

Income Taxation and principles of fairness

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THEMA, IFS

September 2016

- 1 How optimal income taxation is influenced by fairness considerations
- 2 Heterogeneous preferences and utility
- 3 Difficulties associated with utilities a proxy for well-being
- 4 Difficulties associated with utilitarianism
- 5 Review of fairness approaches to optimal taxation
- 6 Reference

Outline

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- Standard approach assumes identical preferences and utility functions
- In standard approach, persons compensated for inferior endowments of characteristics
- When individuals have the same utility function, the only ethical question: degree of risk aversion
- When individual preferences differ: interpersonal comparison involve much more difficult questions generally addressed in terms of fair allocation of resources or opportunities
- Among considerations missed by standard approach: principle that income inequalities due to differences in preferences are not as problematic as inequalities due to differences in qualification or social background

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2 main views on utilities

- 1 Utilities are empirical objects that need to be measured and are inputs of SWF:
 - Utility = subjective self-assessment of well-being, see **economics of happiness** (e.g. Clark, Frijters, Shields JEL 2008)
 - see **choice under uncertainty**
- 2 Utilities are normative indexes that need to be constructed, see usual optimal taxation

1. Utilities = Empirical objects that need to be measured and are inputs of SWF

Utility in economics of happiness

Questions like “Taken all together, how would you say things are these days? Would you say that you are very happy, pretty happy or not too happy?”

Criticisms of this approach:

- Subjective well-being is not a legitimate argument of a theory of justice (Dworkin PhPubA 1981, Rawls 1982, Sen 1985):
 - **Expensive taste argument.** If declaring a lower well-being only reveals a lower subjective disposition to transform consumption into satisfaction, due to a higher level of aspiration, it does not call for compensation
 - **Adaptation.** If declaring a high well-being level only one's ability to adapt to objectively poor conditions \Rightarrow does not justify a policy failing to address these poor conditions

Philosophers have suggested to replace utilities with other arguments, e.g. bundles of resources (Dworkin)

Utility in choice under uncertainty

von Neumann-Morgenstern (vNM) utility functions represent rational preferences. These utility functions can have a cardinal meaning, provided that risk aversion is a direct translation of preference intensity, see Vickrey (Ecta 1945) and e.g. Harsanyi (1976) and Mirrlees (1982).

Criticism of this approach:

- risk aversion is not a measure of intensity of preferences; no ethically appealing cardinal interpretation.
- No comparability that one needs to build a social criterion.

2. Utilities = normative indexes that need to be constructed

Utility in standard optimal taxation

With homogeneous preferences, to choose the least concave utility representation of the preference of the agents and then to aggregate them with a $+/-$ inequality averse aggregator, reflecting the ethical preferences of the social planner

Atkinson (1995)

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Under utilitarian SWF (aggregator of well-being levels):

- In a first-best economy, with homogeneous preferences \Rightarrow the high-skilled agents end up enjoying lower satisfaction than the low-skilled agents, Mirrlees (1974).
- With inelastic earnings (labor supply) i.e. no behavioral responses and homogeneous preferences
 - and concave individual utility \Rightarrow the government taxes 100% of earnings and redistribute income equally across individuals (Edgeworth 1897).
 - and linear individual utility \Rightarrow no taxes at all.
- Utilitarianism can \Rightarrow a majority imposes an arbitrarily large loss to a minority, that is unable to guarantee a safety net to all agents, Rawls (1971).

- Under utilitarian SWF (even weighted), we cannot have (1) equalization of utility when all agents have the same preferences and (2) laissez-faire prevail when all agents have the same skill level, Jacquet and Van de gaer (JPubE 2011), Pikety and Saez (2013).
- Tagging improves redistribution but (usually) at the cost of violating equal treatment of equals (horizontal equity):

Tagging (cont'd)

If 2 agents identical in all dimensions ethically relevant but distinct w.r.to the dimension along which people are tagged (i.e. a dimension which is ethically irrelevant but statistically correlated to some ethically relevant variable, such as the agent's innate skill), **they are treated differently and end up enjoying \neq satisfaction levels** (e.g. Mankiw and Weinzierl, AEJ: Econ.Pol 2010).

