Economic and Social-Class Voting in a Model of Redistribution with Social Concerns*

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Abstract

We investigate how voters' concerns for social status may affect their preferences for redistribution. Social status is given by a voter's relative standing in two dimensions: consumption and social class. By affecting the distribution of consumption levels, redistribution modifies the weights attached to these two dimensions. Thus redistribution not only transfers resources from the rich to the poor, it also amplifies or reduces the importance of social class differences. We show that, due to social concerns, some members of the working class may oppose redistribution, while, at the same time, some members of the elite may favor it. We prove that these effects result in an increase in polarization concerning redistributive policies. Finally, we show that social comparisons give rise to interclass coalitions of voters that, despite having different monetary interests, support the same tax rate.

JEL Classification: D10, D63, H23.

Keywords: redistribution, economic voting, social status, status-seeking.

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1 Introduction

Attitudes towards redistributive policies are one of the issues over which voters, political parties, and governments around the world differ the most. For instance, the European Social Survey, 2017 waves 4-8 (henceforth ESS) reports that the fraction of respondents who agree or strongly agree with the statement "The government should reduce differences in income levels" is 91.51% in Portugal, 83.53% in Italy, 81.8% in Austria, 71.22% in Germany, 65.66% in Switzerland, and 62.59% in the United Kingdom.[1]

Standard models of political economy indicate income as the main determinant of voters' preferences about redistribution (hence, taxation). This is "economic voting"(Romer, 1975, Roberts, 1977, Meltzer and Richard, 1981): low-income individuals should favor greater redistribution and high-income citizens should oppose it. However, the negative correlation between income and support for redistribution is far from perfect.[2] In particular (see Gilens, 1999, Fong, 2001, and the empirical evidence that we report in Section 2), substantial fractions of relatively poor individuals appear to be less in favor of redistribution than what their material interest would suggest. Similarly, a significant share of the socioeconomic elites support high levels of redistribution, even though such policy hurts them from a monetary point of view.

Although these two deviations from pure economic voting seem the two sides of the same coin, the literature has somehow studied each of them in isolation. Papers that focus on agents' expectations about future prospects (Piketty, 1995, Bénabou and Ok, 2001, Bénabou and Tirole, 2006a) can easily rationalize the first discrepancy (blue collars voting against

[1]These percentages refer to individuals in the age range 26-64. Enlarging the age range to include younger and older individuals leads to similar results. Observations from ESS waves 1-3 are excluded to avoid inconsistencies in the measurement of household income, which is used in Tables 1 and 2 below.

[2]See Alesina and Giuliano (2011) and Costa-Font and Cowell (2015) for recent reviews. More in details, discrepancies from pure economic voting have been rationalized by highlighting the role of individual histories (Giuliano and Spilimbergo, 2014, Fisman *et al.*, 2015), race (Alesina and La Ferrara, 2005), culture (Alesina and Glazer, 2004, Luttmer and Singhal, 2011), beliefs concerning the returns to effort (Bénabou and Tirole, 2006a), subjective assessments of the fairness of market outcomes (Fong, 2001, Alesina and Angeletos, 2005), prospects of social mobility (Piketty, 1995, Bénabou and Ok, 2001, Acharya, 2014, Acemoglu *et al.*, 2016), issues of group loyalty and social identity (Corneo and Grüner, 2000, Luttmer, 2001, Corneo and Grüner, 2002, Shayo, 2009, Cervellati *et al.*, 2010), or the structure of inequality (Lupu and Pontusson, 2011).

high taxes because they expect that they will soon climb the social ladder). However, they have harder times in explaining the second deviation (members of the elite in favor of high taxes) since it seems unlikely that rich people may simultaneously be influenced by prospects of downward mobility. On the other hand, papers that abandon the setting of fully rational and self-interested economic agents and implicitly or explicitly rely on some notion of fairness, inequity aversion, or solidarity (Corneo and Grüner, 2000, Fong, 2001, Luttmer, 2001, Alesina and Glazer, 2004, Giuliano and Spilimbergo, 2014) can explain why affluent individuals may support high levels of redistribution. However, they cannot easily explain why non-negligible fractions of the less well-off dislike high taxes, unless they assume that these individuals have wrong perceptions about relative standings in society.

In this paper, we introduce a model that simultaneously rationalizes both phenomena, while still assuming that voters are self-interested.

In line with the evidence coming from the ESS (see Section 2), in our setting voters' preferences toward redistribution are shaped not only by monetary payoffs, but also by social status considerations. In particular, we assume that voters exhibit *status-seeking behavior*.[3]

Furthermore, we let voters differ across two dimensions, *productivity* and *social class*. Productivity determines the voter's income and, ultimately, his level of consumption. Social class captures those factors that are associated with the voter's socioeconomic background and affect his social status even after controlling for the income effects they may entail. Examples include his educational and cultural level (Chan and Goldthorpe, 2007) or the social network that he inherits from his family (Lin, 1999). In line with standard indexes of socioeconomic status (see Hollingshead, 2011) and with historical and evolutionary arguments (see, Gilman, 1981, Henrich and Boyd, 2008, Dow and Reed, 2013),[4] we assume that *social status* is a multidimensional attribute that is jointly determined by an individual's level of consumption and social class.[5]

[3]Status-seeking is an important driver of economic choices in many environments, including consumption choices (Hopkins and Kornienko, 2004), financial strategies (Barberis and Thaler, 2003), and engagement in prosocial activities (Bénabou and Tirole, 2006b).

[4]According to these evolutionary explanations the social class of an individual affects his ranking in society, hence his mating possibilities and offspring's prospect.

[5]Although we focus on social class, our model is general enough to accommodate other characteristics

Formally, we define social status as a weighted average of the voter's relative standing in the two dimensions and we assume that the larger the (positive or negative) distance between the voter's relevant characteristics and the average level in the population, the larger the (positive or negative) effects on his well-being. We thus follow the well-known "Keep up with the Joneses" formulation (Clark and Oswald, 1996, Hopkins and Kornienko, 2004). However, our model displays two distinguishing features. First, as already discussed, social status is a multidimensional attribute (Hollingshead, 2011). Second, we let the weights that define the relevance of consumption and social class to be endogenously determined. In particular, the weight associated to one dimension increases as the dispersion in such dimension within the population increases relative to the other. Put differently, the more disperse consumption (respectively, social class) is in the population, the more visible are the differences in relative consumption (social class), the larger is the relative impact that consumption (social class) has in determining social status. This assumption is in line with the social rank hypothesis discussed in the psychological and sociological literature and finds empirical support in Walasek and Brown (2015, 2016), which shows a positive correlation between income inequality and status-seeking behavior.[6] It is also coherent with the emerging literature about the causes and consequences of "status anxiety" (Wilkinson and Pickett, 2009, Layte, 2012, Layte and Whelan, 2014, Dehley and Dragolov, 2014).

Because in our model the dispersion of consumption in the society is affected by the tax rate, the previous assumptions imply that taxation not only redistributes resources from the rich to the poor, but it also modifies the relative importance of the two dimensions of social comparison. Therefore, taxation can be used as a strategic tool to preserve/eliminate the advantage/disadvantage individuals may have in terms of social class. We label such strategic use of taxation *social-class voting.*

Our first set of results highlights how social concerns influence individual attitudes to-

as the second dimension of heterogeneity. In order for these characteristics to be socially valuable, they must be publicly observable or easily inferable. Possible examples include age, IQ, health, ethnicity, height, beauty (see Persson and Tabellini, 2002 for a model in which age together with income affects preferences for redistribution). We focus on social class both because of its salience in determining social status and because several of these other factors can be incorporated in its definition.

[6]For further evidence, see also Paskov *et al.*, 2013 and Jin *et al.*, 2014.

ward redistribution. On the one hand, social comparisons over consumption amplify economic voting with low-income individuals demanding even higher levels of redistribution, while the opposite holds true for high-income individuals (see Brown-Iannuzzi *et al.*, 2015 for evidence on this pattern). On the other hand, due to comparisons over social classes, social-class voting pushes individuals in high (low) classes to favor (oppose) raises in taxation. When status concerns over social class dominate those over consumption, affluent individuals in high classes may support relatively high levels of redistribution. Noticeably, such support does not stem from fairness or altruistic consideration, neither it emerges as a form of *noblesse oblige*. Instead, it is purely strategic and self-interested.[7] Symmetrically, low productive individuals in low social classes may be less favorable to redistribution than what economic voting would dictate.

Our second result proves that polarization of individual preferences toward redistribution increases with the relevance of status concerns. Importantly, this is true independently of which of the two dimensions of social comparisons (consumption and social class) receive the highest weight. Indeed, as the importance of status concerns increases, both economic voting and social-class voting get amplified. Low productive individuals in high social classes thus become more favorable to redistribution, while high productive individuals in low social classes more strongly oppose it. As such, polarization increases. This pattern is in line with the motivating evidence reported in Section 2.

Finally, we study how individual preferences aggregate. If voters' utility functions are strictly concave in taxation, we characterize interclass coalitions of voters sharing the same preferred level of redistribution. For any level of redistribution, these coalitions are composed of relatively less productive voters in low social classes and relatively more productive

[7]Certainly, members of the elite may support redistributive policies also for other reasons. Some of these reasons may be non-strategic. For instance, affluent individuals may enjoy warm-glow effects, comply to some ethical or religious principle, or perhaps feel guilty for the size or the source of their wealth. Education may also play a role through its influence on political preferences: some members of the elite may have acquired a taste for solidarity by having achieved high levels of education or having attended certain institutions. Other motives can instead be strategic. For instance, elite members may want to keep the level of inequality in the society under control such as to reduce the risk of revolutions against the status quo. However, while these explanations can rationalize why the elite may favor redistribution, they have more difficulties in explaining why, at the same time, members of the lowest classes may oppose it. Our model rationalizes both patterns simultaneously.

voters in high social classes. When the relevance of social concerns is not too high, these coalitions (together with the single-crossing property embedded in our model) further allow us to collapse one of the two dimensions of heterogeneity and rank voters based on their productivity level linearly scaled up or down according to their social class. Standard results then deliver the existence of a unique equilibrium tax rate in a simple model of electoral competition. We show that the equilibrium can be characterized by a system of two equations in two unknowns and we discuss how social concerns influence it.

Our paper investigates the relationship between status-seeking behavior and preferences for redistribution. In this respect, it is related to recent papers by Levy and Razin (2015) and Koenig *et al.* (2017).

Levy and Razin (2015) study preferences for redistribution in a setting where individuals positively sort according to income. In their model, agents interact only with individuals that belong to the same "club", with more prestigious clubs being more rewarding but also more costly to join (examples include the choice of a child's school or the marriage market). When income inequality is high, individuals in the middle class have strong incentives to sort so to avoid mixing with the poor. Thus, to preserve the benefits of sorting, they may oppose redistribution despite having an income below the mean. At the opposite, when income inequality is low, the benefits from sorting are low too. As a result, middle class members may support higher redistribution even though their income may be above the average. Compared to Levy and Razin (2015), our model starts from similar premises: by decreasing income inequality, redistribution impacts on agents' well-being not only because it affects their disposable income but also because it triggers some additional "social" effects. In Levy and Razin (2015), inequality modifies the incentives to sort; in our model, inequality affects the weights that define an agent's social status. Differently from Levy and Razin (2015), we exploit multidimensional heterogeneity to show that the change in social weights can rationalize both deviations from economic voting simultaneously, within the same society and holding fixed the income distribution.

Koenig *et al.* (2017) study how status concerns may shape individual preferences about the provision of public good when a market alternative exists. In their setting, rich individuals support public provision to maintain the exclusivity of the private substitute and thus signal their social prestige. Our model is different from Koenig *et al.* (2017) in two respects. First, whereas Koenig *et al.* (2017) look at public good provision, we consider redistribution. Second, although in both models the coalition of voters supporting a given policy can be heterogeneous in terms of income, our setting also allows voters with the same income but belonging to different classes to support different levels of redistribution. This last feature cannot arise in Koenig *et al.* (2017) due to unidimensional heterogeneity.

The paper is organized as follows. In Section 2, we provide some motivating evidence. Section 3 introduces the model. Section 4 focuses on voters' preferred tax rate. Section 5 studies the aggregation of preferences. Section 6 concludes. The Appendix collects all proofs.

2 Motivating Evidence

As discussed in the Introduction, the literature has highlighted two deviations from economic voting: not all low-income individuals support redistribution and not all high-income individuals oppose it. Using the ESS dataset, Table 1 reports the fraction of people who support government's intervention aimed at reducing inequality as a function of the household income decile of the respondent. In line with economic voting, this fraction decreases as we ascend the income ladder. However, roughly 18% of the respondents that belong to households in the lowest decile of the income distribution do not favor such intervention, while 53% of the individuals that belong to households in the highest decile support it. Thus, the fraction of people who do not align with economic voting is sizable.

To delve more on these discrepancies from economic voting, Table 2 runs an ordered probit regression using the degree of of agreement/disagreement with the statement "Government should reduce differences in income levels" as a dependent variable. Four patterns stand out linking income, social status concerns and attitudes towards redistribution.

Table 1: Percentage of respondents in each income decile who agree with the statement "Government should reduce differences in income levels".

