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SOCIAL STATUS CONCERNS AND THE POLITICAL ECONOMY OF PUBLICLY PROVIDED PRIVATE GOODS*

Jana Friedrichsen, Tobias König and Tobias Lausen

We analyse the political economy of the public provision of private goods when individuals care about their social status. Status concerns motivate richer individuals to vote for the public provision of goods they themselves buy in markets: a higher provision level attracts more individuals to the public sector, enhancing the social exclusivity of market purchases. Majority voting may lead to a public provision that only a minority of citizens use. Users in the public sector may enjoy better provision than users in the private system. We characterise the coalitions that can prevail in a political equilibrium.

Most countries devote considerable resources to the public provision of private goods, such as education, childcare, housing, transport, health and food.¹ For many such goods and services, close substitutes are additionally supplied by markets, giving citizens the choice of whether to consume the publicly provided good or its private sector counterpart: parents can send their children to public schools and kindergartens or to private ones; people can live, if eligible, in private apartments or social housing and they can, in many places, commute by public transport or by private car. In democratic systems, public provision is determined through elections and referenda. A substantial body of research studies the underlying political economy and its interaction with market provision (see, e.g., Stiglitz, 1974; Epple and Romano, 1996b; Glomm and Ravikumar, 1998; Fletcher and Kenny, 2008; Lülfsesmann and Myers, 2011). In a number of ways, the predictions from existing models do not square with empirical observations of public–private (dual) provision systems. In particular, existing models do not capture the observations (i) that richer individuals, who consume the private alternative, often support public provision; (ii) that democratic governments provide goods and services to their citizens even though a majority of voters do not use them; and (iii) that publicly provided goods and services are sometimes of better quality than their alternative in the private market.

Almost all research on the public provision of private goods assumes that individual choices between public and private alternatives are driven solely by price and quality. This neglects that consumer choice is often also shaped by social and reputational concerns: individuals

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¹ In some OECD countries, around one-third of the GDP is devoted to such government programmes, which are growing both in developed and developing countries (Currie and Gahvari, 2008; OECD, 2019, p. 70f).

pay attention to the social perceptions of their consumption, which confers on them prestige, esteem or social approval (see, e.g., Veblen, 1899 [1994]; Leibenstein, 1950; Frank, 1985; Bagwell and Bernheim, 1996; Glazer and Konrad, 1996; Corneo and Jeanne, 1997; Hopkins and Kornienko, 2004). Status concerns also matter in choices between publicly provided goods and their private alternatives: sending one's child to a private rather than to a public school may conspicuously signal high income, great wealth or refined tastes—thus catering to needs for social distinction and elitism (Ireland, 1994; Fershtman *et al.*, 1996; Akerlof and Kranton, 2002; Levy and Razin, 2015). Moreover, private schools often award intangible rents by providing access to socially valuable resources—such as (job) networks, friends and mating partners—for which only imperfect markets exist (Granovetter, 1973).² Private cars and apartments reflect economic prowess and social success, delivering larger image rents than public transportation or social housing, which are often considered the poor man's choice (Frank, 1985; or Litman, 2009, on 'bus stigma' in the USA and the UK). A fortiori, public alternatives are often tainted with welfare stigma and people may not take up social benefits out of fear of being stereotyped as unsuccessful, idle or morally weak (Moffitt, 1983; Besley and Coate, 1992; Lindbeck *et al.*, 1999; Friedrichsen *et al.*, 2018).

In this paper, we analyse the political economy of the public provision of private goods when individuals care about their social status or reputation. We provide a simple model where the level of provision for the tax-financed, publicly provided good is determined by majority voting and a competitive private market for this good is available where individuals can purchase their preferred level of the good at their own expense. The decision whether or not to consume the publicly provided good confers on an individual social status: consuming in the market demonstrates that one belongs to the richer part of the population, thus providing additional utility, above and beyond the pure material benefits from opting out.

We show that status concerns generate a social feedback effect of public provision. Different provision levels partition society differently into public and private sector users, changing their social status rents. In particular, presuming standard income sorting, a higher provision level attracts more and, on average, richer people into the public sector, enhancing the social prestige of private sector consumption, as opting out becomes more socially exclusive.³

This social feedback effect can help explain several puzzling empirical features of public provision that are hard to reconcile with standard voting models in a unified theoretical framework. First, richer individuals often support public services and public welfare although they make no or only little use of such services (Burchardt and Propper, 1999; Busemeyer and Iversen, 2014; Wearing, 2015). For example, in both the USA and the UK more than half of the wealthiest quarter of households favour more government spending on health and education, even though this would imply considerable tax increases for them.⁴ If only pecuniary motives mattered, this

² For an instrumental notion of status, see, for example, Cole *et al.* (1992), Postlewaite (1998) and Mailath and Postlewaite (2003).

³ Our modelling of social status can also be interpreted in terms of social networks or spillovers: the utility of being associated with other individuals is higher the larger their status-relevant assets are, such as ability, soft skills or cultural capital. Increases in the level of public provision keep the circle of private sector consumers socially exclusive. In this sense, our paper makes a first step towards a political economy of social networks when individuals can sort across two social platforms with distinct reputations.

⁴ For example, in the USA and the UK, 58% and 72%, respectively, of respondents in the top income quartile state that governments should spend more or much more on education; similar figures are found for public spending on health. In the 2001 wave of the British Social Attitudes Survey, which explicitly classifies respondents into users and non-users of several kinds of public services, over two-thirds of the respondents whose children or themselves went to a private school stated that they would favour or strongly favour a 1% increase in their income tax to be spent on public education

would be puzzling: richer individuals who choose private alternatives and, thus, tax-finance public provision without benefiting from it should always favour a retrenchment of public provision. Status concerns, as in our model, can accommodate the puzzle: those opting out of public provision may still be willing to pay for (higher) public supply as that would attract more individuals to the public sector, thus increasing the image value of the private alternative (see Proposition 3).

Second, pocketbook voting models predict that the public provision of a good can arise as a voting equilibrium only when a majority of the population actually takes up the publicly provided good. Such majority take-ups are, by and large, observed in the education systems in most OECD countries, where only a minority of about 18% of students attend private educational institutions (OECD, 2020). However, other important goods and services, like housing, nutritional assistance and sometimes public transport, *are* government-provided although a majority of citizens predominantly purchase them in markets (Currie, 2006).⁵ If support for public provision is also driven by the social prestige of being a private consumer, voting may well lead to public provision that is only used by a minority of the population: proponents of public provision may recruit both from inside and outside the public sector and can add up to more than half of the population even if less than half of the population actually consume the publicly provided good (see Proposition 4).

Third, if only price–quality considerations mattered in dual provision, the quality level in the public sector could never be higher than in the private sector: nobody would be willing to incur the extra expenses (say, tuition fees in private schools) in the private system unless quality standards were higher than in the public sector (on schools, see De Fraja, 2004). Again, this is different in the presence of reputation effects: status-concerned citizens are willing to sacrifice a higher quality in the public sector in exchange for the status gain in the private scheme (see Proposition 2). In fact, empirical studies on education reveal that private schools are quite heterogeneous, some offering poorer academic quality than the public schools (Martinez-Mora, 2006; Brunello and Rocco, 2008).⁶ Conversely, status concerns may explain why eligible households forgo substantial economic benefits by not taking up in-kind programmes, such as food stamps or Medicare in the USA, and constrain themselves to the lower qualities of food or medical care that they can afford themselves (Currie and Gahvari, 2008): individuals trade off the avoidance of stigma from program participation against better consumption.⁷ Our results reveal that a quality gap to the disadvantage of the market occurs rather in relatively equal than in relatively unequal societies. Thus, a status-enhanced public provision model predicts private schools of low quality to be more likely in egalitarian countries, such as Sweden, France or Germany, than in the USA or UK.

(Sefton, 2003). Similarly, a British housing poll by IPSOS Mori (2014) reveals that a majority of owner-occupiers and private renters support more social housing being built in their locality. Such findings are corroborated in lab experiments: Buckley *et al.* (2015) find that the majority-preferred tax rate is significantly higher than predicted under the opt-out provision, due to higher-income individuals supporting the public sector without any pecuniary incentives to do so.

⁵ For example, the share of individuals living in social housing is about 17% in the UK (Andrews *et al.*, 2011); roughly 15% of the US population receive benefits from food stamp programs (USDA, 2015). Likewise, in the typical US city, less than 5% of the population uses the public transport system (Litman, 2009).

⁶ For example, Bertola and Checchi (2004) find that Italian public schools, on average, show better academic performance than (religious and lay) private schools. Looking at standardised test scores in mathematics, reading, and science reported in the 2000 OECD Pisa Program, Vandenberghe and Robin (2004) find that public schools outperform private schools in France and Austria. Figlio and Stone (1999) assess the effect of religious and non-religious US private schools on educational outcomes and find that only the latter increase individual outputs relative to public schools; for religious private schools, the treatment effects on math and science high school performance are significantly negative.

⁷ For laboratory evidence on stigma-driven non-take-up, see Friedrichsen *et al.* (2018).

We characterise the political coalitions that can emerge in a voting equilibrium in a model extension where income is distributed continuously. Assuming—as is empirically plausible for normal goods such as education or childcare—that public sector consumers with higher incomes have a higher willingness to pay for the publicly provided good, then, in the absence of status concerns, voting equilibria with dual provision are necessarily of the so-called ‘end-against-the middle’ type (Epple and Romano, 1996b). Such equilibria feature a coalition structure where ‘the rich’ (who opt out) and ‘the poor’ (who think that the provision level and tax burden are already too high) would prefer less public provision while the (equally populous) ‘middle class’ inside the public sector would prefer higher public provision. As previously discussed, with status concerns, some of those who opt out may support (more) public provision. If the status rent from being an exclusive private sector consumer has higher value the richer people get, then these supporters will be the ‘very affluent’. They will coalesce with the middle class and vote for more public provision, being balanced in equilibrium by the moderately rich and the poor who oppose public provision. Even ‘median income earner’ equilibria can emerge, where all individuals who earn more than median income would support higher taxes. Hence, in the presence of status preferences the collection of possible voting equilibria becomes richer.

