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Political economy of growth with a taste for status☆

Lewis S. Davis

Union College, 807 Union Street, Schenectady, NY 12308, United States of America

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ABSTRACT

This paper investigates the political economy of growth when individuals prefer high levels of relative consumption. A pivotal voter determines the equilibrium tax on capital, the revenues from which fund the provision of productive public goods. The taste for status and the distributions of wealth and political power interact to generate stylized versions of oligarchies, middle-class democracies and populist democracies. A rise in the taste for status increases the role of distributional concerns in policy preferences, lowering growth in an oligarchy or populist democracy, but increasing it in a middle-class democracy. In addition, the egalitarian redistribution of wealth or political power causes growth to first rise and then fall as the equilibrium tax rate approaches and then exceeds its growth-maximizing level, generating inverse U-shaped relationships between democracy and growth and inequality and growth.

1. Introduction

In spite of over two decades of subsequent research, the inverted U-shaped relationship between democracy and growth identified by Barro (1996, 1997) remains an important point of reference in the political economy of growth.[1] In part, the enduring importance of the pattern identified by Barro appears to reflect the very diversity of empirical findings regarding democracy and growth, which makes the possibility of heterogeneous effects more plausible. Perhaps more importantly, the argument used to support an inverted U-shaped relationship is intuitively appealing in that it posits that democracy, like many other factors in economic and political life, is subject to diminishing returns. Thus, while a modest amount of democracy may be good for growth, too much is harmful. Indeed, much of the theoretical work on democracy and growth captures one or the other of these relationships, emphasizing either the growth enhancing benefits of democratic over oligarchic arrangements (Acemoglu, 2008; Bourguignon and Verdier, 2000) or the growth-retarding effects of redistributive pressures in fully democratic societies (Alesina and Rodrik, 1994; Persson and Tabellini, 1994).

This paper introduces a parsimonious political economy model that captures both of these possibilities, generating an inverted-U shaped relationship between democracy and growth. Moreover, it simultaneously generates an inverted U-shaped relationship between wealth inequality and growth, a pattern initially identified by Barro (2000).[2] The production side of the model is identical to that in Alesina and Rodrik (1994), in which productive public goods are financed by a tax on capital. The mechanisms at work in Alesina and Rodrik's (1994) model will be familiar to many readers, focusing attention on two innovations introduced here.

The first innovation regards the structure of preferences. We assume that agents care about their level of relative consumption, as first proposed in Veblen's (1915) classic work on conspicuous consumption and formally analyzed in Frank's (1985, 2005) work on positional

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E-mail address: davisl@union.edu.

[1] An inverted U-shaped relationship between democracy and growth is also found by Plumper and Martin (2003) and Comeau (2003). Libman (2012) reviews the literature on non-linearities between democracy and growth.

[2] For additional evidence of a non-linear relationship between inequality and growth, see, for example, Banerjee and Duflo (2003), Chen (2003), Cho et al. (2014), Lin et al. (2009), and Grigoli and Robles (2017).

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goods. Economists have traditionally been reluctant to consider theories rooted in heterodox preferences, on the argument that any social outcome may be justified by referring to arbitrary tastes. A taste for social status, however, is far from arbitrary. A taste for status is evolutionarily adaptive (Frank, 1985) and may emerge as an equilibrium outcome in models of rational choice (Cole et al., 1992; Bisin and Verdier, 1998). Moreover, the emerging literature on the determinants of subjective wellbeing has left little doubt of the reality of social comparisons and, in particular, of the importance of relative income and consumption levels as arguments of individual utility functions.[3]

The second innovation regards the political system. Alesina and Rodrik (1994) consider only two political systems, a pure democracy in which policies are chosen by the median voter and a capitalist dictatorship. We expand on these options by introducing wealth-based suffrage restrictions, as in Benabou (1996).[4] This approach allows us to consider a continuum of political arrangements that exist between universal suffrage and capitalist dictatorship and to investigate the implications of marginal changes in political arrangements, such as are often found in the data.

The assumption that suffrage is restricted by wealth is in broad accord with the historical record, and the extension of the franchise has often taken the form of reducing the economic threshold for suffrage or including previously excluded groups, such as women and racial minorities, that were relatively poor (Lizzeri and Persico, 2004; Engerman and Sokoloff, 2005; Przeworski, 2009). In addition, while limits on adult suffrage are not common in modern democracies, evidence on voting restrictions suggests that these disproportionately affect voter participation among less wealthy individuals.[5] Indeed, if one accepts Lijphart's (1997, 2) claim that "low voter turnout means unequal and socioeconomically biased turnout," then the wealth-based suffrage restrictions considered here may be interpreted as capturing one aspect of a much broader set of policies, institutions, and sociological factors that reduce voter participation and shift the balance of political power toward wealthier groups and individuals.[6]

The model produces several noteworthy results. First, the taste for status plays very different roles in the public and private sectors. A taste for status directly influences agents' preferred tax rates and, thereby, the equilibrium tax policy. In contrast, taking the tax rate as given, the taste for status plays no role in determining key private sector outcomes, including the equilibrium growth rate and the level of income inequality, and, indeed, the equilibrium time-path of consumption is shown to be optimal.[7] This outcome contrasts strongly with Frank (1985), who argues that a taste for status leads to over-consumption and, thus, reduces growth.

Second, the values of key cultural, political and economic parameters partition societies into three types, which we characterize as a *populist democracy*, a *middle-class democracy*, and a *status-oriented oligarchy*. Each societal type exhibits distinct relationships between wealth inequality, the level of democracy, and the taste for status as determinants of the equilibrium tax policy, the rate of economic growth, and income inequality. In a populist democracy the pivotal voter is poor, in that she has less than the average level of capital, and selects an equilibrium tax rate that is greater than the growth-maximizing level of taxes. Moreover, as the social status of the pivotal voter is increasing in the tax rate, a taste for status leads even higher equilibrium taxation, which further lowers economic growth.

At the other extreme is a status-oriented oligarchy, characterized by extreme levels of political inequality. In these societies, concerns over relative consumption lead an elite pivotal voter to undersupply public goods relative to the growth-maximizing level, resulting in low rates of growth and high levels of income inequality. In status-oriented oligarchies, a rise in the taste for status serves to increase the distributional concerns of the pivotal voter, lowering the equilibrium tax rate and reducing the rate of growth. These outcomes correspond in a stylized fashion to the historical accounts of colonial development. For example, Sokoloff and Engerman (2000, p. 224) argue that the political and economic elites in the sugar and mining colonies of the new world established "rules, laws and other government policies that advantaged members of the elite relative to non-members." Similarly, Acemoglu et al. (2001, 2002) stress the growth-retarding effects of policies designed to serve elite interests, noting that elites in extractive colonies tend to establish institutions that "concentrate power in the hands of a small elite and create a high risk of expropriation for the majority of the population, [and thus] are likely to discourage investment and economic development." (Acemoglu et al., 2002, p. 1235).

Between these two types of societies lie middle-class democracies. In these societies, political power is less concentrated, such that the pivotal voter is moderately wealthy, having a capital endowment somewhat greater than the mean. Surprisingly, in middle-class democracies, an increase in the taste for status acts to moderate the pivotal voter's inclination to over-tax capital, raising the rate of economic growth. Not only does the model predict that the effect of status preferences depends on the distribution of economic and political power, but in middle-class democracies the predicted effect for middle-class democracies is the opposite of that expected from analyses that emphasize over-consumption (Frank, 1985).

Third, the model generates novel predictions regarding the relationships between democracy and wealth inequality and the rate of economic growth. In a capitalist dictatorship, in which the wealthiest individual is the pivotal voter, status concerns lead to an undersupply of public goods relative to the growth maximizing level. In such a society, democratization politically empowers less wealthy individuals, who prefer higher capital tax rates, leading the growth rate to first rise and then fall, as the franchise expands. Thus, the model generates an inverted U-shaped relationship between growth and democracy first noted by Barro (1996, 1997). A similar set of interactions causes growth to rise and then fall with increases in the equality of the wealth distribution, generating an inverted U-shaped relationship as in Barro (2000). The idea that low levels of democracy and high levels of wealth inequality generate bad institutional and policy outcomes is not new and is found, for example, in Acemoglu et al. (2001), Rivera-Batiz (2002) and Easterly (2007). However, the potential link between a taste for status and these inverted U-shaped patterns has not been formerly recognized. Finally, the political and economic impacts of an increase in wealth inequality are shown to parallel the impacts of a rise in the taste for status. That is, stronger *preferences* over distributional outcomes mimic changes in the *actual* distribution of wealth.

The model developed here significantly extends the literature on status preferences and economic growth by endogenizing policy

[3] Researchers have found evidence of a preference for status using a variety of comparison groups including co-workers (Brown et al., 2007; Clark and Oswald, 1996), siblings (Kuegler, 2009), those in the same neighborhood (Luttmer, 2005), those of the same race and ethnicity (Davis and Wu, 2014), and people within one's state of residence (Blanchflower and Oswald, 2004). See Clark et al. (2008) and Heffetz and Frank (2011) for recent reviews of this literature.

[4] Benabou (1996, 25) proposes a number of reasons a political system may be "biased against the poor" including "a wealth-restricted voting franchise, unequal lobbying power, vote buying, or simply the fact that poor and less educated individuals have lower participation rates in elections."

[5] For evidence on particular voting restrictions, see Cascio and Washington (2014) on literacy tests, Avery and Peffley (2005) and Brians and Grofman (2001) on restrictive voter registration laws, Alvarez et al. (2007) and Hajnal et al. (2017) on voter identification laws, and Potrafke and Rösel (2018) on restricted polling hours. Each of these studies finds that voting restrictions disproportionately affect participation more among less wealthy individuals, relatively poor minority groups, or political parties associated with the working class. Compulsory voting laws have the opposite effect, e.g. Jaitman (2013) and Carey and Horiuchi (2017). See Hershey (2009) for a review of this literature.

