Chapter Redistribution

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1 Introduction

More than a century ago, Frédéric Bastiat (1850) described taxes as legal plunder. In this chapter, we discuss political-economic models in which a government uses taxes to redistribute income. Citizens elect the political party that rules the government. The outcomes of some of these models can indeed be interpreted as legal plunder. Taxes are used to redistribute income from citizens with high incomes to citizens with low incomes. Many citizens with high incomes do not like high taxes. Illustrative is that on the 8th of April 2021, five out of the top-10 tennis players in the ATP ranking have their residences in Monaco.

In democracies where almost all citizens can vote, we typically observe redistribution from the rich to the poor. In countries where only certain groups are allowed to vote, the outcome is often (appalling) exploitation. When in 1910, the Union of South Africa was formed, black Africans hoped for more rights. The union started, however, with a white-only franchise. It quickly implemented the Native Land Act, which made it impossible for black Africans to keep their land. One reason why white Africans dispossessed black Africans was "plunder." Another reason was the insurance of cheap labor for mines (Acemoglu and Robinson, 2019). This example painfully demonstrates that the right to vote matters.

There is much more to say about redistribution than that taxes are plunder. For example, there is a limit to taxation. The residences of well-paid tennis players in Monaco illustrate this. If taxes are very high, citizens choose actions to avoid taxation. They can work less or even migrate to Monaco. As a result, there is less to redistribute. In one of the models we analyze in this chapter, we argue that social norms may limit redistribution. In another model, citizens' incomes are uncertain. In that model, the distinction between redistribution and insurance is thin.

Citizens' preferences for redistribution are closely related to how they place themselves on the traditional left - right scale. Understanding citizens' preferences for redistribution is a first step towards understanding citizens' ideologies.

The main objective of this chapter is twofold. First, it presents a variety of models that economists and political scientists employ to understand government behavior. We discuss the median-voter model, in which political parties only aim at re-election, partisan models, in which political parties are ideological, and models of redistribution, in which social norms play a role. An essential feature of these models is whether or not political parties are able to make credible promises. Second, we want to understand the redistributive role of the government. In all societies, governments affect the distribution of income and wealth by a variety of policies. The redistributive effects of policies are often at the heart of politics. We employ political-economic models to explain why redistributive policies have changed over time and vary across countries.

The models we discuss have not been exclusively applied to redistributive policies. For example, the median-voter model and partisan models are also used to explain macro-economic policies. The applications to redistributive policies are interesting in themselves, help teach the theory, and highlight the process of model building. We show how economists adapted models or added new elements to explain empirical findings and develop new testable hypotheses.

In this chapter, we focus on one role of elections: aggregating citizens' preferences. There are three broad reasons why citizens have different preferences over policies. First, citizens have different tastes. Like some people prefer red wine to beer, some people prefer roads to public parks. Second, citizens have different opportunities. Some citizens have the abilities to earn a high income, while others lack these abilities. Third, policies have different effects on different people. For example, citizens with high incomes often pay higher taxes than citizens with low incomes. In the models we discuss in this chapter, citizens' preferences over tax rates depend on their abilities and incomes. At elections, citizens can express what they want. They can reveal their preferences over policies. Elections aggregate preferences. In the next chapter, we discuss two additional roles of elections: disciplining politicians by kicking politicans who abused their power out of office, and selecting competent and honest politicians.

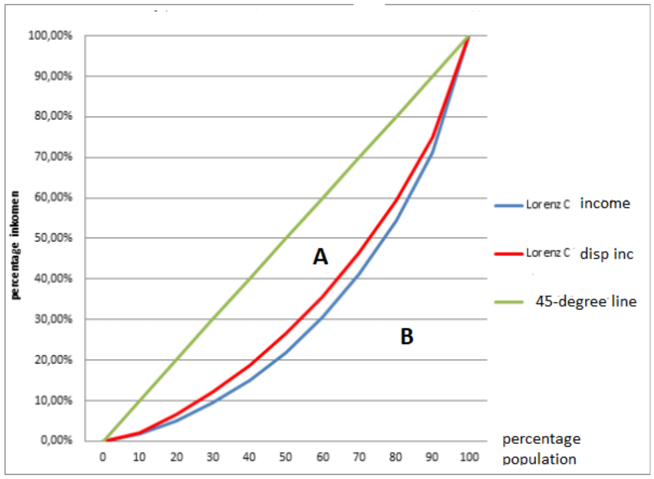

Figure 1: The Lorenz curve for the Netherlands. The blue line shows the Lorenz curve for gross income. The red line for disposable income.

2 The Data

The models discussed in this chapter explain citizens' demand for redistribution by their relative income positions. This section presents some basic statistics of the income distribution and government social public spending as a percentage of GDP.

A well-known way to show the income distribution of a country is the Lorenz curve. It shows the cumulative share of a country's income as earned by citizens. Figure 1 presents the Lorenz curve for the Netherlands in 2014. Figure 1 shows that in the Netherlands the richest ten percent of the population earns approximately 20 percent of national income.

A well-known measure of inequality is the Gini coefficient. It is defined as the area between the Lorenz curve and the area below the 45-degree line, A,divided by the total area below the 45-degree line, A+B: $\left(\frac{\mathrm{A}}{\mathrm{A+B}}\right)$. Note that the higher the Gini coefficient is, the higher inequality is. When there is complete equality, the Gini coefficient is zero. When one person earns the entire income of a country, the Gini coefficient equals (almost) 1. For the Netherlands, the Gini coefficient is 0.4 for gross income and 0.34 for disposable income. As the Gini coefficient is lower for disposable income than for gross income, taxes reduce inequality in the Netherlands.

The Lorenz curve for the Netherlands may look highly unfair, but relative to other countries, the Netherlands has a low Gini coefficient. Figure 2 presents Gini

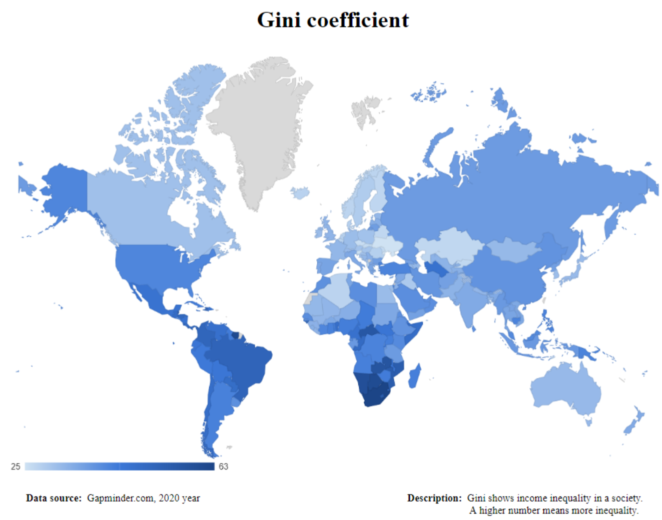

Figure 2: Gini coefficients world wide.

coefficients worldwide. It confirms that inequality is relatively small in the Netherlands. By contrast, in South America and many countries in Africa, inequality is high.

One of the objectives of this chapter is to explain distributive policies. A well-known measure of redistributive policy is public social spending as a percentage of GDP. Figure 3 presents this measure over a long period for various countries. On the one hand, the pattern of public social spending over time is similar for the selected countries. Until the second world war, public social spending was low. It rapidly increased between the fifties and eighties. Despite these similarities, countries differ a lot. In the last decades, spending was low in the Anglo-Saxon countries. It was high in France, Italy, and Sweden.

In the models of this chapter, the government finances income transfers by taxes. We abstract from financing by debt. Moreover, we ignore other reasons for public spending, for example, spending on public goods. As a result, in the models, there is a one-to-one relationship between the tax rate and redistributive spending.