Moreover, the **agent in unfavorable situation may end up at lower utility level than without tagging.**

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Weighted utilitarian social welfare function

Examples: Boadway, Marchand, Pestieau, Racionero (JPET 2002), Choné and Laroque (AER 2010), Lockwood and Weinzierl (JPubE 2015) \Rightarrow Negative marginal tax rates can prevail (composition effect due to heterogeneity in skills and preferences, see Chapter entitled “Income taxation with multidimensional heterogeneity”).

$$\sum_{i \in \mathbb{N}} \underbrace{\alpha_i}_{\text{Pareto weights}} U_i(z_i)$$

- Note that I use the notations of Fleurbaey and Maniquet (2015/2016), z_i being a pair (x_i, ℓ_i) .
- With convex utility possibility set, every efficient allocation can be optimal for this weighted function.

Weighted utilitarian social welfare function

Among criticisms of Fleurbaey and Maniquet (2015/2016) regarding this approach:

The values of weights can only be ascertained after the optimal allocation is identified. It cannot reliably be used to evaluate suboptimal allocations (reform's argument)

[Skip/ for their other points, see their interesting paper.]

Mankiw's just desert approach/ Libertarianism

Principle of **just deserts**: “A person who contributes more to society deserves a higher income that reflects those higher contributions”
(Mankiw Eastern Econ J2010)

Earnings are fair if they reflect the natural differences (whenever they come from) among people. \Rightarrow No need any more to make interpersonal comparisons

Note: market imperfections (pollution, provision of public goods, etc.) should be funded according to agents' incomes, because richer agents benefit more from them. (Mankiw Eastern Econ J2010)

Criticism: rather extreme postulate in theory of fairness

Roemer's equality of opportunity

Roemer (1993, 1995)'s theory of equality of opportunity (EofOp) rewards individuals for their natural talents with some idea of desert.

Sources of inequalities are either individual characteristics for which agents should not be held responsible, called *circumstances*, or individual characteristics for which agents should be held responsible, called *effort variables*.

- Circumstances call for compensation; resulting inequalities should be eliminated.
- Effort variables: agents should be responsible for them; society should be indifferent to inequalities in agents' outcomes that are caused by such characteristics.

Roemer's equality of opportunity (cont'd)

Assume individual outcomes are cardinal and comparable

- Partition agents according to their “genuine” effort.
- In each effort group, give absolute priority to the worst-off
- SW = average value of outcome for the worst-off of all effort groups.
- Roemer assumes outcomes to be cardinal and comparable, e.g. incomes

Roemer's equality of opportunity (cont'd)

Roemer's EofOp (also called "Mean of mins"):

- **Maximin criterion within effort group** (reflecting the compensation ideal for individuals with identical effort)
- **Utilitarian criterion between effort group**, because no concern for inequalities due to differential effort.

Roemer's equality of opportunity (cont'd)

How to measure genuine effort?

- 1 Partition the population by circumstances (“types”)
- 2 Within each subgroup (type) of population, effort level = relative rank in the distribution of outcomes within the subgroup

Roemer's equality of opportunity (cont'd)

Boadway, Brett and Jacquet (2015) allow the government to have varying attitudes towards persons of different preferences by possibly attaching distinct weights on individuals with distinct preferences for leisure:

- **Maximin criterion within effort group** (reflecting the compensation ideal for individuals with identical effort), like in Romer's approach
- **Weighted average criterion between effort group.**

Fleurbaey and Maniquet fair ordering's approach

- Fleurbaey and Maniquet's work (e.g. Fleurbaey and Maniquet 2011) proposes methods for obtaining social ordering functions (SOF) when individual utilities are neither measurable nor interpersonal comparable, and when preferences can differ.
- When comparing two allocations, they assume the planner knows individuals' full indifference curves at each allocation rather than just their preference orderings.
- They combine this with **axioms about social preferences**

Fleurbaey and Maniquet fair ordering's approach

The SOF must satisfy two main normative properties:

- Pareto principle
- A variant of Pigou-Dalton transfer principle (a transfer of resources from an advantaged agent to a relatively disadvantaged one is a social improvement)

⇒ The SOF must be of the **maximin or leximin form** applied to an **index** of each person's preference level.

Fleurbaey and Maniquet: money-metric utility

Index of each preference level: Money-metric utility (introduced in Samuelson, JEL, 1974)

Denote the utility level $u_i(x_i, \ell_i)$ with individuals $i \in \mathbb{N} = \{1, \dots, n\}$, $0 \leq \ell_i \leq 1$ and $x_i \geq 0$.