[6] There is an enormous literature on voter turnout. See Cancela and Geys (2016) and Stockemer (2017) for recent reviews.

[7] This result holds for more generalized preferences, e.g. Fisher and Hof (2000) and Arrow and Dasgupta (2009).

formation.[8] To the degree that it addresses policy, the existing literature focuses on normative questions regarding optimal taxation, as in Frank (1985, 2005), Fershtman et al. (1996), Ljundqvist and Uhlig (2000), Dupor and Liu (2003) and Kawamoto (2008). In contrast, this paper provides a *positive* theory of policy determination, showing how a taste for status interacts with wealth and political inequality to determine the rate of economic growth.

A closely related literature considers whether the status concerns that arise from social matching may limit preferences for redistribution.[9] In Corneo and Grüner (2000), middle-class agents may moderate their preferred level of redistribution when consumption provides a signal of their quality in social matches. Inequality may reduce the attractiveness of redistribution relative to social sorting (Levy and Razin, 2015). These models consider the preference for redistribution in a static setting with egalitarian political institutions. In contrast, the model developed here focuses on preferences regarding the provision of productive public goods, which provides an efficiency case for taxation, and addresses policy selection in an explicitly dynamic setting with a continuum of political arrangements.

By integrating a taste for status into a classical model of the political economy of growth, the model provides a parsimonious explanation for inverted U-shaped relationships between both democracy and growth and inequality and growth. As noted earlier, most theoretical treatments of the democracy-growth relationship generate either a positive or a negative relationship. An exception is Plumper and Martin (2003), who find generate an inverse U-shaped relationship based on excessive rent seeking in autocratic governments and excessive government spending in full democracies. Despite its significant contribution, Plumper and Martin (2003) only formalize government decision-making; the relationship between government decisions and economic outcomes is treated in a purely discursive fashion. Similarly, Banerjee and Duflo (2003) and Benhabib (2003) provide political economy models that support a non-linear relationship between inequality and growth, based on the breakdown economic cooperation by groups with a low economic stake, but they do not consider the implications of alternative political arrangements.

The remainder of the paper proceeds as follows. Section 2 introduces and solves the economic model. Section 3 solves for the political equilibrium. Section 4 investigates the political economy of status preferences, democracy and wealth inequality. Section 5 concludes.

2. Growth and inequality with a taste for status

2.1. Preferences

We follow Veblen (1915) and Frank (1985) in formalizing status preferences around the notion of relative consumption. Lifetime utility is the discounted stream of instantaneous utility:

$$V_i = \int_0^\infty e^{-\rho t} u_{it} \mathrm{d}t, \tag{1}$$

where $\rho > 0$ and instantaneous utility is given by

$$u_{it} = \ln(c_{it}) - \gamma \ln(\bar{c}_t) \tag{2}$$

where $\gamma \in [0,1)$ and $c_i(t)$ and $\bar{c}(t)$ are the levels of individual and average consumption at time t.

As indicated in Eq. (2), instantaneous utility depends positively on an individual's consumption $c_i(t)$ and negatively on average level of consumption $\bar{c}_t(t)$. The parameter γ determines the relative weights of absolute and relative consumption in instantaneous utility, with a higher value of γ indicating a greater relative weight on relative consumption. Because of this, we will refer to γ as the *strength of relative consumption preferences* or as *the taste for status*. We will refer to a society in which $\gamma = 0$ as an *egoistic society*, as utility depends only on own consumption. In contrast, we will refer to a society in which $\gamma \in (0,1)$ as a *status-oriented society*, since in this case agents have a preference for high relative consumption.

2.2. Production

Production in this model is identical to that in Alesina and Rodrik (1994). There is a unit measure of individuals, indexed by i, and endowed with one unit of labor and $k_i(t)$ units of capital. Individual output depends on technology A, the capital-labor ratio k, the flow of productive public goods z:

$$q_i(t) = Ak(t)^\alpha z(t)^{1-\alpha} l_i^{1-\alpha} \tag{3}$$

The provision of productive public goods is funded by a tax on the capital stock, so that the stock of public goods available for production at any time is given by $z(t) = \tau k(t)$. I follow Alesina and Rodrik (1994) in interpreting capital broadly, to include all resources that are accumulated, including human capital and appropriable technology.[10] Alesina and Rodrik (1994, pp. 471–472) argue that a wide variety of policies and institutions, including progressive income taxation, some trade restrictions, and labor unions, redistribute income from capital to labor and, thus, have "qualitatively the same impact" as a tax on capital.

Individual i is endowed with a single unit of labor, which is supplied inelastically, and an initial stock of capital, k_{i0}, which differs across individuals. Individual heterogeneity may be summarized by the ratio of an individual's relative labor endowment, which we measure relative to the economy average,

$$\sigma_i = \frac{\ell_i / k_i}{\bar{\ell} / \bar{k}} = \bar{k} / k_i \in (0, \infty) \tag{4}$$

where the second equality follows from $\ell_i = \bar{\ell} = 1$. Thus, an individual's relative labor endowment is decreasing in her share of the aggregate stock of capital, so that a rise in σ_i corresponds to a reduction in the relative wealth of individual i. We further assume that individuals are ordered by their relative labor endowments and that σ_i is strictly increasing and continuously differentiable in i: $\frac{\mathrm{d}\sigma_i}{\mathrm{d}i} > 0$.

Individual i's after tax income is given by $y_i = (\sigma_i \omega(\tau) + r(\tau))k_i$, where

$$\omega(\tau) = (1-\alpha)A\tau^{1-\alpha} \tag{5}$$

is the wage-capital ratio, which we will call the *normalized wage rate*, and

$$r(\tau) = \alpha A \tau^{1-\alpha} - \tau \tag{6}$$

[8] Frank (1985) argues that consumption-based status concerns may lead to overconsumption, reducing saving and growth. Cole et al. (1992) find that status based on wealth, rather than ancestry, increases saving and economic growth. Fershtman et al. (1996) find that concerns over occupational status may distort the allocation of talent, reducing economic growth. Kawamoto (2008) argues that education-based status may lead to faster than optimal growth. Chang et al. (2008) show that human capital-based status preferences raise the equilibrium growth rate. Murota and Ono (2011) show that status preferences based on money may lead to stagnation. A number of models specifically address the interaction of status preferences and economic inequality. For example, Corneo and Jeanne (2001) show that in the presence of wealth-based status preferences, inequality reduces growth as it reduces the payoff to social climbing through accumulation, whereas in a wealth signaling model, Corneo and Jeanne (1999) find that inequality may either increase or decrease the return to wealth in terms of social status, and Kawamoto (2009) argues that the structure of status preferences matters both for the equilibrium growth rate and for the evolution of inequality.

[9] Reductions in inequality may also have counter-intuitive impacts on the welfare of the poor by increasing status competition and conspicuous consumption, e.g. Hopkins and Kornienko (2004).

[10] Aggregating capital raises important conceptual and practical issues (Cohen and Harcourt, 2003). An alternative might be to use the initial distribution of land or the wheat-sugar suitability ratio (Easterly, 2007).

is the after-tax return to capital. Note that the normalized wage is strictly increasing in the tax rate. In contrast, a rise in the tax rate increases the return to capital, through its effect on the provision of public goods, and decreases it, since capital is being taxed. Since the first effect is subject to diminishing returns, the return to capital rises and then falls in the tax rate. As shown below, this disparity in the effect of taxation on factor returns gives rise to differences in the preferred tax rates of individuals with different relative labor endowments.

Factor returns and the distribution of capital determine the distribution of income, which we will measure using the Gini coefficient:

$$G^y\left(\tau, G^k\right) = \left[\frac{r(\tau)}{r(\tau)+\omega(\tau)}\right]G^k, \tag{7}$$

where $G^k = \frac{1}{2}\int_0^1\int_0^1 |\sigma_i{}^{-1} - \sigma_j{}^{-1}| \mathrm{d}i\mathrm{d}j$ is the Gini coefficient for the distribution of capital.

2.3. The consumer's problem

The consumer's problem is to choose a consumption stream to maximize lifetime utility subject to the accumulation equation, taking the time paths of the tax rate and the average levels of consumption and capital as given. In solving this problem, we assume that the tax rate is, in fact, constant over time. In the following section, we show this to be true of the equilibrium tax rate along a balanced growth path. The consumer's problem is, thus,

$$\max_{c_i(t)} V_i = \int_0^\infty e^{-\rho t}\{\ \ln(c_i(t)) - \gamma\ \ln(\overline{c}(t))\}\mathrm{d}t$$
$$\text{s.t.} \dot{k}_i(t) = \omega(\tau)\overline{k}(t) + r(\tau)k_i(t) - c_i(t) \ \text{ and } \ k_i(0) = k_{i0}.$$

As is well known, along the equilibrium growth path, consumption and capital grow at a constant rate

$$g \equiv \frac{\dot{c}_i}{c_i} = \frac{\dot{k}_i}{k_i} = r(\tau) - \rho \tag{8}$$

which is common across individuals. Note that because individual capital stocks grow at the same rate, relative labor endowments will be constant over time: $\sigma_i(t) = \frac{\overline{k}(t)}{k_i(t)} = \sigma_i(0)$. As a result, along the equilibrium growth path, the distributions of income and wealth are constant over time.

Finally, substituting Eq. (8) into the accumulation equation, we get expressions for the initial levels of individual and average consumption:

$$c_{i0} = (\sigma_i\omega(\tau) + \rho)k_{i0} \tag{9}$$

and

$$\overline{c}_0 = (\omega(\tau) + \rho)\overline{k}_0. \tag{10}$$

Eq. (9) indicates that at each point in time an individual consumes her entire labor income as well as a portion ρ of her capital stock. Note also that the return to capital does not play a role in determining the level of the steady state consumption path. We summarize our findings regarding the relationship between the taste for status and steady state economic outcomes in the following proposition:

Proposition 1. *The irrelevance of the taste for status for steady state economic outcomes.*

Given a constant tax rate, $\tau \geq 0$, and $\gamma \in [0,1)$, the taste for status has no effect on steady state economic variables. In particular, the following variables are independent of the strength of status preferences in the steady state: the rate of per capita income growth, the time paths of consumption levels and capital stocks for all individuals, factor prices, and the distributions of wealth and income.

