely turnout, contributions, and redistribution. The first crucial result can be stated as:

Proposition 2 ***(Median voter)*** *If $c'(\cdot) = 0$, that is contributions do not affect turnout, then:*

1. $p^* = \frac{1}{2}$*: The "decisive" percentile is the median.*

2. $\frac{\partial \tau}{\partial \sigma} > 0$*: Equilibrium redistribution increases with inequality.*

Proof. *See Appendix A.* ■

This proposition spells out the standard median-voter-based result regarding the effect of inequality on redistribution, which I thus obtain as a particular case of my model. If the channel through which contributions affect turnout is shut down, then this setup is essentially identical to the standard one, and we are back to the situation where the median agent is the decisive (median) voter. The only effect of an increase inequality is to increase the desire for redistribution of

[25] The uniqueness of the equilibrium hinges on the assumption that λ is constant. If instead we have a situation where, for instance, a contributor will donate a greater share of her income if the party's position is closer to her preferred policy, the possibility of multiple equilibria arises. (Such an extension is available upon request.) The intuition is that, under such circumstances, increasing its pool of potential supporters may not be in a party's interest, as the policy change required for that may alienate its core supporters so much that it ends up depressing the party's total contributions and turnout. If λ is not too sensitive, we still have uniqueness, and the results follow through.

the median agent, as he becomes poorer relative to the mean, and thus stands to gain more from redistribution.

It is crucial for this result that inequality does not affect turnout. Indeed, when contributions do affect turnout, another channel opens up through which inequality can affect redistribution. The first consequence of this can be stated as follows:

Proposition 3 ***(Wealth bias)*** *If $c'(\cdot) < 0$, then $p^* > \frac{1}{2}$: The decisive agent is wealthier than the median agent.*

Proof. *See Appendix A.* ■

This proposition establishes that introducing a link between campaign contributions and turnout *endogenously* generates a wealth bias in the political process: The decisive agent will be an individual who is wealthier than the median.[26] The intuition for that is quite transparent: Once there is inequality in the distribution of wealth, the need for obtaining campaign resources leads the parties to move their platforms closer to the preferences of wealthier individuals, who can provide them with more of these resources. In other words, campaign contributions are a form of political participation that favors wealthier individuals. Quite importantly, this bias does *not* require any inherent link between wealth and one's propensity to participate in politics.

This result leads us into the following:

Proposition 4 ***(Median voter revisited: Non-monotonicity)*** *If $c'(\cdot) < 0$ and $\lim_{Z\to\infty}(-Zc'(Z)) = \infty$, i.e. the marginal effect of campaign spending does not vanish too rapidly, then there exists $\overline{\sigma} > 0$ such that $\sigma < \overline{\sigma} \implies \frac{\partial \tau}{\partial \sigma} > 0$ and $\sigma > \overline{\sigma} \implies \frac{\partial \tau}{\partial \sigma} < 0$: Equilibrium redistribution increases with inequality if inequality is relatively small, and it decreases with inequality if inequality is relatively large.*

Proof. *See Appendix A.* ■

The impact of inequality on redistribution is driven by the interaction of two effects: what can be termed a "*decisive voter effect*", corresponding to the impact of inequality on the level of redistribution desired by *a given* decisive agent, and a new "*endogenous turnout*" effect. This latter effect stems from the fact that the identity of the decisive agent is now endogenous and varies with inequality. Higher inequality means that relatively rich individuals become richer, and relatively poor individuals become poorer. This leads the two parties, in equilibrium, to adapt their platforms

[26] This wealth bias is similar to that in Roemer (2006).

in order to bring them closer to the interests of wealthier individuals, since they are relatively more valuable in terms of generating the contribution revenues that can be translated into more votes. This shifts the political equilibrium in favor of the relatively wealthy. (This endogenous turnout effect can be seen graphically in Figure 2.) In addition, the decisive voter effect, which is behind Proposition 2, is now more subtle precisely because of the endogenous wealth bias uncovered by Proposition 3: The decisive agent now may be wealthy enough that an increase in inequality can lead her to desire less redistribution. In other words, the model endogenously generates the kind of counteracting effect that had been anticipated by the literature that exogenously postulated the existence of a wealth bias. Put together, the endogenous turnout effect and the possibility of changing the direction of the decisive voter effect can lead to the standard prediction being turned on its head: Higher inequality leads to *less* redistribution.

[FIGURE 2 HERE]

The proposition also elaborates on this possibility more precisely, by showing that in equilibrium there will be a non-monotonic relationship between inequality and redistribution. In order to understand the intuition behind this result, consider a situation of perfect equality ($\sigma = 0$), in which all agents possess the same wealth. In such a situation, the decisive agent is the median, since there is no incentive for the parties to deviate from this position so as to increase their level of contributions. In fact, redistribution is obviously a moot point. Increasing inequality from this initial point gives rise to a small constituency against redistribution, who have slightly more resources than other individuals, and this leads to a decisive agent who is wealthier than the median. However, by the same token, such an increase creates a much larger mass of individuals who are poorer than the mean, and hence in favor of redistribution. This will surely lead to an equilibrium with more redistribution.

As inequality increases, however, the relatively wealthy start having a large advantage in terms of their ability to provide parties with contributions, strengthening the parties' incentive to move their platform away from redistribution. At some point, additional increases in inequality will lead to the decisive agent being one who is wealthy enough to actually demand less redistribution, reverting the standard prediction. That this has to be the case can be seen by considering the situation of perfect inequality ($\sigma = 1$), where all the wealth in the economy belongs to a single individual (of measure zero). Such an individual concentrates in essence all the political power, since the turnout of the relatively poor will be tiny, and she wants no redistribution at all; any decrease in inequality will shift some political power to relatively poorer agents, who will definitely want some redistribution. As a result, the standard prediction will hold when inequality is relatively low, but will be reversed when inequality is sufficiently high.[27] Note that this non-monotonicity result will hold if the effect of obtaining additional contributions does not vanish too rapidly. If $c'(\cdot)$ converges to zero too fast, the political process approaches a situation where contributions do not matter, and Proposition 2 shows that the standard result will prevail in that case.

It is important to stress the reasons why the standard predictions are overturned in this context. First, unlike in that framework, here the decision to vote is endogenous, and responds to increases in inequality. Second, political participation here has two dimensions, and they interact in such a way that equilibrium turnout depends on equilibrium contributions. These two elements, put together, are responsible for the new result. In short, in the standard framework the identity of the decisive voter is fixed: It is the median agent. An increase in inequality leads to more redistribution because it makes this agent poorer. Here, on the other hand, the identity of the decisive voter is determined endogenously because the decision to vote is endogenous, and inequality moves the decisive vote to a relatively wealthier agent.

The mechanism that the model highlights also translates into a specific prediction concerning the behavior of the amounts of contributions gathered by Party D and Party R. This can be summarized in the following:

Corollary 1 *Under the same conditions of Proposition 4,* $\frac{\partial Z_R}{\partial \sigma} > 0$ *and* $\frac{\partial Z_D}{\partial \sigma} < 0$*: Inequality increases the amount of contributions collected by Party R, and decreases the amount collected by Party D.*

Proof. *See Appendix A.* ■

This is a central prediction of this framework. It is crucial for the results that changes in inequality affect the amount that is contributed by the relatively poor and the relatively wealthy, and that this effect alters the incentives of parties in seeking contributions. In equilibrium, it has to be the case that an increase in inequality will increase the contributions gathered by the anti-redistribution party and decrease the resources available to the pro-redistribution party.

[27] This non-monotonicity result is the mirror image of what is obtained by Bénabou (2000): In his framework, support for redistribution decreases with inequality for low levels of the latter, and eventually increases. The key differences are that, in that paper, a wealth bias in the political process is exogenously assumed, and redistribution also helps to pay for efficiency-enhancing expenditures. This is what lies behind his non-monotonicity result. However, this model shows that the conclusions are very different when the decisive agent in the political process is endogenously determined.

In this simple model, however, inequality has no effect on total contributions, which are mechanically kept at $\lambda\left(1-\overline{\delta}\right)\overline{w}$: the increase in contributions to Party R is exactly matched by the decrease in contributions to Party D. This prediction, however, is not robust to a more realistic model of contributing behavior, as will be shown in the extension that follows.

3.6 Extension: Contributions as a Luxury

As discussed in the previous section, it might be natural to assume that contributions are a luxury good: Wealthier individuals tend to spend relatively more on contributions than poorer ones. I introduce this possibility by positing a simple form of Stone-Geary preferences, whereby the utility of an individual who is sufficiently motivated to contribute is given by:

$$\begin{aligned} u(z_i, x_i) &= z_i^{\lambda}\left(x_i - x_{\min}\right)^{1-\lambda} \qquad (14) \\ \text{s.t. } z_i + x_i &\leq w_i \end{aligned}$$

where z_i is the individual contribution, x_i is consumption, and $x_{\min} \geq 0$ is a minimum "subsistence" level of consumption. This parameterization yields a convenient analytic solution:

$$\begin{aligned} z_i &= \lambda\left(w_i - x_{\min}\right), \text{ if } w_i > x_{\min} \qquad (15) \\ & \quad 0, \text{ otherwise} \end{aligned}$$

In words, the individual will contribute a fixed share λ of his wealth in excess of the subsistence level of consumption. It is easy to check that this means that the rich will contribute a larger share of their wealth.

The solution developed so far is now simply a special case where $x_{\min} = 0$. How are the results affected when one considers cases where $x_{\min} > 0$? The following can be stated:

Proposition 5 *If $x_{\min} > \overline{w}$, then:*

1. *The results in Proposition 2 still hold.*

2. *If $x_{\min}$ is sufficiently large, then the results in Proposition 4 still hold.*

Proof. *See Appendix A.* ■

This proposition shows that our basic results – the endogenous wealth bias and the possibility of reversing the standard predictions, and the non-monotonicity of equilibrium redistribution with respect to changes in inequality – apply to the more realistic case where contributions are a luxury good. Note that it focuses on the case where $x_{\min} > \overline{w}$, in which the constraint will bind for a positive mass of individuals, for all values of σ. If $x_{\min} \leq w_{\min} \equiv (1-\sigma)\,\overline{w}$, the comparative statics is obviously the same as in the benchmark case of $x_{\min} = 0$.

This extension also adds more subtlety to the intuition behind the result, and to the effects that campaign contributions bring to political outcomes. In particular, part 2 of Proposition 5 indirectly implies that the results might be different for an intermediate range of $x_{\min}$, and the intuition for that is illuminating. If contributions are a luxury good to which some individuals do not have access, three "classes" of individuals arise in equilibrium: Those individuals who support Party D, but are too poor to contribute; those who support Party D, and may also contribute; and those who support Party R. An increase in inequality, while further dispossessing the first group, might disproportionately favor the second group relative to the third one. This could act to make the decisive position in the political process move to a relatively less wealthy individual. In other words, the fact that contributions are a luxury good creates a political "middle class", which can be large if $x_{\min}$ is in an intermediate range. This adds nuance to the comparative statics, since increases in inequality may disproportionately benefit this middle class.

Furthermore, an interesting new prediction emerges:

Corollary 2 *If $x_{\min} > w_{\min}$, the total amount of contributions increases with inequality.*

Proof. *See Appendix A.* ■

The reason why inequality now unambiguously increases the level of contributions is that it pushes more resources toward wealthier individuals, who contribute disproportionately more. For any level of $x_{\min}$ such that not all politically motivated individuals are able to contribute, an increase in inequality will shift resources in favor of those who are, which must in turn increase the total amount of contributions.

3.7 Summary

I have shown how a model of the political economy of redistribution that takes into account two important features – that political participation is endogenous, and that it can take different forms (e.g. voting and contributing to campaigns) that interact with each other and react differently to changes in inequality – is able to generalize the traditional median voter framework, and derive circumstances under which a wealth bias will endogenously emerge, and the predictions of the latter will fail to hold. Quite importantly, this model makes explicit the mechanism through which it operates, with clear empirical implications. These implications can be summarized as:

1. Inequality reduces the amount of contributions made by the poor, and increases the amount of contributions made by the rich;

2. Inequality reduces the amount of contributions gathered by the pro-redistribution party, and increases the amount of contributions amassed by the anti-redistribution party;

3. Increased inequality will lead to a greater total amount of contributions, if campaign contributions are a luxury good;

4. Inequality reduces the turnout of the poor relatively to the turnout of the rich;

5. Increased inequality will lead to *less* redistribution, unlike in the standard median voter framework, whenever inequality is sufficiently high and turnout is sufficiently sensitive to campaign spending.

