EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

University of Tübingen
Working Papers in
Economics and Finance

No. 92

Can a concern for status reconcile diverse social welfare programs?

by

Oded Stark, Marcin Jakubek

Faculty of Economics and Social Sciences
www.wiwi.uni-tuebingen.de

Can a concern for status reconcile diverse social welfare programs?

by

Oded Stark
Universities of Bonn, Tuebingen, and Warsaw; Georgetown University

and

Marcin Jakubek
Institute of Economics, Polish Academy of Sciences

Mailing Address: Oded Stark
ZEF, University of Bonn
Walter-Flex-Strasse 3
D-53113 Bonn
Germany

September 2016

E-Mail Address: ostark@uni-bonn.de

We are indebted to an anonymous referee for kind words and sound advice.

Abstract

Let there be two individuals: “rich,” and “poor.” Due to inefficiency of the income redistribution policy, if a social planner were to tax the rich in order to transfer to the poor, only a fraction of the taxed income would be given to the poor. Under such inefficiency and a standard utility specification, a Rawlsian social planner who seeks to maximize the utility of the worst-off individual will select a different allocation of incomes than a utilitarian social planner who seeks to maximize the sum of the individuals’ utilities. However, when individuals prefer not only to have more income but also not to have low status conceptualized as low relative income, and when this distaste is incorporated in the individuals’ utility functions with a weight that is greater than a specified critical level, then a utilitarian social planner will select the very same income distribution as a Rawlsian social planner.

Keywords: Maximization of social welfare; Rawlsian social welfare function; Utilitarian social welfare function; Inefficient policy of income redistribution; Distaste for low status

JEL Classification: D31; D60; H21; I38

1. Introduction

When a policy of income redistribution is inefficient, is it possible to align the Rawlsian and the utilitarian approaches which, under a standard utility specification, prescribe different optimal redistribution policies? In this paper we propose a path of reconciliation: acknowledgement by the Rawlsian and the utilitarian social planners that the individuals' utility functions incorporate a distaste for low income status opens the gate to alignment of the two policy perspectives.

Evidence from econometric studies, experimental economics, social psychology, and neuroscience indicates that humans routinely engage in interpersonal comparisons, and that the outcome of that engagement impinges on their sense of wellbeing. People are discontented when their consumption, income or social standing falls below those of others with whom they naturally compare themselves (those who constitute their "comparison group"). Examples of studies that recognize such discontent include Stark and Taylor (1991), Zizzo and Oswald (2001), Luttmer (2005), Fliessbach et al. (2007), Blanchflower and Oswald (2008), Takahashi et al. (2009), Stark and Fan (2011), Stark and Hyll (2011), Fan and Stark (2011), Card et al. (2012), and Stark et al. (2012). Stark (2013) presents corroborative evidence from physiology. The overwhelming weight of the evidence supports the notion of a strong asymmetry: the comparisons that affect an individual's sense of wellbeing significantly are the ones rendered by looking "up" the hierarchy, whereas looking "down" does not appear to be of much consequence or to deliver satisfaction. For example, Andolfatto (2002) demonstrates that individuals are adversely affected by the material wellbeing of others in their comparison group when this wellbeing is far enough below theirs. Cohn et al. (2014) find that in choosing their level of work effort, workers respond to increased relative deprivation but not to increased "relative satisfaction." Frey and Stutzer (2002) and Walker and Smith (2002) review a large body of evidence that lends support to the "upward comparison" view. In the analysis that follows, the interpersonal comparisons are of income, and low status is conceptualized as low relative income. The analysis will be the same if income is replaced by wealth or, for that matter, by consumption.

In the domain of social choice, the Rawlsian approach to social welfare, built on the foundation of the "veil of ignorance,"[1] measures the welfare of a society by the wellbeing of the worst-off individual (the maximin criterion). Rawls argues that if individuals were to select the concept of justice by which a society is to be regulated without knowing their position in that society - the "veil of ignorance" - they would choose principles that involve the least undesirable condition for the worst-off member over utilitarian principles. This hypothetical contract is the basis of the Rawlsian society, and of the Rawlsian maximin social welfare function. In turn, utilitarianism measures the welfare of a society by the sum of the individuals' utilities. Consequently, if different individuals are able to generate different amounts of utility out of the same income, this will lead to a radically unequal income distribution which concentrates income on people who are efficient utility generators. This view was articulated by Lerner (1944) who, we believe, was the first to work it out in full, and by Harsanyi (1976) who argued emphatically that we should maximize utility, and that we should quite deliberately transfer income to individuals who are efficient generators of utility, and away from individuals who are poor generators of utility.