Proof. Proposition 1 follows directly from Eqs. (9)–(11).

The independence of the consumption path from the taste for status may appear counter-intuitive and conflicts with Frank (1985), who finds that relative consumption preferences generate a negative consumption externality that leads to greater-than-optimal consumption of the positional good. In fact, however, the apparent conflict is easy to reconcile. The reason our model does not generate over-consumption is that the key trade-off in the model is not between the positional good "consumption" and the non-positional good "saving" but, rather, between current and future consumption. Since a change in the taste for status affects the marginal utilities of present and future consumption equally, it leaves the marginal rate of substitution between current and future consumption unchanged.

As suggested by the generality of this argument, the irrelevance of consumption externalities for economic outcomes in a dynamic setting is not unique to the model presented here but instead applies to a broad class of growth models with consumption externalities, as previously demonstrated by Fisher and Hof (2000) and Arrow and Dasgupta (2009). However, Proposition 1 is particularly notable in the current context because it suggests that, for a broad class of growth models, the purely economic effects of status preferences may be less important for economic growth than their political economy effects. We turn our attention to these effects now.

3. Policy preferences and political equilibrium

In this section we show that status preferences play a key role in determining equilibrium tax policy. We begin by characterizing the individual's preferred tax rate and investigating how it varies with her relative labor endowment and taste for status. Next, we develop a simple model of the allocation of political authority, which we use to show the existence of an equilibrium tax policy. Finally, we derive the comparative statics of the equilibrium tax rate with respect to the taste for status and the distributions of wealth and political power.

3.1. Preferred tax rates

An individual's preferred tax rate is the rate of taxation that maximizes her lifetime utility given optimal private decision making on the part of herself and others. Substituting Eqs. (8)–(10) into the expression for lifetime utility, we may express the voter's problem as

$$\max_{\tau \in \mathbb{R}^+} V(\tau; \sigma_i, \gamma) = \frac{(1-\gamma)g(\tau)}{\rho^2} + \frac{1}{\rho}\ \ln((\sigma_i\omega(\tau) + \rho)k_{i0}) - \frac{\gamma}{\rho}\ \ln\left((\omega(\tau) + \rho)\overline{k}_0\right) \tag{11}$$

We denote the solution to this problem for individual i as a function of her relative labor endowment and the taste for status: $\tau^*(\sigma_i, \gamma)$. The existence of a solution to the voter's problem is guaranteed by the intermediate value theorem. In particular, we have the following proposition:

Proposition 2. *Existence of a preferred tax rate.*

1. *Given $\gamma \in [0,1)$, a solution to the voter's problem exists and may be represented as a continuously differentiable function $\tau^*(\sigma_i, \gamma) \geq 0$, where $V_\tau(\tau^*(\sigma_i, \gamma); \sigma_i, \gamma) = 0$ and $V_{\tau\tau}(\tau^*(\sigma_i, \gamma); \sigma_i, \gamma) < 0$ for $\tau^*(\sigma_i, \gamma) > 0$.*
2. *There exists a threshold level of the relative labor endowment $\underline{\sigma}(\gamma) = \frac{\gamma - \alpha}{1-\alpha} < 1$ such that $\tau^*(\sigma_i, \gamma) > 0$ for $\sigma_i > \underline{\sigma}(\gamma)$ and $\tau^*(\sigma_i, \gamma) = 0$ for $\sigma_i \leq \underline{\sigma}(\gamma)$.*

Proof. See Appendix A.

The second part of the proposition implies that if the taste for status is sufficiently high, there will be some individuals who prefer a zero tax rate. This result may seem counterintuitive, since at $\tau = 0$ the return to both labor and capital is zero. To understand the intuition behind this result, consider the situation of a pure capitalist with $\sigma_i = 0$. With no labor income, a capitalist's utility depends positively on the return to capital and negatively on the level of average consumption, both of which are increasing in the tax rate in the neighborhood of $\tau = 0$. Proposition 2 implies that if the taste for status is greater than the elasticity of output with respect to capital, $\gamma > \alpha$, then the latter effect dominates, and the capitalist prefers a zero tax.

Among individuals with a preference for a positive tax rate, $\sigma_i > \underline{\sigma}(\gamma)$, poorer individuals prefer a higher tax rate:

$$\frac{d\tau^i}{d\sigma_i} = -\frac{V_{\tau\sigma}}{V_{\tau\tau}} = \frac{\rho^2\omega'(\tau)}{(\sigma_i\omega(\tau)+\rho)^2}\left[\frac{-1}{V_{\tau\tau}}\right] > 0 \tag{12}$$

where the sign of Eq. (12) follows from $V_{\tau\tau} < 0$, from part 1 of Proposition 2. Intuitively, poorer individuals prefer higher taxes because they derive more of their income from labor and the wage is increasing in the tax rate.

In contrast, a rise in the taste for status may either increase or decrease an individual's preferred tax rate, depending on her relative labor endowment. Given $\gamma \in [0,1)$ and $\sigma_i > \underline{\sigma}(\gamma)$, we have

$$\frac{d\tau^*}{d\gamma} = -\frac{V_{\tau\gamma}}{V_{\tau\tau}} = \frac{\rho^2\omega'(\tau)}{(1-\gamma)}\left[\frac{\sigma_i - 1}{(\sigma_i\omega(\tau)+\rho)(\omega(\tau)+\rho)}\right]\left[\frac{-1}{V_{\tau\tau}}\right] = \begin{cases} <0, & \sigma_i < 1 \\ =0, & \sigma_i = 1 \\ >0, & \sigma_i > 1 \end{cases} \tag{13}$$

For a poor individual, $\sigma_i > 1$, the share of wages in own consumption is greater than the share of wages in average consumption. Therefore, an increase in the tax rate increases her relative consumption. An increase in the taste for status raises the weight of relative consumption in her lifetime utility function, increasing her preferred tax rate. In contrast, for a rich individual, $\sigma_i < 1$, relative consumption is decreasing in the wage. In this case, an increase in the taste for status will decrease a relatively wealthy individual's preferred tax rate.

Finally, we show that, given $\gamma \in (0,1)$, there is a unique individual who prefers the growth-maximizing tax rate, $\hat{\tau} = (\alpha(1-\alpha)A)^{1/\alpha} > 0$. To see this, note that the first-order condition for the preferred tax rate may be expressed parametrically as a function of the tax rate: $V_g(g(\tau),\omega(\tau))g'(\tau) + V_\omega(g(\tau),\omega(\tau))\omega'(\tau) = 0$. Imposing $g'(\tau) = 0$, this expression reduces to $V_\omega = 0$. Intuitively, for a voter to prefer the growth-maximizing tax rate, she must target the growth rate exclusively, which only occurs if she is indifferent to the effects of the tax of the level of wages. As shown in Appendix A, given $\gamma \in (0,1)$, there exists a unique value of the relative labor endowment, given by $\hat{\sigma}(\gamma) = \frac{\gamma\rho}{(1-\gamma)\omega(\hat{\tau})+\rho} \geq 0$, that satisfies $V_\omega = 0$. Moreover, if an individual's relative labor endowment is above this value, she will prefer a tax rate that is above the growth maximizing level and the growth rate will be decreasing in the tax rate. Alternately, if the pivotal voter's relative labor endowment is below this level, then she will prefer a tax rate that is below the growth maximizing level.

Proposition 3. *The taste for status and the preferred tax rate.*

Given $\gamma \in (0,1)$, there exists a threshold level of the relative labor endowment, $\hat{\sigma}(\gamma) = \frac{\gamma\rho}{(1-\gamma)\omega(\hat{\tau})+\rho} \geq 0$, with $\hat{\sigma}'(\gamma) \geq 0$, $\hat{\sigma}(0) = 0$, and $\hat{\sigma}(1) = 1$, such that

1. *If $\sigma^i = \hat{\sigma}(\gamma)$, then $\tau^*(\sigma_i,\gamma) = \hat{\tau}$.*
2. *If $\sigma^i < \hat{\sigma}(\gamma)$, then $\tau^*(\sigma_i,\gamma) < \hat{\tau}$ and $g_\tau(\tau^*(\sigma_i,\gamma)) > 0$.*
3. *If $\sigma^i > \hat{\sigma}(\gamma)$, then $\tau^*(\sigma_i,\gamma) > \hat{\tau}$ and $g_\tau(\tau^*(\sigma_i,\gamma)) < 0$.*

Proof. Proposition 3 is proved in Appendix A.

3.2. Political equilibrium

In this section we develop a simple political model in which policies are chosen by a pivotal voter with relative labor endowment, σ^p, so that the pivotal voter's preferred tax rate $\tau^*(\sigma^p,\gamma)$ is a political equilibrium. The distribution of wealth and political power influence political outcomes through their impact on the relative labor endowment of the pivotal voter.

We model the distribution of political power by assuming each enfranchised citizen is endowed with equal political power, in the form of an inelastically supplied vote, while non-enfranchised citizens have no political influence. Suffrage depends on an individual's position in the hierarchy of wealth. As noted in the introduction, this is broadly consistent with the historical record, e.g. Przeworski (2009), Lizzeri and Persico (2004), and Engerman and Sokoloff (2005). While *de jure* suffrage restrictions are no longer common, their impact on the composition of voters is similar to that of voting restrictions in modern democracies, such as voter identification laws and limited polling hours, which tend to reduce turnout disproportionately among less wealthy individuals (Hershey, 2009).