In parts, the empirical phenomena described above might be driven by factors other than status concerns. For instance, altruism, preferences for redistribution and paternalistic concerns might cause richer voters to support public services that they themselves do not use (Gasparini and Pinto, 2006).⁸ However, unlike status concerns, such motives and channels cannot plausibly explain why provision quality could be lower in the private sector as we discuss in Section 3.⁹

Our paper relates to the emerging field of behavioural political economy, studying how behavioural motives affect political behaviour and voting outcomes (e.g., Ortaleva and Snowberg, 2015 (overconfidence); Lizzeri and Yariv, 2017 (self-control problems); Alesina and Pasarelli, 2019 (loss aversion)). More specifically, our paper contributes to the small but growing literature at the intersection between social status and political economy, reconsidering the voting incentives of the rich.¹⁰ In an early contribution, Corneo and Grüner (2000) study voting over redistributive income taxation when relative consumption serves as an instrumental signal for relative wealth and find that status concerns reinforce the reluctance of the rich to redistribute to the poor. This result is driven by taxation reducing the consumption gap between the rich and the poor, thereby reducing the signalling advantage for the rich. In contrast, in our paper, higher income taxes and better public services may benefit the rich as they keep their social clubs (private schools, private housing) smaller and less socially diluted.

The observation that (in-kind) redistribution can be a vehicle for social signalling is new to the literature and differentiates our paper from Levy and Razin (2015), who forcefully demonstrate that richer individuals with incomes above the mean may politically prefer full income equalisation to a laissez-faire society. In their set-up, individuals purchase a costly signalling good in the private market (private education) that differentiates them from the poor (using public schools).

⁸ Indirect incidence may also matter: Fack and Grenet (2010) show that public school performance positively affects housing prices, which would then make homeowners support public provision.

⁹ The few exceptions in the literature that allow for a lower quality in the private sector—see Brunello and Rocco (2008) who argue that private schools can sell lower educational standards at a positive price because they attract students with higher costs of effort—cannot explain why individuals politically support services that they do not use.

¹⁰ A separate strand of the literature documents that individuals have biased perceptions of their own social position, which are reflected in their policy demand for redistribution (see, e.g., Cruces *et al.*, 2013; Kuziemko *et al.*, 2015; and the references cited therein). This literature aims to account for the observation that poorer individuals often want levels of redistribution lower than those predicted by pocketbook voting. By contrast, we assume that individuals hold rational beliefs about their social standing and we also study the voting behaviour of the rich, which has received less attention.

Full income equality (corresponding to pooling in the public sector) can be beneficial for the rich, as it allows them to forgo the signalling costs of the separating signalling equilibrium (tuition fees for private schools). This is different in our paper in three respects. First, the rich consume in the private system and they support redistribution because it enhances the social exclusivity of the private system. Put differently, redistribution is a vehicle for social signalling rather than a remedy against it. Second, the focus of our paper is to characterise conditions for separation to occur as a political equilibrium because we usually observe dual provision of private goods and social stratification, with the poor [rich] staying in the public [private] system. In contrast, Levy and Razin (2015) focus on conditions for when there is a political majority for social pooling. Third, we assume that private alternatives are not purely wasteful signalling items but that they also have intrinsic consumption value. This enables us to explicitly analyse potential quality differences between the public and private sectors.

Enriching the picture by differences in social class, Gallice and Grillo (2019) show under which conditions members of the socio-economic elites may benefit from high income taxation. We share with Gallice and Grillo (2019) the view on taxation as a strategic tool for the rich to increase relative status, which is new to the social status literature. Similar to their results, we find that the rich may support higher redistribution. But the reasons are very different. In their model, high income taxation makes consumption less salient so that differences across agents in that dimension will be less pronounced, relative to social class, thereby benefiting elite members. In contrast, higher redistribution (in-kind) makes differences in consumption choices, if anything, more pronounced in our model: private schools become more socially exclusive.

Our paper further complements the literature, cited above, on image and status concerns in consumer demand and on suppliers' reactions to such desires for distinction (e.g., Rayo, 2013; Friedrichsen, 2018). These studies cover market provision only; the role of status concerns—to our knowledge—has not yet been considered for dual-provision, political economy scenarios. While there is a growing literature on the role of social status concerns for normative policy analysis (see, e.g., Bilancini and Boncinelli, 2012; Truys, 2012, and the references therein), ours is one of very few positive studies on the political economy with status concerns as discussed in the previous paragraphs.

The rest of this paper is organised as follows. In Section 1, we introduce a simple voting model with two income types, the rich and the poor. We use this model to derive a set of results on the economic outcomes in equilibria with dual provision when the poor have a majority (Section 2) and when the rich have a majority (Section 3). In Section 4, we lay out what distinguishes the predictions of the status-enriched voting model from those of paternalism and altruism. We then discuss a model extension with a continuous distribution of income in Section 5, in which we can analyse political coalitions in more detail. All economic results from the two-type model carry over to this environment. We conclude in Section 6. Proofs that do not appear in the main text are contained in the Appendix.

1. A Voting Model of Public Provision

1.1. Framework

General. The economy is populated by two types of individuals who differ in their exogenous incomes y . Denote by y_ℓ the income of the 'poor' and by $y_h > y_\ell$ the income of the 'rich'. The income distribution is fully characterised by the mean income Y , a parameter of mean-preserving

income inequality γ , and the share of the poor in the population, $0 < p_\ell < 1$. Then, mean income is given by $Y = p_\ell y_\ell + (1 - p_\ell)y_h$ and the two income levels can be written as $y_\ell(\gamma) = Y - \gamma(1 - p_\ell)/p_\ell$ and $y_h(\gamma) = Y + \gamma$. For $\gamma = 0$, income is equalised: $y_\ell = y_h = Y$. Inequality reaches its maximum for $\gamma^{\max} := Yp_\ell/(1 - p_\ell)$, where the poor earn $y_\ell = 0$ and the rich $y_h = Y + \gamma^{\max}$. We will typically suppress the dependence of y_ℓ and y_h on γ and Y to simplify the notation.

Goods and their provision. There are two private goods, denoted by x and c . Good c , which serves as the numeraire, is exclusively supplied via markets. Both goods are normal. For good x , there is dual provision: a uniform per capita level \bar{x} is provided by the government to all individuals free of charge; as an alternative to consuming \bar{x} , individuals can opt out of public provision and buy their desired quantity of x in the market. Public and private sector consumption are mutually exclusive: individuals cannot supplement or diminish the publicly provided quantity via additional purchases or sales in the private market. Think of this as parents sending their children to either a public or a private school, but not to both simultaneously.¹¹ To finance public provision, the government levies a proportional income tax at rate t . Everybody must pay the tax, irrespective of whether she consumes \bar{x} or opts out. The production technology of good x is linear and identical in the public and the private sector: one unit of the numeraire can be transformed into one unit of x . We assume a competitive private market and correspondingly normalise the market price of good x to one for both public and private provision.¹²

Preferences. All individuals have identical preferences. They derive utility from the consumption of goods x and c , represented by a smooth, strictly increasing and strictly quasi-concave utility function $u(x, c)$. We make additional assumptions on $u(x, c)$ below. In addition to material utility, individuals can gain social prestige when consuming good x in the market. Specifically, preferences are given by

$$U(x, c, S) = u(x, c) + \mathbb{1} \cdot S, \quad (1)$$

where $\mathbb{1}$ is an indicator for consuming x in the market, and S represents social prestige from market consumption. We assume that status utility is a function of the share of individuals consuming x in the public sector, h^{in} :

$$S := S(h^{\text{in}}) = \begin{cases} \bar{S} & \text{if } 0 < h^{\text{in}} < 1, \\ 0 & \text{otherwise.} \end{cases} \quad (2)$$

Our preference formulation is decidedly simple. Individuals who opt out of the public sector receive an exogenous status rent $\bar{S} \geq 0$, as long as not everybody consumes either in the public or private sector.¹³ Moreover, the additive separability between $u(x, c)$ and S in (1) allows for a

¹¹ There are also topping-up models of public provision (for political economy models, see, e.g., Epple and Romano, 1996a; Levy, 2005). If a topping-up system is at least partly financed by redistributive income taxes, then, in a neoclassical model, the rich prefer a pure market solution also with this provision type. As the rich must co-finance the poor via the tax system, they effectively face a price for the publicly provided good that exceeds the market price. Therefore, topping up alone cannot explain why richer individuals may want to support publicly provided alternatives. For the examples we have in mind—public schooling and social housing—opting out is possible in most of the countries (see, e.g., Besley and Coate, 1991); and we think that status is relevant for these cases. We therefore do not consider a provision system with topping up in this paper.

¹² An alternative model could allow for monopolistic supply in the private sector that may offer good x at a price exceeding that in the public sector and the rich would be happy to accept. Excessive prices in the private sector would allow for equilibria where the rich consume in the private market whereas the poor consume in the public sector but the rich would, in contrast to our model, not vote in favour of public provision because the price of private education already ensures separation. Price regulation as observed in several countries' education markets as well as free entry would work against separation through prices.

¹³ We could also allow for status changing smoothly with the fraction of individuals consuming in the public sector or for it to be the expectation of income conditional on sector choice as in Section 5.

clear distinction between consumption and status utility. The linearity of U in S reflects a constant marginal relevance of status concerns.

Preferences in (1) to (2) capture various social perceptions of public provision and market purchases. For instance, sending one's child to a private rather than to a public school gives social prestige. When, however, everybody attends private schools ($h^{in} = 0$), private schools lose their distinction value. Below, we will ensure that individuals sort into the public or private sector according to income. Thus, we can interpret (1) as also accommodating income signalling concerns: sending one's children to private schools conveys a signal of having high instead of low income. Similarly, private housing is usually associated with a higher social standing than living in social housing, which is often stigmatised as the poor man's choice; and S represents the status differential between these two options—vanishing to zero when everybody lives in either public or private housing.¹⁴

The assumption that choices between publicly provided and private options confer social status requires that they are observable. This is arguably the case for the examples we have in mind: attending private schools is typically noticed by colleagues, friends, family members and other social peers. Living in social housing does not usually remain private (think of urban public housing areas) and it is often subject to welfare stigma. In reality, the binary choice between the public and the private system is hardly the only source of public inferences about income—or some status-bearing asset that positively correlates with income. We deliberately exclude other potential signalling channels because consumption often provides only a noisy signal, and choices between publicly provided and private options affect social status also for a given consumption pattern. For example, attending a private school enhances one's social status even when already wearing designer clothes or driving a luxury car. Likewise, living in social housing means a decrease in social standing, independent of one's levels of consumption.¹⁵

Alternatively, our modelling can also capture peer group or social network effects: in an instrumental interpretation of status, (2) measures the social benefit from being grouped together with someone from the given sector and from getting access to their social resources and connections. For example, private schools may provide different (and typically more valuable) personal contacts for job and marriage markets than their publicly provided counterparts. Similarly, residential areas with private houses are typically embedded in different (and typically better) social environments than areas of public housing. Key to our formulation in (2) is that the network value from being matched with private sector users is larger than that of being matched with public sector users. Note that under network effects, private schools may provide social value, even if incomes or education levels were perfectly observable.

