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Social mobility and the demand for public consumption expenditures

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Abstract The collective choice of public consumption expenditure is reconsidered when voters are socially mobile. In accordance with previous work on social mobility and political economics, the analysis concerns a class of mobility processes that induce mappings from initial income to expected future income that are monotonically increasing and concave. The paper abstracts from the explicitly redistributive role of government and concentrates on public consumption which is modeled as a classical public good. In equilibrium, provision is sensitive to the degree of social mobility, theoretically linking social mobility to public consumption. Further, empirical puzzles about the impact of voting franchise extensions on the growth of government spending are addressed within the context of social mobility.

Keywords Collective decision-making · Majority rule · Public goods · Social mobility · Franchise extension

1 Introduction

One of the most salient features differentiating developed economies is the percentage of national income spent on collective consumption goods. Another prominent factor which distinguishes economies is the degree of social mobility that individuals perceive. To the extent that the percentage of the real economy under governmental control is relatively static, then to explain preferences for collective consumption one must consider how the incomes of individuals, upon which preferences are based, evolve over time. This paper works to that end, by incorporating income dynamics into a standard collective choice model of public expenditure. Following the insight that the possibility of upward mobility provides a check on populist redistributive spending, formalized by Bénabou and Ok (2001), the paper considers how social mobility can affect policy preferences for public expenditures that are not explicitly redistributive. A median voter political equilibrium is identified and characterized in terms of social mobility perceptions.

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Arguably, one of the most influential theories of the size of government has been the model of Meltzer and Richard (1981), which predicts that societies with more income inequality will have larger governments (as a percentage of national income). When public consumption is financed by proportional income taxation, an individual's implicit tax price of public consumption is related directly to the ratio of his income to the economy's mean income. Meltzer and Richard (1981) show that a median voter equilibrium exists in which the median voter demands a greater percentage of national income to be spent collectively (a higher proportional tax rate) when the median-to-mean income ratio is smaller in a less equal (more skewed) distribution. When the median-income voter has a lower implicit price of public consumption, he substitutes away from private consumption and into public services. Whereas Meltzer and Richard (1981) take the income distribution as analytical primitive, the current analysis focuses on the degree of social mobility in the economy, for a given initial income distribution.[1] In this framework, if the median voter is upwardly (downwardly) mobile, then his implicit price of consuming publicly increases (decreases) in expectation and he demands less (more) real expenditure when policy choices are lasting. The effect is magnified in more mobile economies, which is to preview the main result: *ceteris paribus*, economies where upward social mobility is perceived to be greater collectively choose less public consumption as a percentage of national income than the collective choice of less mobile economies.

There has been convincing work that relates social mobility to the demand for income redistribution.[2] The link between social mobility and real government expenditures, however, has not been addressed in the literature. Economists often argue that public provision of goods and services is nothing more than inefficient income redistribution.[3] Governmental involvement in economic life, of course, extends beyond populist income redistribution. While governments do process welfare checks, the revenue raised by income taxation also finances the consumption of publicly provided goods and services (such as education, infrastructure, libraries, parks, the arts, defense, lawful order) that are demanded, to some extent, by all citizens. Furthermore, in a median-voter equilibrium, there is good reason to concentrate on the demand for collective consumption rather than pure redistribution. In reality, voters in the middle of the income distribution do *not* receive lump-sum income transfers, but *are* directly affected by collective consumption.[4]

In the model of Bénabou and Ok (2001), the role of government is purely redistributive, and income taxation finances lump-sum transfers that are positive (negative) for voters with income below (above) the economy's mean income. When taxation is non-distortionary, all with an income below the mean support a tax rate of unity and voters that are richer than average favor a tax rate of zero. Popular support for income redistribution is shown to be affected by income mobility only if the median-income voter expects an income greater than

[1] The model below is a special case of the Meltzer and Richard (1981) model, in which income is determined endogenously and income taxation is distortionary. In the current paper, income endowments and income mobility are determined exogenously, so there are no distortions to income taxation.

[2] The classic in this literature is Hirschman (1973). Subsequent analyses have been provided by Piketty (1995), Lokshin and Ravallion (2000), Bénabou and Ok (2001), Alesina and Glaeser (2004), and Alesina and La Ferrara (2005). Perhaps the first to discuss the relationship between social mobility and politics was de Tocqueville (2000), originally published in 1835.

[3] See Currie and Gahvari (2008) for a recent survey of the theoretical and empirical literature on cash versus in-kind transfers by the government.

[4] It is well acknowledged that real public expenditures have a redistributive element since public consumption is subsidized for the relatively poor, but it is not explicitly redistributive in the sense that some voters receive positive cash transfers at the expense of others whose net transfer is negative.

the mean in the future. The equilibrium tax rate is a corner solution in any event, however, either zero or one in Bénabou and Ok (2001).

One way to overcome this problem is to consider government policy more generally as public consumption rather than pure income redistribution. In the model below, social mobility affects the implied tax price of public consumption faced by the median voter, which changes the policy that maximizes his utility. Even if the median income voter does not expect an income greater than the mean in the future, his most preferred tax rate is an interior solution as he balances demands for public and private consumption.[5] Mobility of any degree will change the median voter's tax price and hence his preferred level of government spending, in contrast to Bénabou and Ok (2001), which requires the median voter to expect his income to jump above the average in order for mobility to affect the equilibrium. Taking policy platforms to be single-dimensional along the lines of public consumption, rather than explicit income redistribution, generalizes the model of Bénabou and Ok (2001), results in an interior solution for the equilibrium policy, and strengthens the theoretical link between social mobility and political outcomes.

