



Redistribution and fairness: a note

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Abstract

The introduction of (inequity adverse) fair agents in a simple redistributive voting game reduces the political relevance of the middle class and increases the equilibrium level of redistribution. Interestingly, some of the predictions in Meltzer and Richard [J. Polit. Econ. 89 (1981) 914–927] are affected: a rise in the income inequality between poor and middle class may not decrease redistribution, because of the additional support for redistribution provided by the fair agents.

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1. Introduction

It is hardly a new insight to relate the size of the welfare state to the degree of income inequality in the economy. Romer (1975), Roberts (1977), and Meltzer and Richard (1981) suggested that, in democracies, in which the dimension of the redistributive policy is determined by selfish voters, a more unequal distribution of income induces more redistribution. In particular, they measure the income inequality with the distance between the median and the mean income in the economy, and conclude that the relevant group in the political arena is the middle class, that is the individuals with the median income. Therefore, if the middle class becomes relatively poorer, for example because of an increase in the income of the rich, the size of the system will increase, whereas if the middle class becomes relatively richer, for example because of a reduction in the income of the poor, the size of the system will decrease.

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This crucial insight relies on the hypothesis of selfish voters. Since they only care about their own well-being, poor voters will support larger redistributive programs, which they benefit from, whereas richer voters, who are net contributors to these programs, will oppose them.

We do, however, observe individuals behaving unselfishly. Several people, for instance, contribute to private charity. This behavior is consistent with altruistic preferences¹: people may “feel good” about giving to others—the “warm glow” motive, see [Andreoni \(1990\)](#)—or they may want to reduce disparity in the society. In the latter case, these individuals would prefer to promote a public income redistribution program that bounds all citizens—not just those willing to give to charity—to contribute.

More importantly, a recent empirical study by [Corneo and Gruner \(2002\)](#) on survey data from 12 countries suggests that individual preferences for redistribution are not exclusively related to the agent’s own economic benefit. Their evidence indicates that agents may selfishly pursue other personal—yet non economic—goals, such as maintaining or improving their social status. Moreover, individuals may support redistributive programs that reduce their private economic and social well-being because of “public values”. In particular, [Corneo and Gruner \(2002\)](#) find that agents are more favorable to redistribute if they believe that the current income distribution in the society is determined more by exogenous reasons, such as family background, than by individual effort.

In this paper, I concentrate on the effect on the redistributive policies of the existence of unselfish voters, who have “public values”. Do [Meltzer and Richard’s \(1981\)](#) crucial insights change, if we take these unselfish behaviors into account?

To answer this question, I consider that, in their voting decisions, a fraction of the agents in the economy behaves according to some notion of “fairness”. These “fair” individuals, who will turn out to behave unselfishly by the standard of an egoistic voter, not only enjoy their own well-being, but they also oppose inequity in the society. There exist several notions of fairness in the literature (see [Rabin, 1993](#); [Bolton and Ockenfels, 2000](#); [Fehr and Schmidt, 1999](#), among others). In this environment of voting for redistributive policies, my concept of fairness leads a “fair” voter to oppose inequality, as measured by the distance between her income and the income of a reference group, which is taken to be the poorest agent in the society.

This notion of “fairness” is meant to capture the “public values effect” identified by [Corneo and Gruner \(2002\)](#). Together with their self-interest, individuals are thus endowed with some concept of justice regarding the income distribution. As in [Bolton and Ockenfels \(2000\)](#) and [Fehr and Schmidt \(1999\)](#), this inequity aversion is self centered,² since individuals do not care about inequality per se, but rather about the difference between their own income and that of a reference group. As in [Bolton \(1991\)](#), the inequity aversion is one-sided: individuals only adverse poverty—and thus the difference between their income and the income of the poorest agent in the society—while there is no envy

¹ Charity may also be due to selfish reasons, as individuals may derive prestige from non-anonymous charity; see [Harbaugh \(1998\)](#).

