

# **On the Political and Economic Determinants of Redistribution: Economic Gains, Ideological Gains, or Institutions?**

**Gustavo de Souza**

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# On the Political and Economic Determinants of Redistribution: Economic Gains, Ideological Gains, or Institutions?\*

Gustavo de Souza

Federal Reserve Bank of Chicago

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## Abstract

I describe a structural method to quantify the contribution of different elements of social choice to the level of redistribution. Estimating a DSGE model with microdata on the support for redistribution, I find that if voters disregarded their ideological views on welfare policies, redistribution in the US would increase 117%. Because ideology is a more important determinant of voting behavior than income, increasing voter turnout or capping campaign contributions would have a small effect on redistribution. Among the drivers of ideology, I find that racial animosity and distrust of the government contributes to a 80% and 44% smaller redistribution, respectively.

**Keywords:** redistribution, preferences for redistribution, dynamic macro models of political-economy

**JEL Codes:** E6, P16, H11

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# 1 Introduction

Redistributive policies, such as welfare transfers and universal health care, are commonly the center of a heated political debate. The U.S. government spends 20% of GDP in this category, less than the world average (22.4%) and the EU (28.1%). Some economists argue that institutional factors explain the lower redistribution in the U.S..<sup>1</sup> Campaign contribution, a lower voter turnout, and/or partisan preferences due to, for instance, religious concerns, could result in low-income voters being misrepresented in the political process. Another possibility is that low-income individuals are averse to redistribution for ideological reasons.<sup>2</sup> In this paper I ask: What are the quantitatively relevant determinants of redistribution? What is more important for voters: economic gains or ideological gains? What is the effect of changing campaign expenditure and voter turnout rules on redistribution? This paper uses a structural method to identify the different political and economic determinants of redistribution and studies how institutional reforms would affect redistribution and welfare.

I start by building a DSGE model with endogenous fiscal policy choice, ideological views on redistribution, partisan preferences, and voter turnout. Agents receive idiosyncratic shocks every period and have limited insurance. They make their standard economic decisions, choosing labor supply, consumption, and savings, and engage in politics by deciding on election turnout, and on which party to vote for. Parties choose their tax proposal to maximize their probability of winning the election and differ in other policy proposals.

Voters choose parties based on three factors: the economic gain from redistribution, ideological gains from redistribution, and partisan preferences. First, voters weigh their economic gain from a party's proposed fiscal policy. For instance, a low-income voter benefits from an increase in redistribution because they pay less taxes than what they receive as transfers. This means that they have large economic gains from an increase in redistribution and

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<sup>1</sup> Aggeborn (2016), Campante (2011), Karabarbounis (2011), and Bachmann and Bai (2013) argue that a higher voter turnout and campaign contribution by the rich reduce redistribution. Roemer (1998) and Roemer (2003) argue that religious issues are the only reason why the poor do not expropriate the rich in the U.S..

<sup>2</sup> Piketty (1998), Alesina and Ferrara (2005), Alesina and Giuliano (2009), Corneo and Grüner (2002) and Lee and Roemer (2006) argue that ideological views on redistribution are the main determinants of redistribution while Meltzer and Richard (1981), Krusell and Rios-Rull (1997) and Corbae et al. (2009) argue that inequality can explain the social choice of redistribution.

are more likely to support a party proposing high redistribution, everything else constant. Second, voters consider their ideological gains. This component captures views on fairness, trust in the government, altruism, racial animosity, and others. For instance, a voter with high animosity against welfare recipients has negative ideological gains from redistribution and, therefore, is more likely to support a party that proposes low redistribution. Third, voters consider their preference for each party, which captures voter views on other policies proposed by parties, for example policies on abortion, immigration, or gun control. Comparing these three factors, voters choose a party to vote for. Therefore, the equilibrium fiscal policy is a function of the distribution of economic gains, ideological views, and partisan preferences.

I show that the different components of voters' preferences can be teased apart using microdata on the support for redistribution and microdata on voting. First, I use the model to get an estimate of the economic gain of each agent. The model provides an estimate of how a marginal increase in taxes would affect individuals at different positions in the income distribution, i.e., the economic gain. Second, I use the model and the survey data on the support for redistribution to identify ideological gains. Knowing agents' support for redistribution and their economic gain of redistribution from the calibrated model, I estimate their ideological gain from redistribution using maximum log-likelihood. In the third step, I estimate voters' preferences for other policies using microdata on voting.

I find that ideological gains are the main determinant of redistribution and that voter turnout or partisan preferences are not quantitatively important. If agents were to vote disregarding their ideological views on redistribution, government size would increase from 0.17% of GDP to 0.36% of GDP, i.e., a 117% increase in redistribution. In contrast, if they voted disregarding their economic benefit from redistribution, the equilibrium tax rate would go from 0.17% to 0.15%, i.e., a 22% drop. This result shows that ideological gains are a crucial determinant of redistribution.

Imposing compulsory voting would not have any effect on the equilibrium government size. Because the economic gain is not an important component in preferences for redistribution, the preferred tax rate does not differ significantly across the income distribution. Therefore, reducing the influence of the rich by increasing voter turnout would not have a

significant effect on the equilibrium tax rate.

I show that racial concerns are an important driver of ideological gains. Voters who hold negative views on Black and Hispanic Americans are more likely to be against an increase in redistribution. Because of that, if agents were to vote disregarding their racial views, redistribution would increase 80%. In the same fashion, voters who hold negative views about welfare recipients are more likely to be against an increase in redistribution, but of relatively smaller importance. If agents were to vote without negative views against welfare recipients, redistribution would increase 27%. I also show that campaign expenditure, alternative voter rationality, or different fiscal rules do not change the finding that ideological gains is the main driver of redistribution.

This paper is related to the literature that studies dynamic models of political-economy. This literature, initiated by Meltzer and Richard (1981), Krusell and Rios-Rull (1997), and Aiyagari and Peled (1995), is focused on understanding how changes in inequality affect redistribution and fiscal policy (Corbae et al. (2009), Pecoraro (2017), Bachmann and Bai (2013)). They have shown that pairwise voting in a standard DSGE model can reproduce U.S. government size (Meltzer and Richard (1981), Krusell et al. (1997), Krusell and Rios-Rull (1997), Corbae et al. (2009), Corbae et al. (2009), Aiyagari and Peled (1995), Pecoraro (2017), Mateos-Planas (2008), Carroll (2013), Azzimonti et al. (2014), Piguillem and Schneider (2013)), the movement of U.S. federal expenditures (Malley et al. (2007), Song (2011), Piguillem and Schneider (2013), Bachmann and Bai (2013)), and that political polarization can reduce growth (Azzimonti (2011), Azzimonti and Talbert (2014)).

I make two contributions to this literature – on the preference for redistribution and on the estimation of the model. The literature on dynamic political-economy models so far has focused on economic gain as the main driver of redistribution. I show that the economic gain plays a coadjuvant role when ideological gains are considered, i.e., the driver of redistribution is people’s ideology and not how much they can profit from it. Moreover, by adding ideological gains to the model, I can reproduce moments in the data that previous models were unable to replicate, such as income differences between left and right-wing voters, political parties’ campaign expenditures, and the support for redistribution observed in the data. My second contribution to this literature is to propose a method to estimate

the different preferences of voters using microdata.

This paper is also related to the literature that studies the political economy of redistribution. Several papers have studied the connection between inequality and redistribution without finding a conclusive answer. Some papers have found a positive,<sup>3</sup> negative,<sup>4</sup> or no relation at all between inequality and government size.<sup>5</sup> Alesina and Ferrara (2005), Alesina and Giuliano (2009), Corneo and Grüner (2002), Fong (2001), and Lee and Roemer (2006) argue that ideological gains are the main determinant of redistribution. According to them, some societies favor redistribution because they prefer to build a more egalitarian economy. Moreover, Alesina et al. (2001), Alesina and Ferrara (2005), Lee and Roemer (2006), Alesina and Glaeser (2013) argue that support against redistributive policy in the U.S. is mainly driven by racism. Roemer (1998) and Roemer (2003) show that the concern for religion and non-tax issues could lead low-income individuals to vote for parties that propose low levels of redistribution. Alesina et al. (1999), Benabou and Ok (2001), Piketty (1995), Alesina et al. (2018), and Alesina and Stantcheva (2020) argue that households are against redistribution if they expect to move up on the income ladder. Campante (2011) argues that campaign contributions can reduce taxes, and Karabarbounis (2011) defends that high-income voters have more influence in the political process through campaign contributions and higher turnout. Bierbrauer et al. (2022) also shows that voter turnout can affect the level of redistribution.

The literature studying the political economy of redistribution makes it clear that several factors might affect the social choice of redistribution. I make one contribution to this literature: I quantify the contribution of these channels. We know from past work that inequality,<sup>6</sup> ideology,<sup>7</sup> non-tax preferences,<sup>8</sup> and political participation<sup>9</sup> affect redistribution. What we do not know is how much these elements can affect the equilibrium redistribution.

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<sup>3</sup> Boustan et al. (2013), Corcoran and Evans (2010), Scervini (2012), Karabarbounis (2011), Kerr (2014), Shelton (2007), Gründler and Köllner (2017), Borge and Rattsø (2004), Milanovic (2000), Alesina and Rodrik (1994), Chernick (2005), and Schwabish (2008)

<sup>4</sup> Moffitt et al. (1998), Gouveia and Masia (1998), Ramcharan (2010)

<sup>5</sup> Rodriguez (1999).

<sup>6</sup> As in Krusell and Rios-Rull (1997), Azzimonti (2011), Corbae et al. (2009), Bachmann and Bai (2013), Pecoraro (2017), and Aiyagari and Peled (1995).

<sup>7</sup> As in Alesina and Ferrara (2005), Alesina and Giuliano (2009), Corneo and Grüner (2002), and Lee and Roemer (2006) among many others.

<sup>8</sup> Roemer (1998) and Roemer (2003).

<sup>9</sup> As in Karabarbounis (2011), Campante (2011), Bierbrauer et al. (2022), among others.

In this paper, I fill this gap by proposing a structural method to quantify the different determinants of redistribution.

This paper also contributes to the literature using structural models in political economy (Diermeier et al. (2005), Finan and Mazzocco (2020), Lim (2013), Aruoba et al. (2019), Iaryczower et al. (2021), Stromberg (2008)). This literature has used estimated structural models to understand how different political reforms would affect the returns to a political career (Diermeier et al. (2005)), the allocation of public funds (Finan and Mazzocco (2020)), criminal sentencing (Lim (2013)), economic performance (Aruoba et al. (2019), Iaryczower et al. (2021)), and policy (Stromberg (2008)). I make two contributions to this literature – on the question and on the methodology. On the question, this is the first paper that uses a structural method to understand redistribution. As discussed before, a structural model allows me to tease apart the many channels affecting the choice of redistribution. A second contribution is on methodology. Differently from the papers cited, I use a dynamic general equilibrium model. A DSGE model allows me to capture the effect of income mobility on the willingness to redistribute and provides a precise estimate of the economic gains from redistribution.

This paper is divided into 5 sections. In the next section I present the model. Section 3 discusses the identification techniques. Section 4 and 5 present the results and conclude the paper.

## 2 Model

The model equilibrium definition is made in two steps. In the first step, I define the economic side of the model, i.e., the equilibrium given the path for taxes. In the following section, I present the political equilibrium where the tax rate is endogenous. Subsequently, I discuss the main features of the model, the reason for their introduction, and the estimation.