Normalize consumption price to 1

- Money-metric utility: level of (lump-sum) transfer which is needed to give at least the same utility level to the individual as in her actual situation where she has $U_i(z_i)$ with her bundle $z_i = (x_i, \ell_i)$, given some fixed **reference wage rate** w .

Fleurbaey and Maniquet: money-metric utility (cont'd)

- This level of minimal transfer is expressed in terms of expenditure function $m_i(w, z_i)$:

$$m_i(w, z_i) = \min \{ t \in \mathbb{R} \mid \exists (x, \ell_i) \in X, x = t + w\ell, u_i(x, \ell) \geq U_i(y_i) \}$$

Note that wage w plays the role of a **parameter** of the money-metric index; it does not need to be the actual wage of individual i .

Once reference wage w is fixed, **the function $m_i(w, \cdot)$ is a numerical representation of i 's preferences.**

Fleurbaey and Maniquet (WP 2015, updated in March 2016)

Fleurbaey and Maniquet: money-metric utility (cont'd)

Representing social ordering by applying W an inequality-averse SWF to individual well-being indexes, Fleurbaey and Maniquet write

$$W(m_i(w_i, z_i)_{i \in \mathbb{N}})$$

where well-being indexes are defined as the value of the money-metric utility function at the **personal wage rate** w_i . Fleurbaey and Maniquet (2015/2016)

- Laissez-faire allocation: $m_i(w_i, z_i) = 0 \forall i$
- With any redistribution: $m_i(w_i, z_i) < 0$ for some i
- \Rightarrow with inequality averse W , laissez-faire is the best feasible allocation.

Discussion: money-metric utility

In summary: Money-metric utility in Fleurbaey and Maniquet's approach: To identify the person with the lowest social ranking, index well-being using some common measure of the resources required to achieve each individual's preference level

"Value judgements that are implicit in comparing individuals' access to resources replace interpersonal comparisons in the implementation of leximin SOFs" (Boadway 2012)

Two SOF types, each one satisfying different transfer axioms: [SKIP]

- The Ω -equivalent leximin SOF: It indexes preference levels by the share of the economy's resources Ω to which individual is indifferent.
- The egalitarian Walrasian SOF: it ranks allocations by the share of Ω that is on the **lowest implicit budget line that is tangential** to the individuals whose indifference curves are lowest.

Fleurbaey and Maniquet fair ordering's approach

Assumption that effort characteristics = preferences of the agents. Agents also differ in productivities (skills, abilities) = circumstances in Roemer's words.

Principles:

- Agents having the same preferences should enjoy the same satisfaction level (end up on the same indifference curve), they should consume bundles they deem equivalent, called pairwise **compensation principle**. In other words, these agents should consume bundles they deem equivalent. \Leftrightarrow No-envy concept (Kolm 1972, Varian JET 1974) (Equal welfare for equal preferences)
- There should be no redistribution between agents having the same skill level, called pairwise **laissez-faire** objective (seeking to equalize transfers for all pairs of agents with identical wages), pairwise **responsibility principle, natural reward principle or liberal reward principle**.

Fleurbaey and Maniquet's approach

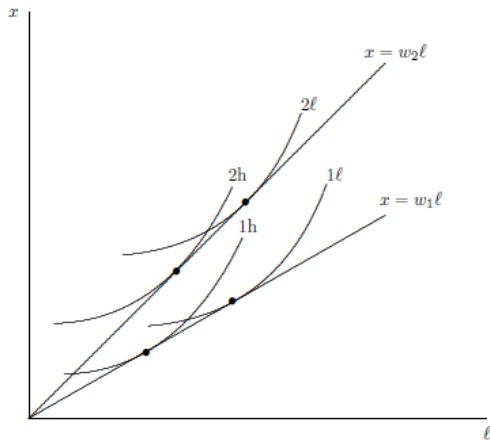
- If 2 persons with the same skill have different budget lines at their common wage rate, a reduction in the difference in their budget lines, holding the (x, y) -bundles of all others constant is socially preferred. (Equal transfer for equal skill)

These two principles are generally mutually incompatible, Fleurbaey (T&D 1994) and Bossert (MSS 1995).