3 The Meltzer and Richard Model

We start with discussing a simple political-economic model of redistribution. It is a simplified version of the model developed by Meltzer and Richard (1981). The next

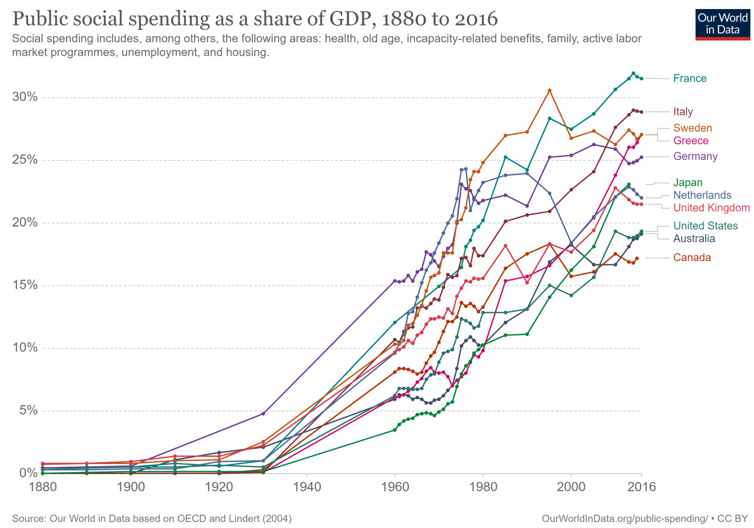

Figure 3: Public social spending as a share of GDP.

section presents a rudimentary model of the working of the economy. It explains the demand for redistribution. Section 3.2 discusses the supply of redistribution emerging from parties competing for office.

3.1 The Demand for Redistribution

We first model the (economic) environment, in which citizens live. Consider a society with a large number of citizens indexed by i. Each citizen i makes two decisions. First, he decides how much time to allocate between working and leisure. Second, he decides for which party to vote at the elections.

Citizen i's income, y_i, equals

$$y_i = n_i$$

where n_i is i's time he devotes to working. The government imposes a flat tax, τ, on income to finance a transfer to each citizen equal to $\tau\bar{y}$, where $\bar{y}$ is the average income in the population. In the empirical literature, public social spending is often used as a measures of redistribution. In our model, $\tau\bar{y}$ serves as the measure of social spending. Citizen i's disposable income equals

$$(1-\tau)\, y_i + \tau\bar{y} = y_i + \tau\,(\bar{y} - y_i)$$

Notice that each citizen i for whom $y_i < \bar{y}$, benefits from the transfer. By contrast, each citizen for whom $y_i > \bar{y}$ suffers from the transfer. Thus, the transfer redistributes income from citizens whose incomes are higher than average to citizens whose incomes are lower than average.

Citizen i consumes his entire disposable income. His preferences are represented by the utility function

$$u_i(n_i) = (1-\tau)\, n_i + \tau \bar{y} - \frac{1}{2\alpha_i} n_i^2. \tag{1}$$

Equation (1) denotes that citizen i enjoys consumption but dislikes working. Through the parameter α_i, we model heterogeneity across agents. We denote by $\bar{\alpha}$ the average value of α_i in the population, and by α_m the median value of α_i. One interpretation of α_i is that it measures how much utility agent i receives from leisure. The lower is α_i, the more agent i likes leisure (or dislikes working). An alternative interpretation of α_i is that it is a measure of i's productivity or talent. The higher is α_i, the more productive i is, so the more expensive leisure is.

To determine i's labor supply, maximize Equation (1) with respect to n_i, yielding

$$n_i = \alpha_i (1-\tau). \tag{2}$$

Note that in our simple model, (2) also denotes i's income.[1] In most countries, mean income is higher than median income. This amounts to $\alpha_m < \bar{\alpha}$. Figure 4 demonstrates this for the United States and the Netherlands.

Having established citizens' decisions as employees, we now determine citizens' demand for redistribution. Which level of τ is optimal for citizen i? To answer this question, substitute (2) into (1), such that i's utility is a function of τ

$$u_i(\tau) = \frac{1}{2}\alpha_i (1-\tau)^2 + \tau(1-\tau)\,\bar{\alpha}.$$

We assume that $0 < \alpha_i < 2\bar{\alpha}$. This assumption ensures that the function $u_i(\tau)$ has a (unique) maximum at

$$\tau_i = \frac{\bar{\alpha} - \alpha_i}{2\bar{\alpha} - \alpha_i}. \tag{3}$$

[1] Note that tax revenues (per capita) equal $\tau\bar{\alpha}$, and public spending (per capita) equals $\tau\bar{y}$. As $\bar{y} = \bar{\alpha}$, the budget constraint is satisfied.

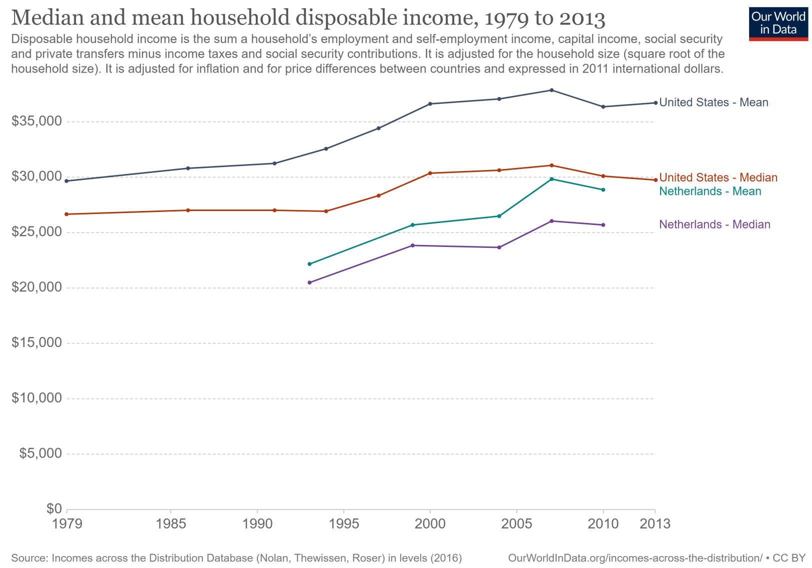

Figure 4: Median and mean income in the United States and the Netherlands.

The optimal policy from citizen i's perspective is often referred to as citizen i's *bliss point*. Equation (3) shows that citizen i's demand for redistribution depends on how productive he is (α_i) relative to the average citizen ($\bar{\alpha}$). A low-productive citizen (low α_i) desires a high tax rate. In contrast, a high-productive citizen (high α_i) desires a low tax rate.

Exercise 1 *Explain why citizens for whom $\alpha_i > \bar{\alpha}$ want a* ***negative*** *tax rate.*

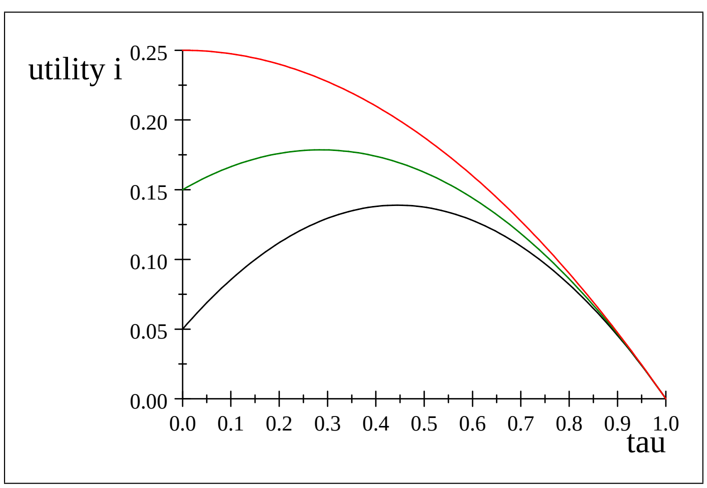

Figure 3.1. u_i for $\alpha_i = 0.1$ (black), $\alpha_i = 0.3$ (green) and $\alpha_i = 0.5$ (red) with $\bar{\alpha} = .5$.

