More on multidimensional, intertemporal and chronic poverty orderings

Florent Bresson† **Jean-Yves Duclos**‡

†: CERDI, CNRS – Université d'Auvergne
‡: CIRPÉE, Université Laval & FERDI

Disclaimer

⚠ **Very first draft!**

A rich man's problem

A rich man's problem

An impressive bunch of poverty indices with sound axiomatic frameworks have been proposed for:

A rich man's problem

An impressive bunch of poverty indices with sound axiomatic frameworks have been proposed for:

- Multidimensional poverty: Chakravarty, Mukherjee & Ranade (1998), Tsui (2002), Bourguignon & Chakravarty (2003), Chakravarty, Deutsch & Silber (2008), Alkire & Foster (2011), Giraud (2012), Chakravary & d'Ambrosio (2013)…

A rich man's problem

An impressive bunch of poverty indices with sound axiomatic frameworks have been proposed for:

- Multidimensional poverty: Chakravarty, Mukherjee & Ranade (1998), Tsui (2002), Bourguignon & Chakravarty (2003), Chakravarty, Deutsch & Silber (2008), Alkire & Foster (2011), Giraud (2012), Chakravary & d'Ambrosio (2013)...
- Intertemporal poverty, Calvo & Dercon (2009), Foster (2009), Hoy & Zheng (2011), Bossert, Chakravarty d'Ambrosio (2012), Busetta & Mendola (2012), Canto, Gradin & del Rio (2012), Zheng (2012), Dutta, Roope & Zank (2013)...

A rich man's problem

An impressive bunch of poverty indices with sound axiomatic frameworks have been proposed for:

- Multidimensional poverty: Chakravarty, Mukherjee & Ranade (1998), Tsui (2002), Bourguignon & Chakravarty (2003), Chakravarty, Deutsch & Silber (2008), Alkire & Foster (2011), Giraud (2012), Chakravary & d'Ambrosio (2013)...
- Intertemporal poverty, Calvo & Dercon (2009), Foster (2009), Hoy & Zheng (2011), Bossert, Chakravarty d'Ambrosio (2012), Busetta & Mendola (2012), Canto, Gradin & del Rio (2012), Zheng (2012), Dutta, Roope & Zank (2013)...

A rich man's problem

An impressive bunch of poverty indices with sound axiomatic frameworks have been proposed for:

- Multidimensional poverty: Chakravarty, Mukherjee & Ranade (1998), Tsui (2002), Bourguignon & Chakravarty (2003), Chakravarty, Deutsch & Silber (2008), Alkire & Foster (2011), Giraud (2012), Chakravary & d'Ambrosio (2013)…
- Intertemporal poverty, Calvo & Dercon (2009), Foster (2009), Hoy & Zheng (2011), Bossert, Chakravarty d'Ambrosio (2012), Busetta & Mendola (2012), Canto, Gradin & del Rio (2012), Zheng (2012), Dutta, Roope & Zank (2013)…

Which measure is appropriate?

The problem

The problem

Poverty is lower with distribution B when compared with distribution A if:

$$P_B(\lambda) - P_A(\lambda) \leqslant 0$$

with:

- P: the poverty measure,
- λ: a function that defines the poverty frontier.

The problem

Poverty is lower with distribution B when compared with distribution A if:

$$P_B(\lambda) - P_A(\lambda) \leqslant 0$$

with:

P: the poverty measure,

λ: a function that defines the poverty frontier.

Contingency of the result with respect to λ and P.

The problem

Poverty is lower with distribution B when compared with distribution A if:

$$P_B(\lambda) - P_A(\lambda) \leqslant 0$$

with:

P: the poverty measure,

λ: a function that defines the poverty frontier.

Contingency of the result with respect to λ and P.

The problem

Poverty is lower with distribution B when compared with distribution A if:

$$P_B(\lambda) - P_A(\lambda) \leqslant 0$$

with:

- P: the poverty measure,
- λ: a function that defines the poverty frontier.

Contingency of the result with respect to λ and P.
Robustness implies using criteria that make it possible to obtain rankings that do not depend on λ and P.

State of the art

State of the art

Technically speaking, intertemporal poverty is multidimensional poverty, so that a common framework can be used for both intertemporal and multidimensional poverty.

State of the art

Technically speaking, intertemporal poverty is multidimensional poverty, so that a common framework can be used for both intertemporal and multidimensional poverty.

Chakravarty & Bourguignon (2002), Duclos, Sahn & Younger (2006) and Bresson & Duclos (2012) propose stochastic dominance conditions that make it possible to obtain robust multidimensional/intertemporal poverty orderings for broad classes of poverty indices and sets of poverty frontiers.