The next section presents evidence in support of this mechanism.

4 Inequality, Campaign Contributions and Voting Behavior: Empirical Analysis

In this section I analyze the interaction between inequality, individual campaign contributions, and voter turnout in the setting of the US presidential election of 2000. The reason why I focus on the 2000 election cycle is that the independent variables I use come mostly from the Census. As a result, a Census year such as 2000 provides a more appropriate match between the different variables along the time dimension. In terms of the model in the preceding section, I take the Republican Party to be the empirical correspondent of Party R, and the Democratic Party as the empirical correspondent of Party D, as the very choice of labels would have hinted. It is rather clear that the latter is typically in favor of more redistribution.[28] In addition, as shown by McCarty, Poole and Rosenthal (2006, ch. 3), income is a foremost determinant of party allegiance in the US, with wealthier individuals being significantly more likely to vote Republican, and this association has indeed increased in recent decades.

The emergence of the so-called "value voters" in popular perception, especially after the 2004 election, has led many to the conclusion that this income effect has become less important (e.g.

[28] For the sake of illustration, the Republican Party platform for the 2004 election explicitly stated that "[the] taxation system should not be used to redistribute wealth or fund ever-increasing entitlements and social programs" (2004 Republican Party Platform, p. 39), while the Democratic platform pledged to "roll back the Bush tax cuts for those making more than $200,000" (2004 Democratic National Platform, p. 27) and mentioned many instances of redistributive policies from the "very wealthiest" to the "middle class".

Frank 2004). Typically, many pundits argue that social conservative voters systematically vote against their economic interests, while others note the fact that many of the "blue" Democratic states in recent elections are relatively high-income states. While these may be important factors, they are also easily reconciled with the evidence on the strength of the income effect: Even among social conservatives and evangelicals, there is a strong relationship between income and propensity to vote Republican, as is the case within states (McCarty, Poole and Rosenthal 2006, ch. 3). In light of that, the comparison between the two parties should reveal how the political outcomes are likely to respond in regard to redistribution.

My empirical strategy is to identify the effects of inequality on overall voting and contribution patterns, and also on party-specific patterns, using variation across counties in the US. It is important to note that some caution is in order when it comes to interpreting the results regarding the data on voting, since much of the impact on turnout in the model comes from the effect of contributions, and contributions that are raised in a given county need not be used in that same county. As will be seen, the results in this regard can be nevertheless illuminating.

4.1 Data Description

I gathered data on individual campaign contributions in the United States, from the Federal Election Commission (FEC). Each individual donation has to be registered with the FEC, and there is publicly available information on the individual donor (name, occupation, zipcode, city, state), the amount given, and the committee to which it was directed. These data are available for all 50 states (and the District of Columbia), which is where my analysis focus, plus donations made from Puerto Rico, Guam, U.S. Virgin Islands, and abroad. These committees can then be matched with the campaign they are associated with, which includes information on the kind of election, the name and party of the candidate. I focus on the presidential elections in 2000, so I limit my attention to contributions to presidential candidate committees and party committees as well.[29] I aggregate the information at the zipcode level, which then enables me to consolidate the data by county, which is the level at which my other variables are available. This leaves me with data on the total number of contributions and the total amount they correspond to, and whether they were directed to the Democratic Party, the Republican Party, or to other parties. Some contributions could not be matched with the data on committees, so they are left as unidentified.

[29] More specifically, I limit my attention to committees classified by the FEC as types P (Presidential), X (Non-Qualified Party, meaning party committees not qualified as multi-candidate), Y (Qualified Party), and Z (National Party Organizations). (Type Z is not subject to the limits we will discuss below.) I include the last three under the presumption that these are also ways in which individuals can express support for presidential candidates.

Table A-1 presents some descriptive statistics on the amount of contributions. This table splits the sample between contributions directed to presidential candidate committees and those given to party committees. The columns labeled "Direct Contributions" correspond to donations from individuals directly to the committee, while the columns labeled "Total" add those contributions that are intermediated by other committees. The main difference between these two types is that contributions of the former type were subject to legal limits – which at the time were set at $1,000 for candidates, and $20,000 to party committees – , while the latter type includes the so-called "soft money", not subject to those limits.[30]

One important message from Table A-1 is that these individual contributions are typically fairly small. Out of the roughly 600,000 observations of direct contributions, the median is $500, and less than five percent of them are above $2,000; the mean is around $800. When all contributions are considered, the median is still $500, and the 95th percentile is $5,000 with the mean hovering around $1,700. These amounts are hardly decisive in the context of a presidential election. Quite interestingly, the table also reveals that total contributions are well below the individual contribution limits, suggesting that such limits were typically not binding. In addition, since the 2000 election preceded the McCain-Feingold Bill, "soft money" could still be used by corporate or union donors essentially without limits. In essence, all of this means that each individual contribution is guaranteed not to make any difference in the outcome, just as an individual vote would be. It follows that strategic motives for contributing, as in "buying policy", are probably not the most appropriate way to think about these contributions. This is precisely in line with the theoretical setup outlined.

Table A-1 also splits the different types of contributions according to the party to which they were directed. A few things are of note in that regard: First, with the exception of a large amount of non-direct contributions that remain unidentified, the vast majority of contributions goes either to the Republican Party or to the Democratic Party. This is hardly surprising. In addition, it can be seen that Republicans vastly outdid Democrats in terms of obtaining individual contributions –

[30] Campaign contribution amounts in the US have been subject to legal limits since the enactment of the Federal Election Campaign Act (FECA), which was originally passed in 1971, and amended in 1974 to set limits on contributions. The Supreme Court, in *Buckley v Valeo* (1976), upheld the limits on individual contributions, but struck down several other limitations. As a result, FECA was amended in 1979 to allow parties to collect and spend unlimited amounts in their activities during election campaigns. This loophole gave rise to the so-called "soft money" – roughly speaking, money not donated directly to a candidate's campaign but that could be used for campaign purposes –, which was not subject to the FECA-imposed limits. This situation prevailed until the enactment of the 2002 Bipartisan Campaign Reform Act, also known as the "McCain-Feingold Bill", which banned "soft money" while increasing the individual contribution limits to $2,000. These limits are raised for every election cycle, in order to keep up with inflation. These numbers are available on the FEC website: <http://www.fec.gov>

by a factor of two when all individual contributions are considered.[31] This is also consistent with the theory, which implies that Party R will collect more resources than Party D.

I also gathered data on the electoral results by county, which are available at the Atlas of U.S. Presidential Elections website. More specifically, I have the total number of votes obtained by all candidates in every county, except in the state of Alaska, where the results are only available at the state level.[32] All the other variables in the analysis were obtained from the 2000 Census, except for the data on religious heterogeneity, which come from the dataset used in Alesina, Baqir and Hoxby (2004) and are obtained from a series of sources from around 1990, as described in their paper. A brief description of all the variables used is in the Data Appendix, and the descriptive statistics at the county level can be seen in Table A-2.

4.2 Results and Discussion

Table 1 shows the results when the contribution data are pooled, with Republicans, Democrats, other parties, and unidentified recipients in the same sample. Columns (1)-(2) have (the log of) total contribution amounts as the dependent variable, normalized by total voting age population (over 18 years old).[33] One can immediately see that they increase with income and with the share of the population with a college degree (measure of educational levels). In other words, richer and more educated counties contribute more, which is hardly surprising. They also increase with how lopsided the county is in terms of contributions, which stands as a proxy for how competitive the election was at the local level. This seems to suggest that contributions are lower in more "disputed" counties, which suggests that the effect of higher awareness brought about by more tightly disputed races is not felt in the level of contributions, or at least that the county level is not where such effects are strongest. (Note that all regressions include state fixed effects, which are important to control for a host of factors such as how competitive the election was (e.g. "swing" vs. "safe" states), regional preferences, etc.) I am mostly interested, however, in the impact of inequality at the county level on political behavior.

[TABLE 1 HERE]

[31] Note that this refers to data on *individual* contributions, not to the total fund-raising of either party.

[32] The list of candidates (parties, number of ballots where present) is: Gore (Democrat, 51), Bush (Republican, 51), Nader (Green, 44), Buchanan (Reform, 49), Browne (Libertarian, 50), Phillips (Constitution, 41), Hagelin (Natural Law, 38), Harris (Socialist Workers, 14), Smith (Libertarian, 1), McReynolds (Socialist, 7), Moorehead (World Workers, 4), Brown (Independent, 1), Lane (Grassroots, 1), Venson (Independent, 1), Dodge (Prohibition, 1), and Youngkeit (Independent, 1). In addition, I have data on "Write-ins" and "None of the Above" (which was an option in Nevada, where it received 3,315 votes).

[33] More precisely, I consider the log of one plus the amount of contributions, so that zero values are left in the sample. The results are qualitatively unchanged if such values are left out.

Column (2) introduces the income inequality variable into the analysis:[34] It has a significant positive effect on the amount of contributions. This is exactly in line with the prediction of the model, when contributions are modeled as a luxury good. Moreover, this effect is also quantitatively important: Using the point estimate, an increase in inequality of one standard deviation leads to a seven-percent increase in the amount contributed per voting age population. A similar effect, though somewhat less significant, is present for other types of heterogeneity, such as racial and religious (as measured by the usual Herfindahl index applied to race and religious denomination).[35] The conclusion from Columns (1)-(2) is thus that all three forms of heterogeneity increase the amount of contributions, although the effect of religious heterogeneity is less distinctive.

Columns (3)-(4) put this result under an interesting light, highlighting the distinctive effect of inequality: While racial and religious heterogeneity have a weak positive effect on the number of people contributing, income inequality displays a clear negative effect on that number. In other words, inequality is associated with fewer people contributing, but contributing a greater amount. This is a first piece of evidence that is clearly consistent with the idea that the rich are contributing more, while the poor reduce their contributions, as a result of greater inequality, as is the case in the theory.

Some additional insight can be gained from Columns (5)-(6), where the dependent variable is voter turnout, measured by total votes as a share of voting-age population.[36] Here the effect of inequality (and racial heterogeneity) is clearly negative, which is consistent with the evidence from the literature that has explored the topic (e.g. Mahler 2002).[37] More generally, this evidence reinforces one of the model's cornerstones, namely the point that contributing to campaigns is a distinct form of political participation, which responds to the social environment in a manner that is distinct from that of other forms of participation. In addition, the fact that contributions and

[34] The 2000 Census does not make individual data available at the county or census block level. This prevents me from computing individual income inequality. As an alternative, I get data aggregated at the census block level, and compute inequality between those blocks (weighted by population). While this underestimates individual inequality, it should still be a good proxy for income heterogeneity, to the extent that incomes sort into neighborhooods.

[35] It should be noted that these variables do capture different dimensions of heterogeneity: the correlation between income inequality and racial heterogeneity is of 0.38, and the correlation between racial and religious heterogeneity is actually negative, -0.23.

[36] I define turnout with respect to total voting-age population, as opposed to total registered voters, because the decision to register is part of the decision to vote as conceptualized in the theory.

[37] In the theory, as far as predictions on total turnout are concerned, many different effects are at play: the number of potential supporters of Party D increases with inequality, but a smaller proportion of them will turn out to vote, as a result of the reduced contributions; the exact opposite holds for Party R. As it turns out, it can be shown that the overall effect in the basic model is positive: Total turnout will *increase* with inequality.

A negative effect in line with the empirical evidence shows up in an extension of my model where the decision to vote has a social component: Part of the reason why people vote is the fact that voting is considered an important activity by the group they belong to (see Feddersen 2004, and Abrams, Iversen and Soskice 2005). This extension, which is available upon request, shows that inequality depresses total turnout, and that all the other results in the model still follow through.

turnout move in opposite directions with respect to changes in heterogeneity also helps us rule out the possibility that the effect on contributions is a spurious one. For instance, one could imagine that increased heterogeneity could be associated with higher contributions because parties would tend to be more distinct in their political platforms in more heterogeneous communities, and this would in turn lead to a perception of higher stakes in the election. This would not be easy to reconcile with the fact that turnout has the opposite reaction.

