

Danziger, Leif; Ursprung, Heinrich

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# CESifo *Working Paper Series*

RISK AVERSION AND SOCIAL MOBILITY:  
THE IMPOSSIBILITY OF ORDER-PRE-  
SERVING INCOME REDISTRIBUTIONS

Leif Danziger  
Heinrich W. Ursprung

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*CESifo*  
*Poschingerstr. 5*  
*81679 Munich*  
*Germany*  
*Phone: +49 (89) 9224-1410/1425*  
*Fax: +49 (89) 9224-1409*  
*<http://www.CESifo.de>*

# RISK AVERSION AND SOCIAL MOBILITY: THE IMPOSSIBILITY OF ORDER-PRESERVING INCOME REDISTRIBUTIONS

## Abstract

The traditional criticism notwithstanding, we show that social mobility can, in principle, explain political income redistributions. Nonetheless, the social-mobility argument for redistribution is not satisfactory, as actual transition probabilities are not consistent with order-preserving redistributions.

Keywords: Political economy, social mobility, income redistribution

JEL Classification: D31, D72, D81, H20

*Leif Danziger*  
*Department of Economics*  
*York University*  
*4700 Keele Street*  
*Toronto, Ontario M3J 1P3*  
*Canada*  
*email: danziger@york.ca*

*Heinrich W. Ursprung*  
*Department of Economics*  
*University of Konstanz*  
*Box D-138*  
*78457 Konstanz*  
*Germany*

## 1. Introduction

In most, if not all, democratic countries income is unequally distributed with the mean income substantially larger than the median income. Why do the poor, who outnumber the rich, then not expropriate the rich via the political process?<sup>1</sup> Various solutions to this "paradox of redistribution" have been advanced in the literature.<sup>2</sup> Answers in line with the political-economy approach to analyzing policy decisions comprise (i) the *incentive argument* which argues that excessive income taxation would reduce the labor supply of the most productive segment of the population and thereby the tax base (Meltzer and Richard, 1981; Epple and Romer, 1991), and furthermore, via external effects, thwart the potential for innovation and endogenous growth (Perotti, 1993); (ii) the *economic-power argument* which maintains that the upper class bribes the middle class into a coalition against the lower class (Breyer and Ursprung, 1998); (iii) the *transaction-cost argument* which accounts for post-redistribution differences in incomes by frictions arising in the political process (Roemer, 1998); and (iv) the *socio-economic argument* which explains the reluctance of the middle class to advocate large-scale income redistribution schemes by their concern to sustain their distinctive social status (Corneo and Grüner, 2000).

Another popular political-economy explanation of the "paradox of redistribution" is based on the *social-mobility argument*: even people who would benefit from large-scale income redistribution in the short run may vote against it because they believe that they or their descendants have a fair chance of moving up the income hierarchy in the future. Piketty (1995), for example, presents a model, which portrays social mobility in an environment in which voters' decisions are determined by their endogenously formed beliefs about the relative importance of effort and luck in economic prosperity. Harms and Zink (2000) resort to the standard assumption that voters base their political decisions on expected income maximization, but model income changes as the outcome of rational individual investment decisions. The basic social-mobility

argument, however, has not fared well in the literature. The fundamental objection usually raised against the argument runs as follows: "If one's perceived likelihood of having any given level of wealth equals the proportion of the population at that wealth level, then one's expected wealth equals the average wealth. With risk-aversion, the expected utility of the wealth lottery is then necessarily less than that of having the average existing wealth level with certainty." (Putterman, 1997, p. 370). "So voting against wealth taxation to preserve the possible good fortune of one's dynasty in the future cannot be part of a dynamic rational expectations equilibrium..." (Putterman et al., 1998, p. 895).