State of the art

Technically speaking, intertemporal poverty is multidimensional poverty, so that a common framework can be used for both intertemporal and multidimensional poverty.

Chakravarty & Bourguignon (2002), Duclos, Sahn & Younger (2006) and Bresson & Duclos (2012) propose stochastic dominance conditions that make it possible to obtain robust multidimensional/intertemporal poverty orderings for broad classes of poverty indices and sets of poverty frontiers.

However, they all assume poverty indices are continuous while many poverty indices are not.

Contribution

Contribution

- Relax the continuity assumption and propose dominance conditions for bidimensional poverty indices that comply with restricted continuity,

Contribution

- Relax the continuity assumption and propose dominance conditions for bidimensional poverty indices that comply with restricted continuity,
- Highlight the changes induced by relaxing the continuity assumption in comparison with the unidimensional case.

Contribution

- Relax the continuity assumption and propose dominance conditions for bidimensional poverty indices that comply with restricted continuity,
- Highlight the changes induced by relaxing the continuity assumption in comparison with the unidimensional case.
- Show how the framework can easily be adapted for the ordering of the chronic component of intertemporal poverty.

Outline

1. Framework
2. Main results
3. Chronic poverty
4. Concluding remarks

Notations

- $\boldsymbol{x} := (x_1, x_2)$ is an individual profile.
- $\lambda : \mathfrak{R}^2_+ \rightarrow \mathfrak{R}$ is a non-decreasing welfare function.
- $\mathscr{L}$ is the set of non-decreasing functions on $\mathfrak{R}^2_+$.
- $\Gamma \in \mathfrak{R}^2_+$ is the poverty domain.
- Λ is the poverty frontier.
- $\Gamma_1(\lambda) \subset \Gamma(\lambda) | x_1 < x_2$.
- $F(x_1, x_2)$ is the joint cumulative distribution function.
- H is a headcount index.

The DSY approach of poverty identification

The DSY approach of poverty identification

How shall we separate the poor from the non-poor in a bidimensional context?

The DSY approach of poverty identification

How shall we separate the poor from the non-poor in a bidimensional context? Duclos, Sahn & Younger (2006) defines the poor as those such that:

$$\lambda(x_1, x_2) \leqslant 0.$$

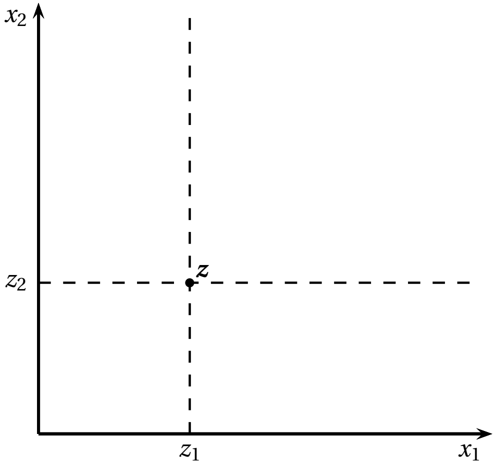


Figure 1: The definition of the poverty domain.

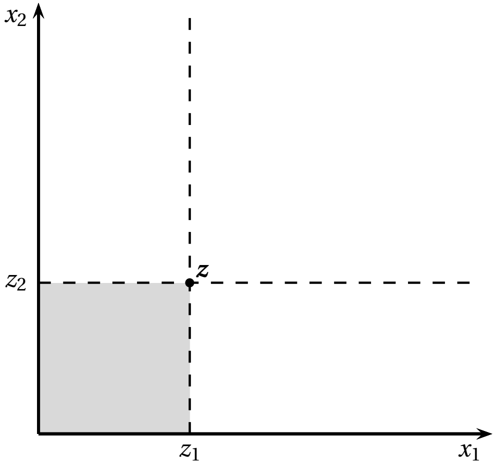


Figure 1: The definition of the poverty domain.

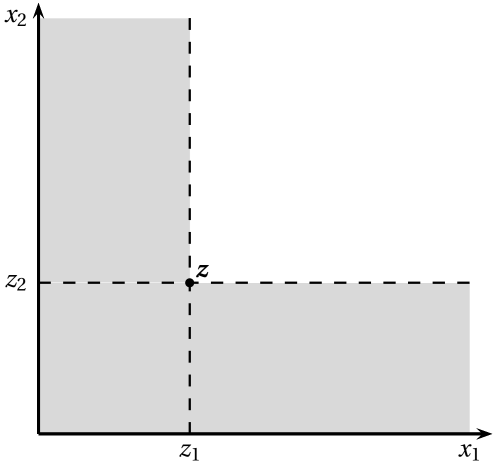


Figure 1: The definition of the poverty domain.