Sequence of events. The model proceeds in three stages. First, a policy (t, \bar{x}) is selected by majority voting (political equilibrium). Second, each individual decides whether to consume good x in the public sector or to purchase it on the market (sector choice). Third, individuals spend their after-tax incomes, taking the policy (t, \bar{x}) and the status from private sector consumption S as given (consumption choice).

¹⁴ Observe that, with two types, our utility formulation in (1) and (2) requires an ordinal notion of social status only: all that matters is that consuming in the private sector provides higher status than in the public sector (the latter we normalise to zero).

¹⁵ As we demonstrate below, in our model, quality in the private sector can be lower than in the public sector. This would have an opposing effect on status, if status is not only determined by the sectoral choice, but also by the level of consumption, e.g., the level of education. Note, however, that education levels or school quality are typically less observable than the sectoral choice.

Equilibrium. We focus on equilibria with *consistent expectations* and *budget balance*. That is, in equilibrium, the expected share of individuals consuming in the public sector, denoted by \hat{h}^{in} , coincides with the actual share h^{in} and

$$t \cdot Y = \bar{x} \cdot h^{in}. \quad (3)$$

By rational expectations and equation (3), for any given mean income Y , the publicly provided level \bar{x} is fully determined by \hat{h}^{in} and t as $\bar{x} = tY/\hat{h}^{in}$. Hence, by directly replacing the rational expectation with the realised values, we can analyse behaviour at Stages 2 and 3 for a given pair (t, h^{in}) and define an equilibrium of the game starting in Stage 2 as follows:

DEFINITION 1. *A pair (t, h^{in}) is an equilibrium economy or feasible if*

- (i) *Individuals with y_i , $i \in \{\ell, h\}$ choose between private and public sector consumption as to maximise their utility given an expected participation of \hat{h}^{in} in the public sector (Utility maximisation).*
- (ii) *The expected share of the population consuming in the public sector coincides with the share actually consuming in the public sector, $\hat{h}^{in} = h^{in}$ (Rational expectations).*
- (iii) *The policy balances the government budget (Budget balance).*

For expositional clarity, we restrict attention to cases where all individuals with the same income make the same deterministic sector choices.

1.2. Consumption and System Choice

Stage 3. An individual with gross income y who opts out of public provision purchases the (unique) bundle $(x, c) > (0, 0)$ that maximises $u(x, c)$ subject to the budget constraint $c + x = y(1 - t)$. Let $x^* := x^*(y(1 - t))$ and $c^* := c^*(y(1 - t)) = y(1 - t) - x^*(y(1 - t))$ be the Marshallian demand for goods x and c . By the separability of U in (1), x^* and c^* do not depend on status concerns. Denote $v(y(1 - t)) := u(x^*, y(1 - t) - x^*)$. Indirect utility when staying out of the public sector is given by

$$V^{out}(t, h^{in}; y) := v(y(1 - t)) + S(h^{in}).$$

If an individual consumes in the public sector, she receives \bar{x} for free and spends her entire net income on good c . Indirect utility for an individual who stays in the public sector is therefore

$$V^{in}(t, h^{in}; y) := u\left(\frac{tY}{h^{in}}, y(1 - t)\right).$$

Stage 2. Anticipating the decisions in Stage 3, an individual opts out if $V^{out}(t, h^{in}; y) > V^{in}(t, h^{in}; y)$, or, equivalently, if the status utility attached to private sector consumption is large enough as to compensate for differences in material consumption utility:

$$S(h^{in}) > u\left(\frac{tY}{h^{in}}, y(1 - t)\right) - v(y(1 - t)) := \Delta^M(t, h^{in}; y). \quad (4)$$

In what follows, we ensure *positive income sorting* over the public and private sector. Denoting $u_c := \partial u(x, c)/\partial c$ and $v' := \partial v(y(1 - t))/\partial(y(1 - t))$, we assume:

ASSUMPTION 1 (DIMINISHING MARGINAL UTILITY). *For all $c, x > 0$, $u_c - v' < 0$.*

Intuitively, in the market, individuals can choose their consumption bundle freely, whereas in the public sector they have to ‘accept’ the given provision level, \bar{x} . Assumption 1 entails that the marginal utility from income is higher when being able to choose freely. Hence, the relative attractiveness of public sector consumption, $\Delta^M(t, h^{in}; y)$, decreases with income. This ensures that whenever the poor are indifferent between public and private sector consumption, the rich opt out. Conversely, whenever the rich decide to attend public schools, so do the poor. Income sorting implies that h^{in} can only take on three values in equilibrium: 0 (pooling in the market), p_ℓ (separating equilibrium) or 1 (pooling in the public sector).

The following assumption demands that status concerns are not too important:

ASSUMPTION 2. *For all $t \geq 0$, $h^{in} > 0$ and $\bar{S} \geq 0$:*

- (i) $v(0) + \bar{S} - u(Y/h^{in}, 0) < 0$.
- (ii) $v((Y + \gamma^{max})(1 - t)) + \bar{S} - u(tY/h^{in}, (Y + \gamma^{max})(1 - t)) > 0$.

According to Assumption 2 (i), status concerns must not drive individuals out of the public sector when their whole income is taxed away. Otherwise, public provision would never occur in equilibrium. Assumption 2 (ii) ensures that if a rich individual receives maximal income, which implies that inequality is also maximal, she must consume good x in the market. If this was not true, we would never observe dual provision.

For later use, define $\hat{t}(y, h^{in}; \bar{S})$ as the tax rate that solves equation (4) with equality. Properties of this tax rate of indifference are summarised in:

LEMMA 1. *Suppose Assumptions 1 and 2 hold. Then, for all $h^{in} > 0$, an individual y 's tax rate of indifference, $\hat{t}(y, h^{in}; \bar{S})$, uniquely exists, and it is increasing with income y . For $0 < h^{in} < 1$, the tax rate of indifference is increasing in the status level \bar{S} .*

Intuitively, a higher income or a higher status gain make the private sector more attractive. Hence, a higher tax rate (resp., public provision level) is needed to keep an individual indifferent between public and private sector consumption.

1.3. Political Preferences and Political Equilibrium

Stage 1. At Stage 1, there is majority voting over policies (t, \bar{x}) . As noted above, the provision level \bar{x} is fully determined by t and h^{in} . Therefore, we can think of majority voting over policies as majority voting over equilibrium economies (t, h^{in}) . In a pairwise comparison, an individual with income y casts her vote for an economy that maximises the upper envelope of $V^{out}(t, \cdot)$ and $V^{in}(t, \cdot)$, defined as:

$$V(t, h^{in}; y) := \max\{V^{out}(t, h^{in}; y), V^{in}(t, h^{in}; y)\}. \quad (5)$$

A political equilibrium is an economy that cannot be defeated in majority voting by any other equilibrium economy:

DEFINITION 2. *An equilibrium economy (t, h^{in}) is a political equilibrium if it garners at least 50% of the votes in any pairwise comparison.*

To obtain clear results, we assume that $V^{in}(t, h^{in}; y) = u(tY/h^{in}, y(1-t))$ is strictly concave and single-peaked over t , given $y \in \{y_\ell, y_h\}$ and $h^{in} > 0$. This assumption ensures that, for any h^{in} , a public sector user has a unique most preferred tax rate, which we denote by $t^*(y, h^{in})$.¹⁶

ASSUMPTION 3. For given h^{in} , $V^{in}(t, h^{in}; y) = u(tY/h^{in}, y(1-t))$ is concave in t and single-peaked at $t^*(y, h^{in})$ for all $y \in \{y_\ell, y_h\}$ and $h^{in} > 0$.

For those in the public sector, a higher tax rate implies a higher provision level, which, however, comes at the cost of reduced consumption of good c . In economic terms, Assumption 3 says that the negative effect on consumption dominates the positive provision effect on utility when taxes are high.

Denote $u_x := \partial u(x, c)/\partial x$ and recall that $u_c = \partial u(x, c)/\partial c$. We further make the following assumption:

ASSUMPTION 4. For all $y \in \{y_\ell, y_h\}$ and (t, \bar{x}) satisfying $tY = h^{in}\bar{x}$,

$$\frac{u_x(\bar{x}, y(1-t))}{yu_c(\bar{x}, y(1-t))} \text{ increases in } y.$$

By normality of good x , individuals with higher income have a larger willingness to pay for good x . However, a higher income also implies a higher ‘price’ of the publicly provided good, since richer individuals have to pay higher taxes, which reduces their ability to spend on good c . Assumption 4 ensures that the normality prevails. As a consequence, the most preferred tax rates of public sector users are increasing in income:

$$\frac{dt^*(y, h^{in})}{dy} > 0.¹⁷$$

This assumption appears plausible for education, nutrition and housing. When attracted by the public sector, richer individuals typically demand a higher quality of these goods in comparison to the poor.¹⁸

Example: CES-type utility function. A utility function satisfying our core assumptions is

$$u(x, c) = \frac{1}{1-\rho} (\alpha x^{1-\rho} + (1-\alpha)c^{1-\rho}), \quad (6)$$

for $\rho > 1$ and $0 < \alpha < 1$. This CES-type function is often used in public provision models (e.g., in Glomm and Ravikumar, 1998; Bearse *et al.*, 2000; 2001; 2005; Glomm *et al.*, 2011). In particular, under (6), the material utility differential between the public and private sectors decreases with income (Assumption 1), while the most preferred tax rates exist and are higher for richer individuals (Assumptions 3–4), which is proven in Appendix A.1. In all our numerical examples to follow, we use the utility function (6).