Also related is the literature on voting franchise extension, which evaluates the impact of franchise extension on the growth of government spending in terms of how the relative income of the new pivotal voter changes once the polity becomes more representative of the population. In this literature as well, it has proven fruitful to differentiate between redistribution and public consumption when evaluating the impact of extending the franchise. Empirical estimates of the impact on public consumption of changing the pivotal voter's income via franchise extension have varied for the experiences of the United States and Europe.[6] The inconsistent econometric results are a puzzle in this literature, a piece of which could be differences in social mobility between the societies.[7]

Social mobility is a broad concept, and a consensus about its proper measurement has yet to emerge in the economics literature.[8] This paper considers social mobility in terms of the degree of state-dependence in the economy's income dynamics. A mobility process consists of conditional probability distributions, which describe the ex-ante future income prospects of individuals. As individuals form expectations of future income, conditional on their initial (endowed) income, the mobility process induces a transition function that maps initial income into expected future income. A more mobile economy in this conception is associated with a less state-dependent mobility process.

When considering social mobility in an economy in terms of perceived state dependence of income evolution, it is interesting to look at subjective responses to questions about social mobility and social justice in the *World Values Survey*. There is a strong perception among Europeans that economic success is random, essentially determined at birth. Averaging across European respondents, 54% believe that luck is more important than hard work in achieving economic success, whereas only 30% of Americans gave this response. Believing that economic success is due to luck connotes greater relevance of birth-right which

[5]The tax rate will never be a corner solution because utility is concave in government spending. Diminishing marginal utility of public consumption prevents the poor from demanding a tax rate of unity. Similarly, the rich will never demand zero taxation, despite their higher tax burden, because initial units of public consumption have high marginal utility. For both cases, it is the diminishing marginal utility of government spending that prevents corner solutions in the optimization problem of voters.

[6]Husted and Kenny (1997) find no significant impact on government spending in the experience of U.S. states in the twentieth century, while Aidt et al. (2006) find that franchise extension led to increased levels of non-redistributive government spending in Europe, using data going back to the nineteenth century.

[7]I thank an anonymous referee for suggesting this inquiry into the franchise extension literature.

[8]Fields and Ok (1999) review the literature on the measurement of income mobility.

Table 1 Luck, economic success, and the fraction of GDP spent collectively

Country	Luck	g	Country	Luck	g
Denmark	77.1	23.3	Ireland	44.9	11.9
Portugal	66.0	23.9	Czech Republic	44.1	29.7
Netherlands	62.9	20.9	Japan	41.4	16.3
Poland	61.1	17.9	Slovenia	41.2	23.7
Spain	56.1	16.6	Switzerland	41.1	11.3
Belgium	53.5	18.9	Austria	39.8	16.1
Germany	53.4	15.9	Finland	39.3	19.8
Italy	52.5	15.4	New Zealand	39.0	8.5
Sweden	51.6	24.5	Australia	38.7	16.2
Hungary	51.1	13.9	Iceland	35.1	8.6
United Kingdom	51.0	18.1	Canada	33.4	13.4
Slovakia	49.7	26.6	Korea	33.1	9.2
France	49.0	21.0	United States	30.2	13.9

Sources: World Values Surveys (1990, 2000), and United Nations (2000)

implies that future income is more state-dependent. A lower percentage of "luck determines income" responses (*Luck*) corresponds to a higher degree of perceived mobility in a society. This paper does not attempt to explain differences in mobility perceptions, but considers their political implications.[9]

Table 1 gives within country averages for the percentage of *World Values Survey* respondents who believe that luck determines economic success in their respective societies, and ranks societies from lowest perceived mobility to highest for a sample of 26 *OECD* countries. Also reported in Table 1 is the fraction of total national output that allocated by government to consumption, g. The government spending data, from the United Nations for the year 2000, are *PPP*-adjusted and correct for differences in the efficiency of public provision. The *Luck* and government spending variables are positively correlated, with a correlation coefficient of 0.55. Furthermore, there is a strong rank correlation between the variables, suggesting that, on average, societies with stronger perceptions of social mobility have lower fractions of the real economy under governmental control.[10]

[9] Alesina and Glaeser (2004) compellingly argue that ideological distinctions between Europeans and Americans follow from over a century of indoctrination through the tools available to those in political control. For example, socially charged educational curriculums and class-based political rhetoric have certainly shaped beliefs about social mobility and social justice. Furthermore, social classes in America were not inherited from a feudal or monarchical system, as in many European countries, so state-dependence of economic rank was less culturally ingrained in the American mind-set from the outset.