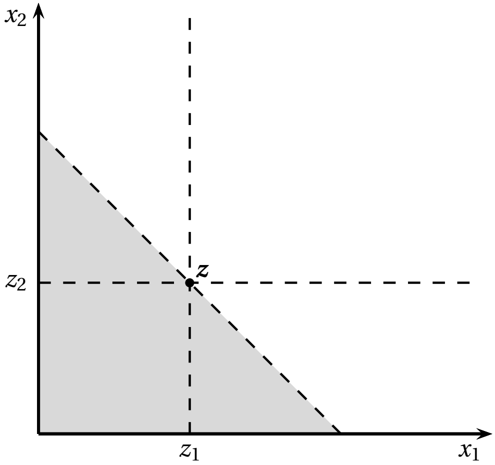


Figure 1: The definition of the poverty domain.

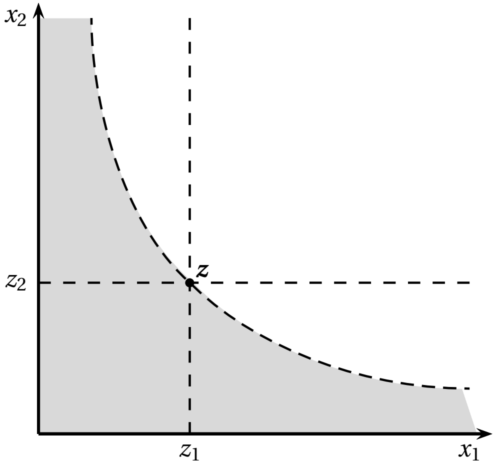


Figure 1: The definition of the poverty domain.

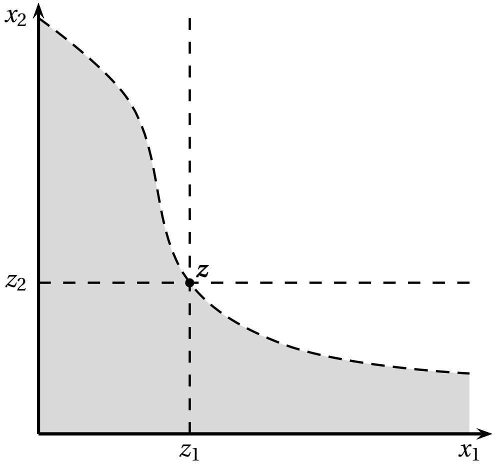


Figure 1: The definition of the poverty domain.

The DSY framework

The DSY framework

Let consider bidimensional additive poverty measures of the form:

$$P(\lambda) = \iint_{\Gamma(\lambda)} \pi(x_1, x_2; \lambda)\, dF(x_1, x_2).$$

The DSY framework

Let consider bidimensional additive poverty measures of the form:

$$P(\lambda) = \iint_{\Gamma(\lambda)} \pi(x_1, x_2; \lambda)\, dF(x_1, x_2).$$

DSY define the class $\ddot{\Pi}(\lambda^+)$ of bidimensional poverty indices $P(\lambda)$ as:

$$\ddot{\Pi}(\lambda^+) = \left\{ P(\lambda) \left| \begin{array}{l} \Gamma(\lambda) \subseteq \Gamma(\lambda^+) \\ \pi(x_1, x_2; \lambda) = 0, \text{ whenever } \lambda(x_1, x_2) = 0 \\ \pi^{(1)}(x_1, x_2; \lambda) \leqslant 0 \text{ and } \pi^{(2)}(x_1, x_2; \lambda) \leqslant 0\ \forall x_1, x_2 \\ \pi^{(1,2)}(x_1, x_2; \lambda) \geqslant 0, \forall x_1, x_2 \end{array} \right. \right\}$$

The DSY solution

The DSY solution

Theorem DSY (Duclos, Sahn & Younger, 2006)

$$P_A(\lambda) > P_B(\lambda),\ \forall P(\lambda) \in \ddot{\Pi}(\lambda^+),$$

$$\text{iff} \quad F_A(x_1, x_2) > F_B(x_1, x_2),\ \forall (x_1, x_2) \in \Gamma(\lambda^+).$$

The issue

Many existing indices do not belong to $\ddot{\Pi}(\lambda^{+})$!

Relaxing continuity

Restricted continuity means continuity within the poverty domain.

Relaxing continuity

Restricted continuity means continuity within the poverty domain.
⇒ Allows the poverty index to show a discontinuity at the poverty line. example

A class of poverty indices with restricted continuity

A class of poverty indices with restricted continuity

Let z^* be the value of permanent income on the poverty frontier, i.e. $\lambda(z^*, z^*) = 0$. $z_1(x_2)$ is the continuous non-negative function so that $\lambda\big(z_1(x_2), x_2\big) = 0 \ \forall x_2$. $z_2(x_1)$ is the inverse of $z_1(x_2)$.