To model wealth-based suffrage, we assume that under a political system $D \in [0,1]$, the electorate consists of $i \in [0,D]$. This approach encompasses a continuum of political systems ranging from a *pure democracy*, $D = 1$, in which political power is evenly distributed across individuals, to a *capitalist dictatorship*, $D = 0$, in which political power is held by a single wealthy individual. In general, for $D < 1$, voting is restricted to a fraction D of population comprised of the wealthiest individuals. In this set up, the identity of the pivotal voter is given by

$$p = D/2. \tag{14}$$

According to the median voter theorem, Downs (1957), in this political set up, the preferred policy of median voter will be a political equilibrium provided policy preferences are single-peaked, in that each voter's preferences have a unique local maximum in the policy space. The following proposition shows that such a set of parameters exists:

Proposition 4. *Single peaked preferences.*

1. *Given any $\gamma \in [0,1)$, there exists a non-degenerate set of parameters, $S_\gamma = \{(\alpha,\rho,A)\} \subset (0,1)^2 \times \mathbb{R}^+$, such that agents have single-peaked preferences provided $(\alpha,\rho,A) \in S_\gamma$.*
2. *Given $(\gamma_0,\alpha_0,\rho_0,A_0) \in S^* \equiv (\gamma,S_\gamma)$, $(\gamma_1,\alpha_1,\rho_1,A_1) \in S^*$ for $\gamma_1 \leq \gamma_0$, $\alpha_1 \geq \alpha_0$, $\rho_1 \leq \rho_0$, and $A_1 \geq A_0$.*

Proof. Proposition 4 is proved in Appendix A.

We may now describe the political equilibrium:

Proposition 5. *Political equilibrium.*

Given $(\gamma,\alpha,\rho,A) \in S^*$ and a political system D, there is a unique political equilibrium at time t in which the equilibrium tax rate is determined by the taste for status and the relative labor endowment of the pivotal voter, $\tau^*(\sigma_t^p,\gamma) \geq 0$, and the relative labor endowment of the pivotal voter is determined by the levels of wealth inequality and democracy, $\sigma_t^p = \sigma^p(D,G_t^k)$. Moreover, the relative labor endowment of the pivotal voter

1. *is equal to that of the median voter in a pure democracy, $\sigma^p(1,G^k) = \sigma^m \geq 1$,*
2. *is equal to one in an egalitarian society, $\sigma^p(D,0) = 1$, and*
3. *is increasing in level of democracy: $\sigma_D{}^p(D,G^k) > 0$.*

Proof. Proposition 5 follows from Proposition 4 and Eqs. (14) and (20).

Proposition 5 indicates that at each point in time the equilibrium tax rate depends on model parameters and a single variable, the pivotal voter's relative labor endowment. In addition, from Eq. (8), along a balanced growth path the rate of capital growth is constant across individuals, indicating that the distribution of capital is constant over time: $G_t^k = G_0^k$. It follows that along a balanced growth path, the pivotal voter's relative labor endowment and the equilibrium tax rate are also constant over time. Furthermore, from the analysis of the consumer's problem in Section 2, we know that given a constant tax rate, individually optimal consumption decisions lead to a balanced growth path. Taken together, these results imply the following corollary:

Corollary 1. *Given $(\gamma,\alpha,\rho,A) \in S^*$, the model supports a unique political-economic equilibrium. In equilibrium, there exists a balanced growth path, along which individual consumption levels and capital stocks grow at a constant rate that is uniform across individuals. Along this growth path, the relative labor endowment of each individual is constant over time, as are the identity of the pivotal voter and the equilibrium tax rate.*

4. Political economy of growth with a taste for status

This section investigates the implications of the model developed above for the relationships between the taste for status, democracy, and wealth inequality and various model outcomes, including the equilibrium tax rate, the rate of economic growth, and the level of income inequality. We begin by characterizing different types of societies that arise endogenously through the interactions between the taste for status and social inequality.

4.1. Four societies

The model supports the existence of four distinct types of societies, a populist democracy, a middle-class democracy, a status-oriented oligarchy, and a non-developmental state. Holding production parameters and the discount rate constant, a society is uniquely identified as a member of one of these types by its levels of democracy, wealth inequality, and the taste for status. These characteristics may be represented more succinctly by an ordered pair, (σ^p,γ), in which the distributions of political and wealth inequality are summarized by their effect on the pivotal voter's relative labor endowment.

Fig. 1 shows the relationship between the taste for status, the pivotal voter's relative labor endowment, and the equilibrium tax rate. Each of the dashed lines in Fig. 1 consists of combinations of $(\sigma^p,\gamma) \in \mathbb{R}^+ x[0,1]$ that generate the same equilibrium tax rate. The heavy dashed lines highlight parameter combinations associated with three key tax rates. The *zero tax locus* is defined by $\underline{\sigma}(\gamma) = \frac{\gamma-\alpha}{1-\alpha}$, such that the preferred tax rate of the pivotal voter is zero $\tau^* = 0$ for all points on or above this line. The *maximum growth locus* is defined by $\sigma^p = \hat{\sigma}(\gamma)$ and consists of parameter combinations such that the preferred tax rate of the pivotal voter maximizes the growth rate, $\tau^* = \hat{\tau}$. This locus is upward sloping and concave in $\sigma^p - \gamma$ space, passing through the points (0,0) and (1,1). The *egalitarian tax locus* is a vertical line at $\sigma^p = 1$ and consists of combinations of parameter values such that the pivotal voter has the average relative labor endowment. Along this line $\tau^* = \overline{\tau}$, which is the tax rate that would prevail if wealth were evenly distributed. The equilibrium tax rate rises as one moves from left to right on the graph. Iso-tax lines are also isogrowth lines. Moving left to right, the growth rate rises until one reaches the $\tau^* = \hat{\tau}$ locus and falls thereafter.

The four regions defined by these thresholds partition the parameter space into regions within which the comparative statics of taxation and growth have the same sign. A society's location in regions I–IV serves to characterize it as being one of four types, which may be characterized as a populist democracy, a middle-class democracy, a status-oriented oligarchy, and a non-developmental state. Region I consists of points to the right of the line $\sigma^p = 1$. These are societies in which political power is sufficiently evenly distributed that the pivotal voter is poor. As a result, we characterize them as *populist democracies*. With political power in the hands of a poor individual, the tax rate is higher, and the growth rate lower, than they would be in an egalitarian society: $\tau^* > \overline{\tau}$ and $g(\tau^*) < g(\overline{\tau})$. Generous public goods provision contributes to high wages and low levels of income inequality.

Region II consists of points that lie between the *maximum growth locus* and the *egalitarian tax locus*. While the pivotal voter in this region is relatively wealthy, it excludes extreme concentrations of wealth and political power. In view of this distinction, we refer to societies in region II as *middle-class democracies*. Relative to a populist democracy, in a middle-class democracy, the equilibrium tax on capital is lower, resulting in faster growth but, with a fewer public goods, also lower wages and greater income inequality. Both populist and middle-class democracies include a subset of egoistic societies, located along the horizontal axis, with $\gamma = 0$.

Region III consists of combinations of $(\sigma^p,\gamma) \in \mathbb{R}^+ x(0,1]$ that lie between the *zero-tax locus* and the *maximum growth locus*. In this region, political power is concentrated among the wealthy. Moreover, societies in this region are status-oriented in that this region does not include any points along the horizontal axis. Given these characteristics, we refer to societies in region III as *status-oriented oligarchies*. In a status-oriented oligarchy, the pivotal voter has a low relative labor endowment and a high taste for status, such that the marginal utility of the normalized wage is negative. As a result, she is willing to sacrifice growth to maintain her social status and therefore selects an equilibrium tax rate below the level necessary to maximize growth. With low levels of public good provision, these societies are characterized by low wages and high levels of income inequality. These outcomes nicely capture the intuition behind Sokoloff and Engerman's (2000) assertion that in colonies with

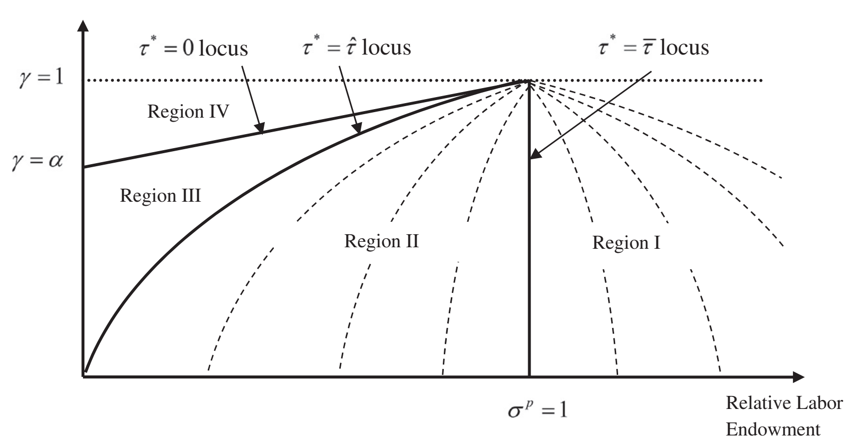

Fig. 1. Iso-tax lines by status orientation and the relative labor endowment of the pivotal voter.

high concentrations of political and economic power, elites deliberately adopted policies designed to maintain their relative status, even though these same policies simultaneously tend to undermine economic growth.

Region IV lies above the *zero tax locus* and consists of societies with extreme concentrations of political power among the wealthy and a high taste for status, which together result in an equilibrium tax rate that is zero. Because this region is associated with a wealthy political elite that refuses to provide productive public goods, we refer to societies in this region as *non-developmental state*. In a non-developmental state, output and the returns to capital and labor are identically zero, each individual consumes her capital stock at a constant rate, $c_i(t) = e^{-\rho t}k_{i0}$, and the inequality of capital and consumption are equal. While the possibility of a non-developmental state is of theoretical interest, these outcomes do not appear to describe any actual societies. As a result, we focus on the other societies for the remainder of the paper.