The model clearly asks for a distinction in the behavior of individuals according to their wealth or income. Since I cannot distinguish individuals by income, I do this by considering subsamples of poorer and richer counties. The argument is that in counties that are richer on average, there should be a larger proportion of rich individuals, and hence political behavior should respond more in line with the model's predictions for wealthier individuals; the analogous reasoning would apply to poorer counties. Needless to say, it is rather likely that there will be "rich" individuals in poor counties, and "poor" individuals in rich ones. The point is that, the "rich" being relatively more numerous in rich counties, we should expect to see at least that any positive effect of inequality on contributions is stronger in such counties.

This approach is pursued in Table 2, by considering separately the poorest and wealthiest quartiles in the county sample.[38] The comparison between Columns (1) and (3) shows a significant difference in the effect of inequality on the total amount of contributions in relatively poor and rich counties: Inequality seems indeed to have a much stronger positive effect in the latter than in the former. This is again consistent with what was to be expected from the theory. In addition, the negative impact on voting is significantly more pronounced in poorer counties, as can be seen from Columns (2) and (4), again in accordance with the theory, although it should again be emphasized that this evidence is less amenable to interpretation.[39]

[TABLE 2 HERE]

A more direct way to get at the mechanism emphasized by the theory is to make use of the distinction between the two main parties. This is what is done in Table 3. The comparison between Columns (1) and (4) displays the main result: While inequality has a strong positive effect on the amount of contributions directed to the Republican Party, it has a (weak) negative effect on the contributions raised by the Democratic Party.[40] This is exactly in line with what is suggested by our

[38] The 25th percentile is around \$30,000, whereas the 75th percentile is around \$40,000.

[39] This is broadly consistent with the evidence in Solt (2005), who finds, at the individual level, that inequality decreases turnout more sharply for the poor.

[40] Note also that Republicans and Democrats are affected differently by changes in racial and religious heterogeneity. The former seem to benefit from religious heterogeneity, whereas the latter seem to profit from racial fragmentation.

theory: The party that favors less redistribution sees its level of contributions go up with inequality, in contrast with what happens to the other party. In addition, the negative effect of inequality on the number of contributors is also more pronounced for the Democrats – in terms of statistical significance, if not in terms of coefficient size.[41]

[TABLE 3 HERE]

In sum, the evidence shows that campaign contributions constitute a distinct form of political participation, which reacts to heterogeneity differently than other more widely studied forms, such as voting, do. More specifically, with respect to income inequality, the picture that emerges is one in which an increase in inequality shifts contributions in favor of less redistribution, and it does so by increasing the amount of contributions by the rich relative to those by the poor. Our evidence on voting is less conclusive, for the reasons already exposed, but it suggests that inequality has a negative effect on turnout. To the extent that voting is an activity where poor and rich are in more equal footing, in principle, this also suggests that the overall effect on redistribution outcomes may very well be negative, in contrast with the standard prediction.

4.3 Robustness

Let us now consider a few sensitivity checks, in order to reassure us of the robustness of the results. One dimension along which they can be checked is whether they apply to election cycles other than 2000. One challenge that emerges for that, as previously alluded to, is the lack of data for the other, non-political variables in the analysis at the county level, in a non-Census year. In any case, to the extent that the variables are reasonably stable over time, at least in terms of the ordering of the counties that they entail, it is possible to have a first pass at this robustness check by running specifications where the voting and campaign contributions variables refer to 2004, while the other variables still refer to 2000.

Tables 4-6 reproduce the exercises performed in Tables 1-3 using the 2004 data. Table 4 shows that the basic result still holds: Inequality increases the amount of campaign contributions, while reducing the number of individuals contributing, and has a negative effect on turnout. It also makes clear that the effect of inequality is distinctively stronger than the effect of other forms of heterogeneity. Table 5 also reaffirms the message from Table 2: The effect of inequality on contributions

[41] Columns (3) and (6) seem to suggest that the impact of inequality on turnout is stronger for Republicans. Here, however, even more caution should be exercised: besides the aforementioned fact that the connection between contributions and voting is not at the local level, in the data, here turnout is defined with respect to total population, not population by group as in the theory.

is significantly positive in the wealthiest counties, while indistinguishable from zero in the poorest counties; conversely, its negative effect on turnout is significant in the latter and negligible in the former. Finally, the difference in the effect of inequality on contributions to Democrats and Republicans is made even sharper in Table 6 than in the corresponding Table 3: The negative effect on contributions gathered by the Democratic Party is now significant, while the positive effect on the contributions obtained by the Republican Party remains strong. In sum, the results remain qualitatively the same; indeed, they are stronger in some respects. One can thus be confident that the evidence in support of the theory is not a fluke from the 2000 election cycle.

[TABLES 4, 5, 6 HERE]

Another direction along which to check robustness relates to the distinction between different types of contributions – some of which were subject to legally imposed limits, while others were not – which was highlighted in the data description. In light of this difference, I check whether the results are maintained when the analysis is restricted to the direct contributions that were limited by law. The results are shown in Table 7. Columns (1)-(2) reproduce the exercise from Table 1, with the full sample: One can see that the positive effect of inequality on the amount contributed and its negative effects on the number of individuals contributing still hold in this restricted sample. In addition, the effect of inequality is distinctively more pronounced than that of other forms of heterogeneity. The exercise from Table 2, on the other hand, fails to produce conclusive results when reproduced in Columns (3)-(4). However, when the distinction is drawn along party lines, the evidence once again favors the theory: The positive impact of inequality on contributions to the Republican Party is again in contrast with its effect on the contributions to the Democrats, just as in Table 3.

[TABLE 7 HERE]

Note that these two sensitivity checks, with the 2004 election cycle (after the McCain-Feingold ban on "soft money") and the direct contributions in the 2000 elections, represent slight departures from the basic model, in that individual contributions face legal limits. However, it can be shown that the results concerning the positive impact of inequality on total contributions, and the differential effect on contributions by relatively rich and poor individuals, and on contributions gathered by different parties, still hold for any cap on individual contributions short of a full ban. (These results are available upon request.) This leads us to expect that the empirical results would hold for the sample of direct contributions and for the 2004 sample, as is confirmed by the data.

One can also wonder whether the results are sensitive to the exclusion of the contributions whose parties to which they were directed are not identified in the data. In particular, Table A-1 shows that such contributions comprise a very important share of total contributions gathered by party committees, so it is fair to ask whether they are driving the results. Table 8 shows this is not the case: Columns (1)-(2) show that the results from Table 1 still hold, while Columns (3)-(4) show the same for the results from Table 2.

[**TABLE 8 HERE**]

Yet another dimension to consider relates to different definitions for some of the variables used in the analysis, in particular the income-related ones. As was mentioned before, issues with data availability prevent the computation of individual- or household-level inequality for counties in the 2000 Census, and the alternative I used was to compute them based on income data by census blocks. However, another alternative would be to use data from 1990, where household-level Gini coefficients have been computed by county.[42] If this is pursued, the results still remain largely unaltered, although the effect on voting disappears. In addition, the income level variable was computed from mean household incomes by census block, weighted by block population and divided by total county population. Alternatively, I used median household income at the county level, from 1997, and the results are also maintained.

5 Concluding Remarks

Some conclusions emerge from this exercise: The relationship between inequality and redistribution becomes much more subtle than what the clean, simple logic of the standard median voter framework would suggest, when one takes into account that political participation is endogenously determined, and takes distinct forms that interact with each other and with inequality. Moreover, the theoretical framework I develop proposes a mechanism for this interaction that is both explicit and directly translatable into the empirics, by focusing on the interplay between voting and campaign contributions. The detailed data I obtain describing campaign contributions and voting behavior in the US suggests that this mechanism has very good explanatory power. They show that these two forms of political participation are distinct in the way they react to heterogeneity in general and inequality in particular. They also strongly suggest that the effect of inequality operates through its different impacts on the behavior of contributions by rich and poor individuals, and on the contributions

[42] See Alesina, Baqir and Hoxby (2004).

obtained by different parties, according to their positions on redistribution.

This framework can also be used to help understand a host of issues that, while outside the direct scope of this paper, still relate to the building blocks upon which it is built. One such issue has to do with the consequences of alternative forms of campaign funding.[43] For instance, in the very active debate on campaign finance reform in the US, it is often mentioned that public funding would help in reducing the disproportionate influence of wealthier individuals and pressure groups on the electoral process. My model suggests that this would indeed be the case, but only if a total ban, or at least very stringent limits, on individual contributions were introduced as well – which has been the subject of a heated debate in which the Supreme Court has been called to intervene many times since the 1970s, as briefly alluded to in the discussion of the data.[44] In fact, I can show that, unsurprisingly, the central results of Propositions 4 and 5, concerning the effect of inequality on redistribution, are maintained as long as the contribution limits are not too restrictive. (These results are also available upon request.) In particular, what matters is not the limit in absolute terms, but rather in comparison with the share of income that individuals would be willing to contribute in the absence of limits. Since the latter is likely to be quite small – Ansolabehere, Figueiredo and Snyder (2003) quote the figure of 0.04 percent of national income devoted to political campaigns in the US in 2000 (before the ban on soft money) – the limits would probably have to be very stringent indeed. In sum, introducing limits on campaign contributions is a way of neutralizing the forces highlighted in the paper, but it would take very tough limits to do so completely.

Another issue that is raised is that of compulsory voting. If the effect of campaign spending goes through its impact on turnout, one could conclude that, by making turnout compulsory, it would be possible to shut down the mechanism highlighted in the paper. I would suggest that such interpretation would have to be taken with a lot of caution, since in practice there are other ways of using campaign resources to influence electoral outcomes – after all, a lot of resources are spent to mobilize voters even in countries where voting is compulsory. As long as that is the case, the mechanism should still operate. Extending the model to deal with these other ways, such as influencing voters' preferences, would be a direction in which to push this research in the future. In addition, of course, turnout is well below 100% even when voting is compulsory, which suggests that there is still scope for influencing turnout even when this margin is not as important as it is in the case of the US.

[43] See Roemer (2006) for a theoretical discussion on the welfare consequences of different forms of campaign finance.

[44] On this debate on campaign finance reform and the history of legal decisions on the topic, see Corrado et al (2005).

This brings us to the final issue of investigating how much of the cross-country differences in terms of inequality and redistribution – which, as stressed in the Introduction, are a significant part of what drives the dissatisfaction with the empirical support for the standard median-voter approach – can be accounted for by this framework. This empirical question would require a careful consideration of the differences in the political systems between, say, the US and Western Europe with respect to campaign finance, turnout, etc. On the other hand, it would be then easier to focus directly on redistribution outcomes, much more so than what can be done at the cross-county level within the US. This is another issue to be tackled by future research.

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6 Appendix A: Proofs

Proof. Lemma 1:

Denote by p^* the percentile of the distribution at which, given the parties' platforms, an individual is indifferent between Parties D and R. One can characterize the wealth level of an individual at p^* by:

$$(1-\tau_D)\, w_{p^*} + \tau_D \overline{w} - \frac{\tau_D^2}{2}\overline{w} = (1-\tau_R)\, w_{p^*} + \tau_R \overline{w} - \frac{\tau_R^2}{2}\overline{w} \implies w_{p^*} = \overline{w}\left(1 - \frac{\tau_D + \tau_R}{2}\right)$$

Given the cdf of the wealth distribution, given by (1), it follows that any percentile p of the distribution will have wealth w_p described by:

$$p = 1 - \left(\frac{w_{\min}}{w_p}\right)^{\frac{1}{\sigma}} \implies w_p = w_{\min}\,(1-p)^{-\sigma} \implies w_p = (1-\sigma)\,\overline{w}\,(1-p)^{-\sigma} \tag{16}$$

Putting these two together yields:

$$\begin{aligned}(1-\sigma)\,\overline{w}\,(1-p^*)^{-\frac{1}{k}} &= \overline{w}\left(1 - \frac{\tau_D+\tau_R}{2}\right) \implies (1-p^*)^{\sigma} = \frac{2(1-\sigma)}{2-(\tau_D+\tau_R)} \implies \\ &\implies p^* = 1 - \left[\frac{2(1-\sigma)}{2-(\tau_D+\tau_R)}\right]^{\frac{1}{\sigma}}\end{aligned} \tag{17}$$

(More precisely, p^* equals the maximum of (17) and zero, but $p^* = 0$ cannot be an equilibrium, since the more redistributive party would then obtain no contribution at all.) From this it immediately follows that $\frac{\partial p^*}{\partial \tau_j} < 0$. Since relatively poor individuals will vote for the party that proposes higher levels of redistribution, p^* represents the share of the population that supports the more redistributive party; we thus have that if either party increases its proposed redistribution, this will decrease the potential support of the more redistributive party.