¹⁶ Note that single-peakedness of $V^{in}(t, h^{in}; y)$ does not imply single-peakedness of $V(t, h^{in}; y)$ because $V^{out}(t, h^{in}; y)$ decreases in t .

¹⁷ Formally, $t^*(y, h^{in})$ solves $\partial V^{in}(t, h^{in}; y)/\partial t = 0$ which is equivalent to $u_x/(yu_c) = h^{in}/Y = t/\bar{x}$, where the last equality follows from budget balance. Under Assumption 4, the LHS increases with y and so does the most preferred tax rate: individuals with higher income have higher most preferred tax rates.

¹⁸ For a discussion of the assumption of increasing most preferred tax rates, see, for example, Epple and Romano (1996b) and Lüllesmann and Meyers (2011).

2. Majority of the Poor

In this section, we analyse the properties of the political equilibrium when the poor have the majority: $p_\ell > \frac{1}{2}$. We demonstrate that with status concerns, there can be a separating equilibrium (dual provision), even for a society with relatively high income equality. Furthermore, the rich may consume a lower quality in the private market than offered by the public sector. Finally, the rich may politically support positive tax rates, so there can be unanimity for public provision. We identify necessary and sufficient conditions for when these outcomes are generic features of the political equilibrium.

2.1. The Separating Political Equilibrium

When the poor hold the majority, their vote is decisive. Among all feasible economies, they will choose the one that maximises their utility. Lemma 2 states that if a separating economy is feasible at the most preferred tax rate of the poor, then this economy will be the unique political equilibrium.¹⁹ We focus the subsequent analysis on this separating equilibrium because we are interested in cases where dual provision actually occurs.²⁰

LEMMA 2. Assume $p_\ell > 1/2$ and $\bar{S} \geq 0$. If, for given parameters, the economy $(t, h^{in}) = (t^*(y_\ell, p_\ell), p_\ell)$ is feasible, then a political equilibrium with $t > 0$ uniquely exists, and it is given by $(t^*(y_\ell, p_\ell), p_\ell)$.

The intuition for Lemma 2 is as follows. Individuals with incomes below the mean materially benefit from the redistributive nature of public provision. Therefore, the poor prefer a separating economy over a pure market economy without public provision. But a separating economy also dominates pooling in the public sector because in the former case redistribution is higher, whereas the poor's social status is the same and equal to zero in both cases. We now develop a condition on the model parameters for inequality and status such that the poor's most preferred political equilibrium exists. In this respect, Lemma 2 proves useful as it tells us that we can concentrate on feasibility.

The economy $(t, h^{in}) = (t^*(y_\ell, p_\ell), p_\ell)$ is feasible, if the poor stay in the public sector and the rich opt out. Using condition (4), this requires that the status from opting out must be large enough to compensate the rich for the material utility differential between public and private sector consumption. At the same time, status must not be too high, as otherwise the poor would opt out, too:

$$\Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_h) < \bar{S} \leq \Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_\ell). \quad (7)$$

In Figure 1, we graphically illustrate the conditions in (7), and we derive some of their properties in Lemma 3.

¹⁹ Note that this implies that the political equilibrium is unique, provided that the poor are not indifferent between several tax candidates. If that were the case, we could introduce a tie-breaking rule to let the poor select the economy with the lowest tax rate when indifferent.

²⁰ We characterise the candidate equilibrium tax rates in the auxiliary Lemma 4 in the Appendix. We can also characterise equilibria outside the region where dual provision at the decisive voter's most preferred tax rate arises as the unique political equilibrium. As this is of little interest for this paper, we concentrate on the dual-provision equilibrium described here. Additional results are available upon request.

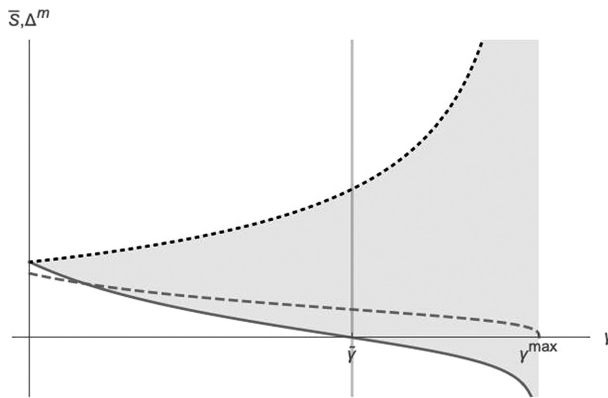


Fig. 1. *Separating Equilibrium under Status Concerns with Majority of the Poor* ($p_\ell > 1/2$).

Notes: The graph draws the material utility differential between staying in and opting out, Δ^M , for the rich (grey solid) and the poor (black dotted) as a function of the degree of inequality γ . The grey area in between the lines represents the parameter combinations (γ, \bar{S}) such that the separating equilibrium with the poor enforcing their most preferred tax $(t, h^m) = (t^*(y_\ell, p_\ell), p_\ell)$, exists. The dashed line plots the utility differential for the rich between opting out and utility without public provision $(t, h^m) = (0, 0)$. To generate the example, we use the utility function (6), with $\rho = 1.5$, $\alpha = 1/2$, $p_\ell = 0.75$, and $Y = 1$.

LEMMA 3. For every $\bar{S} \geq 0$, $\Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_h)$ is (i) positive for $\gamma = 0$, and (ii) monotonically decreasing in γ . There exists (iii) $\tilde{\gamma} \in (0, \gamma^{max})$ such that the rich opt out for $\gamma > \tilde{\gamma}$ and $\bar{S} = 0$.

If there is no income inequality ($\gamma = 0$), the rich (and the poor) earn the mean income, such that they find the public sector relatively attractive in monetary terms at $t^*(y_\ell, p_\ell)$: their material utility differential between public and private sector consumption is positive. Higher inequality increases the rich's income, lowering their incentives to stay in the public sector (see Assumption 1). This effect is amplified by a political equilibrium effect, arising from the fact that the poor's most preferred tax is endogenous: an increase in income inequality reduces the poor's income, so they demand less of the publicly provided good x (see Assumption 4). However, a lower provision level (resp., a lower tax rate) further reduces the relative attractiveness of the public sector for the rich. For this reason, the rich's Δ^M unambiguously decreases with the degree of inequality, becoming negative when inequality exceeds a critical value $\tilde{\gamma}$. Above this critical inequality level, the rich always decide to opt out if status concerns are absent.

For the poor, the situation looks different. As their income decreases as the level of inequality, γ , increases, the material utility differential between public and private sector consumption increases as γ increases for a given tax rate. But the equilibrium tax rate, being endogenous and set by the poor, exerts a countervailing effect as it decreases together with the poor's income (Assumption 4): a decreasing tax rate, *ceteris paribus*, reduces the relative attractiveness of the public sector. In what follows, we assume that the direct effect prevails, ensuring that Δ^M is increasing in γ for the poor. Formally, this is equivalent to assuming that the reaction of the equilibrium tax rate with respect to γ is sufficiently weak:²¹

²¹ It is $\partial(\Delta^M(t^*(y_\ell(\gamma), p_\ell), p_\ell; y_\ell(\gamma)))/\partial\gamma = [u_x Y/h^m - y_\ell(u_c - v')]\partial t^*(y_\ell, \cdot)/\partial\gamma + (u_c - v')\partial y_\ell/\partial\gamma(1 - t^*(y_\ell))$. Since $u_x \partial \bar{x}/\partial t = u_c y_\ell$ at the poor's most preferred tax, this expression simplifies to $y_\ell v' \partial t^*(y_\ell, \cdot)/\partial\gamma + (u_c - v')\partial y_\ell/\partial\gamma(1 - t^*(y_\ell, \cdot))$, which is ambiguous in sign. For $\partial t^*(y_\ell, \cdot)/\partial\gamma$ sufficiently small, however, this expression is positive.

ASSUMPTION 5. For all $\gamma > 0$, we assume that $\partial t^*(y_\ell, \cdot)/\partial \gamma$ is sufficiently small such that $\partial(\Delta^M(t^*(y_\ell(\gamma), p_\ell), p_\ell; y_\ell(\gamma)))/\partial \gamma > 0$.

Observe that Assumption 5 is satisfied in the numerical example underlying Figure 1: the black dotted line, representing Δ^M for the poor, is monotonically increasing in γ .

In the following, we demonstrate that status enlarges the range of parameters for which a separating equilibrium exists. First, consider the case without status concerns, $\bar{S} = 0$. In this case, the separating equilibrium with the most preferred tax rate of the poor, $t^*(y_\ell, p_\ell)$, exists if and only if $\gamma > \tilde{\gamma}$. Intuitively, the rich's income must be relatively high so that the material benefits from choosing good x freely can outweigh the loss from foregoing the public alternative, \bar{x} . Otherwise, the rich would prefer to stay in the public sector and break the separating equilibrium. This changes when status concerns come into play: a separating equilibrium can also exist for $\gamma \leq \tilde{\gamma}$, provided that the status gain from opting out is large enough to compensate the rich for their net material loss from opting out. This is the case if (\bar{S}, γ) lies in the shaded area in Figure 1 to the left of $\tilde{\gamma}$. Such a triangle area necessarily exists if Δ^M is increasing in γ for the poor (Assumption 5).²² We thus can state:

PROPOSITION 1. With status concerns, a separating political equilibrium $(t^*(y_\ell, p_\ell), p_\ell)$ exists for $\gamma < \tilde{\gamma}$ if both (i) $\Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_\ell)$ is monotonically increasing in γ and (ii) $\Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_h) < \bar{S} \leq \Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_\ell)$.

Proposition 1 implies that, in contrast to the predictions of a model without status concerns, a separating equilibrium may result even in very equal societies. Thus, a status-enhanced provision model can be reconciled with the observation that relatively equal countries also provide essential goods and services to their citizens for which private alternatives exist.