² I follow the definition of “self centered” aversion in [Fehr and Schmidt \(1999\)](#). [Bolton and Ockenfels \(2002\)](#) use a different notion. I thank a referee for bringing up this difference.

towards more wealthy agents. Finally, the remaining (majority of) voters are selfish and thus only value their own well-being—i.e., consumption and leisure.

Section 2 analyzes a Meltzer and Richard's economy populated by selfish and (a minority of) "fair" voters. Section 3 revisits the link between inequality and redistribution in this new framework and Section 4 concludes.

2. A Meltzer–Richard economy with fair agents

The simple, elegant model by Meltzer and Richard (1981) may easily be adapted to include these "fair" voters. Consider a unitary mass of individuals who differ in their working ability. These abilities are distributed on the support $[e, \bar{e}] \subset \mathfrak{R}_+$, according to the cumulative distribution function $F(\cdot)$. The distribution of abilities is assumed to have mean \bar{e} and to be skewed, so that the median ability, e^M , is below the mean ability: $e^M < \bar{e}$. A production function transforms labor into the only consumption good, according to the worker's ability: $y(e) = en(e)$, where $n(e)$ represents the amount of labor supplied by the agent with ability e .

There are two types of agents. A fraction $\gamma \in [0, 1]$ is selfish and values consumption and leisure according to a quasi-linear utility function, $U(c, l) = c + u(l)$, where l is leisure, c is consumption, and u is twice differentiable and concave.

A fraction $(1 - \gamma)$ of the population is composed of fair agents. They value their own consumption and leisure, according to the previous utility function, but they also care about the degree of equity in the economy. An equity function E captures the "public values" of these agents, by comparing their own income to the income of a reference group.

In the economic optimization problem, the value taken by this equity function is assumed to be given and thus equity considerations do not play any role in the individuals' labor supply decision. This amounts to assume that, although they dislike inequality, fair high ability agents will not limit their individual labor supply in order to avoid to become "too rich". However, they will vote in favor of income redistributive policies.³

Agents face the usual trade-off between labor, n , and leisure, l , since $n = \bar{l} - l$, where \bar{l} is the total amount of disposable time, which is assumed to be equal across types. Individuals pay a payroll tax, with tax rate τ , on their labor income, and receive a transfer T . Their budget constraint is thus $c = (1 - \tau)en(e) + T$. The redistributive policy is balanced budget, since the income tax is rebated lump sum to all individuals, and thus $T = \tau \int en(e) dF(e)$. Finally, the economic optimization problem yields the usual result, that is, $(1 - \tau)e = u'_l(l^*)$, which implicitly defines l^* as a function of e and τ , and thus $n^* = \bar{l} - l^*$ and $y^* = en^*$.

All agents take their voting decisions by maximizing their indirect utility. Selfish individuals maximize the following quasi-concave indirect utility function: $V^S(\tau) = (1 - \tau)y^* + T + u(l^*)$. As in Meltzer and Richard (1981), preferences are single-peaked and the tax

³ Alternatively, the equity function may be defined as the difference between the personal well-being—that is $U(c, l)$ —of the fair agents and of the poorest agent in the economy. Under this specification, labor supply decisions would turn out not to depend on equity considerations.

rate chosen by an ability type- e selfish agent is implicitly defined by the following expression:

$$-y^*(e) + \tilde{y}^* + \tau(\partial\tilde{y}^*/\partial\tau) = 0 \quad (1)$$

where \tilde{y}^* is the mean income in the economy and $\partial\tilde{y}^*/\partial\tau$ (< 0) represents the distortion induced in the mean income by the payroll tax. Thus, a redistributive policy will only be supported by the selfish agents whose income is below the mean income.

A fair individual maximizes the following indirect utility function: $V^F(\tau) = V^S(\tau) + E$, where $E = -\beta((1 - \tau)(y^* - \underline{y}^*))$, and $\beta \in \mathbb{R}_+$ measures the importance of the inequity aversion relative to their self-interest for the fair agents. Thus, the equity function E , which characterizes the self centered inequity aversion, is defined as the negative of the difference between the net income of the fair individual and the net income of the poorest agent, since $\underline{y}^* = \underline{e}n^*(\underline{e})$.