## 2.1 Economics

### 2.1.1 Demographics

There is a continuum with measure one of infinitely lived households. In every period, households must choose consumption,  $c_t$ , labor supply,  $n_t$ , and savings  $a_{t+1}$ . Households maximize discounted life-time utility:

$$E \left[ \sum_{t=0}^{\infty} \beta^t u(c_t, n_t) \right]$$

Household labor productivity is given by

$$\log \epsilon_{i,t} = \alpha_i + z_{i,t} \tag{1}$$

$$z_{i,t} = \rho z_{i,t-1} + e_{i,t}$$

where  $\alpha_i \sim N(0, \sigma_\alpha^2)$  is a permanent component,  $z_{i,t}$  is a temporary component,  $z_{i,t-1}$  is the last period's temporary component, and  $e_{i,t} \sim N(0, \sigma_e^2)$  is the innovation. Labor supply is remunerated by wage  $w_t$  and savings by interest rate  $r_t$ . Individuals pay tax  $\tau_t$  on income and receive transfer  $T_t$ .

### 2.1.2 Firms

There is a continuum of price taker firms. They have access to production technology given by

$$F(K_t, N_t) = K_t^\alpha N_t^{1-\alpha}$$

and they must pay interest rate  $r_t$  and wages  $w_t$  to maximize their profits. Maximization implies

$$r_t = \alpha K_t^{\alpha-1} N_t^{1-\alpha} - \delta \tag{2}$$

$$w_t = (1 - \alpha) K_t^\alpha N_t^{-\alpha}$$



where  $\delta$  is capital depreciation,  $K_t$  is aggregate capital, and  $N_t$  is aggregate labor supply in effective units.

### 2.1.3 Government

Government revenue comes from a linear tax rate  $\tau_t$  on income. The government expends on a universal transfer  $T_t$  and exogenous expenditure  $G$ . The government's budget constraint is given by

$$T_t = (\tau_t - G_t)(r_t K_t + w_t N_t) \quad (3)$$

Taxes are a pre-determined function of past taxes and the distribution of agents. If  $\tau_t$  is the tax in period  $t$ , the period  $t + 1$  tax rate is given by  $\tau_{t+1} = \Phi(\Gamma_t, \tau_t)$ , where  $\Gamma_t$  is the distribution over  $(a_{i,t}, z_{i,t}, \alpha_{i,t})$ . For now, assume that  $\Phi$  is exogenous.

### 2.1.4 Economic Equilibrium

In this section, I define the economic equilibrium of the model given the path of taxes  $\Phi$ . The household's recursive problem is given by

$$\begin{aligned} \Omega(a, z, \alpha | \Gamma, \tau) &= \max_{c, n, d, a'} u(c, n, d) + \beta E [\Omega(a', z', \alpha | \Gamma', \tau')] & (4) \\ &\text{s.t.} \\ c + d + a' &= (1 + r(\Gamma, \tau)(1 - \tau))a + (1 - \tau)w(\Gamma, \tau)\epsilon n + T(\Gamma, \tau) \\ \log \epsilon &= \alpha + z \\ \tau' &= \Phi(\Gamma, \tau); \Gamma' = \Pi(\Gamma, \tau) \\ a' &\geq \bar{a}, c \geq 0; d \in [0, \bar{d}]; n \geq 0 \end{aligned}$$

where  $(a, z, \alpha)$  are the individual state variables and  $(\Gamma, \tau)$  are the aggregate state variables. As in Krusell and Rios-Rull (1997) and Corbae et al. (2009), the distribution of agents is a state variable because households need to know it to predict future taxes.  $r$  and  $w$  are the prices as a function of  $(\Gamma, \tau)$ .

**Definition 2.1** (Economic Equilibrium). Given a law of motion for taxes  $\Phi$ , an economic equilibrium is defined by a value function,  $\Omega$ , policy functions  $\{h_c, h_n, h_d, h_a\}$ , price functions,  $\{r, w\}$ , a transfer function,  $T$ , and a law of motion of the distribution of agents,  $\Pi$ , such that:

1. Given the price functions, and the laws of motion for taxes and distribution,  $\{\Omega, h_c, h_n, h_d, h_a\}$  solves the household problem on (4);
2. Given aggregate capital and the labor supply implied by  $\Gamma$  and  $h_n$ , firms maximize their profit (2);
3. The government budget constraint is satisfied (3);
4. The law of motion of the distribution of agents,  $\Pi$ , is consistent with households' policy functions.

## 2.2 Politics

The law of motion of taxes,  $\Phi$ , is determined by the partisan competition of two parties: R, right, and L, left. These parties differ in their policy proposals. Each policy proposal has two components: tax policy and non-tax policy. This last one can be understood as capturing the importance of topics such as abortion, gun control, immigration policy, and others, i.e., all policies except redistribution. Voters are going to take into account parties' platform to make their choice of turnout, and vote. The election takes place at the end of every period to decide on the set of policies to be implemented in the next period. A voter choice of party takes into account three elements – the economic gain, ideological gain, and non-tax preferences.

### 2.2.1 Economic Gain

To decide which party to vote for, agents calculate how different tax rates directly affect their welfare. If party  $j \in \{R, L\}$  proposes tax  $\tau^j$ , agents consider how moving from the equilibrium tax  $\Phi(\Gamma, \tau)$  to tax  $\tau^j$  tomorrow will affect their welfare. Voters are rational on this calculation and consider how this one-period tax change affects prices and the future

path of taxes.  $\tilde{\Omega}(\tau^j|a, z, \alpha, \Gamma, \tau)$  captures how an agent in state  $(a, z, \alpha)$  feels about tax rate  $\tau^j$ , given the aggregate state  $(\Gamma, \tau)$ :

$$\begin{aligned} \tilde{\Omega}(\tau^j|a, z, \alpha, \Gamma, \tau) &= \max_{c, n, d, a'} u(c, n, d) + \beta E [\Omega(a', z', \alpha|\Gamma', \tau^j)] & (5) \\ \text{s.t.} & \\ c + d + a' &= (1 + \tilde{r}(\Gamma, \tau, \tau^j)(1 - \tau))a + (1 - \tau)\tilde{w}(\Gamma, \tau, \tau^j)\epsilon n + \tilde{T}(\Gamma, \tau, \tau^j) \\ \log \epsilon &= \alpha + z \\ \Gamma' &= \tilde{\Pi}(\Gamma, \tau, \tau^j) \\ a' &\geq \bar{a}, c \geq 0; d \in [0, \bar{d}]; n \geq 0 \end{aligned}$$

where  $\Omega$  is the value function defined in (4),  $\{\tilde{r}(\Gamma, \tau, \tau'), \tilde{w}(\Gamma, \tau, \tau'), \tilde{T}(\Gamma, \tau, \tau')\}$  are the prices and the transfer that satisfy (2) and (3), and  $\tilde{\Pi}$  is the law of motion of the distribution of agents when the tax rate tomorrow is  $\tau^j$  instead of  $\Phi(\Gamma, \tau)$ .  $\tilde{\Omega}$  measures the economic gain from taxation  $\tau^j$  for an agent in state  $(a, z, \alpha)$ .

### 2.2.2 Ideological Gains

Individuals value redistribution for other reasons than their economic gain. They are concerned about the redistribution share implied by the tax proposed by each party. The fraction of redistribution implied by tax proposal  $\tau^j$  is

$$\phi(\Gamma, \tau, \tau^j) = \frac{T(\tilde{\Pi}(\Gamma, \tau, \tau^j), \tau^j)}{Y(\tilde{\Pi}(\Gamma, \tau, \tau^j), \tau^j)} \quad (6)$$

where  $\tilde{\Pi}(\Gamma, \tau, \tau^j)$  is the next period distribution implied by tax rate  $\tau_j$ ,  $T$  is the lump-sum transfers when the distribution of agents is  $\tilde{\Pi}(\Gamma, \tau, \tau^j)$  and taxes are  $\tau^j$ , and  $Y$  is GDP. The ideological gain of agent  $i$  over the tax rate  $\tau^j$  proposed by party  $j$  is

$$\theta_i \phi(\Gamma, \tau, \tau^j)$$

$\theta_i$  measures how strongly ideologically motivated agent  $i$  is.  $\theta_i$  captures several aspects of voters' behavior. It captures altruism, distrust in the government, fairness perception,

and any other component valued by voters not captured by economic gains. In this sense,  $\theta_i \phi(\Gamma, \tau, \tau')$  measures the degree of our ignorance in preferences for redistribution. Voters differ in their ideological motivation,  $\theta_i \sim N(\mu_\theta, \sigma_\theta^2)$ .

### 2.2.3 Preferences for Redistribution

Preferences for redistribution have two components – economic gain and ideological gain. The welfare of an agent in state  $(a, z, \alpha)$  with ideological gain  $\theta$  over the tax proposed by party  $j$  is

$$V(\tau^j | a, z, \alpha, \theta, \Gamma, \tau) = \underbrace{\tilde{\Omega}(\tau^j | a, z, \alpha, \Gamma, \tau)}_{\text{Economic Gain}} + \underbrace{\theta \phi(\Gamma, \tau, \tau^j)}_{\text{Ideological Gain}} \quad (7)$$

### 2.2.4 Non-tax Preferences

There are two parties:  $L$  and  $R$ . Parties have policy proposals on a wide range of issues, including taxes. Let  $v_i^j$  represent the utility derived by agent  $i$  from all non-tax policies proposed by party  $j \in \{L, R\}$ . Let  $v_i = v_i^R - v_i^L \sim N(\mu_v, \sigma_v^2)$ .

### 2.2.5 Voting

Given the tax rate proposed by each party,  $\{\tau^L, \tau^R\}$ , and the preference of agent  $i$  for each party's non-tax proposal,  $\{v_i^L, v_i^R\}$ , agent  $i$  votes for party  $R$  if

$$V(\tau^R | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau) + v_i \geq V(\tau^L | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau)$$

### 2.2.6 Distributions

Ideological gain,  $\theta_i$ , preference on non-tax policy,  $v_i$ , and productivity,  $\alpha_i$ , are correlated and jointly normally distributed.

$$\begin{pmatrix} \alpha_i \\ \theta_i \\ v_i \end{pmatrix} \sim N \left[ \begin{pmatrix} 0 \\ \mu_\theta \\ \mu_v \end{pmatrix}, \begin{pmatrix} \sigma_\alpha^2 & \rho_{\alpha, \theta} \sigma_\alpha \sigma_\theta & \rho_{\alpha, v} \sigma_\alpha \sigma_v \\ \rho_{\alpha, \theta} \sigma_\alpha \sigma_\theta & \sigma_\theta^2 & \rho_{\theta, v} \sigma_\theta \sigma_v \\ \rho_{\alpha, v} \sigma_\alpha \sigma_v & \rho_{\theta, v} \sigma_\theta \sigma_v & \sigma_v^2 \end{pmatrix} \right] \quad (8)$$

### 2.2.7 Turnout

Voters draw a random voting cost  $\xi_i \in N(\beta_0 + \beta_1 \epsilon_i, 1)$  every period.  $\xi_i$  aims at capturing the opportunity and the intellectual cost related to learning about each party and traveling to the voting station. The probability that an agent votes is

$$P(\epsilon_i) = \Phi(-\beta_0 - \beta_1 \epsilon_i) \quad (9)$$

### 2.2.8 Politico-Economic Equilibrium

The vote share received by party  $R$  is

$$\Pi_R(\tau_R, \tau_L | \Gamma, \tau) = \frac{\int \mathbb{I}\{V(\tau^R | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau) + v_i \geq V(\tau^L | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau)\} P(\epsilon_i) d\Gamma}{\int P(\epsilon_i) d\Gamma}$$

The tax proposed by party  $R$  is

$$b_\tau^R(\tau_L | \Gamma, \tau) = \arg \max_{\tau'} \Pi_R(\tau', \tau_L | \Gamma, \tau) \quad (10)$$

The tax rate implemented is the one proposed by the party with the largest vote share. Now we have all the necessary elements to define the Politico-Economic Equilibrium.

