Measuring Multidimensional Well-being

Koen Decancq

Canazei 2018

Motivation

- Measuring and comparing well-being is a central issue in the measurement of inequality and poverty
- Well-being is multidimensional (Stiglitz et al. 2009)
- Individuals may have different preferences about what is important in their life

How can we measure well-being in a multidimensional framework while respecting the preferences of the concerned individuals?

Outline

Part 1. Measuring well-being on a crossroads

Part 2. Three well-being measures

Part 3. Estimating trade-offs between dimensions

Part 4. Application

Roadmap

Part 1. Measuring well-being on a crossroads

- Building blocks for a well-being measure
- Principles for a well-being measure
- An inconvenient result

Part 2. Three well-being measures

Part 3. Estimating trade-offs between dimensions

Part 4. Applications

Economica LSE

Economica (2015) **82**, 1082–1106
doi:10.1111/ecca.12152

Happiness, Equivalent Incomes and Respect for Individual Preferences

By KOEN DECANCQ†, MARC FLEURBAEY‡ and ERIK SCHOKKAERT††

†*University of Antwerp, CES and CORE* ‡*Princeton University* ††*Katholieke Universiteit Leuven and CORE*

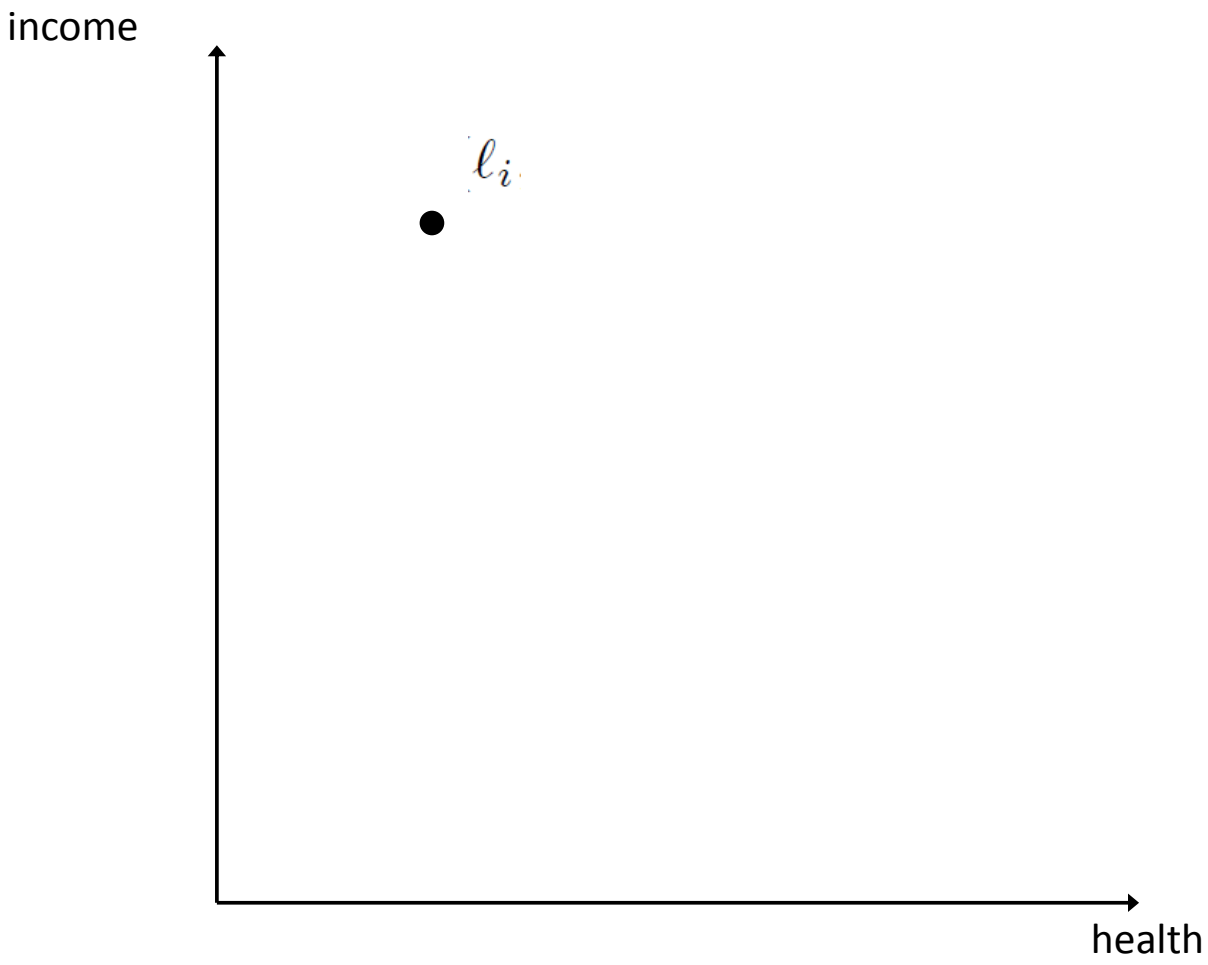
Final version received 2 January 2015.

In this paper, we study interpersonal comparisons of wellbeing. We show that using subjective wellbeing (SWB) levels can be in conflict with individuals' judgments about their own lives. We propose therefore an alternative wellbeing measure in terms of equivalent incomes that respects individual preferences. We show how SWB surveys can be used to derive the ordinal information about preferences needed to calculate equivalent incomes. We illustrate our approach with Russian panel data (RLMS-HSE) for the period 1995–2003 and compare it to standard wellbeing measures such as expenditures and SWB. We find that different groups are identified as worst off.

Building blocks for a well-being measure

1. The outcome vector ℓ_i

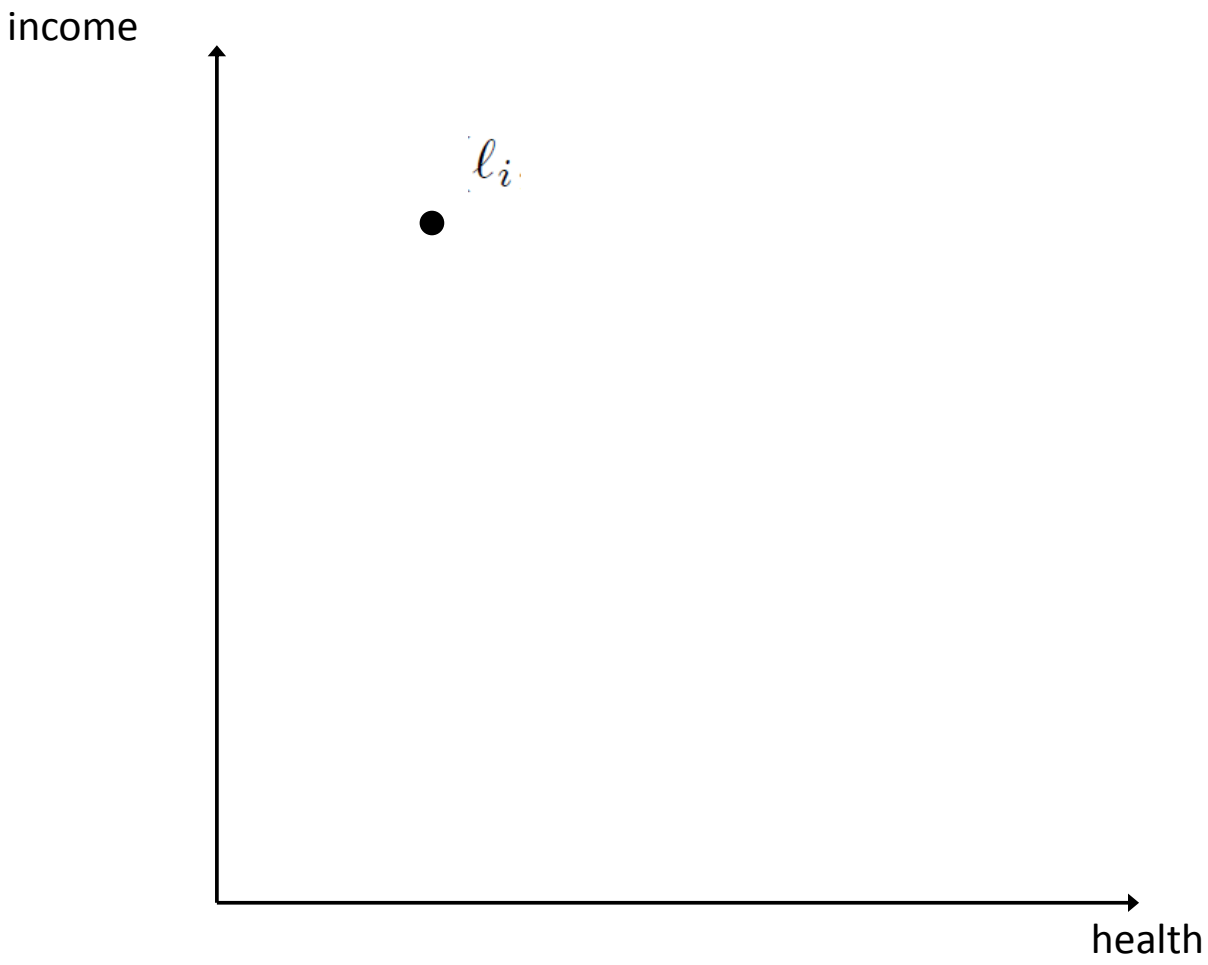
Building blocks for a well-being measure



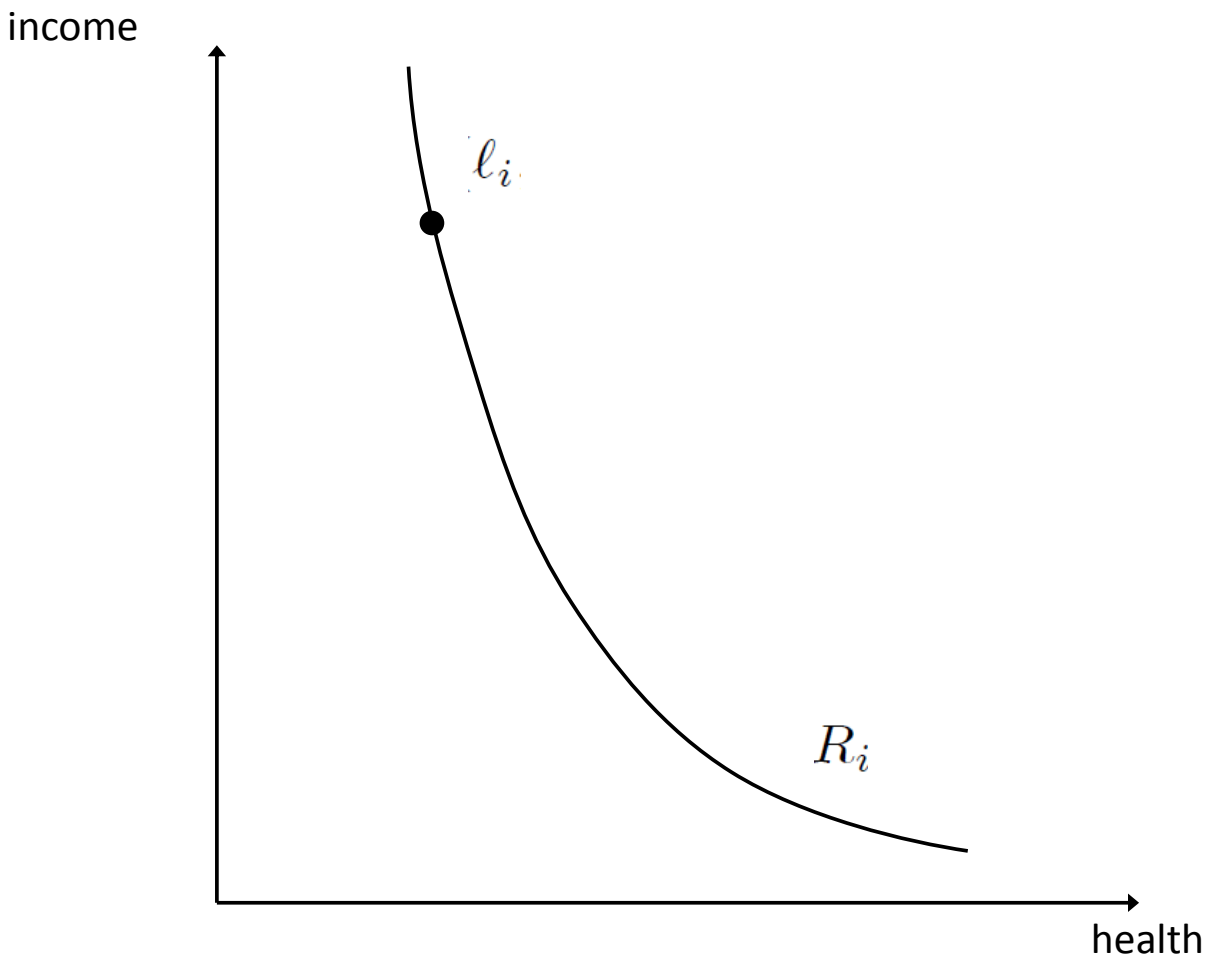
Building blocks for a well-being measure

1. The outcome vector ℓ_i
2. Informed opinion on the good life R_i
   (aka "preference ordering")

Building blocks for a well-being measure



Building blocks for a well-being measure



Building blocks for a well-being measure

1. The outcome vector ℓ_i
2. Informed opinion on the good life R_i
   (aka "preference ordering")
3. Satisfaction function S_i, (so that $s_i = S_i(\ell_i).$)

B20 **CARD 9** All things considered, how satisfied are you with your life as a whole nowadays? Please answer using this card, where 0 means extremely[12] dissatisfied and 10 means extremely satisfied.

Extremely dissatisfied										**Extremely satisfied**	**(Don't Know)**
00	01	02	03	04	05	06	07	08	09	10	88

Building blocks for a well-being measure

1. The outcome vector ℓ_i
2. Informed opinion on the good life R_i
   (aka "preference ordering")
3. Satisfaction function S_i, (so that $s_i = S_i(\ell_i).$)

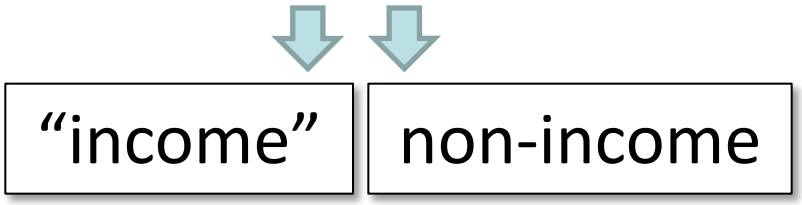
A well-being measure:

$$WB(\ell_i, R_i, S_i)$$

A first well-being measure (the non-starter)

- We split the outcome vector

$$\ell_i = (y_i, x_i)$$



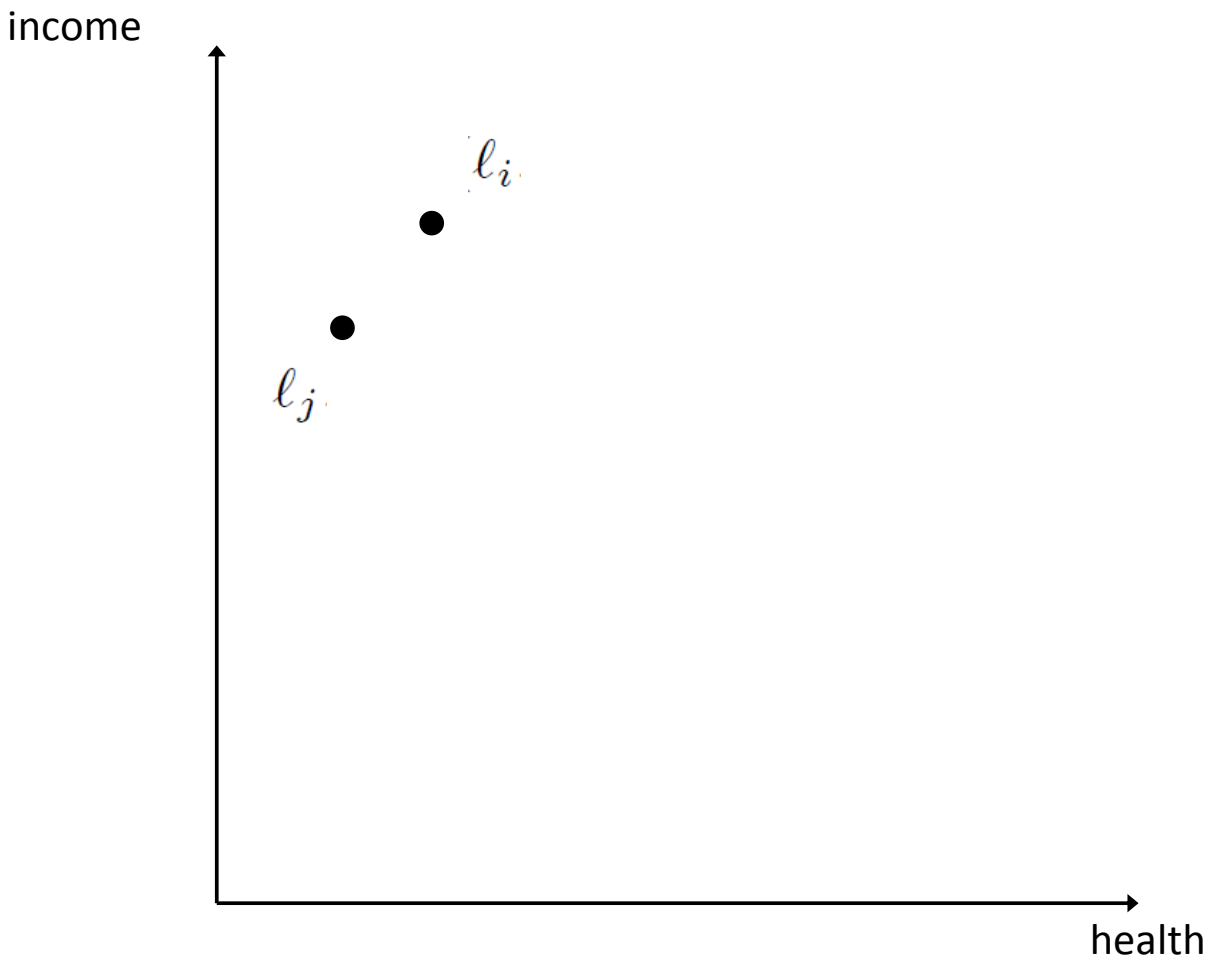
- Where $x_i = (x_i^1, \ldots, x_i^m)$ is again a vector
- A first (familiar) well-being measure:

$$WB^1(\ell_i, R_i, S_i) = y_i.$$

- "Resource fetishism" (Sen, 1985).
- We need a multidimensional measure

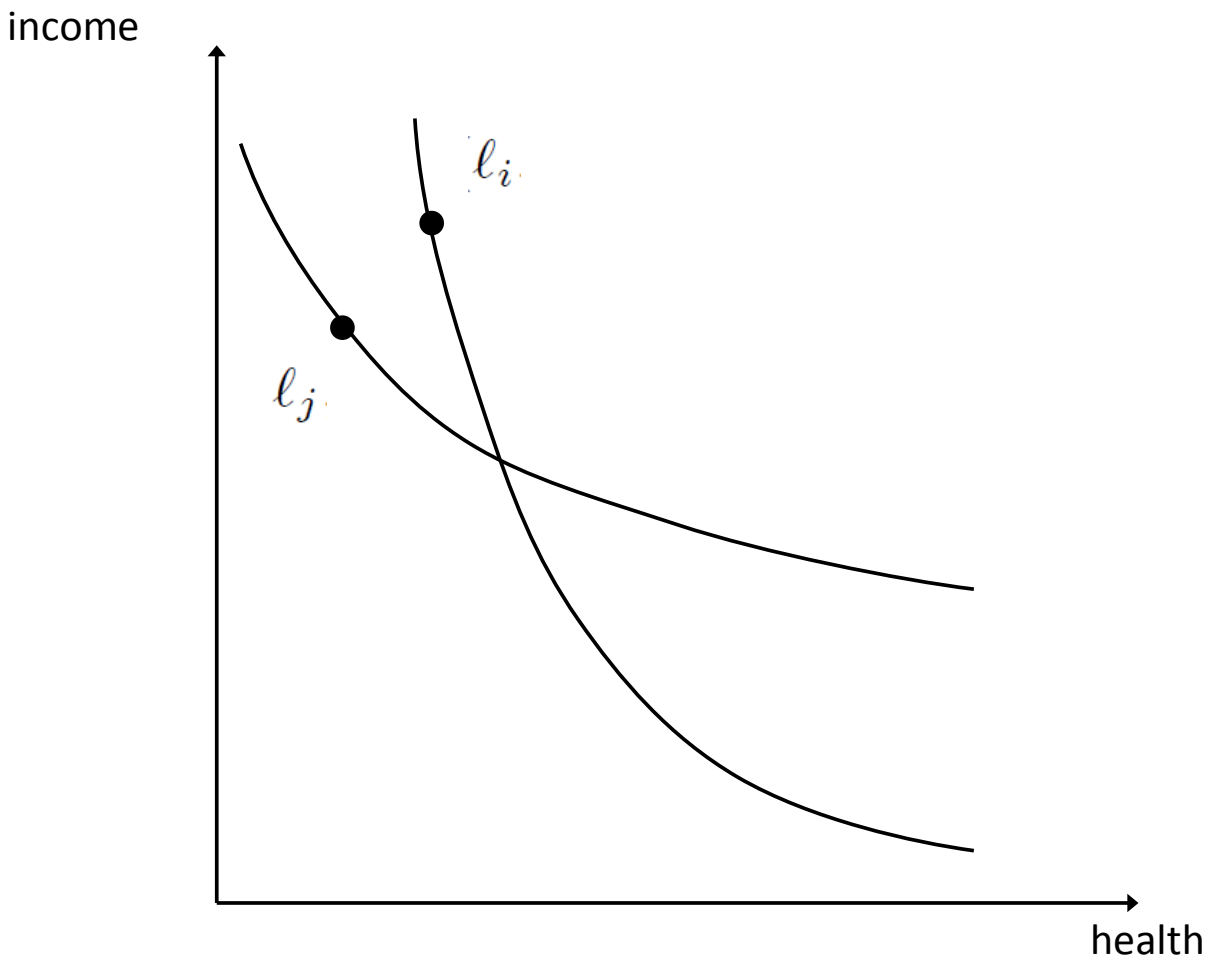
Principles for a well-being measure

Dominance Principle: If $\ell_i \gg \ell_j$, then $WB(\ell_i, R_i, S_i) > WB(\ell_j, R_j, S_j)$.