Household Income Decile	1st	2nd	3rd	4th	5th
% in favor of Gov't intervention	82.30 %	82.18%	79.21%	78.12%	76.19%
Household Income Decile	6th	7th	8th	9th	10th
% in favor of Gov't intervention	74.11%	71.31%	67.76%	63.49%	53.02%

Data source: ESS, waves 4-8. Notes: Respondent is coded in favor if he/she "agrees" or "strongly agrees" with the statement. Respondents belong to the age range 26-64.

Table 2: Ordered probit regressions of preferences for redistribution.

	Dependent variable: Agreement with the statement: "Government should reduce inequality in income levels."		
	(i)	(ii)	(iii)
High Income	-0.1872***	-0.1299***	-0.1380***
	(0.0066)	(0.0099)	(0.0099)
College	-0.2272***	-0.2277***	-0.2268***
	(0.0075)	(0.0075)	(0.0075)
College Father	-0.0839***	-0.0828***	-0.0886***
	(0.0082)	(0.0082)	(0.0092)
Age	0.0047***	0.0050***	0.0049***
	(0.0003)	(0.0003)	(0.0003)
Left-Right Scale	-0.0983***	-0.0984***	-0.0987***
	(0.0015)	(0.0015)	(0.0015)
Success Important	-0.0522***		
	(0.0068)		
Success Important & Poor		0.0466***	0.0593***
		(0.0089)	(0.0091)
Success Important & Rich		-0.0595***	-0.0371***
		(0.0097)	(0.0103)
Tradition Important			0.0708***
& College Father			(0.0139)
Success Important			-0.0494***
& College Father			(0.0145)
Observations	122,401	122,401	122,401

Data source: ESS, waves 4-8. Notes: Estimated standard errors in parenthesis. ***=p-value<0.01. Respondents belong to the age bracket 26-64. Country fixed effects and ESS-wave fixed effects are included in all specifications. The dependent variable takes value between 1 and 5, where 1 (5) stands for a respondent who "strongly disagrees" ("strongly agrees") with the statement "Government should reduce inequality in income levels.". Left-Right scale measures self-declared political position on a 1-10 scale, where 1 (10) represents the most leftist (rightist) position.

First, economic voting emerges in all model specifications: high-income individuals (Variable "Rich" equal to 1) are less favorable to government intervention than low-income ones. Other variables that are likely to be positively correlated with current or lifetime income (*College* and *College Father*) also impact negatively on attitudes toward redistribution.[8]

Second, social status concerns affect preferences for redistribution. As shown in model (i), individuals who think that being high-achievers is important,[9] are less likely to favor government intervention, even after controlling for measures of lifetime income, age (*Age*) and self-declared political position (*Left-Right scale*).

Third, there is a positive correlation between the self-assessed degree of status-seeking behavior and the strength of economic voting. Indeed, as shown in model (ii), low-income (high-income) individuals who think that being high-achievers is important are more strongly in favor of (against) government's intervention (see variables *Success Important & Rich* and *Success important & Poor*).

Fourth, as highlighted by model (iii), individuals who value traditions and customs over the recognition of successes and whose father is highly educated (variable *Tradition Important & College Father*) exhibit a stronger preference for redistribution. The opposite is true for individuals who value acknowledgment of successes over traditions and whose father is highly educated (variable *Success Important & College Father*). Insofar parents' education influences the respondent's social standing even after controlling for income effects (say, it affects both his income and his social network or cultural level) and the importance of traditions proxies the importance of social classes, this is suggestive of social-class voting: inequality reduction receives stronger support among the elites who value social background more than individual achievements.

As discussed above, model (ii) hints at the fact that polarization in redistributive preferences between the rich and the poor is higher among individuals who care about social recognition. To gather additional evidence, we consider four sub-populations within the

[8] *College* and *College Father* are two dummy variables that equal 1 if the respondent or his father completed tertiary education

[9] Dummy variable *Success Important* equals 1 if the respondent agrees with the statement: "It is important to be successful and that others recognize achievements"

Table 3: Difference in the average preference for redistribution b/w rich and poor when respondents deem success recognition important (SR) or not important (No SR).

	ESS	AT	BE	BG	CH	CY	CZ
SR	.291	.003	.378	.425	.558	.167	.262
No SR	.244	.072	.090	.263	.367	.303	.381
SR−No SR	.047	-.069	.288	.162	.191	-.136	-.119
	DE	DK	EE	ES	FI	FR	GB
SR	.454	.292	.270	.165	.371	.239	.420
No SR	.237	.149	.084	.178	.235	.327	.346
SR−No SR	.217	.143	.186	-.013	.136	-.088	.074
	GR	HR	HU	IE	IL	IS	LT
SR	-.064	.039	.059	.202	.128	.339	.189
No SR	-.055	-.009	.061	.242	.106	.349	.156
SR−No SR	-.009	.048	-.002	-.040	.022	-.010	.033
	NL	NO	PL	PT	RU	SE	SI
SR	.490	.350	.392	.042	.272	.362	.284
No SR	.454	.176	.250	.101	.194	.167	.266
SR−No SR	.036	.174	.142	-.059	.078	.195	.018
	SK	TR	UA				
SR	.349	.017	.207				
No SR	.338	-.165	.152				
SR−No SR	.011	-.148	.055				

Data source: ESS, waves 4-8. Notes: Italy is dropped because there are only 15 observations among the poor who deem success as not important.

ESS dataset: (i) rich individuals who deem success recognition important, (ii) poor individuals who deem success recognition important, (iii) rich individual who do not deem success recognition important, and (iv) poor individuals who do not deem success recognition important. We then compute the average preference for redistribution within each of these four sub-populations and we compare the difference between the first two averages (in Table 3, we label this difference "SR") with the difference between the second two averages ("No SR"). If status concerns polarize preferences, we should expect the first difference to be larger than the second. Table 3 shows that this is indeed the case in the overall ESS dataset as well as in two thirds of countries.[10]

In the next section, we introduce a model that rationalizes the empirical patterns high-

[10]The difference between SR and No SR is positive and statistically significant in a 5%-level z-test in the entire ESS dataset and in Belgium, Switzerland, Germany, Estonia, Finland, Norway and Sweden. The difference is never negative and statistically at the 10% level.

lighted in the previous tables. The key mechanism will be the role that taxation plays in determining individuals' social status. This influences agents' preferences toward redistribution and gives rise to both economic and social-class voting.

3 The Model

A society is made by a unit mass of citizens. Citizens are heterogeneous in two dimensions: *productivity* and *social class*. Productivity is represented by the parameter $\theta \in [\theta_{min}, \theta_{max}] = \Theta \subseteq [0, \infty)$. Social class is represented by the parameter $k \in [k_{min}, k_{max}] = K \subseteq [0, \infty)$. As explained in the Introduction, a citizen's social class captures the set of socioeconomic characteristics that affect the individual's social standing even after controlling for his productivity/income (e.g., his level of education or the social capital he inherited from his parents).

Each citizen is thus characterized by the pair $(\theta, k) \in \Theta \times K = T$, which we refer to as the citizen's *type*. Types are distributed in the population according to the joint cumulative density function $F(\theta, k)$, with pdf $f(\theta, k)$, that we assume to be positive for all (θ, k). Marginal distributions over Θ and K are denoted with $F_\theta(\theta)$ and $F_k(k)$. Let $\overline{\theta} = \int_{[\theta_{min}, \theta_{max}]} \theta dF_\theta(\theta)$ be the average productivity in the population and θ^m be the median productivity, $F_\theta(\theta^m) = 1 - F_\theta(\theta^m) = 1/2$. Similarly, let $\overline{k} = \int_{[k_{min}, k_{max}]} k dF_k(k)$ be the average social class and k^m be the median social class, $F_k(k^m) = 1 - F_k(k^m) = 1/2$. In line with the empirical evidence, we assume that the median productivity is below the average one, $\theta^m < \overline{\theta}$. Similarly, $k^m < \overline{k}$.

Citizens inelastically supply one unit of labor in a perfectly competitive labor market. Labor yields an output equal to the citizen's productivity and the price of such output is normalized to 1. Then, in exchange of his labor, type (θ, k) receives a wage equal to θ.

The government taxes income through a proportional tax rate $\tau \in [0, 1]$. Tax revenues are then used to finance the provision of a lump-sum monetary transfer g to all citizens. Borrowing is not allowed. Therefore, the tax rate τ and the transfer g must satisfy the government budget constraint: $g \leq \tau\overline{\theta}$.

The *level of consumption* of type (θ, k) and the *average level of consumption* in the population are thus respectively given by:

$$c\,(\tau, g \mid \theta, k) = (1-\tau)\,\theta + g; \tag{1}$$

$$\overline{c}(\tau, g) = (1-\tau)\,\overline{\theta} + g. \tag{2}$$

Taxes have distortionary effects that negatively affect all citizens.[11] These deadweight losses can capture distortions in the endogenous labor supply of individuals or in their investment decisions and can be microfounded accordingly. Formally, they are represented by a strictly increasing and strictly convex function, $\ell(\cdot) : [0,1] \to \mathbb{R}_+$ with $d\ell(\tau)/d\tau > 0$ and $d^2\ell(\tau)/d\tau^2 > 0$. We further assume that $d\ell(0)/d\tau = 0$ and $d\ell(1)/d\tau > \overline{\theta} - \theta_{min}$. This guarantees that, absent social concerns, all voters have a preferred level of taxation below one. The *consumption* utility of individuals is given by:

$$u(\tau, g \mid \theta, k) = (1-\tau)\theta + g - \ell(\tau). \tag{3}$$

Importantly, citizens care not only about their consumption utility, but also about their *social status*. A citizen's social status is determined by his standing in terms of consumption and social class. In particular, the social status of an individual with type (θ, k) is captured by a function $S\left(c - \overline{c}, k - \overline{k}\right)$. The function $S\,(\cdot, \cdot) : \mathbb{R} \times \mathbb{R} \to \mathbb{R}$ is strictly increasing in both its arguments and such that $S\,(0, 0) = 0$. Intuitively, the social status of an individual is higher (lower), the larger is the positive (negative) gap between the agent's attributes (his level of consumption and his social class) and the average values in the population.[12] Thus,

[11] In the absence of tax distortions, we can still characterize agents' preferred tax rates (see Section 4). However, because social status introduces convexity in the utility function, the aggregation of preferences described in Section 5 would not generalize. Instead, all the insights of the paper would go through if distortions are increasing in individuals' productivity.

[12] A similar formulation appears, among others, in Cooper *et al.* (2001), Bowles and Park (2005), and Gallice and Grillo (2018). An alternative approach assumes that status depends in an ordinal way on an individual's relative standing (see for instance, Hopkins and Kornienko, 2004, and Becker *et al.*, 2005). The two approaches may lead to different implications (see Clark and Oswald, 1998, for differences in the attitudes towards emulation and deviance, or Bilancini and Boncinelli, 2012, for differences in the impact

we assume that social status depends in a cardinal way on an individual's standing. Then:

$$S\left(c-\overline{c},k-\overline{k}\right)=\eta\cdot\left(W_c\left(\sigma_c,\sigma_k\right)\cdot\left(c-\overline{c}\right)+W_k\left(\sigma_c,\sigma_k\right)\cdot\left(k-\overline{k}\right)\right). \tag{4}$$

The parameter $\eta\geq 0$ captures the overall importance of social status considerations, while $W_c\in[0,1]$ and $W_k\in[0,1]$ denote the relative weights of consumption and social class in determining status. We normalize weights so that they add up to one, $W_c+W_k=1$

In line with the literature linking income inequality, status-seeking behavior and status anxiety (cf. Introduction), we let W_c and W_k be increasing in the level of dispersion of the relevant variable. Thus, as the dispersion in consumption levels widens (respectively, shrinks), the importance of consumption in determining the agent's overall status increases (respectively, decreases). The same is true for social class. Formally:

$$W_c\left(\sigma_c,\sigma_k\right)=\frac{\sigma_c}{\sigma_c+\lambda\sigma_k},\qquad W_k\left(\sigma_c,\sigma_k\right)=\frac{\lambda\sigma_k}{\sigma_c+\lambda\sigma_k}, \tag{5}$$

where σ_c is the standard deviation of consumption in the population, σ_k is the standard deviation of social class in the population, and $\lambda>0$ is a rescaling factor that makes the two standard deviations comparable.

4 Social Concerns and Individual Preferences

A citizen's *total utility* is given by the sum of consumption utility (3) and status-seeking considerations (4). Formally, the utility of type (θ,k) is given by:

$$\begin{aligned} v(\tau,g\mid\theta,k)&=u\left(\tau,g\mid\theta,k\right)+S\left(c(\tau,g\mid\theta,k)-\overline{c}(\tau,g),k-\overline{k}\right)=\\ &=\left(1-\tau\right)\theta+g-\ell(\tau)+\eta\left(\frac{\left(1-\tau\right)^2\sigma_\theta}{\left(1-\tau\right)\sigma_\theta+\lambda\sigma_k}\left(\theta-\overline{\theta}\right)+\frac{\lambda\sigma_k}{\left(1-\tau\right)\sigma_\theta+\lambda\sigma_k}\left(k-\overline{k}\right)\right), \end{aligned} \tag{6}$$

where the second equality follows from $\sigma_c=(1-\tau)\sigma_\theta$.

of redistributive policies and the relevance of social waste when status is determined by the consumption of a conspicuous good).