Figure 3.1 presents the utilities of three citizens as a function of τ. It illustrates that in the present model $u_i(\tau; \alpha_i)$ is single peaked. The more τ deviates from τ_i, the lower is i's utility. Proposition 1 gives a nice and important feature of single-peaked utility functions.

Proposition 1 *Suppose that in our model, citizens can choose between τ_1 and τ_2 with $\tau_1 < \tau_2$. If citizen i prefers τ_1 to τ_2, then all citizens j with $\alpha_j > \alpha_i$ prefer τ_1 to τ_2. Likewise, if citizen i prefers τ_2 to τ_1, then all citizens j with $\alpha_j < \alpha_i$ prefer τ_2 to τ_1.*

Proof: To prove Proposition 1, suppose that $\tau_1 < \tau_2$ and $u_i(\tau_1) > u(\tau_2)$, meaning

$$\begin{aligned} u_i(\tau_1) - u_i(\tau_2) &= \frac{1}{2}\alpha_i (1-\tau_1)^2 + \tau_1 (1-\tau_1)\bar{\alpha} - \left(\frac{1}{2}\alpha_i (1-\tau_2)^2 + \tau_2 (1-\tau_2)\bar{\alpha}\right) \\ &= \frac{1}{2}\alpha_i \left[(1-\tau_1)^2 - (1-\tau_2)^2\right] + \left[\tau_1(1-\tau_1) - \tau_2(1-\tau_2)\right]\bar{\alpha} \end{aligned}$$

which is clearly increasing in α_i. Hence, if $u_i(\tau_1) - u(\tau_2) > 0$ for α_i, $u_i(\tau_1) - u(\tau_2) > 0$ for all $\alpha_j > \alpha_i$. The proof for the opposite case is analogous.□

Proposition 1 directly results from single peakedness of preferences. With single-peaked preferences, one can rank citizens' preferences on the basis of α_i. As citizens' income depends linearly on α_i, citizens' preferences over τ can also be ranked on income. The higher is y_i, the less redistribution i wants. An implication of Proposition 1 is that if citizen i is indifferent between τ_1 and τ_2, and $\tau_1 > \tau_2$, all citizens j with $\alpha_j > \alpha_i$ prefer τ_2 to τ_1, while all citizens j with $\alpha_j < \alpha_i$ prefer τ_1 to τ_2.

Equation (3) shows that two forces drive citizen i's demand for redistribution. The first force is his income relative to mean income. The second force is the effect of τ on mean income. Note that if $\alpha_i = 0$, then $\tau_i = \frac{1}{2}$. Thus, the poorest citizen does not want $\tau = 1$. There is a limit to redistribution. When the tax rate exceeds a certain threshold, in the present model this threshold equals $\tau = \frac{1}{2}$, a higher tax rate reduces tax revenues. The reason is that a high tax rate discourages people to work.

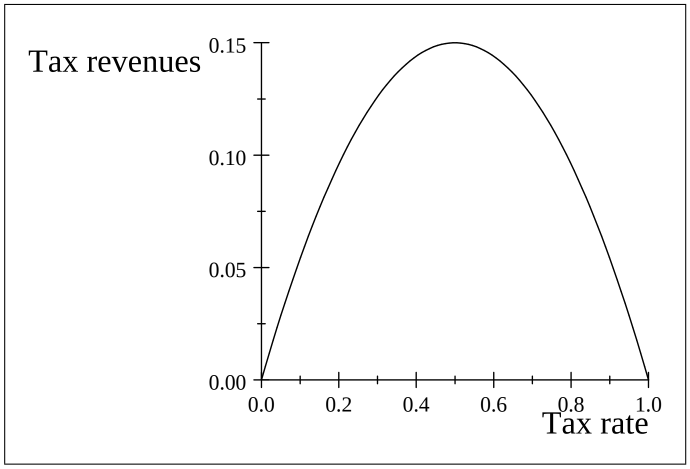

Figure 3.1. The Laffer curve. Tax revenues, $\tau \bar{y}$ as a function of τ.

Figure 3.1 illustrates that tax revenues increases in τ for $\tau < \frac{1}{2}$, and decreases in τ for $\tau > \frac{1}{2}$. This curve is called the Laffer curve. Clearly, in the present model, no citizen benefits from a tax higher than one half. You could see this force as an efficiency argument against high taxes. Taxes should not discourage citizens too much to work.

Equation (3) shows how individual income affects preferences for redistribution. The model employed is a static model. However, the demand for redistribution needs not only to depend on a citizen's current income but also on his expected future income.

Exercise 2 *Argue why young educated people demand less redistribution than you would expect on the basis of their current incomes.*

Exercise 3 *Argue why uncertainty about future income increases the demand for redistribution.*

In our model, the demand for redistribution is driven by its consequences for citizens' pocketbooks. Of course, citizens may have concerns that go beyond their own private concerns. They may have views about what is fair and what is unfair. This raises the question of where these views of fairness come from. Some cultures may deal differently with inequality than others. As we discuss in Section 5, norms of fairness may also be endogenous, emerging from the economic-political system.

One way of assessing citizens' demand for redistribution is asking them about it. Surveys, like the World Value Survey (WVS), contain questions related to redistribution. For example, the WVS asks respondents "Do you think that what the government is doing for people in poverty in this country is too much, the right amount, or too little?" In the light of our model, we expect that citizens with $\tau_i < \tau$ report too much, citizen with $\tau_i \sim \tau$ report the right amount, and citizens with $\tau_i > \tau$ report too little.

Using survey data, Alesina and Giuliano (2011) examine the individual determinants of the demand for redistribution. Consistent with Equation (3) they find that richer people have lower demand for redistribution. They also find that a person's background or culture is important. In particular, blacks have a much higher demand for redistribution than whites. Females demand higher redistribution than males. Ideology also matters. Left-wing respondents have higher demand for redistribution, even after having controlled for income. Higher educated respondents have lower demand for redistribution. One reason might be that higher educated people expect to get higher incomes in the future, which may reduce their demand for redistribution. Finally, Alesina and Giuliano (2011) find that perceptions of fairness matter. First, citizens who believe that success results from hard work have lower demand for redistribution than citizens who believe that luck is important for success. Second, there is an extensive experimental literature that indicates that many citizens are inequality averse.[2]

Overall, the empirical research on the demand for redistribution supports the idea that relative income is important. There are three caveats. First, relative income is not the only determinant. Ranking citizens' demand for redistribution is inappriorate for citizens who expect to have higher incomes in the future. Second, different social beliefs about fairness may complicate empirical research across countries. Third, for τ_i to be empirically relevant, it is also important that citizen i knows his income position relative to the median. Stantcheva (2020) shows that this condition is not always satsified. She finds that conditional on income, Republicans tend to overestimate their income positions. This may explain why Republicans demand less redistribution. More generally, misperceptions about the incidence of taxes have consequences for the demand for redistribution.

[2]Building on psychological insights, a new strand in the economics literature shows that macroeconomic conditions during young adulthood shape citizens' preferences. Citizens who grow up in a recession have a higher demand for redistribution (Giuliano and Spilimbergo, 2014). Cotofan, et al. (2021) show that this higher demand for redistribution is restricted to one's in-group.

3.2 The Supply of Redistribution: The Downsian Model

The demand-side of the model of redistribution describes what different citizens want from the government. The supply-side describes what the government offers. The models we discuss in this section are electoral models. Elections play an important role. We consider a society in which two parties, $P \in \{L, R\}$, compete for office. Prior to the election, parties simultaneously announce their party platforms, τ_P^a. The platform is an announcement (or promise) of the tax rate the party implements, if elected. Citizens observe τ_L^a and τ_R^a. Based on the announced platforms, citizens make expectations about the tax rate each party will actually choose, τ_P, if it wins the elections, $\tau_P^e(\tau_L^a, \tau_R^a) = E(\tau_P | \tau_L^a, \tau_R^a)$ for $P \in \{L, R\}$.[3] We assume that all citizens vote.[4] The party that gets most votes wins the election. It determines the tax rate, τ_P, after the election.