A class of poverty indices with restricted continuity

Let z^* be the value of permanent income on the poverty frontier, i.e. $\lambda(z^*, z^*) = 0$. $z_1(x_2)$ is the continuous non-negative function so that $\lambda\big(z_1(x_2), x_2\big) = 0 \; \forall x_2$. $z_2(x_1)$ is the inverse of $z_1(x_2)$.

We consider the class $\Pi(\lambda^+)$ of bidimensional poverty indices $P(\lambda)$ as:

$$\Pi(\lambda^+) = \left\{ P(\lambda) \;\middle|\; \begin{array}{l} \Gamma(\lambda) \subset \Gamma(\lambda^+), \\ \pi(x_1, x_2; \lambda) \geqslant 0, \text{ whenever } \lambda(x_1, x_2) = 0, \\ \pi^{(x_1)}\big(x_1, z_2(x_1)\big) \leqslant 0, \; \forall x_1 \in [0, z^*], \\ \pi^{(x_2)}\big(z_1(x_2), x_2\big) \leqslant 0, \; \forall x_2 \in [0, z^*], \\ \pi^{(1)}(x_1, x_2; \lambda) \leqslant 0 \text{ and } \pi^{(2)}(x_1, x_2; \lambda) \leqslant 0 \, \forall x_1, x_2, \\ \pi^{(1,2)}(x_1, x_2; \lambda) \geqslant 0, \; \forall x_1, x_2 \end{array} \right\}$$

A class of poverty indices with restricted continuity

Let z^* be the value of permanent income on the poverty frontier, i.e. $\lambda(z^*, z^*) = 0$. $z_1(x_2)$ is the continuous non-negative function so that $\lambda\big(z_1(x_2), x_2\big) = 0 \ \forall x_2$. $z_2(x_1)$ is the inverse of $z_1(x_2)$.

We consider the class $\Pi(\lambda^+)$ of bidimensional poverty indices $P(\lambda)$ as:

$$\Pi(\lambda^+) = \left\{ P(\lambda) \;\middle|\; \begin{array}{l} \Gamma(\lambda) \subset \Gamma(\lambda^+), \\ \pi(x_1, x_2; \lambda) \geqslant 0, \text{ whenever } \lambda(x_1, x_2) = 0, \\ \pi^{(x_1)}\big(x_1, z_2(x_1)\big) \leqslant 0, \ \forall x_1 \in [0, z^*], \\ \pi^{(x_2)}\big(z_1(x_2), x_2\big) \leqslant 0, \ \forall x_2 \in [0, z^*], \\ \pi^{(1)}(x_1, x_2; \lambda) \leqslant 0 \text{ and } \pi^{(2)}(x_1, x_2; \lambda) \leqslant 0 \, \forall x_1, x_2, \\ \pi^{(1,2)}(x_1, x_2; \lambda) \geqslant 0, \ \forall x_1, x_2 \end{array} \right\}$$

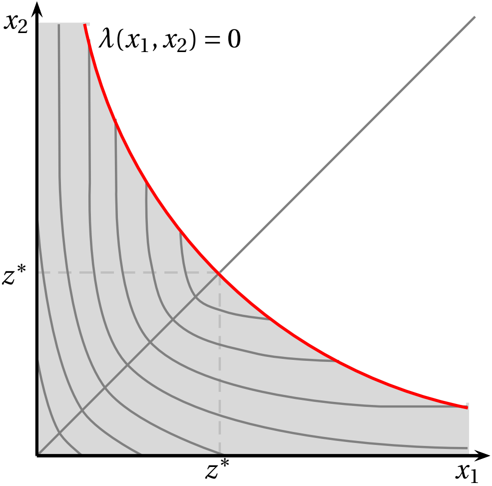


Figure 2: A member of $\Pi(\lambda^+)$

Main result

Main result

Let $H(\lambda)$ be the bidimensional headcount, *i.e.* $H(\lambda) := \iint_{\Gamma(\lambda)} dF(x_1, x_2)$.

Main result

Let $H(\lambda)$ be the bidimensional headcount, *i.e.*
$H(\lambda) := \iint_{\Gamma(\lambda)} dF(x_1, x_2)$.

Theorem 1

$$P_A(\lambda) \geqslant P_B(\lambda),\ \forall P(\lambda) \in \Pi(\lambda^+),$$

iff $H_A(\lambda) \geqslant H_B(\lambda)\ \forall \lambda \in \mathscr{L}$ s. t. $\Gamma(\lambda) \subseteq \Gamma(\lambda^+)$.