2.2. Quality in the Market vs. Public Sector

We now discuss the implications of status concerns for the levels of provision, both in the private and public sector. In a separating equilibrium without status ($\bar{S} = 0$), everybody who opts out of public provision purchases a higher level than the level provided by the public sector, \bar{x} .²³ As noted in the introduction, this prediction is not always in line with empirical evidence suggesting that some individuals consume in the private sector but choose a lower level than \bar{x} . Status concerns can rationalise this observation: in exchange for the status gains from opting out, individuals might be willing to accept lower consumption levels of good x when buying it in the market. We find that the emergence of a separating equilibrium with lower market consumption levels crucially depends on the levels of status and income inequality:

PROPOSITION 2. In a separating political equilibrium $(t^*(y_\ell, p_\ell), p_\ell)$ with status concerns, $\bar{S} > 0$, we find $0 < \tilde{\gamma} < \tilde{\gamma}$ such that $x^* \leq \bar{x}$ if and only if $\gamma \leq \tilde{\gamma}$ and $\Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_h) < \bar{S} \leq \Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_\ell)$.

²² A shaded area, such as in Figure 1, always occurs in the vicinity but to the left of $\tilde{\gamma}$, as long as the poor's Δ^M is monotone in γ . We keep, however, with Assumption 5 for the clarity of exposition.

²³ For $\bar{S} = 0$ individuals who opt out of the public sector are characterised by $\Delta^M(t, h^{in}; y) < 0$, or, equivalently, by $u(x^*(y(1-t)), c^*(y(1-t))) > u(\bar{x}, y(1-t))$. As $c^* = y(1-t) - x^* < y(1-t)$, this can only hold if $x^*(y(1-t)) > \bar{x}$.

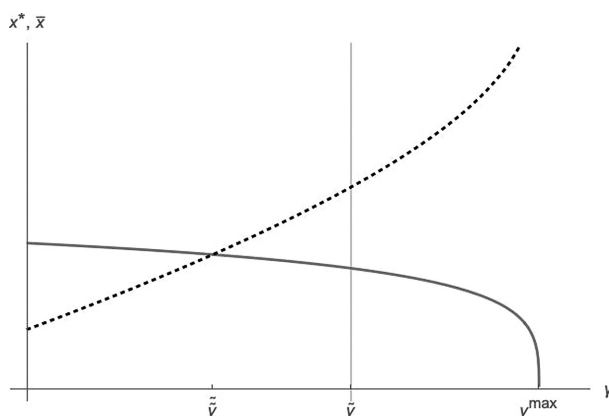


Fig. 2. *Quality in the Public vs. Private Sector.*

Notes: The graph draws the separating equilibrium quantities consumed by the poor inside the public sector \bar{x} (grey solid) and the quantity of good x consumed by the rich in the market x^* (black dotted), for varying degrees of inequality γ . To generate the graph, we use the utility function (6) with $\rho = 1.5$, $\alpha = 1/2$, $p_\ell = 0.75$, and $Y = 1$ (as in Figure 1).

To illustrate Proposition 2, consider Figure 2, which depicts the public provision level \bar{x} and the rich's market demand x^* over γ in a separating equilibrium with status concerns.²⁴ At $\gamma \geq \tilde{\gamma}$, the rich consume a higher level of x in the market than is provided to the poor in the public sector: $x^* > \bar{x}$. Now assume that γ decreases below $\tilde{\gamma}$. The quantity of good x consumed by the rich will decline for two reasons. First, gross income y_h decreases; second, the equilibrium tax increases, as the poor demand higher levels of x when becoming relatively richer in a more equal economy. Due to the latter effect, the public provision level \bar{x} increases when γ decreases. Hence, there is some critical γ below which the inequality $x^* > \bar{x}$ flips. Below this threshold of income inequality, the rich are so poor that they cannot afford high levels of good x in the market and, therefore, are forced to accept a lower level than offered by the public sector—and the (sufficiently high) social status from opting out makes the rich want to pay for the cross-subsidisation through public provision.

An interesting implication of Proposition 2 is that we expect a quality gap to the disadvantage of the market to occur rather in relatively equal than in relatively unequal societies. A status-enhanced public provision model thus predicts private schools of low quality to be more likely in egalitarian countries, such as France, Germany or Sweden, than in the UK or USA.

2.3. Voting Behaviour of the Rich

In a standard, pure neoclassical model of voting the rich will always oppose public provision. However, this prediction is not in line with empirical evidence suggesting that richer individuals often support publicly provided goods and services, although they make no or only little use of them. Status concerns can accommodate this observation. If the prestige of private sector

²⁴ To generate the figure, we assume that \tilde{S} is fixed such that condition (7) is satisfied for all γ . This is the case for $\tilde{S} = \Delta^M(t^*(Y, p_\ell), p_\ell; Y)$ —where Δ^M for the rich and the poor intersect in Figure 1. We can alternatively adjust \tilde{S} such that the separating equilibrium is just maintained as γ changes or to any other \tilde{S} satisfying (7).

consumption is high enough, richer individuals might be better off in a separating equilibrium with dual provision, voluntarily accepting the costs of subsidising the public sector.

Define S^0 as the rich's utility loss from financing public provision:

$$S^0 := v(y_h) - v(y_h(1 - t^*(y_\ell, p_\ell))) > 0. \quad (8)$$

The rich are (weakly) better off in a separating equilibrium if the utility loss from paying taxes does not exceed the status gain from social separation: $S^0 \leq \bar{S}$. This is, somewhat surprisingly, true for relatively equal societies:

PROPOSITION 3. *Suppose $p_\ell > 1/2$. Then, there exists $0 < \bar{\gamma} < \tilde{\gamma}$ such that for all $\gamma \leq \bar{\gamma}$, the rich are (weakly) better off in any separating equilibrium $(t^*(y_\ell, p_\ell), p_\ell)$ than in a pure market economy $(0, 0)$.*

The intuition for this result is that if inequality is low, the tax burden for the rich is also relatively low. At the same time, for low inequality, status must be sufficiently large in a separating equilibrium, otherwise the rich do not opt out. Both these effects make $\bar{S} > S^0$ more likely.

In Figure 1, S^0 is represented by the dashed line, strictly decreasing in this example. The rich are better off in a separating equilibrium for all γ smaller than the level where the dashed line and the rich's Δ^M curve intersect. However, $\bar{S} > S^0$ also holds for some separating equilibria to the right of this intersection. In fact, for the specific utility function used (see equation (6) and the parameters in Figure 1), the rich would endorse public provision for more parameter constellations than for which they would oppose it. This shows that, in the presence of status concerns, unanimity in favour of public provision, which in a standard voting model can never occur, may become even likely.

3. Provision for a Minority

Some important goods and services such as housing, nutritional assistance and transportation are typically publicly provided in democratic countries, while the majority of citizens chooses the private alternatives and only low-income individuals consume the publicly provided option (see, e.g., Litman, 2009; Andrews *et al.*, 2011; USDA, 2015). While (most) existing voting models cannot account for such a minority provision, a status-enhanced model can. To show this in our simple model with two income types, we give the rich the majority.²⁵

If $p_\ell < 1/2$, a political equilibrium with dual provision can only exist if there is an economy (t, p_ℓ) such that (i) the poor stay in the public sector; (ii) the rich opt out; and (iii) the rich are better off in this economy than in one without public provision. Condition (i) is satisfied if $\bar{S} \leq u(tY/p_\ell, y_\ell(1 - t)) - v(y_\ell(1 - t))$. If the rich stay out of the public sector, they receive utility $V^{out} = v(y_h(1 - t)) + \bar{S}$, which is strictly decreasing in t . Hence, the only possible equilibrium candidate is the lowest tax rate satisfying the above inequality. But this is the tax rate of indifference of the poor, $\hat{t}(y_\ell, p_\ell; \bar{S})$, from Lemma 1. By income sorting, the rich opt out at $\hat{t}(y_\ell, p_\ell; \bar{S})$, so condition (ii) is satisfied. Condition (iii) demands $v(y(1 - \hat{t}(y_\ell, p_\ell; \bar{S}))) + \bar{S} > v(y_h)$, or equivalently:

$$\bar{S} > v(y_h) - v(y_h(1 - \hat{t}(y_\ell, p_\ell; \bar{S}))) := \tilde{S}^0(\bar{S}). \quad (9)$$

²⁵ This allows us to show that status concerns can lead to minority provision even in a setting where a neoclassical model is maximally biased against public provision. For the possibility of minority provision in a model with continuous types, see the working paper version of this paper (Friedrichsen *et al.*, 2019).

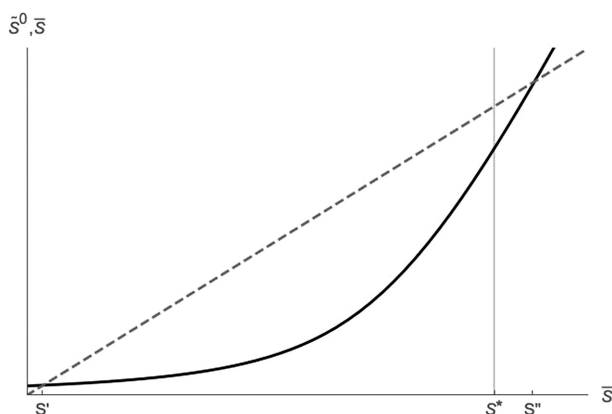


Fig. 3. *Separating Equilibrium under Status Concerns with Majority of the Rich* ($p_\ell < 1/2$).

Notes: The graph depicts \bar{S}^0 , representing the rich's utility difference between a situation where they offer the poor their tax rate of indifference and a situation with no provision, over \bar{S} . The political equilibrium with the poor minority staying in the public sector exists for intermediate status levels $S' < \bar{S} < S''$. To generate the example, we use the utility function (6) with $\rho = 1.5$, $\alpha = 0.1$, $p_\ell = 0.25$, $\gamma = 0.05$ and $Y = 1$.