When the individuals' distaste for low status is not taken into account by the two social planners, the planners will not see eye to eye as to how to redistribute the available incomes when the policy of taxing and the transferring of income is inefficient: the Rawlsian social planner will choose an equal income distribution, whereas the utilitarian social planner will not. However, when the individuals' distaste for low relative income is acknowledged by the social planners and the strength of this distaste is greater than a concrete critical value, then, even under the utilitarian criterion, the maximization of social welfare aligns with the maximization of the utility of the poorest, worst-off individual. For a specific, yet standard, utility representation, estimates of the magnitude of the inefficiency of the redistributive policies and of the weight accorded to low relative income in individuals' utilities in a real world setting suggest that the analytically derived condition for unanimity is likely to hold empirically. A practical implication of this reconciliation is that if the social planner recognizes that the preferences of individuals include a component that weighs low relative income sufficiently negatively, then a social

[1] "[N]o one knows his place in society, his class position or social status; nor does he know his fortune in the distribution of natural assets and abilities, his intelligence and strength, and the like" (Rawls, 1999, p. 118).

planner who is concerned about poverty alleviation does not need to be worried about a social planner who is a utilitarian taking over as the policy maker. The latter will attend to the poorest just as well.

2. A concern for status and synchronization of the optimal choices of Rawlsian and utilitarian social planners

Consider a society that consists of two individuals. Let the utility function of an individual be

$$u(x,z)=(1-\beta)f(x)-\beta RI(z-x)\,, \tag{1}$$

where $x \geq 0$ denotes the individual's income; $z \geq 0$ is the income of the other individual; the function $f(x)$, such that $f'(x)>0, f''(x)<0$, converts income into utility; and $RI(\cdot)$, a measure of low status, is a continuous function such that $RI(y)>0$, $RI'(y)>0$, and $RI''(y)>0$ for $y>0$, and $RI(y)=0$ for $y \leq 0$ and, furthermore, $\lim_{y \to 0^+} RI'(y) \equiv RI_0 > 0$.[2, 3] The individual's distaste for low status is weighted by $\beta \in [0,1)$; namely, the coefficient β represents the intensity of the individual's distaste for low relative income, whereas the individual's taste for (absolute) income is weighted by $1-\beta$. When the individuals are not concerned at having low relative income, $\beta=0$.

The advantage of using the $RI(\cdot)$ function is that unlike the often used measure of status expressed by ordinal rank in the income distribution, we apply a cardinal measure. This measure is sensitive to changes in the incomes of individuals higher up in the income distribution, even if in terms of ordinal rank a change does not occur. For example, in the income distribution (20, 10) the ordinal measure of the status of the individual whose income is 10 is the same (second) as in the income distribution (11, 10), but if expressed

---

[2] These properties of the $RI(\cdot)$ function relate to the properties of the widely used index of relative deprivation (cf., for example, Stark, 2013).

[3] The result reported below holds also for a fractional definition of the measure of low status, namely for a utility function

$$u(x,z)=(1-\beta)f(x)-\beta RI\left(\frac{z}{x}\right),$$

in which $RI(y)$ is a continuous function such that for $y>1$ it is positive, strictly increasing, and strictly concave, and for $y \leq 1$ it is defined as $RI(y) \equiv 0$. Furthermore, $\lim_{y \to 1^+} RI(y) > 0$.

cardinally, as in our case, the measure of his status is not the same across the two income distributions.

The utility specification in (1) draws on two assumptions. First, each one of the two individuals attaches the same weights to income and to low relative income. In a way, this assumption can be reasoned by the "(veil of) ignorance," that is, the weights are set before "fate" unravels and reveals the respective levels of income (specifically, which individual is richer, and which is poorer). Second, in using weights that sum up to one, the utility function has the characteristic that a weak taste for income correlates with a strong distaste for low relative income (and vice versa). This assumption can be interpreted as us assigning 100 percent of weight to income and to relative income, permitting any ratio between these two terms in the preference specification.