[10] Kendall's τ-statistic of rank correlation was calculated to be 0.385 rejecting with 99% confidence a null hypothesis that government size and mobility perceptions are independently distributed against the alternative of positive rank correlation. There exist similar rank correlations between the *Luck* variable and measures of government consumption from different years and different sources, such as the *OECD*. If the percentage of national income spent on public consumption expenditures (g) is regressed on the *Luck* variable and the log of per capita GDP (gdp), the estimated coefficient on the *Luck* variable is significantly positive with 98% confidence:

$$g = \underset{(15.395)}{27.762} + \underset{(0.0873)}{0.227} \times Luck - \underset{(1.445)}{2.159} \times gdp.$$

2 Preliminaries

2.1 Income distribution

An endowment economy is populated by a continuum of individuals with initial income, denoted by $x \in X \equiv [0, \infty)$. Individuals along the continuum are indexed by $i \in [0, 1]$ according to initial income, which has c.d.f. F over support X such that $F(0) = 0$, $F(\infty) = 1$. Mean income, denoted by $\bar{x}$, is given by the first moment of the distribution, i.e., $\bar{x} = \int_{x=0}^{\infty} x dF(x)$. The initial income of an individual in the ith quantile, $i \in [0, 1]$, of the distribution is given by x^i, where $x^i = F^{-1}(i) \equiv \inf\{x \in X : F(x) \geq i\}$. Specifically, the income of the median individual in the distribution is denoted x^{med}, where $x^{\text{med}} = F^{-1}(1/2) \equiv \inf\{x \in X : F(x) \geq 1/2\}$. In accord with the empirical regularity that income distributions are right-skewed, I assume that median income is less than mean income.

Assumption 1 Right-skewness: $x^{\text{med}} = F^{-1}(1/2) < \bar{x}$.

Future income is uncertain due to social mobility and individuals form future income expectations conditional on their initially endowed income. Denoting second period income by $y \in X$, let $\mathrm{E}(y|x^i)$ express the expected future income of an individual initially in the ith quantile of the income distribution. Denote by $M(y|x^i) = \int_{s=0}^{y} m(s|x^i)ds$ the probability that an individual initially in the ith quantile of the distribution will have at most a future income of y. The ex-ante expected future income of individual i for a given mobility process, M, is the first moment of the conditional distribution, i.e.,

$$\mu_M(x^i) \equiv \mathrm{E}_M(y|x^i) = \int_{y=0}^{\infty} y dM(y|x^i) = \int_{y=0}^{\infty} y m(y|x^i) dy,$$

where $\mu_M(\cdot)$ is the implied transition function from current period income to expected future income for a given mobility process, M. After introducing the policy environment, the mechanics of social mobility are made more explicit. For now, simply assume that the distribution's mean income is expected to increase at some exogenous and finite natural growth rate, γ.

Assumption 2 Natural rate of economic growth:

$$\bar{y} = \int_{x=0}^{\infty} \left[\int_{y=0}^{\infty} y dM(y|x) \right] dF(x) = \int_{x=0}^{\infty} \mu_M(x) dF(x) = (1+\gamma)\bar{x}.$$

2.2 Policy environment and voter utility

For its part, the government raises tax revenues via proportional income taxation at rate t to finance the provision of pure public goods, g. Mobility considerations impact voter preferences for g if the vote over the public choice has lasting effects or, if there is *policy persistence*. Policy persistence is a procedural reality of legislation in representative democracies. In a natural sense as well, policy persistence characterizes long-term government projects, such as building and maintaining infrastructure. I take policy persistence as given and, for simplicity, assume that there are two periods, initial and future.[11] Individuals vote in the initial period for a policy that gets implemented in both the initial and future periods. When forming preferences for the durable policy, individuals consider future income, which is uncertain due to social mobility.[12]

A voter's future utility is defined over private market consumption and public consumption, $U(c, g)$ with $U_c > 0$, $U_g > 0$, and $U_{gg} < 0$. Assume that risk-neutral individuals consume their entire net income in private markets, so that $c_1^i = (1-t)x^i$ is first period consumption and $c_2^i = (1-t)\mu_M(x^i)$ is expected future consumption. The expected lifetime utility of individual i is taken to be quasi-linear.

$$U(c^i, g) = (1-t)[x^i + \mu_M(x^i)] + 2H(g), \tag{1}$$

where $H(\cdot)$ is an increasing and concave function. Voters weigh the benefits and costs on the margin to determine their demand for collective consumption.

3 Social mobility and majority-rule equilibrium

3.1 Policy preferences with income uncertainty

Normalize the population's measure to one, so that aggregate income in the economy equals mean income in each period. Assuming the government must balance the budget, per capita tax revenue equals aggregate public spending, or

$$t(\bar{x} + \bar{y}) = t(2+\gamma)\bar{x} = 2g. \tag{2}$$

Rearranging (2) and substituting into (1) yields the lifetime expected indirect utility of individual i, which can be written as

$$W(g; x^i) = \left[(2+\gamma)\bar{x} - 2g\right]\left[\frac{x^i + \mu_M(x^i)}{(2+\gamma)\bar{x}}\right] + 2H(g). \tag{3}$$

As a voter, the *preferred policy* of individual i maximizes (3) by equating the marginal cost of government spending with its marginal benefit:

$$\frac{x^i + \mu_M(x^i)}{(2+\gamma)\bar{x}} = H_g(g), \tag{4}$$

[11] While policy persistence is a rather extreme assumption, it would be sufficient to assume that government spending is only persistent on the "downside", meaning that government expansions enacted today cannot be retracted in the future. See Tanzi and Schuknecht (2000) for a comprehensive account of the growth in government spending as a percentage of national incomes around the world since the turn of the twentieth century. See Peacock and Wiseman (1961) for evidence of an upward "ratchet effect" of government expenditures following wars for the United Kingdom. See Higgs (1987) for an account of episodes which permanently expanded government expenditures in the United States. Furthermore, the assumption of policy persistence is made to facilitate comparison of the Bénabou and Ok (2001) study of social mobility with the politics of income redistribution. See their paper for further institutional motivations of the policy persistence assumption.