While we agree with the negative assessment of the social-mobility argument, we do so for a different reason. In our opinion, the standard objection is not valid since it presupposes that voters make their decisions behind a veil of complete uncertainty. If one concedes that political decisions are made for the not too distant future, it is more realistic to consider an imperfect veil of uncertainty with social mobility following a pattern with well-known transition probabilities. Under these circumstances, the representative-agent line of reasoning breaks down and the political process would not bring about complete income equalization. The majority could maximize its expected income by expropriating all income from the minorities, but with risk aversion, even a selfish majority would not want to leave the minorities without income. The reason is that each member of the present majority knows that he runs the risk of later becoming part of a minority and therefore being expropriated. However, we show that with realistic transition probabilities, the social-mobility argument cannot generate a post-redistribution income distribution that preserves the order of the original income distribution. Specifically, in order for a high-income individual's post-redistributive income to exceed that of a majority middle-income individual, a high-income individual must have a higher probability of becoming a middle-income individual than a middle-income individual has of remaining a middle-income individual.

This is inconsistent with the stylized facts about transition probabilities. Empirical studies on social mobility clearly indicate that the degree of downward mobility from the upper strata of society is less than what is required for an order-preserving income redistribution.<sup>3</sup>

In the next section we present our model of the social mobility explanation of the "redistribution paradox" within a framework of an incomplete veil of uncertainty,<sup>4</sup> and we formally prove that with realistic transition probabilities, order-preserving income redistributions are impossible.

## 2. Social Mobility behind an Imperfect Veil of Uncertainty

Consider an economy in which there is no production and a population consisting of a unit continuum of individuals. Time is discrete. Each individual receives an endowment income of either  $x_l$ ,  $x_m$ , or  $x_h$  of a non-storable good in each period, where  $0 < x_l < x_m < x_h$ . Hence, the individuals who receive  $x_l$  belong to the low-income group, the individuals who receive  $x_m$  belong to the middle-income group, and the individuals who receive  $x_h$  belong to the high-income group. The transition probabilities are denoted by  $p_{ij}$ , so that e.g.  $p_{lm}$  is the probability that an individual who receives  $x_l$  in one period will receive  $x_m$  in the following period. The transition probabilities are independent across individuals and over time.

For simplicity, assume  $p_{lh}=p_{hl}=0$ , i.e., an individual does not move directly from the low-income group in one period to the high-income group in the following period, and vice versa. The equilibrium sizes of the three income groups are then

$$S_l = p_{hm}p_{ml}/D, S_m = p_{hm}p_{lm}/D, S_h = p_{mh}p_{lm}/D, \quad (1)$$

where

$$D = p_{hm}p_{ml} + p_{hm}p_{lm} + p_{mh}p_{lm}.$$

We assume that  $p_{lm}$ ,  $p_{ml}$ ,  $p_{mh}$ ,  $p_{hm} > 0$  so that there are individuals in all three income groups, and that  $p_{hm}p_{ml} > p_{hm}p_{lm} + p_{mh}p_{lm}$  so that the middle-income individuals constitute the majority.

Individuals have no access to borrowing or lending, and there is no private insurance. The individuals' utility in each period depends on only their consumption in that period, and they are risk averse. If  $c$  denotes the consumption in one period, the utility is  $U(c)$ , where  $U' > 0$  and  $U'' < 0$ . We assume that  $U'(0) = \infty$ .

In each period the individuals vote for a scheme of redistributive taxation for the next period. The taxation must satisfy the redistribution constraint

$$t_l S_l + t_m S_m + t_h S_h = 0, \quad (2)$$

where  $t_l$ ,  $t_m$ , and  $t_h$  are the redistributive taxes (positive or negative) levied on individuals with endowment  $x_l$ ,  $x_m$ , and  $x_h$ , respectively.