Now suppose, by way of contradiction, that $\tau_D < \tau_R$. It follows that the relatively poor will prefer Party R over Party D. It then follows that, by reducing τ_R, Party R can both decrease the overall tax rate and increase its own share of votes, since $\frac{\partial p^*}{\partial \tau_j} < 0$. This will obviously increase the party's utility. Similarly, Party D can unambiguously increase its utility by increasing τ_D. This situation cannot be an equilibrium. One thus concludes that, in equilibrium, we must have $\tau_D \geq \tau_R$.

■

Proof. Lemma 2:

Part 1 follows immediately from Lemma 1: Relatively poor individuals, if they vote and/or contribute, will do so for Party D. Hence the population of potential supporters of Party D is those individuals below the p^* percentile.

We can use this and (16) to compute the total wealth held by this population:

$$\int_0^{p^*} (1-\sigma)\,\overline{w}\,(1-p)^{-\sigma}\,dp = \left[-\overline{w}\,(1-p)^{1-\sigma}\right]_0^{p^*} = \left(1-(1-p^*)^{1-\sigma}\right)\overline{w} \tag{18}$$

Using (3) and the uniform distribution of δ_i, which is uncorrelated with wealth, we obtain that a share of $1-\overline{\delta}$ of that set of individuals will give a fraction λ of their income to Party D: $Z_D = \lambda\left(1-\overline{\delta}\right)\left(1-(1-p^*)^{1-\sigma}\right)\overline{w}$. A similar reasoning yields $Z_R = \lambda\left(1-\overline{\delta}\right)(1-p^*)^{1-\sigma}\,\overline{w}$. ■

Proof. Lemma 3:

Let us start by considering $\theta \in [0,1)$. Suppose, by the way of contradiction and without loss of generality, that we have $\pi_D > \pi_R$. Differentiating (6) with respect to τ_j, in such a situation, yields:

$$\frac{\partial U_j}{\partial \tau_j} = (1-\theta)\frac{\partial u\left(\tau,\widehat{\tau}_j\right)}{\partial \tau}\frac{\partial \tau}{\partial \tau_j} \tag{19}$$

which follows from the step-function nature of the “office-seeking” term in the utility function. From (7), it follows that:

$$\frac{\partial \tau}{\partial \tau_D} = \frac{\pi_D}{\pi_D+\pi_R} + \frac{(\tau_D-\tau_R)\left(\pi_R\frac{\partial \pi_D}{\partial \tau_D} - \pi_D\frac{\partial \pi_R}{\partial \tau_D}\right)}{(\pi_D+\pi_R)^2} \tag{20}$$

$$\frac{\partial \tau}{\partial \tau_R} = \frac{\pi_R}{\pi_D+\pi_R} + \frac{(\tau_D-\tau_R)\left(\pi_R\frac{\partial \pi_D}{\partial \tau_R} - \pi_D\frac{\partial \pi_R}{\partial \tau_R}\right)}{(\pi_D+\pi_R)^2} \tag{21}$$

Note also that, given (10) and (11), we have:

$$\frac{\partial \pi_D}{\partial \tau_D} = \frac{\partial \pi_D}{\partial \tau_R} = \frac{\partial p^*}{\partial \tau_D}\left[(1-c(Z_D)) - c'(Z_D)\lambda\left(1-\overline{\delta}\right)\overline{w}\,(1-\sigma)\,(1-p^*)^{-\sigma}\,p^*\right] < 0 \tag{22}$$

$$\frac{\partial \pi_R}{\partial \tau_R} = \frac{\partial \pi_R}{\partial \tau_D} = -\frac{\partial p^*}{\partial \tau_R}\left[(1-c(Z_R)) - c'(Z_R)\lambda\left(1-\overline{\delta}\right)\overline{w}\,(1-\sigma)\,(1-p^*)^{1-\sigma}\right] > 0 \tag{23}$$

Putting these together, it follows that, if $\pi_D > \pi_R$ in equilibrium, we must have:

$$\frac{\partial \tau}{\partial \tau_D} = \frac{\partial \tau}{\partial \tau_R} = 0$$

However, combining (20), (21), (22) and (23) also reveals that $\frac{\partial \tau}{\partial \tau_D} = \frac{\partial \tau}{\partial \tau_R}$ implies $\pi_D = \pi_R$. This contradiction establishes the result.

Now consider the case where $\theta = 1$ (parties are pure office-seekers). If $\pi_D > \pi_R$, Party R will have an incentive to increase its proposed rate in order to increase their share of vote, since parties are into maximizing their votes. The converse would be true for Party D if $\pi_D < \pi_R$. Equilibrium would thus require $\pi_D = \pi_R$. ■

Proof. Proposition 1:

Lemma 3 and (7) imply that in equilibrium we have $\tau = \frac{\tau_D + \tau_R}{2}$. Using this in (17) immediately implies that p^* and τ are linked by equation (13): To any p^* corresponds a unique τ. In addition, Lemma 3 and equations (10) and (11) imply that:

$$\left(1 - c\left(\lambda\left(1-\overline{\delta}\right)(1-p^*)^{1-\sigma}\,\overline{w}\right)\right)(1-p^*) = \left(1 - c\left(\lambda\left(1-\overline{\delta}\right)\left(1-(1-p^*)^{1-\sigma}\right)\overline{w}\right)\right)p^* \implies$$

$$\implies p^* = \frac{\left(1 - c\left(\lambda\left(1-\overline{\delta}\right)(1-p^*)^{1-\sigma}\,\overline{w}\right)\right)}{\left(1 - c\left(\lambda\left(1-\overline{\delta}\right)(1-p^*)^{1-\sigma}\,\overline{w}\right)\right) + \left(1 - c\left(\lambda\left(1-\overline{\delta}\right)\left(1-(1-p^*)^{1-\sigma}\right)\overline{w}\right)\right)} \equiv \Omega(p^*)$$

Note that $\Omega(p^*) \in [0,1]$, and also that it is a continuous function of p^*. It follows from Brouwer's fixed point theorem that $\Omega(p^*)$ has a fixed point, which characterizes the equilibrium. Note also that:

$$\begin{aligned}
\Omega'(p^*) &= \frac{-c'(Z_R)\frac{\partial Z_R}{\partial p^*}\left(2 - c(Z_R) - c(Z_D)\right) + (1-c(Z_R))\left(c'(Z_R)\frac{\partial Z_R}{\partial p^*} + c'(Z_D)\frac{\partial Z_D}{\partial p^*}\right)}{\left[(1-c(Z_R)) + (1-c(Z_D))\right]^2} \\
&\propto -(1-c(Z_D))\,c'(Z_R)\frac{\partial Z_R}{\partial p^*} + (1-c(Z_R))\,c'(Z_D)\frac{\partial Z_D}{\partial p^*} = \\
&= \left[(1-c(Z_D))\,c'(Z_R) + (1-c(Z_R))\,c'(Z_D)\right](1-\sigma)\,\lambda\left(1-\overline{\delta}\right)(1-p^*)^{-\sigma}\,\overline{w} < 0
\end{aligned}$$

It thus follows that this fixed point is unique. ■

Proof. Proposition 2:

1. (a) i. If $c'(\cdot) = 0$ everywhere, meaning that contributions do not affect turnout, then (12) will imply that:

$$p^* = \frac{1-c}{(1-c)+(1-c)} = \frac{1}{2}$$

ii. Using (13), one can compute:

$$\begin{aligned}
\frac{\partial \tau}{\partial \sigma} &= \left[(1-p^*)^{-\sigma} + (1-\sigma)(1-p^*)^{-\sigma}\left(\log(1-p^*) - \sigma\frac{\frac{\partial p^*}{\partial \sigma}}{1-p^*}\right)\right] = \\
&= (1-p^*)^{-\sigma}\left[(1 + (1-\sigma)\log(1-p^*)) - \frac{(1-\sigma)\,\sigma}{(1-p^*)}\frac{\partial p^*}{\partial \sigma}\right] \qquad (24)
\end{aligned}$$

The last term in square brackets is obviously equal to zero, given part (i) above. The term $(1 + (1-\sigma)\log(1-p^*))$ is equal to $1 - (1-\sigma)\log 2 > 0$, hence $\frac{\partial \tau}{\partial \sigma} > 0$.

■

Proof. Proposition 3:

Suppose $p^* \leq \frac{1}{2}$. It follows from (12) and $c'(\cdot)$ that $Z_R \leq Z_D$. This in turn requires:

$$(1-p^*)^{1-\sigma} \leq \frac{1}{2} \implies p^* \geq 1 - \left(\frac{1}{2}\right)^{\frac{1}{1-\sigma}} > \frac{1}{2}$$

where the last inequality follows from the fact that $1-\left(\frac{1}{2}\right)^{\frac{1}{1-\sigma}}$ is monotonically increasing in σ, and $\lim_{\sigma\to 0} 1-\left(\frac{1}{2}\right)^{\frac{1}{1-\sigma}}=\frac{1}{2}$. This contradiction establishes the result. ■

Proof. Proposition 4:

Consider (24), as we momentarily disregard the possibility of a corner solution in which $p^* > \overline{p}(\sigma) \equiv 1-(1-\sigma)^{\frac{1}{\sigma}}$ and $\tau = 0$. One needs to sign $\frac{\partial p^*}{\partial \sigma}$ in order to figure out the behavior of $\frac{\partial \tau}{\partial \sigma}$. Given (12), and using the implicit function theorem, it follows that:

$$\frac{\partial p^*}{\partial \sigma} = \frac{\lambda\left(1-\overline{\delta}\right)\overline{w}\left(1-p^*\right)^{1-\sigma}\log(1-p^*)\left[c'(Z_R)(1-p^*)+c'(Z_D)p^*\right]}{(1-c(Z_R))+(1-c(Z_D))-\lambda\left(1-\overline{\delta}\right)\overline{w}\left(1-\sigma\right)\left(1-p^*\right)^{-\sigma}\left[c'(Z_R)(1-p^*)+c'(Z_D)p^*\right]} \tag{25}$$

The key term is the one in square brackets, which is clearly negative. This means that the numerator is positive, since $\log(1-p^*)<0$. Similarly, one can conclude that the denominator is positive. As a result, we have $\frac{\partial p^*}{\partial \sigma}>0$: an increase in inequality unambiguously leads to the decisive agent being at a higher position in the wealth distribution. We can also rewrite:

$$\frac{\partial p^*}{\partial \sigma} = \frac{-\left(1-p^*\right)\log\left(1-p^*\right)A}{\left(1-\sigma\right)A+B}$$

where $A \equiv -\lambda\left(1-\overline{\delta}\right)\overline{w}\left(1-p^*\right)^{-\sigma}\left[c'(Z_R)(1-p^*)+c'(Z_D)p^*\right]$, and $B \equiv (1-c(Z_R))+(1-c(Z_D))$.

We can now use this back in (24). There are two terms in square brackets, which correspond to two separate effects: the term $(1+(1-\sigma)\log(1-p^*))$ corresponds to the change in the preferred rate of the decisive agent, *keeping the identity of this agent fixed.* This could be called a "decisive voter effect": Inequality affects the desire for redistribution of any given decisive agent. Note that this term will be positive if p^* is sufficiently small: A sufficiently poor agent will always have her desire for redistribution increased by inequality. (In particular, this will always be the case for the median agent, as shown in Proposition 3.) However, it can be negative if p^* is sufficiently large. The second term, $-\frac{(1-\sigma)\sigma}{(1-p^*)}\frac{\partial p^*}{\partial \sigma}$, will be negative, as argued above. This corresponds to an "endogenous turnout" effect, given by the effect of inequality, by increasing the amount of contributions from the rich relative to those from the poor, in leading to the decisive agent being an individual at a higher percentile, who is thus less keen on redistribution. Combining the endogenous turnout effect and the possibility that the decisive voter effect be negative, it is possible that $\frac{\partial \tau}{\partial \sigma}$ be negative.