Main result

Let $H(\lambda)$ be the bidimensional headcount, *i.e.*
$H(\lambda) := \iint_{\Gamma(\lambda)} dF(x_1, x_2)$.

Theorem 1

$$P_A(\lambda) \geqslant P_B(\lambda), \ \forall P(\lambda) \in \Pi(\lambda^+),$$

iff $H_A(\lambda) \geqslant H_B(\lambda)\ \forall \lambda \in \mathscr{L}$ s. t. $\Gamma(\lambda) \subseteq \Gamma(\lambda^+)$.

⇒ More demanding that Theorem DSY!

Increasing the ordering power

Increasing the ordering power

Different options:

Increasing the ordering power

Different options:

- Consider higher-orders of dominance (but Zheng, 1999).
- Add more structure (like symmetry).
- Consider specific families for λ.
- Assume a minimal set for the poverty domain.

Increasing the ordering power

Different options:

- Consider higher-orders of dominance (but Zheng, 1999).
- Add more structure (like symmetry).
- Consider specific families for λ.
- Assume a minimal set for the poverty domain.

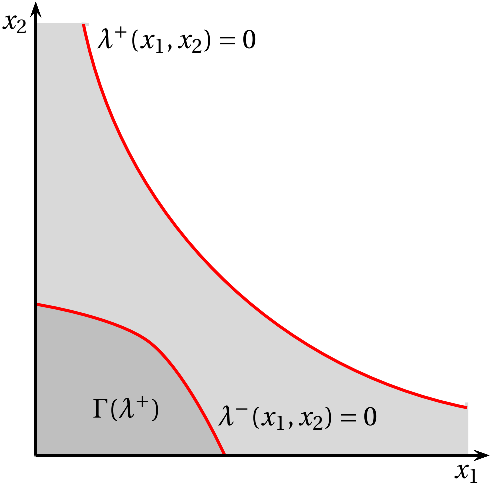


Figure 3: A minimal poverty domain.

$\bar{\Gamma}(\lambda^+, \lambda^-) := \Gamma(\lambda^+) \not\cap \Gamma(\lambda^-)$ be the domain where the poverty frontier is assumed to be located.

Partial headcount

Partial headcount

$F_{\lambda,1}$ and $F_{\lambda,2}$ are *partial headcount* indices defined as:

$$F_{\lambda,1}(x_1) := \int_0^{x_1} F\big(z_2(y_1)|y_1\big) f_1(y_1)\, dy_1,$$
$$F_{\lambda,2}(x_2) := \int_0^{x_2} F\big(z_1(y_2)|y_2\big) f_2(y_2)\, dy_2.$$

A lower bound for the poverty frontier

A lower bound for the poverty frontier

Let $\bar{\Gamma}(\lambda^+,\lambda^-) := \Gamma(\lambda^+) \not\cap \Gamma(\lambda^-)$ be the domain where the poverty is assumed to be located.

A lower bound for the poverty frontier

Let $\bar{\Gamma}(\lambda^+,\lambda^-) := \Gamma(\lambda^+) \not\cap \Gamma(\lambda^-)$ be the domain where the poverty is assumed to be located.

Theorem 2

$$P_A(\lambda) \geqslant P_B(\lambda),\ \forall P(\lambda) \in \Pi(\lambda^+),\ \lambda \in \mathscr{L} \text{ s. t. } \Lambda(\lambda) \subseteq \bar{\Gamma}(\lambda^+,\lambda^-),$$

$$\begin{aligned}
\text{iff} \quad & F_A(x_1,x_2) \geqslant F_B(x_1,x_2),\ \forall (x_1,x_2) \in \Gamma(\lambda^+),\\
\text{and} \quad & H_A(\lambda) \geqslant H_B(\lambda)\ \forall \lambda \in \mathscr{L} \text{ s. t. } \Lambda(\lambda) \subseteq \bar{\Gamma}(\lambda^+,\lambda^-),\\
\text{and} \quad & F^A_{\lambda,t}(x) \geqslant F^B_{\lambda,t}(x) \forall t \in \{1,2\},\ x \in [0,z^*],\ \lambda \in \mathscr{L} \text{ s. t. } \Lambda(\lambda) \subseteq \bar{\Gamma}(\lambda^+,\lambda^-).
\end{aligned}$$

A lower bound for the poverty frontier

Let $\bar{\Gamma}(\lambda^+,\lambda^-) := \Gamma(\lambda^+) \not\cap \Gamma(\lambda^-)$ be the domain where the poverty is assumed to be located.