Consider $w_1 < w_2$ and h : high taste for leisure, l : low taste for leisure.
Same number of each type for simplicity.
Figure shows laissez-faire allocation.

Incompatibility of these two principles

Laissez-faire allocation:



Suppose the government knows who is who and is contemplating to make lump-sum transfers to satisfy both principles:

- Responsibility Pr.: same taxes on the high-wage types $2h$ and $2l$. Similarly, same taxes on the low-wage types $1h$ and $1l$. \Rightarrow parallel shift in the two budget lines.
- Compensation Pr. for the high-distaste for work persons: the indifference curves for $1h$ and $2h$ must coincide \Rightarrow particular set of lump-sum transfers between wage types, the Principle of Compensation will not be satisfied for the low-distaste for work types $1l$ and $2l$.

\Rightarrow Not possible to satisfy the Principle of Compensation for the two preference types at the same time while maintaining the Principle of Responsibility.

Fleurbaey and Maniquet usually propose SOFs that satisfy one transfer principle while weakening the other.

Weaken the responsibility requirement; consider (only) laissez-faire selection.

Keep the compensation principle.

Fleurbaey and Maniquet's approach

Class of social orderings that combine compensation and responsibility principles, called **reference-wage egalitarian equivalent**:

$$\min_{i \in \mathbb{N}} m_i(\tilde{w}, z_i)$$

with \tilde{w} a **common** reference wage rate (see Preston and Walker 1999, p.346).

Fleurbaey and Maniquet's compensation principle

$$\min_{i \in \mathbb{N}} m_i(\tilde{w}, z_i)$$

Consider all preferences are identical. Let U_0 be a common representation of agents' preferences, the social ordering that maximizes $\min_{i \in \mathbb{N}} U_0(z_i)$ is exactly the same as every member of the reference-wage egalitarian-equivalent class. Indeed, when **preferences are identical**, the ranking of individuals in terms of money-metric utility $m_i(\tilde{w}, z_i)$ is the same as the ranking in terms of utility $U_0(z_i)$, whatever \tilde{w} , because $m_i(\tilde{w}, z_i)$ is a numerical representation of the same preferences as U_0 , for all \tilde{w} .

\Rightarrow **equalization** of $U_0(z_i)$ in First-best **since maximin.** \Rightarrow

Compensation principle satisfied.

Fleurbaey and Maniquet's laissez-faire objective/selection (very weak responsibility requirement)

$$\min_{i \in \mathbb{N}} m_i(\tilde{w}, z_i)$$

Consider all productivities are equal. $\Rightarrow \tilde{w} =$ common reference wage rate. \Rightarrow Let U_0 be a common representation of agents' preferences, the social ordering that maximizes $\min_{i \in \mathbb{N}} U_0(z_i)$ is exactly the same as every member of the reference-wage egalitarian-equivalent class. Indeed, when **preferences are identical**, the ranking of individuals in terms of money-metric utility $m_i(\tilde{w}, z_i)$ is the same as the ranking in terms of utility $U_0(z_i)$, whatever \tilde{w} , because $m_i(\tilde{w}, z_i)$ is a numerical representation of the same preferences as U_0 , for all \tilde{w} .

\Rightarrow **equalization** of $m_i(\tilde{w}, z_i)$. \Rightarrow **Laissez-faire objective satisfied.**

We will return to Fleurbaey and Maniquet's work in a few slides. First, let us focus on social marginal welfare weights.

Jacquet and Van de gaer (JPubE 2011)

- Double heterogeneity in individual's characteristics:
skill levels and disutilities of labor (tastes)
Labor supply along the extensive margin:
- They check the optimal tax schedules against Equality of Opportunity fairness requirements: Standard criteria used in optimal taxation perform poorly
- They compare the optimal tax policy under 15 normative criteria

Social marginal welfare weights are modified with social preferences from social choice

Jacquet and Van de gaer (JPubE 2011)

Tax in w_L -jobs,
< 0 when transfer

$$\frac{T_L^w}{x_L} - T_L^u = \frac{1}{\eta(x_L, \alpha_L^*)} \left(1 - g_L + \frac{\nu}{\lambda \gamma_L F(\alpha_L^*)} \right) - \frac{S_{\alpha_L^*}^X}{\lambda \gamma f(\alpha_L^*) x_L}$$