The pairs (τ, g) that maximize (6) subject to $g \leq \tau\overline{\theta}$ are the preferred policies of voter (θ, k), $(\tau^*(\theta, k), g^*(\theta, k))$. Obviously, such policies satisfy the budget constraint with equality. Thus, from now on, we will focus on the optimal tax rate only. It is immediate to verify that $\tau^*(\theta, k)$ is non-empty, compact and upperhemicontinuous. When $\tau^*(\theta, k)$ is a singleton, we abuse notation and write $\tau^*(\theta, k)$ to denote its unique value. Moreover, to simplify the exposition, our discussion in the main text assumes that the set of maximizers is a singleton for all voters. To highlight the dependence of $\tau^*(\theta, k)$ on a parameter $x \in \mathbb{R}$, we write $\tau^*(\theta, k \mid x)$. We say that $\tau^*(\theta, k \mid x)$ is non-decreasing (respectively, non-increasing) in x, if $x' > x''$ implies that for every $\tau' \in \tau^*(\theta, k \mid x')$ and $\tau'' \in \tau^*(\theta, k \mid x'')$, $\min\{\tau', \tau''\} \in \tau^*(\theta, k \mid x'')$ and $\max\{\tau', \tau''\} \in \tau^*(\theta, k \mid x')$ (respectively, $\min\{\tau', \tau''\} \in \tau^*(\theta, k \mid x')$ and $\max\{\tau', \tau''\} \in \tau^*(\theta, k \mid x'')$).

In what follows, it is convenient to rescale types so that they represent distances from the population averages. Thus, each voter (θ, k) is identified by $(\theta_d, k_d) = \left(\theta - \overline{\theta}, k - \overline{k}\right)$. We denote the joint distribution of (θ_d, k_d) with $F_d(\theta_d, k_d)$.[13] We can then classify citizens in four different groups:

i. The *working class.* These are voters who are below the average both in terms of productivity and social class, $\theta_d \leq 0$ and $k_d \leq 0$.

ii. The *nouveau riche.* These are voters who are more productive than the average, but belong to low social classes, $\theta_d > 0$ and $k_d \leq 0$.

iii. The *new poors.* These are voters who are less productive than the average, but belong to a relatively high social class, $\theta_d \leq 0$ and $k_d > 0$.

iv. The *elite.* These are voters who are above the average both in terms of productivity and social class, $\theta_d > 0$ and $k_d > 0$.

Substituting for the government's budget constraint, we can write the first and second

[13] The distribution is easily derived from $F(\theta, k)$ and has support $[\theta_{d,min}, \theta_{d,max}] \times [k_{d,min}, k_{d,max}]$ where $\theta_{d,min} = \theta_{min} - \overline{\theta}$, $\theta_{d,max} = \theta_{max} - \overline{\theta}$, $k_{d,min} = k_{min} - \overline{k}$, and $k_{d,max} = k_{max} - \overline{k}$. Marginal distributions $F_{d,\theta}(\theta)$ and $F_{d,k}(k)$ are obtained in a similar way.

derivative of (6) with respect to the tax rate as follows:

$$\frac{\partial v(\tau, \tau\overline{\theta} \mid \theta_d, k_d)}{\partial \tau} = -\theta_d - \frac{d\ell(\tau)}{d\tau} + \eta\sigma_\theta \cdot \frac{\lambda\sigma_k k_d - (1-\tau)\left((1-\tau)\,\sigma_\theta + 2\lambda\sigma_k\right)\theta_d}{\left((1-\tau)\,\sigma_\theta + \lambda\sigma_k\right)^2}; \tag{7}$$

$$\frac{\partial^2 v(\tau, \tau\overline{\theta} \mid \theta_d, k_d)}{\partial \tau^2} = -\frac{d^2\ell(\tau)}{d\tau^2} + 2\eta\sigma_\theta\lambda\sigma_k \cdot \frac{\lambda\sigma_k\theta_d + \sigma_\theta k_d}{\left((1-\tau)\,\sigma_\theta + \lambda\sigma_k\right)^3}. \tag{8}$$

Expression (7) describes how a change in the level of redistribution (as measured by the size of τ) impacts on the utility of type (θ_d, k_d). Two effects are simultaneously at play. The first effect $(-\theta_d - d\ell(\tau)/d\tau)$ captures economic voting and does not depend on social concerns: an increase in the level of taxation τ benefits individuals whose income is below average $(\theta_d < 0)$, as what they pay is less than what they get, and harms those whose income is above average $(\theta_d > 0)$, as what they pay is more than what they get. Furthermore, the distortionary effects of taxation $(-d\ell(\tau)/d\tau)$ push against high levels of taxation. The second effect captures the impact of social concerns (the third term in (7)). Since an increase in τ reduces the dispersion in net income, it reduces the standard deviation of consumption. As such, it decreases the relevance of consumption (W_c) and increases the relevance of social class (W_k) in determining an individual's overall social status. This may benefit or harm the individual depending on his position in the two dimensions. The sign of this second effect is certainly negative for the nouveau riche and certainly positive for the new poors. In the remaining two groups (the working class and the elite), the effect can go in either directions depending on which of the two dimensions stands out the most. If it is consumption (i.e., if the absolute value of θ_d is sufficiently larger than the one of k_d), social concerns amplify economic voting: low productive individuals in the working class prefer even higher levels of redistribution, while high productive individuals in the elite more strongly oppose them. Instead, if social class stands out (i.e., if the absolute value of k_d is sufficiently larger than the one of θ_d), *social-class voting* emerges: members of the working class (elite) support lower (higher) levels of redistribution in order to overcome their disadvantage (protect their advantage) in terms of social class.

Expression (8) further indicates that the citizen's relative standing in the two dimensions also affects the concavity or convexity of his utility function. Consider first a situation in which taxes are not distortionary (i.e., $\ell(\tau) = 0$ for any $\tau \in [0,1]$). Then, the utility function would be concave for members of the working class and convex for members of the elite. For the nouveau riche and the new poors, it could be either convex or concave.[14] Starting from this baseline, tax distortions introduce concavity with respect to taxation. In Section 5, we exploit this fact to aggregate individual preferences.

We can now characterize the preferred level of taxation of generic type (θ_d, k_d). As a first step, consider the limit case in which social concerns do not exist ($\eta = 0$). Individuals then follow pure economic voting and thus trade off their private marginal benefit from the redistributive scheme against marginal tax distortions. We refer to this situation as the benchmark case, indexed by B.

Remark 1. *If social concerns do not exist ($\eta = 0$), $\tau_B^*(\theta_d, k_d)$ is a singleton equal to $\tau_B^*(\theta_d) = \max\left\{0, \frac{d\ell^{-1}(-\theta_d)}{d\tau}\right\}$.*

Now consider the case in which social concerns exist ($\eta > 0$). Agents' preferred level of taxation is shaped by both economic voting and social-class voting. Our first result shows that a citizen's preferred policy is monotonic in each of his characteristics separately. Thus, within a given social class, standard economic voting holds: more productive individuals want lower levels of redistribution. Similarly, holding productivity (and thus income) fixed, social-class voting holds: individuals in higher social classes are more favorable to redistribution.

Proposition 1. *$\tau^*(\theta_d, k_d)$ is non-increasing in θ_d for every k_d and non-decreasing in k_d for every θ_d.*

Figure 1 provides a graphical representation of Proposition 1 by focusing on the preferred tax rate of four selected individuals under the assumption that these tax rates are

[14] More precisely, the function is convex (concave) if and only if the "standardized" advantage that agents enjoy in one dimension is stronger (weaker) than the "standardized" disadvantage they suffer in the other. Formally, the function is convex if and only if $\theta_d/\sigma_\theta > k_d/(\lambda\sigma_k)$ and concave if and only if $\theta_d/\sigma_\theta \leq k_d/(\lambda\sigma_k)$.

unique. Consider first type $(\theta_{d,min}, k_{d,min})$ and let $\tau^*(\theta_{d,min}, k_{d,min}) \in (0,1)$ be his preferred tax rate. Type $(0, k_{d,min})$ belongs to the same social class as type $(\theta_{d,min}, k_{d,min})$ but he is more productive so that he does not gain from redistribution. It follows that his preferred tax level, $\tau^*(0, k_{d,min})$, is certainly lower than $\tau^*(\theta_{d,min}, k_{d,min})$ (below, we show that $\tau^*(0, k_{d,min}) = 0$). In contrast, the preferred tax rate of type $(\theta_{d,min}, k_{d,max})$ is certainly higher than $\tau^*(\theta_{d,min}, k_{d,min})$. This agent benefits from redistribution not only because he has the same low productivity as voter $(\theta_{d,min}, k_{d,min})$, but also because high levels of redistribution increase the relevance of his high social class. Finally, the preferred tax rate of type $(0, k_{d,max})$ is certainly above $\tau^*(0, k_{d,min})$ and below $\tau^*(\theta_{d,min}, k_{d,max})$. However, its ordering with respect to $\tau^*(\theta_{d,min}, k_{d,min})$ remains ambiguous and depends on two conflicting forces. On the one hand, type $(0, k_{d,max})$ is less favorable to taxation than type $(\theta_{d,min}, k_{d,min})$ as the former is a net loser in terms of monetary redistribution, while the latter is not. On the other hand, type $(0, k_{d,max})$ is more favorable to taxation than type $(\theta_{d,min}, k_{d,min})$, as the former wants to protect his advantage in terms of social class, which the latter would rather eliminate.

We can now characterize agents' preferred level of taxation and study how this is influenced by social concerns. To this goal, it is convenient to focus on each of the four social groups separately.

Working Class. If $\theta_d \le 0$ and $k_d \le 0$, the optimal level of taxation in the absence of social concerns is $\tau_B^*(\theta_d) = d\ell^{-1}(-\theta_d)/d\tau$ (cf. (7) and Remark 1). Because the utility function of these voters is strictly concave (see expression (8)), $\tau_B^*(\theta_d)$ remains the unique optimal level of taxation even in the presence of social concerns for all those voters for whom the third term in (7) is equal to 0. More precisely, these are the types (θ_d, k_d) such that

$$\eta\sigma_\theta \cdot \frac{\lambda\sigma_k k_d - (1-\tau_B^*(\theta_d))\left((1-\tau_B^*(\theta_d))\,\sigma_\theta + 2\lambda\sigma_k\right)\theta_d}{\left((1-\tau_B^*(\theta_d))\,\sigma_\theta + \lambda\sigma_k\right)^2} = 0. \tag{9}$$

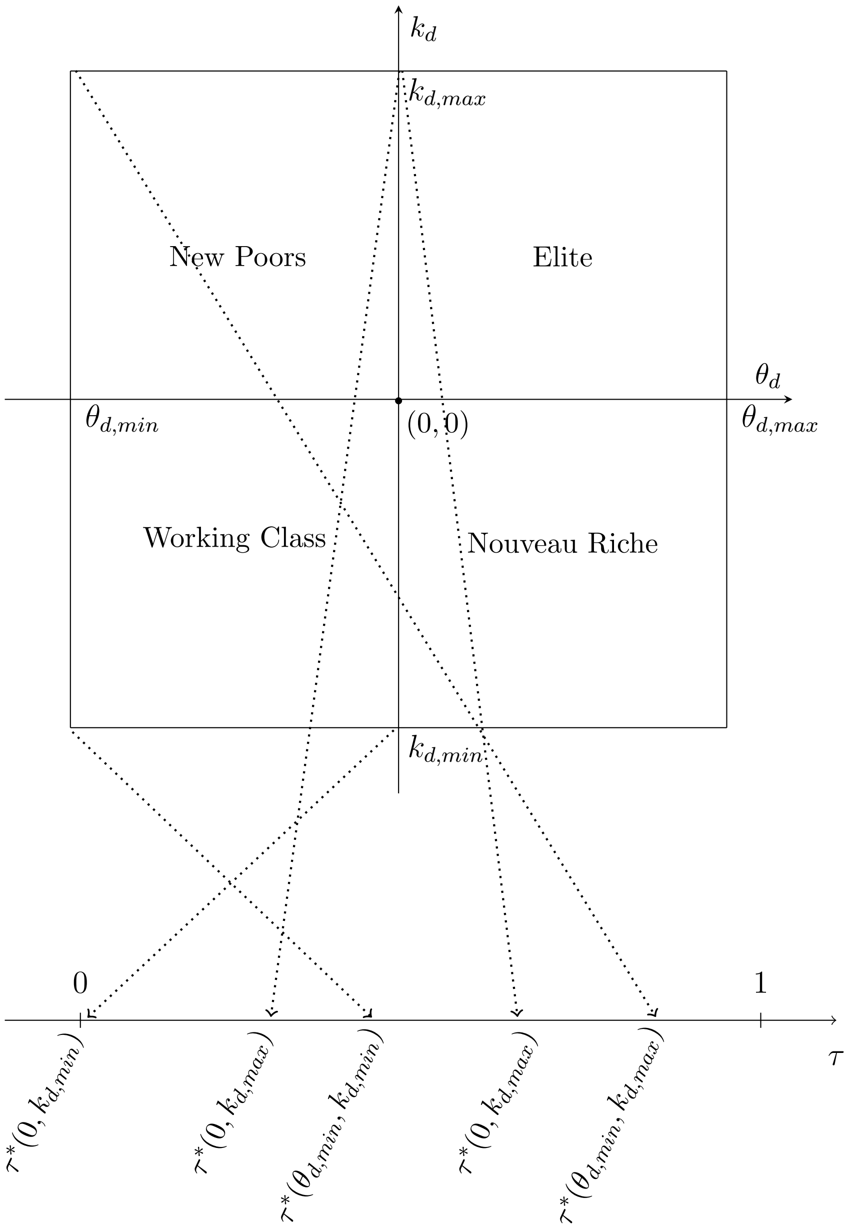

Figure 1. Agents' preferred tax rate as a function of their types.