4.2. Growth, income inequality, and the taste for status across societies

In this section we investigate how the taste for status affects the rate of economic growth and level of income inequality and how these relationships vary across societies. Differentiating growth with respect to taste for status, we have

$$\frac{dg}{d\gamma} = \begin{cases} \dfrac{\overset{-}{dg}}{d\tau}\dfrac{\overset{+}{d\tau}}{d\gamma} < 0 & (\sigma^p, \gamma) \in R^I \\ \dfrac{\overset{-}{dg}}{d\tau}\dfrac{\overset{0}{d\tau}}{d\gamma} = 0 & \sigma^p = 1 \\ \dfrac{\overset{-}{dg}}{d\tau}\dfrac{\overset{-}{d\tau}}{d\gamma} > 0 & (\sigma^p, \gamma) \in R^{II} \\ \dfrac{\overset{0}{dg}}{d\tau}\dfrac{\overset{+}{d\tau}}{d\gamma} = 0 & \sigma^p = \hat{\sigma}(\gamma) \\ \dfrac{\overset{+}{dg}}{d\tau}\dfrac{\overset{-}{d\tau}}{d\gamma} < 0 & (\sigma^p, \gamma) \in R^{III} \end{cases} \tag{15}$$

where the signs follow from Eq. (13) and Proposition 3. The comparative static results indicate that the relationship between growth and the taste for status differs across societies. An increase in the taste for status increases the weight of distributional outcomes in the determination of the equilibrium tax rate. This increases the over-taxation of capital in a populist democracy, and furthers the under-provision of public goods in a status-oriented oligarchy, both of which reduce the equilibrium growth rate. Paradoxically, in a middle-class democracy, an increase in the taste for status raises the rate of economic growth. This occurs because a rise in the taste for status increases the importance of the pivotal voter's common social bond with the wealthy, which is that she enjoys a higher than average level of consumption, and thus moderates her incentive to tax the rich.

A similar logic underlies the relationship between the taste for status and income inequality. In this case, however, the relationship is somewhat simpler, as income inequality is decreasing in the tax rate for all societies. We have

$$\frac{dG^y}{d\gamma} = \begin{cases} \dfrac{\overset{-}{dG^y}}{d\tau}\dfrac{\overset{+}{d\tau}}{d\gamma} < 0 & \sigma^p > 1 \\ \dfrac{\overset{-}{dG^y}}{d\tau}\dfrac{\overset{0}{d\tau}}{d\gamma} = 0 & \sigma^p = 1 \\ \dfrac{\overset{-}{dG^y}}{d\tau}\dfrac{\overset{-}{d\tau}}{d\gamma} > 0 & \sigma^p < 1 \end{cases} \tag{16}$$

where the signs follow from Eqs. (7) and (13). Thus, income inequality is decreasing in the taste for status in a populist democracy and increasing in the taste for status in a middle-class democracy or status-oriented oligarchy. On the threshold between regions I and II, the pivotal voter consumes the average consumption bundle. Because of this, her tax preferences are independent of the taste for status.

4.3. Growth, income inequality, and democracy across societies

In all societies, democratizing political reform shifts political power such that an individual with a greater relative labor endowment becomes pivotal and the equilibrium tax rate rises. However, the growth implications of an increase in the tax rate differ across societies. Differentiating the growth rate with respect to the level of democracy, we have

$$\frac{dg}{dD} = \begin{cases} \dfrac{\overset{-}{dg}}{d\tau}\dfrac{\overset{+}{d\tau}}{d\sigma^p}\dfrac{\overset{+}{d\sigma^p}}{dD} < 0, & \sigma^p > \hat{\sigma}(\gamma) \\ \dfrac{\overset{0}{dg}}{d\tau}\dfrac{\overset{+}{d\tau}}{d\sigma^p}\dfrac{\overset{+}{d\sigma^p}}{dD} = 0, & \sigma^p = \hat{\sigma}(\gamma) \\ \dfrac{\overset{+}{dg}}{d\tau}\dfrac{\overset{+}{d\tau}}{d\sigma^p}\dfrac{\overset{+}{d\sigma^p}}{dD} > 0, & \sigma^p < \hat{\sigma}(\gamma) \end{cases} \tag{17}$$

where the signs follow from Eqs. (12), (14) and Proposition 3. Thus, for populist and middle-class democracies democratization reduces growth, and the mechanism underlying this result is the same as that outlined by Alesina and Rodrik (1994): an increase in democracy reduces the relative wealth of the pivotal voter, raising the equilibrium tax rate and decreasing growth and income inequality. In a status-oriented oligarchy, however, the initial tax rate is below the level necessary to maximize the rate of economic growth. In these societies, democratization shifts political power to a less wealthy individual, which increases the equilibrium tax rate, but this increases the growth rate.

Because income inequality is decreasing in the tax rate, an increase in democracy reduces the level of income inequality in all three types of societies:

$$\frac{dG^y}{dD} = \frac{\overset{-}{dG^y}}{d\tau}\frac{\overset{+}{d\tau}}{d\sigma^p}\frac{\overset{+}{d\sigma^p}}{dD} < 0. \tag{18}$$

Our results indicate that democratization generates a trade-off between growth and equality in populist and middle-class democracies. As before, however, no such tradeoff exists for a status-oriented oligarchy. An increase in democracy simultaneously increases the growth rate and decreases the level of income inequality.

Fig. 2 illustrates the relationship between growth and democracy for status-oriented and egoistic societies. In an egoistic society, growth is maximized when political power is in the hands of a pure capitalist, such that $(\sigma^p, \gamma) = (0,0)$. Since she has no labor income, an egoistic capitalist chooses the tax rate to maximize the return to capital, and thereby also maximizes growth. If we permit the level of democracy to rise, increasingly democratic societies are associated with higher rates of taxation, lower growth rates, and lower levels of income inequality. These results are familiar from Alesina and Rodrik (1994), who find that growth is decreasing in the level of democracy. The relationship between democracy and growth in an egoistic society is shown in Fig. 2 by the solid line $g(D|\gamma = 0)$.

Next, we repeat this exercise with a status-oriented society with $\gamma_0 \in (0, \alpha)$. As before, we start with $D = 0$. In this case, however, because the capitalist dictator cares about her social status, she will choose a tax rate that is below the growth-maximizing level. That is, she sacrifices both capital income and economic growth in order to increase her relative consumption. As before, successive democratic reforms increase the relative labor endowment of the pivotal voter and raise the equilibrium tax rate. In a status-oriented society, however, the growth rate will initially rise in the tax rate, as the society approaches the $\tau = \hat{\tau}$, reaching its

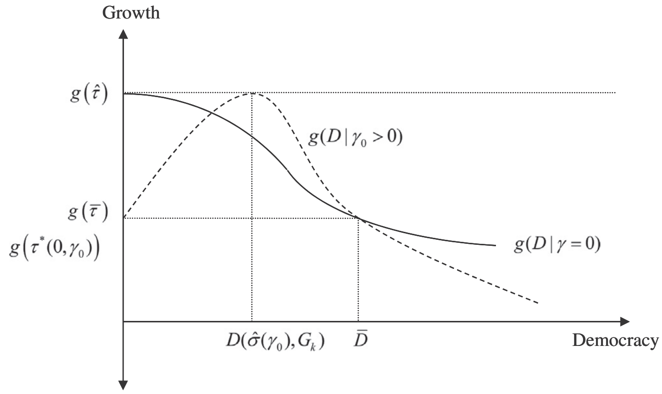

Fig. 2. Democracy and growth in egoistic and status-oriented societies.

highest point at $g(\hat{\tau})$. Thereafter the growth rate falls in the level of democracy as the society transitions first to a middle-class democracy and then to a populist democracy. The relationship between democracy and growth for a status-oriented society is illustrated in Fig. 2 by the dashed line $g(D|\gamma_0>0)$.

In this exercise, Alesina and Rodrik's (1994) result that growth is maximized in a capitalist dictatorship is shown to be a special case that obtains only in an egoistic society. In general, the growth maximizing level of democracy $\hat{D}=D(\hat{\sigma}(\gamma),G^k)$ is defined implicitly by $\hat{\sigma}(\gamma)=\sigma^p(\hat{D},G^k)$. Totally differentiating this expression, we have

$$\frac{d\hat{D}}{d\gamma}=\frac{\hat{\sigma}_\gamma}{\sigma^p_D}>0 \text{ and } \frac{d\hat{D}}{dG^k}=\frac{-\sigma^p_{G^k}}{\sigma^p_D}>0. \tag{19}$$

Thus, a more democratic political system is necessary to maximize growth in societies with a greater taste for status or greater wealth inequality. Fig. 2 also indicates there is a level of democracy at which the two curves cross, defined implicitly by $\sigma^p(\bar{D},G^k)=1$. At this level of democracy, the average voter is pivotal, $\sigma^p=1$, and the rate of economic growth is equal to that of an egalitarian society and independent of the taste for status. This discussion is summarized in the following proposition:

Proposition 6. *Status orientation, democracy and growth.*
Given $(\gamma,\alpha,\rho,A)\in S$, so that tax policy preferences are single peaked,

1. *The maximum potential growth rate for a society is given by $g(\hat{\tau})$, a value that is independent of the taste for status.*
2. *In an egoistic society, growth is maximized in a capitalist dictatorship and is monotonically decreasing in the level of democracy.*
3. *In a status-oriented-society, a capitalist dictator chooses a tax rate such that growth is below its maximum rate. The growth rate is initially increasing in the level of democracy, reaches its maximum rate at a critical level of democracy $\hat{D}$, and is falling in the level of democracy thereafter.*
4. *The growth-maximizing level of democracy is greater in societies with greater wealth inequality or a greater taste for status.*
5. *Given the initial level of wealth inequality, there exists a level of democracy, $\bar{D}=D(1,G_k)$, such that growth is independent of the taste for status.*

Thus, one of the model's key predictions is that growth rises and falls in the level of democracy for a status-oriented society, a pattern is distinct from the strictly negative monotonic relationship between democracy and growth in an egoistic society. As noted in the introduction, the inverted U-shaped relationship depicted in Fig. 2 is in keeping with Barro's (1996, 1997) finding of a quadratic relationship between democracy and growth. The mechanism in the model that generates this pattern is also closely related the interpretation that Barro provides, namely that at low levels of democracy, there are gains from increases in the rule of law, while at higher levels of democracy these gains are offset by the distortions associated with redistribution. In this interpretation, key dimensions of institutional quality, such as the protection of property rights, and the impersonal administration of justice, are important public goods that tend to be underprovided in societies with low levels of democracy (Acemoglu et al., 2001; Rivera-Batiz, 2002).