**Definition 2.2.** (Politico-Economic Equilibrium) *A politico-economic equilibrium is defined by a path for taxes,  $\Phi$ , an economic equilibrium,  $\{\Omega, h_c, h_n, h_a, r, w, T, \Pi\}$ , a deviation value function,  $\{\tilde{V}, \tilde{h}_c, \tilde{h}_n, \tilde{h}_a\}$ , an aggregate response to the deviation in taxes,  $\{\tilde{\Pi}, \tilde{r}, \tilde{w}, \tilde{T}\}$ , partisan redistribution proposals,  $\{\tau_R^*, \tau_L^*\}$ , and the party's best response,  $\{b_\tau^R, b_\tau^L\}$  such that*

1. *Given a path for taxes  $\Phi$ ,  $\{\Omega, h_c, h_n, h_a, r, w, T, \Pi\}$  is a stationary economic equilibrium;*
2. *Given the aggregate response to taxes  $\{\tilde{\Pi}, \tilde{r}, \tilde{w}, \tilde{T}\}$  and the continuation value  $\Omega$ ,  $\{\tilde{V}, \tilde{h}_c, \tilde{h}_n, \tilde{h}_a\}$  solves the voter's deviation problem (5);*
3. *Given the labor supply,  $\tilde{h}_n$ , prices satisfy firms' profit maximization, (2), and transfers satisfy the government budget constraint, (3), for every  $\tau$ ;*
4. *The party's best response  $\{b_\tau^R, b_\tau^L\}$  solves (10);*

5. Tax proposals  $\{\tau_R^*, \tau_L^*\}$  are a Nash Equilibrium

$$\tau_R^*(\Gamma, \tau) = b_\tau^R(\tau_L^*(\Gamma, \tau)|\Gamma, \tau); \tau_L^*(\Gamma, \tau) = b_\tau^L(\tau_R^*(\Gamma, \tau)|\Gamma, \tau)$$

6. The path of taxes follows the election outcome:

$$\Phi(\Gamma, \tau) = \begin{cases} \tau_R^*(\Gamma, \tau), & \text{if } \Pi_R(\tau_R, \tau_L|\Gamma, \tau) \geq 0.5 \\ \tau_L^*(\Gamma, \tau), & \text{if } \Pi_L(\tau_R, \tau_L|\Gamma, \tau) \geq 0.5 \end{cases}$$

Throughout the paper, I will restrict the attention to the steady-state equilibrium defined below.

**Definition 2.3.** (Steady State Politico-Economic Equilibrium) *A steady-state politico-economic equilibrium is a politico-economic equilibrium that satisfies  $\Gamma^* = \Pi(\Gamma^*, \tau^*)$  and  $\tau^* = \Phi(\Gamma^*, \tau^*)$ .*

## 2.3 Discussion

A Bewley model, such as the one developed here, is insightful for understanding the political economy of redistribution because it 1) endogenously generates inequality, 2) makes the government safety net valuable for its precautionary effect, and 3) endogenously generates social mobility. As pointed out by Benabou and Ok (2001) and Alesina and Ferrara (2005), social mobility may play an important role in government size choices: Agents are more likely to be against/support redistributive policies if they are more likely to go up/down in the income distribution.

There is another important reason for using a traditional macroeconomic model to answer a political economy question: getting the elasticities of capital and labor supply to tax changes as accurately as possible. Agents do not only take the redistributive effects of taxes into account but also how this impacts the economy. All these effects are incorporated in the economic gain,  $\tilde{\Omega}$ .

Voter turnout is added to reproduce the higher political engagement of the rich. As shown by Campante (2011) and Karabarbounis (2011), political engagement is correlated with income. They conjecture that the rich have more influence in the political process and

shift the social choice in their favor. In the U.S. economy, the voter turnout is about 60% and it is positive correlated with income. Therefore, one could expect that only a few voters influence the tax choice and that high income individuals are over represented.

## 3 Estimation

In this section, I describe the estimation procedure. This is done in three steps. In the first step, I take parameters from the literature to calibrate the model. The remaining economic parameters are estimated by a Simulated Method of Moments given government fiscal policy. In the last step, I use log-likelihood to estimate the preferences for redistribution and the non-tax policy preferences.

### 3.1 Step 1 - Calibration

#### 3.1.1 Timing

Because the U.S. has a presidential election every four years, every period in the model corresponds to four years in the data.

#### 3.1.2 Utility Function

The utility function is given by

$$u(c, n) = \log(c) - \chi \frac{n^{1+\gamma}}{1+\gamma}$$

where the parameters of the utility function to be estimated are  $\chi$ ,  $\gamma$ , and  $\varrho$ .

The estimates of the Frisch elasticity  $1/\gamma$  range from 0.1, in the microeconomic literature, to 3, in the macroeconomic literature. I set  $\gamma$  to 1. In the robustness section, I show that the results are not sensitive to changes in this parameter.

#### 3.1.3 Idiosyncratic Shock and Production Technology

I estimate a bi-yearly income process given by (1) using data from the PSID. I follow the procedure of Floden and Linde (2001).  $\alpha_i$  is fully captured by observables after controlling

Table 1: **Calibrated Parameters**

Parameter	Description	Method	Target/Reference/Method	Value
<b>Utility Parameters</b>				
$\gamma$	Inverse Frisch Elasticity	Literature		1
<b>Idiosyncratic Shocks</b>				
$\rho_\epsilon$	persistence of idiosyncratic shock	Estimation	GMM	0.895
$\sigma_\epsilon$	variance of idiosyncratic shock	Estimation	GMM	0.25
$\sigma_\alpha$	variance of permanent shock	Estimation	OLS	0.294
<b>Government</b>				
$\tau^*$	marginal tax rate	Data	Avg. fed. gov. size	0.19
$g$	variable expenditure	Data	Avg. exp. with interest and admin.	0.23
$G$	fixed expenditure	Data	All else except transf. and $g$	0.069
<b>Turnout</b>				
$\beta_0$	Level turnout probability	Data	Probit	0.31
$\beta_1$	Slope of turnout and labor productivity	Data	Probit	0.14

for time shock and age. Moreover, it is assumed that wages are observed with measurement error. So  $\alpha_i = X_i\beta$  where  $X_i$  contains race, gender, and education dummies. I follow the literature and assume the capital share  $\alpha = 0.36$ . The estimates are presented in table (1).

### 3.1.4 Government

The fixed cost  $G$  is calibrated to reproduce the share of federal expenditure not used on education, health, social protection or housing.  $G = 0.14$

### 3.1.5 Turnout

The parameters governing the turnout probability,  $\{\beta_0, \beta_1\}$ , are estimated with a probit regression of labor income on voter turnout. The data is from the CPS election complement.

## 3.2 Step 2 - SMM

If the taxes in this model are fixed, its steady state becomes a traditional Aiyagari model. I use this fact to estimate the parameters  $\{\beta, \chi\}$  targeting moments of the U.S. economy.

I choose  $\tau^*$  to replicate U.S. government revenue as a share of GDP: 0.19. The time discounting,  $\beta$ , is calibrated to reproduce the capital over income ratio of 6.27.<sup>10</sup> The disutility of labor supply,  $\chi$ , is calibrated to reproduce the average weekly hours of work: 0.241. Table (2) presents the estimated parameters.

<sup>10</sup> The average in the U.S. between 1993 and 2013 using the Survey of Consumer Finances.



Table 2: SMM Parameters

Par.	Description	Target	Value	Model	Data Target
$\beta$	Time discounting	Capital/Income	0.972	6.29	6.27
$\chi$	Labor disutility	Avg. hours of work	9.28	0.24	0.24

**Description:** This table shows the calibrated parameters of the model. The first column shows the parameter, the second column shows the description of the parameter, the third column shows a description of the targeted parameter, the fourth column shows the calibrated value of the parameter, if the fifth column shows the model generated target value, and the last column shows the data target. The capital-income ratio uses data from the Survey of Consumer Finances from 1993 to 2013 and the remaining statistics are from the CEX.

### 3.3 Step 3 - Log-likelihood

The remaining parameters to be estimated are those governing the joint distribution of ideological gains, non-tax policy preferences, and income,  $\{\mu_\theta, \sigma_\theta, \mu_v, \sigma_v, \rho_{\alpha,\theta}, \rho_{\alpha,v}, \rho_{\theta,v}\}$ . These parameters are estimated with a two-step log-likelihood using data and model outcomes.

#### 3.3.1 Ideological Gain

Voters' ideological gains can be identified from a survey on the support for redistribution increase. The American National Election Studies (ANES) ask voters every election if they want redistribution to increase, decrease, or remain the same. Reproducing the survey in the model, I can identify the distribution of ideological gains by log-likelihood.

On the aggregate state  $(\Gamma^*, \tau^*)$ , individual  $i$ 's preferences for redistribution on taxes  $\tau$  is given by

$$\tilde{\Omega}(\tau|a_i, z_i, \alpha_i, \Gamma^*, \tau^*) + \theta_i \phi(\Gamma^*, \tau^*, \tau)$$

Agent  $i$  would support transfers to increase, decrease or stay the same if and only if<sup>11</sup>

$$\begin{aligned} \text{Increase: } \tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i) + \theta_i \phi_\tau(\tau^*) > 0 &\implies \theta_i > -\frac{\tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i)}{\phi_\tau(\tau^*)} \\ \text{Decrease: } \tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i) + \theta_i \phi_\tau(\tau^*) < 0 &\implies \theta_i < -\frac{\tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i)}{\phi_\tau(\tau^*)} \\ \text{Stay the Same: } \tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i) + \theta_i \phi_\tau(\tau^*) = 0 &\implies \theta_i = -\frac{\tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i)}{\phi_\tau(\tau^*)} \end{aligned}$$

From the calibration step,  $\tilde{\Omega}$ ,  $\phi$  and state variables  $(\Gamma^*, \tau^*)$  are known. Therefore, knowing

<sup>11</sup> For ease of notation, I remove  $(\Gamma^*, \tau^*)$ .

an agent's support for redistribution I can infer the range of their unobserved ideological gains. To be able to have a continuous distribution for  $\theta_i$ , I assume that an agent's opinion is captured with measurement error  $\kappa$ :

$$\begin{aligned}
\text{Increase: } \theta_i &\in \left( -\frac{\tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i)}{\phi_\tau(\tau^*)} + \kappa, \infty \right) \\
\text{Stay the Same: } \theta_i &\in \left[ -\frac{\tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i)}{\phi_\tau(\tau^*)} - \kappa, -\frac{\tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i)}{\phi_\tau(\tau^*)} + \kappa \right] \\
\text{Decrease: } \theta_i &\in \left( -\infty, -\frac{\tilde{\Omega}_\tau(\tau^*|a_i, z_i, \alpha_i)}{\phi_\tau(\tau^*)} - \kappa \right)
\end{aligned}$$

Since the respondent's state  $(\alpha_i, z_i, \alpha_i)$  is not observed, the probability of an agent with income  $y_i$  supporting a tax decrease is

$$\Upsilon^{\text{decrease}}(\mu_\theta, \sigma_\theta, \rho_{\alpha, \theta}, \kappa | y_i) = \int \Phi \left( \frac{\frac{\frac{\partial \tilde{\Omega}(a_i, z_i, \alpha_i | \tau^*)}{\partial \tau^*}}{\frac{\partial \phi(\tau^*)}{\partial \tau^*}} - \kappa - \mu_\theta - \rho_{\alpha, \theta} \frac{\sigma_\theta}{\sigma_\alpha} \alpha_j}{\sqrt{(1 - \rho_{\alpha, \theta}^2) \sigma_\theta}} \right) I\{w\epsilon_j n_j + a_j r = y_i\} d\Gamma_j$$

where the integral is over the latent state  $(a_i, z_i, \alpha_i)$ . The distribution, prices, labor supply, and the tax rate used are those from the calibration step. In a similar fashion one can write the probability of agent  $i$  supporting a tax increase,  $\Upsilon^{\text{increase}}$ , or supporting taxes staying the same,  $\Upsilon^{\text{stay}}$ . The log-likelihood is

$$\begin{aligned}
L_\theta(\mu_\theta, \sigma_\theta, \rho_{\alpha, \theta}, \kappa | \{h_i, y_i\}) &= \sum_i I\{h_i = 1\} \log \Upsilon^{\text{decrease}}(\mu_\theta, \sigma_\theta, \rho_{\alpha, \theta}, \kappa | y_i) + \\
&I\{h_i = 2\} \log \Upsilon^{\text{stay}}(\mu_\theta, \sigma_\theta, \rho_{\alpha, \theta}, \kappa | y_i) + \\
&I\{h_i = 3\} \log \Upsilon^{\text{increase}}(\mu_\theta, \sigma_\theta, \rho_{\alpha, \theta}, \kappa | y_i)
\end{aligned} \tag{11}$$

To estimate the model, I use questions relating to the support for welfare expenditure, expenditure with poor people, and food stamps. By stacking different policies, the results will not depend on policy-specific preferences. In the robustness section I show that results

are not sensitive to the question used.