Then, for every productivity level $\theta_d \leq 0$, define

$$h(\theta_d) = \max\left\{\frac{(1-\tau_B^*(\theta_d))\left((1-\tau_B^*(\theta_d))\,\sigma_\theta + 2\lambda\sigma_k\right)}{\lambda\sigma_k}\cdot\theta_d, k_{d,min}\right\}. \tag{10}$$

By construction, as long as $h(\theta_d) > k_{d,min}$, the preferred tax rate of type $(\theta_d, h(\theta_d))$ is the same as in the benchmark model without social concerns. Because $h(0) = 0$ and $h(\cdot)$ is non-decreasing in θ_d, Proposition 1 implies that types (θ_d, k_d) with $k_d > h(\theta_d)$ have a preferred level of taxation that is higher than the one of the benchmark model.[15] For these types social concerns reinforce economic voting. On the contrary, the preferred level of taxation of all types (θ_d, k_d) with $k_d < h(\theta_d)$ is lower than the benchmark. The preferences of these agents are mostly driven by social-class voting, which pushes them to reduce the negative impact their low social class has in determining status. The negative orthant of Figure 2 highlights these two groups respectively in red and blue when $\ell(\tau) = \tau^2$.

Nouveau riche. For types $\theta_d > 0$ and $k_d \leq 0$, social concerns unambiguously push against redistribution. Taxation simultaneously decreases the relevance of consumption (the dimension over which these individuals are strong) and increases the relevance of social class (the dimension over which they are weak). As a result, $\tau^*(\theta_d, k_d) = \tau_B^*(\theta_d) = 0$ for every voter in this group.

New poors. For types $\theta_d \leq 0$ and $k_d > 0$, the situation is opposite to the one of the nouveau riche. Thus, these individuals support higher tax rates: $\tau^*(\theta_d, k_d) > \tau_B^*(\theta_d)$.

Elite. In the benchmark model, the optimal tax rate of voters in the elite ($\theta_d > 0$ and $k_d > 0$) is equal to 0. The presence of social concerns can thus only (weakly) raise their preferred level of taxation.[16] No matter whether their preferred tax rate is an interior or corner solution, Proposition 1 implies that for all productivity levels $\theta_d \in (0, \theta_{d,max}]$, we can find a social class $h(\theta_d)$ such that all voters (θ_d, k_d) with $k_d \leq h(\theta_d)$ have a preferred tax rate equal to zero (cf. grey area in the positive orthant of Figure 2). Instead, voters (θ_d, k_d) with $k_d > h(\theta_d)$ have a preferred tax rate greater than zero (cf. red area in the positive orthant of Figure 2). For these latter voters, social-class voting dominates: despite being net losers from the redistributive scheme, they demand a positive taxation to preserve their advantage in terms of social class.

[15] The proof of Proposition 2 show that this relationship is strict. The same is true for the one of types (θ_d, k_d) with $k_d < h(\theta_d)$.

[16] Because of social concerns, the utility function is not necessarily strictly concave. Thus, the approach we followed with the working class is no longer valid. See the proof of Proposition 2 for details.

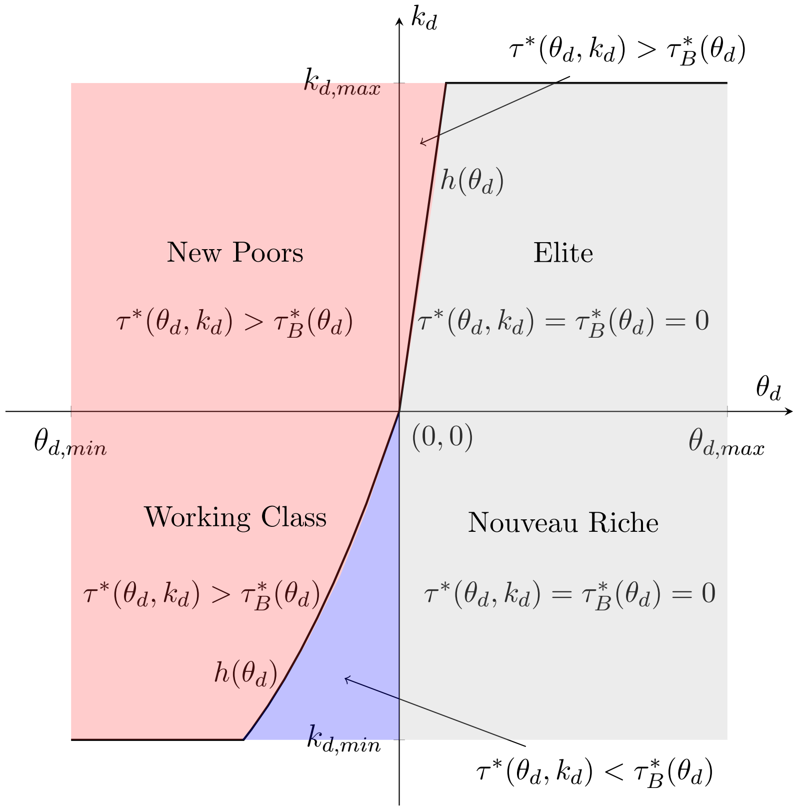

Figure 2. The effect of social concerns on agents' preferred tax rate.

The presence of social concerns may thus increase or decrease an individual's preferred level of taxation depending on his relative standing in the society. The relationship between the relevance of social concerns (as measured by η) and an agent's preferred tax rate can be summarized as follows (see also Figure 2).

Proposition 2. *There exists a weakly increasing function* $h : [\theta_{d,min}, \theta_{d,max}] \to [k_{d,min}, k_{d,max}]$ *such that: (i)* $h(0) = 0$*, (ii) for any* $\theta_d \in [\theta_{d,min}, 0]$*,* $\tau^*(\theta_d, k_d \mid \eta)$ *is non-decreasing in* η *if* $k_d \geq h(\theta_d)$ *and non-increasing in* η *otherwise, and (iii) for any* $\theta_d \in (0, \theta_{d,max}]$*,* $\tau^*(\theta_d, k_d \mid \eta)$ *is non-decreasing in* η*.*

Because social concerns affect voters' preferred level of taxation, they also impact the level of *polarization* concerning redistributive policies. Let polarization be the difference between the average preferred tax rate of the voters who are more favorable to redistribution and the average preferred tax rate of the voters who more strongly oppose it. Proposition 1 implies that these two groups of voters are respectively given by the new poors and by the nouveau riche.[17] Formally, define polarization as:

$$\Pi(\eta,\sigma_\theta,\sigma_k) = \int_0^{k_{d,max}} \int_{\theta_{d,min}}^{0} \tau_+^*(\theta_d,k_d \mid \eta,\sigma_\theta,\sigma_k) f(\theta_d,k_d) d\theta_d dk_d - \int_{k_{d,min}}^{0} \int_0^{\theta_{d,max}} \tau_-^*(\theta_d,k_d \mid \eta,\sigma_\theta,\sigma_k) f(\theta_d,k_d) d\theta_d k_d, \tag{11}$$

where $\tau_+^*(\theta_d,k_d \mid \eta,\sigma_\theta,\sigma_k)$ and $\tau_-^*(\theta_d,k_d \mid \eta,\sigma_\theta,\sigma_k)$ are respectively the highest and lowest preferred tax rate of voter (θ_d,k_d).[18]

Proposition 3. *Polarization $\Pi(\eta,\sigma_\theta,\sigma_k)$ is weakly increasing in η. Furthermore, polarization is weakly increasing in σ_θ (weakly decreasing in σ_k) if $\sigma_\theta < \lambda\sigma_k$.*

To understand Proposition 3, note that when the relevance of social concerns η increases, the function $h(\theta_d)$ remains constant for all types $\theta_d \leq 0$ (see (10)). Then, Proposition 2 implies that the new poors want higher levels of redistribution, while the nouveau riche still support no redistribution (see Figure 2). Hence, polarization goes up, which is line with the evidence discussed in Section 2.

Proposition 3 further says that polarization is increasing with the dispersion in productivity (hence, income) when such dispersion is not too high ($\sigma_\theta < \lambda\sigma_k$). However, when the standard deviation in productivity becomes larger than the one in social class, the proposition also allows for a reversal in the relationship between polarization and income dispersion. To gain intuition for this possibility, consider an increase in σ_θ. Keeping the voter's type fixed, his preferred level of taxation depends on σ_θ only insofar this parameter affects status-seeking considerations (cf. the last term in (7)). We can thus identify two effects. On the one hand, social weight W_c goes up and thus economic voting becomes more important. As a result, polarization increases: individuals with low productivity and high social status support higher levels of redistribution, while individuals with high productivity

[17] Other definitions of polarization are possible. For instance, we could consider the difference between the average preferred tax rate of the xth percentile of voters who are more favorable to redistribution, and the average preferred tax rate of the xth percentile of voters who more strongly oppose redistribution. In this case, the results of Proposition 3 would hold true if, given distribution $F_d(\theta_d,k_d)$, the former group of voters is sufficiently concentrated in the red region of Figure 2, and the latter in the blue and grey regions.

[18] Obviously, if $\tau_+^*(\theta_d,k_d \mid \eta,\sigma_\theta,\sigma_k)$ is a singleton, then $\tau_+^*(\theta_d,k_d \mid \eta,\sigma_\theta,\sigma_k) = \tau_-^*(\theta_d,k_d \mid \eta,\sigma_\theta,\sigma_k)$.

and low status still want no redistribution. On the other hand, social weight W_k decreases and thus social-class voting becomes less important. Because social-class voting is one of the reasons pushing the new poors to support high levels of redistribution, the optimal level of taxation of these voters may decrease, thus lowering the degree of polarization in the society. This can occur only if an increase in σ_θ does not boost economic voting a lot, which can be the case when σ_θ is high.[19]

The results in Proposition 3 can thus be related to the growing literature linking political polarization with measures of inequality (see McCarty *et al.*, 2006 and Voorheis *et al.*, 2015). The majority of these studies identifies a positive correlation between these two variables, which is compatible with our model. Nonetheless, Pontusson and Rueda (2008) show that this correlation is subject to significant differences across countries and Barth *et al.* (2015), by explicitly considering preferences about welfare spending, find that inequality has no effect on polarization.[20] Proposition 3 suggests that this cross country heterogeneity could be potentially explained by taking into account the two opposing channels we just described.

5 Interclass Coalitions and Aggregation of Preferences

As discussed in Section 4, social concerns introduce disagreement among voters who have the same productivity but belong to different social classes. In spite of this heterogeneity, our model allows for a smooth aggregation of individual preferences within the working class. To clarify, denote with $\varphi(\tau, \theta_d, k_d)$ the derivative of the utility function of voter (θ_d, k_d) with respect to τ,

$$\varphi(\tau, \theta_d, k_d) := \frac{\partial v(\tau, \tau\overline{\theta} \mid \theta_d, k_d)}{\partial \tau}. \tag{12}$$

Pick any voter (θ_d, k_d) in the working class with preferred tax rate equal to $\tau^\star(\theta_d, k_d) \in (0,1)$.[21] Then, we must have $\varphi(\tau^*(\theta_d, k_d), \theta_d, k_d) = 0$. Furthermore, it is easy to show that

[19] Indeed, one can construct examples in which polarization is first increasing and then decreasing σ_θ.

[20] In Barth *et al.*'s (2015) setting, inequality may even decrease polarization, although they do not find evidence for such inverse relationship.

[21] Such voter always exists. Consider the set $\{(\theta_d, k_d) : \theta_d < 0, k_d = h(\theta_d)\}$. If $\theta_d < 0$, $h(\theta_d)$ is continuous and $h(0) = 0$. Thus, the set is non-empty. For any voter in such a set, the strict concavity of the utility

$\tau^*(\theta_d, k_d)$ must also be the unique preferred tax rate of all voters (θ_d', k_d') in the working class for whom $\varphi(\tau^*(\theta_d, k_d), \theta_d', k_d') = 0$. Based on this insight, define the set $T^\circ := \{(\theta_d, k_d) \in \mathbb{R}^2_- : \exists \tau \in [0,1] \text{ for which } \varphi(\tau, \theta_d, k_d) = 0\}$ and the mapping $\vartheta : T^\circ \times [k_{d,min}, 0] \to \mathbb{R}$ so that

$$\vartheta(\theta_d, k_d, k_d') = \theta_d + Q(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)(k_d' - k_d) \tag{13}$$

with

$$Q(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k) = \frac{\eta\sigma_\theta\lambda\sigma_k}{(1+\eta)[(1-\tau^*(\theta_d, k_d))\sigma_\theta + \lambda\sigma_k]^2 - \eta\lambda^2\sigma_k^2}. \tag{14}$$

For any $k_d' \leq 0$, the definition of $Q(\cdot)$ implies that $\varphi(\tau^*(\theta_d, k_d), \vartheta(\theta_d, k_d, k_d'), k_d') = 0$.