This specification is consistent with the empirical results by [Corneo and Gruner \(2002\)](#), who suggest that agents may support redistribution because of “public values”—for instance, because they perceive that the income inequality driven by family background is unfair and ought to be modified. Moreover, as in [Bolton and Ockenfels \(2000\)](#) and [Fehr and Schmidt \(1999\)](#), this inequity aversion is self-centered,⁴ since every fair agent compares her income to the income of a reference group. As in [Bolton \(1991\)](#), however, the inequality aversion is one-sided, since fair agents only compare their income to the income of the poorest agent in the economy. I thus choose to disregard any envy—or social rivalry—component in the equity function: agents are not induced to favor redistribution because they dislike to be poorer than the rich, although they clearly take into account their economic self-interest. In the next section, I shall argue that the introduction of double-sided inequity aversion induces more redistribution, but does not change the qualitative results. Finally, the degree of fairness—measured by the parameter β —is assumed to be independent of the fair agents’ income. Thus, by being further apart from the poor, richer fair agents have a larger altruistic motive for redistribution. However, once also the economic cost of the redistribution is taken into account—and if self-interest is more relevant than “public values”, i.e., if $\beta < 1$ —then richer fair agents will support lower levels of redistribution than middle income ones (see next equation).

An ability type- e fair agent will thus vote the tax rate that is implicitly determined by the following expression:

$$-y^*(e) + \tilde{y}^* + \beta(y^*(e) - \underline{y}^*) + \tau(\partial\tilde{y}^*/\partial\tau) = 0. \quad (2)$$

As for the selfish agents, preferences are single-peaked and the tax rate is decreasing in the voters’ income. In this case, however, individuals whose income is above the mean may still vote in favor of some redistribution, if they care sufficiently about fairness, i.e., if β is large enough. To allow for the richest fair agent to vote a non-negative tax rate, I assume that $\beta = (\bar{y}^* - \tilde{y}^*)/(\bar{y}^* - \underline{y}^*)$ (< 1).

By combining Eqs. (1) and (2), it is easy to see that, for a given ability type- e , a fair voter will choose a weakly higher tax rate than a selfish voter. In fact, the fair voter has an additional reason to redistribute in favor of the poor: to reduce the income gap between

⁴ See footnote 2.

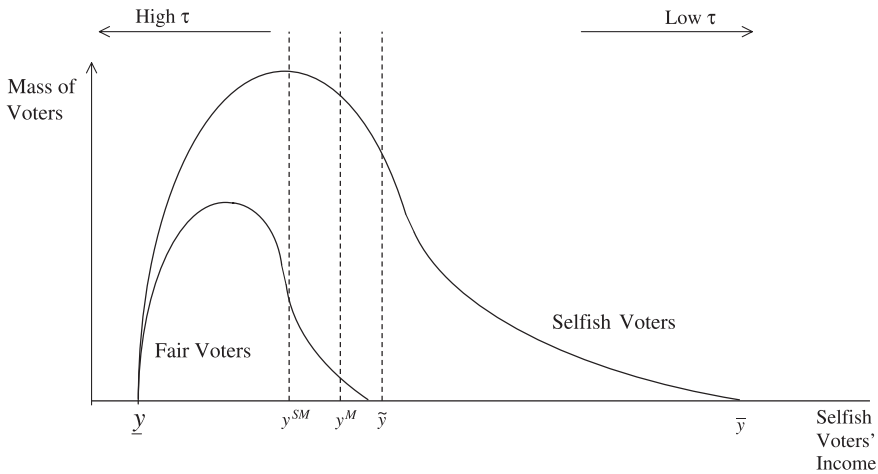


Fig. 1. Voting for redistribution.

herself and the poorest agent. Eqs. (1) and (2) can be used to find the correspondence between the income of a selfish agent, y^S , and of a fair agent, y^F , who will choose to vote for the same non-negative tax rate:

$$y^S = (1 - \beta)y^F + \beta\underline{y}. \tag{3}$$

Clearly, if a selfish and a fair voter support the same (non-negative) tax rate, the fair agent has a higher income than the selfish agent. In fact, since \underline{y} represents the lower support of the income distribution, then $y^S < y^F$, except when $y^S = y^F = \underline{y}$.