### 3.3.2 Non-tax Policy Preference

The final parameters to be estimated are those related to the distribution of the non-tax policy preference,  $v$ . Note that the probability of a voter in state  $(a_i, z_i, \alpha_i)$  with an ideological gain  $\theta_i$  to vote for the left-wing party is

$$\begin{aligned} \tilde{\Lambda}^L(a_i, z_i, \alpha_i, \theta_i) = \\ \Phi_{\Theta} \left( \tilde{\Omega}(a_i, z_i, \alpha_i | \tau^R) - \tilde{\Omega}(a_i, z_i, \alpha_i | \tau^L) + \theta_i (\phi(\tau^R) - \phi(\tau^L)) | \alpha_i, \theta_i \right) \end{aligned} \quad (12)$$

where  $\Theta$  are the parameters of the distribution (8) and  $\Phi_{\Theta}$  is the distribution of  $v_i$  conditional on  $\theta_i$  and  $\alpha_i$ . After normalizing  $\sigma_v$  to 1, the unknown parameters of  $\Theta$  left to be estimated are  $\{\mu_v, \rho_{\alpha, v}, \rho_{\alpha, \theta}\}$ .

The probability (12) depends on state variables  $(a_i, z_i, \alpha_i)$  and on ideological gain  $\theta_i$ , which are unobserved in the data. But they can be inferred from income  $y_i$  and the opinion on redistribution,  $h_i$ . Therefore, the probability of an individual with income  $y_i$  who supports redistribution decreases to vote for the left wing party is

$$\Lambda_{decrease}^L(\Theta_i | y_i) = \int_j \left[ \int_{-\infty}^{\frac{V'(\bar{\tau}|a_i, z_i, \alpha_i)}{V'_j(\bar{\tau})} - \kappa} \tilde{\Lambda}^L(a_i, z_i, \alpha_i, \theta_i) \pi_{\Theta}(\theta_i | \alpha_j) \right] I \{w\epsilon_j n_j + a_j r = y_i\} d\Gamma_j$$

We can similarly write the probability of an agent who supports redistribution to increase to vote for the left wing party and the probability of an agent who supports redistribution to stay the same to vote for the left wing party. Using those, the probability of an agent to vote for the left wing party is

$$\begin{aligned} \Lambda^L(\Theta_i | y_i, h_i) = & \mathbb{I} \{h_i = decrease\} \Lambda_{decrease}^L(\Theta_i | y_i) + \\ & \mathbb{I} \{h_i = stay\ the\ same\} \Lambda_{stay}^L(\Theta_i | y_i) + \mathbb{I} \{h_i = increase\} \Lambda_{increase}^L(\Theta_i | y_i) \end{aligned}$$

Finally, I can write the log-likelihood as

$$L_v(\mu_v, \sigma_v, \rho_{\alpha,v}, \rho_{\alpha,\theta} | \{d_i, b_i, y_i\}_{i,t}) = \sum_i d_i \log \Lambda^L(\Theta_i | y_i, h_i) + (1 - d_i) \log \Lambda^R(\Theta_i | y_i, h_i) \quad (13)$$

### 3.3.3 Fixed Point Algorithm

To estimate ideological gains and non-tax preferences, I have to solve a fixed point problem. The log-likelihoods (11) and (18), which estimate the ideological gains and the non-tax preferences, require me to compute the economic gain,  $\tilde{\Omega}$ , the ideological gains,  $\phi$ , and the steady-state of the model. But these variables are themselves a function of the ideological gains and the non-tax preferences.

I use a standard guess and update approach to find the fixed point between model equilibrium variables and log-likelihood outcomes. I guess  $\{\mu_\theta, \sigma_\theta, \mu_v, \sigma_v, \rho_{\alpha,\theta}, \rho_{\alpha,v}, \rho_{\theta,v}\}$ , and solve the model. With the output of the model ( $\tilde{\Omega}$ ,  $\phi$ , tax proposals, and steady-state variables), I estimate the log-likelihood (18) and (11). Using the output of the estimations, I update the guess until convergence is obtained.

## 4 Results

### 4.1 Estimated Parameters

Table 3 shows the estimated parameters governing the non-tax preferences, and the ideological gains. Table 3 provides two important insights – on the support of redistributive policies and on the importance of non-tax preferences.

First, the average level of ideological gains,  $\mu_\theta$ , is negative, which means that the median agent in the U.S. holds negative ideological views on redistribution. Second,  $\rho_{\theta,v}$  is negative and close to  $-1$ , which means that people that oppose redistribution for ideological reasons also favor other policies proposed by the right-wing party.

Table 3: **Estimated Parameters**

Parameter	Parameter	Standard Deviation
<b>Non-Tax Preferences</b>		
$\mu_v$	-0.035	0.018
<b>Ideological Gains</b>		
$\mu_\theta$	-0.276	0.015
$\sigma_\theta$	1.409	0.12
<b>Correlations</b>		
$\rho_{\theta,v}$	-0.959	0.102
$\rho_{\alpha,\theta}$	-0.112	0.051
$\rho_{\alpha,v}$	0.281	0.095

**Description:** This table shows the estimated parameters of distribution 8, using log-likelihoods 11 and 18. The likelihoods are estimated using data from the American National Election Studies (ANES) from 1996 to 2012 for every 4 years. I used the questions on voters' support to increase the expenditure on welfare, foods stamps, or expenditure with the poor to estimate 11. To estimate 18, I define the Republican Party as the right-wing party and the Democratic Party as the left-wing party. The standard deviation is calculated using bootstrap.

## 4.2 Model Validation

In table 4 I show that the model is able to reproduce a set of important moments. The equilibrium tax rate in the model is 0.18, close to the 0.19 observed in the data. The income differences between right and left voters constitute an important moment in this table. The models in the traditional politico-macro literature were unable to reproduce this difference because economic gains were the only factor in political support. The model I present in this paper reproduces an income difference close to the one observed in the data. The model also approximates average turnout, the covariance of income and turnout, and the share of individuals supporting a tax increase.

## 4.3 Preferences for Redistribution

Agents have a positive economic gain from redistribution but oppose redistribution due to ideological views. Table 5 decomposes the utility gain from a marginal increase in redistribution between economic gains and ideological gains. On average, agents lose from an increase in redistribution because the economic gain is not large enough to offset negative ideological views that agents hold against redistribution.

Ideological gain differences are the main driver of heterogeneity on preferences for redis-

Table 4: **Validation**

	Model	Data
$\tau^*$	0.17	0.19
Right Voter Inc./Left Voter Inc.	1.00	1.02
Turnout	0.68	0.61
Cov(income, Turnout)	0.10	0.19
Shr. supporting taxes to stay const.	0.43	0.4

**Description:** This table compares moments generated by the model, in column *Model*, with moments in the data, in column *Data*. The first line,  $\tau^*$ , has government revenue as share of GDP. The data is from IMF, the table reports the average revenue over GDP for United States between 1980 and 2016. The second line has the ratio of right wing voter income over left wing voter income. Column *Data* presents the ratio of average incomes from the Cooperative Congressional Election Study (CCES) from 2006 to 2016. Line *Turnout* has the average turnout from the CPS election complement. The following line has the covariance of turnout and relative income. The column *Shr. supporting taxes to stay const.* has the share of individuals that support taxes to stay constant in the model and in the data. The data is from ANES.

tribution, instead of differences in economic gain as in Meltzer and Richard (1981), Krusell et al. (1997), and many others. Column 4 of table 5 decomposes the variance of the marginal gain of redistribution between economic gain and ideological gains. It shows that the variance of ideological gains is 2.6 times larger than the variance of economic gains.<sup>12</sup>

Table 5: **Decomposition of Marginal Gain of Redistribution**

Description	Model Object	Mean	Stand. Dev.
Marginal Gain of Redistribution	$\tilde{\Omega}_\tau(a_i, z_i, \alpha_i   \Gamma^*, \tau^*, \tau) + \theta_i \phi_\tau(\Gamma^*, \tau^*, \tau)$	0.001	0.086
Economic Gain	$\tilde{\Omega}_\tau(a_i, z_i, \alpha_i   \Gamma^*, \tau^*, \tau)$	0.021	0.028
Ideological Gain	$\theta_i \phi_\tau(\Gamma^*, \tau^*, \tau)$	-0.02	0.101

**Description:** This table shows the mean and variance of the marginal gain of redistribution, which is the derivative of 7 with respect to future  $\tau^*$ .

## 4.4 Counterfactuals

Table 6 presents government size shutting down different mechanisms of the model. The first column contains a description of the model, the second column the equilibrium tax rate, and the third column has the change in tax rate compared to the baseline model. Table 6 indicates through different experiments that ideological gains are the most important determinants of redistribution.

According to the first panel, the equilibrium tax rate is affected more by ideological gains than by economic gains. As discussed before, agents are against redistribution due

<sup>12</sup> Figure 2 in the appendix shows the optimal tax rate across the income distribution breaking it down between economic gains and ideological gains.

to ideology. For this reason, if agents were to vote disregarding their ideological views, redistribution would increase from 0.18 to 0.38, a 110% increase. Removing economic gains from the model, on the other hand, would lead to a decrease in the equilibrium tax rate of only 22%. This result shows that ideological gains are the main drivers of redistribution.

Table 6 shows that turnout regulation is not an important determinant of redistribution. Table 6 shows that imposing full turnout, and thereby increasing the representation of low-income voters, would not affect the equilibrium tax rate. This is explained by Figure 2 in the appendix. Because ideological gains are the main driver of preferences for redistribution, voters at the top of the income distribution support redistribution as much as the median voter. Therefore, increasing the participation of low-income voters would not have an important impact on redistribution.

Panel 3 in table 6 once more shows the importance of ideological gains for individuals' preferences for redistribution. The optimal tax rate is 0.22, 22% higher than the equilibrium tax rate. Ignoring the ideological gains on redistribution, the optimal tax rate would be 0.42. This result shows that ideological gains are the main component of preferences for redistribution.

## 4.5 Why Ideological Gains Matter so Much?

What are the features of the data making ideological gains the main driver of redistribution? Figure 1 can answer this question. It plots the share of individuals supporting redistribution in different income percentiles in the data, in the model, and in the model if it only had the economic gain.

The model predicts a large role for ideological gains because economic gains cannot generate the correlation between income and support for an increase in redistribution observed in the data. If the model did not have any ideological gains from redistribution, all individuals with low income should support redistribution. Figure 1 shows that all agents with an income below the 33rd percentile have economic gains from redistribution. But, according to the data though, only 40% of the agents with an income below the 33rd percentile support an increase in redistribution. Therefore, to approximate the support for redistribution observed in the data, the model backs-out strong negative ideological gains from redistribution.