If $\vartheta(\theta_d, k_d, k_d') \leq 0$, this mapping identifies a voter in class $k_d' \leq 0$ with the same preferred tax rate as type (θ_d, k_d). Then, $Q(\cdot)$ captures the marginal adjustment in the productivity dimension that is needed to compensate for a marginal change in social class and guarantee that the optimal tax rate does not change. Noticeably, such marginal adjustment is constant in k_d'. In other words, function $\vartheta(\cdot)$ is linear in k_d'.

By varying $k_d' \in [k_{d,min}, 0]$, function $\vartheta(\theta_d, k_d, \cdot)$ identifies the *interclass coalition* of voters in the working class, whose preferred tax rate is $\tau^*(\theta_d, k_d)$.[22] In this respect, $Q(\cdot)$ measures the heterogeneity in the productivity levels of the members of such coalition. If $Q(\cdot)$ is small, the set of voters who share the same preferred tax rate is relatively homogeneous in terms of productivity. In contrast, if $Q(\cdot)$ is large, the coalition includes voters with more heterogeneous productivity levels. Moreover, because $Q(\cdot) \geq 0$, the coalition is composed by relatively less productive individuals in low social classes and relatively more productive individuals in high social classes. Finally, it is worthwhile to point out that interclass coalitions are heterogeneous in terms of productivity even if productivity is identically distributed across all classes: $Q(\cdot) > 0$ even if θ_d and k_d are independently distributed.

A change in the relevance of social concerns η impacts on $Q(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)$, and

function (cf. (8)) and the assumptions we made on function $\ell(\cdot)$ ensure that the optimal tax rate is unique and pinned down by the first order necessary condition.

[22] As we vary k_d', $\vartheta(\theta_d, k_d, k_d')$ may fall outside the working class, i.e. $\vartheta(\theta_d, k_d, k_d') \notin [\theta_{d,min} 0]$. In this case, voter $(\vartheta(\theta_d, k_d, k_d'), k_d)$ will not belong to the interclass coalition. This turns out to be irrelevant in our discussion.

thus on the composition of a coalition, through two different channels: directly because $Q(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)$ depends on η, and indirectly because $Q(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)$ also depends on $\tau^*(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)$, which, in turn, depends on η. Whereas the first channel implies a positive correlation between η and $Q(\cdot)$, the second channel can go in both directions depending on the voter we are considering (cf. Proposition 2). Nonetheless, if the social class of a voter is sufficiently high, then the heterogeneity in productivity levels of the coalition that supports his preferred tax rate unambiguously widens following an increase in the relevance of social concerns.

Proposition 4. *Let (θ_d, k_d) be a voter in the working class and suppose that $k_d \geq h(\theta_d)$. Then, $Q(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)$ is increasing in η.*

Interclass coalitions can be constructed within the working class because the utility function of these voters is everywhere strictly concave. Thus, if a tax rate solves $\varphi(\tau, \theta_d, k_d) = 0$, such tax rate must be voter (θ_d, k_d)'s preferred policy. However, as we move out from the working class, voters' utility functions are no longer everywhere strictly concave in τ. Thus, the optimal tax rate may not be unique and the first order condition may not identify it.

Nonetheless, in the benchmark model in which $\eta = 0$, deadweight losses from taxation guarantee that the preferred tax rate of any voter (θ_d, k_d) with $\theta_d \leq 0$ is the solution of $\varphi(\tau, \theta_d, k_d) = 0$. Moreover, $Q(\cdot) \equiv 0$ and interclass coalitions are thus homogeneous in terms of productivity.

By continuity, if we pick any voter $(\theta_d, k_d) \in [\theta_{d,min}, 0) \times [k_{d,min}, k_{d,max}]$, we can find values of η small enough to guarantee that $\varphi(\tau, \theta_d, k_d) = 0$ still identifies the unique optimal tax rate of such voter. Then, as long as the relevance of social concerns is not too high, we can extend mapping $\vartheta(\cdot)$ to $[\theta_{d,min}, \theta_{d,max}) \times [k_{d,min}, k_{d,max}] \times [k_{d,min}, k_{d,max}]$ and define interclass coalitions that span all social classes (see the proof of Proposition 5 for details). Figure 3 depicts function $\vartheta(\cdot)$ for two different types (θ_d, k_d) and (θ'_d, k_d) with $\theta'_d > \theta_d$. The blue line groups all individuals whose preferred tax rate coincides with the preferred tax rate of type (θ_d, k_d), while the red line does the same for types who share preferred tax rate $\tau^*(\theta'_d, k_d)$. The two lines have slope $1/Q(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)$ and $1/Q(\theta'_d, k_d \mid \eta, \sigma_\theta, \sigma_k)$.

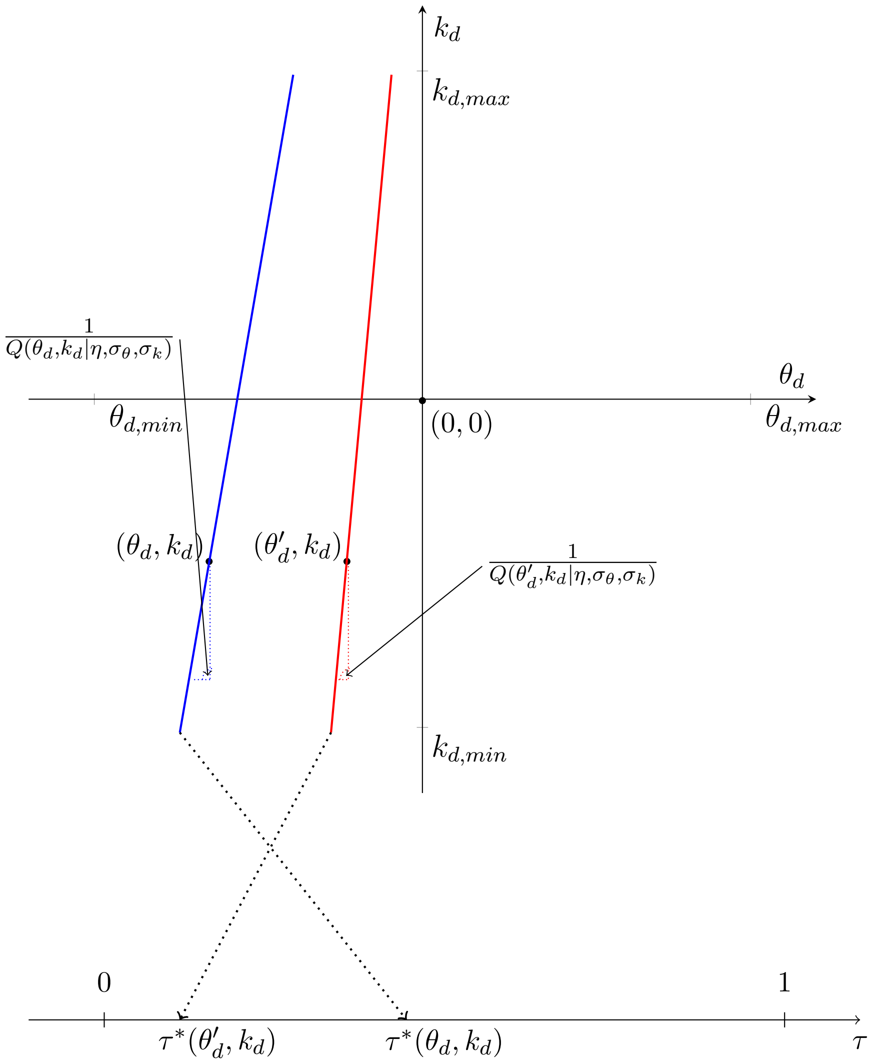

Figure 3. Coalitions of voters with the same optimal tax rate.

It is immediate to verify that Proposition 4 also extends to all voters $[\theta_{d,min}, \theta_{d,max}) \times [k_{d,min}, k_{d,max}]$ provided that the relevance of social concerns is sufficiently low. Finally, because the median productivity is below the average productivity, the previous construction can be used to identify an interclass coalition with the property that half of the population has a preferred tax rate greater than the one of the voters in such coalition, and the other half has a preferred tax rate lower than that. In the discussion that follows, we implicitly assume that η is small enough to guarantee that these results hold true.

The previous steps can then be used to characterize the political equilibrium of a Downsian model of electoral competition in which two candidates announce a vector of policies (τ, g) under the constraint $\tau = g\overline{\theta}$. Indeed, starting from any voter (θ_d, k_d) with $\theta_d < 0$

and such that $\tau^*(\theta_d, k_d) \in (0,1)$, function $\vartheta(\cdot)$ and Proposition 1 enables us to split the population in two groups: those with a preferred tax rate greater than $\tau^*(\theta_d, k_d)$ (i.e., voters with productivity below $\vartheta(\cdot)$) and those with a preferred tax rate below it (i.e., voters with productivity above $\vartheta(\cdot)$). In other words, we can collapse one of the two dimensions of voters' heterogeneity. Within the resulting unidimensional space, we can follow standard arguments to conclude that the political game has a unique voting equilibrium in which both candidates announce the preferred tax rate of the "median voter" in the unidimensional space which derives from (13). We denote this tax rate with τ^{VE}.[23]

Formally, let $\psi : [\theta_{d,min}, 0) \times [k_{d,min}, k_{d,max}] \to [0,1]$ be a function that, for any type (θ_d, k_d), measures the mass of individuals with preferred tax rate above $\tau^*(\theta_d, k_d)$:

$$\psi(\theta_d, k_d) := \int_{k_{d,min}}^{k_{d,max}} \int_{\theta_{d,min}}^{\vartheta(\theta_d, k_d, y)} f(x,y)\, dx dy. \tag{15}$$

The equilibrium tax rate of the political game, τ^{VE}, coincides with the preferred tax rate of any type (θ_d^*, k_d) for which $\psi(\theta_d^*, k_d) = 1/2$. This last equation identifies the *decisive voter* (θ_d^*, k_d): half of the electorate has a preferred tax rate greater or equal than $\tau^*(\theta_d^*, k_d)$ and the opposite is true for the other half of the electorate. Without loss of generality we can assume that the decisive voter belongs to the median class, $(\theta_d^*, k_d) = (\theta_d^*, k_d^m)$.[24]

Proposition 5. *There exists $\overline{\eta} > 0$ such that if $\eta \leq \overline{\eta}$, the equilibrium tax rate τ^{VE} is unique and coincides with the unique preferred tax rate of the decisive voter (θ_d^*, k_d^m). Thus, τ^{VE} and (θ_d^*, k_d^m) jointly satisfy the system:*

$$\varphi\left(\tau^{VE}, \theta_d^*, k_d^m\right) = 0 \tag{16}$$

$$\psi(\theta_d^*, k_d^m) - \frac{1}{2} = 0 \tag{17}$$

[23] Consider any pair of announcements by politicians in which at least one of the two tax rates is not $\tau \neq \tau^{VE}$. Then, any candidate who is winning with probability lower than 1 (such candidate must exist and cannot be already announcing τ^{VE}) could deviate to τ^{VE} and be strictly better off. Thus, such profile of policy announcements cannot be an equilibrium of the political game.

[24] Obviously, if $\psi(\theta_d^*, k_d^m) = 1/2$, then $\psi(\vartheta(\theta_d^*, k_d^m, k_d'), k_d') = 1/2$ for any k_d'. This indeterminacy does not play any role in our analysis.

The equilibrium tax rate and the identity of the decisive voter can thus be obtained solving the system of non-linear equations (16)-(17). From an operational point of view, this can be done by deriving the preferred tax rate $\tau^* (\theta_d, k_d^m)$ of increasingly more productive individuals and search for the productivity level that satisfies (17).

Note that social concerns influence the voting equilibrium in two ways. First, as described by Proposition 2, they change the preferred tax rates of each individual, hence of the decisive voter. Second, they modify the identity of the decisive voter (θ_d^*, k_d^m) by modifying interclass coalitions (i.e., they affect function $Q(\cdot)$, see Proposition 4). Both effects can be non-linear. Moreover, the second effect depends on the specific distribution over types, $F(\theta, k)$. Thus it is not possible to provide a general analytic solution of the equilibrium tax rate. However, such solution can be easily characterized when $Q(\cdot) \simeq 0$, so that the identity of the decisive voter is almost constant and the second effect described above can be ignored.