Whenever the rich prefer $(\hat{t}(y_\ell, p_\ell; \bar{S}), p_\ell)$ over the market economy $(0, 0)$, they also prefer $(\hat{t}(y_\ell, p_\ell; \bar{S}), p_\ell)$ over any economy with pooling in the public sector since redistribution lowers their utility. Thus, we can state:

PROPOSITION 4. *Suppose $p_\ell < \frac{1}{2}$. For given $\gamma > 0$, there exists a unique inner political equilibrium $(t, h^{in}) = (\hat{t}(y_\ell, p_\ell; \bar{S}), p_\ell)$ if and only if $\bar{S} > \bar{S}^0(\bar{S})$.*

We illustrate condition (9) with an example in Figure 3, which depicts \bar{S}^0 against \bar{S} . The dashed line is the 45° degree line. Here, public provision for the poor minority occurs if social prestige is neither too low nor too high. Intuitively, for low social status, the separating economy fails to be a political equilibrium because the rich are not sufficiently compensated for their tax payments, and therefore do not support public provision. When social status increases, the poor must be offered a higher tax to stay in the public sector, and thus to keep the private system socially exclusive. Condition (9) holds for status values exceeding a certain minimum level S' . However, status cannot be too high because high-status levels push up the level of public provision, thus becoming too costly at some point, such that the rich are worse off than in a pure market solution. Therefore, the economy $(\hat{t}(y_\ell, p_\ell; \bar{S}), p_\ell)$ ceases to be a political equilibrium for social status exceeding a certain upper level, S'' .²⁶

Minority provision requires a tax rate that just keeps the poor indifferent between public and private sector consumption to ensure that the rich can separate in the private market and obtain a status gain. This separation-ensuring tax rate is increasing in status such that the desire for separation may push tax rates beyond even the level that the poor would prefer. In Figure 3, we mark by S^* the status level at which the poor's tax rate of indifference (which depends on \bar{S}) is equal to their most preferred tax $t^*(y_\ell, p_\ell)$ (which is independent of \bar{S}). For $\bar{S} > S^*$, status

²⁶ The existence of such an upper level in this example is driven by the convexity of the tax rate of indifference in the status level, following from Assumption 3, which then leads to convexity of $\bar{S}^0(\bar{S})$ up to a certain point.

concerns sustain minority provision with tax rates that even exceed the ideal tax rate of the poor: from their point of view, there is over-provision of good x .

4. Status vs. Paternalism and Altruism

Status concerns endow richer individuals with a motive to vote for the public provision of private goods, even if they do not materially benefit from it. However, alternative (behavioural) assumptions may also explain some of the empirical features of real-world dual-provision systems, which are hard to reconcile with standard voting models. In particular, paternalism and altruism constitute relevant candidate explanations. In this section, we show what our model distinguishes from these approaches.

Suppose that (rich) individuals are paternalists who believe that the poor under-invest in ‘merit’ goods like education or health. We use the same framework as above but now assume that the rich gain extra utility whenever the poor’s consumption of the merit good x exceeds some minimum level, x^{min} , which lies above the poor’s market consumption in the laissez-faire without government intervention: $x^{min} > x^*(y_\ell)$. Specifically, let the preferences of the rich be given by

$$U(x, c) = u(x, c) + \mathbb{1} \cdot P, \quad (10)$$

where P is paternalism utility and $\mathbb{1}$ is an indicator for when the poor’s consumption passes the minimum level. By contrast, the poor’s utility is just $u(x, c)$.

Under paternalism, there can be provision for the (poor) minority—as is the case under status. To see this, assume that the rich have the majority: $p_\ell < 1/2$. In a separating political equilibrium, they offer the poor exactly the tax that is consistent with the minimum consumption level under the public budget constraint, i.e., $t^{min} := x^{min} p_\ell / Y$. At this tax rate, the poor choose to consume in the public sector because $x^{min} > x^*(y_\ell)$ and, therefore, $t^{min} > \hat{t}(y_\ell, p_\ell)$.²⁷ For (t^{min}, p_ℓ) to be a political equilibrium, the following is necessary and sufficient:

$$u(t^{min} Y / p_\ell, y_h(1 - t^{min})) + P < v(y_h(1 - t^{min})) + P \quad (11)$$

$$P > v(y_h) - v(y_h(1 - t^{min})) := P_0. \quad (12)$$

Condition (11) requires that the rich cannot benefit from consuming the publicly provided good at the minimum tax. Unlike status utility, paternalism utility does not depend on sector choices; thus, P cancels out. Condition (12) states that paternalism utility must be high enough to compensate the rich for the taxes they have to pay to force the poor to the minimum consumption level. Condition (11) is implied by Assumption 1. Therefore, for all $P > P_0$, (t^{min}, p_ℓ) is the unique political equilibrium.

Thus, a model with paternalistic preferences can explain why richer individuals vote for the public provision of goods they themselves do not use and, hence, the emergence of minority provision. However, paternalism cannot accommodate the observation that private schools may be of lower quality than public schools. This can be directly seen from condition (11), which implies that the material utility differential for the rich, $\Delta^M(t, p_\ell; y_h)$, is negative in a

²⁷ At the tax rate of indifference the poor receive utility $v(y_\ell(1 - \hat{t}(y_\ell, p_\ell))) < v(y_\ell)$ and the public provision level is $\bar{x} = \hat{t}(y_\ell, p_\ell) Y / p_\ell$. As good x is normal, $x^*(y_\ell) > x^*(y_\ell(1 - \hat{t}(y_\ell, p_\ell)))$. Moreover, as the poor’s material utility differential between public and private sector consumption Δ^M is zero at $\hat{t}(y_\ell, p_\ell)$, $x^*(y_\ell(1 - \hat{t}(y_\ell, p_\ell))) > \bar{x}$. Therefore, for $x^{min} > x^*(y_\ell)$, we must have $t^{min} > \hat{t}(y_\ell, p_\ell)$.

paternalism equilibrium.²⁸ However, this violates the necessary condition for private market quality to fall below \bar{x} , namely that $\Delta^M(t, p_\ell; y_h)$ must be positive (see Subsection 2.2). For the same reason, the paternalism model cannot provide a rationale for public provision in relatively equal societies: for inequality sufficiently low, Δ^M is positive for the rich, which is incompatible with condition (11).

In a model in which individuals are altruistic, we can derive similar results. If we assume that the rich feel pity for the poor, we can also accommodate minority provision.²⁹ But, as altruism for the poor does not interfere with the rich's sectoral choice, their material utility differential between public and private consumption must be negative in a separating equilibrium. Consequently, as with paternalism, there can be neither lower consumption in the market nor dual provision for societies that have relatively equal income distributions.

As noted in the introduction, there are also non-behavioural arguments for why the quality in the private sector can be lower than in the public sector. Thus, when combined with other extensions of the neoclassical provision model, altruism or paternalism could account for the other observed surprising facts mentioned in the introduction (though the emergence of dual provision for relatively equal societies would still be difficult to explain). We do not aim to imply that status is the only relevant factor in the context of public provision. However, a status-enhanced model allows for the accommodation of several phenomena of real-world dual-provision systems, which are hard to reconcile with neoclassical voting models, in a single, unified framework.

5. Political Coalitions in a Continuous-Type Model

A question receiving substantial attention in the literature on the public provision of private goods is what political coalitions in dual-provision systems look like (see, e.g., Epplé and Romano, 1996b; Lülfsmann and Myers, 2011). The topic of coalition formation is also addressed by work on the political economy of cash redistribution in the presence of status concerns (Levy and Razin, 2015; Gallice and Grillo, 2019). In this section, we study how status concerns affect the coalition structure for in-kind provision.

In a model with two income types, political coalitions are straightforward: the only possible (non-singleton) coalition encompasses unanimity between the rich and the poor (see Subsection 2.3). In reality, however, political alliances are more diverse, often comprising a number of different social groups. To accommodate such diversity, we could extend our model to more than two, say n , income groups. The coalition results will then, however, crucially depend on (external) assumptions about the number and the sizes of the groups as well as on the income levels of the groups and their relation to each other. Therefore, we consider a model with a continuous distribution of income types, in which social segmentation arises endogenously.

We build our analysis on Epplé and Romano (1996b), a standard voting model on public provision with continuously distributed incomes. The Epplé and Romano model is famous for

²⁸ If the poor have the majority ($p_\ell \geq 1/2$), t^{min} in condition (11) must be replaced with the most preferred tax of the poor, $t^*(y_\ell, p_\ell)$, in order for this tax to be feasible and, hence, the political equilibrium.

²⁹ For instance, we could assume that the rich's utility positively depends on the utility of or on the quantity of good x consumed by the poor.

its so called ends-against-the-middle result: in a political equilibrium, a group of middle-income earners who favour tax increases must be exactly offset by a coalition of the rich and the poor, who both favour marginal tax cuts. We show that status concerns give rise to a wider range of political coalitions. In particular, we demonstrate that the political equilibrium is of one of three different types, including a novel ‘ends-against-the-ends’ constellation, where the upper rich ally with the upper middle class inside the public sector to support a marginal tax increase.³⁰ In the following, we present the main results and the mechanics of our model. The full analysis and numerical examples are contained in the working paper version of this paper (Friedrichsen *et al.*, 2019).

Framework. Incomes are continuously distributed, and preferences of individuals are given by

$$U(x, c, a) = u(x, c) + \beta \cdot S^a, \quad (13)$$

where $\beta \geq 0$ measures the intensity of status concerns and S^a denotes the status utility of the sector choice a , which takes on the value ‘in’ for an individual who consumes in the public sector and ‘out’ for people who opt out of public provision and buy good x on the market. Status values S^a are endogenous and increase in the expected incomes of the population subgroup taking decision a :

$$S^a = \mathbf{E}(y|a) \text{ for } a \in \{in, out\}. \quad (14)$$

One interpretation of the preferences given by (13) and (14) is in terms of social signalling: choices between the publicly provided and private alternatives of a good communicate about one’s income or wealth (or about some other status asset correlated to income or wealth), and the status value attached to a sector is larger the richer its typical user is expected to be.³¹ In equilibrium, there will be income sorting such that the status associated with the private sector is higher than that of the public sector. Further, the social status ascribed to each sector is larger, the more people stay in the public sector. This (equilibrium) dependence of S^{out} on the share of public sector users is akin to the status formulation of our two-type model and is crucial for the results.

In particular, under status concerns, policy changes have a social feedback effect: a higher tax rate attracts more and, on average, richer individuals into the public sector such that the status value from market consumption, S^{out} , increases; the private sector becomes more select. This status effect may override the reduction in consumption utility from increased tax payments. Thus, in line with the empirical evidence quoted in the introduction, rich non-users of publicly provided goods may politically support a marginal increase in the tax rate.