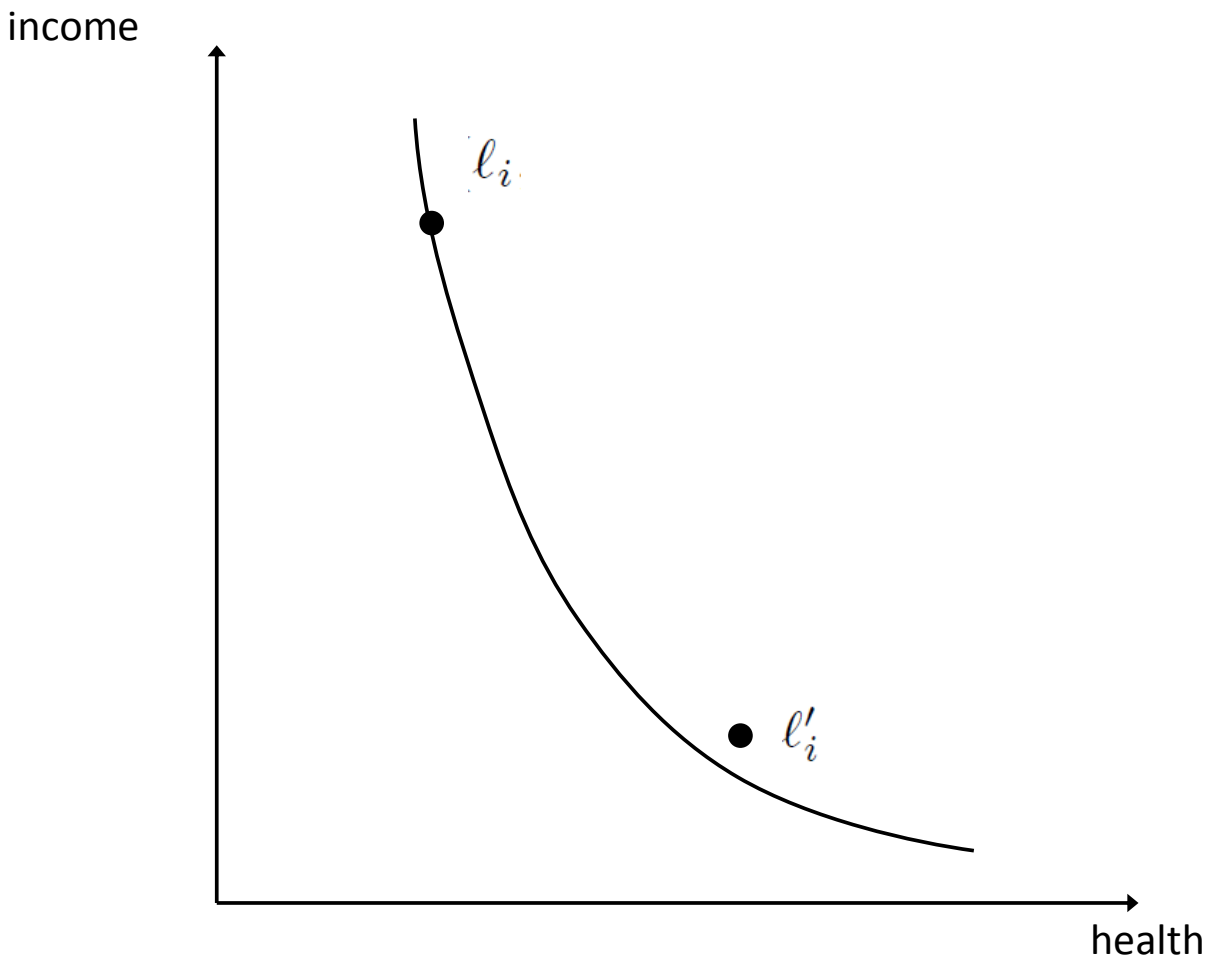
Principles for a well-being measure

Dominance Principle: If $\ell_i \gg \ell_j$, then $WB(\ell_i, R_i, S_i) > WB(\ell_j, R_j, S_j)$.

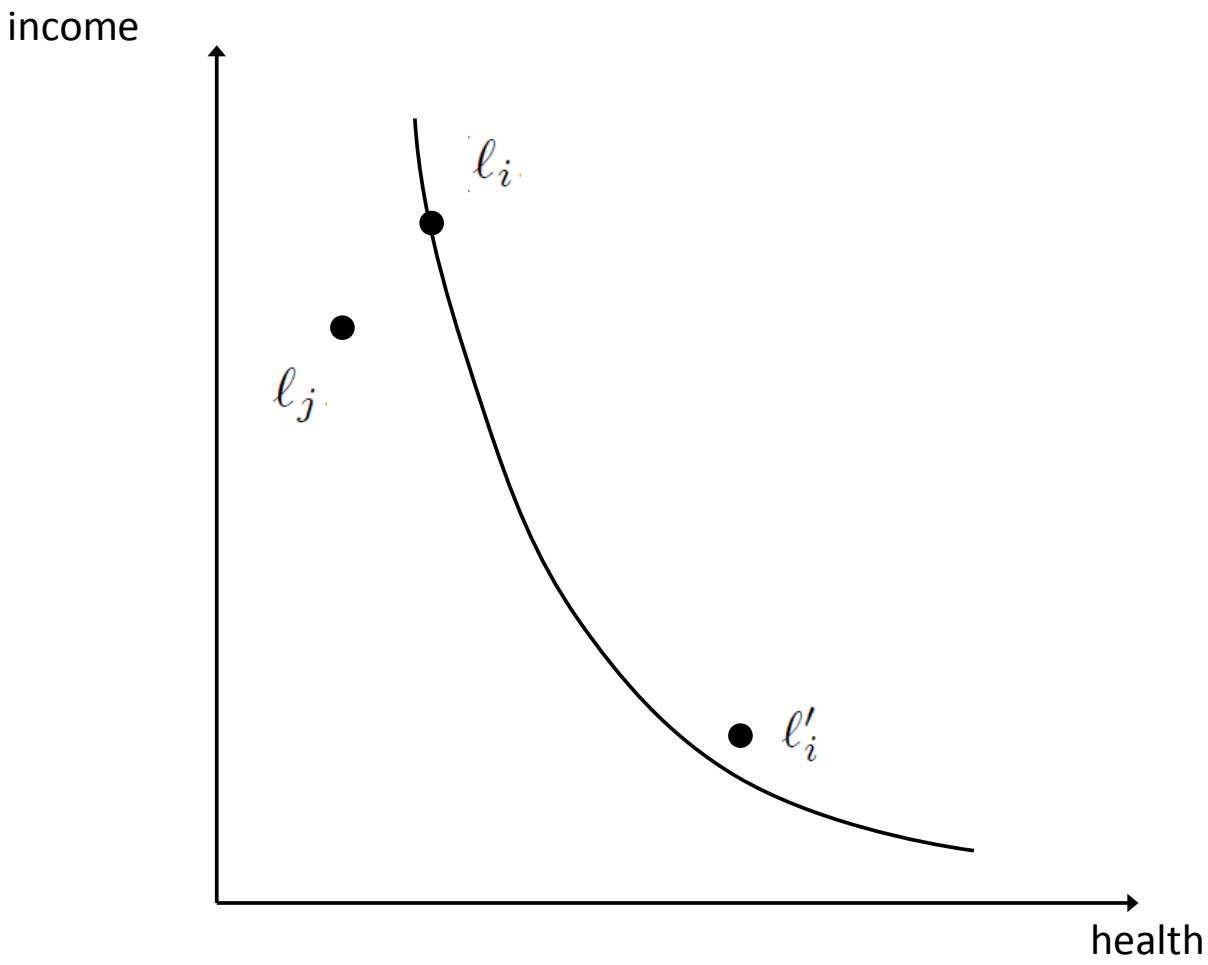


Principles for a well-being measure

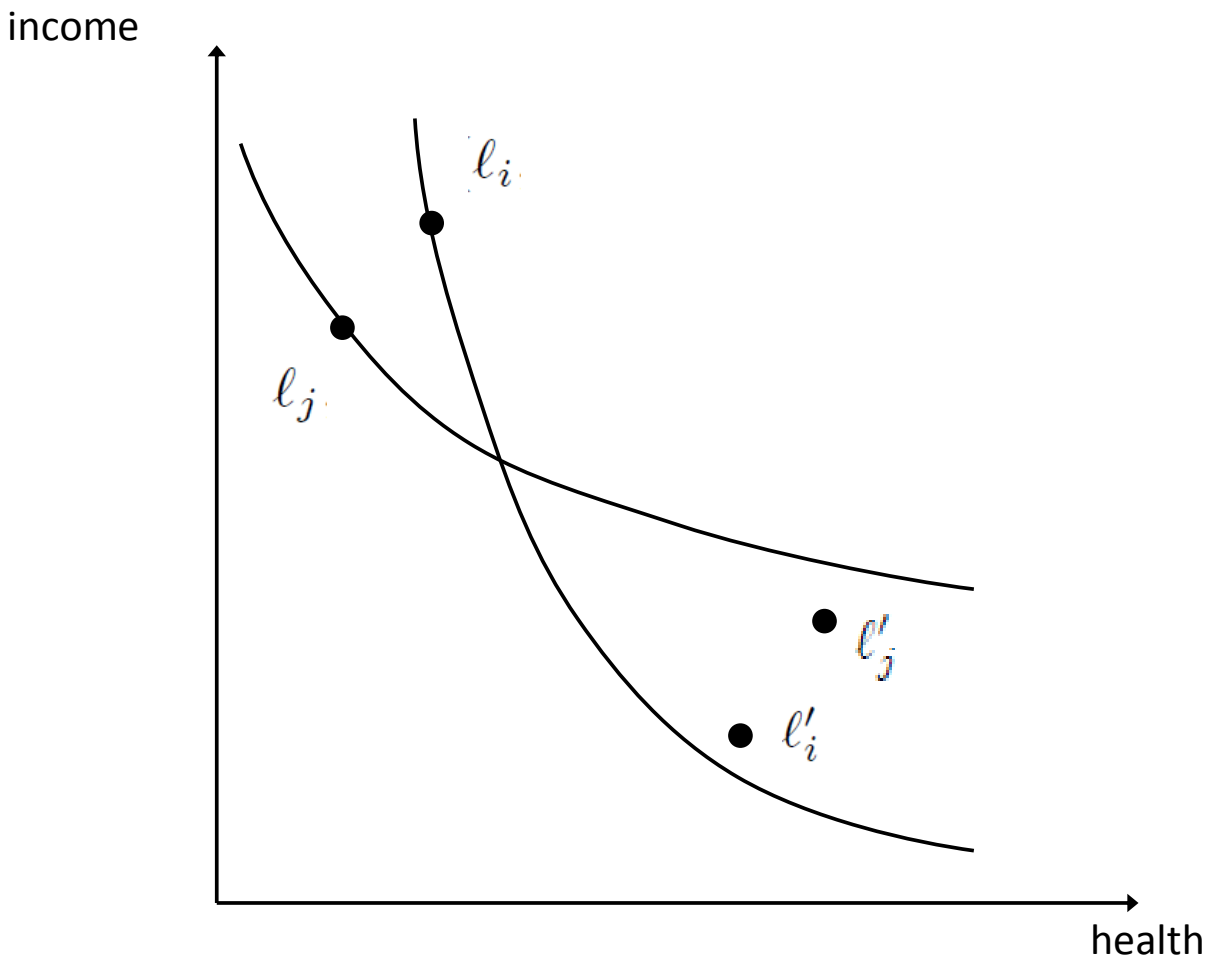
Personal Preference Principle: If $\ell_i' P_i \ell_i$, then $WB(\ell_i', R_i, S_i) > WB(\ell_i, R_i, S_i)$.



An inconvenient result

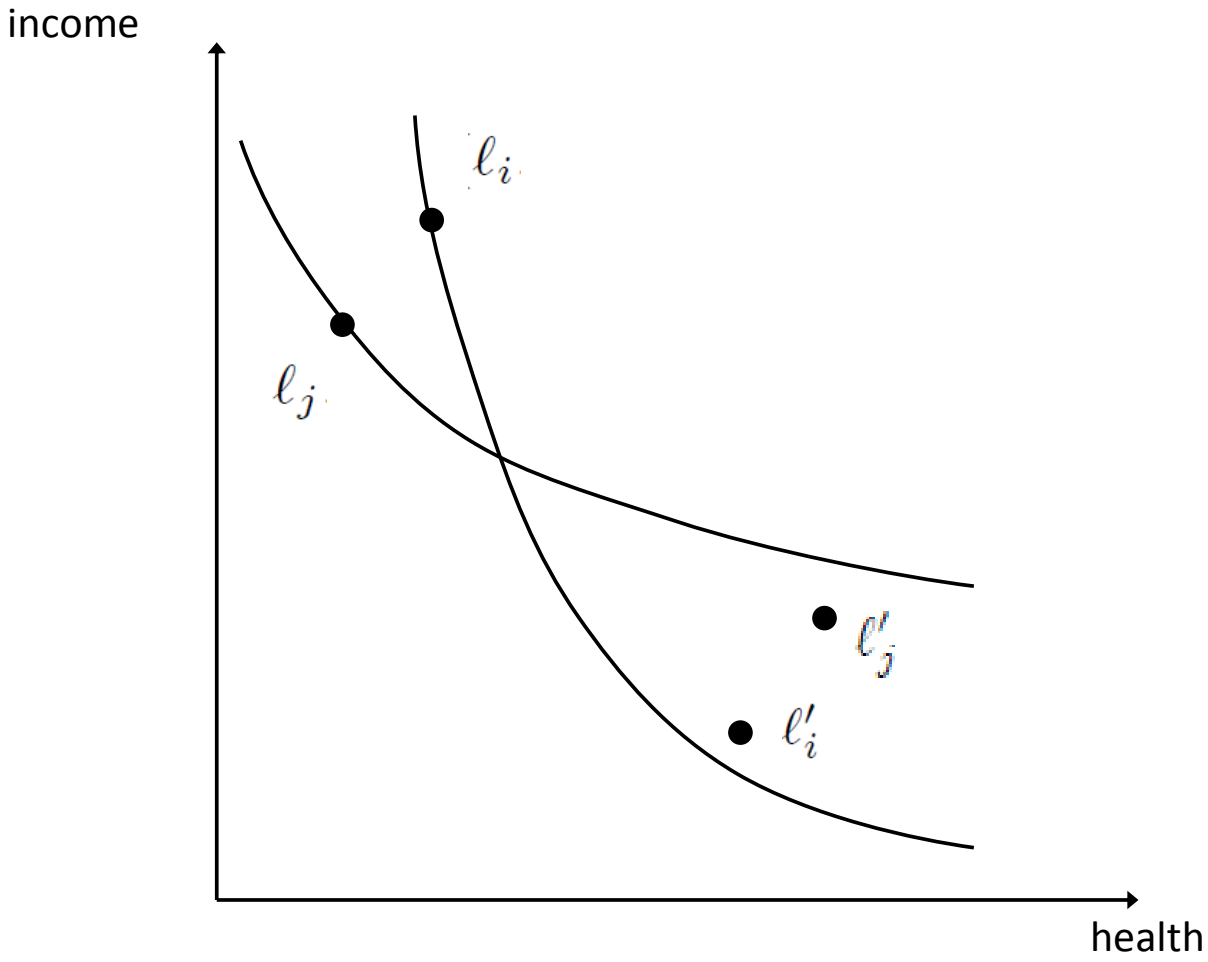


An inconvenient result



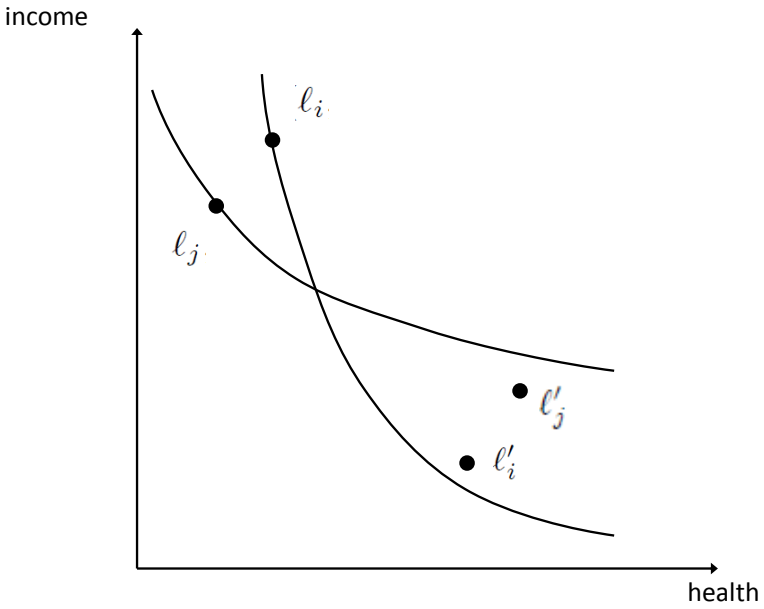
An inconvenient result

- Trouble in paradise !



An inconvenient result

- Based on this little graph we find a deep (and inconvenient) result:
- As soon as people disagree on the good life, no well-being measure satisfies both principles



Dominance Principle: If $\ell_i \gg \ell_j$, then $WB(\ell_i, R_i, S_i) > WB(\ell_j, R_j, S_j)$.

Personal Preference Principle: If $\ell'_i P_i \ell_i$, then $WB(\ell'_i, R_i, S_i) > WB(\ell_i, R_i, S_i)$.

- And we have to choose …


The
Crossroads

Roadmap

Part 1. Measuring well-being on a crossroads

Part 2. Three well-being measures

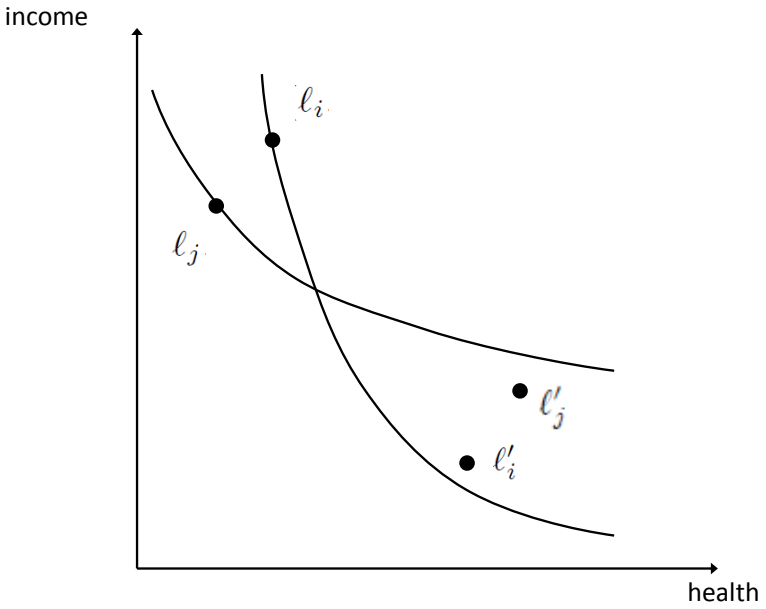
- Composite well-being index
- Life satisfaction
- Equivalent incomes

Part 3. Estimating trade-offs between dimensions

Part 4. Applications

Route 1. Use a common view on the good life

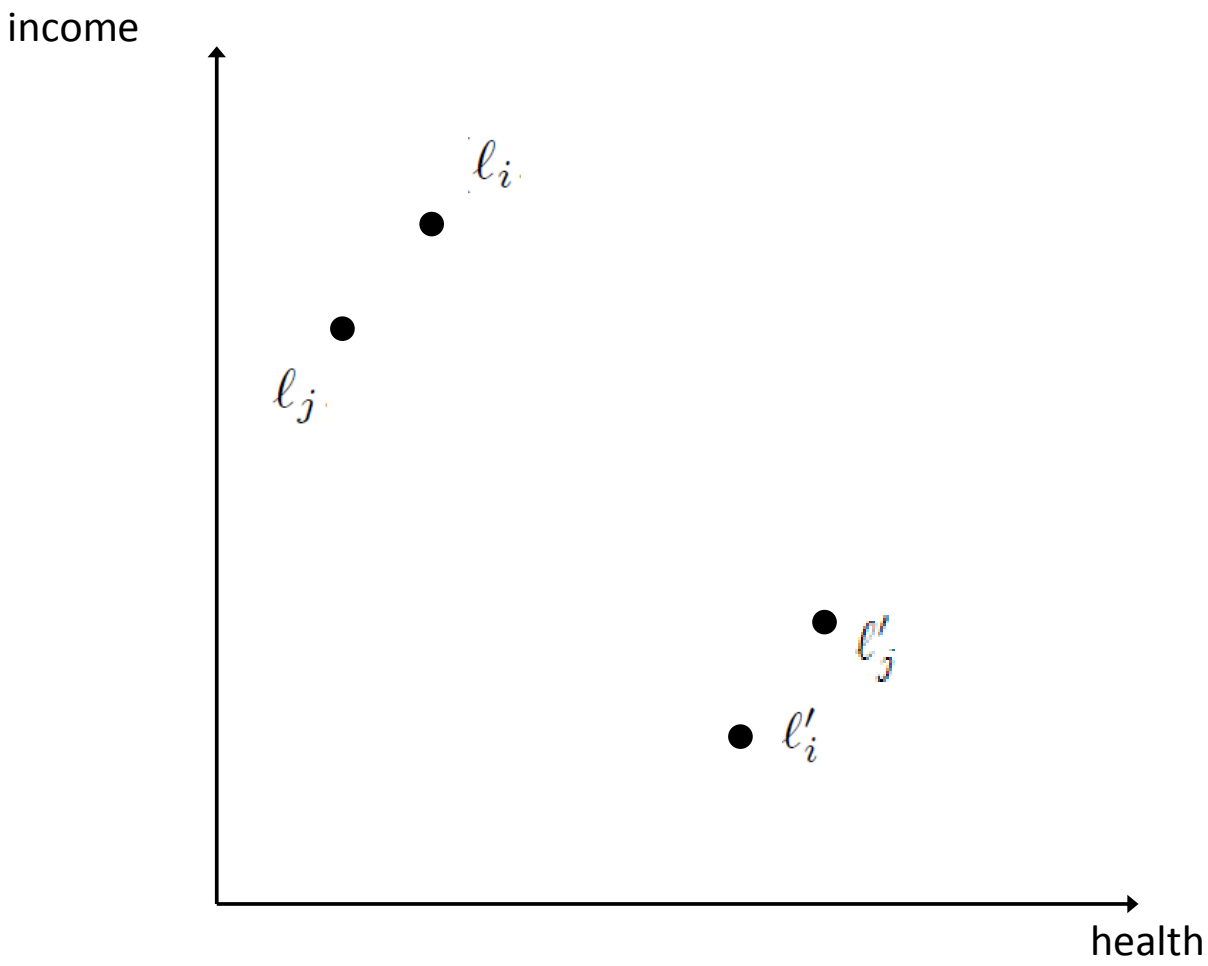
- Based on this little graph we find a deep and annoying result:
- As soon as people disagree on the good life, no well-being measure satisfies both principles