[12] The paper is implicitly discussing intra-generational mobility. The main flavor of the results would remain in the context of inter-generational mobility. An overlapping generations framework incorporating intergenerational mobility would have the current old generation voting altruistically for the level of government services enjoyed by their descendants in the future.

where $H_g(\cdot)$ is the derivative of H with respect to government expenditure. The quasi-linearity of (1) ensures that individuals with different income levels have the same decreasing marginal benefit schedule for collective consumption.[13] Note that the marginal cost of collective consumption is a constant for a given initial income, x^i, that does not depend on the level of spending. Therefore, there is a unique solution to (4) for each initial income level, which defines an individual's most preferred level of government spending, g^i, as an implicit function of initial income:

$$g^i = H_g^{-1}\left[\frac{x^i + \mu_M(x^i)}{(2+\gamma)\bar{x}}\right] \equiv h[x^i + \mu_M(x^i)], \tag{5}$$

where $h(\cdot) > 0$ and $h'(\cdot) < 0$ by the concavity of H. Preferences of individuals are single-peaked, and peak points occur at lower levels of spending as lifetime expected incomes rise. One's income relative to the mean is a "unit tax price" for public consumption in terms of the numeraire private market consumption. Equation (5) then naturally can be interpreted as a social demand curve for public consumption; *ceteris paribus*, the relatively rich have a higher price of collective consumption and demand less than the relatively poor.[14] Noting that

$$\frac{\partial h}{\partial x^i} = h'(\cdot)[1 + \mu'_M(x^i)],$$

the most preferred levels of government spending are monotonic in initial income whenever $\mu'_M(\cdot)$ is monotonic. Furthermore, most preferred levels of spending are monotonically decreasing in initial income whenever $\mu'_M(\cdot) > -1$.

3.2 Social mobility processes and monotonic policy preferences

The final feature of the economy is the mobility process, which is described in terms of conditional probability distributions. Recall that $M(y|x^i) = \int_{s=0}^{y} m(s|x^i)ds$ gives the probability that an individual with initial income x^i will have at most income y in the future, and that $\mu_M(x^i)$ gives the ex-ante expected future income of an individual with initial income x^i for a given mobility process M.

To compare different mobility processes in terms of conditional distributions, it is useful to distinguish between the extreme cases of *no* mobility and *perfect* mobility. Complete state dependence represents the case of *no* mobility, so $m(y|x^i) = 1$ when $y = x^i$ and $m(y|x^i) = 0$ for all $y \neq x^i$. In the case of *perfect* mobility, there is complete state *in*dependence, so for any future income $y \in X$, $m(y|x^i) = m(y|x^j)$ for any $x^i, x^j \in X$. Every income quantile draws next period's income from the same (unconditional) distribution, so future expected

[13] That condition is reasonable when describing public consumption expenditures at large. Some government services may hold greater marginal values for the relatively rich, such as health care and public opera houses, but the opposite may be true for other services, such as public transportation and transition programs for the structurally unemployed. Still others, such as the maintenance costs of democratic elections and the rule of law, should be marginally valued equally by all.

[14] This is standard in models where government spending is financed with proportional income taxation, such as Meltzer and Richard (1981) and Persson and Tabellini (2000). Note that the monotonicity of h in relative income follows from the quasi-linearity of the utility function because it rules out any income effects. There is only a substitution effect in the model. More generally, the result that the relatively rich prefer lower spending levels than the relatively poor holds whenever the (uncompensated) price elasticity of demand for public consumption is greater than the income elasticity of demand. See Kenny (1974) and Husted and Kenny (1997).

income equals the mean of the distribution in the case of perfect mobility. Quite simply then, say that there is social mobility in the economy when there is not complete state dependence in future income dynamics.

The following assumption is a stochastic dominance criterion for the conditional distributions of *individuals* within any given mobility process, which describes the nature of state dependence in income dynamics.

Assumption 3 (Monotonicity) For a given mobility process M, the conditional distribution of a relatively rich individual stochastically dominates the conditional distribution of a relatively poor individual, i.e.,

$$\text{for } x, x' \in X,\ \text{ if } x < x' \quad \text{then } M(y|x) \geq M\left(y|x'\right) \quad \text{for all } y \in X,$$

with strict inequality for at least one $y \in X$.

The assumption ensures that mobility processes preserve the rank of individuals in the distribution of ex-ante expected future incomes, i.e., for $x, x' \in X$,

$$x < x' \quad \Rightarrow \quad \mu_M(x) = \int_{y=0}^{\infty} y dM(y|x) \leq \int_{y=0}^{\infty} y dM\left(y|x'\right) = \mu_M\left(x'\right).$$

Loosely, the assumption takes account of the social and economic advantages of those born in the upper socio-economic classes, or the disadvantages of those born poor. In other words, rank at birth determines rank at maturity, so ex-ante future income prospects depend on one's initial rank in the distribution. Technically, the assumption implies that for a mobility process M, expected future income, $\mu_M(x)$, is monotonically increasing in initial income, x. Denote by $\Phi(F, X)$ the class of mobility processes that satisfy Assumptions 2 and 3.