4.4. Growth, income inequality and wealth inequality across societies

The effect of a rise in wealth inequality depends entirely on its effect on its impact on the pivotal voter, which may in general be positive or negative. To avoid this indeterminacy, we restrict attention to *canonical changes in wealth inequality*, which we define here to be mean preserving redistributions of capital such that "the rich get richer and the poor get poorer." In particular, for a canonical change in wealth inequality, we have

$$\frac{d\sigma_i}{dG^k}=\begin{cases} >0, & \text{for } \sigma_i>1 \\ =0, & \text{for } \sigma_i=1 \\ <0, & \text{for } \sigma_i<1 \end{cases} \tag{20}$$

This restriction allows us to sign the impact of a broad class of changes in wealth inequality on key model outcomes. Differentiating the growth rate with respect to the level of wealth inequality, we have

$$\frac{dg}{dG^k}=\begin{cases} \overset{-}{\frac{dg}{d\tau}}\,\overset{+}{\frac{d\tau}{d\sigma^p}}\,\overset{+}{\frac{d\sigma^p}{dG^k}}<0 & (\sigma^p,\gamma)\in R^I \\ \overset{-}{\frac{dg}{d\tau}}\,\overset{+}{\frac{d\tau}{d\sigma^p}}\,\overset{0}{\frac{d\sigma^p}{dG^k}}=0 & \sigma^p=1 \\ \overset{-}{\frac{dg}{d\tau}}\,\overset{+}{\frac{d\tau}{d\sigma^p}}\,\overset{-}{\frac{d\sigma^p}{vG^k}}>0 & (\sigma^p,\gamma)\in R^{II} \\ \overset{0}{\frac{dg}{d\tau}}\,\overset{+}{\frac{d\tau}{d\sigma^p}}\,\overset{-}{\frac{d\sigma^p}{dG^k}}=0 & \sigma^p=\hat{\sigma}(\gamma) \\ \overset{+}{\frac{dg}{d\tau}}\,\overset{+}{\frac{d\tau}{d\sigma^p}}\,\overset{-}{\frac{d\sigma^p}{dG^k}}<0 & (\sigma^p,\gamma)\in R^{III} \end{cases} \tag{21}$$

Thus, the effect of a rise in wealth inequality on economic growth differs across societies. In a populist democracy, it increases the relative labor endowment of the pivotal voter, raising the equilibrium tax rate, and decreasing the growth rate. In a middle-class democracy, an increase in wealth inequality reduces the relative labor endowment of the pivotal voter, reducing the equilibrium tax rate and increasing the rate of growth. The logical progression underlying a status-oriented oligarchy is similar, except that a fall in the tax rate reduces the rate of economic growth.

Embedded in Eq. (21) are results on the relationship between inequality and equilibrium taxation. In particular, the model predicts that an increase in wealth inequality increases the equilibrium tax rate in a populist democracy and decreases it in a middle-class democracy or status-oriented oligarchy. These results suggest the traditional narrative regarding a negative relationship between inequality and taxation, originating with Meltzer and Richard (1981), holds only for a subset of democratic societies in which the pivotal voter is poor.

Comparing results for Eqs. (15) and (21), we find that the pattern of comparative statics for growth and equilibrium taxation across societies for wealth inequality is *qualitatively the same* as that for a rise in the taste for status. This provides a surprising but intuitively appealing result: the political and economic effects of a rise in the degree to which agents care about distributional outcomes mirrors those of a rise in wealth inequality. In short, a change in *preferences* over distributional outcomes mimics a change in the *actual* distribution of wealth.

Changes in wealth inequality affect income inequality through two channels. First, there is the direct effect of wealth inequality on the distribution of capital income. Second, there is an indirect, political economy effect, which acts through the impact of wealth inequality on the tax preferences of the pivotal voter. In particular, we have

$$\frac{\mathrm{d}G^y}{\mathrm{d}G^k}=\begin{cases}\dfrac{\overset{+}{G^y}}{G^k}+\dfrac{\mathrm{d}\overset{-}{G^y}}{\mathrm{d}\tau}\dfrac{\mathrm{d}\overset{+}{\tau}}{\mathrm{d}\sigma^p}\dfrac{\mathrm{d}\overset{+}{\sigma^p}}{\mathrm{d}G^k}><0 & \sigma^p>1\\ \dfrac{\overset{+}{G^y}}{G^k}+\dfrac{\mathrm{d}\overset{-}{G^y}}{\mathrm{d}\tau}\dfrac{\mathrm{d}\overset{+}{\tau}}{\mathrm{d}\sigma^p}\dfrac{\mathrm{d}\overset{0}{\sigma^p}}{\mathrm{d}G^k}>0 & \sigma^p=1\\ \dfrac{\overset{+}{G^y}}{G^k}+\dfrac{\mathrm{d}\overset{-}{G^y}}{\mathrm{d}\tau}\dfrac{\mathrm{d}\overset{+}{\tau}}{\mathrm{d}\sigma^p}\dfrac{\mathrm{d}\overset{-}{\sigma^p}}{\mathrm{d}G^k}>0 & \sigma^p<1\end{cases} \tag{22}$$

In each case, the direct effect of an increase in wealth inequality is to increase income inequality. As indicated in the third line of Eq. (22), in societies with a relatively wealthy pivotal voter the indirect effect reinforces the direct effect. A rise in wealth inequality reduces the relative labor endowment of the pivotal voter, lowering the equilibrium tax rate and raising income inequality. In a populist democracy, however, the net effect is indeterminate, as the direct effect may be partly or fully offset by the indirect effect. These results indicate that changes in wealth inequality produce a tradeoff between growth and income inequality in middle-class democracies, with higher wealth inequality associated with faster growth and greater inequality. However, this tradeoff does not exist for status-oriented oligarchies. In these societies, an equalizing redistribution of wealth will both raise economic growth and reduce income inequality.

Fig. 3 illustrates the relationship between growth and inequality for egoistic and status-oriented societies in which the pivotal voter is relatively wealthy, $D<\overline{D}(G^k)$. With egoistic preferences, this society is a middle-class democracy, indicating that growth is strictly increasing in the level of wealth inequality and approaches its maximum rate of $\hat{g}$ as $G^k\to 1$. In contrast, in a status-oriented society, wealth inequality eventually reaches the level at which the growth rate is maximized, and beyond this point, additional increases in income inequality reduce the rate of economic growth. More generally, the growth maximizing level of wealth inequality $\hat{G}^k(\gamma,D)$ is implicitly defined by $\sigma^p(D,\hat{G}^k)=\hat{\sigma}(\gamma)$. Thus, the growth maximizing level

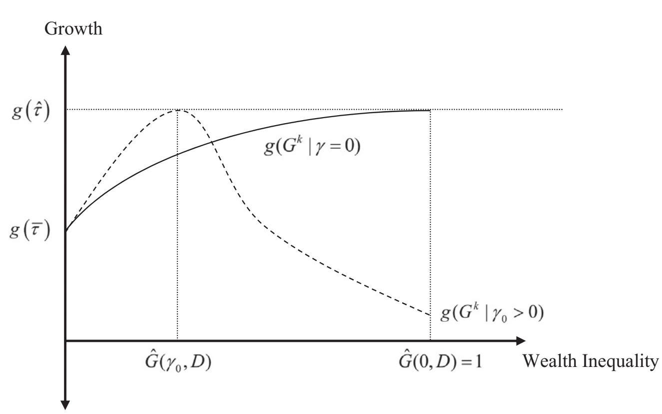

Fig. 3. Inequality and growth in egoistic and status-oriented societies with $D<\overline{D}$.

of wealth inequality is higher for more democratic societies and lower for more status-oriented societies:

$$\frac{\mathrm{d}\hat{G}^k}{\mathrm{d}D}=\frac{-\sigma^p_D}{\sigma^p_{G^k}}>0\ \text{and}\ \frac{\mathrm{d}\hat{G}^k}{\mathrm{d}\gamma}=\frac{\hat{\sigma}_\gamma}{\sigma^p_{G^k}}<0. \tag{23}$$

Note that the relationship between growth and wealth inequality in Fig. 3 does not hold if the distributions of wealth and political power are such that $D>\overline{D}(G^k)$, indicating that the pivotal voter is poor. In this case, an increase in inequality increases the relative labor endowment of the pivotal voter, leading to a higher equilibrium tax rate and lower rate of economic growth. Moreover, because the preferred tax rate of a poor pivotal voter is increasing in the taste for status, the growth rate of a status-oriented society is strictly less than an otherwise similar egoistic society.

The relationship between growth and wealth inequality depicted in Eq. (21) is both non-linear and, in general, more complex than that considered in the empirical literature on inequality and growth. First, if one disregards predictions regarding populist democracies on the grounds that societies in which the poor play a pivotal political role are relatively scarce, then the model predicts an inverted U-shaped relationship between wealth inequality and economic growth. This pattern is similar to that in Barro (2000), who finds that the relationship between growth and (income) inequality is positive for rich countries and negative for poor countries. Second, cross-country empirical work that looks for a linear relationship between growth and inequality tends to find that this relationship is negative. Given that the majority of observations in cross-country studies are from developing countries, it may make sense to interpret this relationship in terms of the mechanics of status-oriented oligarchies.