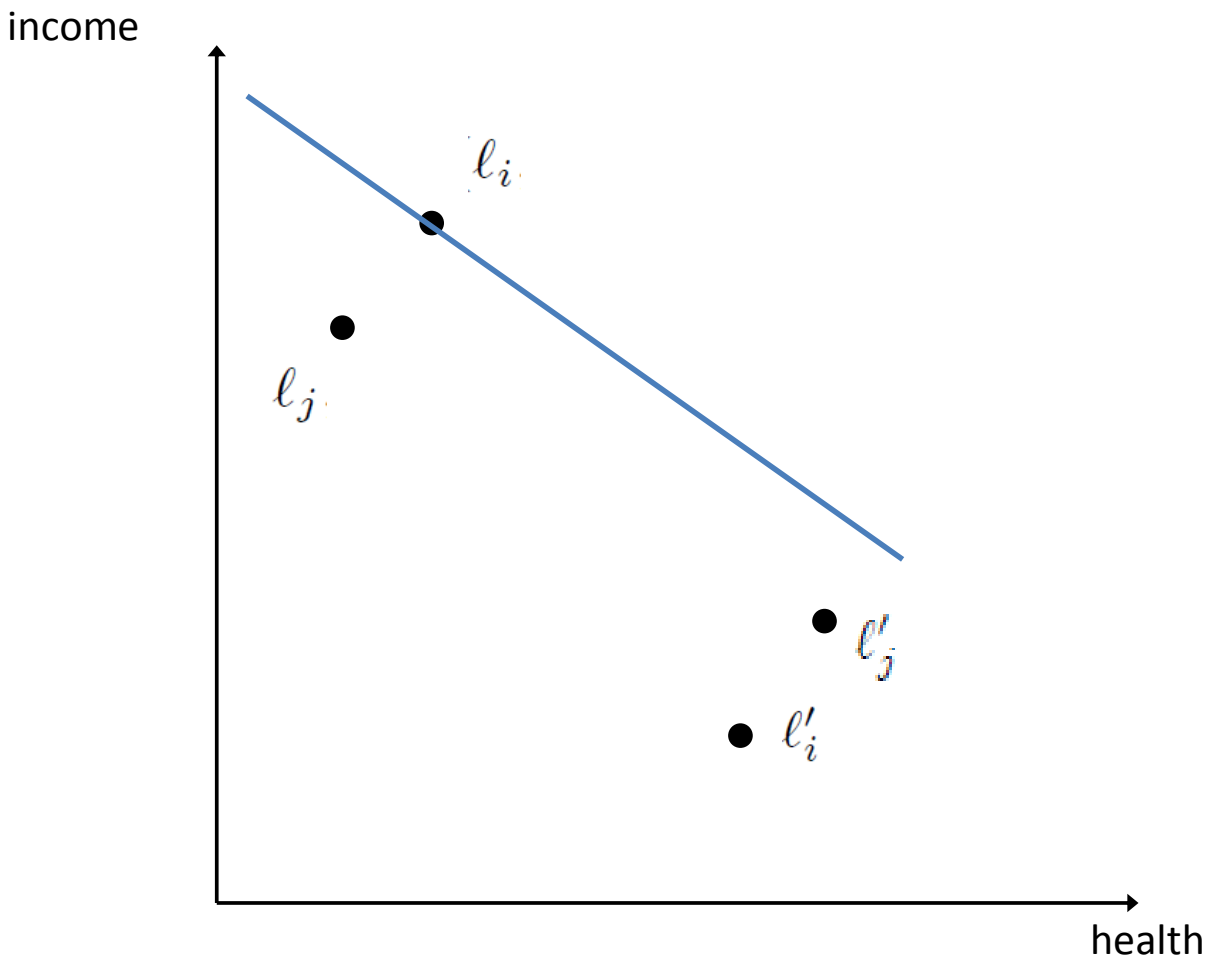
Dominance Principle: If $\ell_i \gg \ell_j$, then $WB(\ell_i, R_i, S_i) > WB(\ell_j, R_j, S_j)$.

Personal Preference Principle: If ~~$\ell'_i \succ_i \ell_i$~~, then $WB(\ell'_i, R_i, S_i) > WB(\ell_i, R_i, S_i)$.

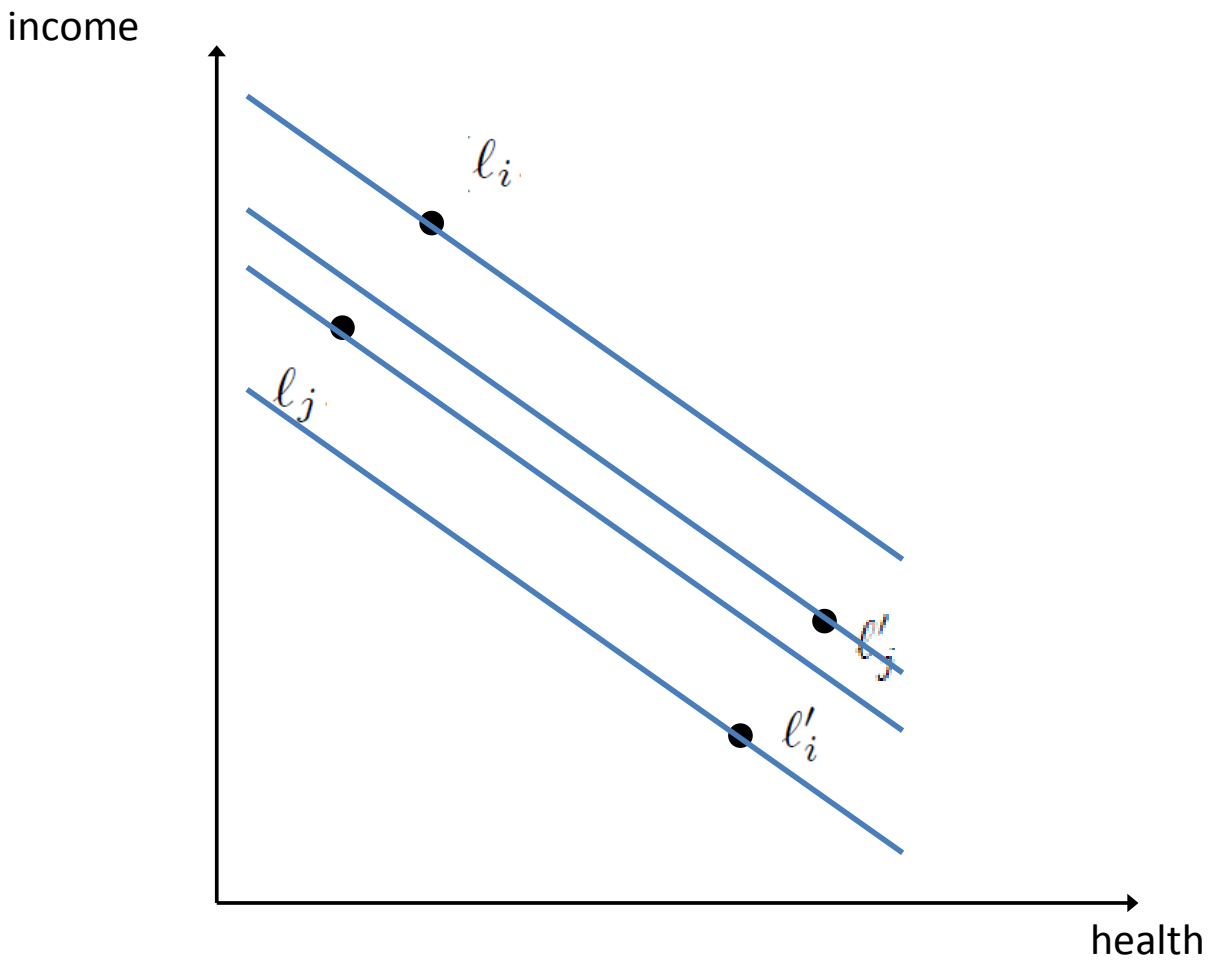
Route 1. Use a common view on the good life



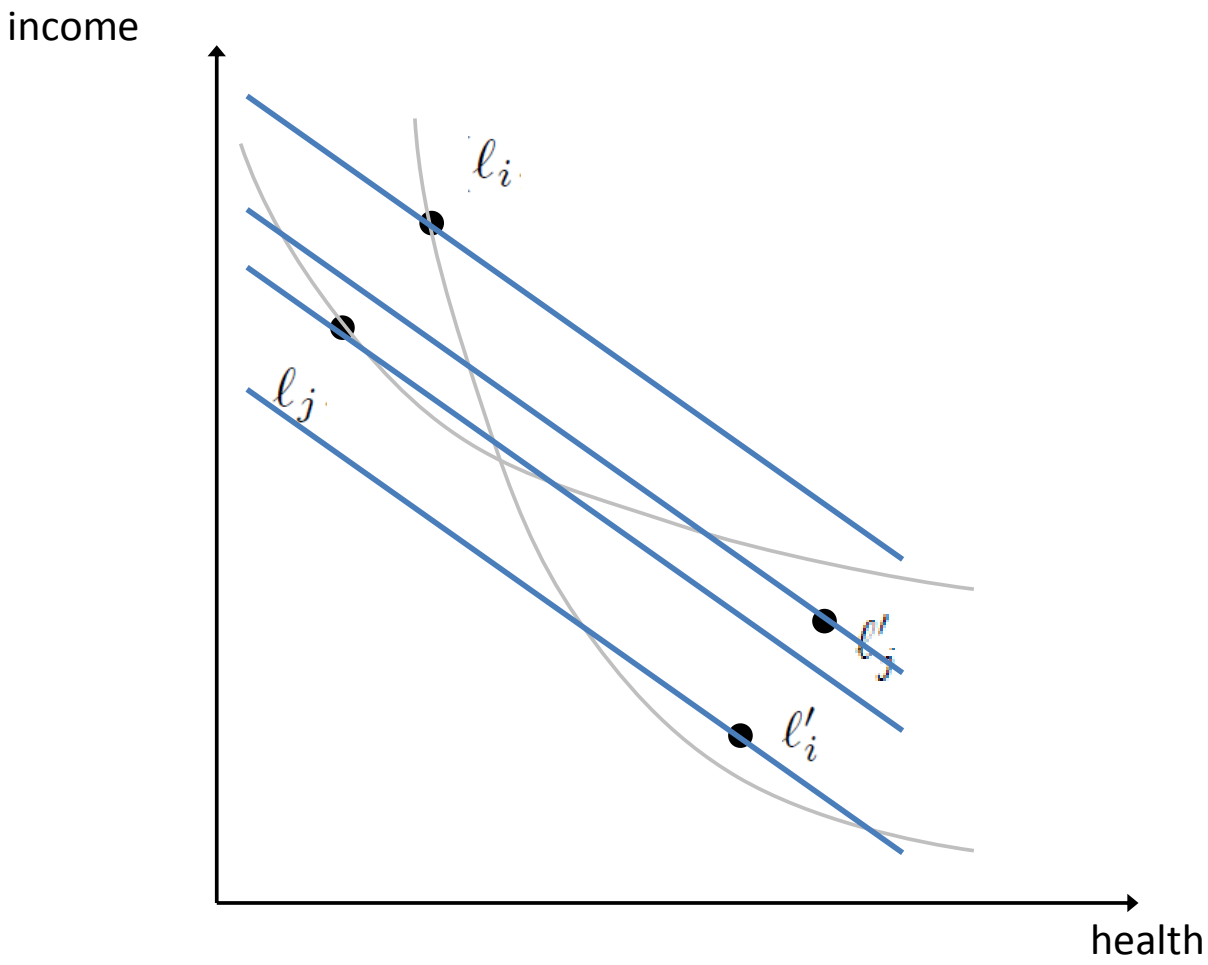
Route 1. Use a common view on the good life



Route 1. Use a common view on the good life



Route 1. Use a common view on the good life



Route 1. Use a common view on the good life

- A composite index of well-being

$$WB^2(\ell_i, R_i, S_i) = I(\ell_i).$$

- A popular mathematical structure

$$I(\ell_i) = \left[w^0 \left(f^0 \left(y_i\right)\right)^\beta + w^1 \left(f^1 \left(x_i^1\right)\right)^\beta + \cdots + w^m \left(f^m \left(x_i^m\right)\right)^\beta\right]^{1/\beta},$$

  - Degree of substitutability

Route 1. Use a common view on the good life

- A composite index of well-being

$$WB^2(\ell_i, R_i, S_i) = I(\ell_i).$$

- A popular mathematical structure

$$I(\ell_i) = \left[w^0 \left(f^0 \left(y_i \right) \right)^\beta + w^1 \left(f^1 \left(x_i^1 \right) \right)^\beta + \cdots + w^m \left(f^m \left(x_i^m \right) \right)^\beta \right]^{1/\beta},$$

  - Degree of substitutability
  - Transformation function

Route 1. Use a common view on the good life

- A composite index of well-being

$$WB^2(\ell_i, R_i, S_i) = I(\ell_i).$$

- A popular mathematical structure

$$I(\ell_i) = \left[w^0 \left(f^0\left(y_i\right)\right)^\beta + w^1 \left(f^1\left(x_i^1\right)\right)^\beta + \cdots + w^m \left(f^m\left(x_i^m\right)\right)^\beta\right]^{1/\beta},$$

  - Degree of substitutability
  - Transformation function
  - Weighting scheme

Econometric Reviews, 32(1):7–34, 2013

ISSN: 0747-4938 print/1532-4168 online
DOI: 10.1080/07474938.2012.690641

Taylor & Francis
Taylor & Francis Group

WEIGHTS IN MULTIDIMENSIONAL INDICES OF WELLBEING: AN OVERVIEW

Koen Decancq[1] and María Ana Lugo[2]

[1] *Centre for Social Policy, University of Antwerp, Belgium, Center for Economic Studies, Katholieke Universiteit Leuven, Leuven, Belgium and CORE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium*
[2] *Department of Economics, University of Oxford, Oxford, UK and The World Bank, Washington, District of Columbia, USA*

□ *Multidimensional indices are becoming increasingly important instruments to assess the wellbeing of societies. They move beyond the focus on a single indicator and yet they are easy to present and communicate. A crucial step in the construction of a multidimensional index of wellbeing is the selection of the relative weights for the different dimensions. The aim of this article is to study the role of these weights and to critically survey eight different approaches to set them. We categorize the approaches in three classes: data-driven, normative, and hybrid weighting, and compare their respective advantages and drawbacks.*

Keywords Composite indicator; Multidimensional wellbeing index; Weights.

JEL Classification I31; C43; O1.

Route 1. Use a common view on the good life

- How to set the weights?
- Three main approaches

1. Data-driven
   - Depend only on information on outcomes
   - BUT: Hume's guillotine
2. Normative
   - Depend only on the common opinion on the "good life"
   - BUT: the opinion of whom?
3. Hybrid
   - Depend on both

Route 1. Use a common view on the good life

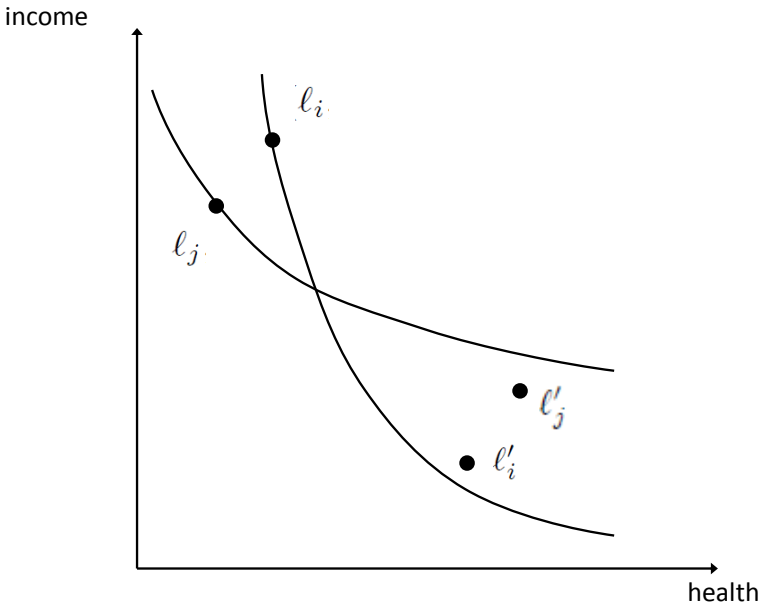
- Answer from the OECD: www.oecdbetterlifeindex.org
- A beautiful and interactive website where the user can select her preferred weights
- (that are used to compare all individuals)

Route 1. Use a common view on the good life

"... those with a stake in the outcomes will almost certainly be in a better position to determine what weights to apply than the analyst calibrating a measure of poverty."

Back to the cross road

- Based on this little graph we find a deep (and inconvenient) result:
- As soon as people disagree on the good life, no well-being measure satisfies both principles



Dominance Principle: If $\ell_i \gg \ell_j$, then $WB(\ell_i, R_i, S_i) > WB(\ell_j, R_j, S_j)$.

Personal Preference Principle: If $\ell'_i P_i \ell_i$, then $WB(\ell'_i, R_i, S_i) > WB(\ell_i, R_i, S_i)$.

- And take the other route

Route 2. Use life satisfaction

- Why don't we ask the individuals themselves?

$$WB^3(\ell_i, R_i, S_i) = S_i(\ell_i),$$

- Subjective Well-Being (SWB)
  - Affects (happiness)
  - Cognitive valuations (life satisfaction)

Route 2. Use life satisfaction

- Why don't we ask the individuals themselves?

$$WB^3(\ell_i, R_i, S_i) = S_i(\ell_i),$$

- Subjective Well-Being (SWB)
  - Affects (happiness)
  - Cognitive valuations (life satisfaction)
- Are the opinions of individuals (preferences) respected?

Route 2. Use life satisfaction

- Under the consistency assumption

$$S_i(\ell_i) \geq S_i(\ell_i') \text{ if and only if } \ell_i R_i \ell_i'$$

the preferences of the concerned individuals are respected in <u>intra-personal</u> comparisons

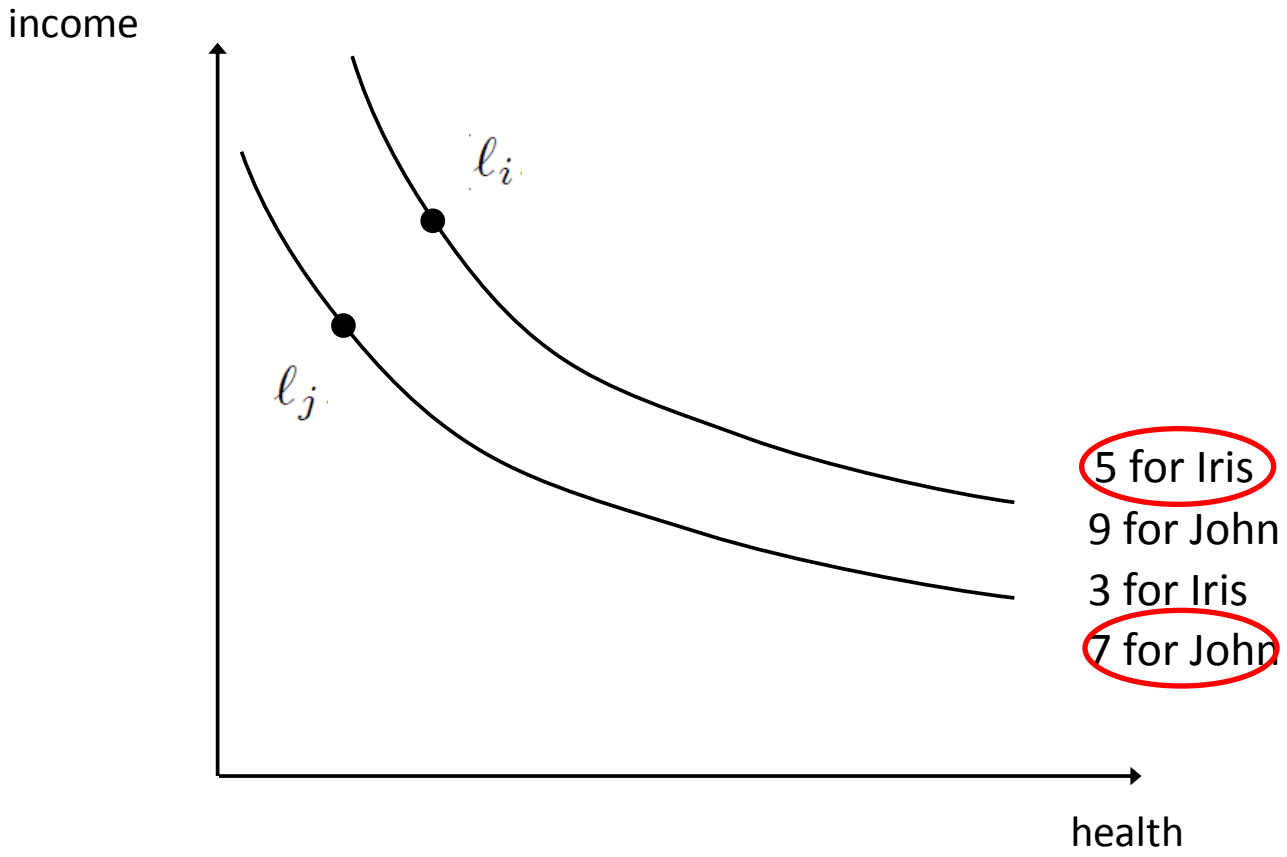
Personal Preference Principle: If $\ell_i' P_i \ell_i$, then $WB(\ell_i', R_i, S_i) > WB(\ell_i, R_i, S_i)$.