To begin with, let the incomes be a of the "poor" individual 1, and b of the "rich" individual 2, such that $0 \leq a < b$. We introduce two social planners: a Rawlsian, and a utilitarian, who can transfer income from "rich" 2 to "poor" 1 in order to obtain an optimal income distribution. Let $t \in [0, b]$ denote the income that is taken away from 2 (henceforth "tax"). Due to inefficiency of the policy of redistribution, only a fraction of the taxed income ends up being transferred to 1. We denote this fraction by $0 < \lambda \leq 1$.

We make an implicit assumption that the lump-sum transfer does not alter the individuals' behavior (nor, consequently, their income) with respect to their work/leisure optimization. This assumption is fine if income is taken to be exogenous. However, if income includes labor income, and if individuals optimally choose how much time to allocate to work, then a lump sum transfer may change the individuals' optimal labor supply if they have a distaste for low relative income; that is, the poor individual may work less when his income is increased, as his marginal disutility from low relative income decreases when his income is raised by the transfer. A modeling of such an effect is in Sorger and Stark (2013).

What will be the income transfer policies of the Rawlsian and utilitarian social planners when the individuals exhibit a distaste for low relative income, and transfers are costly (namely are subject to the cost of the policy)?

The maximization problem of a Rawlsian social planner is:

$$\max_{0\le t\le b} SWF_R(t) = \max_{0\le t\le b}\left\{\min\left\{u(a+\lambda t, b-t), u(b-t, a+\lambda t)\right\}\right\}$$
$$= \max_{0\le t\le b}\left\{\min\left\{(1-\beta)f(a+\lambda t) - \beta RI(b-t-a-\lambda t),\right.\right.$$
$$\left.\left.(1-\beta)f(b-t) - \beta RI(a+\lambda t-b+t)\right\}\right\}.$$

It is easy to see that, as long as the income of individual 1 is lower than the income of individual 2, it pays to execute a transfer and continue to do so up to the point at which the individuals attain equal incomes. From that point onwards, any additional transfer will drive the utility of individual 2 below the utility of individual 1, and thereby decrease social welfare. Therefore, the optimal Rawlsian tax is

$$t^{R*} = \frac{b-a}{1+\lambda},$$

yielding equal post-transfer incomes

$$x_1^{R*} = x_2^{R*} = \frac{a+\lambda b}{1+\lambda}$$

for any $\beta \in [0,1)$ and $\lambda \in (0,1]$.

The maximization problem of a utilitarian social planner is

$$\max_{0\le t\le b} SWF_U(t) = \max_{0\le t\le b}\left\{u(a+\lambda t, b-t) + u(b-t, a+\lambda t)\right\}$$
$$= \max_{0\le t\le b}\left\{(1-\beta)f(a+\lambda t) - \beta RI(b-t-a-\lambda t)\right. \tag{2}$$
$$\left.+(1-\beta)f(b-t) - \beta RI(a+\lambda t-b+t)\right\}.$$

When the individuals' preferences exhibit no concern for interpersonal comparisons ($\beta = 0$), $SWF_U(t)$ in (2) reduces to

$$SWF_U(t) = f(a+\lambda t) + f(b-t).$$

Then

$$SWF_U'(t) = \lambda f'(a+\lambda t) - f'(b-t),$$

and

$$SWF_U''(t) = \lambda^2 f''(a+\lambda t) + f''(b-t) < 0. \tag{3}$$

Therefore, when $\beta = 0$, we get that

$$SWF_U'\left(t^{R*}\right) = SWF_U'\left(\frac{b-a}{1+\lambda}\right) = -(1-\lambda)f'\left(\frac{a+\lambda b}{1+\lambda}\right) \le 0,$$

and, thus, $SWF_U'\left(\frac{b-a}{1+\lambda}\right) = 0$ only if $\lambda = 1$, which, together with (3), implies that the utilitarian social planner will choose to equalize incomes only if the redistribution policy is perfectly costless. Denoting the utilitarian's optimal tax in the absence of a distaste for low relative income by t^{U*}, and the utilitarian's post-transfer incomes in the absence of a distaste for low relative income by x_i^{U*}, $i = 1,2$, it follows for any $\lambda < 1$ that $t^{U*} < t^{R*}$ and, hence, $x_1^{U*} = a + \lambda t^{U*} < b - t^{U*} = x_2^{U*}$.