Theorem 2

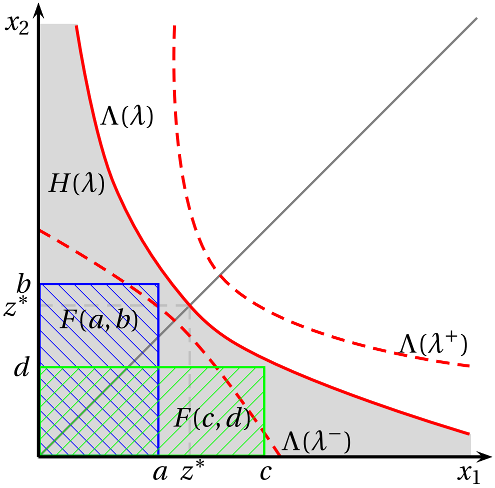
$$P_A(\lambda) \geqslant P_B(\lambda),\ \forall P(\lambda) \in \Pi(\lambda^+),\ \lambda \in \mathscr{L} \text{ s. t. } \Lambda(\lambda) \subseteq \bar{\Gamma}(\lambda^+,\lambda^-),$$

iff $F_A(x_1,x_2) \geqslant F_B(x_1,x_2),\ \forall (x_1,x_2) \in \Gamma(\lambda^+),$

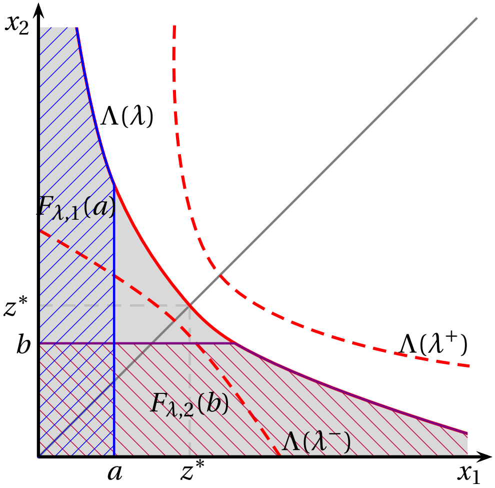
and $H_A(\lambda) \geqslant H_B(\lambda)\ \forall \lambda \in \mathscr{L}$ s. t. $\Lambda(\lambda) \subseteq \bar{\Gamma}(\lambda^+,\lambda^-),$

and $F^A_{\lambda,t}(x) \geqslant F^B_{\lambda,t}(x) \forall t \in \{1,2\},\ x \in [0,z^*],\ \lambda \in \mathscr{L}$ s. t. $\Lambda(\lambda) \subseteq \bar{\Gamma}(\lambda^+,\lambda^-).$

Third condition vanishes if we assume $\pi(z_1(x_2),x_2) = c \geqslant 0\ \forall x_2$.



x_2
$\Lambda(\lambda)$
$H(\lambda)$
b
z^*
$F(a,b)$
d
$F(c,d)$
$\Lambda(\lambda^+)$
$\Lambda(\lambda^-)$
a
z^*
c
x_1



x_2
$\Lambda(\lambda)$
$F_{\lambda,1}(a)$
z^*
b
$\Lambda(\lambda^+)$
$F_{\lambda,2}(b)$
$\Lambda(\lambda^-)$
a
z^*
x_1

Remarks

- Contrary to the unidimensional case, imposing a minimal set for the poverty domain raises the ordering power.
- In the specific case of intersection poverty domains, conditions in Theorems 1 and 2 boil down to Theorem DSY's condition.

Additional axioms

Symmetry and asymmetry investigated in Bresson & Duclos (2012) for continuous indices.

Additional axioms

Symmetry and asymmetry investigated in Bresson & Duclos (2012) for continuous indices.

- Symmetry means $\pi(x_1, x_2) = \pi(x_2, x_1)\ \forall (x_1, x_2)$.

Additional axioms

Symmetry and asymmetry investigated in Bresson & Duclos (2012) for continuous indices.

- Symmetry means $\pi(x_1, x_2) = \pi(x_2, x_1)\ \forall(x_1, x_2)$.
- Asymmetry means (for instance) $\pi(x_1, x_2) \geqslant \pi(x_2, x_1)$ $\forall(x_1, x_2)$ so that $x_1 \leqslant x_2$.

Additional axioms

Symmetry and asymmetry investigated in Bresson & Duclos (2012) for continuous indices.

- Symmetry means $\pi(x_1, x_2) = \pi(x_2, x_1)\ \forall (x_1, x_2)$.
- Asymmetry means (for instance) $\pi(x_1, x_2) \geqslant \pi(x_2, x_1)$ $\forall (x_1, x_2)$ so that $x_1 \leqslant x_2$.