Proposition 6. *Let* $(\eta, \sigma_\theta, \sigma_k) \in \mathbb{R}_{++}$*. Then, the equilibrium tax rate* τ^{VE} *is such that:*

(a) $\tau^{VE} \to \tau_B^*(\theta_d^m)$ *as the importance of social concerns vanishes* $(\eta \to 0)$*.*

(b) $\tau^{VE} \to 0$ *as heterogeneity in productivity vanishes* $(\sigma_\theta \to 0)$*.*[25]

(c) $\tau^{VE} \to \min\{1, \frac{\partial \ell^{-1}(-(1+\eta)\theta_d)}{\partial \tau}\} > \tau_B^*(\theta_d^m)$ *as heterogeneity in social classes vanishes* $(\sigma_k \to 0)$*.*

Proposition 6(a) states that if social concerns are not strong, then the equilibrium tax rate approaches the optimal tax rate of the voter with median productivity, as in a standard model à la Meltzer and Richard (1981). When all individuals are very similar in terms of productivity (Proposition 6(b)), the benefit brought by redistributive policies to individuals less productive than the average becomes negligible, but taxation maintains its distortionary effects. Then, the equilibrium tax rate approaches 0. Finally (Proposition 6(c)), when individuals do not differ much in terms of social class, the productivity of the decisive voter equals the median productivity in the population, as in a standard model à la Meltzer and

[25] As σ_θ converges to 0, we keep the range of θ_d constant. The same is true for the range of k_d when σ_k converges to 0 at point (c).

Richard (1981). However, the decisive voter has now an additional reason to support redistribution, namely to reduce the social stigma he suffers in the consumption dimension. Thus, social concerns reinforce economic voting and induce low income individuals to support higher levels of redistribution. As a result, the equilibrium tax rate converges to a value that is higher than the one of the benchmark case.

Now suppose that $Q(\cdot)$ is bounded away from 0 and consider how an increase in the relevance of social concerns, η, affects the identity of the decisive voter. By (17), the mass of voters with preferred level of taxation above $\tau^*(\theta_d^*, k_d^m)$ changes by:

$$\frac{\partial}{\partial \eta}\left(\int_{k_{d,min}}^{k_{d,max}} \int_{\theta_{d,min}}^{\vartheta(\theta_d^*, k_d^m, y)} f(x,y)dxdy\right) = \int_{k_{d,min}}^{k_{d,max}} \frac{\partial Q(\theta_d^*, k_d^m)}{\partial \eta} \cdot (y - k_d^m) \cdot f(\vartheta(\theta_d^*, k_d^m, y), y)dy. \tag{18}$$

By Proposition 4, we know that $\partial Q(\theta_d^*, k_d^m)/\partial\eta$ is positive if the decisive voter (θ_d^*, k_d^m) has a social class above $h(\theta_d^*)$. This is the case in societies in which differences in social classes are neither too strong nor too discriminatory against the majority of voters. In the remaining case, $\partial Q(\theta_d^*, k_d^m)/\partial\eta$ can be either positive or negative.

If $\partial Q(\theta_d^*, k_d^m)/\partial\eta$ is indeed positive, (18) implies that a raise in η increases the mass of voters with preferred tax rate above $\tau^*(\theta_d^*, k_d^m)$ in classes $k_d > k_d^m$ and decreases it in classes $k_d < k_d^m$. If the net balance is positive (i.e., (18) is greater than 0), more than 50% of the electorate now supports a tax rate higher than $\tau^*(\theta_d^*, k_d^m)$. To restore (17), the new decisive voter must then have a lower productivity. As suggested by (18), this will occur if socio-cultural elites are sizable and enjoy high social prestige. On the contrary, in societies in which such elites are small, a raise in the relevance of social concerns results in an increase in the productivity of the decisive voter. If $\partial Q(\theta_d^*, k_d^m)/\partial\eta < 0$, the reversed implications hold true.

As far as the equilibrium level of taxation is concerned, a change in η modifies both the identity of the decisive voter and his preferences. When these two channels push in the same direction, the effect on τ^{VE} is unambiguous. On the contrary, when they push in opposite directions, the equilibrium level of taxation can increase or decrease depending on the specific parameters of the model. For instance, if the prestige enjoyed by high social classes is sufficiently higher than the stigma suffered by low ones (i.e., $\int_{k_{d,min}}^{k_{d,max}}(y-k_d^m)\cdot f(\theta_d^m, y)dy > 0$) and the median social class is sufficiently high (i.e., k_d^m below but close to 0), the equilibrium tax rate τ^{VE} increases with η. Indeed, these assumptions imply that (i) the preferred level of taxation of the original decisive voter is increasing in η (i.e., such voter lies in the red region of Figure 2), and (ii) a raise in η yields a decrease in the productivity of the decisive voter. Combining these two results with Proposition 1, τ^{VE} must increase.

6 Conclusions

People care about their standing in society and the relevance of status-seeking behavior has been proven to be an important driver of economic decisions in a variety of settings.

In this paper, we investigated how social status concerns may affect voters' preferences for redistribution. We showed that the stratification of a society into different social classes may lead individuals who have different levels of productivity (and thus the different gross incomes) to share the same desired level of taxation and redistribution. This happens because voters' preferences toward redistribution are shaped not only by their monetary interests (economic voting), but also by their desire to preserve/overcome the advantages/disadvantages they experience in terms of social class (social-class voting). We also showed that social concerns increase the level of polarization concerning redistributive policies. Finally, we showed that when the impact of social concerns is not too large, the sets of voters who share the same tax rate have a simple structure and this can be used to characterize a political equilibrium.

The predictions of our model can help rationalize well documented deviations from pure economic voting, namely the fact that in many countries, a non-negligible fraction of the socioeconomic elites appear to be relatively favorable to redistribution, whereas the opposite holds true for some members of the working class.

Appendix

Proof of Remark 1.

When $\eta = 0$, the utility function of all voters is strictly concave in τ for all $\tau > 0$. Thus, (7) implies that the optimal tax rate of all voters is unique and equal to 0 if $\theta_d \geq 0$ and to the solution of $-\theta_d = d\ell(\tau)/d\tau$ otherwise. $\square$

Proof of Proposition 1.

Consider utility function $v(\tau, g \mid \theta_d, k_d)$. The function is twice continuously differentiable and its indifference curves are path-connected (this follows from the fact that the function is continuous in τ and, furthermore, g enters additively linearly). Furthermore, observe that

$$\frac{\partial v(\tau, g \mid \theta_d, k_d)}{\partial \tau} = -\theta_d + \overline{\theta} - \frac{d\ell(\tau)}{d\tau} + \eta\sigma_\theta \cdot \frac{\lambda\sigma_k k_d - (1-\tau)\left((1-\tau)\,\sigma_\theta + 2\lambda\sigma_k\right)\theta_d}{\left((1-\tau)\,\sigma_\theta + \lambda\sigma_k\right)^2}$$

$$\frac{\partial v(\tau, g \mid \theta_d, k_d)}{\partial g} = 1 > 0$$

It is immediate to verify that $\frac{\partial v(\tau, g|\theta_d, k_d)}{\partial \tau}$ is everywhere decreasing in θ_d and increasing in k_d. Thus, the strict Spence-Mirrlees condition holds. Hence, the function has the strict single crossing property in $-\theta_d$ holding k_d constant and in k_d holding θ_d constant. Finally, given the additive structure of the utility function, it is immediate to see that $v(\tau, g \mid \theta_d, k_d)$ is quasisupermodular. The statement of the Proposition thus follows from Theorem 4 in Milgrom and Shannon (1994) (see also Gans and Smart, 1996). $\square$

Proof of Proposition 2.

Let $\theta_d \in [\theta_{d,min}, 0]$. Define $\hat{h}(\theta_d) = (1 - \tau_B^*(\theta_d))\,[(1 - \tau_B^*(\theta_d))\,\sigma_\theta + 2\lambda\sigma_k]\,\theta_d/(\lambda\sigma_k)$ (recall that in the absence of social concerns $\tau_B^*(\theta_d)$ is a singleton). It is immediate to verify that $\hat{h}(\theta_d)$ is constant with respect to η, increasing in θ_d for all $\theta_d \leq 0$ and equal to 0 at 0, $\hat{h}(0) = 0$. Differently from $h(\theta_d)$ (see (10) in the main text), $\hat{h}(\theta_d)$ is unconstrained and may fall outside $[k_{d,min}, k_{d,max}]$. In other words, $\hat{h}(\theta_d)$ may be lower than $k_{d,min}$. Because $\theta_d \leq 0$ and $\hat{h}(\theta_d) \leq 0$, the utility function of voter $(\theta_d, \hat{h}(\theta_d))$ is strictly concave in the tax rate. Hence, $\tau^*(\theta_d, \hat{h}(\theta_d))$ is a singleton and it is equal to $\tau_B^*(\theta_d)$. Pick any type $(\theta_d, k_d) \in [\theta_{d,min}, \theta_{d,max}] \times [k_{d,min}, k_{d,max}]$ such that $k_d \geq \hat{h}(\theta_d)$. We want to show that that $\tau^*(\theta_d, k_d \mid \eta)$ is non-decreasing in η. Fix any η' and any $\tau^* \in \tau^*(\theta_d, k_d \mid \eta')$. Because $k_d \geq \hat{h}(\theta_d)$, Proposition 1 and the previous argument imply $\tau^* \in [\tau_B^*(\theta_d), 1]$ (It is immediate to see that the result of Proposition 1 does not depend on the specific set of classes $[\theta_{d,min}, \theta_{d,max}] \times [k_{d,min}, k_{d,max}]$ and extend to any subset of $\mathbb{R}^2$). If $\tau^* = 0$, the result is trivially true. If $\tau^* \in (0, 1)$, (7) must hold with equality. Because $\tau^* \geq \tau_B^*(\theta_d)$, it must be the case that $-\theta_d - d\ell(\tau^*(\theta_d, k_d))/d(\tau) \leq 0$. Hence the last term in (7) must be non-negative. Thus, the utility function of voter (θ_d, k_d) satisfies the single crossing property in τ with respect to η and we can conclude that $\tau^*(\theta_d, k_d \mid \eta)$ is non-decreasing in η. Similarly, if $\tau^* = 1$ at η', the last term in (7) must be positive, hence increasing in η. Thus, the single crossing property implies that $\tau^*(\theta_d, k_d) = 1$ for every $\eta'' \geq \eta'$. By a symmetric reasoning, if $k_d < \hat{h}(\theta_d)$, $\tau^*(\theta_d, k_d \mid \eta)$ is non-increasing in η. Part (i) and (ii) of the proposition follow from defining $h(\theta_d) = \max\{\hat{h}(\theta_d), k_{d,min}\}$ for all $\theta_d \leq 0$.

Now consider $\theta_d \in (0, \theta_{d,max}]$. Pick η' and $\tau^* \in \tau^*(\theta_d, k_d \mid \eta')$. If $\tau^* \in (0, 1]$, we can replicate the same argument as before and conclude that the preferred tax rate is increasing in η (in this case the fact that the last term in (7) is positive follows directly from the fact that $\theta_d > 0$). Suppose instead that $\tau^* = 0$. Focus first on the nouveau riche ($k_d \leq 0$). Obviously (7) is negative for all τ independently of the value of η. Thus, if $k_d \leq 0$, a tax rate equal to zero is the unique maximizer, $\tau^*(\theta_d, k_d) = \{0\}$ for all η. Now consider types in the elite, i.e., $(\theta_d, k_d) \in \mathbb{R}^2_{++}$. If $0 \in \tau^*(\theta_d, k_{d,max})$, let $h(\theta_d) = k_{d,max}$. Instead, if $0 \notin \tau^*(\theta_d, k_{d,max})$, let $h(\theta_d) = \inf\{k_d : 0 \notin \tau^*(\theta_d, k_d)\}$. This set is well defined because the set of maximizers is upperhemicontinuous, Proposition 1 holds and we just argued that $\tau^*(\theta_d, k_d) = \{0\}$ for all voters (θ_d, k_d) with $k_d = 0$. Suppose there exist θ_d'' and θ_d' such that $\theta_d'' > \theta_d'$ and $h(\theta_d'') < h(\theta_d')$. By the upperhemicontinuity of the set of maximizers, $0 \in \tau^*(\theta_d', h(\theta_d'))$. By Proposition 1, $0 \in \tau^*(\theta_d'', h(\theta_d'))$, hence (again by Proposition 1) $0 \in \tau^*(\theta_d'', k_d)$ for all $k_d \in [h(\theta_d''), h(\theta_d')]$. This contradicts the definition of $h(\theta_d')$. Thus, $h(\theta_d)$ is weakly increasing in θ_d. For any $(\theta_d, k_d) \in \mathbb{R}^2_{++}$ for which $0 \in \tau^*(\theta_d, k_d \mid \eta')$, we must have

$$\ell(\tilde{\tau}) + \tilde{\tau}\theta_d \geq \eta'\sigma_\theta\tilde{\tau} \cdot \frac{\lambda\sigma_k k_d - [(1-\tilde{\tau})(\sigma_\theta + \lambda\sigma_k) + \lambda\sigma_k]\theta_d}{(\sigma_\theta + \lambda\sigma_k) \cdot [(1-\tilde{\tau})\sigma_\theta + \lambda\sigma_k]} \quad \forall \tilde{\tau} \neq 0. \tag{19}$$

If the right-hand side of (19) is negative for all $\tilde{\tau}$, it remains negative for all $\eta \in \mathbb{R}_+$. Instead, if the right-hand side of (19) is positive for some $\tilde{\tau}$ (this is possible if and only if $k_d > \theta_d$), we can find $\eta'' > \eta'$ such that for that $\tilde{\tau}$ the inequality is reversed for any $\eta \geq \eta''$. Then, if $\eta \geq \eta''$, there exists $\tau^* > 0$ such that $\tau^* \in \tau^*(\theta_d, k_d \mid \eta)$ for all $\eta \geq \eta''$. In either cases, $\tau^*(\theta_d, h(\theta_d) \mid \eta)$ is non-decreasing in η. □

Proof of Proposition 3.