We start with discussing the Downsian model of electoral competition.[5] Downs (1957) made three important assumptions: T

1. The sole objective of parties is to win the election. Parties are purely *office motivated*. Later in this chapter, we will study *policy-motivated* parties. Party P's utility can be written as

$$u_P = kI_P,$$

   where $k > 0$ denotes the rents from office party P receives, and I_P is a dummy variable, taking $I_P = 1$ if party P wins the election, and taking $I_P = 0$ if party P loses the election.

2. The party that wins the election implements the platform it announced prior to the election. Hence, $\tau_P = \tau_P^a$. Economists say that parties can commit themselves to implement announced platforms.

3. There is full information. Citizens know the model (for example, that $\tau_P = \tau_P^a$ and how the tax rate affects their utilities). This means that $\tau_P^e = \tau_P$. Parties

[3] In our model, citizens have the same information. It is therefore natural to assume that all citizens have the same expectations about policies.

[4] In the next chapter, we relax this assumption. We discuss models in which citizens can also abstain from voting.

[5] Meltzer and Richard (1981) first applied the Downsian model to redistribution. Their model has been used by many economists and political scientists as a starting point for a positive theory of redistribution.

also know the model (for example, citizens' preferences).

The Downsian Model of Redistribution

1. Party L and R simultaneously announce τ_L^a and τ_R^a, respectively.

2. All citizens vote for party L or R.

3. The party that gets the majority of the votes takes office and chooses $\tau_P = \tau_P^a$.

4. Citizen i's preferences are given by the indirect utility function

$$u_i(\tau) = \frac{1}{2}\alpha_i (1-\tau)^2 + \tau(1-\tau)\bar{\alpha}$$

   with α_i being distributed according to the density function $f(\alpha)$ with $0 < \alpha < 2\bar{\alpha}$.

5. Party P's preferences are given by $u_P = kI_P$.

6. If citizen i is indifferent between party L and R, he tosses a fair coin.

The next proposition describes the equilibrium of the Downsian redistributional game.

Proposition 2 *In the unique Nash equilibrium of the Downsian Model of Redistribution, (i) citizen i votes for party L if $\left|\tau_L^a - \frac{\bar{\alpha}-\alpha_i}{2\bar{\alpha}-\alpha_i}\right| < \left|\tau_R^a - \frac{\bar{\alpha}-\alpha_i}{2\bar{\alpha}-\alpha_i}\right|$, for party R if $\left|\tau_L^a - \frac{\bar{\alpha}-\alpha_i}{2\bar{\alpha}-\alpha_i}\right| > \left|\tau_R^a - \frac{\bar{\alpha}-\alpha_i}{2\bar{\alpha}-\alpha_i}\right|$, and for party L with probability one-half if $\left|\tau_L^a - \frac{\bar{\alpha}-\alpha_i}{2\bar{\alpha}-\alpha_i}\right| = \left|\tau_R^a - \frac{\bar{\alpha}-\alpha_i}{2\bar{\alpha}-\alpha_i}\right|$; (ii) both parties announce the tax rate that coincides with the median voter's bliss point, $\tau_L^a = \tau_R^a = \frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m}$.*

Proof: We solve the model backwards. We first show that (i) in Proposition 2 is a weakly optimal response for citizen i to the vote strategies of the other citizens. Symmetry and single peakness of citizen i's indirect utility function ensure that the platform that is closest to citizen i's bliss point yields the highest payoff.[6] Citizen i's vote is decisive for the election outcome if and only if his vote creates a tie or breaks

[6] Symmetry of citizens' indirect utility functions makes the proof easier, but is not necessary.

a tie. In these cases, it is optimal for citizen i to vote for the platform that is closest to his bliss point. In all the other cases, citizen i's vote is not relevant. Hence, it is a weakly dominant strategy for citizen i to vote in line with (i) in Proposition 2. We now show that in equilibrium, $\tau_L^a = \tau_R^a = \frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m}$. To win the elections, a party needs the support of half of the voters (plus one). Proposition 1 shows that if the median voter casts his ballot for party P, party P wins the election. $\tau_L^a = \tau_R^a = \frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m}$ is an equilibrium outcome, because given $\tau_R^a = \frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m}$, a deviation by party L leads to a certain defeat. To prove uniqueness, suppose that $\tau_L^a \neq \frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m}$ and $\tau_R^a \neq \frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m}$. Then either party L or party R has an incentive to deviate by choosing $\frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m}$ to win the election with certainty.$\square$

The Downsian model of redistribution generates the testable prediction that the tax rate depends positively on the difference between the mean and the median income in a population. No redistribution takes place if $\bar{\alpha} = \alpha_m$. A striking feature of the median-voter model is that to explain redistributional policies, we do not need to know details of the income distribution of the entire population. Information about the mean and the median suffices.

There is a huge empirical literature testing the Downsian model applied to redistribution. An aspect of the model that is emphasized by Meltzer and Richard (1981) is that α_m should not be seen as characterizing the median *citizen* in the population. α_m refers to the median *voter*. This distinction is not important when all citizens are allowed to vote and actually vote. In the nineteenth century, however, several countries imposed income requirements for voting. The elimination of these income requirements led to a shift of the median voter, and, as the model predicts, to more redistribution. The data indeed suggest that franchise extensions increased votes for redistribution (Melzter and Richard, 1983).

Another prediction of the median-voter model is convergent of platforms. This prediction is often rejected (Hibbs, 1977, and Alesina and Rosenthal, 1995). In Sections 3.3-3.5, we investigate models of redistribution where parties have ideological motives.

Across countries, there is mixed support for the Downsian model of redistribution. Early studies present negative correlations between income growth and inequality (Alesina and Rodrik, 1994 and Persson and Tabellini, 1994). As high tax rates reduce economic growth, these correlations are consistent with the main prediction of the Downsian model of redistribution that inequality leads to high public social spending. However, the model cannot explain why redistributive policies in Europe are far more extensive than in the United States (see Alesina and Angeletos, 2005). The difference between mean and median income is larger in the United States than in most European countries. Figure 4 serves as illustration. It shows the mean and median income in the Netherlands and the Unites States in the last decades. Clearly, the difference between mean and median income is higher in the United States than in the Netherlands. Distributive programs are more extensive in the Netherlands, however (see Figure 3).

Karabarbouris (2011) shows that regressing public social spending on multiple measures of inequality leads to the predicted result that a rise in median income leads to less public social spending. Moreover, higher incomes of the rich and poor decrease public social spending. This rejects the prediction of the median-voter model that knowledge about median and mean income is sufficient to explain public social spending. Karabarbouris' findings suggest that the median-voter model takes a too simplified view of the political process. Some voters are more influential than other voters. The rich has more political influence than the poor. In later chapters, we will see that political participation increases in income. This is one possible explanation why the rich has more influence.

The median-voter model applied to redistribution captures the intuitive idea that parties are likely to be responsive to a majority of the electorate in case of distributive policies. It emphasizes individual income as an important component of preferences for redistribution. It is hard to imagine that citizens' incomes have nothing to do with preferences for redistribution. The empirical literature generally supports this idea. The model does not explain everything. This is hardly surprising as the median-voter model is a simple model that abstracts from many aspects of real-world economic-political systems. Parties know citizens' preferences and the working of the economic system. Voters know the costs and benefits of redistribution. One prediction of the model is convergence of party platforms. In practice, we do not observe full convergence. In fact, in the last decades, we have observed more and more polarization. In the next sections, we relax some of the main assumptions underlying the median voter model to explain polarization.