Denoting the utilitarian's optimal post-transfer incomes in the presence of a distaste for low relative income (namely, when $\beta > 0$) by x_i^{U**}, $i = 1,2$, the following claim states that there exists a critical level $\beta_0 < 1$ such that if the individuals' weight assigned to a distaste for low relative income is not lower than β_0, then the optimal level of the tax chosen by the utilitarian social planner, t^{U**}, equalizes the incomes of the two individuals; namely, his chosen tax is the very tax chosen by the Rawlsian social planner: $t^{U**} = t^{R*}$.

Claim 1. If

$$\beta \ge \beta_0 \equiv \frac{(1-\lambda)f'\left(\frac{a+\lambda b}{1+\lambda}\right)}{(1-\lambda)f'\left(\frac{a+\lambda b}{1+\lambda}\right) + (1+\lambda)RI_0}, \tag{4}$$

then $t^{U**} = t^{R*}$, and $x_i^{U**} = x_i^{R*}$ for $i = 1,2$. Moreover, $\beta_0 < 1$.

Proof: We consider the following two jointly exhausting cases: $t > t^{R*}$, and $t \le t^{R*}$.

When $t > t^{R*}$ (namely, when $a + \lambda t > b - t$), individual 1 does not experience low relative income. In this case

$$SWF_U(t) = (1-\beta)f(a+\lambda t) + (1-\beta)f(b-t) - \beta RI(a+\lambda t - b + t).$$

Consequently,

$$
\begin{aligned}
SWF_U'(t) &= (1-\beta)\left[\lambda f'(a+\lambda t) - f'(b-t)\right] - \beta\left[\lambda RI'(a+\lambda t-b+t) + RI'(a+\lambda t-b+t)\right] \\
&= -(1-\beta)\left[f'(b-t) - \lambda f'(a+\lambda t)\right] - \beta(\lambda+1)RI'(a+\lambda t-b+t) < 0,
\end{aligned} \tag{5}
$$

where the inequality sign in (5) follows from the concavity of $f(\cdot)$ and the properties of $RI(\cdot)$. The negativity of $SWF_U'(t)$ for $t > t^{R*}$ implies that the utilitarian social planner will surely not elect to make a transfer such that individual 1 will end up having a post-transfer income that is higher than the income of individual 2.

When $t \le t^{R*}$, individual 2 does not experience low relative income. In this case

$$
SWF_U(t) = (1-\beta)f(a+\lambda t) - \beta RI(b-t-a-\lambda t) + (1-\beta)f(b-t). \tag{6}
$$

From the concavity of $f(\cdot)$ and the properties of $RI(\cdot)$, we have that $SWF_U(t)$ is strictly concave for $t \in (0, t^{R*})$:

$$
\begin{aligned}
SWF_U''(t) &= (1-\beta)\left[\lambda^2 f''(a+\lambda t) + f''(b-t)\right] - \beta(1+\lambda^2)RI''(b-t-a-\lambda t) \\
&< 0.
\end{aligned} \tag{7}
$$

Combining (5) and (7) we know that for t^{R*} to constitute a (global) maximum of (2), it suffices that $SWF_U(t)$ is strictly increasing in the tax rate from $t = 0$ all the way up to $t = t^{R*}$, which is equivalent to requiring that the left-hand derivative of the social welfare function is non-negative in $t = t^{R*}$, namely that

$$
SWF_{U-}'(t^{R*}) = SWF_{U-}'\left(\frac{b-a}{1+\lambda}\right) = -(1-\beta)(1-\lambda)f'\left(\frac{a+\lambda b}{1+\lambda}\right) + \beta(1+\lambda)RI_0 \ge 0, \tag{8}
$$

where the inequality part of (8) is equivalent to (4). The proof of the claim is completed on noticing that, because $(1+\lambda)RI_0 > 0$, β_0 defined in (4) is indeed smaller than one. Q.E.D.