We know that any voter (θ_d, k_d) with $\theta_d > 0$ and $k_d \leq 0$ has a unique preferred tax rate equal to 0 for any profile of parameters (see proof of Proposition 2). The proposition thus follows if we can show that for any (θ_d, k_d) with $\theta_d \leq 0$ and $k_d > 0$, $\max\{\tau \in \tau^*(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)\}$ is weakly increasing in η and weakly increasing in σ_θ (weakly decreasing in σ_k) when $\sigma_\theta < \lambda\sigma_k$. The first result follows from Proposition 2 after noticing that $k_d > 0 \geq h(\theta_d)$ (recall that $h(\cdot)$ is weakly increasing in θ_d and equal 0 at $\theta_d = 0$). Now consider changes in σ_θ (the proof for σ_k is analogous). At $\tau = 0$, (7) is positive for any type (θ_d, k_d) with $\theta_d \leq 0$ and $k_d > 0$. Thus $0 \notin \tau^*(\theta_d, k_d)$. Differentiating (7) with respect to σ_θ we get that $\frac{\partial^2 v(\tau, \tau\bar{\theta} \mid \theta_d, k_d)}{\partial\tau\partial\sigma_\theta} \geq 0$ if and only if $[\lambda\sigma_k - (1-\tau)\sigma_\theta]k_d \geq 2\lambda\sigma_k(1-\tau)\theta_d$. Since $\theta_d \leq 0$ and $k_d > 0$, the previous inequality is always satisfied if $\lambda\sigma_k \geq \sigma_\theta$. Monotone comparative static results (see Milgrom and Shannon (1994) and the steps in the proof of Proposition 1) imply $\max\{\tau \in \tau^*(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)\}$ is non-decreasing in σ_θ. □

Proof of Proposition 4.

Because the utility function of voters is strictly concave, $\tau^*(\theta_d, k_d)$ is a singleton. Then

$$\begin{aligned}
&\frac{\partial Q(\theta_d, k_d \mid \eta, \sigma_\theta, \sigma_k)}{\partial \eta} = \\
&\quad = \frac{\sigma_\theta\lambda\sigma_k[\sigma_\theta(1-\tau^*(\theta_d,k_d)) + \lambda\sigma_k][(\sigma_\theta(1-\tau^*(\theta_d,k_d)) + \lambda\sigma_k) + 2\sigma_\theta\eta(1+\eta)\frac{\partial\tau^*}{\partial\eta}]}{[(1+\eta)(1-\tau^*(\theta_d,k_d))\sigma_\theta + \lambda\sigma_k)^2 - \eta\lambda^2\sigma_k^2]^2}.
\end{aligned}$$

Such derivative is positive if $\frac{\partial \tau^*}{\partial \eta} \geq 0$. By Proposition 2, this is the case if $k_d \geq h(\theta_d)$. $\square$

Proof of Proposition 5.

Let $\eta = 0$. Then, $Q(\cdot) \equiv 0$ and the utility function of all voters is strictly concave in τ. Thus, each voter has a unique preferred tax rate and, for any $\theta_d < 0$, this is the rate $\tau \in (0, 1)$ that solves $\varphi(\tau, \theta_d, k_d) = 0$ (recall that in the benchmark case, we rule out the possibility that some voters have a preferred tax rate equal to 1 by assuming that function $\ell(\tau)$ is sufficiently steep). Because $\theta_d^m < 0$, this property holds true for more than 50% of voters. Moreover, when $\eta = 0$, voters' utility functions do not depend on social class and satisfy the single crossing property in τ with respect to θ_d. Then, standard results (cf. Gans and Smart, 1996) show that the voting equilibrium coincides with the unique policy preferred by the voter with median productivity. Thus, (16) and (17) must be satisfied.

Now suppose that $\eta > 0$. For any voter $(\theta_d, k_d) \in \mathbb{R}^2_-$, (8) is negative for all $\tau \in [0, 1]$. Define

$$\eta_1(\theta_d, k_d) = \begin{cases} 1 & \text{if } \lambda\sigma_k k_d \geq (\sigma_\theta + 2\lambda\sigma_k)\theta_d \\ \frac{\theta_d(\sigma_\theta+\lambda\sigma_k)^2}{\sigma_\theta[\lambda\sigma_k k_d - (\sigma_\theta+2\lambda\sigma_k)\theta_d]} & \text{otherwise.} \end{cases}$$

If $\eta \leq \eta_1(\theta_d, k_d)/2$, then $\tau^*(\theta_d, k_d)$, the unique preferred tax rate of voter (θ_d, k_d), is strictly between 0 and 1 and it is the unique tax rate τ that satisfies $\varphi(\tau, \theta_d, k_d) = 0$.[26]

Furthermore, (8) implies that for any voter $(\theta'_d, k'_d) \in \mathbb{R}_- \times \mathbb{R}_{++}$, we can define

$$\eta_2(\theta'_d, k'_d) = \begin{cases} 1 & \text{if } \lambda\sigma_k\theta_d \leq \sigma_\theta k_d \\ \frac{d\ell^2(\tau)}{d\tau^2}\frac{[(1-\tau)\sigma_\theta+\lambda\sigma_k]^3}{2\sigma_\theta\lambda\sigma_k[\sigma_\theta k_d+\lambda\sigma_k\theta_d]} & \text{otherwise.} \end{cases}$$

If $\eta \leq \eta_2(\theta'_d, k'_d)/2$, (8) is negative for every $\tau \in [\tau^*(\theta_d, k_d), 1]$.[27] By Proposition 1, if $\eta \leq \eta_1(\theta_d, k_d)/2$ we know that the preferred tax rates of types (θ_d, k'_d) with $k'_d \geq k_d$ must be weakly higher than the unique preferred tax rate of voter (θ_d, k_d), $\tau^*(\theta_d, k_d)$. If $\eta \leq \min\{\eta_1(\theta_d, k_d)/2, \eta_2(\theta_d, k'_d)/2\}$, since the utility function is strictly concave in τ for

[26] The threshold guarantees that for these voters $\varphi(\cdot)$ is not negative for all τ. It can be shown that, because of our assumptions on $d\ell(1)/d\tau$, $\varphi(\cdot)$ cannot be always positive for all τ.

[27] The threshold guarantees that (8) is negative for all τ independently of the actual voter.

all $\tau \in [\tau^*(\theta_d, k_d), 1]$, the optimal tax rate of voter (θ_d, k_d') must be unique and it is either 1 or the solution to $\varphi(\tau, \theta_d, k_d') = 0$. To rule out the first possibility, we can require $\eta \leq \min\{\eta_1(\theta_d, k_d)/2, \eta_2(\theta_d, k_d')/2, \eta_3(\theta_d, k_d')/2\}$, where $\eta_3(\theta_d, k_d') = \left[\frac{d\ell(1)}{d\tau} + \theta_d\right] \frac{\lambda\sigma_k}{\sigma_\theta k_d'}$. For every $\theta_d \in [\theta_{d,min}, \theta_d^m/2]$, let $\eta^*(\theta_d) := \min\{\eta_1(\theta_d', k_d')/2, \eta_2(\theta_d', k_d')/2, \eta_3(\theta_d, k_d')/2\}$ and observe that this threshold is bounded away from 0 for all θ_d. Moreover, $\eta^*(\theta_d)$ is a continuous function of θ_d. Thus, it admits a minimum in the interval $[\theta_{d,min}, \theta_d^m/2]$. Let this minimum be η^*. Clearly, $\eta^* > 0$.

Now let $\eta \leq \eta^*$ and consider voter $(\theta_d^m, k_{d,max})$. By the previous discussion, $\tau^*(\theta_d^m, k_{d,max})$ is unique. By the construction of function $\vartheta(\cdot)$ (see (13) and (14)), it must thus be the case that $\varphi(\tau^*(\theta_d^m, k_{d,max}), \vartheta(\theta_d, k_{d,max}, k_d), k_d) = 0$ for all k_d. If $\vartheta(\theta_d^m, k_{d,max}, k_d) \geq \theta_{d,min}$, then $\tau^*(\theta_d^m, k_{d,max})$ is also the optimal tax rate of voter $(\vartheta(\theta_d^m, k_{d,max}, k_d), k_d)$ (recall that we are assuming $\eta \leq \eta^*$). By the definition of $\vartheta(\cdot)$, $\vartheta(\theta_d^m, k_{d,max}, k_d) \geq \theta_{d,min}$ for all k_d if and only if $\vartheta(\theta_d^m, k_{d,max}, k_{d,min}) \geq \theta_{d,min}$. Because $Q(\cdot)$ is increasing in τ, this last condition is satisfied if $\eta \leq \frac{k_{d,max}-k_{d,min}}{\theta_d^m-\theta_{d,min}} \frac{\lambda\sigma_k}{\sigma_\theta} := \eta_4$. Following similar steps, we can also conclude that if $\eta \leq \frac{k_{d,max}-k_{d,min}}{\theta_d^m/2-\theta_d^m} \frac{\lambda\sigma_k}{\sigma_\theta} := \eta_5$, then $\vartheta(\theta_d^m/2, k_{d,max}, k_d) \geq \theta_d^m$ for all k_d and $\tau^*(\theta_d^m/2, k_d)$ is the preferred tax rate of all voters $(\vartheta(\theta_d^m/2, k_{d,max}, k_d), k_d)$. Let $\eta^{**} := \min\{\eta_4, \eta_5\}$. Obviously, $\eta^{**} > 0$.

Define $\overline{\eta} = \min\{\eta^*, \eta^{**}\}$. By the previous results, if $\eta \leq \overline{\eta}$, any voter $(\vartheta(\theta_d, k_{d,max}, k_d), k_d)$ with $\theta_d \in [\theta_d^m, \theta_d^m/2]$ and $k_d \in [k_{d,min}, k_{d,max}]$ have a unique optimal tax rate and this tax rate solves $\varphi(\tau, \vartheta(\theta_d, k_{d,max}, k_d), k_d) = 0$. Furthermore, for all $\theta_d \in \left[\theta_d^m, \frac{\theta_d^m}{2}\right]$ define

$$\hat{\psi}(\theta_d) = \int_{k_{d,min}}^{k_{d,max}} \int_{\theta_{d,min}}^{\vartheta(\theta_d, k_{d,max}, y)} f(x, y) dx dy.^{28}$$

$\hat{\psi}(\theta_d)$ is a continuous function of θ_d. We can thus differentiate (13) and get

$$\frac{\partial\vartheta(\hat{\theta}_d, k_{d,max}, k_d')}{\partial\hat{\theta}_d} = 1 + (k_d' - k_{d,max}) \cdot \frac{\partial Q}{\partial\tau} \cdot \frac{\partial\tau^*(\hat{\theta}_d, k_{d,max})}{\partial\theta_d} > 0,$$

where the inequality follows from Proposition 1 and the fact that $\partial Q/\partial\tau > 0$ (cf. (14)).

[28] Because $\eta \leq \overline{\eta}$, $\vartheta(\theta_d, k_{d,max}, y) \geq \theta_{d,min}$ for all $\theta_d \in [\theta_d^m, \theta_d^m/2]$.

Because $f(\theta_d, k_d) > 0$ for all (θ_d, k_d), $\hat{\psi}(\theta_d)$ is increasing in θ_d in the interval $\left[\theta_d^m, \frac{\theta_d^m}{2}\right]$. Finally, because $\eta \leq \overline{\eta}$, the definition of θ_d^m yields that $\hat{\psi}(\theta_d^m) < 1/2$ and $\hat{\psi}(\theta_d^m/2) > 1/2$. We conclude that there exists a unique $\theta_d^\dagger \in \left[\theta_d^m, \frac{\theta_d^m}{2}\right]$ such that $\hat{\psi}(\theta_d^\dagger) = 1/2$.

If $\eta \leq \overline{\eta}$, starting from voter $(\theta_d^\dagger, k_{d,max})$, function $\vartheta\left(\theta_d^\dagger, k_{d,max}, k_d\right)$ uniquely identifies a mass of voters in each class k_d that supports levels of redistribution above or below $\tau^*\left(\theta_d^\dagger, k_{d,max}\right)$. Integrating over the set of social classes, we obtain the mass of voters in the overall population with preferred tax rate above or below $\tau^*\left(\theta_d^\dagger, k_{d,max}\right)$. As argued in the main text, in a Downsian model of electoral competition, both candidates must propose the tax rate preferred by voter $(\theta_d^\dagger, k_{d,max})$. This is also the preferred tax rate of any voter $(\vartheta(\theta_d^\dagger, k_{d,max}, k_d), k_d)$. By construction, such tax rate is the unique value that solves $\varphi\left(\tau, \vartheta(\theta_d^\dagger, k_{d,max}, k_d), k_d\right) = 0$. The Proposition follows defining $\vartheta(\theta_d^\dagger, k_{d,max}, k_d^m) = \theta_d^*$. □

Proof of Proposition 6.