Due to the monotonicity of ex-ante future income expectation in initial income and the monotonicity of the policy preference function h in lifetime expected income, most preferred policies are monotonic in initial income. As such, the individual with the initial median income in the distribution will have the median policy preference for *any* mobility process $M \in \Phi(F, X)$. Since preferences are single-peaked, the Median Voter Theorem applies, and the following proposition follows immediately.

Proposition 1 *For any mobility process $M \in \Phi(F, X)$, the policy most preferred by the initial median-income voter, g_M^{med}, is the winning policy g_M^*, i.e.,*

$$g_M^* = g_M^{\text{med}} = h[x^{\text{med}} + \mu_M(x^{\text{med}})].$$

3.3 Comparing political equilibria under different upward mobility processes

The analysis is concerned more specifically with *upward* social mobility, which would reasonably require that the poorest member of society be upwardly mobile, or require that

$$\left.\frac{d\mu_M(x}{dx}\right|_{x=0} > 1.$$

If the second derivative of $\mu(\cdot)$ does not change signs, then concentrating on upward social mobility requires that the transition function is *concave* in x due to the finite growth assumption. The final assumption on the mobility process is a sufficient condition to ensure the concavity of the transition function. For any $M \in \Phi(F, X)$, let $M(y|x) = p \in [0, 1]$. Denote the inverse of the conditional probability by the function $\varphi_x(p)$, i.e., $y = M^{-1}(p|x) \equiv \varphi_x(p)$.

Assumption 4 (Sufficient condition for concavity) For any $\delta > 0$,

$$\varphi_{x+\delta}(p) - \varphi_x(p) < \varphi_x(p) - \varphi_{x-\delta}(p).$$

Denote by $\Phi^+(F, X)$ the class of mobility processes that satisfy Assumptions 2, 3 and 4, so that $\Phi^+(F, X) \subset \Phi(F, X)$.

Lemma 1 *The transition function $\mu_M(x)$ that is induced by any mobility process $M \in \Phi^+(F, X)$ is increasing and concave, i.e., if $M \in \Phi^+(F, X)$, then for any $\delta > 0$*

$$\mu_M(x) - \mu_M(x - \delta) > \mu_M(x + \delta) - \mu_M(x). \tag{6}$$

Proof See Appendix. □

Focusing attention on concave transition functions aids the comparison with the influential work on social mobility and the politics of income redistribution by Bénabou and Ok (2001). Concavity of the transition function is a natural property to impose when considering upward social mobility, as it ensures that the relatively poor expect a larger percentage change in income than the relatively rich.

Lemma 2 *For any mobility process $M \in \Phi^+(F, X)$, the median-income voter is upwardly mobile in expectation, i.e.,*

$$\text{if } M \in \Phi^+(F, X), \text{ then } \mu_M(x^{\text{med}}) > x^{\text{med}}.$$

Proof See Appendix. □

Note that the induced transition function gives a mapping of current income into expected future income that is "between" the extreme cases of complete state dependence and state independence. The more concave is the transition function, the closer it is to the extreme case of state independence. Refer to a "more mobile" process as one where the induced transition function is more concave, or can be obtained from an increasing and concave transformation of the transition function induced by the less mobile process. Social mobility in this conception has the effect of inducing a distribution of ex-ante expected future incomes that is *less skewed* than the initial income distribution. Use the binary ordering $\succeq$ to rank mobility processes, so that $M \succeq N$ reads mobility process M is "more mobile" than process N.

Definition 1 (Mobility ordering) For any mobility processes $M, N \in \Phi^+(F, X)$, $M \succeq N$ if and only if $\mu_M(x)$ is more concave than $\mu_N(x)$. In other words, for an increasing and concave function $\phi(\cdot)$,

$$M \succeq N \quad \text{if and only if} \quad \mu_M(x) = \phi[\mu_N(x)]$$

Proposition 2 *Within the class of mobility processes considered, economies that have more mobile processes will have lower levels of collective consumption in a majority rule equilibrium, i.e., for $M, N \in \Phi^+(F, X)$,*

$$\text{if } M \succeq N, \quad \textit{then } g_M^* < g_N^*.$$

Proof See Appendix. □

When the median voter expects to be upwardly mobile, his expected price of public consumption relative to market consumption increases and he substitutes out of public provision at the margin.

4 Comparison with the politics of income redistribution

The continuity of demand for public expenditure in expected relative lifetime income strengthens the theoretical relation between income dynamics and political outcomes established by Bénabou and Ok (2001), which considers the demand for income redistribution. In the deterministic case they consider, Bénabou and Ok (2001) conclude that in order for the median voter to prefer no redistribution to perfect redistribution, the transition function must be sufficiently concave to make the future income distribution negatively-skewed. The voter with the initial median income must expect a discrete jump in income above the mean income. In the current analysis, however, an arbitrarily small degree of concavity changes the level of public consumption preferred by the median voter, as any expected increase in his future income raises the cost of public consumption in terms of private market consumption.