Status preferences imply that indirect policy preferences of private sector users may no longer peak at a zero but instead at a strictly positive tax rate. We assume that individuals have a unique most preferred tax when opting out and that this tax rate increases with income. Economically this assumption means that the utility gain from mixing with the rich is complementary to income—a frequent assumption in matching models with status concerns (see, e.g., Levy and Razin, 2015).

³⁰ This coalition contains four (endogenous) subgroups of the population, and thus would remain undetected in a model with three income types.

³¹ Our status preference is close to Corneo and Jeanne (1997) and Bénabou and Tirole (2011), who also assume that the status value of a certain consumption decision increases with the (perceived) income of individuals making the same choice.

For those consuming in the public sector, most preferred tax rates are still increasing with income, as in the standard framework.³²

Coalitions in a political equilibrium. In a majority voting equilibrium, the groups of individuals who respectively prefer a marginal tax cut and tax increase must exactly offset each other, and each constitute half of the population. To convey the implications of status concerns for the political coalitions, we go through the three possible equilibrium constellations in order of increasing relevance of status concerns.³³ First, assume that status does not matter ($\beta = 0$). Under the ensuing pocketbook voting, the rich who opt out always advocate a marginal tax decrease. As the most preferred tax rates are positively aligned with income for those who consume in the public sector, the rich form a coalition with individuals at the bottom of the income distribution. Their coalition is balanced by a coalition of middle-income earners staying inside the public sector, who prefer relatively high levels of taxation (and thereby high levels of public provision) in an *ends-against-the-middle* equilibrium.

Second, assume that individuals are concerned with status ($\beta > 0$) but not too much. Then, some richer individuals, though choosing private alternatives, may benefit from higher public provision due to its positive impact on their social status. Politically, these individuals will join the middle class in support of an expansion of the public sector. As the desire for social exclusivity is assumed to grow with income, this coalition of supporters comprises the richest individuals. They are offset by a coalition of less rich private sector consumers, for whom monetary concerns still override status concerns, with the poor, who favour a cut in taxes and public provision levels. Thus, in this novel *ends-against-the-ends* equilibrium, the upper and lower end in a sector form a coalition with the corresponding end from the other sector.

Third, if status concerns are sufficiently strong among all non-users, the *median income earner* may determine the equilibrium. Everybody outside the public sector favours an increase in public provision for the sake of additional status. This implies positive income monotonicity among private sector users and, hence, a monotonic preference ordering over the whole income range. Consequently, the classical median-income voter equilibrium is restored, where only the poorest in the public sector object to tax increases.

Status concerns can make rich individuals willing to support an expansion of the public sector, even though they primarily rely on private alternatives. The use of our configuration of political equilibria is that it tells us *with whom* these individuals are forming political alliances. For goods like education, where status rents and income appear to be complementary—an assumption that would be even more plausible if the status gain from keeping the private sector socially exclusive is viewed as a social peer or congestion effect—the rich can be expected to ally with the middle class inside the public sector, thereby breaking up their pecuniary-driven coalition with the poor. In this sense, social status concerns result in a compression of votes. Political coalitions between the extremes of the income distribution, which are predicted in Epplé and Romano (1996b) but not often observed in reality, lose their inevitability.

³² S^{in} increases in the tax rate, too, but this effect does not interfere with neoclassical voting motives.

³³ This illustration of the effects of status concerns on the possible types of the political equilibrium should, however, be taken with some caution: the interaction between consumption utilities, the income distribution and the strength of status concerns in a political equilibrium does not allow for unambiguous comparative statics. Nevertheless, the numerical examples we provide in the working paper version demonstrate that the strength of status motives alone can affect coalition structures and, at least for some parameter constellations, shape policy outcomes in an intuitively plausible way.

6. Conclusion

Governments provide goods to their citizens that are at least partly private in nature: education, housing, transport, health services, etc. In democratic regimes, the provision of these goods is determined in a political process, balancing the votes for and against (a larger volume of) public provision. In this paper, we have shown that social motives, here exemplified by social status concerns, may substantially affect the political and economic properties of voting equilibria.

Status-concerned non-users of the public sector may be willing to subsidise public provision though they do not directly materially benefit from it. Thus, status concerns, whether intrinsically motivated or purely instrumental, can, in addition to other social motives such as altruism (Coate, 1995), concerns for equal opportunities (Gasparini and Pinto, 2006) and paternalistic preferences, help explain why, for example, certain private goods are publicly provided although the majority does not take them up. Unlike status concerns, these other types of social preferences fail to explain, however, why private consumption levels are lower than public provision levels, as sometimes happens in reality. Our approach is the first to accommodate several puzzling observations of public provision in a single unified framework.

The social feedback effect we identify in this paper, i.e., that redistributive income taxation may increase or maintain the social status of the non-beneficiaries, applies for the political economy of the welfare state in general, including cash redistribution. The reason is that all redistributive mechanisms, whether cash or in-kind, partition the population into two groups—beneficiaries and net contributors. Belonging to either group sends socially informative signals about an underlying status-bearing personal characteristic such as income, a strong work ethic or social attractiveness as a partner. However, taking up or declining a publicly provided good—such as schooling, housing, food stamps—is more openly visible than receiving (or not receiving) cash payments. Thus, we think that the motives of social status are particularly relevant for in-kind redistribution or for those types of social benefit payments where recipients can be easily identified and where sorting along income lines is particularly strong.

We restrict attention to a linear tax scheme through which richer individuals contribute to public provision. It is easily seen that the rich's social gains from private sector consumption must be higher with progressive tax rates, but for sufficiently high social status, our results still go through. One can imagine other and non-tax-related contributions to public provision, which are administered entirely privately, through (imperfect) markets, that individuals might use to enhance their social status, like in-kind donations (providing equipment for public schools, donating playgrounds for social housing areas, etc.). Further, when individuals care about social status, richer people are likely to favour discriminatory in-kind programmes while poorer people tend to advocate anonymous cash transfers. Allowing for voting to take place over both in-kind and cash redistribution or incorporating (in-kind) donations would be interesting extensions of our model.

Appendix A

Proofs for Propositions 1 and 4 are contained in the main text. The remaining proofs are included here in order of the respective results in the main text.

A.1. Proof of Lemma 1

As preferences are strictly convex, $v(y(1-t)) - u(tY/h^{in}, y(1-t)) > 0$ for $t = 0$. Hence, $v(y(1-t)) + S(h^{in}) - u(tY/h^{in}, y(1-t)) > 0$ for $t = 0$ and any $S(h^{in}) \geq 0$. By Assumption 2 (i), this inequality is reversed for $t = 1$. As, by Assumption 1, $u_c - v' < 0$, there exists a unique tax rate $t = \hat{t}(y, h^{in}; \bar{S}) \in (0, 1)$ solving $v(y(1-t)) + S(h^{in}) - u(tY/h^{in}, y(1-t)) = 0$. For $0 < h^{in} < 1$, implicitly differentiating this equation with respect to \bar{S} gives $d\hat{t}(y, h^{in}; \bar{S})/d\bar{S} = -[y(u_c - v') - u_x Y/h^{in}]^{-1}$. By Assumption 1, this expression is positive. Likewise, $d\hat{t}(y, h^{in}; \bar{S})/dy > 0$ for $h^{in} > 0$. \square

A.2. Proof that the Example Utility Function and Chosen Parameterisation in Examples Satisfy Assumptions 1–4

For the utility function given in (6), indirect utility when staying in the public sector is

$$V^{in}(t, h^{in}; y) = \frac{1}{1-\rho} \left(\alpha \left(\frac{tY}{h^{in}} \right)^{1-\rho} + (1-\alpha)(y(1-t))^{1-\rho} \right),$$

which is humped-shaped over t , peaking at

$$t^*(y, h^{in}) = \left(\frac{1-\alpha^{1/\rho}}{\alpha} \frac{Y^{(\rho-1)/\rho}}{h^{in}y} + 1 \right)^{-1}.$$

Thus, this utility function satisfies Assumption 3. Further, for $\rho > 1$, the most preferred tax $t^*(y, h^{in})$ is increasing in income, so that Assumption 4 also holds.

The indirect material utility when opting out of public provision is

$$v(y(1-t)) = \frac{1}{1-\rho} (1-\alpha) \left(1 + \left(\frac{1-\alpha}{\alpha} \right)^{-\frac{1}{\rho}} \right) \left(\frac{y(1-t)}{1 + \left(\frac{1-\alpha}{\alpha} \right)^{-\frac{1}{\rho}}} \right)^{1-\rho}.$$

Thus, we have

$$u_c - v' = (1-\alpha)(y(1-t))^{-\rho} \left[1 - \left(1 + \left(\frac{1-\alpha}{\alpha} \right)^{-\frac{1}{\rho}} \right)^{\rho} \right],$$

which, for all $\rho > 0$, is smaller than zero, as required by Assumption 1.

Finally, note that the utility function in (6) is also consistent with Assumption 2. As $u(Y/h^{in}, 0)$ is decreasing in h^{in} , Assumption 2 (i) effectively imposes a maximum value for social status, $S^{max} := u(Y, 0) - v(0)$, so that for any \bar{S} below this maximum value and at a tax rate of 1, the status gain from opting out does not exceed the loss in material utility. By Assumption 1, we know that $\Delta^M(t, h^{in}; y)$ is increasing in t . Further, the preferred tax rate of the poor cannot exceed 1, $t^*(y, h^{in}) \leq 1$. It follows that, for any γ , $\Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_\ell) \leq S^{max}$. In any separating equilibrium, we further have $\bar{S} \leq \Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_\ell)$ because any separating equilibrium with the poor's most preferred tax rate satisfies condition (7). Thus, $\bar{S} \leq S^{max}$ in any separating equilibrium. Finally, our chosen utility and parameterisation are also consistent with Assumption 2 (ii) for the chosen parameterisation. This is easily seen in Figures 1 and 2, where we find a threshold inequality level such that the rich opt out at $\gamma = \gamma^{max}$ for $\bar{S} = 0$. \square

A.3. Proof of Lemma 2

We first prove an auxiliary lemma.