Take any sequence $(\eta_n)_{n\geq 1} \to 0$. Obviously, the conditions of Proposition 5 hold when n is sufficiently large. Suppose this is indeed the case and let $(\theta_{d,n}^*, k_d^m)$ be the sequence of decisive voters as defined by (17). For every (θ_d, k_d, k_d'), we have $Q(\theta_d, k_d) \to 0$ and, consequently, $\vartheta(\theta_d, k_d, k_d') \to \theta_d$. $\psi(\cdot, \cdot)$ is a continuous function; thus for every (θ_d, k_d) the left-hand side of (17) converges to $F_{d,\theta}(\theta_d)$. At $\eta = 0$, $\psi(\theta_d, k_d^m) = 1/2$ if and only if $\theta_d = \theta_d^m$. Then $(\theta_{d,n}^*, k_d^m)$ converges to (θ_d^m, k_d^m). Moreover, the actual tax rate will be the preferred tax rate of voter (θ_d^m, k_d^m) which is given by $\tau_B^*(\theta_d^m)$.

Now consider any sequence of $(\sigma_{k,n})_{n\geq 1} \to 0$. As $(\sigma_{k,n})_{n\geq 1} \to 0$, $Q(\theta_d, k_d)$ converges to 0 for all (θ_d, k_d). Thus $\vartheta(\theta_d, k_d, k_d') \to \theta_d$ for all (θ_d, k_d, k_d') and $\psi(\theta_d, k_d) \to F_\theta(\theta_d)$ for all (θ_d, k_d). Following steps similar to the ones we used in the proof of Proposition 5 we can show that, for values of σ_k low enough, the identity of the decisive voter will be identified by (17) and the equilibrium tax rate will be the unique preferred tax rate of the decisive voter. This is indeed the case along the sequence $(\sigma_{k,n})_{n\geq 1}$ when n is sufficiently large. At $\sigma_k = 0$, the decisive voter is equal to (θ_d^m, k_d^m) and, obviously, $k_d^m = 0$. Thus, the sequence of decisive voters converges to $(\theta_d^m, 0)$ and the equilibrium tax rate converges to the preferred tax rate of such voter. In turn, this limit is given by $\frac{d\ell^{-1}(-(1+\eta)\theta_d^m)}{d\tau}$ if $(1+\eta)\theta_d^m + \frac{d\ell(\tau)}{d\tau} = 0$ admits a solution for some $\tau \in [0,1]$, or by 1 if the right-hand side of the previous equality is positive for all $\tau \in [0,1]$.

Finally, consider a sequence of $(\sigma_{\theta,n})_{n\geq 1} \to 0$. As $(\sigma_{\theta,n})_{n\geq 1} \to 0$, $Q(\theta_d, k_d)$ converges to 0 for all (θ_d, k_d). Thus $\vartheta(\theta_d, k_d, k'_d) \to \theta_d$ for all (θ_d, k_d, k'_d) and $\psi(\theta_d, k_d) \to F^*_\theta(\theta_d)$ for all (θ_d, k_d) where

$$F^*_\theta(\theta_d) = \begin{cases} 1 & \text{if } \theta_d \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

As in the proof of Proposition 5, we can show that for σ_θ small enough the identity of the decisive voter is identified by (17). This is indeed the case along the sequence $(\sigma_{\theta,n})_{n\geq 1}$ when n is sufficiently large. At $\sigma_\theta = 0$, and the decisive voter is equal to $(0, k^m_d)$. Thus, the sequence of decisive voters converges to $(0, k^m_d)$ and the equilibrium tax rate converges to the preferred tax rate of such voter. In turn, this tax rate is given by 0 because the productivity of the decisive voter converges to 0 as $(\sigma_{\theta,n})_{n\geq 1} \to 0$. $\square$

References

[1] Acharya, A. (2016). Information Aggregation Failure in a Model of Social Mobility, *Games and Economic Behavior*, 100, 257-272.

[2] Akerlof, G.A. (1976). The economics of caste and of the rat race and other woeful tales, *Quarterly Journal of Economics*, 90, 599-617.

[3] Akerlof, G.A. (1997). Social distance and social decisions, *Econometrica*, 65, 1005-1027.

[4] Alesina, A., G. M. Angeletos (2005). Fairness and redistribution, *American Economic Review*, 95, 960-980.

[5] Alesina, A., Giuliano, P. (2011). Preferences for redistribution, in Benhabib, J., Jackson, M.O. and Bisin, A. (eds), *Handbook of Social Economics*, Vol. 1A, The Netherlands: North Holland, pp. 93-131.

[6] Alesina, A., Glaeser, E. (2004). *Fighting poverty in the US and Europe: A world of difference*, Oxford University Press, Oxford UK.

[7] Alesina, A. La Ferrara, E. (2005). Preferences for redistribution in the land of opportunities, *Journal of Public Economics*, 89, 897-931.

[8] Archer, L., Hutchings, M., Ross, A. (2005). *Higher education and social class: Issues of exclusion and inclusion*. Routledge.

[9] Barberis, N., Thaler, R. (2003). A survey of behavioral finance, in Constantinides, G.M., Harris, M. and Stulz, R.M. (eds), *Handbook of the Economics of Finance*, Vol. 1, Elsevier, pp. 1053-1128.

[10] Barth, E., Finseraas, H., Moene, K. (2015). Political reinforcement: How rising inequality curbs manifested welfare generosity, *American Journal of Political Science*, 59, 565-577.

[11] Becker, G. Murphy, K., Werning, I. (2005). The equilibrium distribution of income and the market for status, *Journal of Political Economy*, 113, 282-310.

[12] Bénabou, R., Ok, E. (2001). Social mobility and the demand for redistribution: The POUM hypothesis, *Quarterly Journal of Economics*, 116, 447-487.

[13] Bénabou, R., Tirole, J. (2006a). Belief in a just world and redistributive politics, *Quarterly Journal of Economics*, 121, 699-746.

[14] Bénabou, R., Tirole, J. (2006b). Incentives and prosocial behavior. *The American Economic Review*, 96, 1652-1678.

[15] Bilancini, E., Boncinelli, L. (2012). Redistribution and the notion of social status, *Journal of Public Economics*, 96, 651-657.

[16] Bowles, S., Park, Y. (2005). Emulation inequality and work hours: was Thorsten Veblen right?, *The Economic Journal*, 115, F397-F412.

[17] Breen, R., Jonsson, J.O. (2005). Inequality of opportunity in comparative perspective: Recent research on educational attainment and social mobility, *Annual Review of Sociology*, 31, 223-243.

[18] Brown-Iannuzzi, J.L., Lundberg, K.B., Kay, A.C., Payne, B.K. (2015). Subjective status shapes political preferences, *Psychological Science*, 26, 15-26.

[19] Cervellati, M., Esteban, J., Kranich, L. (2010). Work values, endogenous sentiments and redistribution, *Journal of Public Economics*, 94, 612-627.

[20] Clark, A.E., Oswald, A.J. (1998). Comparison-concave utility and following behaviour in social and economic settings, *Journal of Public Economics*, 70, 133-155.

[21] Cooper, B., Garcia-Penalosa, C., Funck, P. (2001). Status effect and negative utility growth, *The Economic Journal*, 111, 642-665.

[22] Corneo, G., Grüner, H.P. (2000). Social limits to redistribution, *American Economic Review*, 90, 1491-1507.

[23] Corneo, G., Grüner, H.P. (2002). Individual preferences for political redistribution, *Journal of Public Economics*, 83, 83-107.

[24] Costa-Font, J., Cowell, F. (2015). Social identity and redistributive preferences: A survey, *Journal of Economic Surveys*, 29, 357-374.

[25] Davis, N.J., Robinson, R.V. (1988). Class identification of men and women in the 1970s and 1980s, *American Sociological Review*, 53, 103-112.

[26] Dow, G., Reed, C. (2013). The origins of inequality: Insiders, outsiders, elites, and commoners, *Journal of Political Economy*, 121, 609-41.

[27] Fisman, R., Jakiela, R., Kariv, S. (2015). How did distributional preferences change during the Great Recession?, *Journal of Public Economics*, 128, 84-95.

[28] Fong, C. (2001). Social preferences, self-interest, and the demand for redistribution, *Journal of Public Economics*, 82, 225-246.

[29] Gallice, A., Grillo, E. (2018). A model of educational investment, social concerns and inequality, *The Scandinavian Journal of Economics*, forthcoming.

[30] Gans, J.S., Smart, M. (1996). Majority voting with single-crossing preferences, *Journal of Public Economics*, 59, 219-237.

[31] Gilens, M. (1999). *Why Americans Hate Welfare: Race, Median and the Politics of Anti-Poverty Policy.* Chicago University Press, Chicago.

[32] Gilman, A. (1981). The development of social stratification in bronze age Europe, *Current Anthropology*, 22, 1-23.

[33] Giuliano, P., Spilinbergo, A. (2014). Growing up in a recession, *Review of Economic Studies*, 81, 787-817.

[34] Henrich, J., Boyd, R. (2008). Division of labor, economic specialization, and the evolution of social stratification, *Current Anthropology*, 49, 715-24.

[35] Hollingshead, A. (2011). Four Factor Index of social status, *Yale Journal of Sociology*, 8, 21-52.

[36] Hopkins, E., Kornienko, T. (2004). Running to keep in the same place: Consumer choice as a game of status, *American Economic Review*, 94, 1085-107.

[37] Jencks, C. (1979). *Who gets ahead? The determinants of economic success in America.* New York: Basic Books.

[38] Kalmijn, M. (1994). Assortative mating by cultural and economic occupational status, *American Journal of Sociology*, 100, 422-52.

[39] Koenig, T., Lausen, T., Wagener, A. (2017). Social status concerns and the political economy of publicly provided private goods, Mimeo.

[40] Layte, R. (2012). The association between income inequality and mental health: testing status anxiety, social capital, and neo-materialist explanations, *European Sociological Review*, 28, 498-511.

[41] Layte, R., Whelan, C.T. (2014). Who feels inferior? A test of the status anxiety hypothesis of social inequalities in health, *European Sociological Review*, 30, 525-535.

[42] Levy, G., Razin, R. (2015). Preferences over equality in the presence of costly income sorting, *American Economic Journal: Microeconomics*, 7, 308-337.

[43] Lin, N. (1999). Social networks and status attainment, *Annual Review of Sociology*, 25, 467-487.

[44] Lin, N., Ensel, W.M., Vaughn, J.C. (1981). Social resources and strength of ties: Structural factors in occupational status attainment, *American Sociological Review*, 46, 393-405.

[45] Lupu, N., Pontusson, J. (2011). The structure of inequality and the politics of redistribution, *American Political Science Review*, 105, 316-336.

[46] Luttmer, E.F.P. (2001). Group loyalty and the taste for redistribution, *Journal of Political Economy*, 109, 500-528.

[47] Luttmer, E.F.P., Singhal, M. (2011). Culture, context, and the taste for redistribution, *American Economic Journal: Economic Policy*, 3, 157-179.

[48] Mason, L. (2013). The rise of uncivil agreement: Issue versus behavioral polarization in the American electorate, *American Behavioral Scientist*, 57, 140-159.

[49] McCarty, N., Poole, K., Rosenthal, H. (2006). *Polarized America: The dance of ideology and unequal riches.* Cambridge, MA: MIT Press.

[50] Meltzer, A., Richard, S. (1981). A rational theory of the size of government, *Journal of Political Economy*, 89, 914-927.

[51] Milgrom, P., Shannon C. (1994). Monotone Comparative Statics, *Econometrica*, 62, 157-180.

[52] Personn, T., Tabellini, G. (2002). *Political Economics: Explaining Economics Policies*, MIT Press, Cambridge, Massachussets.

[53] Piketty, T. (1995). Social mobility and redistributive policies, *Quarterly Journal of Economics*, 110, 551-584.

[54] Pontusson J., Rueda, D. (2008). Inequality as a source of political polarization: A comparative analysis of twelve OECD countries. In P. Beramendi and C.J. Anderson (Eds.), Democracy, inequality and representation, 312-353. New York: Russell Sage.

[55] Postlewaite, A. (1998). The social basis of interdependent preferences, *European Economic Review*, 42, 779-800.

[56] Roberts, K. W. (1977). Voting over income tax schedules, *Journal of Public Economics*, 8, 329-340.

[57] Romer, T. (1975). Individual welfare, majority voting and the properties of a linear income tax, *Journal of Public Economics*, 7, 163-188.

[58] Shayo, M. (2009). A model of social identity with an application to political economy: nation, class, and redistribution, *American Political Science Review*, 103, 147-174.

[59] Voorheis, J., McCarty, N., Shor, B. (2015), Unequal incomes, ideology and gridlock: How rising inequality increases political polarization, Mimeo.

[60] Wilkinson, R. G., Pickett, K. (2009). Income inequality and social dysfunction, *Annual Review of Sociology*, 35, 493-511.