- What about <u>interpersonal</u> comparisons?
- A more attractive (useful) principle:

Same Preference Principle: If $R_i = R_j = R$ and $\ell_i P \ell_j$, then $WB(\ell_i, R_i, S_i) > WB(\ell_j, R_j, S_j)$.

Route 2. Use life satisfaction

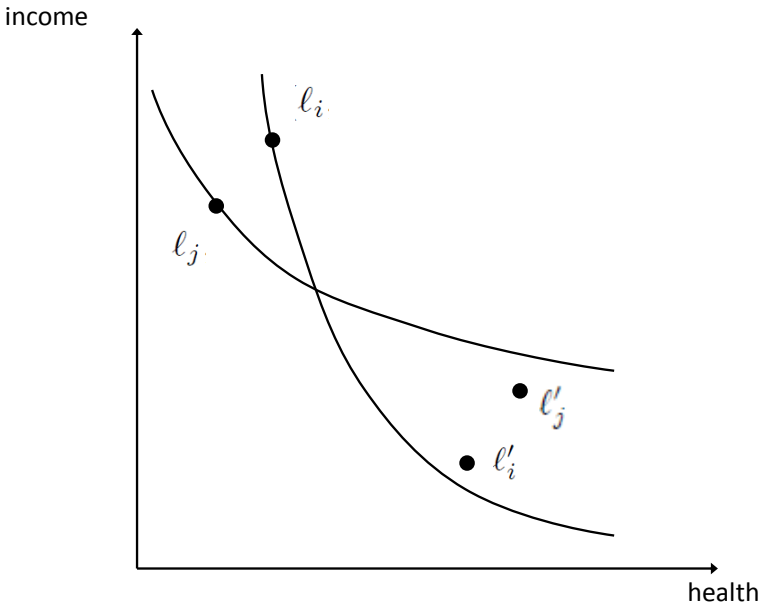
Same Preference Principle: If $R_i = R_j = R$ and $\ell_i P \ell_j$, then $WB(\ell_i, R_i, S_i) > WB(\ell_j, R_j, S_j)$.



- SWB does not fulfil the Same Preference Principle
- SWB does not fulfil the Dominance Principle

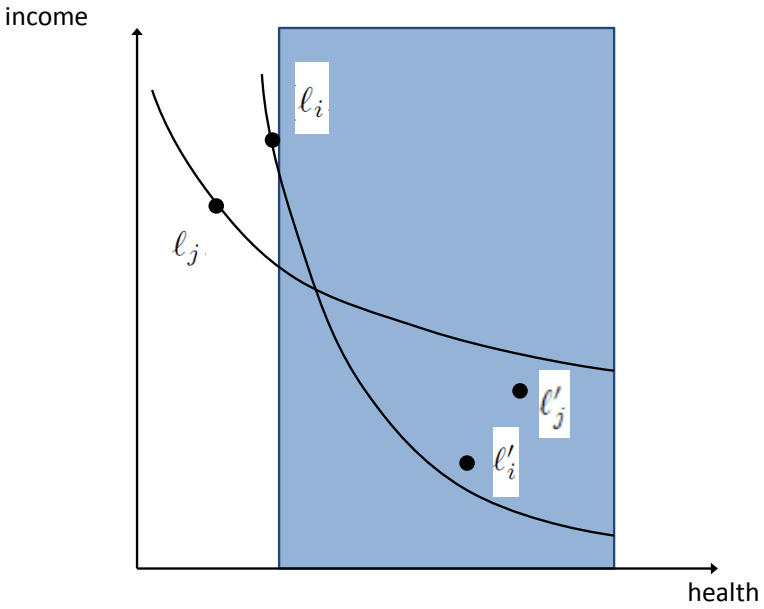
Route 3. Equivalent Incomes

- Is there a third route?
- A measure that satisfies Same Preference Principle
- Back to the trouble maker:
- Let's weaken the Dominance Principle



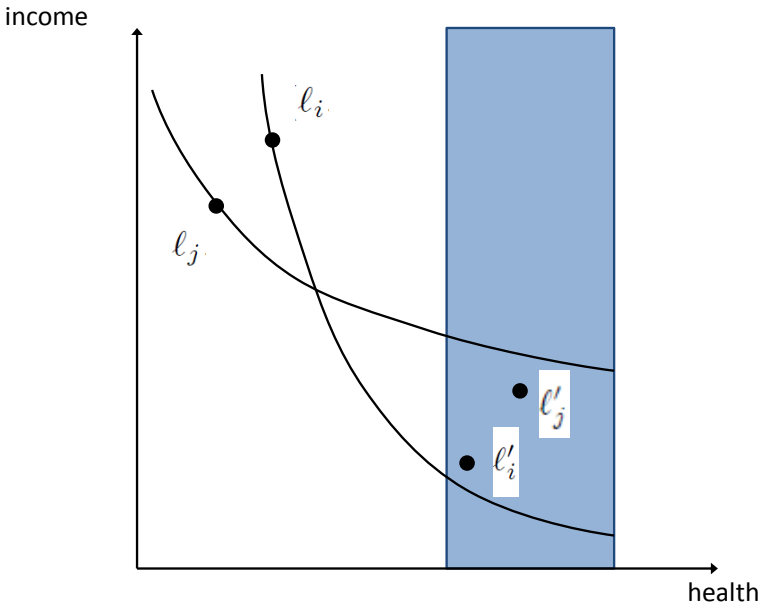
Route 3. Equivalent Incomes

- Is there a third route?
- A measure that satisfies Same Preference Principle
- Back to the trouble maker:
- Let's weaken the Dominance Principle



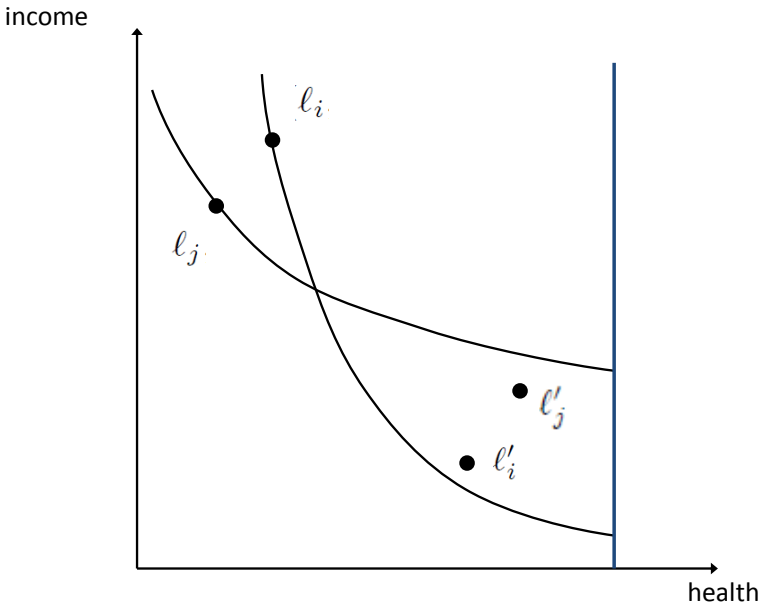
Route 3. Equivalent Incomes

- Is there a third route?
- A measure that satisfies Same Preference Principle
- Back to the trouble maker:
- Let's weaken the Dominance Principle



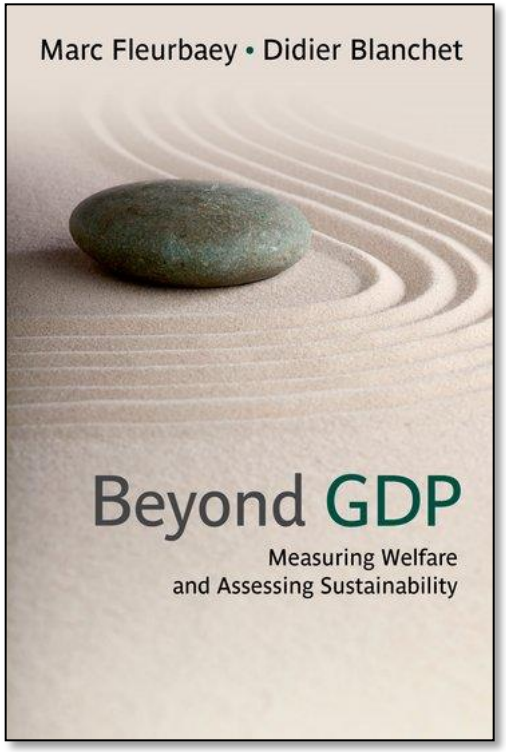
Route 3. Equivalent Incomes

- Is there a third route?
- A measure that satisfies Same Preference Principle
- Back to the trouble maker:
- Let's weaken the Dominance Principle



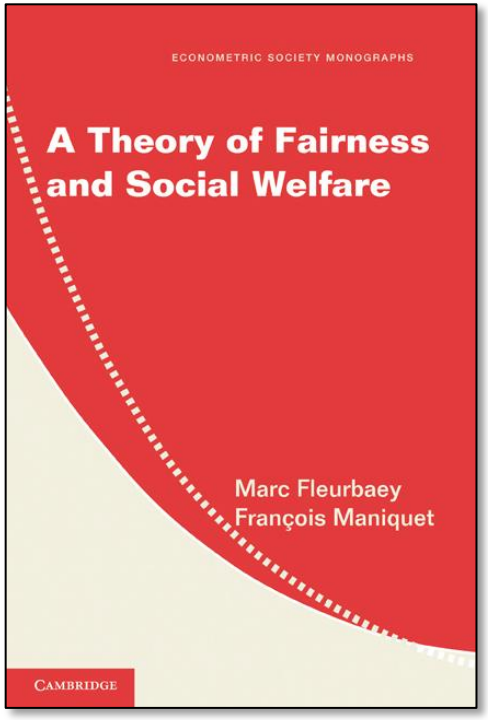
Route 3. Equivalent Incomes

- There is a measure that satisfies the Same Preference principle and such a weak dominance principle
- And that is “Equivalent Income”
- Developed in 70s by Samuelson and others
- Revitalized recently by Fleurbaey, Maniquet, Schokkaert and others



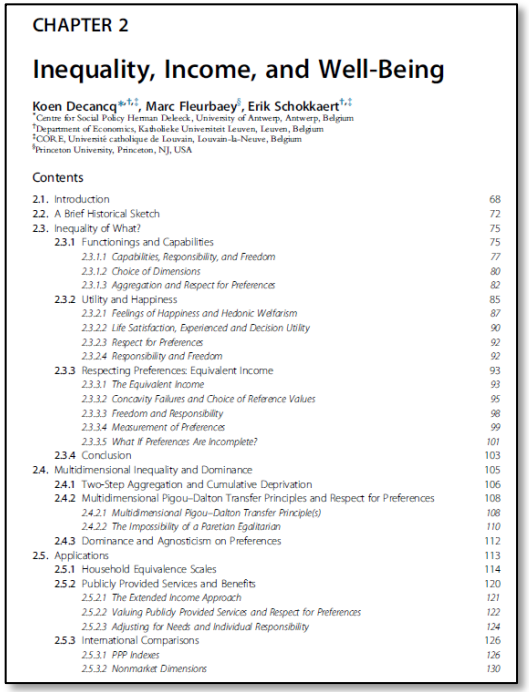
Route 3. Equivalent Incomes

- There is a measure that satisfies the Same Preference principle and such a weak dominance principle
- And that is “Equivalent Income”
- Developed in 70s by Samuelson and others
- Revitalized recently by Fleurbaey, Maniquet, Schokkaert and others



Route 3. Equivalent Incomes

- There is a measure that satisfies the Same Preference principle and such a weak dominance principle
- And that is “Equivalent Income”
- Developed in 70s by Samuelson and others
- Revitalized recently by Fleurbaey, Maniquet, Schokkaert and others



CHAPTER 2

Inequality, Income, and Well-Being

Koen Decancq[*,†,‡], Marc Fleurbaey[§], Erik Schokkaert[†,‡]
[†]Centre for Social Policy Herman Deleeck, University of Antwerp, Antwerp, Belgium
[‡]Department of Economics, Katholieke Universiteit Leuven, Leuven, Belgium
[§]CORE, Université catholique de Louvain, Louvain-la-Neuve, Belgium
[¶]Princeton University, Princeton, NJ, USA

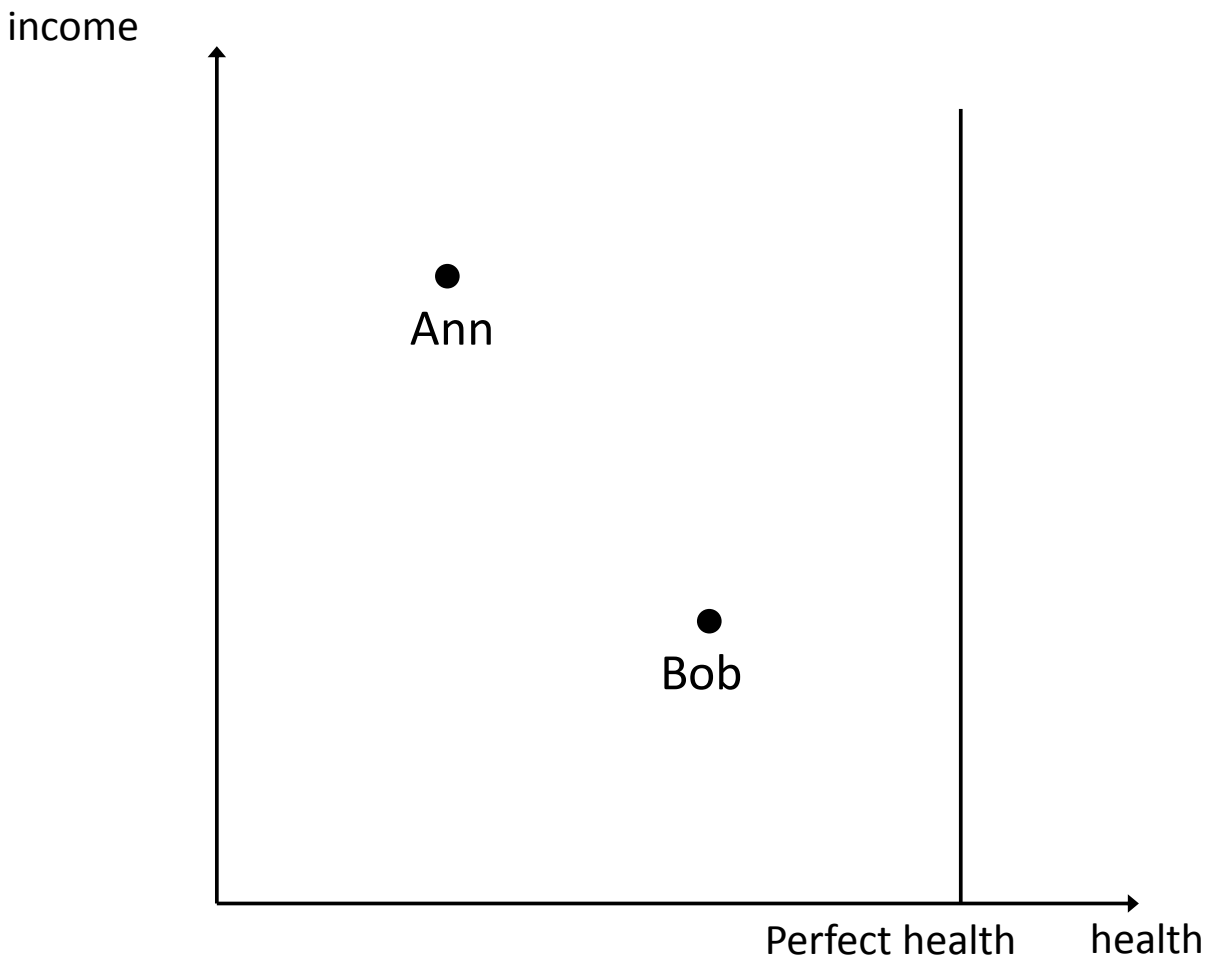
Contents

Route 3. Equivalent Incomes

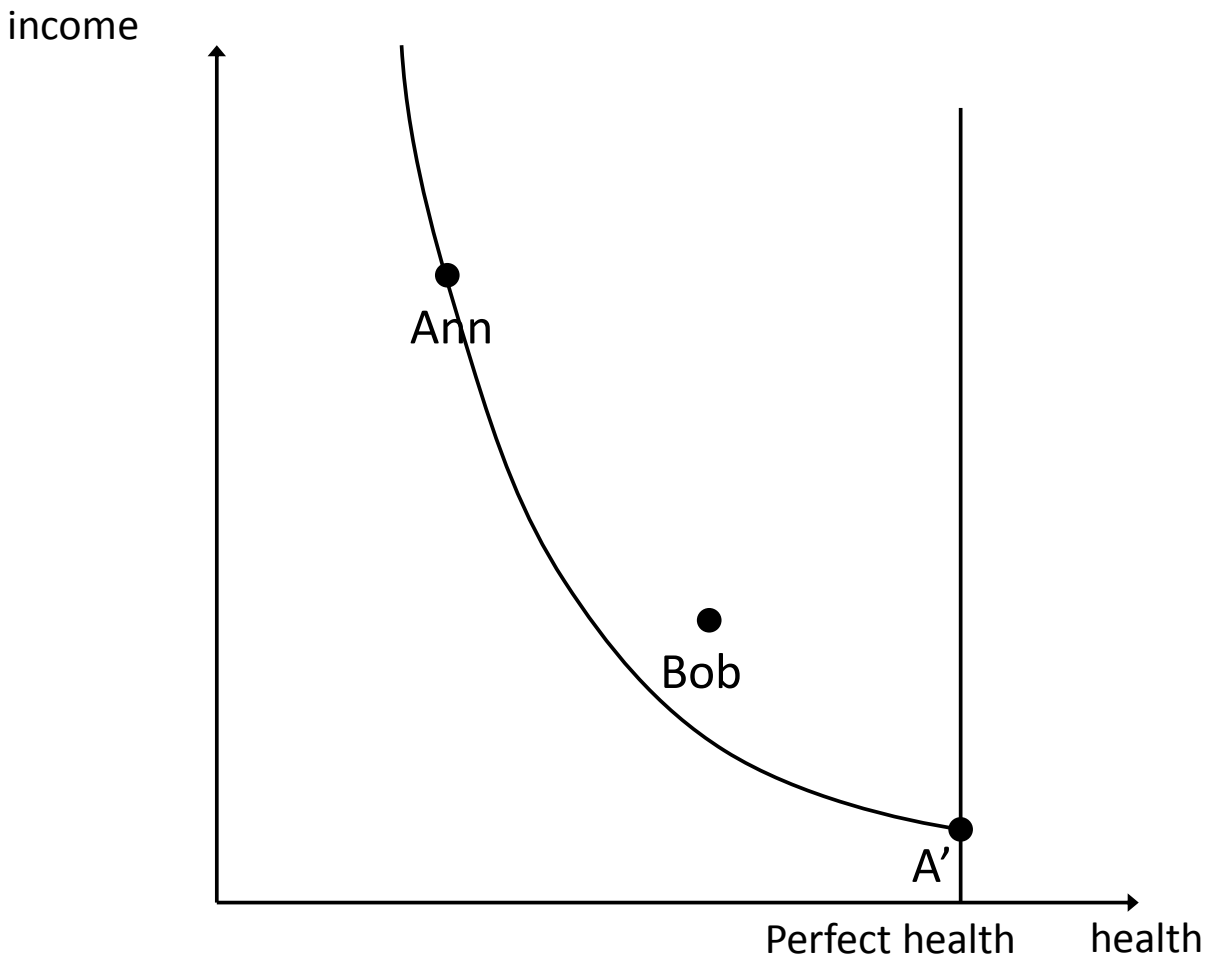
- Equivalent income =
  the hypothetical income that -- if combined with a reference value on all non-income dimensions -- would place the individual in a situation that she finds equally good as her initial situation

$$WB^4(\ell_i, R_i, S_i) = y_i^* \text{ such that } (y_i, x_i)\, I_i\, (y_i^*, \widetilde{x})\,.$$