To find a political equilibrium of this redistributive voting game, selfish and fair voters have to be ranked in order to identify the median voter. Recall that there exists a one-to-one (negative) relation between the income of an agent and her vote—see Eqs. (1) and (2)—and that Eq. (3) establishes a correspondence between the voting of selfish and fair agents based on their income. Fig. 1 orders all voters⁵ according to the income of the selfish agents, with the income of the fair voters being normalized to the selfish agents' income through Eq. (3). As such, Fig. 1 displays the mass of voters for each tax rate, from the highest—corresponding to the low-income agents—to the lowest one—for the high-income selfish agents. Hence, the selfish median voter's income type, y^{SM} , can be obtained by the following expression:

$$y^{SM} = \left\{ y \mid \gamma F(y) + (1 - \gamma)F\left(\frac{y - \beta\underline{y}}{1 - \beta}\right) = \frac{1}{2} \right\}. \tag{4}$$

Associated to this selfish median voter, y^{SM} , there is also a fair median voter, y^{FM} , who will choose the same tax rate. Her type can be found using Eq. (3): $y^{FM} = (y^{SM} - \beta\underline{y}) / (1 - \beta)$.

⁵ This figure is drawn for $\gamma > 1/2$ and thus the mass of selfish agents is higher than that of fair agents.

How does this economy composed of selfish and fair agents compare to Meltzer and Richard’s (1981) selfish economy? In the latter case, there are only selfish agents, $\gamma = 1$, and the equilibrium tax rate depends on the difference between the median, $y^M = e^M n^*(e^M)$, and the mean income, \bar{y}^* , as in Eq. (1). In the former case, the mean income is still \bar{y}^* , but the income of the median selfish voter, y^{SM} , is now given by Eq. (4). It is straightforward to see that the presence of fair voters reduces the income of the median voter, $y^{SM} < y^M$, and therefore increases the size of the redistributive program. This is not surprising. Because of their fairness, some rich agents act as selfish poor agents (see Fig. 1) and support the redistributive policy, hence reducing the relative income of the decisive or median voter.⁶

3. Inequality and redistribution

The message of the exercise carried out in the previous section is that in the presence of fair agents, the middle class (the median income type) loses some of its political relevance and becomes less decisive. How does this observation affect the traditional link between income inequality and redistribution?

To analyze this relation, I consider three types of increases in income inequality: (i) rich become richer, (ii) poor become poorer, and (iii) a mean preserving spread, which combines the first two types.

Definition 1. Let $G(\cdot)$ be the cumulative distribution function after a change in income inequality has occurred. Given some y' and y'' , such that $\underline{y} < y' < y^M < y'' < \bar{y}$, there are three types of increases in income inequality:

- (I) (Rich become richer) if $\begin{cases} F(y) = G(y) \text{ for } y \leq y'' \\ F(y) \geq G(y) \text{ for } y > y'' \end{cases}$ and \bar{y} increases;
- (II) (Poor become poorer) if $\begin{cases} F(y) \leq G(y) \text{ for } y \leq y' \\ F(y) = G(y) \text{ for } y > y' \end{cases}$ and \underline{y} decreases;
- (III) (Mean preserving spread) if $\begin{cases} F(y) \leq G(y) \text{ for } y \leq y' \\ F(y) = G(y) \text{ for } y' \leq y \leq y'' \\ F(y) \geq G(y) \text{ for } y \geq y'' \end{cases}$, \underline{y} decreases, \bar{y} increases, and \tilde{y} does not change.