To see how (24) will behave when both the "decisive voter" and the "endogenous turnout" effects interact, note that we can rewrite it as:

$$\begin{aligned}\frac{\partial\tau}{\partial\sigma} &= (1-p^*)^{-\sigma}\left[(1+(1-\sigma)\log(1-p^*)) + \frac{(1-\sigma)\,\sigma}{(1-p^*)}\frac{(1-p^*)\log(1-p^*)\,A}{(1-\sigma)\,A+B}\right] = \\ &= (1-p^*)^{-\sigma}\left[1+(1-\sigma)\log(1-p^*)\left(1+\frac{\sigma A}{(1-\sigma)\,A+B}\right)\right] = \\ &= (1-p^*)^{-\sigma}\left[1+(1-\sigma)\log(1-p^*)\frac{A+B}{(1-\sigma)\,A+B}\right]\end{aligned}$$

If we let $A\to\infty$, the term in square brackets will converge to $1+\log(1-p^*)$. Using Z_R as described by (9), we can rewrite $A=-\frac{1}{(1-p^*)}Z_R\left[c'(Z_R)(1-p^*)+c'(Z_D)p^*\right]$; if $\lim_{Z\to\infty}(-Zc'(Z))=\infty$ – i.e. if $c'(Z)$ goes to zero sufficiently slowly, we can let A grow without bound by increasing $\overline{w}$. (Note that, by choosing units, we are essentially free to increase $\overline{w}$ arbitrarily.) Under such conditions, the behavior of $\frac{\partial\tau}{\partial\sigma}$ will be determined by the behavior of $1+\log(1-p^*)$.

It is easy to see that $\lim_{\sigma\to1}p^*=1$: This is a situation of "perfect inequality", where all wealth is held by a single (zero-measure) individual who obviously favors Party R against redistribution. In fact, $\sigma\to1$ implies $Z_D\to0$ and $Z_R\to\lambda\left(1-\overline{\delta}\right)\overline{w}$; since we impose $\lim_{Z\to0}c(Z)=1$, it follows that $p^*\to1$. It is also straightforward to see that $\lim_{\sigma\to0}p^*=\frac{1}{2}$, since when all individuals are equal there is no incentive to deviate from the median to obtain contributions. It suffices to note that $\sigma\to0$ implies $Z_D\to p^*\lambda\left(1-\overline{\delta}\right)\overline{w}$ and $Z_R\to(1-p^*)\,\lambda\left(1-\overline{\delta}\right)\overline{w}$, and that with those values it will be the case that $p^*=\frac{1}{2}$ will satisfy the equilibrium condition. In addition, we have shown that $\frac{\partial p^*}{\partial\sigma}>0$. Putting all of this together, we conclude that $\lim_{\sigma\to0}\frac{\partial\tau}{\partial\sigma}\propto1-\log(2)>0$, $\lim_{\sigma\to1}\frac{\partial\tau}{\partial\sigma}<0$, and $\frac{\partial^2\tau}{\partial\sigma^2}<0$ for all $\sigma\in(0,1)$. This in turn means that there exists a $\overline{\sigma}$ such that $\frac{\partial\tau}{\partial\sigma}>0$ if and only if $\sigma<\overline{\sigma}$. Finally, note that, from (13), we have $\lim_{\sigma\to0}\tau=\lim_{\sigma\to1}\tau=0$. Given the results above concerning the behavior of $\lim_{\sigma\to0}\frac{\partial\tau}{\partial\sigma}$, $\lim_{\sigma\to1}\frac{\partial\tau}{\partial\sigma}$, and $\frac{\partial^2\tau}{\partial\sigma^2}$, these imply that $\tau>0$ for all $\sigma\in(0,1)$. In other words, we have $p^*<\overline{p}(\sigma)$ for all $\sigma\in(0,1)$, and there is no corner solution in this case. This completes the proof. ■

Proof. Corollary 1:

Totally differentiating (12) with respect to σ we obtain:

$$-\left(1-c(Z_R)\right)\frac{\partial p^*}{\partial\sigma}-(1-p^*)c'(Z_R)\frac{\partial Z_R}{\partial\sigma}=\left(1-c(Z_D)\right)\frac{\partial p^*}{\partial\sigma}-p^*c'(Z_D)\frac{\partial Z_D}{\partial\sigma}$$

From (8) and (9), it is easy to see that $\frac{\partial Z_R}{\partial\sigma}=-\frac{\partial Z_D}{\partial\sigma}$, hence:

$$\left[(1-c(Z_D))+(1-c(Z_R))\right]\frac{\partial p^*}{\partial\sigma}=-\left[(1-p^*)c'(Z_R)+p^*c'(Z_D)\right]\frac{\partial Z_R}{\partial\sigma}$$

It follows that the sign of $\frac{\partial Z_R}{\partial\sigma}$ will be the same as that of $\frac{\partial p^*}{\partial\sigma}$, while the opposite holds for $\frac{\partial Z_D}{\partial\sigma}$. Since under the conditions of Proposition 4 we have $\frac{\partial p^*}{\partial\sigma}>0$, the result immediately follows. ■

Proof. Proposition 5:

Let us start by showing the following:

Lemma 4 *If $x_{\min} > 0$, the contributions raised by Party D and Party R are respectively:*

$$Z_D = \lambda\left(1-\overline{\delta}\right)\left[\left(1-p_{\min}\right)^{1-\sigma} - \left(1-p^*\right)^{1-\sigma}\right]\overline{w} - \lambda\left(1-\overline{\delta}\right)\left(p^*-p_{\min}\right)x_{\min} \tag{26}$$

$$Z_R = \lambda\left(1-\overline{\delta}\right)\left(1-p^*\right)^{1-\sigma}\overline{w} - \lambda\left(1-\overline{\delta}\right)\left(1-p^*\right)x_{\min} \tag{27}$$

where $p_{\min} \equiv 1-\left(\frac{(1-\sigma)\overline{w}}{x_{\min}}\right)^{\frac{1}{\sigma}}$ is the lowest percentile of the distribution that will still contribute.

Proof. *Let us start by determining the lowest percentile of the distribution that will still contribute, i.e. that with wealth $x_{\min}$. Using (16), one can characterize it as:*

$$p_{\min} = 1-\left(\frac{(1-\sigma)\,\overline{w}}{x_{\min}}\right)^{\frac{1}{\sigma}} \tag{28}$$

Party D's total revenue will thus be given by:

$$\begin{aligned} Z_D &= \lambda\left(1-\overline{\delta}\right)\int_{p_{\min}}^{p^*}\left((1-\sigma)\,\overline{w}\,(1-p)^{-\sigma} - x_{\min}\right)dp = \lambda\left(1-\overline{\delta}\right)\left[-\overline{w}\,(1-p)^{1-\sigma}\right]_{p_{\min}}^{p^*} - \lambda\left(1-\overline{\delta}\right)x_{\min}\,[p]_{p_{\min}}^{p^*} = \\ &= \lambda\left(1-\overline{\delta}\right)\left[\left(1-p_{\min}\right)^{1-\sigma} - \left(1-p^*\right)^{1-\sigma}\right]\overline{w} - \lambda\left(1-\overline{\delta}\right)\left(p^*-p_{\min}\right)x_{\min} \end{aligned}$$

Similarly, Party R's revenues are given simply by:

$$\begin{aligned} Z_R &= \lambda\left(1-\overline{\delta}\right)\int_{p^*}^{1}\left((1-\sigma)\,\overline{w}\,(1-p)^{-\sigma} - x_{\min}\right)dp = \lambda\left(1-\overline{\delta}\right)\left[-\overline{w}\,(1-p)^{1-\sigma}\right]_{p^*}^{1} - \lambda\left(1-\overline{\delta}\right)x_{\min}\,[p]_{p^*}^{1} = \\ &= \lambda\left(1-\overline{\delta}\right)\left(1-p^*\right)^{1-\sigma}\overline{w} - \lambda\left(1-\overline{\delta}\right)\left(1-p^*\right)x_{\min} \end{aligned}$$

■

Note in addition that it must be the case that in equilibrium we must have $p^* > p_{\min}$: if that were not the case, Party D will obtain no contributions at all, and would thus have an incentive to move its platform to the right. It is straightforward to show that this implies that $\frac{\partial \pi_D}{\partial \tau_D} < 0$, and $\frac{\partial \pi_R}{\partial \tau_R} > 0$, and hence Lemma 3 still holds. It follows that Proposition 1 still describes the equilibrium, since Lemma 1 remains unaltered. The only difference are the values of Z_D and Z_R, which are now described by (26) and (27). As a result, Proposition 2 still holds.

As for Proposition 4, note that, since (13) still holds, the same goes for (24). What is changed is the behavior of $\frac{\partial p^*}{\partial \sigma}$, which is now described by:

$$\frac{\partial p^*}{\partial \sigma} = \frac{\lambda\left(1-\overline{\delta}\right)}{(1-\sigma)\,A+B}\left[\begin{array}{c} \overline{w}\,(1-p^*)^{1-\sigma}\log(1-p^*)c'(Z_R)(1-p^*)+ \\ +\overline{w}c'(Z_D)p^*\left[(1-p^*)^{1-\sigma}\log(1-p^*) - (1-p_{\min})^{1-\sigma}\log(1-p_{\min})\right]+ \\ +\left[\overline{w}\,(1-p_{\min})^{-\sigma}\,(1-\sigma) - x_{\min}\right]\frac{\partial p_{\min}}{\partial \sigma}c'(Z_D)p^* \end{array}\right] \tag{29}$$

Substituting this into (24), and using the fact that the last term in square brackets is zero, since $\overline{w}\,(1-p_{\min})^{-\sigma}\,(1-\sigma) = x_{\min}$ by the definition of $p_{\min}$, we get:

$$\frac{\partial \tau}{\partial \sigma} = (1-p^{*})^{-\sigma}\left[1 + (1-\sigma)\log(1-p^{*})\frac{A+B}{(1-\sigma)\,A+B} - (1-\sigma)\,\sigma\frac{1-p_{\min}}{1-p^{*}}\log(1-p_{\min})\frac{\widehat{A}}{(1-\sigma)\,A+B}\right] \tag{30}$$

where $\widehat{A} \equiv -\lambda\left(1-\overline{\delta}\right)\overline{w}\,(1-p_{\min})^{-\sigma}\,c'(Z_D)p^{*}$. This is the same as in (24), except for the last (positive) term in square brackets. Proceeding as in the proof of Proposition 4, by letting A and $\widehat{A}$ grow arbitrarily, we can see that the behavior of (30) is now governed by the behavior of $1+\log(1-p^{*}) - \sigma\frac{1-p_{\min}}{1-p^{*}}\log(1-p_{\min})$.