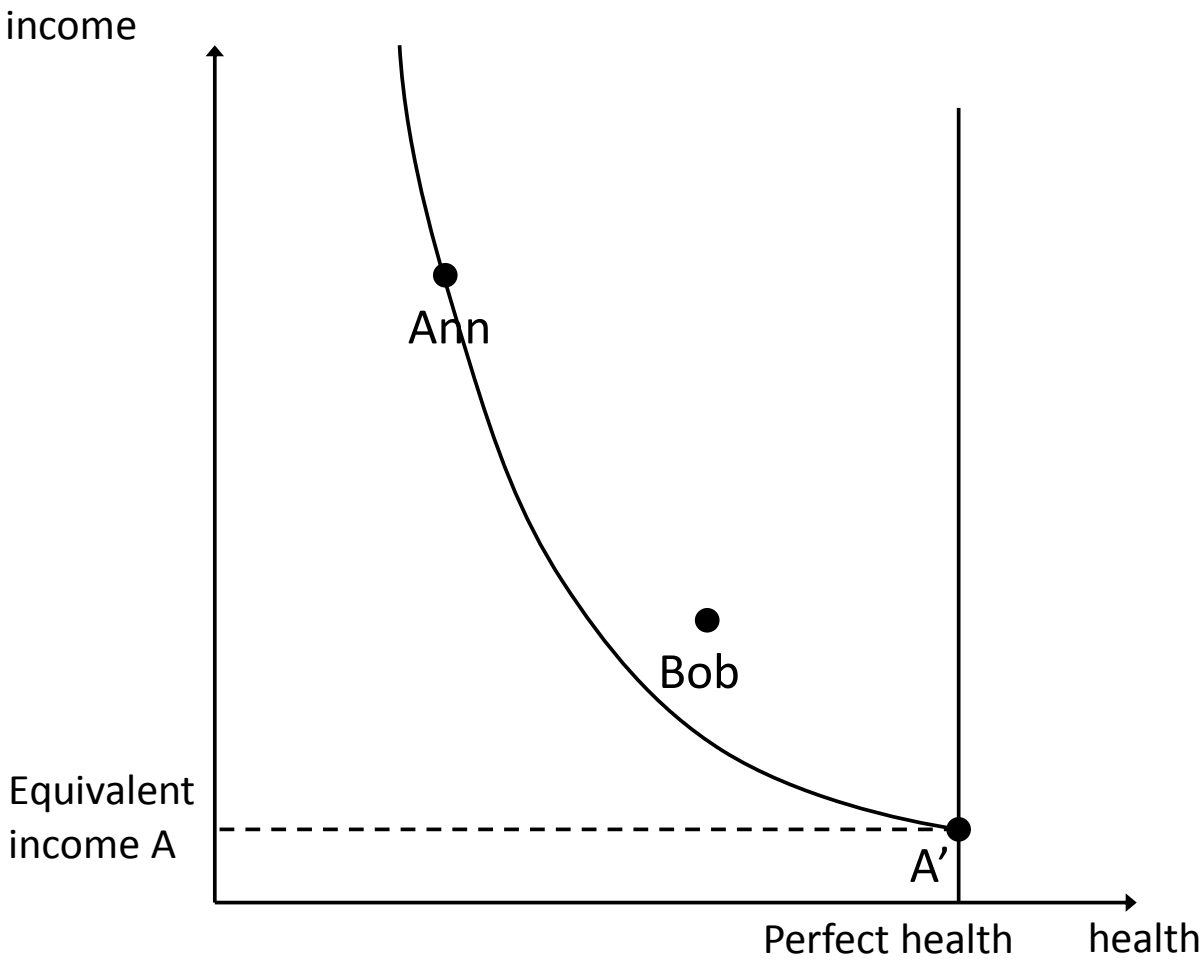
Route 3. Equivalent Incomes



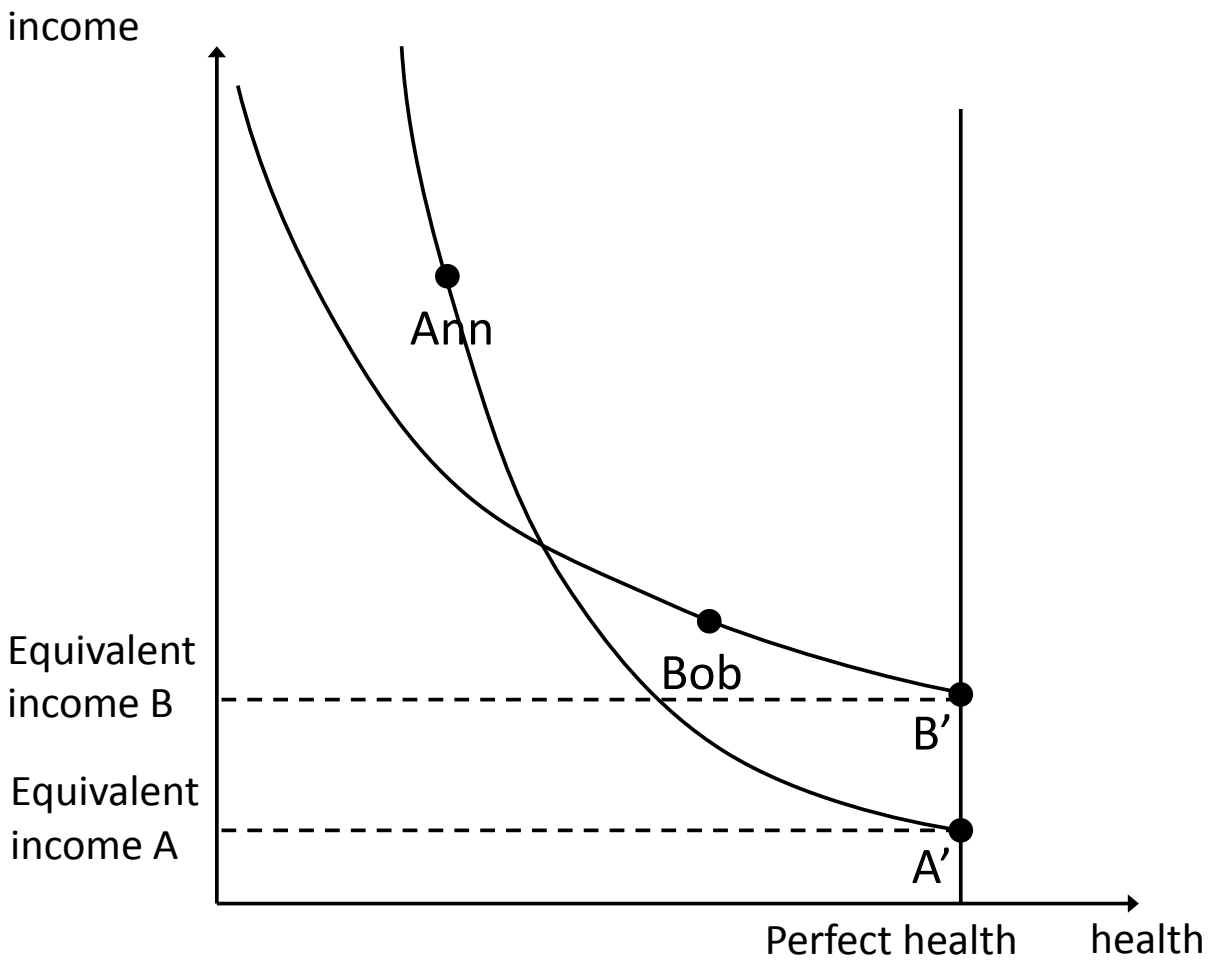
Route 3. Equivalent Incomes



Route 3. Equivalent Incomes



Route 3. Equivalent Incomes



Route 3. Equivalent Incomes

- Equivalent incomes

$$WB^4(\ell_i, R_i, S_i) = y_i^* \text{ such that } (y_i, x_i)\, I_i\, (y_i^*, \widetilde{x})\,.$$

- Additional information is neccessary on:
  - The reference values: an ethical question, hence room for debate.
  - The preferences of the individuals (see next part).

Outline

Part 1. Measuring well-being on a crossroad

Part 2. Three well-being measures

Part 3. Estimating trade-offs between dimensions

- Life satisfaction approach
- Discrete choice approach
- Adaptive Bisectional Dichotomous Choice (ABDC)

Part 4. Applications

Estimating trade-offs between dimensions

- Problem: we don't observe preferences in real world data
- Three approaches:
  - Stated preference: ask people

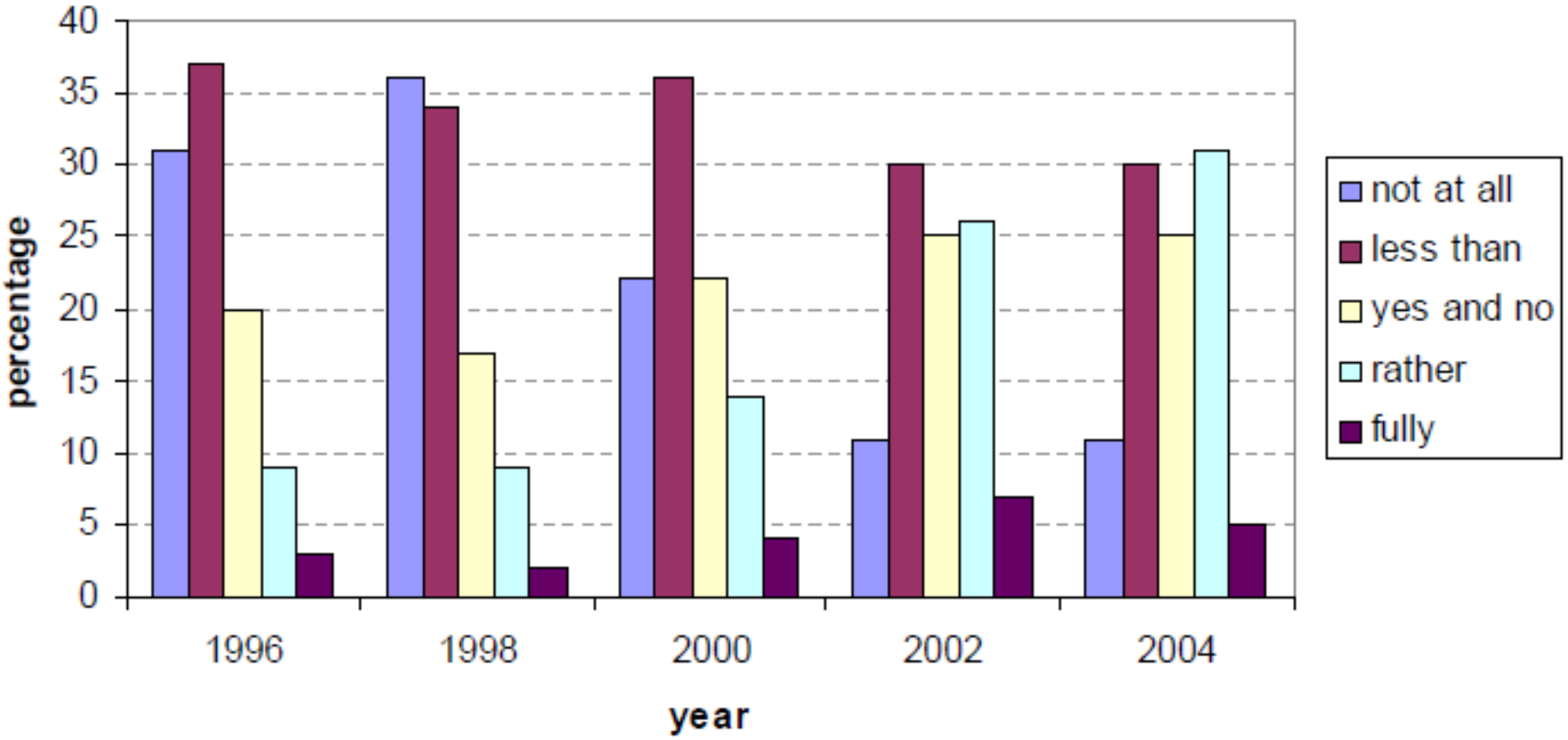
    (in health economics: Fleurbaey and Schokkaert, 2013)
  - Revealed preference: infer from behavior

    (in labor supply applications: Decoster and Haan, 2014; Bargain et al. 2013)
  - Use Life satisfaction surveys: estimate from evaluations

    (in functioning-framework: Clark and Oswald 2002; Decancq, Fleurbaey and Schokkaert, 2015)

Life satisfaction approach

- Example with RLMS-HSE data (from Decancq et al. 2015)
- Life satisfaction in Russia



Life satisfaction approach

- Starting point: estimate a "standard" life satisfaction regression

$$S_{it} = \alpha_i + \mu_t + \gamma_1' \ell_{it} + \gamma_2' Z_{it} + d_{it},$$

- Sophistications
  - Heterogeneity in coefficients
  - Decreasing marginal returns in income

$$S_{it} = \alpha_i + \mu_t + (\beta + \Gamma Z_{it}) \ln(y_{it}) + (\vartheta + \Lambda Z_{it})' q_{it} + \delta' Z_{it} + d_{it},$$

- Equivalent income

$$y_{it}^* = y_{it} \exp\left[\left(\frac{\vartheta + \Lambda Z_{it}}{\beta + \Gamma Z_{it}}\right)' (q_{it} - q_i^*)\right]$$

Life satisfaction

Table 7: Satisfaction estimation

	coefficients	standard errors
log expenditures (per cons. unit)	0.314***	(0.0264)
self-assessed health	0.432***	(0.0423)
housing (in 100.000 rubles)	0.284***	(0.0825)
unemployed	0.161	(0.135)
wage arrears	-0.0872	(0.0680)
high status	0.325***	(0.0970)
middle status	0.259***	(0.0461)
higher educ.	0.236	(0.153)
married	0.0907	(0.102)
as married	-0.0197	(0.103)
divorced	-0.292**	(0.110)
widowed	-0.489***	(0.121)
ref. group unemployment	-1.087**	(0.333)
ref. group expenditures	-0.176**	(0.0613)
age squared/100	0.0809***	(0.0171)
1996	-0.189***	(0.0525)
1998	-0.408***	(0.0752)
2000	-0.0809	(0.0962)
2001	0.158	(0.109)
2002	0.616***	(0.124)
2003	0.353*	(0.139)
young X health	-0.0960*	(0.0445)
young X expend.	0.0316+	(0.0188)
male X health	-0.120*	(0.0465)
male X unemployed	-0.347***	(0.101)
rural X health	-0.109*	(0.0542)
rural X house	0.217*	(0.107)
minority X health	0.118+	(0.0667)
minority X expend.	-0.253***	(0.0616)
high educ. X house	-0.193*	(0.0813)
high educ. X unemployed	-0.468***	(0.133)
high educ. X arrear	-0.150*	(0.0756)
N	40120	
pseudo R^2	0.082	

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Life satisfaction approach

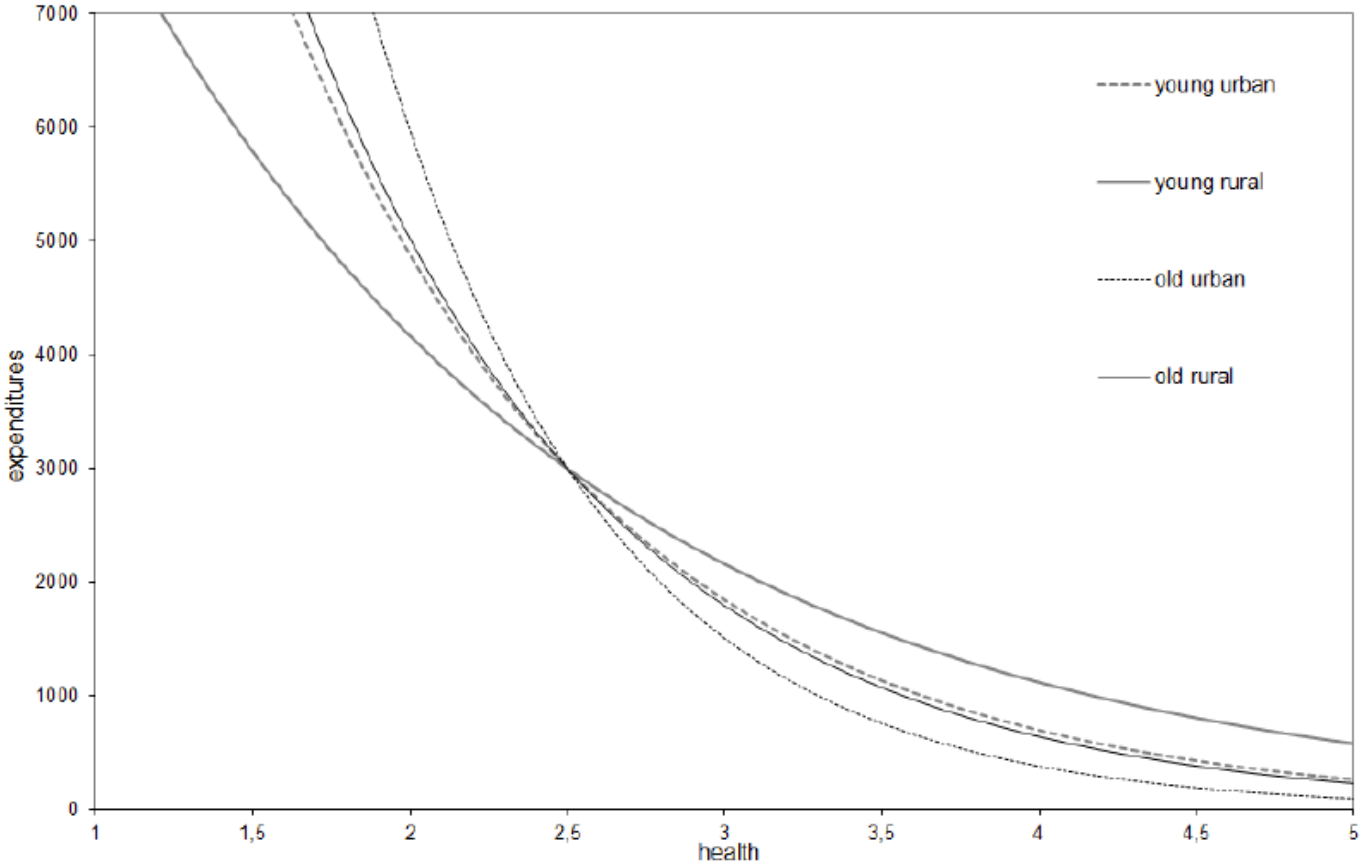


Figure 1: Indifference map in the health-expenditure space.

Life satisfaction approach

- Problems:
  - Endogeneity (of income and other dimensions)
  - Are variables dimensions or control variables?
  - What if scaling is determined by dimensions?
  - Low R squared
  - Group preferences

Outline

Part 1. Measuring well-being on a crossroad

Part 2. Three well-being measures

Part 3. Estimating trade-offs between dimensions

- Life satisfaction approach
- Discrete choice approach
- Adaptive Bisectional Dichotomous Choice (ABDC)

Part 4. Applications

Eliciting preference-based weights for the Human Development Index with a discrete choice experiment*

Koen Decancq† Verity Watson‡

Abstract

The Human Development Index uses equal weights to aggregate GDP per capita, life expectancy and schooling. These equal weights have been criticized for being arbitrary and leading to troubling tradeoffs. We study how a discrete choice experiment can be used to elicit alternative preference-based weights for the Human Development Index. We cary out four discrete choice experiments with comparable samples of young economists in Belgium, Colombia, Ethiopia, and the United States. These experiments allow us to test several assumptions underlying the Human Development Index. We find that ...

Discrete choice approach

- Discrete choice experiments are used often in marketing, environmental and health economics to estimate preferences.

- Present (binary) choices to respondent and estimate their preferences

- Pre-pilot with 600 Belgian (business economics) students in fall 2014.

Discrete choice approach

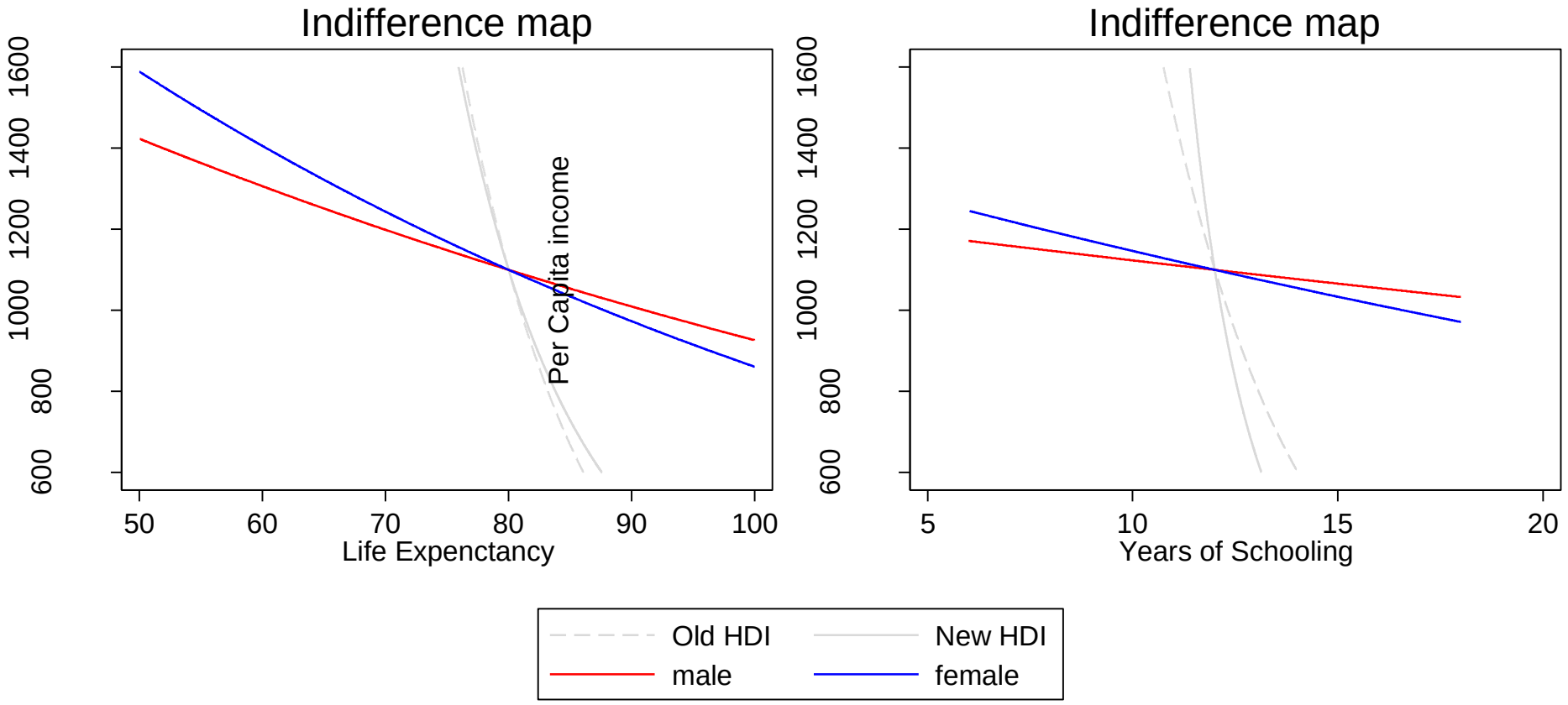
EXAMPLE QUESTION

	Life A	Life B
Health (life expectancy)	70 years	90 years
Education (years of schooling)	16 years	10 years
Income per person in household (income per month)	3,500 Euro	1,500 Euro

In all other aspects the lives are the same

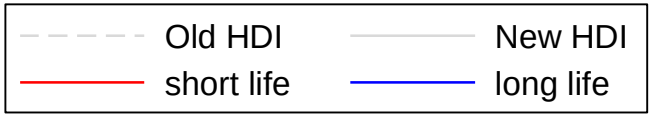
Which life would you prefer to live? PLEASE SHADE ONE CIRCLE ONLY	**Life A**	**Life B**
	●	○

Discrete choice approach (Belgium)