The majority has the power to enact its most preferred taxation scheme. The individuals with the current endowment income of  $x_m$ , which constitute the majority, therefore set the redistributive taxes for the next period so as to maximize their own expected utility of consumption which is

$$p_{ml}U(x_l + t_l) + p_{mm}U(x_m + t_m) + p_{mh}U(x_h + t_h). \quad (3)$$

Maximizing expected utility (3) of the members of the middle-income group subject to the redistribution constraint (2), one obtains the unique majority choice of the redistributive taxes given by the redistribution constraint together with

$$(p_{ml}/S_l)U'(x_l + t_l) = (p_{mm}/S_m)U'(x_m + t_m) = (p_{mh}/S_h)U'(x_h + t_h).$$

Thus, the redistributive taxes equalize the fraction of the current majority members that will be in each of the income groups in the next period multiplied by the marginal utility of the consumption of a member of this income group. Using equations (1), this condition becomes

$$p_{lm}U'(x_l+t_l)=p_{mm}U'(x_m+t_m)=p_{hm}U'(x_h+t_h), \quad (4)$$

showing that the transition probability of becoming a middle-class individual in the next period multiplied by the marginal utility of an individual's current consumption is the same for all income groups.

Three aspects of the political-economic equilibrium deserve to be emphasized:

First, the political process does not generally equalize post-tax incomes. A complete equalization presupposes that  $p_{lm}=p_{mm}=p_{hm}$  and would therefore only occur if the probability of becoming a middle-class individual is the same for all income groups.

Second, although the majority has the power to do so, it will not expropriate all of the income received by the minority low-income group (or, for that matter, the minority high-income group) and leave that group without any consumption, i.e. the majority chooses  $x_l+t_l>0$ . The reason is that an individual who receives  $x_m$  and belongs to the majority in this period, may get  $x_l$  and belong to the low-income minority in the next period. Since the marginal utility at zero consumption is infinity, no one would want to run the risk of getting into a situation in which he would end up with no consumption at all in the next period, no matter how small the likelihood of this happening would be. The majority therefore votes for less than full expropriation of the low-income minority's income, and hence pays an insurance premium by choosing a smaller expected consumption for themselves in the next period than they could obtain with full expropriation. In this way, members of the current majority insure themselves against the outcome in which they become part of the low-income minority in the next period. In fact, if  $x_l$  is sufficiently small as



compared to  $x_m$  and  $x_h$ , the majority even chooses to redistribute income toward the low-income group.

Third, an increase in the endowment income of either the majority group or one of the minority groups leads to an increase in the consumption of all three groups. This is because the consumption must necessarily increase for one of the groups, and condition (4) entails that the consumption must then increase for all groups. In fact, the consumption pattern of the three groups is independent of the original distribution of total endowment income. To see this, let  $E = x_l S_l + x_m S_m + x_h S_h$  denote total endowments in the economy, and  $f_l = (x_l + t_l)/E$ ,  $f_m = (x_m + t_m)/E$ ,  $f_h = (x_h + t_h)/E$  denote the proportion of  $E$  obtained by an individual in the low-, middle-, and high-income groups after redistribution. The redistribution constraint and condition (4) can then be rewritten as

$$f_l S_l + f_m S_m + f_h S_h = 1, \text{ and}$$

$$p_{lm} U'(f_l E) = p_{mm} U'(f_m E) = p_{hm} U'(f_h E),$$

which shows that the consumption pattern depends on total endowment income, but not on its original distribution.

In order for the political redistribution process to preserve the order of disposable incomes, i.e., in order for  $f_l < f_m < f_h$ , the transition probability of becoming a middle-income individual in the next period must increase with the current income – it must be the case that  $p_{lm} < p_{mm} < p_{hm}$ . In other words, a current middle-income individual must be more likely than a current low-income individual to receive a middle income in the next period, but less likely than a current high-income individual to receive a middle income in the next period. The latter restriction is not, however, borne out in the real world. Empirical studies on social mobility indicate that the degree of mobility at the top (and bottom) of the earnings distribution is

significantly lower than at the broad middle range of the distribution (Atkinson et al., 1992, p. 76), which in the context of our model means that  $p_{mm} < p_{hh} = 1 - p_{hm}$ . Since the time span characterized by policy persistence is rather short and therefore  $p_{mm} > 1/2 \Psi p_{hm} < p_{mm}$ , the stylized facts of social mobility are inconsistent with an order-preserving redistribution. A recent study on labor earnings in Germany by Trede (1997) provides a rough estimate of the order of magnitude involved. Identifying the middle-income group with the second, third, and fourth quintiles, the average two-year transition probabilities  $p_{mm}$  and  $p_{hm}$  are approximately 84% and 32%, respectively.<sup>5</sup> The difference of over 50% between the two transition probabilities indicates that  $p_{mm}$  will exceed  $p_{hm}$  even if the period of policy persistence is substantially longer than two years.