Additional axioms

Symmetry and asymmetry investigated in Bresson & Duclos (2012) for continuous indices.

- Symmetry means $\pi(x_1, x_2) = \pi(x_2, x_1)\ \forall (x_1, x_2)$.
- Asymmetry means (for instance) $\pi(x_1, x_2) \geqslant \pi(x_2, x_1)$ $\forall (x_1, x_2)$ so that $x_1 \leqslant x_2$.

Both properties permits the ordering of a larger set of distributions because they make it possible to benefit from compensations effects within the poverty domain.

Symmetry

Symmetry

Let λ_S define a symmetric poverty frontier.

Symmetry

Let λ_S define a symmetric poverty frontier.

$$\Pi_S(\lambda_S^+) = \left\{ P(\lambda) \in \Pi(\lambda_S^+) \;\middle|\; \begin{array}{l} \lambda \in \mathscr{L}_S, \\ \pi(x_1, x_2; \lambda_S) = \pi(x_2, x_1; \lambda_S), \forall (x_1, x_2) \in \Gamma(\lambda_S) \end{array} \right\}.$$

Symmetry

Let λ_S define a symmetric poverty frontier.

$$\Pi_S(\lambda_S^+) = \left\{ P(\lambda) \in \Pi(\lambda_S^+) \;\middle|\; \begin{array}{l} \lambda \in \mathscr{L}_S, \\ \pi(x_1, x_2; \lambda_S) = \pi(x_2, x_1; \lambda_S), \forall (x_1, x_2) \in \Gamma(\lambda_S) \end{array} \right\}.$$

Theorem 3

$$P_A(\lambda) \geqslant P_B(\lambda),\ \forall P(\lambda) \in \Pi_S(\lambda_S^+),$$

iff $F_A(x_1, x_2) + F_A(x_2, x_1) \geqslant F_B(x_1, x_2) + F_B(x_2, x_1),\ \forall (x_1, x_2) \in \Gamma_1(\lambda_S^+)$

and $H_A(\lambda) \geqslant H_B(\lambda)\ \forall \lambda \in \mathscr{L}_S$ s. t. $\Gamma(\lambda) \subseteq \Gamma(\lambda_S^+)$

and $\sum_{t=1}^{2} F_{\lambda,t}^A(x) \geqslant \sum_{t=1}^{2} F_{\lambda,t}^B(x)\ \forall x \in [0, z^*],\ \lambda \in \mathscr{L}_S$ s. t. $\Gamma(\lambda) \subseteq \Gamma(\lambda_S^+)$.

Asymmetry

Asymmetry

We still assume that the poverty frontier is symmetric.

Asymmetry

We still assume that the poverty frontier is symmetric.

$$\Pi_{AS}(\lambda_S^+) = \left\{ P(\lambda) \in \Pi(\lambda_S^+) \;\middle|\; \begin{array}{l} \lambda \in \mathcal{L}_S \\ \pi^{(x_1)}\big(x_1, z_2(x_1)\big) \leqslant \pi^{(x_1)}\big(z_1(x_1), x_1\big) \leqslant 0, \;\; \forall x_1 \in [0, z^*] \\ \pi^{(1)}(x_1, x_2; \lambda) \leqslant \pi^{(2)}(x_2, x_1; \lambda) \quad \text{if } x_1 \leqslant x_2 \\ \pi^{(1,2)}(x_1, x_2; \lambda) \geqslant \pi^{(1,2)}(x_2, x_1; \lambda) \quad \text{if } x_1 \leqslant x_2 \end{array} \right\}$$

Asymmetry

Asymmetry

Theorem 5

$$P_A(\lambda) > P_B(\lambda),\ \forall P(\lambda) \in \Pi_{AS}(\lambda_S^+),$$

iff $F_A(x_1,x_2) > F_B(x_1,x_2),\ \forall (x_1,x_2) \in \Gamma_1(\lambda_S^+)$
and $F_A(x_1,x_2) + F_A(x_2,x_1) > F_B(x_1,x_2) + F_B(x_2,x_1),\ \forall (x_1,x_2) \in \Gamma_1(\lambda_S^+)$
and $H_A(\lambda) \geqslant H_B(\lambda)\ \forall \lambda \in \mathscr{L}_S$ s. t. $\Gamma(\lambda) \subseteq \Gamma(\lambda_S^+)$
and $\sum_{t=1}^{T} F_{\lambda,t}^{A}(x) \geqslant \sum_{t=1}^{T} F_{\lambda,t}^{B}(x)\ \forall x \in [0,z^*],\ T \in \{1,2\},\ \lambda \in \mathscr{L}_S$ s. t. $\Gamma(\lambda) \subseteq \Gamma(\lambda_S^+)$.