This term will be negative if and only if $(1-p^{*})+(1-p^{*})\log(1-p^{*}) < \sigma(1-p_{\min})\log(1-p_{\min}) = \sigma\left(\frac{(1-\sigma)\overline{w}}{x_{\min}}\right)^{\frac{1}{\sigma}}\log\left(\left(\frac{(1-\sigma)\overline{w}}{x_{\min}}\right)^{\frac{1}{\sigma}}\right)$. Note that we can increase this last expression, which is negative, and bring it arbitrarily close to zero for any value of σ by setting $\frac{x_{\min}}{\overline{w}}$ large enough. This means that, for $x_{\min}$ sufficiently large relative to $\overline{w}$, this inequality will hold for some range of (large) σ, for which redistribution will thus be decreasing in inequality. Just as in Proposition 4, eventually the term $1+\log(1-p^{*})$ will itself become positive, as σ decreases, and the opposite effect will prevail. This shows that the non-monotonicity result of Proposition 4 still holds. ■

Proof. Corollary 2:

Adding Z_D and Z_R as described by (26) and (27) yields:

$$Z = \lambda\left(1-\overline{\delta}\right)\overline{w}\,(1-p_{\min})^{(1-\sigma)} - \lambda\left(1-\overline{\delta}\right)(1-p_{\min})\,x_{\min}$$

It follows that:

$$\frac{\partial Z}{\partial \sigma} \propto -\overline{w}\,(1-p_{\min})^{(1-\sigma)}\log(1-p_{\min}) - \left[\overline{w}(1-\sigma)\,(1-p_{\min})^{-\sigma} - x_{\min}\right]\frac{\partial p_{\min}}{\partial \sigma}$$

The first term, which is positive, corresponds to the fact that an increase in inequality shifts wealth to relatively wealthy individuals, who are above the contribution threshold. The second term corresponds to the effect of inequality through a change in the percentile at which individuals start to contribute – i.e. the percentile at which the level of wealth $x_{\min}$ is attained. We can immediately note, from (16), that the term in square brackets is actually identical to zero: The change in $p_{\min}$ has no effect, since an individual at that percentile contributes an amount of zero. It follows that:

$$\frac{\partial Z}{\partial \sigma} \propto -\overline{w}\,(1-p_{\min})^{(1-\sigma)}\log(1-p_{\min}) > 0$$

as long as $p_{\min} > 0$, which will be the case if $x_{\min} > w_{\min}$. In words, increases in inequality lead to larger amounts of contributions in equilibrium. ■

7 Appendix B: Generic Wealth Distribution

Now let us consider the case where the wealth distribution is given by some generic distribution function F defined over $[0, \infty)$. The only assumptions I will impose are that F is differentiable (and with full support, such that $F'(w) > 0$ for all $w > 0$), that it has a finite expected value, which I will denote $\overline{w}$, and that it is right-skewed, such that $w_{med} < \overline{w}$, where $F(w_{med}) = \frac{1}{2}$.

The main difficulty with a "generic" distribution is to conceptualize inequality. First of all, keeping in line with the standard median voter framework, I will impose that changes in inequality will increase the distance between median and mean income: $\frac{\partial w_{med}}{\partial \Delta} < 0$. For simplicity, I will consider that the "inequality" of F is measured by a parameter Δ; in order to fix ideas, I will consider $\Delta \in [0,1]$, and think of it as the Gini coefficient: $\Delta = 0$ is a situation of perfect equality, where every individual has the same wealth $\overline{w}$, while $\Delta = 1$ is the limit situation where all the wealth in the economy is held by a single individual of measure zero. This difficulty will nevertheless restrict us to heuristic proofs in a few cases, which can be made more rigorous and precise by using specific functional form assumptions, as shown in the main text.

I will now show how each of the proofs can be adapted for this general case:

- **Lemma 1:**

If the cdf of the wealth distribution is given by F, it follows that the percentile p^* of the distribution will be characterized by:

$$p^* = F(w_{p^*}) = F\left(\overline{w}\left(1 - \frac{\tau_D + \tau_R}{2}\right)\right) \tag{31}$$

From this we get that $\frac{\partial p^*}{\partial \tau_j} < 0$, since F is increasing. The lemma thus follows as before.

- **Lemma 2:**

The total wealth held by the individuals below p^* is now $\int_0^{p^*} F^{-1}(p)dp$, where F^{-1} denotes the inverse function – which exists, since we have $F'(w) > 0$. It follows that:

$$Z_D = \lambda\left(1 - \overline{\delta}\right) \int_0^{p^*} F^{-1}(p)dp \tag{32}$$

$$Z_R = \lambda\left(1 - \overline{\delta}\right) \int_{p^*}^{1} F^{-1}(p)dp = \lambda(1 - \overline{\delta})\overline{w} - Z_D \tag{33}$$

For future reference, we note that:

$$\frac{\partial Z_D}{\partial p^*} = \lambda\left(1 - \overline{\delta}\right) F^{-1}(p^*) > 0 \tag{34}$$

$$\frac{\partial Z_R}{\partial p^*} = -\frac{\partial Z_D}{\partial p^*} < 0 \tag{35}$$

- **Lemma 3:**

Given the new version of Lemma 2, and the corresponding signs from (34) and (35), we get:

$$\frac{\partial \pi_D}{\partial \tau_D} = \frac{\partial \pi_D}{\partial \tau_R} = \frac{\partial p^*}{\partial \tau_D}\left[(1-c(Z_D)) - c'(Z_D)\frac{\partial Z_D}{\partial p^*}p^*\right] < 0 \tag{36}$$

$$\frac{\partial \pi_R}{\partial \tau_R} = \frac{\partial \pi_R}{\partial \tau_D} = -\frac{\partial p^*}{\partial \tau_R}\left[(1-c(Z_R)) + c'(Z_R)\frac{\partial Z_R}{\partial p^*}(1-p^*)\right] > 0 \tag{37}$$

The lemma thus follows as before.

- **Proposition 1:**

Now we have

$$p^* = \frac{\left(1-c\left(\lambda\left(1-\overline{\delta}\right)\int_{p^*}^1 F^{-1}(p)dp\right)\right)}{\left(1-c\left(\lambda\left(1-\overline{\delta}\right)\int_{p^*}^1 F^{-1}(p)dp\right)\right) + \left(1-c\left(\lambda\left(1-\overline{\delta}\right)\int_0^{p^*} F^{-1}(p)dp\right)\right)} \equiv \Omega(p^*)$$

Note that we still have that $\Omega(p^*) \in [0,1]$, and also that it is a continuous function of p^*. Note also that:

$$\begin{aligned}
\Omega'(p^*) &= \frac{-c'(Z_R)\frac{\partial Z_R}{\partial p^*}(2-c(Z_R)-c(Z_D)) + (1-c(Z_R))\left(c'(Z_R)\frac{\partial Z_R}{\partial p^*} + c'(Z_D)\frac{\partial Z_D}{\partial p^*}\right)}{\left[(1-c(Z_R)) + (1-c(Z_D))\right]^2} \\
&\propto -(1-c(Z_D))\,c'(Z_R)\frac{\partial Z_R}{\partial p^*} + (1-c(Z_R))\,c'(Z_D)\frac{\partial Z_D}{\partial p^*} = \\
&= \left[(1-c(Z_D))\,c'(Z_R) + (1-c(Z_R))\,c'(Z_D)\right]\lambda\left(1-\overline{\delta}\right)F^{-1}(p^*) < 0
\end{aligned}$$

It thus follows that there exists a unique fixed point, and the proposition follows. The equilibrium tax rate is now given by:

$$\tau = 1 - \frac{F^{-1}(p^*)}{\overline{w}} \tag{38}$$

- **Proposition 2:**

1. Same as before.

2. Using (38) one can compute:

$$\frac{\partial \tau}{\partial \Delta} = -\frac{1}{\overline{w}}\frac{\partial w_{p^*}}{\partial \Delta} - \frac{1}{\overline{w}}\frac{1}{F'(w_{p^*})}\frac{\partial p^*}{\partial \Delta} \tag{39}$$

   where the last term uses the inverse function theorem. The last term in square brackets is obviously equal to zero, given part (1) above. The term $-\frac{1}{\overline{w}}\frac{\partial w_{p^*}}{\partial \Delta}$ here captures the change in the wealth of the median agent, relative to mean income, that is brought about by a change in inequality. Since $\frac{\partial w_{med}}{\partial \Delta} < 0$ by assumption, it follows that $\frac{\partial \tau}{\partial \Delta} > 0$.

- **Proposition 3:**

Again, suppose $p^* \leq \frac{1}{2}$. It still follows from (12) and $c'(\cdot)$ that $Z_R \leq Z_D$. This in turn requires:

$$\lambda(1-\overline{\delta})\overline{w} - Z_D \leq Z_D \implies Z_D \geq \frac{\lambda(1-\overline{\delta})\overline{w}}{2} \implies \int_0^{p^*} F^{-1}(p)dp \geq \frac{\int_0^1 F^{-1}(p)dp}{2}$$

Now note that $p^* \leq \frac{1}{2}$ also implies that:

$$\frac{w_{med}}{2} = \int_0^{\frac{1}{2}} w_{med}dp \geq \int_0^{p^*} F^{-1}(p)dp$$

Putting these two together, we get:

$$\frac{w_{med}}{2} \geq \frac{\int_0^1 F^{-1}(p)dp}{2} = \frac{\overline{w}}{2} \implies w_{med} \geq \overline{w}$$

which is in contradiction with the assumption of right-skewness of the distribution F. This contradiction establishes the result.

- **Proposition 4 (Heuristic):**

We cannot establish the non-monotonic property as rigorously as was the case with the Pareto distribution, since one needs to specify what exactly do changes inequality mean, and this requires more structure on the family of distributions being considered – as was done by assuming the Pareto distribution. We can still offer, however, some characterization of the possible results, especially for limit cases of perfect (in)equality.

To see this, let us start by noting that the expression that corresponds to (25) is now:

$$\frac{\partial p^*}{\partial \Delta} = \frac{\left[c'(Z_R)(1-p^*) + c'(Z_D)p^*\right] \lambda \left(1-\overline{\delta}\right) \int_0^{p^*} \frac{\partial w_p}{\partial \Delta} dp}{(1-c(Z_R)) + (1-c(Z_D)) - \lambda \left(1-\overline{\delta}\right) w_{p^*} \left[c'(Z_R)(1-p^*) + c'(Z_D)p^*\right]} \tag{40}$$

The term in square brackets and the denominator are the same as before – hence they are negative and positive, respectively. The numerator is likely to be positive, to the extent that an increase in inequality will decrease the wealth of the relatively poor individuals, so that $\int_0^{p^*} \frac{\partial w_p}{\partial \Delta} dp$ would likely be negative. There is thus a tendency towards having $\frac{\partial p^*}{\partial \Delta} > 0$: an increase in inequality leads to the decisive agent being at a higher position in the wealth distribution.

We can use this back in (39). The "decisive voter" effect is captured by the term $-\frac{1}{\overline{w}} \frac{\partial w_{p^*}}{\partial \Delta}$. Note that this term will be positive if p^* is sufficiently close to $\frac{1}{2}$, given our assumption on the effect of an increase in inequality on the median agent: A sufficiently poor agent will always have her desire for redistribution increased by inequality. However, it can be negative if p^* is sufficiently large. The "endogenous turnout" effect is captured by the second term, $-\frac{1}{\overline{w}} \frac{1}{F'(w_{p^*})} \frac{\partial p^*}{\partial \Delta}$, which will likely be negative, as argued above. Combining the endogenous turnout effect and the possibility that the decisive voter effect be negative, it is possible that $\frac{\partial \tau}{\partial \Delta}$ be negative. We cannot be sure about that, though, without imposing more structure on the distribution function.

Even without imposing additional structure, we can substitute (40) into (39), in order to gauge at the behavior of equilibrium redistribution in response to changes in inequality when both effects are taken into account. This substitution yields:

$$\frac{\partial \tau}{\partial \Delta} = -\frac{1}{\overline{w}}\frac{\partial w_{p^*}}{\partial \Delta} - \frac{1}{\overline{w}}\frac{1}{F'(w_{p^*})}\frac{\left[c'(Z_R)(1-p^*)+c'(Z_D)p^*\right]\lambda\left(1-\overline{\delta}\right)\int_0^{p^*}\frac{\partial w_p}{\partial \Delta}dp}{(1-c(Z_R))+(1-c(Z_D))-\lambda\left(1-\overline{\delta}\right)w_{p^*}\left[c'(Z_R)(1-p^*)+c'(Z_D)p^*\right]} \tag{41}$$

Let us consider the limit cases of $\Delta \to 0$ (all individuals have the same wealth, $\overline{w}$) and $\Delta \to 1$ (all the wealth in the economy is held by a single individual), thinking of Δ as being the Gini coefficient. Since $\lim_{Z\to 0} c(Z) = 1$, it is easy to see that we still have $\lim_{\Delta\to 1} p^* = 1$ and $\lim_{\Delta\to 0} p^* = \frac{1}{2}$, for the same reasons as in the Pareto case. Now note that, given our definitions for the limit cases, it follows that when $\Delta \to 0$ and $p^* \to \frac{1}{2}$, we have $F'(w_{p^*}) \to \infty$; similarly, when $\Delta \to 1$ and $p^* \to 1$, we have $F'(w_{p^*}) \to 0$. (See Figures 3 and 4.) This seems to indicate that the "decisive voter" effect should prevail when inequality is low – and it will then be positive, as stressed before – while the "endogenous turnout" effect will be stronger when inequality is high. This indicates the distinct possibility of a non-monotonic relationship between inequality and redistribution. That will depend, however, on the behavior of $\frac{\partial w_p}{\partial \Delta}$ along the distribution, and understanding this requires more specific assumptions on what this distribution is like.