Data from own survey in Antwerp in October 2014

Discrete choice approach (Belgium)

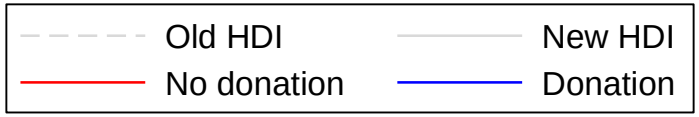


Data from own survey in Antwerp in October 2014

Discrete choice approach (Belgium)

Data from own survey in Antwerp in October 2014

Discrete choice approach (Belgium)



Data from own survey in Antwerp in October 2014

Discrete choice approach

- Problems:
  - Parametric specification
  - Group preferences

Outline

Part 1. Measuring well-being on a crossroad

Part 2. Three well-being measures

Part 3. Estimating trade-offs between dimensions

- Life satisfaction approach
- Discrete choice approach
- Adaptive Bisectional Dichotomous Choice (ABDC)

Part 4. Applications

Non-parametric well-being comparisons

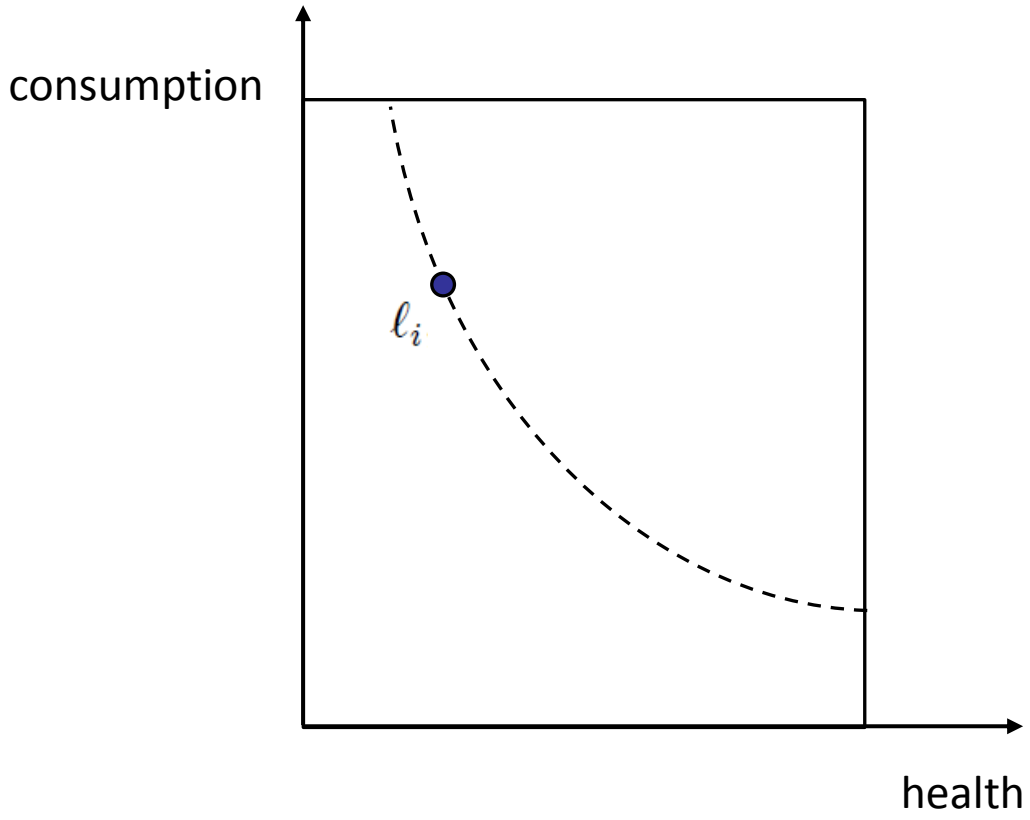
Koen Decancq* Annemie Nys†

December 23, 2017

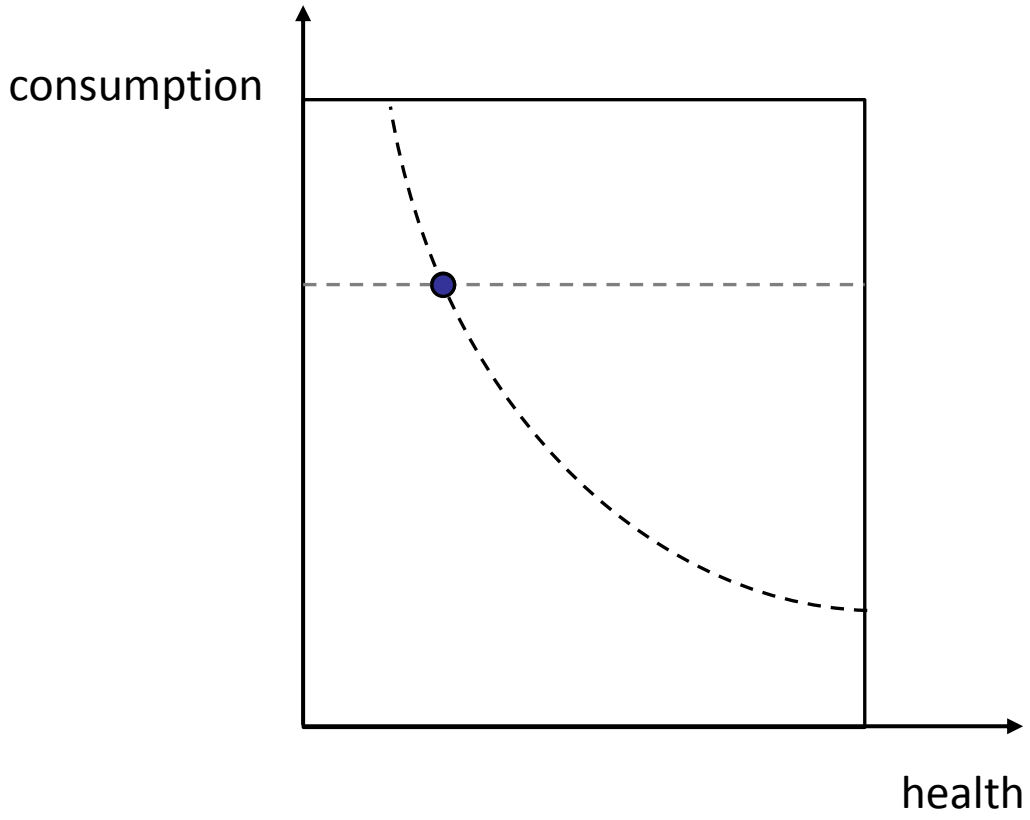
Abstract

We study the problem of making interpersonal well-being comparisons when individuals have heterogeneous –possibly incomplete– preferences. We present a robust –also incomplete– criterion for well-being comparisons that states that one individual is better off than another one if the intersection between the extended upper contour set of the better off individual and the extended lower contour set of the worse off individual is empty. We implement the criterion in the consumption-health space using an online survey with 2,260 respondents in the United States to investigate how incomplete the resulting interpersonal well-being comparison is. To chart the contour sets of the respondents, we propose a new "adaptive bisectional dichotomous choice" (ABDC) procedure that is based on

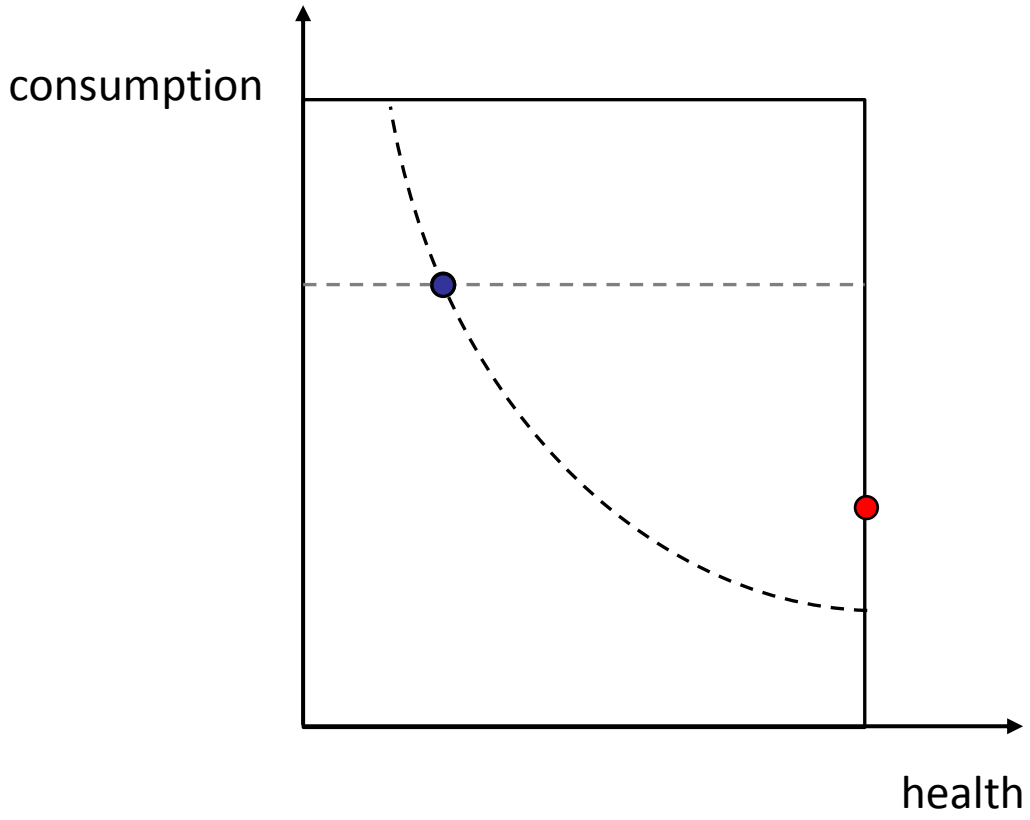
Charting contour sets with the ABDC method



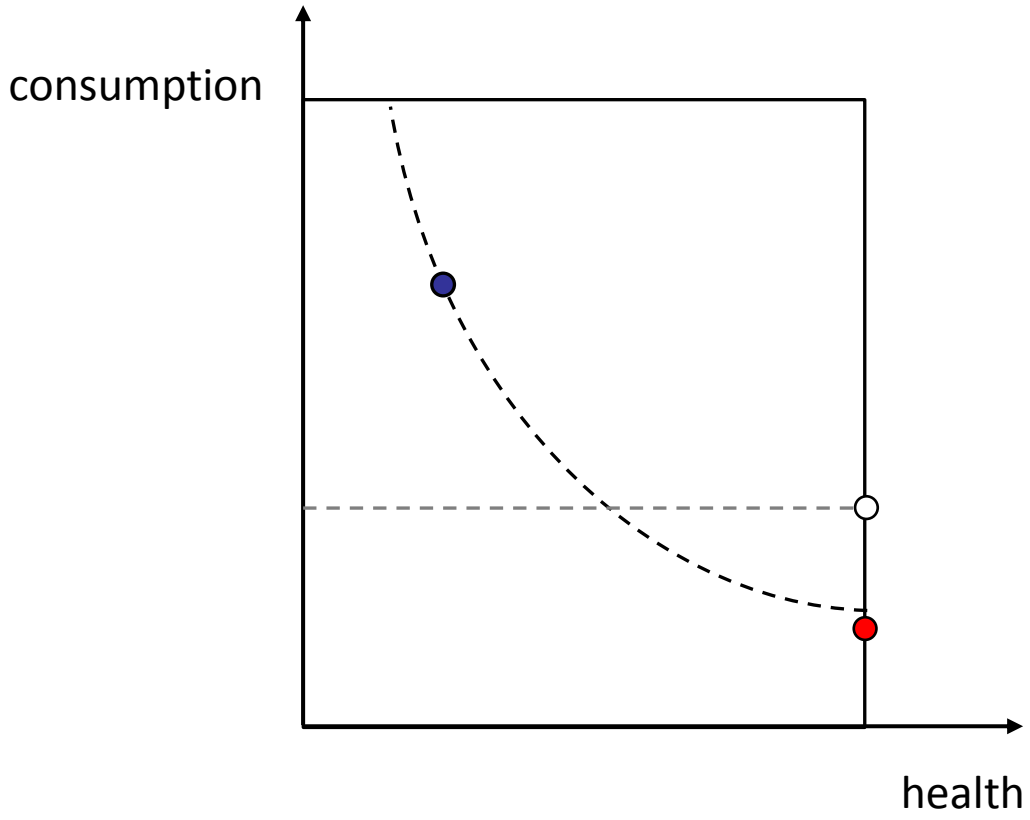
Charting contour sets with the ABDC method



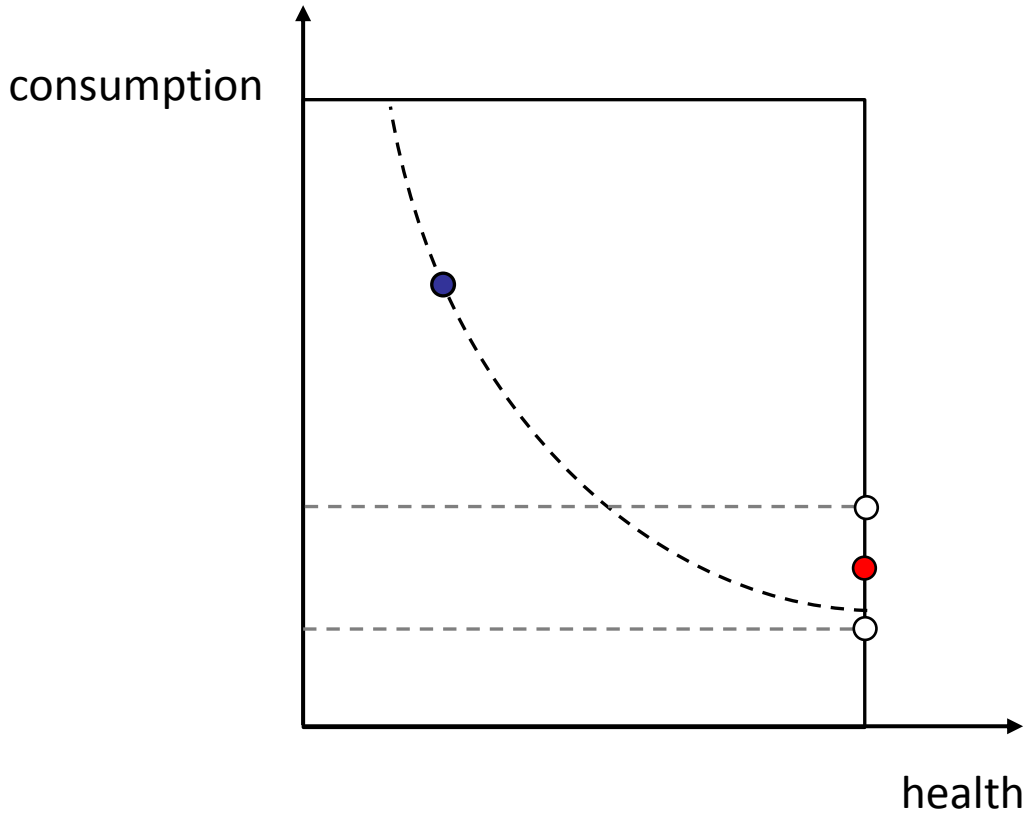
Charting contour sets with the ABDC method



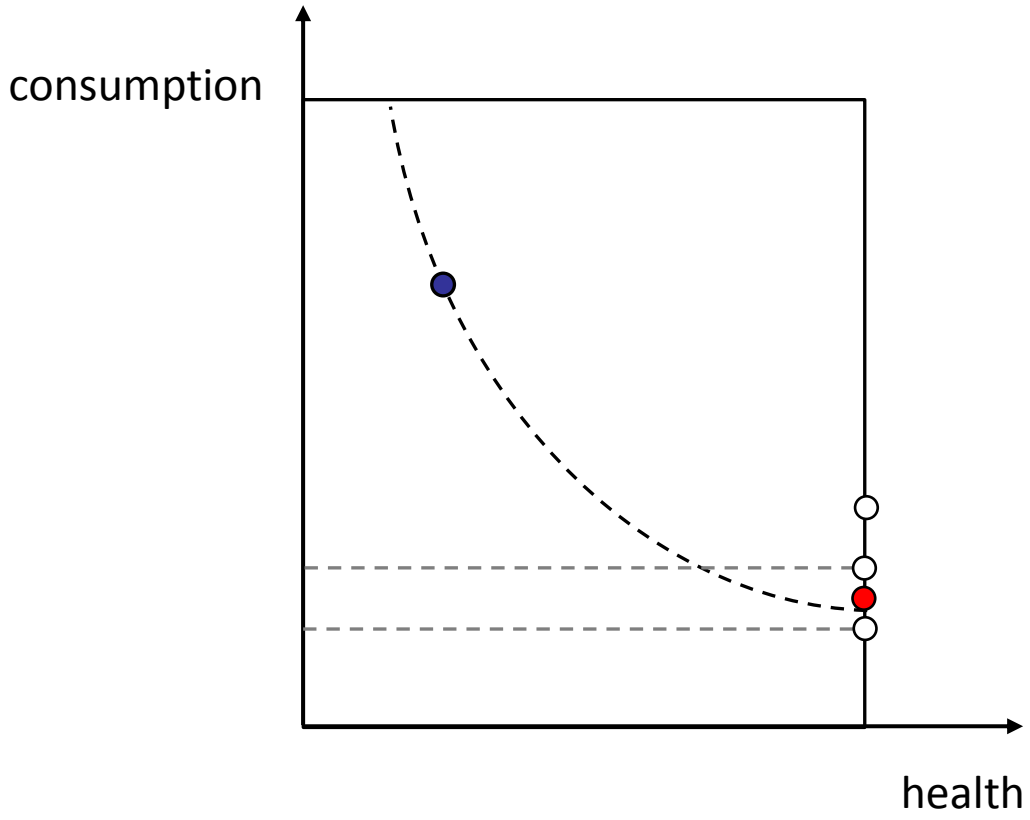
Charting contour sets with the ABDC method



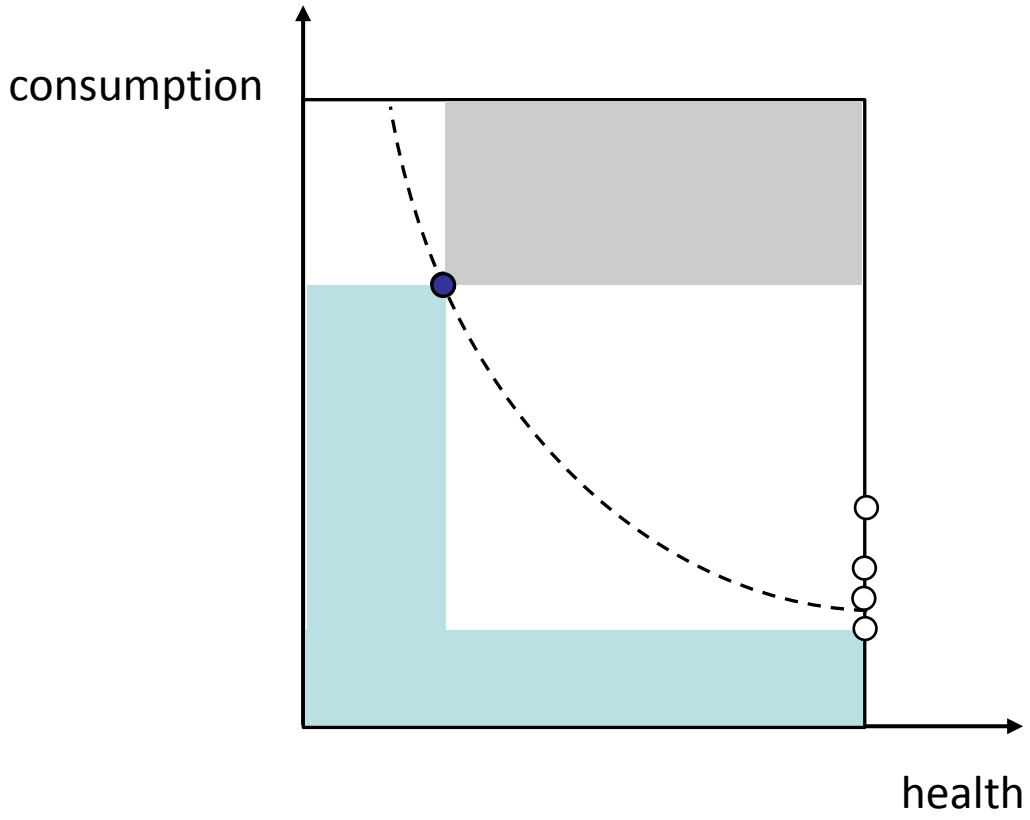
Charting contour sets with the ABDC method



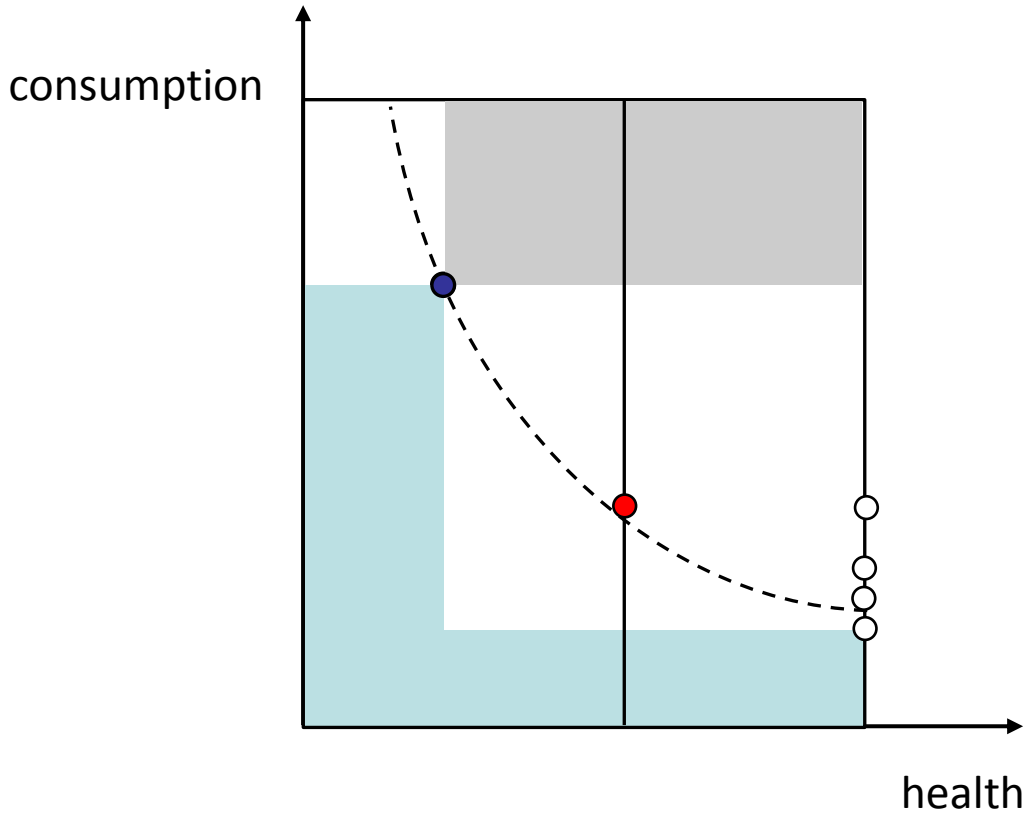
Charting contour sets with the ABDC method