Diamond/Saez's tax formula

New term under
Social Preferences
from Social Choice

where ν : Lagrangian multiplier associated to the ICC $x_H \geq x_L$

Under Pref. from social Choice: $\nu > 0$ and $x_H = x_L$ i.e. IC binds

$\nu > 0$ reduces the value of the welfare weights on the low-skilled

Saez and Stantcheva (2016 AER): Generalized social marginal welfare weights

- Saez and Stantcheva's approach: To apply marginal social welfare weights not on unobservable utility indices but directly to observed earning levels. Saez (ReStud 2001) already rely on weights applied to earning levels directly.
- The weight at each earning level depends on the characteristics of the subpopulation of agents earning that level, and can be inspired by fairness principles.
- The objective of the planner is defined in terms of the relative weights that are assigned to set of people arning different incomes.

Generalized social marginal welfare weights

For a SWF $\int_{i \in \mathbb{N}} \alpha_i U_i(y_i)$, a marginal change δT to the function $T \Rightarrow$ change in SW equal, by the envelope theorem, to:

$$- \int_i \underbrace{\alpha_i \frac{\partial U_i}{\partial x_i}}_{\equiv g_i \text{ taken as given at a given allocation}} \delta T(y_i).$$

Focus on the weighted \int of $\delta T(y)$ over all levels of y .

- Saez and Stantcheva do this to evaluate whether a (small) reform is a social improvement.
- $\delta T(y)$ desirable iff $-\int_i g_i \delta T(y_i) > 0$
- Optimality: no budget neutral reform can increase welfare.

Generalized social marginal welfare weights

Saez and Stantcheva replace restrictive social welfare weight by **generalized social marginal welfare weights**.

- g_i measures social value of \$1 transfer for person i .
- Specified to directly capture fairness criteria.
- They give examples where weights are related to SWF (hence deduce from a SWF and a formula like $g_i \equiv \alpha_i \frac{\partial U_i}{\partial x_i} = \alpha_i u_{x_i}$) and where weights are not related to SWF.

Marginal tax rates depend on y only: express everything in terms of observables y .

$H(y)$: CDF of earnings, $h(y)$:pdf of earnings (both depend on $T(\cdot)$)

$\bar{G}(y)$ is the (relative) average social marginal welfare weight for individuals earning at least y :

$$\bar{G}(y) \equiv \frac{\int_{\{i|y_i \geq y\}} g_i}{\text{Prob}(y_i \geq y) \cdot \int_i g_i}$$

$\bar{g}(y)$ is the average social marginal welfare weight at y defined so that

$$\int_y^{\infty} \bar{g}(y') dH(y') = \bar{G}(y) [1 - H(y)]$$

Optimal nonlinear income tax formula expressed with welfare weights

$$T'(y) = \frac{1 - \bar{G}(y)}{1 - \bar{G}(y) + \alpha(y)\varepsilon(y)}$$

with $\alpha(z)$: average elasticity of z_i w.r.to $1 - T'$ at $z_i = z$

$\alpha(z)$: local Pareto parameter $\frac{yh(y)}{1-H(y)}$.

Proof: similar to tax perturbation method (small reform approach) in Saez (ReStud 2001).

- Individual weights need to be aggregated up to characteristics that tax system can conditioned on
 - E.g., if T can depend on y and characteristics x^b fair to redistribute (e.g. earnings ability), $T(y, x^b)$, aggregate weights at each $(y, x^b) \rightarrow \bar{g}(y, x^b)$
 - If standard $T(y)$, aggregate at each y : $\bar{G}(y)$ and $\bar{g}(y)$.
- Then apply previous (standard) tax formula.
- **Can we back out generalized social welfare weights?** Optimum $\Leftrightarrow \text{Max SWF} = \int_i \alpha_i U_i$ with Pareto weights $\alpha_i = \frac{g_i}{u_{x_i}} \geq 0$ where g_i and u_{x_i} **are evaluated at the optimal allocation.**
 - **Impossible to posit correct weights α_i without first solving for optimum.**

Underlying welfare weights of fairness (Fleurbaey and Maniquet's) approach

w_{\min} -equivalent leximin criterion of Fleurbaey and Maniquet (2011)