[FIGURES 3 AND 4 HERE]

- **Corollary 1:**

Totally differentiating (12) with respect to Δ we obtain:

$$-(1-c(Z_R))\frac{\partial p^*}{\partial \Delta} - (1-p^*)c'(Z_R)\frac{\partial Z_R}{\partial \Delta} = (1-c(Z_D))\frac{\partial p^*}{\partial \Delta} - p^*c'(Z_D)\frac{\partial Z_D}{\partial \Delta}$$

It is easy to see that $\frac{\partial Z_R}{\partial \Delta} = -\frac{\partial Z_D}{\partial \Delta}$, hence:

$$\left[(1-c(Z_D))+(1-c(Z_R))\right]\frac{\partial p^*}{\partial \Delta} = -\left[(1-p^*)c'(Z_R)+p^*c'(Z_D)\right]\frac{\partial Z_R}{\partial \Delta}$$

It follows that the sign of $\frac{\partial Z_R}{\partial \Delta}$ will be the same as that of $\frac{\partial p^*}{\partial \Delta}$, while the opposite holds for $\frac{\partial Z_D}{\partial \Delta}$, just as before. To the extent that we have $\frac{\partial p^*}{\partial \Delta} > 0$, the result immediately follows.

8 Data Appendix

The variables used in the empirical analysis are defined as follows, all at the county level:

1. **Contributions:** Individual contributions are obtained from the file "indiv00.do", available on <www.fec.gov/finance/disclosure/ftpdet.shtml#1999_2000>, which are then merged with data on committees from the file "cm00.do", available on the same URL. I limit the analysis to contributions to presidential candidates (filer type "P" in the committee file) and party committees (filer types "X", "Y", and "Z"). (The procedure is analogous for gathering data for the 2003/2004 election cycle.) "Direct contributions" refer to transaction type "15" in the "indiv00.do" file.

   (a) **Amount:** Log of one plus total amount of contributions (in the two-year election cycle) divided by population over 18 years old (so that zeros are kept in sample).

   (b) **Number:** Number of individual contributions (in the two-year election cycle) divided by population over 18 years old.

   (c) **Contribution Margin:** Absolute value of the difference between contributions to Democrats and Republicans divided by total contributions to both parties (in the two-year election cycle).

2. **Voting:** Data on votes is obtained from the Atlas of U.S. Presidential Elections, on <http://www.uselectionatlas.org

   (a) **Turnout:** Total number of votes in the election divided by population over 18 years old.

   (b) **Vote Margin:** Margin of victory of winning candidate, in percentage points.

   (c) **Bush Win:** Dummy for counties won by George W. Bush.

3. **Other Variables:**

   (a) **Income:** Sum of median household income per census block, weighted by population, divided by total county population. (Counties with a single census block are excluded.). Computed from Summary File 3 of the 2000 Census.

   (b) **Education:** % of population with at least college degree. Computed from 5-Percent Public Use Microdata Sample (PUMS) files of the 2000 Census.

   (c) **Racial Heterogeneity:** Herfindahl index of racial heterogeneity. The races are defined by combining the definitions of "race" and "Hispanic origin" in the 2000 Census: My categories are “White”, “Black or African American”, “American Indian and Alaska Native”, “Asian”, “Native Hawaiian and Other Pacific Islander”, ”Other” – all of these restricted to “Non-Hispanic” origin – and “Hispanic”. Computed from 5-Percent Public Use Microdata Sample (PUMS) files of the 2000 Census.

(d) **Religious Heterogeneity:** Herfindahl index of religious heterogeneity, from a variety of sources obtained for around 1990. These data come from Alesina, Baqir and Hoxby (2004).

(e) **Income Inequality:** Gini coefficient between census blocks within a county, weighted by population. Computed from Summary File 3 of the 2000 Census.

Table 1. 2000 Elections: Full Sample

	(1) Amount	(2) Amount	(3) Number	(4) Number	(5) Turnout	(6) Turnout
Log Income	0.343	0.353	0.001	0.001	0.058	0.052
	[0.064]***	[0.063]***	[0.000]**	[0.000]*	[0.008]***	[0.008]***
Education	0.045	0.036	0	0	0	0.003
	[0.003]***	[0.003]***	[0.000]***	[0.000]***	[0.000]	[0.000]***
Contribution Margin	0.084	0.086	0	0		
	[0.030]***	[0.029]***	[0.000]***	[0.000]***		
Vote Margin					0.096	0.035
					[0.011]***	[0.010]***
Bush Win	-0.085	-0.034	-0	-0	0.005	-0.012
	[0.026]***	[0.026]	[0.000]	[0.000]	[0.004]	[0.003]***
Racial Heterogeneity		0.243		0.001		-0.162
		[0.083]***		[0.000]		[0.013]***
Religious Heterogeneity		0.031		0.001		-0.005
		[0.078]		[0.000]*		[0.011]
Income Inequality		**1.301**		**-0.004**		**-0.43**
		[0.275]* **		**[0.002]** **		**[0.037]*** **
Observations	2916	2881	2915	2881	2936	2901
R-squared	0.373	0.377	0.339	0.331	0.507	0.611

Notes: OLS regressions; robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
For the definitions of the variables, see Data Appendix.

Table 2. 2000 Elections: Full Sample (Poorest and Richest Quartiles in County Distribution)

	(1) Amount	(2) Turnout	(3) Amount	(4) Turnout
	Poorest		Richest	
Log Income	0.397	0.041	0.216	0.065
	[0.200]**	[0.028]	[0.175]	[0.016]***
Education	0.02	0.002	0.041	0.003
	[0.006]***	[0.001]**	[0.005]***	[0.000]***
Contribution Margin	0.149		-0.007	
	[0.047]***		[0.078]	
Vote Margin		0.054		0.004
		[0.019]***		[0.015]
Bush Win	-0.01	0	-0.043	-0.006
	[0.056]	[0.006]	[0.054]	[0.005]
Racial Heterogeneity	0.023	-0.094	0.627	-0.257
	[0.127]	[0.024]***	[0.194]***	[0.023]***
Religious Heterogeneity	-0.083	0.002	0.173	-0.066
	[0.142]	[0.019]	[0.224]	[0.028]**
Income Inequality	**0.773**	**-0.509**	**2.008**	**-0.1**
	[0.418]*	**[0.073]*****	**[0.612]*****	**[0.061]**
Observations	724	732	708	710
R-squared	0.172	0.557	0.567	0.682

Notes: OLS regressions; robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
For the definitions of the variables, see Data Appendix.

Table 3. 2000 Elections: Democrats and Republicans

	(1) Amount	(2) Number	(3) Turnout	(4) Amount	(5) Number	(6) Turnout
	Democrats			Republicans		
Log Income	0.124	0	-0.037	0.263	0.001	0.089
	[0.025]***	[0.000]**	[0.008]***	[0.042]***	[0.000]***	[0.008]***
Education	0.014	0	0.002	0.025	0	0
	[0.002]***	[0.000]***	[0.000]***	[0.002]***	[0.000]***	[0.000]
Contribution Margin	-0.212	0		0.245	0.001	
	[0.013]***	[0.000]***		[0.018]***	[0.000]***	
Vote Margin			-0.175			0.219
			[0.010]***			[0.012]***
Bush Win	-0.068	0		0.004	0	
	[0.013]***	[0.000]***		[0.016]	[0.000]	
Racial Heterogeneity	0.112	0	0.009	0.05	0	-0.146
	[0.036]***	[0.000]	[0.010]	[0.057]	[0.000]	[0.012]***
Religious Heterogeneity	-0.006	0	-0.029	0.1	0.001	0.017
	[0.034]	[0.000]	[0.008]***	[0.058]*	[0.000]**	[0.009]*
Income Inequality	**-0.103**	**-0.002**	**-0.001**	**0.603**	**-0.002**	**-0.38**
	[0.135]	**[0.001]*** **	**[0.028]**	**[0.204]*** **	**[0.001]**	**[0.034]*** **
Observations	2880	2881	2901	2880	2881	2901
R-squared	0.442	0.336	0.551	0.387	0.278	0.67

Notes: OLS regressions; robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
All variables are defined as in the Data Appendix, except that votes and contributions are restricted to those for the corresponding party.

Table 4. 2004 Election: Full Sample

	(1) Amount	(2) Amount	(3) Number	(4) Number	(5) Turnout	(6) Turnout
Log Income	0.562	0.549	0.001	0.001	0.16	0.157
	[0.066]***	[0.067]***	[0.000]***	[0.000]***	[0.009]***	[0.009]***
Education	0.055	0.048	0	0	0	0.003
	[0.003]***	[0.003]***	[0.000]***	[0.000]***	[0.000]	[0.000]***
Contribution Margin	0.055	0.07	0.001	0		
	[0.037]	[0.037]*	[0.000]**	[0.000]*		
Vote Margin					0.061	-0.005
					[0.010]***	[0.010]
Bush Win	-0.079	-0.054	-0.001	-0.001	0.008	-0.007
	[0.030]***	[0.032]*	[0.000]***	[0.000]***	[0.004]*	[0.004]*
Racial Heterogeneity		0.046		0		-0.2
		[0.092]		[0.000]		[0.015]***
Religious Heterogeneity		0.178		0		-0.023
		[0.096]*		[0.000]		[0.012]*
Income Inequality		**1.172**		**-0.01**		**-0.373**
		[0.299]* **		**[0.002]*** **		**[0.041]*** **
Observations	2840	2807	2840	2807	2882	2848
R-squared	0.465	0.465	0.472	0.485	0.517	0.616

Notes: OLS regressions; robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
All variables defined as in the Data Appendix, but votes and contributions refer to the 2004 election.

Table 5. 2004 Election: Full Sample (Poorest and Richest Quartiles in County Distribution)

	(1) Amount	(2) Turnout	(3) Amount	(4) Turnout
	Poorest		Richest	
Log Income	0.335	0.052	0.456	0.23
	[0.221]	[0.026]**	[0.181]**	[0.024]***
Education	0.041	0.002	0.049	0.002
	[0.009]***	[0.001]**	[0.005]***	[0.001]***
Contribution Margin	0.022		0.139	
	[0.064]		[0.097]	
Vote Margin		0.02		-0.035
		[0.016]		[0.018]*
Bush Win	0.015	0.002	-0.136	0.002
	[0.058]	[0.007]	[0.061]**	[0.007]
Racial Heterogeneity	-0.034	-0.088	0.117	-0.344
	[0.158]	[0.023]***	[0.213]	[0.028]***
Religious Heterogeneity	0.125	-0.022	0.262	-0.116
	[0.165]	[0.018]	[0.258]	[0.037]***
Income Inequality	**0.426**	**-0.462**	**2.139**	**-0.015**
	[0.574]	**[0.069]*** **	**[0.647]*** **	**[0.079]**
Observations	701	729	677	677
R-squared	0.192	0.543	0.644	0.717

Notes: OLS regressions; robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
All variables are defined as in Table 4.

Table 6. 2004 Elections: Democrats and Republicans

	(1) Amount	(2) Number	(3) Turnout	(4) Amount	(5) Number	(6) Turnout
	Democrats			Republicans		
Log Income	0.143	0	-0.019	0.461	0.001	0.173
	[0.039]***	[0.000]	[0.009]**	[0.053]***	[0.000]***	[0.009]***
Education	0.038	0	0.004	0.03	0	-0.001
	[0.003]***	[0.000]***	[0.000]***	[0.002]***	[0.000]***	[0.000]**
Contribution Margin	-0.399	-0.001		0.366	0.001	
	[0.021]***	[0.000]***		[0.027]***	[0.000]***	
Vote Margin			-0.235			0.229
			[0.011]***			[0.011]***
Bush Win	-0.15	-0.001		0.031	0	
	[0.022]***	[0.000]***		[0.024]	[0.000]	
Racial Heterogeneity	0.085	0	-0.012	-0.007	0	-0.184
	[0.051]*	[0.000]	[0.011]	[0.070]	[0.000]	[0.013]***
Religious Heterogeneity	-0.124	-0.001	-0.029	0.165	0.001	0.004
	[0.053]**	[0.000]***	[0.008]***	[0.075]**	[0.000]***	[0.010]
Income Inequality	**-0.717**	**-0.008**	**-0.043**	**1.004**	**-0.002**	**-0.325**
	[0.203]***	**[0.002]*****	**[0.035]**	**[0.236]*****	**[0.001]**	**[0.039]*****
Observations	2807	2807	2848	2807	2807	2848
R-squared	0.589	0.519	0.637	0.411	0.324	0.673

Notes: OLS regressions; robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%
All variables are defined as in Table 4, except that votes and contributions are restricted to those for the corresponding party.