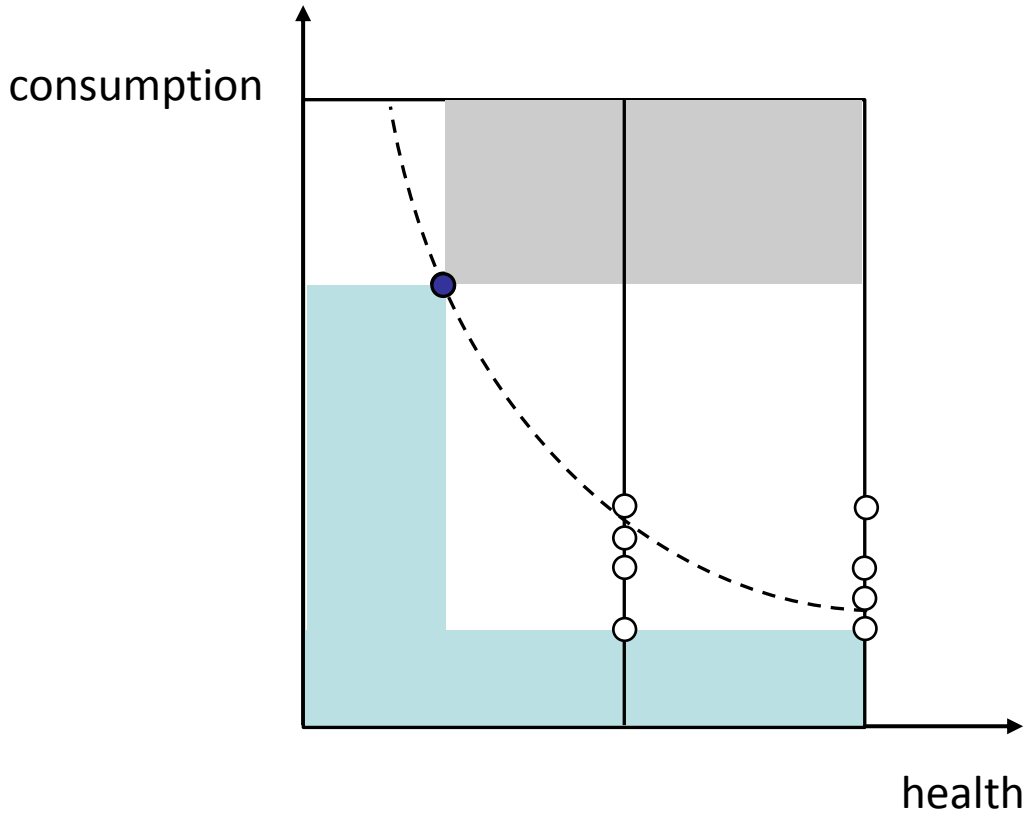
Charting contour sets with the ABDC method



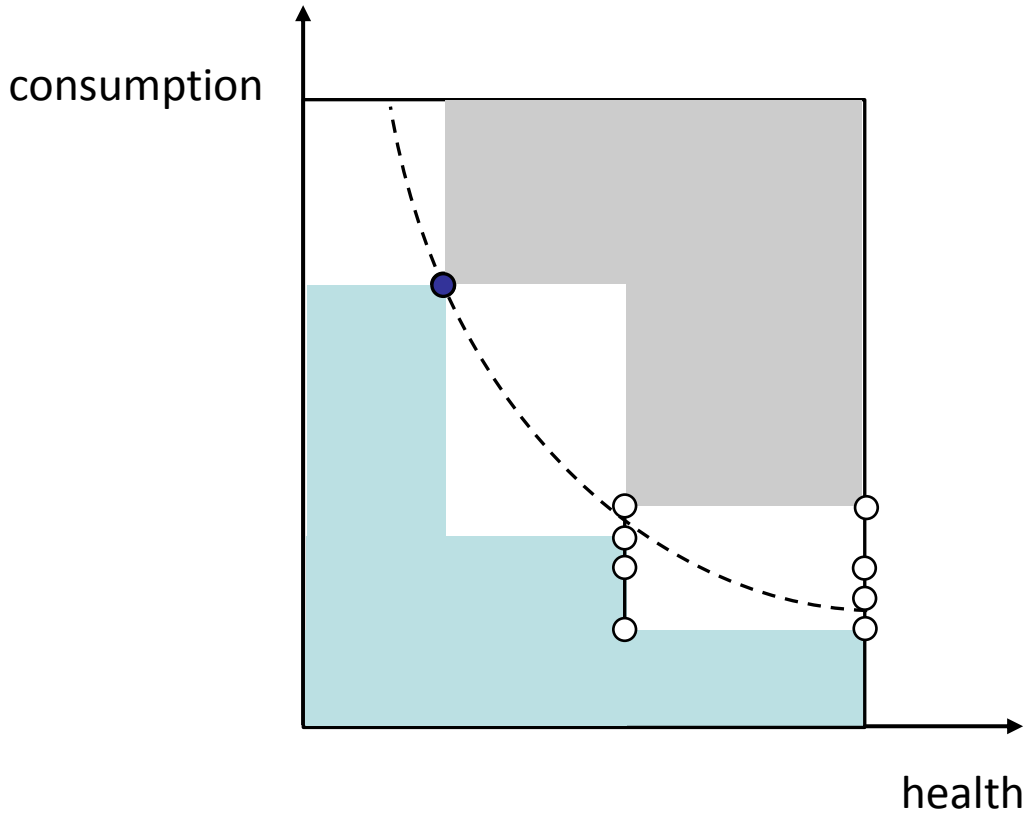
Charting contour sets with the ABDC method



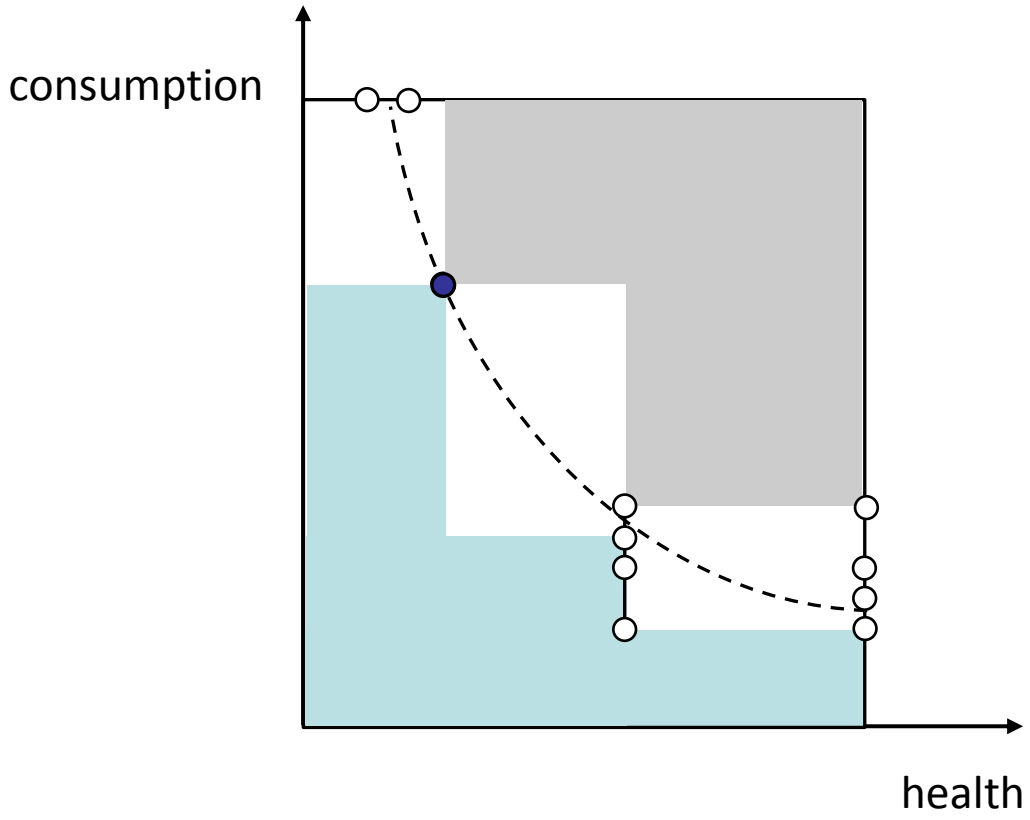
Charting contour sets with the ABDC method



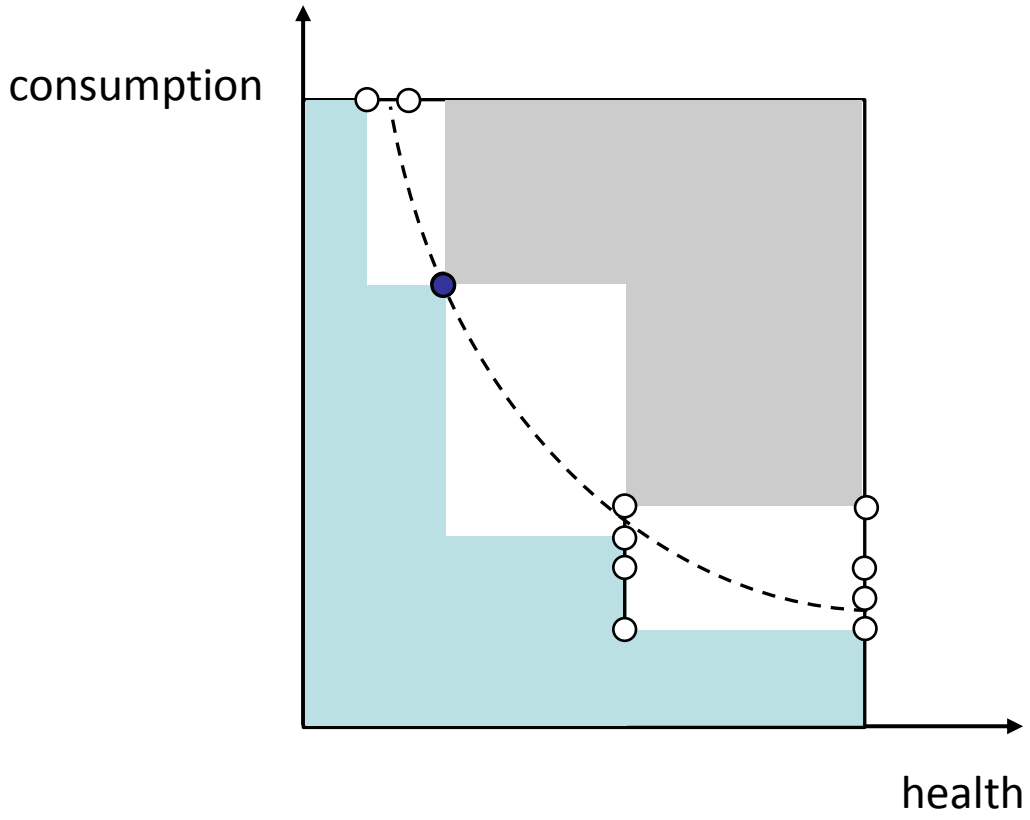
Charting contour sets with the ABDC method



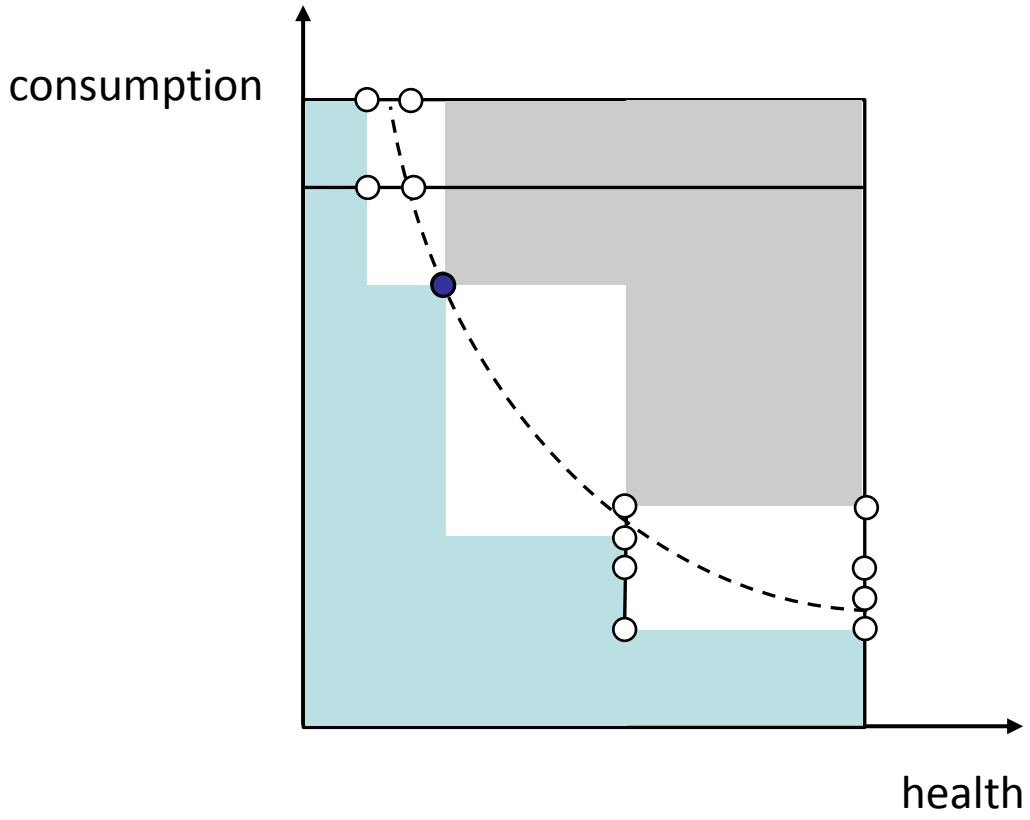
Charting contour sets with the ABDC method



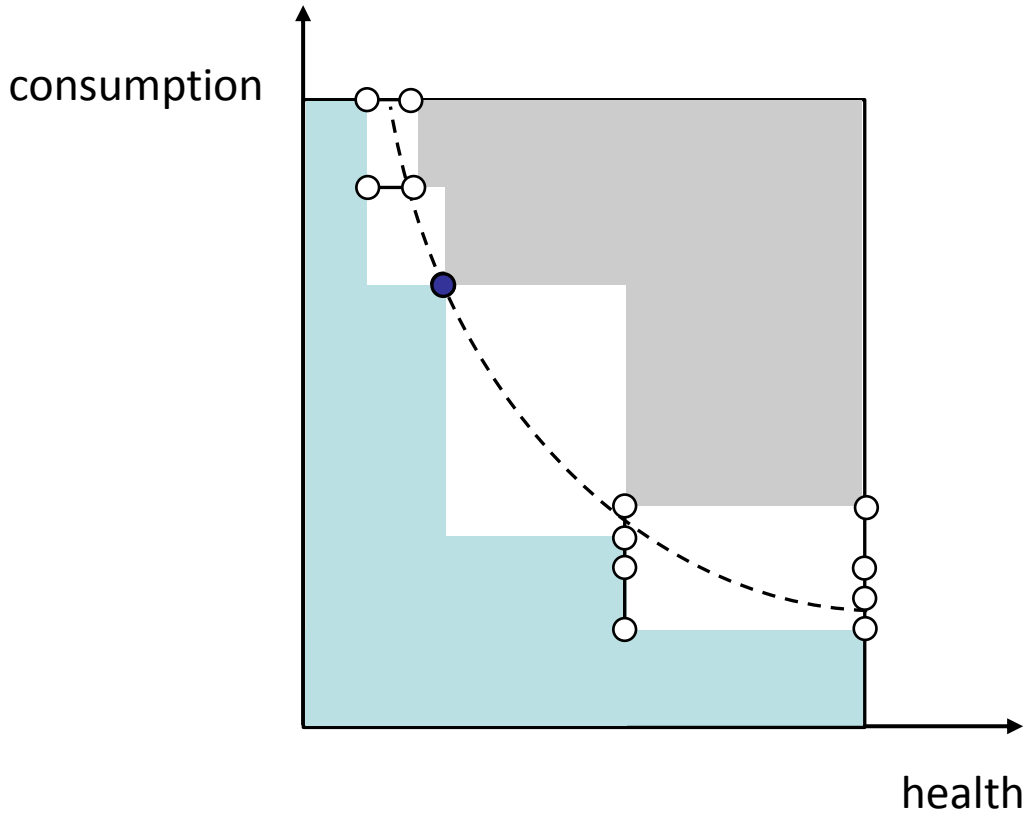
Charting contour sets with the ABDC method



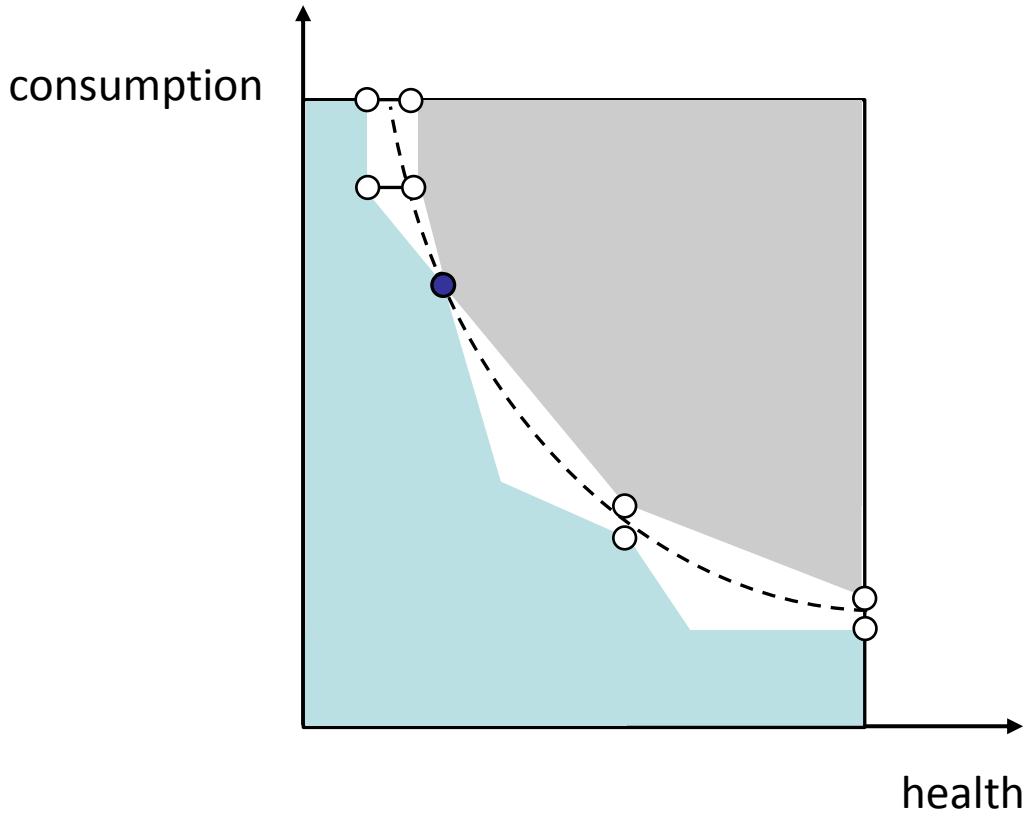
Charting contour sets with the ABDC method



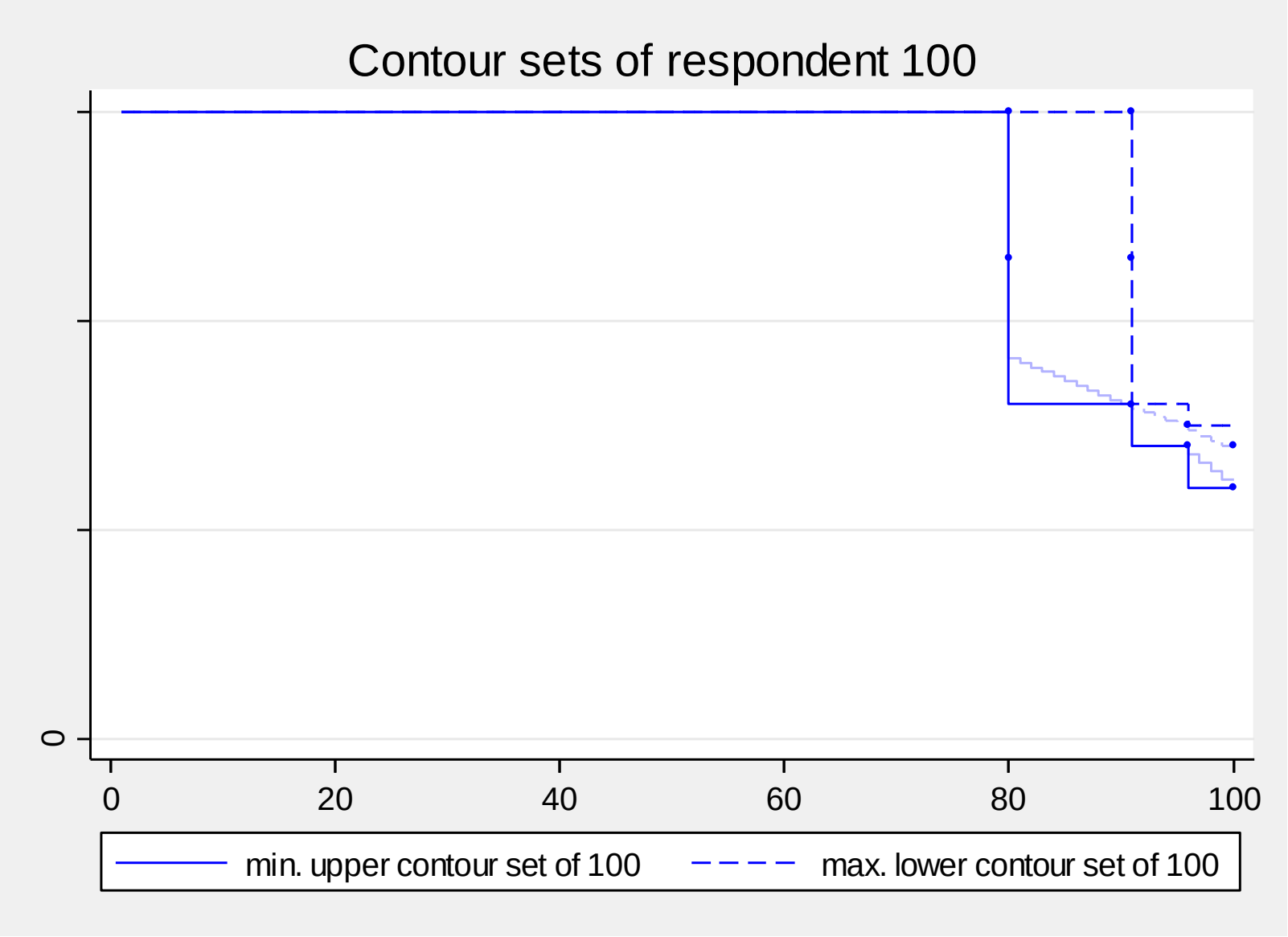
Charting contour sets with the ABDC method



Charting contour sets with the ABDC method



Adaptive Bisectional Dichotomous Choice



Outline

Part 1. Measuring well-being on a crossroad

Part 2. Three well-being measures

Part 3. Estimating trade-offs between dimensions

Part 4. Applications

- Well-being inequality in Russia

Economica LSE

Economica (2017) **84**, 210–238
doi:10.1111/ecca.12231

Wellbeing Inequality and Preference Heterogeneity

By KOEN DECANCQ†,‡, MARC FLEURBAEY†† and ERIK SCHOKKAERT‡

†*University of Antwerp, LSE* ‡*KULeuven and CORE* ††*Princeton University*

Final version received 8 February 2017.