Exercise 4 *Argue whether or not the Median Voter Theorem holds when three parties compete for office.*

3.3 A Partisan World

In the Downsian model, parties choose policies to win the elections. In a two-party system where all citizens vote, this assumption naturally implies convergence of platforms. As discussed above, there is a lot of evidence that parties' platforms are not identical. This suggests that parties are not only concerned with winning the elections. They also care about the policies they implement.

In this section, we replace the assumption that parties' unique objective is to win the election by the assumption that parties are policy motivated. A plausible reason for policy-motivated parties is that parties promote the interests of different groups in society. In the context of redistribution, this would mean that one party represents the interests of citizens with lower incomes, and that the other party represents the interests of citizens with higher incomes. In this and the next two sections, we assume that party L's preferences are represented by the utility function

$$u_L(\tau) = \frac{1}{2}\alpha_L (1-\tau)^2 + \tau(1-\tau)\bar{\alpha} \text{ with } \alpha_L < \alpha_m \tag{4}$$

and that party R's preferences are represented by[7]

$$u_R(\tau) = \frac{1}{2}\alpha_R (1-\tau)^2 + \tau(1-\tau)\bar{\alpha} \text{ with } \bar{\alpha} > \alpha_R > \alpha_m. \tag{5}$$

These utility functions imply that party L and R have different bliss points: $\frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L} > \frac{\bar{\alpha}-\alpha_R}{2\bar{\alpha}-\alpha_R}$.

What are the implications of replacing office-motivated parties by policy-motivated parties for the outcomes of the model? Proposition 3 gives the answer to this question.

Proposition 3 *The unique equilibrium of the Downsian Model of Redistribution with policy-motivated parties is identical to the unique equilibrium of the Downsian Model of Redistribution with office-motivated parties.*

[7] $\bar{\alpha} > \alpha_R$ means that party R's bliss point is higher than zero.

Proof: To prove Proposition 3, first consider citizen i's vote decision. He observes τ_L^a and τ_R^a, and must determine if τ_L^a or τ_R^a yields a higher utility. This problem is identical to the problem he faces in the model with office-motivated parties. Hence, citizen i casts his ballot for the party whose platform is closest to his bliss point $\frac{\bar{\alpha}-\alpha_i}{2\bar{\alpha}-\alpha_i}$. When choosing their platforms, parties anticipate citizens' vote strategies. Suppose that each party choose the platform that coincides with its bliss point. Then, if elected, the party implements the policy it mostly desires. However, at least one of the parties has an incentive to deviate in order to increase its chances of re-election. For example, if for τ_L^a and τ_R^a party L wins the election, party R has an incentive to deviate by choosing a platform that is closer to the median voter such that it attracts his vote. A platform that is optimal from an ideological point of view is worthless if it will not be implemented. It is now easy to see that incentives to deviate remain unless parties choose platforms that coincide with the tax rate most preferred by the median voter.$\square$

There are two ways of looking at Proposition 3. First, Proposition 3 shows that the median voter result does not depend on the assumption that parties are office-motivated. Even in a partisan model, the median-voter result survives. Office-motivated parties choose policies to get elected. Policy-motivated parties need office to implement policies. Second, to explain partisan policies, a phenomenon we observe, we need to relax another assumption of the Downsian model.

3.4 Uncertainty about Citizens' Preferences

The median-voter models discussed in the previous two sections are models with complete information. Citizens know the working of the economy, know parties' motives and observe parties' platforms. Regarding the information parties possess, the assumption that parties know the median voter's preferences is important. In this section, we discuss a model of electoral competition developed by Calvert (1985). His model differs from the standard median-voter model in that voters are not explicitly modeled. Instead, he makes an ad-hoc assumption about how platforms affect the probabilities with which parties win the election.

Define $F\left(\tau_L^e, \tau_R^e\right)$ as the probability that party R wins the elections as a function of parties' expected policies after the election:

$$\begin{aligned} F\left(\tau_L^e, \tau_R^e\right) &= \Pr(I_R = 1 | \tau_L^e, \tau_R^e) \text{ with} \\ 0 &< F\left(\tau_L^e, \tau_R^e\right) < 1, \text{ and } F\left(\tau_L^e, \tau_R^e\right) \text{ continuous and differentiable.} \end{aligned}$$

Assumption 1 $\frac{\partial F\left(\tau_L^e, \tau_R^e\right)}{\partial \tau_L^e} < 0$ *and* $\frac{\partial F\left(\tau_L^e, \tau_R^e\right)}{\partial \tau_R^e} < 0$ *for* $\tau_R^e > \tau_L^e$.

Assumption 1 implies that if a party's platform converges to the other party's platform, it increases its chances of winning the elections.

By modeling the election outcome through $F\left(\tau_L^e, \tau_R^e\right)$, citizens are no longer players of the game. You can see $F\left(\tau_L^e, \tau_R^e\right)$ as a short-cut for citizens' vote strategies that simplifies the analysis. Economists often use short-cuts. At the same time, many economists are suspicious to them. They want to know whether a used short-cut is consistent with rational behavior. Before solving the model, we show that $F\left(\tau_L^e, \tau_R^e\right)$ with Assumption 1 can be derived from a richer model in which citizens are rational players.

The key assumpton in this richer model is that parties are uncertain about the bliss point of the median voter, τ_m. This assumption is in line with empirical research by Broockman and Skovron (2018) who find that U.S. politicians have limited knowledge about citizens' opinions. Assuming that parties do not know the exact value of τ_m does not mean that they have no clue. Given the importance of knowing τ_m for winning the elections, parties have incentives to learn τ_m. In practice, tools, like polls, give some but not full information about τ_m. Suppose that when parties choose their platforms they believe that the median-voter's bliss point, τ_m, is uniformly distributed on $[\tau_m^e - h, \tau_m^e + h]$. Thus, when choosing their platforms, parties know τ_m^e and h, but do not exactly know τ_m.

Let us now determine the probability that party R wins the elections. Suppose $\tau_L \leq \tau_R$. In the present model, the median voter is still decisive. If τ_m is closer to party R's platform than party L's platform, party R wins the election. This implies that party R wins the elections if $\tau_m > \frac{1}{2}\left(\tau_L + \tau_R\right)$. Using that τ_m is uniformly distributed on $[\tau_m^e - h, \tau_m^e + h]$, we get

$$F\left(\tau_L, \tau_R\right) = \Pr\left[\tau_m > \frac{1}{2}\left(\tau_L + \tau_R\right)\right] = \frac{h + \tau_m^e - \frac{1}{2}\left(\tau_L + \tau_R\right)}{2h} \tag{6}$$

Note that $\frac{\partial F\left(\tau_L^e,\tau_R^e\right)}{\partial \tau_L^e} < 0$ and $\frac{\partial F\left(\tau_L^e,\tau_R^e\right)}{\partial \tau_R^e} < 0$. Hence, our short-cut -$F(\tau_L, \tau_R)$ with Assumption 1- can be derived from a model, in which citizens vote for the party whose platform yields highest utility.