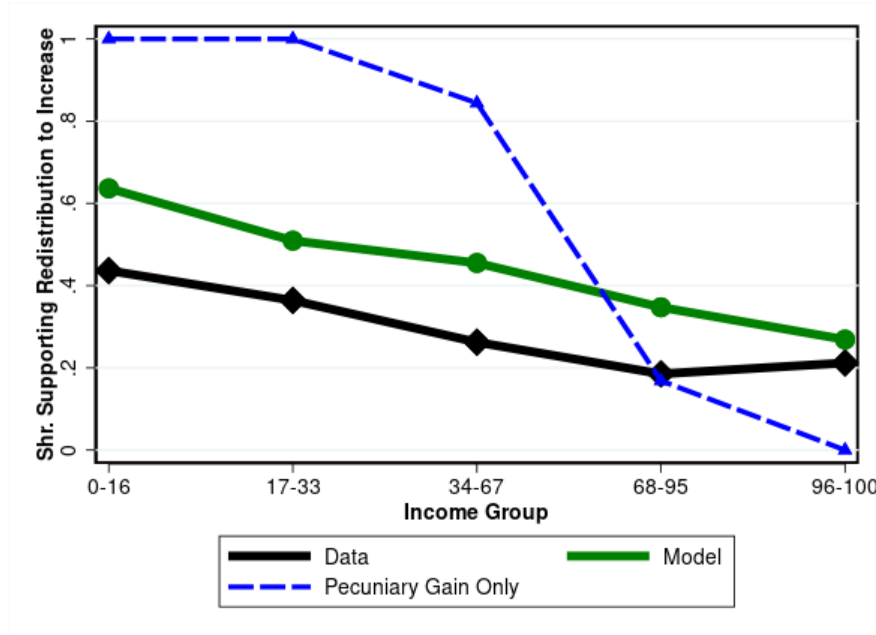
Table 6: Counterfactuals

Model	Eq. Tax Rate	Chg.
Baseline	0.166	0%
<i>Preferences</i>		
No Ideological Gain	0.36	117%
No Economic Gain	0.153	-8%
No Partisan Pref.	0.192	16%
<i>Turnout</i>		
Full Turnout	0.166	0%
Constant Turnout on Inc.	0.166	0%
<i>Optimal Redistribution</i>		
Optimal Redistribution	0.218	31%
Opt. Red. No Ideological Gain	0.346	108%
Opt. Red. No Economic Gain	0.218	31%

**Description:** This table presents the equilibrium tax rate removing different characteristics of the model. The line *Baseline* has the equilibrium tax rate in the model discussed. Column *Model* has a description of the model used, column *Eq. Tax Rate* has the equilibrium tax rate, and column *Chg.* has the change in tax rate compared to the baseline model. *No Ideological Gain* sets  $\theta_i = 0, \forall i$ . *No Economic Gain* sets the economic gain to zero,  $\tilde{\Omega} = 0$ . *No Partisan Pref.* removes non-tax preferences from the baseline model,  $v_i = 0, \forall i$ . *Full Turnout* sets the cost of voting to zero for all agents. *Constant Turnout on Inc.* sets  $\beta_1 = 0$ . The line *Optimal Redistribution* has the steady state equilibrium tax rate that maximizes aggregate  $\tau$  every period. Line *Opt. Red. No Ideological Gain* has the optimal tax rate without any ideological gain, i.e.,  $\theta_i = 0, \forall i$ . Line *Opt. Red. No Economic* has the optimal tax rate disregarding the economic gain, i.e.,  $\tilde{\Omega} = 0$ .



Figure 1: Support for Redistribution on the Data and Model



**Description:** This figure shows the share of individuals supporting an increase in redistribution according to income. The x-axis is divided into 5 percentile groups: 0-16, 17-33, 34-67, 68-95 and 96-100. The blue line contains the share of individuals that support the increase in expenditure with welfare, food stamps or overall expenditure with the poor in blue according to data from the American National Election Studies (ANES) from 1994 to 2012. The green line contains the share of individuals supporting an increase in redistribution on the model. The blue line contains the share of individuals that have a economic gain from an increase in redistribution.

## 4.6 What Drives Ideological Gains?

There are several potential drivers of ideological gains. Unrealistic expectations of income growth (Alesina and Ferrara (2005), Benabou and Ok (2001), Alesina et al. (2018)), missinformation about own's position in the income distribution (Hvidberg et al. (2020)), distrust of the government (Kuziemko et al. (2015)), sense of fairness and justice (Fong (2001), Alesina and Angeletos (2005)), racial animosity (Alesina and Glaeser (2013), Alesina et al. (2001), Alesina and Stantcheva (2020), Alesina et al. (2021), Alesina et al. (1999), Tabellini (2020), Gilens (1995), Gilens (1996), Harell et al. (2016), O'Brien (2017)), animosity towards immigrants (Alesina and Stantcheva (2020), Dahlberg et al. (2012)), and social preferences (Alesina et al. (2022), Corneo and Grüner (2002)).<sup>13</sup>

The objective of this paper is not to point out where ideological gains come from, but to show its relevance in determining equilibrium redistribution. Still, to drive future research to promising channels, in this section I decompose the contribution of each one of these

<sup>13</sup> For a review of the literature, see Stantcheva (2021a), Stantcheva (2021b), and Alesina and Giuliano (2009).

explanations to ideological gains and government size. I assume the following model:

$$\theta_i = X'_{i,expectation}\beta_{expectation} + X'_{i,distrust}\beta_{distrust} + X'_{i,fairness}\beta_{fairness} + X'_{i,race}\beta_{race} + \\ X'_{i,immigrats}\beta_{immigrats} + X'_{i,socialpref}\beta_{socialpref} + X'_{i,information}\beta_{information} + X'_{i,demo}\beta_{demo} + \epsilon_i^\theta$$

where  $X'_{i,j}$  is a set of observable characteristics of respondent  $i$  containing variables that capture different drivers of ideological gains.<sup>14</sup>  $X'_{i,expectation}$  contains variables affecting  $i$ 's prospects of income growth: dummies if the respondent or the economy will be better off next year.  $X'_{i,distrust}$  contains a set of variables capture  $i$ 's distrust of the government: dummies if the respondent agrees that the government wastes money, if they don't trust government, if they think that less government is better, if they think that government has low efficiency, or if they dislike the federal government.  $X'_{i,fairness}$  contains a set of variables that captures  $i$ 's views on fairness and justice: dummies if the respondent thinks that society ensures equal opportunity, if that it's not a big problem that some have more chances in life, or that we should worry less about how equal people are.  $X'_{i,race}$  contains a set of variables that capture  $i$ 's views on racial minorities: dummies if the respondent doesn't agree that conditions make it difficult for Black people to succeed, if they dislike Black or Hispanic people, share of non-whites among low-income households in the region, and if the respondent thinks that Black/Hispanic people are lazy. This category also has as an explanatory variable the share of non-whites among low-income households in the region interacted with dummy if the respondent is white.  $X'_{i,immigrats}$  contains a set of variables that captures  $i$ 's views on immigrants: share of foreign born among low-income individuals in the region, share of foreign born among low-income individuals in the region interacted with dummy if respondent is white, and dummy if dislike illegal immigrants.  $X'_{i,socialpref}$  contains a set of variables that captures  $i$ 's views on altruism and other social groups: dummies if the respondent had devoted time to volunteer work in the past year, if dislike poor people, if dislike middle income people, if dislike high income people, and if dislike welfare recipients.  $X'_{i,information}$  contains a set of variables that capture how informed respondent  $i$  is: dummies if don't understand political issues, if politics and government seem so complicated that respondent can't under-

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<sup>14</sup> I also assume that  $v_i = Y_i'\Delta + \epsilon_i^v$ . But given that partisan preferences are quantitatively less important, I discuss its result on appendix 7.2.

Table 7: Drivers of Ideological Gains

Variable	Description	Share on Tot. Var.	Eq. Tax Rate	Chg
Expectation	Expectation on income growth	0.01%	0.142	0.00%
Distrust of the Government	Distrust of the government, efficiency of the government, and corruption	1.37%	0.205	44.73%
Justice and Fairness	Concern about inequality and equality of opportunity	2.62%	0.142	0.00%
Race	Views on blacks and hispanics and share of racial minorities among households below the poverty line	2.55%	0.256	80.87%
Immigration	Views on immigrants and share of immigrants among households below the poverty line	0.39%	0.142	0.00%
Altruism and Social Preferences	Views on poor people, middle income people, high income people, and welfare recipients	5.82%	0.179	26.71%
Lack of Information	Self-declared level of understanding of public policy and political debates	0.14%	0.142	0.00%
Demographic Characteristics	Race, age, religion, and education	0.42%	0.142	0.00%
Unexplained Component		82.66%	0.307	117.03%

**Description:** This table presents the effect of different channels in explaining ideological gains and its contribution to the equilibrium tax rate. The first column has a driver of ideological gain described on the literature, the second column has its description, the third column contains the share of variance in ideological gains that can be explained by that component. The fourth and fifth columns contain the equilibrium tax rate and change in tax rate coming from removing different components of ideological gains. For doing so I calculate the equilibrium tax rate setting  $\beta_j = 0, j \in \{expectation, distrust, fairness, race, immigrants, socialpref, informations, demo\}$

stand, and if they don't follow news on politics and government. Finally,  $X_{i,demo}$  contains a set of demographic characteristics: dummies if White, less than 65 years of age, has a religion, and has at least some college.

Table 7 shows the results of the decomposition. Column 3 shows the percentage of the variance in ideological gains that can be explained by each component. Columns 4 and 5 show the equilibrium tax rate if we set that component to zero, i.e.,  $\beta_j = 0, j \in \{expectation, distrust, fairness, race, immigrants, socialpref, informations, demo\}$ .

Views on Black people are an important determinant of redistribution, according to table 7. Because agents that have negative views on Black people are more likely to be against an increase in redistribution, the model predicts that removing the component of ideological gains driven by racial animosity would increase redistribution by 80%. Table 14 in the appendix shows that there are two important factors driving this result. The first is the strong correlation between support for redistribution and the belief that conditions make it difficult for Black people to succeed. The second is from White respondents on regions with a large share of racial minorities receiving welfare transfers.

Distrust of the government and social preferences are also important drivers of redistribution, according to table 7. Line 2 of table 7 shows that if citizens could be made to trust the government, redistribution would increase 44%. Column 6 also shows that social preferences is an important drivers. If agents did not had a negative view on welfare recipients, redistribution would increase 26%.

## 5 Robustness

I conclude that ideological gains are the main determinant of redistribution. In particular, I find voter turnout, and partisan preferences to play insignificant roles. Ideological gains are important because the model predicts a strong correlation between economic gains and income. But, in the data, the correlation between support for redistribution and income is weak. Therefore, a large share of the preference for redistribution has to be explained by ideological gains.

In this section, I show that my results are robust to alternative Frisch elasticities, the functional form of ideological gains, to estimating the model using data from the World Value Survey, to alternative voter rationality, and to alternative fiscal rules.

### 5.1 Campaign Contributions

In this section, I show that results are not affected by the inclusion of campaign contribution to the model. I assume that voters make campaign contributions for warm-glow reasons, as in Campante (2011). Then, I re-write the log-likelihoods discussed in 3.3 to estimate the effect of campaign expenditure on voting. I found that campaign contribution has an insignificant effect on voting and on redistribution.

**Model** I assume utility of agents to be given by

$$u(c, n, d) = \log(c) - \chi \frac{n^{1+\gamma}}{1+\gamma} + \varsigma \frac{d^{1+\varrho}}{1+\varrho}$$

where  $d$  is campaign contribution, which are made to the same party that agents vote for.

Agent  $i$  votes for party  $R$  if

$$V(\tau^R | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau) + \varphi D^R + v_i \geq V(\tau^L | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau) + \varphi D^L$$

where  $D^j$  is the campaign contribution received by party  $j$  and  $\varphi$  is the effect of campaign expenditure on voting.