To facilitate comparison with Bénabou and Ok (2001), modify the above model slightly so that (i) there is no economic growth ($\gamma = 0$) and (ii) the policy that is voted upon in the initial period does not get implemented until the future period. With pure income redistribution via proportional taxation and lump-sum transfers T, the expected future utility of individual i is written

$$U(c^i; x^i) = (1 - t)\,\mu(x^i) + T. \tag{7}$$

A balanced budget requires that per capita revenues equal per capita expenditures:

$$t\bar{x} = T. \tag{8}$$

Plugging (8) into (7) implies an indirect utility function given by

$$W(t; x^i) = \mu(x^i) + t[\bar{x} - \mu(x^i)]. \tag{9}$$

If $\mu(x^i) < \bar{x}$, then the net transfer is positive and rational voter i prefers *complete redistribution*, so that everyone gets $\bar{x}$ in the next period. In a skewed distribution, the median voter has income less than the average, so in the absence of social mobility, $\mu(x^{\text{med}}) = x^{\text{med}} < \bar{x}$. With no mobility, the median voter prefers complete redistribution and $t = 1$ theoretically is elected since the median voter is decisive due to single-peaked preferences. What happens when social mobility is introduced? If $\mu(x^{\text{med}}) < \bar{x}$, then the equilibrium tax rate is still $t = 1$, even when the median voter is (to some degree) upwardly mobile.

In order for the median voter to prefer no income redistribution in the future, the transition function must be "concave enough" to give him a future expected income greater than the mean income, i.e., it must be that $\mu(x^{\text{med}}) > \bar{x}$ for the median to prefer no income redistribution.[15] In either case, however, the policy most preferred by the median voter is a corner solution.

[15] Note that the monotonicity assumption then requires that the transition process reverse the skewness of the distribution, in expectation, if $\mu(x^{\text{med}}) > \bar{x}$ is satisfied.

In the politics of public consumption, on the other hand, the median voter's policy preference is sensitive to an arbitrarily small degree of mobility. All that is required for the median voter to prefer a smaller government, and hence lower taxes, is that $\mu(x^{\text{med}}) > x^{\text{med}}$. Furthermore, when considering the politics of public consumption, the most preferred policy of the median voter is an interior solution, as all voters demand strictly positive amounts of public and private market consumption. The difference between the two public choice issues is that the demand for public expenditure is continuous and decreasing in expected relative future income, whereas the demand for income redistribution is a step function from $t = 1$ when $\mu(x^{\text{med}}) \leq \bar{x}$ to $t = 0$ when $\mu(x^{\text{med}}) > \bar{x}$. Thus, the following corollary to Proposition 2 has been established.

Corollary 1 *The collective choice of public expenditure is "more sensitive" to the degree of social mobility in the economy than the collective choice of income redistribution. Over a range, $\mu(x^{\text{med}}) \in [0, \bar{x}]$ social mobility* does not *affect the politics of income redistribution, whereas social mobility* does *affect the politics of public expenditure for* any *mobility process such that $\mu(x^{\text{med}}) \neq x^{\text{med}}$. Moreover, the tax rate that corresponds to the equilibrium public consumption policy is an interior solution, $t^* \in (0, 1)$.*

5 Relation to the literature on voting franchise extension

A popular idea in the literature on explaining government growth is that voting franchise extensions can account for the expansions of governments. The central dynamic is that a franchise extension results in a new median voter, whose income is lower than the original median voter, since it has historically been the literate, land-owning, rich, male members of society who have extended voting rights to those lower in the income distribution. As a result, the new lower-income median voter has a smaller tax price for public expenditures, demands more of it, and the level of government services increases following an extension of the voting franchise. However, the evidence on this prediction is mixed.

Documenting the experience of voting franchise expansions in U.S. states from the twentieth century, Husted and Kenny (1997) find that franchise extension does not have a significantly positive impact on the level of government expenditures that are not directly redistributive.[16] Husted and Kenny (1997) explain the result in terms of the elasticities of demand for public services, arguing that their result is evidence that the (uncompensated) price elasticity is smaller than the income elasticity of demand for government services. On the other hand, for a panel of European economies, Aidt et al. (2006) find that government spending increased following franchise extensions. For the European franchise extensions, perhaps the income elasticity was smaller than the price elasticity, whereas the opposite was true in the United States. But, there is no reason, a priori, to believe estimates of these elasticities should be culturally sensitive.

As an alternative theoretical explanation for the empirical puzzle of the effect of franchise extension on growth in government spending, consider differences in social mobility perceptions as discussed above. Since the franchise extension results in a pivotal voter with a lower income and thus a lower tax price per unit of spending, extending the franchise results in an increase in government spending given the utility structure from above. However, when one considers social mobility as a concave transition function, the impulse for

[16]There is a positive impact on welfare spending and other direct transfers.

government growth following franchise extension will be muted. The reason is simple. Despite the lower initial income of the new median voter, he will be more upwardly mobile in expectation than the original median voter due to the concavity of the mobility process.

Therefore, the change in government spending in response to a franchise extension is smaller when there is social mobility in the economy. To see this, compare the two-period incomes of the old and new median voters both with and without social mobility. Denote the income of the median voter before the franchise extension by x_1^m and the income of the median voter after the franchise extension by $x_2^m < x_1^m$. *Without* social mobility, the change in the median-voter's income is $2x_1^m - 2x_2^m = 2(x_1^m - x_2^m)$. *With* social mobility, the change in the median-voter's income is $x_1^m + \mu(x_1^m) - [x_2^m + \mu(x_2^m)]$. The concavity of $\mu(\cdot)$ implies that $x_1^m - x_2^m \geq \mu(x_1^m) - \mu(x_2^m)$, whenever $\mu'(x_2^m) \leq 1$.[17] If $x_1^m - x_2^m \geq \mu(x_1^m) - \mu(x_2^m)$, then

$$2(x_1^m - x_2^m) \geq x_1^m + \mu(x_1^m) - [x_2^m + \mu(x_2^m)].$$

In other words, the change in the expected lifetime income of the median voter following a franchise extension is greater when it is assumed that there is no social mobility in the economy. As a result, the new median voter demands less growth in government when he perceives mobility compared to the case when he perceives no mobility. In this way, allowing for social mobility adds another dimension to the theoretical link between franchise extension and the growth of government.