Let us now solve the median-voter model with policy-motivated parties and an election outcome determined by $F(\tau_L, \tau_R)$. Party L's best response to party R's policy results from maximizing

$$\begin{aligned}&\left[1 - F(\tau_L, \tau_R)\right]\left[\frac{1}{2}\alpha_L(1-\tau_L)^2 + \tau_L(1-\tau_L)\bar{\alpha}\right] + \\ &F(\tau_L, \tau_R)\left[\frac{1}{2}\alpha_L(1-\tau_R)^2 + \tau_R(1-\tau_R)\bar{\alpha}\right],\end{aligned}$$

yielding the first-order condition:

$$\begin{aligned}&\frac{\partial F(\tau_L, \tau_R)}{\partial \tau_L}\frac{1}{2}(\tau_L - \tau_R)\left\{2(\alpha_L - \bar{\alpha})\left[2(\alpha_L - \bar{\alpha}) + (\tau_L + \tau_R)(2\bar{a} - \alpha_L)\right]\right\} + \\ &\left[1 - F(\tau_L, \tau_R)\right]\left[(1-2\tau_L)\bar{a} - \alpha_L(1-\tau_L)\right] = 0. \qquad (7)\end{aligned}$$

Equation (7) shows the trade-off party L faces. The expression in the second line equals zero if party L chooses its bliss point, $\frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L}$. Call this the policy motive. The expression in the first line equals zero, if $\tau_L = \tau_R < \frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L}$. Call this the office motive. The policy motive gives an incentive to party L to choose a platform close to its bliss point. The office motive gives an incentive to party L to choose a platform close to τ_R. In equilibrium, $\tau_R > \tau_L > \frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L}$. For party R, an analogous expression can be derived. Hence, policies partially converge. The degree of convergene depends on the parameters of the model. The more sensitive the election outcome is to changes in policies, the stronger is the office motive relative to the policy motive.[8] If due to exogenous circumstances party L is likely to win the election, it can afford a platform that is close to its bliss point. For example, a party leader who is regarded as highly competent, can afford a policy that is close to its bliss point.

Proposition 4 *Consider a Downsian Model of Redistribution with policy-motivated parties and uncertainty about the median voter's bliss point. An equilibrium exists in which parties' platforms partially converge.*

[8] With the micro foundation of $F(\tau_L^e, \tau_R^e)$ given above [see (6)], we can show that the smaller is the uncertainty about the median-voter's bliss point, the more sensitive is the election outcome for changes in policies.

Proposition 4 shows that when parties promote the interests of different groups and are uncertain about the median-voter's preferences, they choose different platforms. In the models of this section and the previous two sections, electoral competition leads to full convergence of platforms or partial convergence of platforms. The next section shows that this result crucially hinges on the commitment assumption.

3.5 Dropping the Commitment Assumption

So far, we have assumed that parties can commit to their platforms. The elected party implements the platform it announced before the election. Alesina (1988) was the first to challenge this assumption. What is it that prevents the elected party to implement its most preferred policy? Alesina's answer is "nothing in a one-shot game."[9]

Alesina (1988) argues that parties face a time-inconsistency problem. Before the elections, parties have incentives to announce platforms to increases their chances of winning the elections. After the election, the elected party has an incentive to implement its most desired policy. Rational voters understand these incentives. They anticipate that after the elections, parties choose their most desired policies. The optimal response of each citizen is to base his vote decision on his expectations about future policies.

In this section, we assume that parties cannot commit themselves to platforms announced before the elections. In the description of the supply-side of the Downsian model in Section 3.2, we have made a distinction between the announced tax rate, τ_P^a, the expected tax rate, τ_P^e and the actual tax rate, τ_P. In the model with commitment, $\tau_P^a = \tau_P$, and thus $\tau_P^e = \tau_P^a$. In the model without commitment, citizens ignore τ_P^a and form expectations about parties' policies from parties' incentives after the elections.

We solve the partisan game of the previous section, but now without commitment, by backward induction. After the election, the elected party chooses the policy it most desired: $\tau_P = \frac{\bar{\alpha}-\alpha_P}{2\bar{\alpha}-\alpha_P}$. Once in office, electoral concerns do not matter

[9] Delfgaauw and Swank (2021) answer is procedures. In the models of this chapter, the politician in office can choose the policies he wants. In practice, politicians have to follow procedures to change policy. For example, in most countries, policies have to be approved by parliament. Delfgaauw and Swank employ models of partial commitment.

anymore. At the election, citizens anticipate the policy the elected party will implement. The probability that party R wins the election equals $F\left(\frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L}, \frac{\bar{\alpha}-\alpha_R}{2\bar{\alpha}-\alpha_R}\right)$. When making announcements, parties anticipate that citizens will ignore them. Whatever big promises they make, citizens base their expectations on τ_P. Theory does not give guidance on what parties announce when announcements are ignored in equilibrium. Proposition 5 summarizes the above discussion.

Proposition 5 *Consider the partisan model without commitment. In the unique equilibrium, the elected party chooses its most preferred policy. The probability that party R wins the election is $F\left(\frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L}, \frac{\bar{\alpha}-\alpha_R}{2\bar{\alpha}-\alpha_R}\right)$. Parties' announcements before the elections do not affect the election outcome.*

Proposition 5 shows that when parties cannot commit themselves, elections do not lead to (partial) convergence of policies. It is worth emphasizing that Proposition 5 does not imply that the preferences of the median voter are not relevant for redistribution. The reason is that the median voter determines the election outcome. Suppose, for example, that τ_R is closer than τ_L to τ_m. Then, $F\left(\frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L}, \frac{\bar{\alpha}-\alpha_R}{2\bar{\alpha}-\alpha_R}\right) > \frac{1}{2}$. That is, party R is more likely to win the election.

Exercise 5 *Determine the equilibrium of a partisan model without commitment when three parties compete for office.*

4 Normative Implications

What do citizens want: policy convergence or divergence? We first answer this question for a symmetric version of the partisan model without commitment. Specifically, we assume that each party wins the election with probability one-half, $F\left(\frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L}, \frac{\bar{\alpha}-\alpha_R}{2\bar{\alpha}-\alpha_R}\right) = \frac{1}{2}$. Moreover, we assume that parties' bliss points have the same distance from the median voter's bliss point:

$$\frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L} - \frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m} = \frac{\bar{\alpha}-\alpha_m}{2\bar{\alpha}-\alpha_m} - \frac{\bar{\alpha}-\alpha_R}{2\bar{\alpha}-\alpha_R}.$$

Note that we have constructed a situation where the *expected* outcome under policy divergence is equal to the outcome under policy convergence. In our model, citizens are risk averse. Their utility functions are concave. From standard micro theory we know that in this constructed situation *all* citizens prefer the certain median-voter outcome to a gamble between the partisan policies with the same expected outcome. They prefer a certain middle of the road policy to a gamble between two uncertain opposite policies.

Standard micro theory can also be used to argue what happens if we relax the assumption of symmetry. If $F\left(\frac{\bar{\alpha}-\alpha_L}{2\bar{\alpha}-\alpha_L}, \frac{\bar{\alpha}-\alpha_R}{2\bar{\alpha}-\alpha_R}\right) = \frac{1}{2}$ but τ_L is closer to τ_m than τ_R, then citizens for whom α_i is high may prefer policy divergence. Convergence means $\tau = \tau_m$. In this case, the expected τ is higher under policy divergence. This benefits citizens with high α_i. The disutility of the risk resulting from the gamble is compensated by a higher expected tax rate.

We conclude that with a sufficient degree of symmetry in the economic-political system, policy divergence is bad for all citizens. In other cases, policy convergence is good for many citizens, but not for all.

Exercise 6 *In the well-known Hotelling model, two hot dog vendors are free to position themselves on a beach that is one kilometre long. Citizens are evenly distributed along the beach and dislike walking. The vendors are identical in all relevant aspects. They want to maximize sales. Argue why in the Hotelling model, citizens dislike convergence. Explain why citizens dislike convergence in the Hotelling model, but like it in our political setting?*

5 Redistribution Across Countries

As discussed in Section 3.2, differences between median and mean income do not fully explain redistributive policies across countries. The scatterplot in Figure 5 depicts a *negative* correlation between inequality and public social spending. Redistributive policies are more extensive in Europe than in the Unites States. At the same time, inequality is higher in the Unites States than in Europe. These differences between Europe and the United States are hard to reconcile with the Downsian model of redistribution.