The vote share received by party  $R$  is

$$\Pi_R(\tau_R, \tau_L | \Gamma, \tau) = \frac{\int \mathbb{I}\{V(\tau^R | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau) + \varphi D^R + v_i \geq V(\tau^L | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau) + \varphi D^L\} P(\epsilon_i) d\Gamma}{\int P(\epsilon_i) d\Gamma}$$

And, equally, the campaign contribution received

$$D_R(\tau_R, \tau_L | \Gamma, \tau) = \int \mathbb{I}\{V(\tau^R | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau) + \varphi D^R + v_i \geq V(\tau^L | a_i, z_i, \alpha_i, \theta_i, \Gamma, \tau) + \varphi D^L\} h_d(a_i, z_i, \alpha_i, \Gamma, \tau) d\Gamma$$

where  $h_d$  is the campaign contribution of an agent in state  $(a_i, z_i, \alpha_i, \Gamma, \tau)$ .

Given these small changes to the model, the equilibrium definition is the same as in the baseline model.

**Calibration** I estimate  $\varrho$  using the first-order condition and data on campaign contributions. The first-order condition with respect to  $d$  is

$$\varsigma d^\varrho = \frac{1}{c}$$

Taking logs we get

$$\log(d) = \frac{1}{\varrho} \log\left(\frac{1}{c}\right) - \log(\varsigma) \quad (14)$$

I reproduce equation (14) using data from CEX on table (8) column 1. Column 2 reproduces the same regressions controlling for age, education, and marital status.

One could be concerned about endogeneity due to selection: Only 3% of agents make campaign contributions. To deal with this, I use Heckman's two-step consistent estimator. As an instrument in the participation equation, I use the average turnout of voters in the same income group, race, state, and year. Columns 3 and 4 present the estimators. According to table (8),  $\rho \in [-5.5, -4.63]$ . I use  $\rho = -5$ .

Table 8: **Elasticity of Campaign Contribution**

	(1)	(2)	(3)	(4)
	$\log(h_d)$	$\log(h_d)$	$\log(h_d)$	$\log(h_d)$
$\log(\frac{1}{c})$	-0.216*** (0.0345)	-0.193*** (0.0363)	-0.206*** (0.0437)	-0.189*** (0.0451)
Controls		X		X
Heckman Correction			X	X
$N$	2744	2744	49988	49988
adj. $R^2$	0.017	0.050	0.136	0.336

**Description:** Standard errors in parentheses. This table presents the estimated value of  $1/\rho$  from equation (14) using data from CEX. Columns 1 and 2 present the parameters of a standard OLS using data from all years from 2004 to 2015. As controls it uses dummies for age, education and marital status. Columns 3 and 4 present the estimators of using a two-step Heckman selection model only for federal election years between 2004 to 2015. As an instrument in the participation equation I use the average turnout in the current election of agents at the same educational level, income, race and state with the intent of capturing shocks to political engagement.\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.010$

**Log-Likelihoods** Following the same steps described in 3.3, I estimate the effect of campaign spending on voters,  $\varphi$ . While the log-likelihood estimating ideological gains is the same as before, 11, the probability that a voter in state  $(a_i, z_i, \alpha_i)$  with an ideological gain  $\theta_i$  votes for the left-wing party is

$$\tilde{\Lambda}^L(a_i, z_i, \alpha_i, \theta_i, D_t) = \Phi_{\Theta} \left( \tilde{\Omega}(a_i, z_i, \alpha_i | \tau^R) - \tilde{\Omega}(a_i, z_i, \alpha_i | \tau^L) + \theta_i (\phi(\tau^R) - \phi(\tau^L)) + \varphi(D_t^R - D_t^L) | \alpha_i, \theta_i \right) \quad (15)$$

where  $D_t = \{D_t^R, D_t^L\}$  is the expenditure of both parties on the election at year  $t$  in which agent  $i$  is voting. I normalize campaign expenditure every year such that  $D_t^R + D_t^L = 1$ .

Building on 15, the probability that an individual with income  $y_i$  who supports redistribution decreases to vote for the left wing party is

$$\Lambda_{decrease}^L(\Theta_i, \varphi | y_i, D_t) = \int_j \left[ \int_{-\infty}^{\frac{V'(\bar{\tau} | a_j, z_j, \alpha_j)}{V_p'(\bar{\tau})} - \kappa} \tilde{\Lambda}^L(a_i, z_i, \alpha_i, \theta_i) \pi_{\Theta}(\theta_i | \alpha_j) \right] I \{w\epsilon_j n_j + a_j r = y_i\} d\Gamma_j$$

Using this expression, I can easily write the log-likelihood 18 taking into account the effect

of campaign contribution as

$$L_v(\mu_v, \sigma_v, \rho_{\alpha,v}, \rho_{\alpha,\theta}, \varphi | \{d_i, b_i, y_i, D_t\}_{i,t}) = \sum_i d_i \log \Lambda^L(\Theta_i, \varphi | y_i, h_i, D_t) + (1 - d_i) \log \Lambda^R(\Theta_i, \varphi | y_i, h_i, D_t) \quad (16)$$

For consistency, I assume that  $\varphi \geq 0$ .

**Results** I find results to be quantitatively and qualitatively not affected by the addition of campaign contribution. In fact, I found  $\varphi = 0$ , which leads to exactly same estimated parameters and counterfactuals as in tables 3 and 6. This result is driven by the fact that, in the data, campaign contribution is negatively correlated with voting share after taking into account income and support for redistribution increase. Therefore, the effect of campaign expenditure has to be small or null.

## 5.2 Frisch Elasticity

The Frisch elasticity affects the dead weight loss generated by taxes and could, therefore, change the predicted economic gain from taxes,  $\tilde{\Omega}$ , and the estimated preferences for redistribution. To test if that is the case, I estimate the model and counter-factuals using Frisch elasticities of 0.5 and 0.3. Table 12 still shows that  $\mu_\theta < 0$ , i.e., agents do, on average, oppose redistribution. Table 9 shows that the other two calibrations of the Frisch elasticity still generate a large positive change in the tax rate if agents voted without ideological gains.

## 5.3 Functional form of Ideological Gains

In this section, I evaluate whether the results depend on the functional form assumed for the ideological gains. First, I assume that agents are concerned with the log of redistribution instead of its level,  $\log(\phi(\Gamma, \tau, \tau^j))$ . Second, I assume that agents are concerned with the welfare of agents with income below the poverty line instead of the level of redistribution.<sup>15</sup>

<sup>15</sup> The welfare of agents with income below the poverty line over tax rate  $\tau^j$  proposed by party  $j$  is  $\int_i \tilde{\Omega}(\tau^j | a_i, z_i, \alpha_i, \Gamma, \tau) \mathbb{I}\{a_i r + w_i \epsilon_i n_i < \bar{y}\}$ . Where  $\bar{y}$  is the poverty line, which is calibrated such that 11% of agents are below it.

Table 9: Counterfactuals: Robustness with alternative Frisch Elasticity

Model	(1) Baseline		(2) $1/\gamma = 0.5$		(3) $1/\gamma = 0.3$	
	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.
Baseline	0.166	0%	0.154	0%	0.154	0%
Preferences						
No Ideological Gains	0.36	117%	0.435	183%	0.424	175%
No Economic Gain	0.153	-8%	0.154	0%	0.154	0%
No Partisan Pref.	0.192	16%	0.180	17%	0.154	0%
Institutions						
Full Turnout	0.166	0%	0.166	8%	0.166	8%
Constant Turnout on Inc.	0.166	0%	0.167	8%	0.166	8%
Optimal Redistribution						
Optimal Redistribution	0.218	31%	0.193	25%	0.193	25%
Opt. Red. No Ideological Gains	0.346	108%	0.346	125%	0.346	125%
Opt. Red. No Economic Gain	0.218	31%	0.193	25%	0.193	25%

This table presents the equilibrium tax rate removing different characteristics of the model under 3 different model calibrations. On column 1, I use the baseline calibration. Columns 2 and 3 assume the Frisch elasticity to be 0.5 and 0.3, respectively. All the parameters of the model are calibrated again in these two former cases. Column *Eq. Tax Rate* has the equilibrium tax rate, and column *Chg.* has the change in tax rate compared to the baseline model. *No Ideological Gains* sets  $\theta_i = 0, \forall i$ . *No Economic Gain* sets the economic gain to zero,  $\tilde{\Omega} = 0$ . *No Partisan Pref.* removes non-tax preferences from the baseline model,  $v_i = 0, \forall i$ . *Full Turnout* sets the cost of voting to zero for all agents. *Constant Turnout on Inc.* sets  $\beta_1 = 0$ . The line *Optimal Redistribution* has the steady state equilibrium tax rate that maximizes  $\tau$  every period. Line *Opt. Red. No Ideological Gains* has the optimal tax rate without ideological gains, i.e.,  $\theta_i = 0, \forall i$ . Line *Opt. Red. No Economic* has the optimal tax rate disregarding the economic gain, i.e.,  $\tilde{\Omega} = 0$ .



Table 10: **Counterfactuals: Robustness with alternative Ideological Gains and Turnout**

Model	(1) Baseline		(2) Log Ideo. Gains		(3) Poor Ideo. Gains		(4) WVS		(5) Turnout Probability	
	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.
Baseline	0.166	0%	0.167	0%	0.155	0%	0.202	0.00%	0.168	0.00%
Preferences										
No Ideological Gains	0.36	117%	0.295	77%	0.384	148%	0.459	127.09%	0.335	99.53%
No Economic Gain	0.153	-8%	0.167	0%	0.154	-1%	0.142	-29.98%	0.154	-7.91%
No Partisan Pref.	0.192	16%	0.167	0%	0.244	57%	0.142	-29.98%	0.154	-8.19%
Institutions										
Full Turnout	0.166	0%	0.167	0%	0.192	24%	0.203	0.13%	0.167	-0.71%
Constant Turnout on Inc.	0.166	0%	0.167	0%	0.192	24%	0.203	0.14%	0.168	0.31%
Optimal Redistribution										
Optimal Redistribution	0.218	31%	0.142	-15%	0.270	74%	0.142	-29.98%	0.193	14.96%
Opt. Red. No Ideological Gains	0.346	108%	0.346	107%	0.423	173%	0.346	71.23%	0.346	106.52%
Opt. Red. No Economic Gain	0.218	31%	0.142	-15%	0.244	57%	0.142	-29.98%	0.218	30.22%

This table presents the estimated parameters for different versions of the model. Column *Baseline* presents the baseline model for comparison. Column  $1/\gamma = 0.3$  estimates the model setting the Frisch elasticity to 0.3. The third column estimates the model setting all government exogenous expenditure as fixed expenditure. Column *Dynamic* presents the estimated parameters with fully rational voters with in subgame perfect equilibrium as in Krusell et al. (1997), Krusell and Rios-Rull (1997) and the literature on dynamic political economy models. The column named *Utilitarian* presents the parameters of a model in which voters are concerned with the average welfare in the economy. Column *Primaries* presents the model in which voters must first decide on the tax proposal of each party, in primaries. The equilibrium is defined in section 5.5. The last column has the solution of the model when the selection on the voting decision is treated.

Different functional forms deliver the same result— ideological gains are the main driver of redistribution. Table 12 shows that, on average, agents are against an increase in redistribution due to their ideology. Table 10 predicts that if agents were to vote without ideological gains, redistribution would increase by more than 150%. That is expected. Despite the functional form, the fact that income only weakly correlates with support for redistribution will still predict that a large percentage of preferences for redistribution is driven by ideological gains. Assuming different functional forms will only reflect in  $\mu_\theta$  and  $\sigma_\theta$  but not on how much can be explained by ideological gains.

## 5.4 World Value Survey

To test if results are specific to ANES, I also estimate the model using data from the World Value Survey. Respondents to the World Value Survey are asked their view on income inequality. They can choose a response between 1, which means that "Incomes should be made more equal," and 10, which means "We need larger income differences." I assume that agents choosing between 1 and 3 want redistribution to decrease, 4 and 7 want redistribution to stay constant, and above 7 want redistribution to decrease. Data is for the years of 1995, 1999, 2006, and 2011.