- Fair social orderings always maximin \Rightarrow criterion assigns maximal weight to agents exhibiting the lowest value of well-being index, those with $w = w_{\min}$ getting smallest (net) transfer from government
- $U_i = x_i - v(y_i/w_i, \theta_i)$, w_i : skill, θ_i : preference for work.
- labor supply: $\ell_i = y_i/w_i \in [0, 1]$, full time work: $\ell = 1$.
- $\text{Max min } m_i(w_{\min}, z_i)$ where $w_{\min} = \min_{i \in \mathbb{N}} w_i$
- Fleurbaey and Maniquet optimal tax system:

$$\forall y \leq w_{\min}, T'(y) = 0$$

$$\forall y > w_{\min}, \frac{T'(y)}{1 - T'(y)} = \frac{1 - F(y)}{\varepsilon(y) y f(y)}$$

[Skip] Derivation of optimal tax system in Fleurbaey and Maniquet [skip]

- ① Identify agents with the lowest well-being index in each skill group

Among w_{\min} -agents, assuming $0 \leq \ell \leq 1$, their incomes $\in [0, w_{\min}]$.

Denote $y^* \in [0, w_{\min}]$ **the gross income for which the tax level is maximal** (or lowest transfer) over $[0, w_{\min}]$.

Assume that some agents with minimal productivity, one of them having index i_0 , earn an income of y^*

[Skip]

Individual i_0 's choice reveals that he prefers bundle $\left(x^*, \frac{y^*}{w_{\min}}\right)$ to all other possible bundles affordable given the tax scheme.

[See Figure in Fleurbaey and Maniquet 2015]

[Skip]

The agents choosing to earn y^* among the lowest productivity agents have the lowest well-being index.

2. Compare well-being indexes of agents from distinct productivity groups.

⇒ Focus on agents having **the same or lower well-being index than agent i_0** since maximin over well-being indexes.

Draw implicit budgets of w' and w'' -agents which tell us how much they would earn if their productivity were w_{\min} .

Slopes of the two implicit budget lines = w_{\min}/w' and w_{\min}/w'' tell us how much they would earn if their productivity were w_{\min} .

[Skip]

The two implicit budgets are strictly below the tax schedule. \Rightarrow All agents having a productivity larger than w_{\min} prefer their actual bundle to being allowed to maximize their preferences over implicit budgets of intercept

$$m_{i_0} \left(w_{\min}, \left(x^*, \frac{y^*}{w_{\min}} \right) \right).$$

\Rightarrow All agents having a productivity equal to w' or w'' (and more generally $> w_{\min}$) have their implicit budget above agent i_0 's.

\Rightarrow Agent i_0 has the lowest well-being index

underlying welfare weights: $g(y^*) > 0$ and $g(y) = 0 \forall y \neq y^*$.

Underlying welfare weights of fairness (Fleurbaey and Maniquet's) approach

- Their optimal tax system implies $\bar{G}(y) = 1$ for $0 \leq y \leq w_{\min}$
- Hence, $\int_y^{\infty} [1 - g(y')] dH(y') = 0$
- Differentiating w.r.to y : $\bar{g}(y) = 1$ for $0 \leq y \leq w_{\min}$
- For $y > w_{\min}$, $\bar{G}(y) = 0$.

Underlying welfare weights:

- Let $T_{\max} \equiv \max_{\{i:w_i=\min w_i\}} (y_i - x_i)$
- $g(x_i, y_i; w_i, w_{\min}, T_{\max}) = 0$ for $w_i > w_{\min}$, for any $y_i - x_i$
- $\bar{g}(\cdot; w_i = w_{\min}, w_{\min}, T_{\max})$ is an endogenous Dirac distribution concentrated on $y - x = T_{\max}$.
- This forces government to provide same transfer to all with w_{\min}
- If at every $y < w_{\min}$ can find w_{\min} agents, this forces equal transfer ar all $y < w_{\min}$
- Zero transfer above w_{\min} since no w_{\min} agents found there.

Poverty alleviation

- Poverty gets substantial attention in public debate.
- Poverty alleviation objectives can lead to **Pareto dominated outcomes**:
 - Besley and Coate (AER 1992) and Kanbur, Keen, and Tuomala (EER 1994).
 - Intuition: disregard people's disutility from work.

Luck-desert distinction [Skip]

See Fleurbaey and Maniquet (2016)

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