General framework

General framework

Main assumption: Intertemporal poverty can be additively decomposed into chronic and transient components, that is:

$$P(\lambda) = C\big(P(\lambda)\big) + T\big(P(\lambda)\big).$$

where $C()$ is the chronic component and $T()$ the transient component.

Different views

- the “spell” approach: poor are either chronic poor or transient poor.
- the “components” approach: poor can cumulate chronic and transient forms of poverty

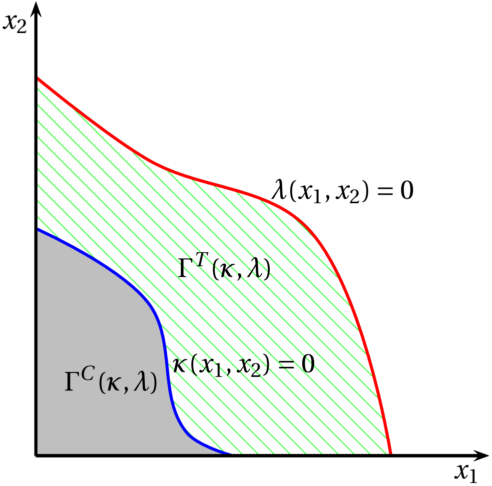


Figure 4: Chronic and transient poverty with the "spell" approach.

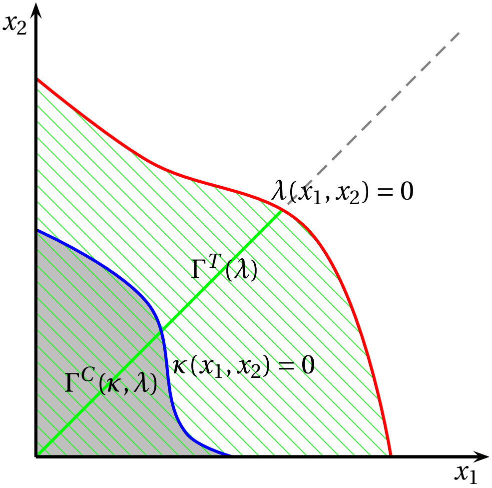


Figure 5: Chronic and transient poverty with the “component” approach.

Dominance checks

Dominance checks

In both cases, the chronic poverty domain is the bottom part of the poverty domain.

Dominance checks

In both cases, the chronic poverty domain is the bottom part of the poverty domain.

⇒ Assuming that $C\big(P(\lambda)\big) \in \Pi(\lambda^{+})$, Theorems 1 to 6 can be used to obtain robust orderings.

Further work

Further work

To do:

- Reference to profile $(z^*; z^*)$ should be generalized to any point on the poverty frontier,

Further work

To do:

- Reference to profile $(z^*; z^*)$ should be generalized to any point on the poverty frontier,
- Asymmetry with asymmetric poverty frontiers.

Further work

To do:

- Reference to profile $(z^*; z^*)$ should be generalized to any point on the poverty frontier,
- Asymmetry with asymmetric poverty frontiers.
- Higher-order of dominance (Pigou-Dalton transfers, transfer-sensitivity…)

Further work

To do:

- Reference to profile $(z^*; z^*)$ should be generalized to any point on the poverty frontier,
- Asymmetry with asymmetric poverty frontiers.
- Higher-order of dominance (Pigou-Dalton transfers, transfer-sensitivity…)
- Implementation.

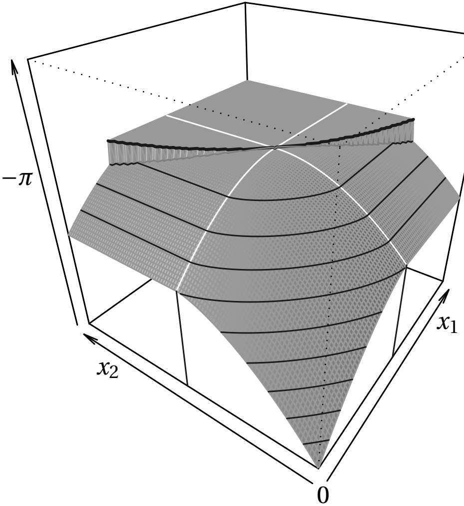
Further work

To do:

- Reference to profile $(z^*; z^*)$ should be generalized to any point on the poverty frontier,
- Asymmetry with asymmetric poverty frontiers.
- Higher-order of dominance (Pigou-Dalton transfers, transfer-sensitivity...)
- Implementation.
- Discontinuities within the poverty domain

The end

Thank you for your attention.



Note: the opposite of the individual poverty index is depicted on the figure.

Figure 6: A bidimensional poverty index with restricted continuity.

back