5. Conclusion

This paper develops a positive theory of economic growth when individuals have a taste for status. The analysis finds the taste for status interacts with the levels of democracy and wealth inequality to generate three distinct types of societies, populist democracies, middle-class democracies and status-oriented oligarchies, each of which exhibits a unique pattern of comparative statics with respect to growth and income inequality. While the political economy of populist democracies parallels results from earlier work, status preferences play an important role in the political economy of middle-class democracies and status-oriented oligarchies. In middle-class democracies, concerns over status cause the relatively rich pivotal voter to moderate her demand for public goods, raising the rate of economic growth and increasing income inequality. In status-oriented oligarchies, the pivotal voter's status concerns are sufficiently strong that she effectively starves the economy of public goods in order to decrease the level of average consumption. This outcome fits the observation that oligarchic elites in developing countries appear to choose policies that lower the rate of growth but protect their social status (Sokoloff and Engerman, 2000; Acemoglu et al., 2002). Furthermore, looking across societies, we find that comparative static results for the taste for status mimic those of an actual rise in wealth inequality.

The model also predicts the existence of non-linear inverted U-shaped relationships between democracy and growth and inequality and growth. It is, to the best of our knowledge, the only model to produce both non-linearities in a parsimonious fashion. Although the empirical literatures on democracy and growth and inequality and growth are not themselves conclusive, there is sufficient evidence of non-linearities in these relationships to make a theoretical explanation for them attractive. Beyond these non-linearities, it is too early to comment on the model's predictions. There is to date no empirical evidence regarding the role that the taste for status may play in economic growth. However, a recent working paper finds that the taste for status varies significantly across countries and is, moreover, positive and finite for the majority of countries (Davis and Wu, 2018). This suggests there is sufficient international variation in the taste for status for meaningful empirical analysis to be conducted.

In closing, we comment briefly on two alternative specifications of the taste for status. First, a number of studies suggest that the taste for status varies positively with an individual's wealth or income (Kahneman and Deaton, 2010; Clark et al., 2008). To investigate this possibility, assume an individual's taste for status is a function of their relative labor endowment: $\gamma_i = \gamma(\sigma_i) > 0$, $\gamma'(\sigma_i) < 0$, so that richer individuals have a greater taste for status, with $\gamma(0) = \gamma_0 < 1$. The effects of democratization and decreases in wealth inequality may be illustrated graphically in Fig. 1, where the equilibrium tax rate is determined by moving left to right along a declining, rather than horizontal, locus of points defined by $\gamma_i = \gamma(\sigma_i)$. Moving along this locus, changes in the taste for status may either augment or offset the impact of changes in the relative labor endowment. In a status-oriented oligarchy, for example, a rise in democracy results in a pivotal voter who is both poorer and less status-oriented, both of which raise the preferred tax rate and increase the rate of economic growth. Changes in the wealth and status-orientation of the pivotal voter are also reinforcing in a middle-class democracy. In contrast, the introduction of wealth-dependent status preferences leads to offsetting effects of democratization in a populist democracy: the fall in the status-consciousness of the pivotal voter tends to offset the incentive for over-taxation by a poorer pivotal voter. Thus, the analysis in the model extends relatively easily to accommodate heterogeneous, wealth-dependent status preferences.

Next, we consider the case in which individuals are sorted into peer groups and make local rather than national status comparisons (Kingdon and Knight, 2007; Luttmer, 2005; Knight et al., 2009; Pérez-Asenjo, 2011; Davis and Wu, 2014). In this case, the implications of the model are likely to depend on the distributions of wealth within and across peer groups. However, it is possible to draw some preliminary insights about the effects of wealth-based sorting from an illustrative example. For simplicity, assume that consumption decreases linearly in $i \in (0,1)$, so that average group consumption equals consumption by the median group member, and consider the case in which sorting partitions the population into two equal size sets by wealth. Wealth-based sorting has two effects on policy preferences. First, within each group, sorting reduces the average difference between an individual's consumption and her reference consumption level. This serves to decrease the role of status preferences in determining the preferred tax rate. Second, sorting decreases the correlation between absolute and relative consumption, with the result that preferred taxes are more equal within the middle two quarters of the population. To see this, consider the preferences of the *poor rich*, with $i \in (1/4, 1/2)$. Before sorting, these individuals have high absolute and relative consumption levels, so absolute and relative concerns tend to reduce the preferred tax rate. However, after sorting they are poor relative to the reference level of consumption, which will increase their preferred tax rate. Similarly, sorting will tend to reduce the preferred tax rate of the rich poor, individuals with $i \in (1/2, 3/4)$, who swap low global status for high local status. Thus, wealth-based sorting reduces the tension between rich and poor associated with relative consumption. Indeed, if we allow the number of equal-sized reference groups to increase without bound, individual and reference consumption converge and the taste for status is irrelevant for model outcomes. This preliminary analysis, however, should not be oversold. In particular, the effects of wealth-based sorting are likely to be attenuated if people care about both intragroup and intergroup status (Alesina and Glaeser, 2004; Alesina et al., 2011; Buell et al., 2014). In this case, a rise in reference consumption level will have two opposing effects, corresponding to a loss of within group status and an increase in intergroup status, reducing the role of sorting on policy preferences.

Appendix A. Mathematical appendix

Proof of Proposition 2. Existence of a preferred tax rate.

The preferred tax rate will satisfy the following maximization problem

$$\max_{\tau \in \mathbb{R}^+} V(\tau; \sigma_i, \gamma) = \frac{(1-\gamma)g(\tau)}{\rho^2} + \frac{1}{\rho}\ \ln((\sigma_i\omega(\tau)+\rho)k_{i0}) - \frac{\gamma}{\rho}\ \ln\left((\omega(\tau)+\rho)\bar{k}_0\right) \tag{24}$$

Let $(\sigma_i, \gamma) \in \mathbb{R}^+ x[0,1)$. The first order condition for an internal preferred tax rate is $V_\tau(\tau; \sigma_i, \gamma) = 0$. Below, we show that an interior solution to this problem exists provided $\sigma_i > \frac{\gamma-\alpha}{1-\alpha}$ and a boundary solution exists provided $\sigma_i < \frac{\gamma-\alpha}{1-\alpha}$..

First, consider the limit of $V_\tau(\tau; \sigma_i, \gamma)$ as τ approaches zero. Substituting expressions for $\omega'(\tau) = (1-\alpha)^2 A\tau^{-\alpha}$ and $r'(\tau) = \alpha(1-\alpha)A\tau^{-\alpha} - 1$, we have

$$\begin{aligned}\lim_{\tau\to0}\rho^2 V_\tau(\tau;\sigma_i,\gamma) &= \lim_{\tau\to0}(1-\gamma)[\alpha(1-\alpha)A\tau^{-\alpha}-1] + \rho\left[(1-\alpha)^2A\tau^{-\alpha}\right] \\ &\quad\times\left[\frac{\sigma_i}{\omega(\tau)\sigma_i+\rho} - \frac{\gamma}{\omega(\tau)+\rho}\right] \\ &= \lim_{\tau\to0}\left\{(1-\gamma)\alpha(1-\alpha) + (1-\alpha)^2\rho\left[\frac{\sigma_i}{\omega(\tau)\sigma_i+\rho} - \frac{\gamma}{\omega(\tau)+\rho}\right]\right\}A\tau^{-\alpha} - (1-\gamma)\end{aligned}$$

Thus, V_τ will approach positive or negative infinity, depending on the sign of the bracketed expression. Taking the limit as τ goes to zero of the bracketed expression, we have

$$\begin{aligned}&\lim_{\tau\to0}\left[(1-\gamma)\alpha(1-\alpha) + (1-\alpha)^2\rho\left[\frac{\sigma_i}{\omega(\tau)\sigma_i+\rho} - \frac{\gamma}{\omega(\tau)+\rho}\right]\right] \\ &= (1-\gamma)\alpha(1-\alpha) + (1-\alpha)^2\rho\left[\frac{\sigma_i-\gamma}{\rho}\right] = (1-\alpha)[(1-\alpha)\sigma_i - (\gamma-\alpha)] \\ &= \begin{cases} > 0 & \sigma_i > \underline{\sigma}(\gamma) \\ = 0 & \sigma_i = \underline{\sigma}(\gamma) \\ < 0 & \sigma_i > \underline{\sigma}(\gamma)\end{cases}\end{aligned}$$

where $\underline{\sigma}(\gamma) = \frac{\gamma-\alpha}{1-\alpha}$. It follows that $\lim_{\tau\to0}\rho^2 V_\tau(\tau;\sigma_i,\gamma) = \begin{cases} +\infty & \sigma_i > \underline{\sigma}(\gamma) \\ -(1-\gamma) & \sigma_i = \underline{\sigma}(\gamma) \\ -\infty & \sigma_i < \underline{\sigma}(\gamma)\end{cases}$.