Claim 1 informs us that if the individuals' distaste for having low relative income is greater than a specified critical level, then the optimal transfer chosen by a utilitarian social planner in order to maximize the sum of the individuals' utilities will be such as to equalize incomes, which is exactly the same as the optimal transfer choice of the Rawlsian social planner.

3. An example, and a numerical result

In this section we carry Claim 1 to specific functions that describe the individuals' preferences towards income and towards low relative income. We let

$$f(x) = \ln(x+1) \tag{9}$$

and

$$RI(y) = \begin{cases} e^{y} - 1 & \text{if } y > 0, \\ 0 & \text{if } y \leq 0. \end{cases} \tag{10}$$

It is easy to confirm that these two functions obey the functional assumptions made in Section 2. With (9) and (10), (1) reduces to

$$u(x,z) = (1-\beta)\ln(x+1) - \beta \max\left\{e^{z-x} - 1, 0\right\}, \tag{11}$$

and (8) simplifies to

$$SWF'_{U-}(t^{R*}) = -(1-\beta)(1-\lambda)\frac{1+\lambda}{1+a+\lambda(1+b)} + \beta(1+\lambda).$$

Then, condition (4) takes the form

$$\beta \geq \beta_0 \equiv \frac{1-\lambda}{2+a+b\lambda}. \tag{12}$$

Noting that $\frac{1-\lambda}{2+a+b\lambda} < \frac{1-\lambda}{2} < 1$, it follows that in order for condition (12) to hold with $f(\cdot)$ as defined in (9) and with $RI(\cdot)$ as defined in (10), it suffices that

$$\beta \geq \frac{1-\lambda}{2}. \tag{13}$$

Namely, under utility specification (11), when the individuals' weight assigned to a distaste for low relative income is not smaller than half the per-dollar cost of the redistribution policy, it is optimal for the utilitarian social planner to equalize incomes, aligning his choice with that of the Rawlsian social planner.

How likely does condition (13) hold in a real world setting? Critics of the US government welfare programs estimate that 70 cents in the dollar is the overhead cost of the US government assistance programs, with a mere 30 cents ending up in the pockets of the poor (cf., for example, Woodson, 1989, and the studies discussed in Tanner, 1996). Taking these estimates to constitute a lower limit on the efficiency of redistributive programs, namely, presuming that λ is at its minimal level of $1/3$, implies that condition (13) will be satisfied if the intensity of the individuals' distaste for low relative income is at least half as high as their taste for income ($\beta \geq 1/3$). In such a case, even if the social planner is a utilitarian, he will end up subscribing to the Rawlsian maximin criterion. Although we do not have readily available approximations of β, from a study by Clark and Senik (2010), we can infer that β is strictly positive and substantial,[4] from a study by Luttmer (2005) we can infer that relative income comparisons impact at least as much as income on individuals' happiness,[5] and from Vernazza (2013) we learn that, as a trigger of migration, relative income comparisons are more important than absolute income. It is, thus, quite reasonable to assume that β might be close to one half and, therefore, $\beta \geq \frac{1-\lambda}{2}$ is likely to hold even for quite low estimates of λ.

4. Conclusion

When a utilitarian social planner acknowledges the individuals' distaste for low status, he may well end up seeing eye to eye with a Rawlsian social planner in the choices that he makes concerning an optimal tax-and-transfer policy. This congruence implies that a Rawlsian social planner who cares about the worst-off individual can comfortably entrust a utilitarian social planner with managing the income distribution program, provided the latter commits himself to integrating into his measure of the individuals' utilities a duly weighted distaste for low status.

[4] Clark and Senik (2010) reviewed data collected in 2006/7 as part of Wave 3 of the European Social Survey. Their analysis of a usable sample of around 19,000 observations from 18 countries reveals that income comparisons are acknowledged as at least somewhat important by a majority of Europeans; are mostly upward; and are associated with lower levels of happiness.

[5] Luttmer (2005) uses 1987-1988 and 1992-1994 panel data from the US National Survey of Families and Households to estimate the influence of relative income on the reported levels of happiness. The results show that higher average income in the individual's locale has a negative effect on the individual's sense of wellbeing, the strength of this effect being similar to that of the happiness experienced from his own income.