Alesina and Angeletos (2011) also point to another difference between Americans and Europeans. Americans tend to believe that economic outcomes are predominantly the result of hard work, while Europeans tend to believe that economic outcomes are the result of luck. Figure 6 shows that less than 40 percent of the people

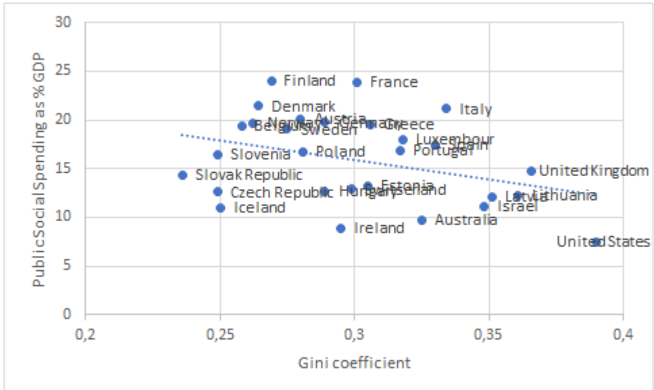

Figure 5: Correlation between Public Social Spending and Inequality (OECD, 2019).

in the United States believe that luck determines income, while more than 60 percent of the people in Portugal and Denmark believe this. These numbers raise the natural question "who is right, citizens in Portugal and Denmark or citizen in the United States and Canada?" Although this question is natural, it is not the most interesting one. A more interesting question is how can we explain that in some countries more citizens believe that luck determines income than in other countries? In many economic models, beliefs are endogenous. They are formed in equilibrium. Ideally, a political-economic model of redistribution can explain economic outcomes, redistribution, *and* social beliefs.

Figure 6 also shows that across countries, the percentage of citizens who believe that luck determines income and public social spending are positively correlated. Countries where people tend to believe that income depends on luck redistribute more. Alesina and Angeletos (2005) have developed a model that can explain this correlation. The key feature of their model is that citizens have a particular notion of fairness: people should get what they deserve. Inequality caused by luck should be reduced. Inequality caused by hard work should be accepted. In this section, we present a simplified version of their model.

5.1 A Model of Fairness and Redistribution

We consider a society in which citizens make decisions early in their lifes that affect their future incomes. After citizens have made their decisions, the government chooses a tax rate to redistribute income. The key feature of the model is that

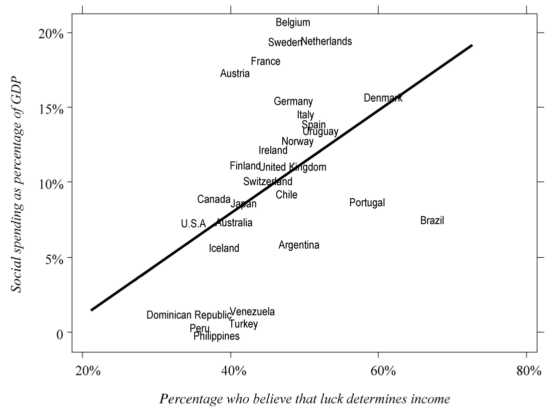

Figure 6: The correlation between the percentage of GDP allocated to social public spending and the fraction of the population who believes that luck determines income.

citizens make their decisions *before* the government redistributes income. As a result, citizens' decisions depend on their beliefs about future distributive policy.

Specifically, we assume that at the beginning of the game, each citizen makes an investment decision, $IN_i = \{0, 1\}$, where $IN_i = 1$ denotes that i invests and $IN_i = 0$ denotes that i does not invest. You could interpret $IN_i = 1$ as an investment in human capital that affects i's future income. If $IN_i = 1$, citizen i's pre-tax income equals $y_i = y_H$. If $IN_i = 0$, with probability ρ, i's pre-tax income equals $y_i = y_H$, and with probability $1 - \rho$, it equals $y_i = y_L < y_H$. Thus, not investing leads to an uncertain income, while investing leads to a sure high income. The cost of the investment, c_i, varies across citizens. We assume that c_i is uniformly distributed on the interval $[0, c]$. Finishing college or university is harder for some citizens than for others.

As in the previous models, the government imposes a tax rate on income and redistributes the revenues equally across citizens. Disposable income of a citizen in the high-income group equals $(1 - \tau) y_H + \tau \bar{y}$ where $\bar{y} = \sigma y_H + (1 - \sigma) [\rho y_H + (1 - \rho) y_L]$ and σ denotes the share of citizens who invested. Disposable income of a citizen in the low-income group equals $(1 - \tau) y_H + \tau \bar{y}$ with probability ρ, and $(1 - \tau) y_L + \tau \bar{y}$ with probability $1 - \rho$.

Following Alesina and Angeletos (2005), we assume that citizens receive disutility from unfair outcomes.

$$\begin{aligned}\Omega &= \sigma\left[(1-\tau)\,y_H+\tau\bar{y}-y_H\right]^2+(1-\sigma)\,\rho\left[(1-\tau)\,y_H+\tau\bar{y}-(\rho y_H+(1-\rho)\,y_L)\right]^2 \\ &\quad+(1-\sigma)\,(1-\rho)\left[(1-\tau)\,y_L+\tau\bar{y}-(\rho y_H+(1-\rho)\,y_L)\right]^2 \\ &= (1-\sigma)\,(1-\rho)\,(y_H-y_L)^2\left[\sigma\tau^2\,(1-\rho)+\rho\,(1-\tau)^2\right] \qquad (8)\end{aligned}$$

Equation (8) describes the social norm that citizens should get what they deserve: citizens who invested should receive y_H, while citizens who did not invest should receive expected income $\rho y_H+(1-\rho)\,y_L$. Equation (8) attaches quadratic costs to deviations of what citizens get from what they should get. We choose a quadratic specification for sake of tractability. If $\tau=0$, only citizens who did not invest experience unfair outcomes. A positive tax rate is always unfair to citizens who invested. They deserve a high wage. The higher τ is, the fairer outcomes are for citizens who did not invest. In other words, the higher is τ, the less luck determines whether citizens who did not invest receive a high or low wage.

You can verify that the sign of the effect of an increase in τ on Ω depends on whether τ is higher or lower than $\frac{\rho}{(1-\rho)\sigma+\rho}$. If τ is lower, an increase in τ reduces fairness. If τ is higher, an increase in τ improves fairness. A higher value of σ widens the range of τ for which an increase in τ reduces fairness. This is intuitive. If a high fraction of citizens invested, our notion of fairness implies that taxes should be low.

Citizen i's utility equals

$$u_i=(1-\tau)\,y_i+\tau\bar{y}-IN_ic_i-\frac{1}{2}\gamma\Omega \qquad (9)$$

The first three terms of (9) represent i's private utility from consumption. The last term represents the common disutility from social unfair outcomes [see (8)]. The parameter γ is the weight citizens atttribute to fairness.

At the end of the game, the elected party chooses the tax rate. As in the Downsian model, we assume that two office-motivated parties compete for office, and that parties can make binding commitments. As shown earlier in this chapter, under these assumptions, parties choose platforms in accordance with the median voter's preferences. In the present model, this means that if $\sigma>\frac{1}{2}$, the elected party chooses a tax rate that is optimal for citizens who invested. By contrast, if $\sigma<\frac{1}{2}$, the elected party chooses a tax rate that is in the interest of citizens who did not invest.

We solve the model by backward-induction. We first derive the tax rate the elected party chooses, given citizens' investment decisions. Next, we determine citizens' investment decisions given the anticipated tax rate.