Data from the WVS also support the result that agents are against redistribution due to their ideology, according to table 12. Moreover, without ideological gains, redistribution

would increase by 127%, according to the result in table 10.

## 5.5 Alternative Turnout Probability

In the main model I assumed that the turnout probability was only a function of the permanent component of productivity. I now relax this assumption and allow the turnout probability to also depend on the ideological gains:

$$P(\epsilon_i, \theta_i) = \Phi(-\beta_0 - \beta_1\epsilon_i - \beta_2\theta - \beta_3|\theta|) \quad (17)$$

where  $\beta_2$  and  $\beta_3$  captures the effect of preferences for redistribution on voter turnout.

To estimate parameters of the turnout probability, I add yet another log-likelihood to the estimation procedure. An agent with income  $y_i$  who supports decreasing redistribution has probability of voting given by

$$B_{decrease}(\beta|y_i) = \int_j \int_{-\infty}^{\frac{V'(\bar{\tau}|a_j, z_j, \alpha_j)}{V'_p(\bar{\tau})} - \kappa} P(\epsilon_i, \theta_i|\beta) I \{w\epsilon_j n_j + a_j r = y_i\} d\Gamma_j$$

where  $\beta = \{\beta_0, \beta_1, \beta_2, \beta_3\}$ . Equivalently, we can write down the probabilities of an agent who supports redistribution staying constant or increasing,  $B_{stay}$  and  $B_{increase}$ . The probability of an agent voting is given by

$$B(\beta|y_i, h_i) = \mathbb{I} \{h_i = decrease\} B_{decrease}(\beta|y_i) + \mathbb{I} \{h_i = stay\ the\ same\} B_{stay}(\beta|y_i) + \mathbb{I} \{h_i = increase\} B_{increase}(\beta|y_i)$$

where  $h_i$  is a variable with agent supporting redistribution to increase, stay the same or decrease. Finally, we can write the log-likelihood as:

$$L_v(\beta|\{y_i, h_i, b_i\}_i) = \sum_i b_i \log B(\beta|y_i, h_i) + (1 - b_i) \log (1 - B(\beta|y_i, h_i)) \quad (18)$$

where  $b_i$  is a dummy if agent  $i$  voted. To estimate the model, I use data from ANES stacking all the presidential elections between 1996 and 2012.

I still find that a policy inducing full turnout would not have a large effect on redistribution. Table 10 shows in column 4 the main counterfactuals. Notice that without ideological gains, the equilibrium tax rate would increase 127%. On the other hand, with full turnout the equilibrium tax rate would decrease 0.7%.

## 5.6 Expectation Over Future Taxes

In the main part of the paper, I assumed that voters have rational expectations about the path of taxes, as in Krusell et al. (1997). In this section, I relax this assumption to understand how important assumptions on voter rationality are. I consider two different types of voter beliefs about the path of taxes: that taxes are constant at the steady-state level or that they follow an exogenously calibrated path.

If agents expect taxes to be constant at the steady-state level after elections, value function 4 is given by

$$\begin{aligned} \Omega(a, z, \alpha | \Gamma, \tau) &= \max_{c, n, d, a'} u(c, n, d) + \beta E [\Omega(a', z', \alpha | \Gamma', \tau^*)] & (19) \\ \text{s.t.} & \\ c + d + a' &= (1 + r(\Gamma, \tau)(1 - \tau))a + (1 - \tau)w(\Gamma, \tau)\epsilon n + T(\Gamma, \tau) \\ \log \epsilon &= \alpha + z \\ a' &\geq \bar{a}, c \geq 0; d \in [0, \bar{d}]; n \geq 0 \end{aligned}$$

where  $\tau^*$  is the steady state tax rate. Therefore, if taxes today are  $\tau$ , agents still expect them to jump to  $\tau^*$  tomorrow.

I also solve a model in which taxes follow an exogenously given path:

$$\Phi_{exo}(\tau) = a_1 + a_2\tau + a_3\tau^2$$

where  $(a_1, a_2, a_3)$  are calibrated to reproduce the path of taxes in the U.S. from 1970 to 2015.

Under these two different assumptions of voter expectations of future taxes, I still find that ideological gains are the main determinant of redistribution. Table 11 shows that

Table 11: Counterfactual: Alternative Voter Expectation and Fiscal Policy

Model	Baseline		S.S. Tax Path		Calibrated Tax Path		Tax Progressiveness		Adm. Cost	
	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.	Eq. Tax Rate	Chg.
Baseline	0.166	0%	0.166	0.00%	0.154	0.00%	0.154	0.0%	0.178	0%
Preferences										
No Ideological Gains	0.36	117%	0.371	123.18%	0.461	199.79%	0.308	100.2%	0.310	74%
No Economic Gain	0.153	-8%	0.154	-7.59%	0.142	-7.98%	0.142	-8.0%	0.104	-41%
No Partisan Pref.	0.192	16%	0.180	8.23%	0.218	41.91%	0.155	0.4%	0.207	17%
Institutions										
Full Turnout	0.166	0%	0.167	0.14%	0.154	0.16%	0.154	0.0%	0.207	16%
Constant Turnout on Inc.	0.166	0%	0.167	0.13%	0.154	0.16%	0.154	0.0%	0.207	16%
Optimal Redistribution										
Optimal Redistribution	0.218	31%	0.218	31.24%	0.218	41.91%	0.193	25.3%	0.207	17%
Opt. Red. No Ideological Gains	0.346	108%	0.346	108.14%	0.346	125.05%	0.346	125.0%	0.295	66%
Opt. Red. No Economic Gain	0.218	31%	0.218	31.24%	0.218	41.91%	0.193	25.3%	0.236	33%

This table presents the estimated parameters for different versions of the model. Column *Baseline* presents the baseline model for comparison. Column  $1/\gamma = 0.3$  estimates the model setting the Frisch elasticity to 0.3. The third column estimates the model setting all government exogenous expenditure as fixed expenditure. Column *Dynamic* presents the estimated parameters with fully rational voters with in subgame perfect equilibrium as in Krusell et al. (1997), Krusell and Rios-Rull (1997) and the literature on dynamic political economy models. The column named *Utilitarian* presents the parameters of a model in which voters are concerned with the average welfare in the economy. Column *Primaries* presents the model in which voters must first decide on the tax proposal of each party, in primaries. The equilibrium is defined in section 5.5. The last column has the solution of the model when the selection on the voting decision is treated.

without ideological gains, redistribution would increase between 123% and 199%.

## 5.7 Tax Progressiveness

In this section, I evaluate whether the results depend on the progressivity of the tax schedule. To introduce progressiveness and keep the model tractable, I assume that the transfer  $T$  is targeted only at low productivity workers:

$$T(\alpha_i) = \begin{cases} T, & \text{if } \alpha_i < 0 \\ 0, & \text{if } \alpha_i \geq 0 \end{cases}$$

where  $\alpha_i$  is the productivity of worker  $i$ . This functional form for the transfer scheme has a set of benefits. First, it captures that high-income households have more to lose from an increase in taxes than in the linear setting. Second, because transfers are conditional on pre-determined characteristics, the discontinuity in transfer does not generate discontinuity in the value function. Third, because the degree of tax progressivity is fixed, agents are still voting on only one dimension, the marginal tax  $\tau$ , which avoids the complexity of solving a model with multiple endogenous policies.

Taking tax progressivity into account, I find an even larger role for ideological gains. Table 12 shows that agents are still against an increase in redistribution due to ideology and that its variance is 4 times larger. Table 11 shows that if agents voted without taking

Table 12: **Estimated Parameters under Different Model Specifications**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)	(10)
	Baseline	$1/\gamma = 0.5$	$1/\gamma = 0.3$	Log Ideo. Gains	Poor Ideo. Gains	WVS	Turnout Probability	S.S. Tax Path	Calibrated Tax Path	Tax Progressiveness	Adm. Cost
	Non-Tax Preferences										
$\mu_v$	-0.04	-0.04	-0.04	-0.12	-0.04	0.19	-0.04	-0.04	-0.04	-0.03	-0.01
	Ideological Gains										
$\mu_\theta$	-0.28	-0.27	-0.26	-0.02	-0.27	-0.46	-0.28	-0.28	-1.45	0.51	-0.10
$\sigma_\theta$	1.41	1.48	1.48	0.09	1.41	2.99	1.44	1.45	5.72	1.17	1.08
	Correlations										
$\rho_{\theta,v}$	-0.96	-0.96	-0.96	-0.20	-0.96	-0.67	-0.96	-0.95	-0.95	-0.98	-0.95
$\rho_{\alpha,v}$	0.28	0.28	0.26	0.47	0.27	0.02	0.28	0.30	0.09	0.81	0.43
$\rho_{\alpha,\theta}$	-0.11	-0.10	-0.09	-0.08	-0.10	-0.02	-0.11	-0.12	0.11	-0.81	-0.24

This table presents the estimated parameters for different versions of the model. Column *Baseline* presents the baseline model for comparison. Column  $1/\gamma = 0.3$  estimates the model setting the Frisch elasticity to 0.3. The third column estimates the model setting all government exogenous expenditure as fixed expenditure. Column *Dynamic* presents the estimated parameters with fully rational voters with in subgame perfect equilibrium as in Krusell et al. (1997), Krusell and Rios-Rull (1997) and the literature on dynamic political economy models. The column named *Utilitarian* presents the parameters of a model in which voters are concerned with the average welfare in the economy. Column *Primaries* presents the model in which voters must first decide on the tax proposal of each party, in primaries. The equilibrium is defined in section 5.5. The last column has the solution of the model when the selection on the voting decision is treated.

ideological gains into account, redistribution would increase by 100%.

Adding tax progressivity to the model increases the correlation of economic gains with income, which, as discussed in section 4.5, increases the role played by ideological gains. With tax progressivity, low-income voters have more to benefit from an increase in redistribution while high-income ones have more to lose. But, since in the data the correlation between support for redistribution and income is almost zero, there is a large component of preferences accounted for by ideological gains. Therefore, adding tax progressivity can only strengthen the result that ideological gains are the main determinant of redistribution.

## 5.8 Administrative Cost

In reality, agents could be against increases in redistribution due to administrative and implementation costs. In this subsection, I consider a model in which increases in government size would also increase the administrative costs of the government.

I consider a government with budget constraint given by

$$T = (\tau(1 - g) - G)(rK + wN)$$

where  $g$  is the percentage of revenue spent on administrative costs. I calibrate  $g$  to 0.23, which is the share of federal expenditure on interest rate and administration. As one can see from tables 12 and 11, the ideological gains are still the main drivers of redistribution.

## 6 Conclusion

In this paper, I estimate a dynamic model of the political economy to identify the determinants of redistribution. The model was estimated with a novel procedure created to tease apart different components of voters' preferences: economic gains, ideological gains, non-tax preferences, and campaign expenditure. Using data and the structure of the model, I study how preferences are aggregated into policy.

I find that ideological gains are the main determinant of redistribution and that institutions, such as voter turnout and campaign contribution, are not quantitatively important. The median agent in the U.S. is ideologically against redistribution. Ideological gains are so important that if agents were to vote disregarding their ideology on redistribution, federal taxes would increase from 0.17 to 0.36, a 117% increase. Imposing compulsory voting or abolishing campaign contributions would not have any effect on the equilibrium tax rate because the preferences for redistribution do not change considerably across the income distribution.

I find that ideological gains are the main determinant of redistribution because there is a small correlation between income and support for redistribution. A model with only economic gains would predict income and support for redistribution to be tightly correlated. Since that is not the case and the model is estimated to reproduce the support for redistribution observed in the data, it must be the case that voters are highly ideological when supporting redistribution.

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## 7 Appendix

### 7.1 Identifying Variation and Correlations

So far we have learned that social preferences are the main determinant of redistribution. In this section I ask: why is the variance of social preferences so large? In other words: what is the identifying variation behind the log-likelihoods presented in section 3?