Considering the effect of social mobility can help explain why Husted and Kenny (1997) find an insignificant impact of the franchise extension on public consumption in the United States, whereas Aidt et al. (2006) uncover a positive impact in European economies. If there was a perception of greater social mobility in the United States. than in Europe, then differences in social mobility can account for the stronger impacts of franchise extension that have been identified by Aidt et al. (2006).

Within the framework of the model, to understand the finding that spending in the United States was insensitive to the franchise extension, imagine that the new median voter in the US has an expected lifetime income that is roughly the same as that of the initial median-voter, i.e., imagine that $x_2^m + \mu_{\mathrm{US}}(x_2^m) \approx x_1^m + \mu_{\mathrm{US}}(x_1^m)$. In this case, moving the pivotal voter down the income distributions results in a reduction in the pivotal voter's initial income that is essentially made up for by the greater mobility expectations associated with the lower quantiles of the distribution. The net effect would be no change in government spending. On the other hand, if the mobility process is less concave, then the effect of higher expected future income of the new median voter cannot outweigh the change in initial income affected by the franchise extension. If Italians, for example, perceive a lower degree of mobility, then the change in the lifetime expected income of the pivotal voter affected by franchise extension is larger, i.e., $x_2^m + \mu_I(x_2^m) < x_1^m + \mu_I(x_1^m)$. *Ceteris paribus*, the extension of the franchise affects a greater change in the lifetime expected income of the pivotal voter in the less mobile economy, i.e.,

$$\mu_{\mathrm{I}}(x_1^m) - \mu_{\mathrm{I}}(x_2^m) > \mu_{\mathrm{US}}(x_1^m) - \mu_{\mathrm{US}}(x_2^m).$$

[17]The individual for whom $\mu'(x^i) = 1$ is the individual who expects the biggest gross increase in his income as this is where the difference between the transition function and the 45-degree line is maximized. Since $\mu(\cdot)$ is a process which benefits the relatively poor more than the relatively rich, it is likely that individual with the median income of the population's distribution will not have $\mu'(x^m) \geq 1$. Since the new median voter after the franchise extension can be no poorer than the median of the population, the condition that $\mu'(x_2^m) \leq 1$ is satisfied.

The apparent differences between the American and European experiences in the responsiveness of government spending to franchise extension can be rationalized in terms of differences in social mobility.

6 Conclusion

The possibility of upward social mobility has for long been recognized as an important determinant of political sentiment in capitalistic societies, but economists have begun formalizing that idea only recently. In terms of the politics of *income redistribution*, when the median-income voter is decisive in a one-dimensional election over the degree of income redistribution, and the income distribution is right-skewed, the median-income voter (and everyone with incomes below the mean) has an incentive to support perfect redistribution, *ceteris paribus*. Of course, we do not observe this outcome in reality. Bénabou and Ok (2001) have provided conditions on the mobility process that rationalize this fact. Simply, if the median-income voter expects to have an income in the future above the mean, then he will not support perfect redistribution, but supports no redistribution at all. This is achievable with a concave mobility process, but it requires that the future distribution of income be left-skewed, at least in expectation. Bénabou and Ok (2001) reluctantly dismiss, therefore, the role that social mobility has on political outcomes, but the dismissal is less convincing in other realms of public policy.

This paper has considered *collective consumption*, rather than income redistribution, as the policy choice variable over which candidates form political platforms. In doing so, it is immediate that the chosen policy will never be a tax-rate of unity, as man cannot live on public services alone. When considering collective consumption, rather than income redistribution, it is no longer the case that the median-income voter must expect a future income greater than the mean to change his policy preference. The continuity of demand for collective consumption in its implicit tax price ensures that an arbitrarily small degree of mobility changes one's most preferred policy because the expected price of public consumption changes for any degree of mobility in the economy. For the median-income voter, mobility affects public consumption preferences in instances when it would not affect preferences for income redistribution.

This paper argues that economies with higher degrees of social mobility will choose lower levels of public consumption expenditures in equilibrium. The result is intuitive, and can be applied in comparing the United States, with its reputation for social fluidity and relatively small public sector, to Europe, with it reputation for social rigidity and relatively large public sectors. Subjective data on perceived social mobility support the popular notion that social mobility is higher in the United States than in Europe and indeed, every other *OECD* country.

It is clear that one's perception of social mobility in society should affect one's policy preferences, but a related question is *why* do perceptions of mobility differ across societies? Piketty (1995) suggests that trans-generational observations of the elasticity of income to effort formulate one's perception of social mobility, which is certainly an acceptable hypothesis. It seems, however, also reasonable to think that perceptions are formed at a macro-level by the institutional characteristics of labor markets and culture. An interesting avenue for future research will be to investigate the institutional factors that co-vary with subjective perception of mobility, and to develop a model that can explain the formation of mobility perceptions. It is interesting, especially in relation to the United States, where even the abjectly poor have the perception that America is the "land of opportunity," when in the realities of most, the American dream will always remain a dream.