5.2 The Low-Tax Equilibrium

We first consider the case that a majority of the citizens invests. This means that the median voter invests. Under the assumptions of the Downsian model, each party chooses a platform that maximizes the indirect utility function of the median citizen, which is

$$u_m(\tau) = (1-\tau)\, y_H + \tau \bar{y} - \frac{1}{2}\gamma \Omega(\tau) \tag{10}$$

where $\Omega(\tau)$ is given by (8). Maximizing (10) with respect to τ yields

$$\tau = \tau_{\text{low}} = \frac{\rho}{\sigma(1-\rho)+\rho} - \frac{1}{\gamma\left[\sigma(1-\rho)+\rho\right](y_H - y_L)}. \tag{11}$$

Equation (11) shows that a positive tax requires that (i) citizens attribute sufficient weight to fairness, (ii) the consequences of luck for income outcomes are sufficiently important, and (iii) the probability of y_H if a citizen does not invest is high enough. These requirements are intuitive. In an equilibrium where $\sigma > \frac{1}{2}$, a rich person determines the tax rate. Privately, he suffers from redistribution. Thus, he is only willing to redistribute if the norm of fairness is sufficiently important. If the difference between y_H and y_L is small, the consequences of luck are small and not worth to repair. Equation (11) also captures the intuitive result that the higher is the share of citizens who invested, the smaller is τ. A higher value of ρ means that the interests of citizens who invested and citizens who did not are more alligned. This reduces the costs of redistribution.

Now consider citizens' investment decisions. Citizens anticipate τ_{low}. Citizen i invests if

$$\begin{aligned}
(1-\tau_{\text{low}})\, y_H + \tau_{\text{low}}\bar{y} - c_i &> \rho(1-\tau_{\text{low}})\, y_H + (1-\rho)(1-\tau_{\text{low}})\, y_L + \tau_{\text{low}}\bar{y} \\
c_i &< (1-\tau_{\text{low}})(1-\rho)(y_H - y_L)
\end{aligned}$$

It follows that the share of citizens investing equals

$$\sigma_{\tau_{\text{low}}} = \sigma = \frac{(1-\tau_{\text{low}})(1-\rho)(y_H - y_L)}{c}. \tag{12}$$

Equation (12) shows the intuitive result that a low tax rate, a high probability of a low income, and a big difference between the high and low wage encourage citizens to invest. The parameter c can be interpreted as a country measure of the cost of investing. Thus, a high cost discourages citizens from investing. We have assumed that a majority of the citizens invest. This requires that $\sigma_{\tau_{\text{low}}} > \frac{1}{2}$. A high return and a low cost of $IN_i = 1$ make the low-tax equilibrium viable.

5.3 The High-Tax Equilibrium

We now consider the case that the minority of the citizens invests, so that the median voter does not invest. We assume that the median voter's income equals y_L. In this case, the elected party choose a tax rate that maximizes

$$u_m(\tau) = (1-\tau)\, y_L + \tau\bar{y} - \gamma\frac{1}{2}\Omega(\tau) \tag{13}$$

yielding

$$\tau = \tau_{\text{high}} = \frac{\rho}{\sigma(1-\rho)+\rho} + \frac{1}{\gamma(1-\rho)(1-\sigma)(y_H-y_L)} \tag{14}$$

Two forces drive τ_{high}. First, the elected party wants to increase the tax rate to redistribute income from the high-income group to the low-income group. This force dominates for small values of γ. Second, the elected party wants to impose a tax to improve fairness. The first term of the right-hand side of (14) captures this force. In the absence of fairness concerns, parties fully tax income, $\tau_{\text{high}} = 1$.If only fairness matters ($\gamma \to \infty$), the tax rate is determined by σ and ρ. In the high-tax equilibrium, a larger difference between y_H and y_L decreases the tax rate.

When making their investment decisions, citizens anticipate τ_{high}. The analysis of citizens investment decisions is similar in the high-tax equilibrium as in the low-tax equilibrium. We obtain the share of citizens investing, $\sigma_{\tau_{\text{high}}}$, by replacing τ_{low} by τ_{high} in (12). Note that as $\tau_{\text{high}} > \tau_{\text{low}}$, $\sigma_{\tau_{\text{high}}} < \sigma_{\tau_{\text{low}}}$. In the high-tax equilibrium, we must have that the median voter does not invest, $\sigma_{\tau_{\text{high}}} < \frac{1}{2}$.

Exercise 7 *Suppose that the median voter does not invest, but that his income equals y_H. How does this alternative assumption affects the results?*

5.4 Two Equilibria for the Same Set of Parameters

We have identified two equilibria of the game, a low-tax and a high-tax equilibrium. The low-tax equilibrium requires that $\sigma_{\tau_{\text{low}}} > \frac{1}{2}$. The high-tax equilibrium requires that $\sigma_{\tau_{\text{high}}} < \frac{1}{2}$. As $\tau_{\text{high}} > \tau_{\text{low}}$, these inequalities can hold for the same set of parameters. The interpretation of this result is that two countries that are identical *ex ante* can be very different *ex post*. In one country, taxes are high, few citizens invest in human capital, output is low, and citizens believe that luck plays an important role in individual outcomes. In the other country, taxes are low, many citizens invest, output is high, and citizens believe that luck plays a minor role in individual outcomes.

Proposition 6 *The model of redistribution with social beliefs has two equilibria for a range of parameters. In the low-tax equilibrium, a majority of citizens invests. Citizens believe that hard work is more important for outcomes than luck. In the high-tax equilibrium, a minority of citizens invests. Citizens believe that luck is more important for outcomes than hard work.*

What causes the presence of multiple equilibria? Citizens' investment decisions are based on their beliefs about future policy. If citizens believe that taxes will be low, many citizens invest, which leads to political support for low taxes. Analogously, if citizens believe that taxes will be high, few citizens invest, which leads to support for high taxes. You could say that anticipated policies are self-fulfilling prophecies. Self-fulfilling prophesies can only arise in environments where beliefs are crucial for decisions. When citizens were to make investment decisions after the winning party has chosen the tax rate, beliefs would not play a role.

Note that in the present model, multiple equilibria are not due to the existence of the social norm. If $\gamma = 0$, then $\tau_{\text{low}} = 0$ and $\tau_{\text{high}} = 1$. In fact, outcomes of the two equilibria partially converge due to the social norm. The reason is that the social norm is a common determinant in citizens' utility functions. The social norm of fairness is important for explaining the extent to which citizens believe that luck determines outcomes. When the tax rate is high, few citizens invest. Thus, the incomes of many citizens are determined by luck. When the tax rate is low, many citizens invest. Luck determines income for relatively few citizens.

So far, having luck or bad luck concern income outcomes. By investing a citizen can escape from being subject to luck. In our model, a citizen's type, as given by c_i, can also be viewed as a determinant of luck. A citizen with a low value of c_i can afford investing. Notice that a model with a social norm that incorporates this form of luck cannot explain the positive correlation between the share of citizens who believe that luck determines income and public social spending. It is no doubt that social beliefs or norms exist. Which social beliefs prevail is an empirical question. The norm of fairness described by (8) helps to explain the correlation presented in Figure 6.

6 Discussion

This chapter emphasizes that for understanding redistribution, knowing the preferences of the median voter is important. In the rudimentary median voter model, redistribution depends on the difference between mean and median income. We have shown that parties having policy motives may lead to partisan cycles in redistribution. Given policy motives, the amplitude of cycles is larger when parties can commit themselves than when they cannot. The median voter is also important in partisan models, as he is important for election outcomes. In the model with a norm of fairness, the median voter also determines outcomes. His behavior before the election shapes the norm and policy.

The importance of the median voter to understand redistributive policy raises the question of who is the median voter? In practice, this depends on a wide variety of factors. An important factor is political franchise. If in our model, the members of a specific group do not have the right to vote, this is likely to affect the median voter's income. Another factor is turnout. This is important because in many countries turnout is lower among citizens with lower income. Information is also important. Citizens must know their positions in the income distributions.

Do our models explain the data? Consistent with the data, our models predict that individual income is important for understanding redistributive policies. For understanding differences across countries, equilibrium norms of fairness are important. However, existing models of redistribution cannot explain the sharp rises in public social spending between the early sixties and mid eighties.