In Meltzer and Richard (1981), where the only relevant dimension is the difference between the mean and median income, a type I increase in inequality induces more

⁶ Notice that, with double-sided inequity aversion, the mass of fair voters in Fig. 1 would shift to the left, due to the additional motive for redistribution. This may further reduce the relative income of the median voter and thus lead to more redistribution.

redistribution, since the mean income rises relatively to the median voter's income. By the same token, a type II increase reduces redistribution, since the middle class becomes relatively richer, whereas a mean preserving spread, which does not change the median income, leaves the redistribution level unaffected. In other words, a variation in income inequality is relevant in so far as it concerns the relative position of the middle class (the median income type).

In an economy populated by selfish and fair agents, changes in income inequality play an additional role, since they may influence the perception of inequity by the fair voters. The next proposition suggests that this element of fairness may overturn the results in Meltzer and Richard (1981).

Proposition 1. *In an economy with selfish and fair agents, (1) if $y'' > y^{SM}$, then a type I increase in inequality rises the equilibrium tax rate; (2) a type II increase in inequality has an ambiguous effect on the equilibrium tax rate; and (3) if $y'' > y^{SM}$, then a type III increase in inequality rises the equilibrium tax rate.*

The proof is straightforward. In case 1, if $y'' > y^{SM}$, the increase in inequality concerns exclusively the agents who are richer than the (selfish) median voter. Thus, as in Meltzer and Richard (1981), the median voter's type does not change, and the only relevant effect is the increase in the mean income. The median voter is relatively poorer, as compared to the mean income, and votes for more redistribution.⁷

The second case, in which poor agents become poorer, is more interesting. On one hand, as in Meltzer and Richard (1981), the mean income decreases, and thus the median voter becomes relatively richer. On the other hand, however, the reduction in the income of the reference group (\underline{y} decreases) induces the fair agents to increase their desired level of redistribution. This produces a change in the correspondence between the income of a selfish and of a fair agent, who votes for the same tax rate (see Eq. (3)). The distribution of fair voters shifts to the left, with respect to the selfish voters (see Fig. 1), and the income of the selfish median voter, y^{SM} , is reduced (see Eq. (4)). Thus, a type II increase in inequality decreases both the mean income and the income of the (selfish) median voter. The overall effect on the equilibrium tax rate is therefore ambiguous. It is worth noticing that the latter effect may be magnified in case of double-sided inequality aversion. In fact, the decrease in the income of the poor would put them further away from the richest agent and thus would lead to a higher demand for redistribution. This represents a further shift of the left tail of the distribution of fair voters—the poor—to the left and may induce more redistribution if it further reduces the median voter's income.

Finally, case 3 isolates the “fairness” effect. The mean income in the economy does not change. As in case 1, if $y'' > y^{SM}$, the rise in inequality, due to increase in the income of the rich individuals, does not affect the median voter. However, as in case 2, the reduction in the income of the poorest individuals (\underline{y} decreases) induces all fair agents to vote for more redistribution. The distribution of fair voters moves to the left, relatively to the selfish

⁷ In case of double-sided inequality aversion, there would be an additional effect towards more redistribution, since the poor agents are now further apart from the richest individual.

voters, and the income of the selfish median voter, y^{SM} , is reduced. As a result, the equilibrium tax rate increases.⁸

4. Conclusions

The introduction of fair voters into a [Meltzer and Richard \(1981\)](#) selfish environment strengthens the message that more inequality leads to more redistribution. In fact, the existence of fair voters limits the political relevance of the middle class. In particular, if the distance between the poor and the middle class increases, the level of redistribution need not to decrease, as predicted by [Meltzer and Richard \(1981\)](#). The increased poverty of the reference group will push the (inequity averse) fair agents to support more redistribution, which may balance the opposite voting behavior of the selfish voters.

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⁸ Again, this effect would be magnified by a double-sided inequality aversion function.