### 3. Conclusion

Social mobility cannot by itself explain the “paradox of redistribution”. Only in conjunction with, for example, the incentive argument may it be possible for social-mobility considerations to contribute to a satisfactory positive theory of political redistribution. The reason for the insufficiency of the social-mobility explanation is, however, not the traditional criticism that is predicated on the counterfactual assumption of a complete veil of uncertainty at the time of policy decision. Rather, the reason is that under the realistic assumption of an incomplete veil of uncertainty, actual transition probabilities would give rise to a pattern of redistribution, which is not order-preserving.

## References

- Atkinson, A., F. Bourguignon and C. Morrisson, 1992, Empirical studies of earnings mobility, *Fundamentals of pure and applied economics* 52 (Harwood Academic Publishers, Chur).
- Bénabou, R. and E. Ok, 1998, Social mobility and the demand for redistribution: The POUM hypothesis, NBER Working Paper No. 6795.
- Breyer, F. and H. Ursprung, 1998, Are the rich too rich to be expropriated? Economic power and the feasibility of constitutional limits to redistribution, *Public Choice* 94, 135-156.
- Corneo, G. and H.P. Grüner, 2000, Social limits to redistribution, *American Economic Review* (forthcoming).
- Epple, D. and T. Romer, 1991, Mobility and redistribution, *Journal of Political Economy* 99, 828-858.
- Falkinger, J., 1999, Social instability and redistribution of income, *European Journal of Political Economy* 15, 35-51.
- Harms, P. and S. Zink, 2000, Invest, expropriate, or wait? Expected income and the demand for redistribution, Working Paper, Department of Economics, University of Konstanz.
- Meltzer, A. and S. Richard, 1981, A rational theory of the size of government, *Journal of Political Economy* 52, 914-927.
- Perotti, R., 1993, Political equilibrium, income distribution, and growth, *Review of Economic Studies* 60, 755-776.
- Piketty, T., 1995, Social mobility and redistributive politics, *Quarterly Journal of Economics* 110, 551-584.
- Putterman, L., 1997, Why have the rabble not redistributed the wealth? On the stability of democracy and unequal property, in: J. Roemer, eds., *Property relations, incentives and welfare. Proceedings of a Conference held in Barcelona, Spain, by the International Economic Association* St. Martin's Press, New York) 359-389.
- Putterman, L., J. Roemer and J. Silverstre, 1998, Does egalitarianism have a future? *Journal of Economic Literature* 36, 861-902.
- Roemer, J., 1998, Why the poor do not expropriate the rich: An old argument in new garb, *Journal of Public Economics* 70, 399-424.
- Trede, M., 1997, *Statistische Messung der Einkommensmobilität* (Vandenhoeck & Ruprecht, Göttingen).

Wessels, J., 1993, Redistribution from a constitutional perspective, *Constitutional Political Economy* 4, 425-448.

## Notes

<sup>1</sup> A related question is to what extent the poor can obtain income redistribution if they are politically powerless but in a position to disrupt the social stability in society (Falkinger, 1999).

<sup>2</sup> See Putterman (1997) for a survey.

<sup>3</sup> See Atkinson et al. (1992) for a survey of the empirical literature on earnings mobility.

<sup>4</sup> A similar presentation is found in Bénabou and Ok (1998) and a related one, using a normative constitutional set-up, in Wessels (1993).

<sup>5</sup> These figures refer to gross labor incomes earned by males in the West German states in the 1983-1993 period (Trede, 1997, p. 126).