Next, we show that the marginal utility of the tax rate is negative for sufficiently large values of τ. Taking the limit as τ goes toward infinity, we have

$$\begin{aligned}\lim_{\tau\to\infty}\rho^2 V_\tau(\tau;\sigma_i,\gamma) &= \lim_{\tau\to\infty}(1-\gamma)r'(\tau) + \rho\omega'(\tau)\left[\frac{\sigma_i}{\sigma_i\omega(\tau)+\rho} - \frac{\gamma}{\omega(\tau)+\rho}\right] \\ &= \lim_{\tau\to\infty}(1-\gamma)(\alpha(1-\alpha)A\tau^{-\alpha}-1) + \frac{\rho(1-\alpha)}{\tau}\left[\frac{\sigma_i\omega(\tau)}{\sigma_i\omega(\tau)+\rho} - \frac{\gamma\omega(\tau)}{\omega(\tau)+\rho}\right] \\ &= \lim_{\tau\to\infty}(1-\gamma)\alpha(1-\alpha)A\tau^{-\alpha} - (1-\gamma) + \frac{\rho(1-\alpha)(1-\gamma)}{\tau} = -(1-\gamma) < 0\end{aligned}$$

Because $\rho^2 V_\tau(\tau; \sigma_i, \gamma)$ is continuous in τ and $\lim_{\tau\to\infty}\rho^2 V_\tau(\tau;\sigma_i,\gamma)$ is negative and bounded away from zero, there exists some (large) value of τ, $\tilde{\tau}>0$, such that $\rho^2 V_\tau(\tau;\sigma_i,\gamma)<0, \forall\tau\geq\tilde{\tau}$. Let $\sigma_i > \frac{\gamma-\alpha}{1-\alpha}$ and consider the modified consumer's problem: $\max_\tau V(\tau, \sigma_i, \gamma)$ over $\tau\in[0,\tilde{\tau}]$. Since we are maximizing a continuous function over a compact interval, a solution $\tau^*(\sigma_i,\gamma)$ to this problem exists and occurs at a boundary point or a critical point of V. Furthermore, since $\sigma_i > \frac{\gamma-\alpha}{1-\alpha}$, we know that $V(\tau,\sigma_i,\gamma)$ is increasing at $\tau=0$ and decreasing at $\tau=\tilde{\tau}$, so the maximum does not occur at one of the boundary points, indicating an interior solution. Finally, since V is twice continuously differentiable, the maximum must satisfy $V_\tau(\tau^*(\sigma_i,\gamma);\sigma_i,\gamma)=0$ and $V_{\tau\tau}(\tau^*(\sigma_i,\gamma);\sigma_i,\gamma)<0$, which proves part 1 of Proposition 1.

Next, let $\sigma_i < \frac{\gamma-\alpha}{1-\alpha}$ and consider the modified consumer's problem: $\max_\tau V(\tau,\sigma_i,\gamma)$ subject to $\tau \in [0,\tilde{\tau}]$. Since V is continuous in τ and the domain is compact, a solution $\tau^*(\sigma_i,\gamma)$ to this problem exists. Assume for the moment that the maximum occurs at an interior point $\tau^*(\sigma_i,\gamma)>0$ and let the value of lifetime utility at this maximum be $V_{\max}$. Recall, however, that because $\sigma_i < \frac{\gamma-\alpha}{1-\alpha}$, $\lim_{\tau\to 0+} V_\tau(\tau;\sigma_i,\gamma)=-\infty$ and, thus, $\lim_{\tau\to 0+} V(\tau;\sigma_i,\gamma)=\infty$. It follows that there exists an $\varepsilon>0$ such that $V(\tau;\sigma_i,\gamma)>V_{\max}$ $\forall\ \tau\in(0,\varepsilon)$. This contradicts our assumption of an interior maximum. It follows that $\tau^*(\sigma_i,\gamma)=0$.

Proof of Proposition 3. The taste for status and the preferred tax rate.

Part 1: Let $(\gamma,\alpha,\rho,A)\in S$, such that $\tau^*(\sigma^p,\gamma)>0$ is a political equilibrium with $V_\tau(\tau^*(\sigma^p,\gamma))=0$, and define $\hat{\sigma}(\gamma)=\frac{\gamma\rho}{(1-\gamma)\omega(\hat{\tau})+\rho}$. Differentiating V with respect to τ, we have,

$$V_\tau=0 \Leftrightarrow r'(\tau^p)=-\frac{\rho\omega'(\tau^p)}{1-\gamma}\left[\frac{\sigma^p}{\sigma^p\omega(\tau^p)+\rho}-\frac{\gamma}{\omega(\tau^p)+\rho}\right].$$

Thus,

$$\begin{aligned} r'(\tau^*(\sigma^p,\gamma))=0 &\\ &\Leftrightarrow \frac{\sigma^p}{\sigma^p\omega(\tau^*(\sigma^p,\gamma))+\rho}=\frac{\gamma}{\omega(\tau^*(\sigma^p,\gamma))+\rho}\\ &\Leftrightarrow \sigma^p(\omega(\tau^*(\sigma^p,\gamma))+\rho)=\gamma(\sigma^p\omega(\tau^*(\sigma^p,\gamma))+\rho)\\ &\Leftrightarrow \sigma^p=\frac{\gamma\rho}{(1-\gamma)\omega(\tau^*(\sigma^p,\gamma))+\rho}\end{aligned}$$

Note that σ^p appears on both sides of this equation. Next we show that such a σ^p exists that satisfies this condition. Let $\hat{\sigma}(\gamma)=\frac{\gamma\rho}{(1-\gamma)\omega(\hat{\tau})+\rho}$. This function is continuous on $\gamma\in[0,1]$, with $\hat{\sigma}(0)=0$, $\hat{\sigma}(1)=1$ and $\hat{\sigma}'(\gamma)>0$. Thus, given $\gamma\in[0,1]$, there exists a $\sigma^p\in[0,1]$ such that $\sigma^p=\hat{\sigma}(\gamma)=\frac{\gamma\rho}{(1-\gamma)\omega(\hat{\tau}))+\rho}$. This implies that $\tau^*(\sigma^p,\gamma)=\hat{\tau}$, such that $\sigma^p=\frac{\gamma\rho}{(1-\gamma)\omega(\tau^*(\sigma^p,\gamma))+\rho}$, which implies $r'(\tau^*(\sigma^p,\gamma))=0$.

Proof of parts 2 and 3: We have $V_\tau=0 \Leftrightarrow r'(\tau^p)=-\frac{\rho\omega'(\tau^p)}{1-\gamma}\left[\frac{\sigma^p}{\sigma^p\omega(\tau^p)+\rho}-\frac{\gamma}{\omega(\tau^p)+\rho}\right]$. It follows that $r'(\tau^p)>0 \Leftrightarrow \sigma^p<\hat{\sigma}(\gamma)$ and $r'(\tau^p)<0 \Leftrightarrow \sigma^p>\hat{\sigma}(\gamma)$.

Proof of Proposition 4. Single-peaked preferences.

To prove Proposition 4, we show that given $\gamma\in[0,1)$, there exists a non-degenerate parameter space $S_\gamma=\{(\alpha,\rho,A)\}\subset(0,1)^2\times\mathbb{R}^+$ such that $V_\tau(\tau_0;\sigma_i,\gamma)=0$ implies $V_{\tau\tau}(\tau_0;\sigma_i,\gamma)<0$ for all $\sigma_i\geq 0$. It follows that any critical point τ_0 is a local maximum. Given that V is both continuous and differentiable, as can be seen from Eq. (22), τ_0 will be a unique global maximum as well, such that agents have single-peaked preferences on the parameter space $S^*\equiv(\gamma,S_\gamma)$.

Let $\gamma\in[0,1)$ and let $\tau_0>0$ such that $V_\tau(\tau_0;\sigma_i,\gamma)=0$. The FOC for the pivotal voter's problem may be written as

$$(1-\gamma)r'(\tau_0)+\rho\omega'(\tau_0)\left[\frac{\sigma_i}{\omega(\tau_0)\sigma_i+\rho}-\frac{\gamma}{\omega(\tau_0)+\rho}\right]=0.$$

Taking the limit as $\rho\to 0$, the second term of the FOC goes to zero, indicating that the FOC is satisfied provided $(1-\gamma)r'(\tau_0)=0$ and, thus, that $\lim_{\rho\to 0}\tau_0=\hat{\tau}=(\alpha(1-\alpha)A)^{1/\alpha}>0$. The SOC for the pivotal voter's problem is $-\frac{\alpha(1-\gamma)}{1-\alpha}+\rho\omega(\tau)\omega'(\tau)\left[\frac{\gamma}{(\omega(\tau)+\rho)^2}-\frac{\sigma_i^2}{(\omega(\tau)\sigma_i+\rho)^2}\right]<0$.

Noting that $\omega'(\tau)=(1-\alpha)\omega(\tau)/\tau$, we may write this condition as

$$\frac{\tau_0}{\rho}>\frac{(1-\alpha)^2}{\alpha(1-\gamma)}\left[\gamma\left(\frac{\omega(\tau)}{\omega(\tau)+\rho}\right)^2-\left(\frac{\sigma_i\omega(\tau)}{\sigma_i\omega(\tau)+\rho}\right)^2\right].$$

For $\sigma_i>1$, the bracketed expression is negative, so the SOC holds for all parameter values. In addition, taking the limit of this expression as $\rho\to 0$, we have

$$\frac{(\alpha(1-\alpha)A)^{1/\alpha}}{\rho}>\begin{cases}-(1-\gamma)\dfrac{(1-\alpha)^2}{\alpha(1-\gamma)}<0, & \sigma_i>0\\ \gamma\dfrac{(1-\alpha)^2}{\alpha(1-\gamma)}>0, & \sigma_i=0\end{cases}$$

Thus, for $\sigma_i>0$, the *SOC* holds for sufficiently small *rho*, as the RHS of this expression is negative. In the limiting case of the pure capitalist, $\sigma_i=0$, the SOC is again satisfied for sufficiently small rho, as the LHS approaches positive infinity.

Preferences are single peaked provided $V_{\tau\tau}<0$ at any critical point of $V(\tau)$. Since lifetime utility is concave in the return to capital and convex in the level of average consumption, $V_{rr}<0$ and $V_{\overline{CC}}>0$, this tends to occur when the return to capital is large relative to the disutility of average consumption, and thus, when A and α are sufficiently large and γ and ρ are sufficiently small. This is the basis of part 2 of the proposition.

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