Table 7. 2000 Elections: Direct Contributions

	(1) Amount	(2) Number	(3) Amount	(4) Amount	(5) Amount	(6) Number	(7) Amount	(8) Number
	Full Sample		1st Quartile	4th Quartile	Democrats		Republicans	
Log Income	0.289	0.001	0.309	0.17	0.123	0	0.26	0.001
	[0.049]***	[0.000]**	[0.148]**	[0.140]	[0.025]***	[0.000]**	[0.041]***	[0.000]***
Education	0.031	0	0.017	0.039	0.014	0	0.025	0
	[0.003]***	[0.000]***	[0.005]***	[0.004]***	[0.002]***	[0.000]***	[0.002]***	[0.000]***
Contribution Margin	0.103	0	0.164	0.035	-0.21	0	0.243	0.001
	[0.022]***	[0.000]***	[0.034]***	[0.063]	[0.013]***	[0.000]***	[0.018]***	[0.000]***
Bush Win	-0.03	0	-0.036	-0.051	-0.068	0	0.004	0
	[0.019]	[0.000]	[0.035]	[0.041]	[0.013]***	[0.000]***	[0.016]	[0.000]
Racial Heterogeneity	0.099	0	-0.023	0.268	0.111	0	0.048	0
	[0.065]	[0.000]	[0.108]	[0.158]*	[0.036]***	[0.000]	[0.057]	[0.000]
Religious Heterogeneity	0.104	0	0.077	0.138	-0.008	0	0.102	0
	[0.063]	[0.000]*	[0.116]	[0.188]	[0.034]	[0.000]	[0.057]*	[0.000]**
Income Inequality	**0.589**	**-0.004**	**0.606**	**0.691**	**-0.103**	**-0.002**	**0.603**	**-0.002**
	[0.227]* **	**[0.001]** **	**[0.379]**	**[0.496]**	**[0.135]**	**[0.001]*** **	**[0.202]*** **	**[0.001]**
Observations	2881	2881	724	708	2881	2881	2881	2881
R-squared	0.406	0.311	0.212	0.597	0.456	0.337	0.39	0.281

Notes: OLS regressions; robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.
For the definitions of the variables, see Data Appendix.

Table 8. 2000 Elections: Contributions to Identified Parties

	(1)	(2)	(3)	(4)
	Amount	Number	Amount	Amount
	Full Sample		1st Quartile	4th Quartile
Log Income	0.621	0.001	0.779	0.376
	[0.108]***	[0.000]***	[0.419]*	[0.236]
Education	0.061	0	0.055	0.065
	[0.005]***	[0.000]***	[0.013]***	[0.007]***
Contribution Margin	-0.124	0	-0.155	-0.019
	[0.062]**	[0.000]***	[0.118]	[0.141]
Bush Win	0.051	0	-0.024	-0.013
	[0.047]	[0.000]	[0.103]	[0.078]
Racial Heterogeneity	0.167	0	-0.144	0.447
	[0.161]	[0.000]	[0.310]	[0.312]
Religious Heterogeneity	0.483	0.001	0.359	0.317
	[0.164]***	[0.000]*	[0.347]	[0.391]
Income Inequality	**1.788**	**-0.004**	**1.597**	**2.351**
	[0.489]* **	**[0.001]** **	**[1.043]**	**[0.863]*** **
Observations	2794	2881	674	707
R-squared	0.383	0.326	0.251	0.58

Notes: OLS regressions; robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.
All variables defined as in the Data Appendix, except that contributions to unidentified parties are dropped from the sample.

Table A1. Individual Contributions: Descriptive Statistics

	Direct Contributions			Total Contributions		
	Candidate	Party	Overall	Candidate	Party	Overall
Mean [a]	675.64	983.15	836.25	947.09	2366.72	1735.68
Median [a]	500	300	500	500	375	500
75th percentile [a]	1000	1000	1000	1000	1000	1000
95th percentile [a]	1000	5000	2000	1000	10000	5000
Total Democrats [b]	62	110	172	63	113	176
Total Republicans [b]	121	171	292	204	172	376
Total Other [b]	5	4	9	7	3	10
Total Unidentified [b]	3	21	24	4	577	581
Total [b]	191	306	497	278	865	1,143
Observations	283,675	310,171	593,846	292,863	365,979	658,842

Notes: Source: Own calculation, based on data from Federal Election Committee.
[a] In dollars.
[b] In millions of dollars.

Table A2. County-Level Variables: Descriptive Statistics

Variable	Obs	Mean	Median	Min	Max
Amount	3047	283,271	11,914	0	195 million
Amount Direct	3047	130,617	10,250	0	23 million
Amount Republicans	3047	81,941	6,950	0	9.6 million
Amount Democrats	3047	41,310	1,400	0	11.9 million
Income	3048	36,704	34,662	11,594	87,622
Education	3047		11.8	3.7	53.4
Contribution Margin	3028	0.65	0.718	0	1
Vote Margin	2936	0.237	0.207	0	0.856
Bush Win	2936	0.792	1	0	1
Racial Heterogeneity	3047	0.258	0.204	0.011	0.768
Religious Heterogeneity	2006	0.627	0.687	0	0.886
Income Inequality	3048	0.123	0.115	0	0.355

Notes: All variables defined as in the Data Appendix.

Figure 1. Equilibrium *p**

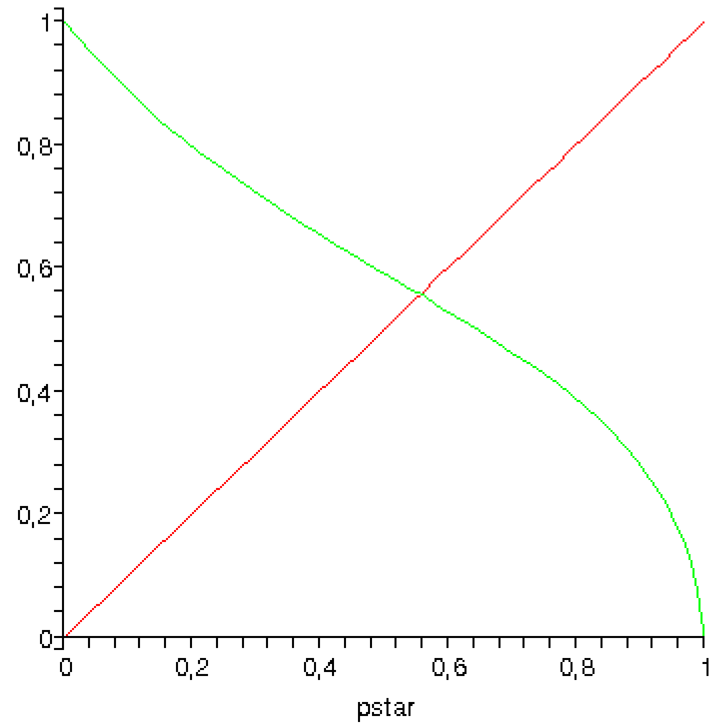

Figure 2. The “endogenous turnout” effect

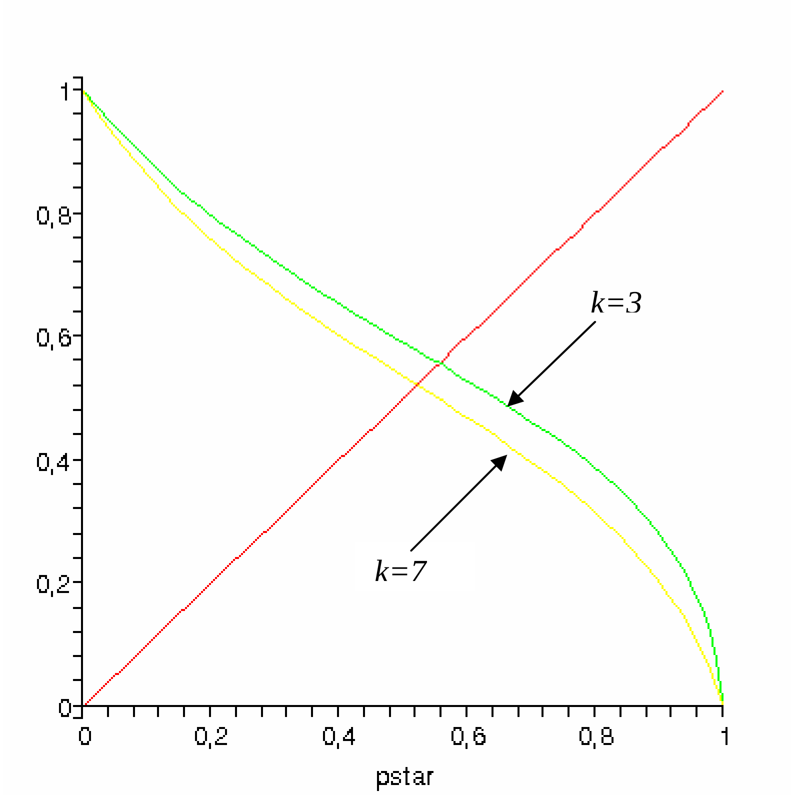

Figure 3. Perfect inequality: $\Delta \to 1$

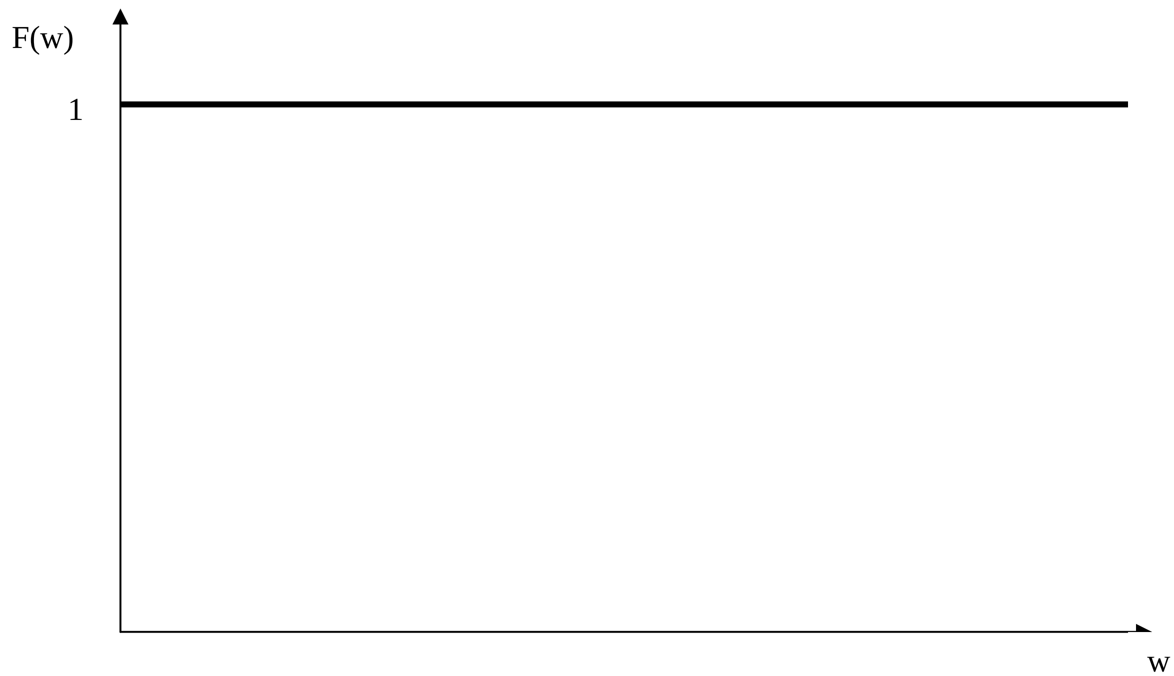

Figure 4. Perfect equality: $\Delta \to 0$