For now I will focus on the moments determining  $\mu_\theta$  and  $\sigma_\theta$ . For this purpose, I generate responses to the tax opinion question while changing only two moments: the correlation of the wiliness to increase transfers with income and the share of individuals supporting tax increases. I will show that the first determines the variance while the second affects the mean of preferences for redistribution.

Given the income distribution  $\{Income_i\}_i$ , I draw sample  $\{u_i\}_i$  to generate a social preference  $\{\theta_i\}_i$  given by

$$\theta_i = \beta Income_i + u_i$$

$$u \sim N(0, 1)$$

After ordering the distribution of  $\{\theta_i\}_i$ , the bottom  $p\%$  is assumed to support the tax cut, an intermediate share  $q\%$  is chosen to support tax maintenance and the remaining to support tax increase. Therefore, changing  $\beta$ , keeping  $p\%$  constant, one can change the correlation of tax support with income while keeping the average support for tax cuts the same.

The main conclusion from this section is the following: the fact that there is a large amount of high income individuals supporting tax increases and low income against redistribution implies that there is large variation in the support for redistributive policy in the economy unexplained by economic gains. I.e.,  $\sigma_\theta$  must be large. If  $\sigma_\theta$  is large, the variance in support for redistribution and equilibrium redistribution are driven by social preferences.

### 7.2 Drivers of Ideological Gains and Partisan Preferences

Table 13: Setting Parameters to Zero

Parameter	Eq. Tax Rate	Chg.
Baseline	0.181	0%
$\mu_\theta = 0$	0.340	88%
$\sigma_\theta = 0$	0.141	-22%
$\rho_{\theta,v} = 0$	0.221	22%
$\rho_{\alpha,\theta} = 0$	0.181	0%
$\rho_{\alpha,v} = 0$	0.181	0%

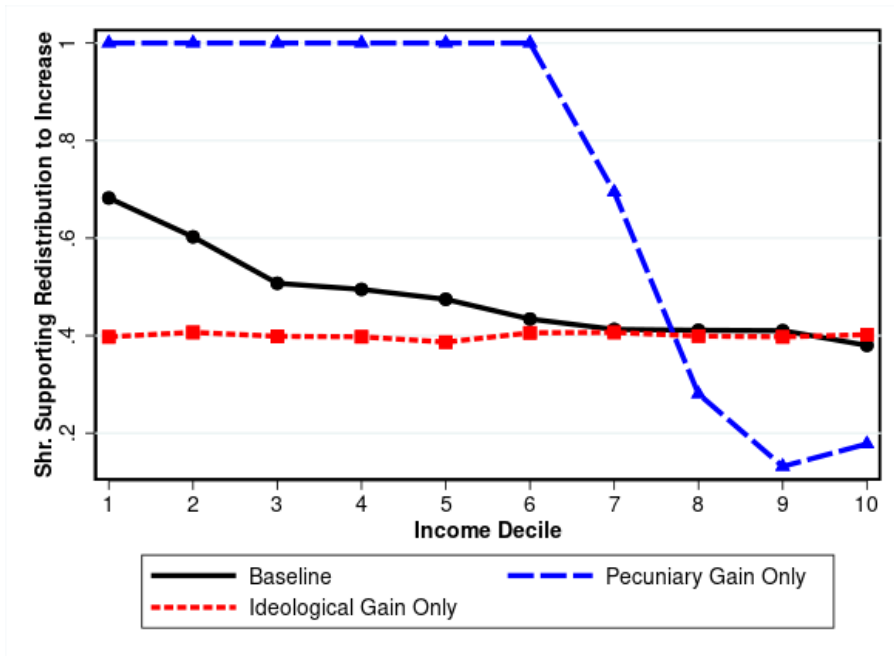
**Description:** This table presents the equilibrium tax rate setting different parameters to zero. Column *Parameter* has a description of the model used, column *Eq. Tax Rate* has the equilibrium tax rate, and column *Chg.* has the change in tax rate compared to the baseline model.

Table 14: Full List of Ideological Gains Controls

Variable	Description	Value	Share on Total Variance
<i>Unexplained Component</i>			
$\mu_\theta$	Constant	-0.476	0
$\sigma_\theta$	Variance of unexplained component	1.956	82.66%
<i>Expectation</i>			
I_better_next	Dummy if better off next year	0.037	0.01%
I_econ_better_next	Dummy if economy better next year	-0.009	0.00%
<i>Distrust of the Government</i>			
I_waste	Dummy if government wastes money	-0.310	0.48%
I_trust	Dummy if don't trust government	-0.140	0.10%
I_lessgov	Dummy if less government better	-0.390	0.71%
I_efficiencygov	Dummy if government has low efficiency	0.031	0.00%
I_dislike_fed	Dummy if dislike federal government	0.114	0.07%
<i>Justice and Fairness</i>			
I_justice	Dummy if society ensures equal opportunity to succeed	0.640	2.21%
I_somemore	Dummy if not big problem if some have more chance in life	0.347	0.14%
I_equal	Dummy if Should Worry less about How Equal People Are	0.311	0.26%
<i>Race</i>			
I_diffblk	Dummy if don't agree that conditions make difficult for blacks to succeed	-0.565	0.54%
I_dislike_blk	Dummy if have negative views on blacks	-0.047	0.01%
I_dislike_hisp	Dummy if have negative views on hispanics	0.238	0.28%
race_p	Share of non-whites among low-income households in the region	1.842	0.34%
race_p_white	Share of non-whites among low-income households in the region interacted with dummy if individual is white	-1.674	1.24%
I_blk_hardworking	Dummy if think that blacks are lazy	-0.144	0.10%
I_hispanic_hardworking	Dummy if think that hispanics are lazy	-0.087	0.04%
<i>Immigration</i>			
foreign_born_p	Share of foreign born among low-income individuals in the region	0.743	0.09%
foreign_born_p_white	Share of foreign born among low-income individuals in the region interacted with dummy if individual is white	-0.118	0.00%
I_dislike_illegal	Dummy if dislike illegal immigrants	-0.233	0.29%
<i>Altruism and Social Preferences</i>			
I_volunteer	Dummy if had devoted time to volunteer work in the past year	0.109	0.06%
I_dislike_poor	Dummy if dislike poor people	-0.276	0.30%
I_dislike_middle	Dummy if dislike middle income people	0.207	0.07%
I_dislike_rich	Dummy if dislike high income people	0.522	1.37%
I_dislike_welfare	Dummy if dislike welfare recipients	-0.869	4.02%
<i>Lack of Information</i>			
I_notwellunderstand	Dummy if don't understand political issues	-0.081	0.04%
I_complicated	Dummy if politics and government seem so complicated that respondent can't understand	0.166	0.04%
I_notinformed	Dummy if don't follow news on politics and government	-0.112	0.06%
<i>Demographic Characteristics</i>			
race	Dummy if white	0.197	0.17%
age	Dummy if less than 65	0.128	0.05%
religion	Dummy if has religion	-0.111	0.07%
educ	Dummy if at least some college	-0.161	0.14%

Figure 2: Decomposition of Tax Preference on Income Deciles

(a) Decomposition of Support for Redistribution and Income Decile



(b) Preferred Tax and Income Decile

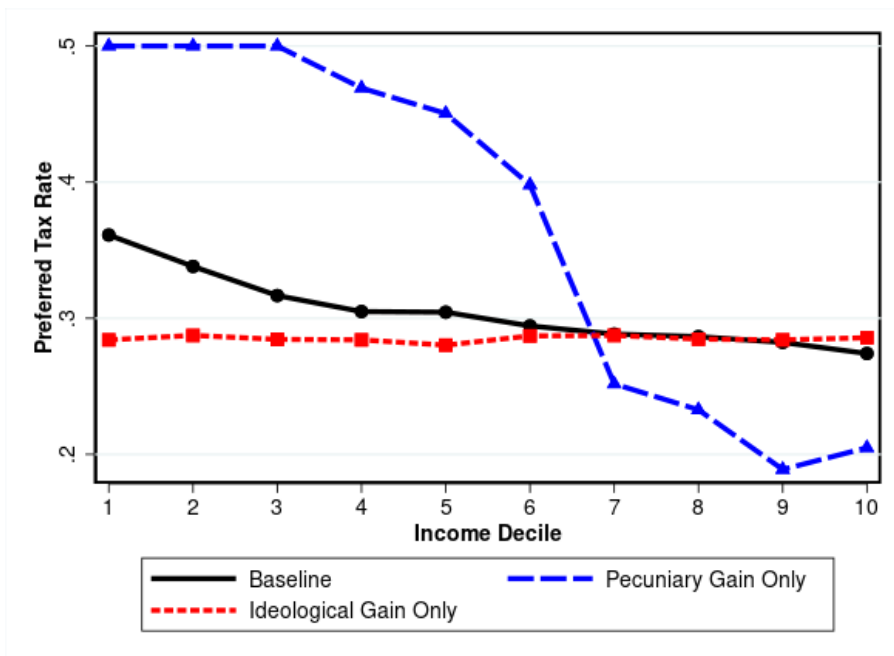
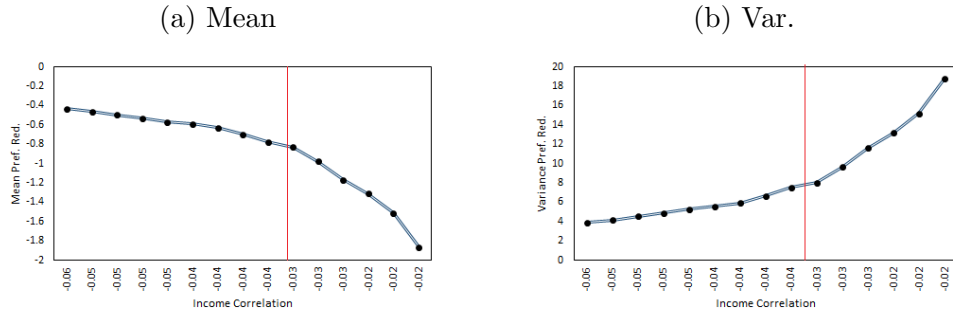
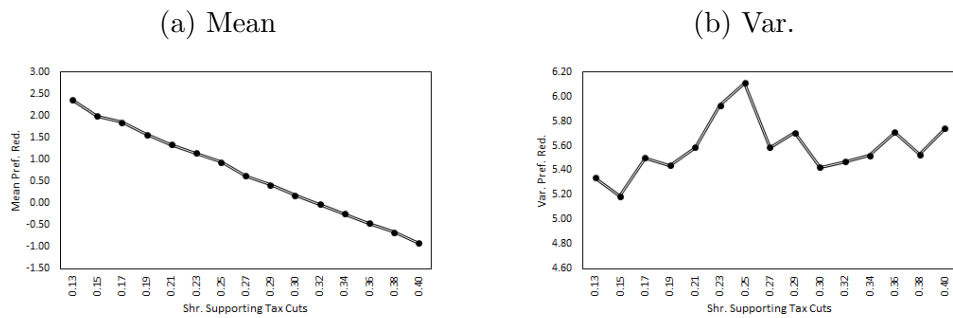


Figure 3: Social Preferences and Income Correlation



**Description:** Figure (a) presents the income correlation on the x-axis,  $\beta$ , and the estimated mean social preference on the y-axis. Figure (b) presents the income correlation on the x-axis and the variance of social preferences. For simplicity, this model is estimated without any income correlation.

Figure 4: Pref. Redistribution and Shr. Supporting Tax Increase



**Description:** Figure (a) presents the share supporting tax cuts,  $p$ , on the x-axis and the estimated mean social preference on the y-axis. Figure (b) presents the share supporting tax cuts,  $p$ , on the x-axis and the variance of the preferences for redistribution. For simplicity, this model is estimated without income correlation.