LEMMA 4. For $p_\ell > \frac{1}{2}$, any separating political equilibrium (t, p_ℓ) must be of one of the following types:

$$(t, h^{in}) = (t^*(y_\ell, p_\ell), p_\ell),$$

$$(t, h^{in}) = (\hat{t}(y_h, p_\ell; \bar{S}) - \epsilon, p_\ell) \text{ with } \epsilon \rightarrow 0 \text{ and } \hat{t}(y_h, p_\ell; \bar{S}) < t^*(y_\ell, p_\ell),$$

$$(t, h^{in}) = (\hat{t}(y_\ell, p_\ell; \bar{S}), p_\ell) \text{ with } \hat{t}(y_\ell, p_\ell; \bar{S}) > t^*(y_\ell, p_\ell).$$

PROOF. Consider first the case that a separating economy is incentive-compatible given the policy $(t, \bar{x}) = (t^*(y_\ell, p_\ell), t^*(y_\ell, p_\ell)Y/p_\ell)$. Then, by single-peakedness of V^{in} , every policy with $t \neq t^*(y_\ell, p_\ell)$ that would also induce $h^{in} = p_\ell$ would make the poor worse off. Now, consider the case that the economy $(t^*(y_\ell, p_\ell), p_\ell)$ is not feasible for the reason that the rich do not opt out at $t^*(y_\ell, p_\ell)$. If $\hat{t}(y_h, p_\ell; \bar{S}) < t^*(y_\ell, p_\ell)$, all economies (t, p_ℓ) with $t \in [\hat{t}(y_h, p_\ell; \bar{S}), t^*(y_\ell, p_\ell)]$ are not incentive-compatible. By Assumption 1, however, $\hat{t}(y_\ell, p_\ell; \bar{S}) < \hat{t}(y_h, p_\ell; \bar{S})$. Therefore, there exist policies (t, \bar{x}) with $t \in (\hat{t}(y_\ell, p_\ell; \bar{S}), \hat{t}(y_h, p_\ell; \bar{S}))$ and $\bar{x} = tY/p_\ell$ which will induce $h^{in} = p_\ell$ as an equilibrium outcome. Among these policies, the poor will choose the one with the highest tax possible, as $V^{in}(t, p_\ell; y_\ell)$ is strictly increasing in t for $t < t^*(y_\ell, p_\ell)$. Therefore, $\hat{t}(y_h, p_\ell; \bar{S}) - \epsilon$ is the only equilibrium candidate for $h^{in} = p_\ell$ and $t < t^*(y_\ell, p_\ell)$. Next, consider the case in which $t^*(y_\ell, p_\ell)$ is not feasible since the poor opt out: $\hat{t}(y_\ell, p_\ell; \bar{S}) > t^*(y_\ell, p_\ell)$, which is only possible if $\bar{S} > 0$. Then, by Assumption 1, $\hat{t}(y_\ell, p_\ell; \bar{S}) < \hat{t}(y_h, p_\ell; \bar{S})$. As V^{in} is strictly decreasing in t to the right of $t^*(y_\ell, p_\ell)$, $\hat{t}(y_\ell, p_\ell; \bar{S})$ is the only candidate tax in this scenario. \square

Lemma 4 states that, if the poor hold the majority, then there are three candidates for a separating political equilibrium. In each of the equilibrium candidates, the poor consume in the public sector, $h^{in} = p_\ell$. In the first candidate, the poor enforce their most preferred tax, $t^*(y_\ell, p_\ell)$; this is the poor's favourite separating political equilibrium. In the second candidate, the poor can only enforce a lower than their most preferred tax, namely the tax that just discourages the rich from consuming in the public sector, $\hat{t}(y_h, p_\ell; \bar{S}) - \epsilon$; for any higher tax, the rich would not want to opt out. In the third candidate, the poor vote for a tax at which they are just attracted to the public sector, $\hat{t}(y_\ell, p_\ell; \bar{S})$ but that exceeds their most preferred tax rate.

The second case can only be an equilibrium if the rich do not opt out at the most preferred tax of the poor and if the poor prefer this candidate both over pooling in the public sector and over pooling in the market. The third case needs a relatively high-status utility from private sector consumption, so that the poor want to forgo the public alternative, even when it is tailored to them in a materially optimal manner.

We now prove Lemma 2:

Suppose that $p_\ell > 1/2$ and that $(t^*(y_\ell, p_\ell), p_\ell)$ is feasible. Note that an individual's most preferred tax $t^*(y, h^{in})$ solves $\partial V^{in}(t, h^{in}; y)/\partial t = 0$, or, equivalently, $u_x/u_c = h^{in}y/Y$. Therefore, we can think of choosing the most preferred tax for the poor as choosing the consumption bundle (x, c) that maximises $u(x, c)$ subject to the budget set $c + h^{in}y_\ell/Y \cdot x \leq y_\ell$. As $h^{in}y_\ell/Y < 1$, the

implicit price of good x is smaller for the poor under public provision than under no provision $(t, \bar{x}) = (0, 0)$, and it is the lowest for $h^{in} = p_\ell$. By quasi-concavity of $u(x, c)$, $V^{in}(t^*(y_\ell, p_\ell), p_\ell; y_\ell) > V^{in}(t^*(y_\ell, 1), 1; y_\ell) > V^{out}(0, 0; y_\ell)$. By single-peakedness of V^{in} , $(t, h^{in}) = (t^*(y_\ell, p_\ell), p_\ell)$ also strictly dominates the remaining candidates for a separating equilibrium listed in Lemma 4. \square

A.4. Proof of Lemma 3

If $\gamma = 0$, then both the poor and the rich earn mean income, $y_\ell = y_h = Y$. In the separating equilibrium, $h^{in} = p_\ell$. Therefore, the implicit price for public provision that the poor face is $h^{in}y/Y = p_\ell < 1$. Hence, the poor are better off under their most preferred tax rate than in the market solution. But then, $\Delta^M(t^*(Y, p_\ell), p_\ell; Y) > 0$. Moreover, it holds that $\partial(\Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_h))/\partial\gamma = [u_x Y/h^{in} - y_h(u_c - v')]\partial t^*(y_\ell, p_\ell)/\partial\gamma + (1 - t^*(y_\ell, p_\ell))(u_c - v')\partial y_h/\partial\gamma$. This expression is negative by Assumptions 1 and 2 (i). For maximal inequality ($\gamma = \gamma^{max}$), the material utility differential of the rich is negative by Assumption 2 (ii). As a consequence, there exists a critical inequality level $\tilde{\gamma}$, solving $\Delta^M(t^*(y_\ell(\gamma), p_\ell), p_\ell; y_h(\gamma)) = 0$, above which the rich opt out. \square

A.5. Proof of Proposition 2

In a separating equilibrium, the poor consume $\bar{x} = t^*(y_\ell, p_\ell)Y/p_\ell$ and the rich consume $x^*(y_h(1 - t^*(y_\ell, p_\ell)))$. Note first that at $\gamma = \tilde{\gamma}$, $\Delta^M(t^*(y_\ell, p_\ell), p_\ell, y_h) = 0 \Leftrightarrow u(x^*(y_h(1 - t^*(y_\ell, p_\ell))), c^*(y_h(1 - t^*(y_\ell, p_\ell)))) = u(\bar{x}, y_h(1 - t^*(y_\ell, p_\ell)))$. As $c^* = y_h(1 - t^*(y_\ell, p_\ell)) - x^* < y_h(1 - t^*(y_\ell, p_\ell))$, we have $x^* > \bar{x}$. Second, note that for $\gamma = 0$, we have $y_h = y_\ell = Y$. For the rich in the market, the price of good x in units of good c is one; for the poor, consuming in the public sector, this price is $p_\ell y_\ell/Y < 1$. As good x is not a Giffen good, $x^* < \bar{x}$. Finally, consider how x^* and \bar{x} change with γ . It is $\partial x^*/\partial\gamma = \partial x^*/\partial(y(1 - t^*(y_\ell, p_\ell)))[(1 - t^*(y_\ell, p_\ell))\partial y_h/\partial\gamma - y_h\partial t^*(y_\ell, p_\ell)/\partial\gamma]$. From the normality of good x , and as $\partial t^*(y_\ell, p_\ell)/\partial\gamma < 0$ by Assumption 4, $\partial x^*/\partial\gamma > 0$. But $\partial \bar{x}/\partial\gamma = Y/p_\ell \partial t^*(y_\ell, p_\ell)/\partial\gamma < 0$. Hence, there is a critical inequality threshold $\tilde{\gamma} < \tilde{\gamma}$, solving $x^*(y_h(\tilde{\gamma})(1 - t^*(y_\ell(\tilde{\gamma}), p_\ell))) = t^*(y_\ell(\tilde{\gamma}), p_\ell)Y/p_\ell$ such that $x^* < \bar{x}$ for $\gamma \leq \tilde{\gamma}$. \square

A.6. Proof of Proposition 3

Recalling the definitions of Δ^M in (4) and of S^0 in (8), define

$$\begin{aligned}\zeta(\gamma) &:= S^0 - \Delta^M(t^*(y_\ell, p_\ell), p_\ell; y_h) \\ &= v(y_h) - u\left(\frac{t^*(y_\ell, p_\ell)Y}{p_\ell}, y_h(1 - t^*(y_\ell, p_\ell))\right).\end{aligned}$$

This function tracks the difference between the rich's utility loss from financing public provision (S^0) and the material utility advantage of consuming in the public sector over consuming in the private sector (Δ^M), which may be negative in case of a disadvantage.

For $\gamma = 0$, $\zeta(0) = v(Y) - u(t^*(Y, p_\ell)Y/p_\ell, Y(1 - t^*(Y, p_\ell))) < 0$. For $\gamma = \tilde{\gamma}$, Δ^M is zero for the rich, so that $\zeta(\tilde{\gamma}) > 0$. As $\zeta(\gamma)$ is continuous, there is at least one $\gamma < \tilde{\gamma}$ such that $\zeta(\gamma) = 0$. Define $\bar{\gamma}$ as the smallest γ in this solution set. As $\zeta(\gamma) \leq 0$ for $\gamma \leq \bar{\gamma}$ and as $\bar{\gamma}$ is strictly greater than the rich's Δ^M in a separating equilibrium, it follows that $\bar{\gamma} \geq S^0$ at any separating

equilibrium with $\gamma \leq \bar{\gamma}$. This implies that the rich are better off than in the market economy as the status gained exceeds the loss from public provision. \square

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