References

Andolfatto, David (2002). "A theory of inalienable property rights," *Journal of Political Economy* 110(2): 382-393.

Blanchflower, David G. and Oswald, Andrew J. (2008). "Hypertension and happiness across nations," *Journal of Health Economics* 27(2): 218-233.

Card, David, Mas, Alexandre, Moretti, Enrico, and Saez, Emmanuel (2012). "Inequality at work: The effect of peer salaries on job satisfaction," *American Economic Review* 102(6): 2981-3003.

Clark, Andrew E. and Senik, Claudia (2010). "Who compares to whom? The anatomy of income comparisons in Europe," *Economic Journal* 120(544): 573-594.

Cohn, Alain, Fehr, Ernst, Herrmann, Benedikt, and Schneider, Frédéric (2014). "Social comparison and effort provision: Evidence from a field experiment," *Journal of the European Economic Association* 12(4): 877-898.

Fan, C. Simon and Stark, Oded (2011). "A theory of migration as a response to occupational stigma," *International Economic Review* 52(2): 549-571.

Fliessbach, Klaus, Weber, Bernd, Trautner, Peter, Dohmen, Thomas, Sunde, Uwe, Elger, Christian E., and Falk, Armin (2007). "Social comparison affects reward-related brain activity in the human ventral striatum," *Science* 318(5854): 1305-1308.

Frey, Bruno S. and Stutzer, Alois (2002). *Happiness and Economics: How the Economy and Institutions Affect Human Well-being*. Princeton: Princeton University Press.

Harsanyi, John C. (1976). *Essays on Ethics, Social Behaviour and Scientific Explanation*. Dordrecht: D. Reidel Publishing.

Lerner, Abba P. (1944). *The Economics of Control: Principles of Welfare Economics*. New York: Macmillan.

Luttmer, Erzo F. P. (2005). "Neighbors as negatives: Relative earnings and well-being," *Quarterly Journal of Economics* 120(3): 963-1002.

Rawls, John (1999). *A Theory of Justice*. Cambridge, MA: Harvard University Press.

Sorger, Gerhard and Stark, Oded (2013). "Income redistribution going awry: The reversal power of the concern for relative deprivation," *Journal of Economic Behavior and Organization* 86: 1-9.

Stark, Oded (2013). "Stressful integration," *European Economic Review* 63:1-9.

Stark, Oded and Fan, C. Simon (2011). "Migration for degrading work as an escape from humiliation," *Journal of Economic Behavior and Organization* 77(3): 241-247.

Stark, Oded and Hyll, Walter (2011). "On the economic architecture of the workplace: Repercussions of social comparisons among heterogeneous workers," *Journal of Labor Economics* 29(2): 349-375.

Stark, Oded, Hyll, Walter, and Wang, Yong (2012). "Endogenous selection of comparison groups, human capital formation, and tax policy," *Economica* 79(313): 62-75.

Stark, Oded and Taylor, J. Edward (1991). "Migration incentives, migration types: The role of relative deprivation," *Economic Journal* 101(408): 1163-1178.

Takahashi, Hidehiko, Kato, Motoichiro, Matsuura, Masato, Mobbs, Dean, Suhara, Tetsuya, and Okubo, Yoshiro (2009). "When your gain is my pain and your pain is my gain: Neural correlates of envy and schadenfreude," *Science* 323(5916): 937-939.

Tanner, Michael (1996). *The End of Welfare: Fighting Poverty in the Civil Society*. Washington, DC: Cato Institute.

Vernazza, Daniel R. (2013). "Does absolute or relative income motivate migration?," London School of Economics. Mimeo.

Walker, Iain and Smith, Heather J. (2002). *Relative Deprivation: Specification, Development, and Integration*. Cambridge: Cambridge University Press.

Woodson, Robert L. (1989). *Breaking the Poverty Cycle: Private Sector Alternatives to the Welfare State*. Harrisburg: Commonwealth Foundation.

Zizzo, Daniel J. and Oswald, Andrew J. (2001). "Are people willing to pay to reduce others' incomes?," *Annales d'Economie et de Statistique* 63-64: 39-65.