Furthermore, it was assumed that the mobility process is exogenous and unrelated to government policy. Many real-world government services, such as education, do have implications for social mobility, and not just in perception. It will be interesting to consider how interactions between public policy outcomes and the degree of social mobility affect policy preferences and the political equilibrium.

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Appendix: Proof of lemmas and proposition

Proof of Lemma 1 Putting $\mu(x)$ in terms of $\varphi_x(p)$, we have $\mu(x) = \int_0^1 \varphi_x(p)dp$. Putting (6) in terms of $\varphi_x(p)$, we have

$$\int_0^1 \varphi_{x+\delta}(p)\,dp - \int_0^1 \varphi_x(p)\,dp < \int_0^1 \varphi_x(p)\,dp - \int_0^1 \varphi_{x-\delta}(p)\,dp, \quad \text{or}$$

$$\int_0^1 \left[\varphi_{x+\delta}(p) - \varphi_x(p)\right]dp < \int_0^1 \left[\varphi_x(p) - \varphi_{x-\delta}(p)\right]dp, \quad \text{or}$$

$$\int_0^1 \left\{\left[\varphi_{x+\delta}(p) - \varphi_x(p)\right] - \left[\varphi_x(p) - \varphi_{x+\delta}(p)\right]\right\}dp < 0. \tag{10}$$

Assumption 3 (monotonicity) ensures that whenever $x' > x$, $\varphi_{x'}(p) > \varphi_x(p)$, so the condition is satisfied by Assumption 4. Therefore, Assumption 4 is sufficient to ensure that (6) is satisfied. □

Proof of Lemma 2 When future expected income is plotted against current income and upward social mobility is a concave transition function, $\mu_M(x)$ begins above the 45-degree line, crosses the 45-degree line only once at x_M^* and is below the 45-degree line for all $x > x_M^*$. Since $\mu_M(\cdot)$ is an increasing and concave function, x_M^* is unique. Using Jensen's inequality, we have that

$$\mu_M(\bar{x}) = \mu_M\left[\int_{x=0}^{\infty} x\,dF(x)\right] \geq \int_{x=0}^{\infty} \mu_M(x)\,dF(x) = (1+\gamma)\bar{x} > \bar{x}. \tag{11}$$

Equation (11) shows that the voter with the initial mean income is upwardly mobile in expectation. If there is a unique x_M^* that satisfies $\mu_M(x_M^*) = x_M^*$ and $\mu_M(\bar{x}) > \bar{x}$, then it is clear that $x_M^* > \bar{x}$. In other words, for a mobility process $M \in \Phi^+(F, X)$, there exists a unique $x_M^* > \bar{x}$ such that all agents with initial income $x \in [0, x_M^*)$ have $\mu_M(x) > x$ and all agents with initial income $x \in [x_M^*, \infty]$ have $\mu_M(x) \leq x$. The interpretation is that all with an initial income less than x_M^* are upwardly mobile in expectation. Moreover, since $\mu_M(\bar{x}) > \bar{x}$ for any $M \in \Phi^+(F, X)$, it must be that $x_M^* > \bar{x}$. Skewness of the distribution implies that $\bar{x} > x^m$, which implies that $\mu_M(x^m) > x^m$, so the voter with the initial medial income is upwardly mobile in expectation. □

Proof of Proposition 2 $M \succeq N$ implies $\mu_M(x) = \phi[\mu_N(x)]$, where ϕ is an increasing and concave function. First, we must establish the claim that $\mu_M(\bar{x}) > \mu_N(\bar{x}) > \bar{x}$. To prove the claim, apply Jensen's inequality and the growth rate assumption in a similar way as above:

$$\begin{aligned}
\mu_M(\bar{x}) &= \phi[\mu_N(\bar{x})] = \mu_N[\phi(\bar{x})] = \mu_N\left[\phi\left(\int_{x=0}^{\infty} x dF(x)\right)\right] \\
&\geq \mu_N\left[\int_{x=0}^{\infty} \phi(x) dF(x)\right] = \mu_N(\bar{x}) = \mu_N\left[\int_{x=0}^{\infty} x dF(x)\right] \\
&\geq \int_{x=0}^{\infty} \mu_N(x) dF(x) = (1+\gamma)\bar{x} > \bar{x}.
\end{aligned}$$

Thus, $\mu_M(\bar{x}) > \mu_N(\bar{x}) \geq \bar{x}$. Since $\mu_M(x)$ crosses $\mu_N(x)$ only once and from above, for any $x < \bar{x}$, we have that $\mu_M(x) > \mu_N(x)$. The assumption of skewness implies that $x^{\text{med}} < \bar{x}$, so $\mu_M(x^{\text{med}}) > \mu_N(x^{\text{med}})$. Since an individual's policy preferences are a decreasing function of expected lifetime income, we have that

$$g_M^{\text{med}} = h\left[x^{\text{med}} + \mu_M(x^{\text{med}})\right] < h\left[x^{\text{med}} + \mu_N(x^{\text{med}})\right] = g_N^{\text{med}}.$$

Since the Median Voter Theorem applies and the median preference wins the election for any mobility process in $\Phi^+(F, X)$ by Proposition 1, we have that for $M, N \in \Phi^+(F, X)$, if $M \succeq N$ then $g_M^* < g_N^*$. □

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