Standard measures of multidimensional inequality (implicitly) assume common preferences for all individuals, and hence are not sensitive to preference heterogeneity among members of society. In this paper, we measure the inequality of the distribution of equivalent incomes, which is a preference-sensitive multidimensional wellbeing measure. To quantify the contribution of preference heterogeneity to wellbeing inequality, we use a decomposition method that calculates wellbeing inequality in different counterfactual distributions. We focus on four sources of wellbeing inequality: the correlation between outcomes and preferences, the preference heterogeneity, the correlation between the outcome dimensions, and the inequality within each of the outcome dimensions. We find that preference heterogeneity accounts for a considerable part of overall wellbeing inequality in Russia for the period 1995–2005.

Notation

- **Outcomes**: distribution matrix

$$L = \begin{bmatrix} \ell_1^1 & \dots & \ell_1^m \\ \ell_2^1 & \dots & \ell_2^m \\ \dots & \dots & \dots \\ \ell_n^1 & \dots & \ell_n^m \end{bmatrix}$$

- **Preferences**: individuals have a preference ordering R_i over outcomes ("well-considered judgments")
- We write R_i=$R(a_i)$ with a_i a preference vector

$$A = \begin{bmatrix} a_1^1 & \dots & a_1^k \\ a_2^1 & \dots & a_2^k \\ \dots & \dots & \dots \\ a_n^1 & \dots & a_n^k \end{bmatrix}$$

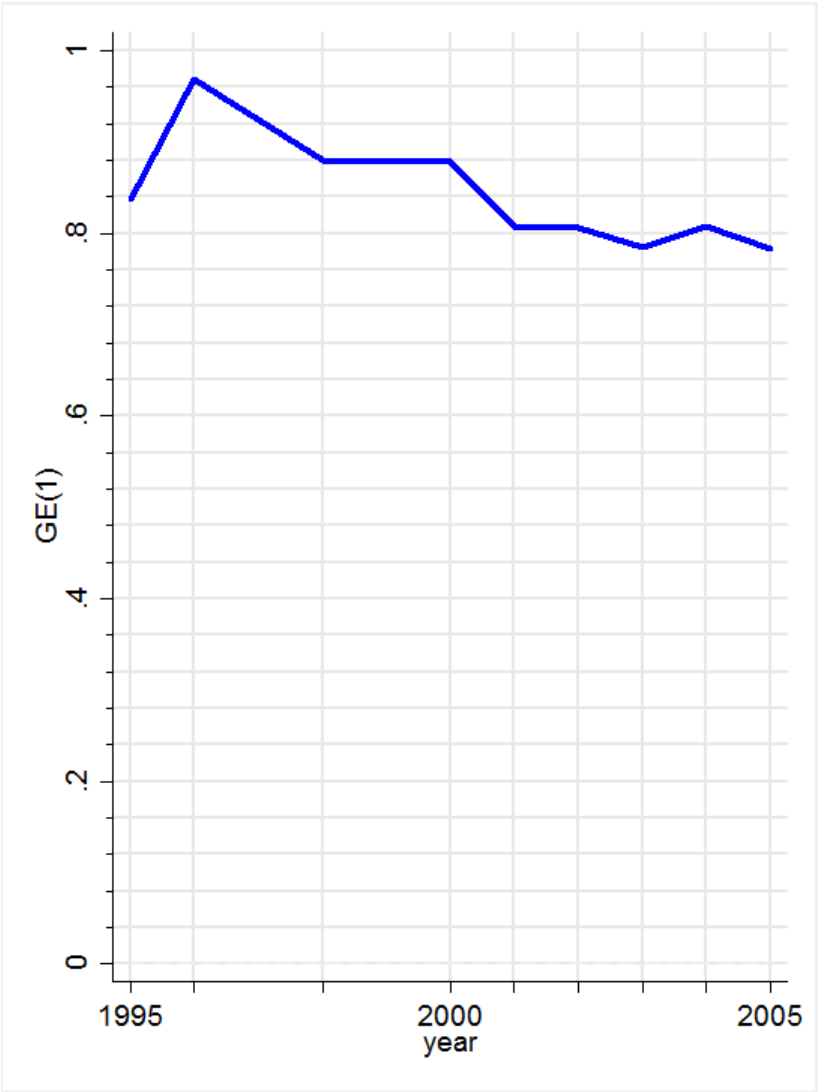
Well-being inequality

- Measuring well-being inequality:

$$I(L, A)$$

$$GE_{\alpha}(L, A) = \frac{1}{\alpha(\alpha - 1)n} \left[\sum_{i=1}^{n} \left(\frac{WB\left(\ell_i, a_i\right)}{\mu} \right)^{\alpha} - 1 \right],$$

Well-being inequality



What drives this inequality?

- Correlation between outcomes and preferences?
- Preference heterogeneity?
- Correlation between the outcome dimensions?
- Inequality in the outcome dimensions?

Decomposing well-being inequality

- We construct four building blocks:
  - Reshuffled preference matrix $\tilde{A}$
  - Equalized preference matrix $\overline{A}$
  - Reshuffled outcome matrix $\tilde{L}$
  - Equalized outcome matrix $\overline{L}$

Decomposing well-being inequality

- "Preference first" decomposition

$$I(L,A) = \underbrace{(I(L,A) - I(L,\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(L,\widetilde{A}) - I(L,\overline{A}))}_{\substack{preference \\ heterogeneity}} +$$

$$\underbrace{(I(L,\overline{A}) - I(\widetilde{L},\overline{A}))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},\overline{A}) - I(\overline{L},\overline{A}))}_{\substack{outcome \\ inequality}}.$$

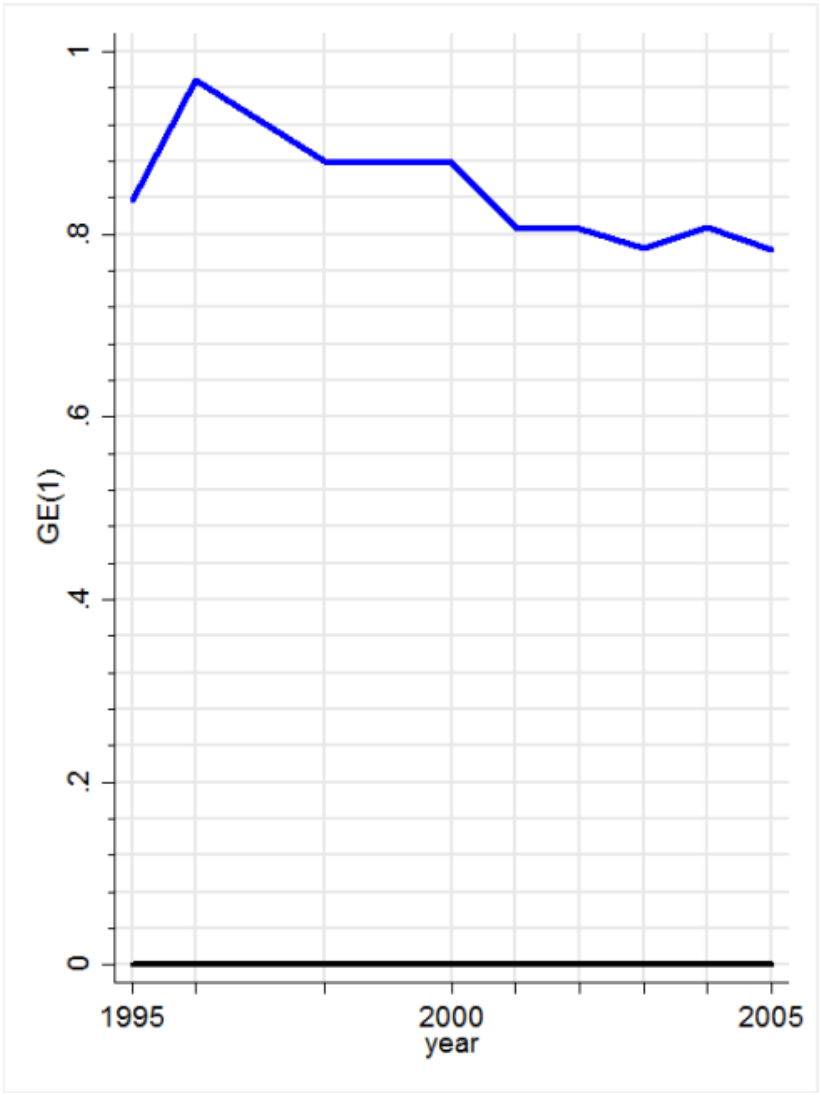
Decomposing well-being inequality

- "Outcome first" decomposition

$$I(L,A) = \underbrace{(I(L,A) - I(\widetilde{L},A))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},A) - I(\overline{L},A))}_{\substack{outcome \\ inequality}} +$$

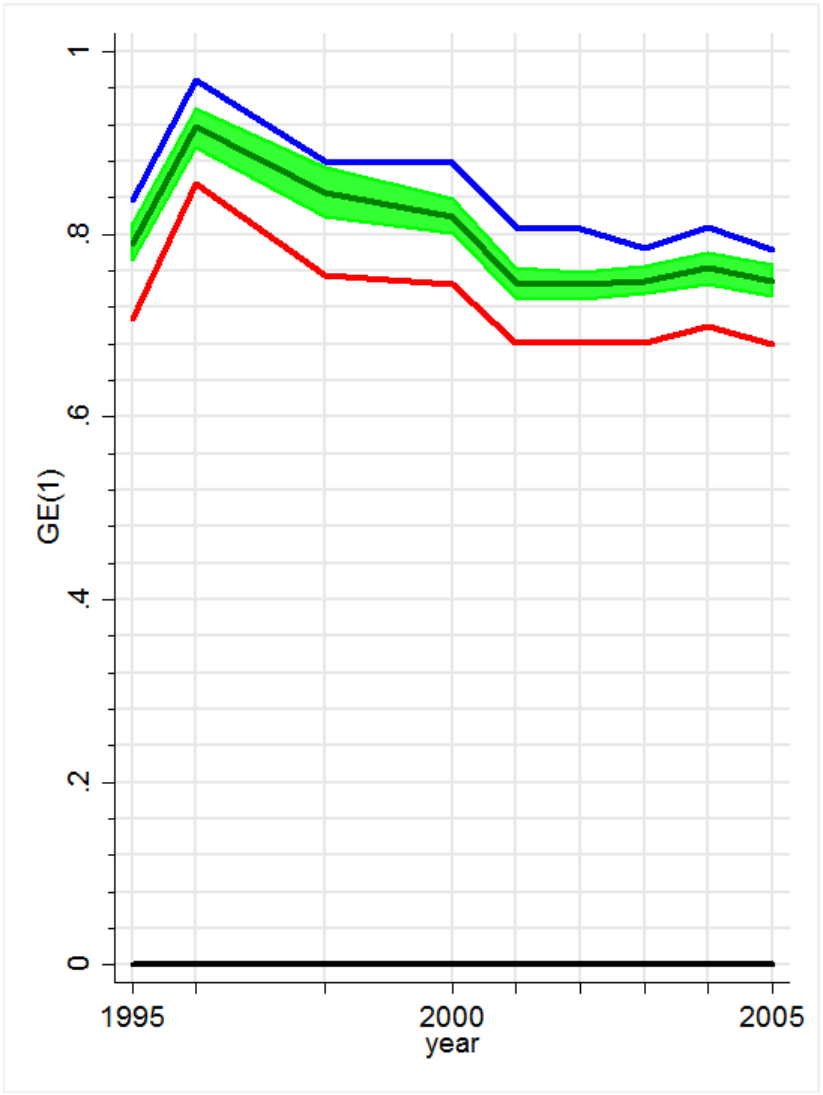
$$\underbrace{(I(\overline{L},A) - I(\overline{L},\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(\overline{L},\widetilde{A}) - I(\overline{L},\overline{A}))}_{\substack{preference \\ heterogeneity}}.$$

Decomposing well-being inequality



$$I(L,A) = \underbrace{(I(L,A) - I(L,\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(L,\widetilde{A}) - I(L,\overline{A}))}_{\substack{preference \\ heterogeneity}} +$$
$$\underbrace{(I(L,\overline{A}) - I(\widetilde{L},\overline{A}))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},\overline{A}) - I(\overline{L},\overline{A}))}_{\substack{outcome \\ inequality}}.$$

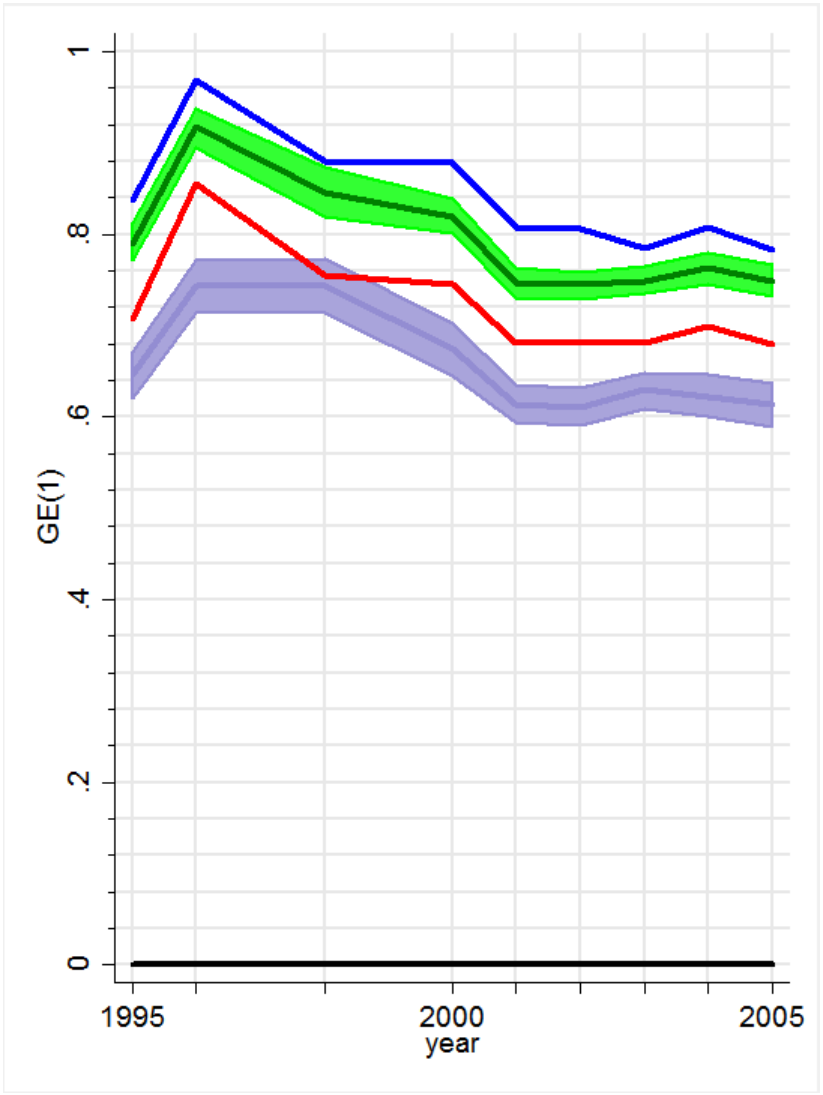
Decomposing well-being inequality



$$I(L,A) = \underbrace{(I(L,A) - I(L,\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(L,\widetilde{A}) - I(L,\overline{A}))}_{\substack{preference \\ heterogeneity}} +$$
$$\underbrace{(I(L,\overline{A}) - I(\widetilde{L},\overline{A}))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},\overline{A}) - I(\overline{L},\overline{A}))}_{\substack{outcome \\ inequality}}.$$

Contribution of preferences

Decomposing well-being inequality



$$I(L,A) = \underbrace{(I(L,A) - I(L,\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(L,\widetilde{A}) - I(L,\overline{A}))}_{\substack{preference \\ heterogeneity}} +$$
$$\underbrace{(I(L,\overline{A}) - I(\widetilde{L},\overline{A}))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},\overline{A}) - I(\overline{L},\overline{A}))}_{\substack{outcome \\ inequality}}.$$

Removing the outcome correlation decreases well-being inequality

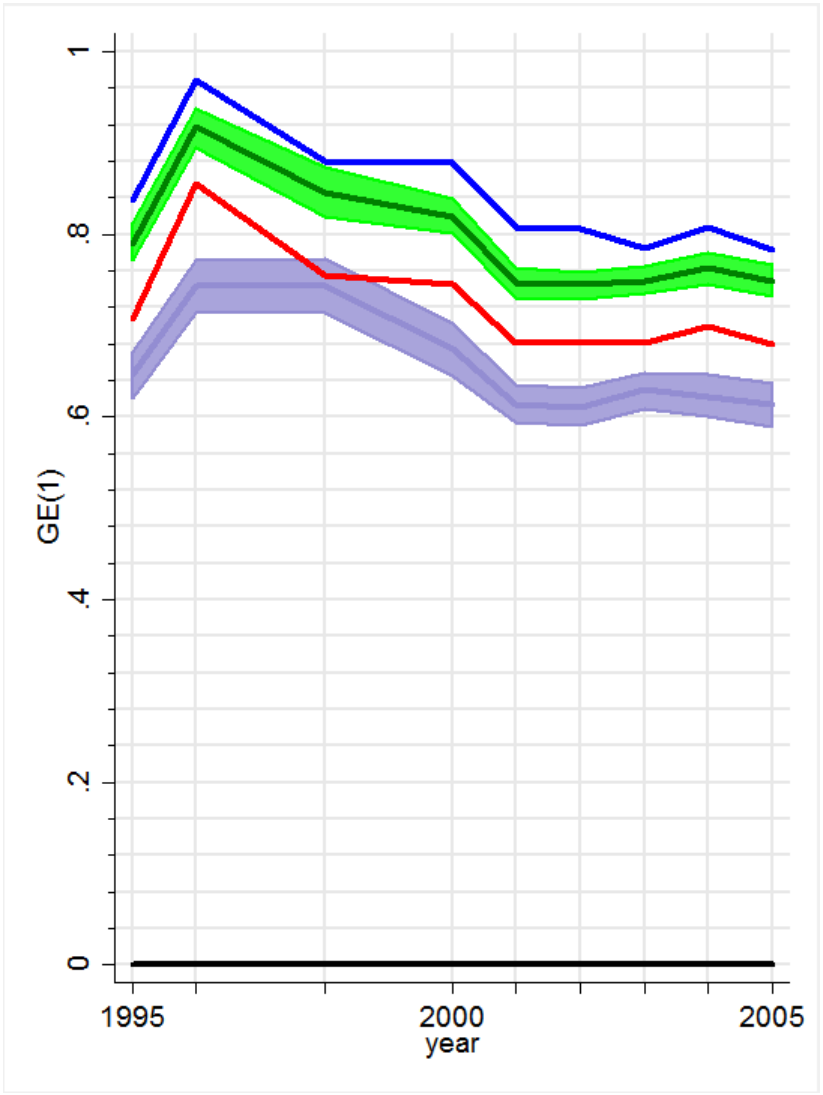
Correlation between dimensions of well-being

- Outcome correlation between dimensions of well-being (Spearman rank correlation)

		Expenditures	Health	Housing	Unemployment
1995	Health	0.0444			
	Housing	0.2296	-0.1062		
	Unemployment	-0.0633	0.1363	-0.0649	
	Wage arrears	0.0104	0.1027	-0.0248	-0.1353
2000	Health	0.1226			
	Housing	0.2904	-0.0734		
	Unemployment	-0.0744	0.1428	-0.0961	
	Wage arrears	0.0028	0.0538	-0.0658	-0.1094
2005	Health	0.1666			
	Housing	0.2023	-0.0821		
	Unemployment	-0.1284	0.1736	-0.0936	
	Wage arrears	-0.0046	0.0522	-0.0498	-0.0713

Source: Own computations with RLMS-HSE

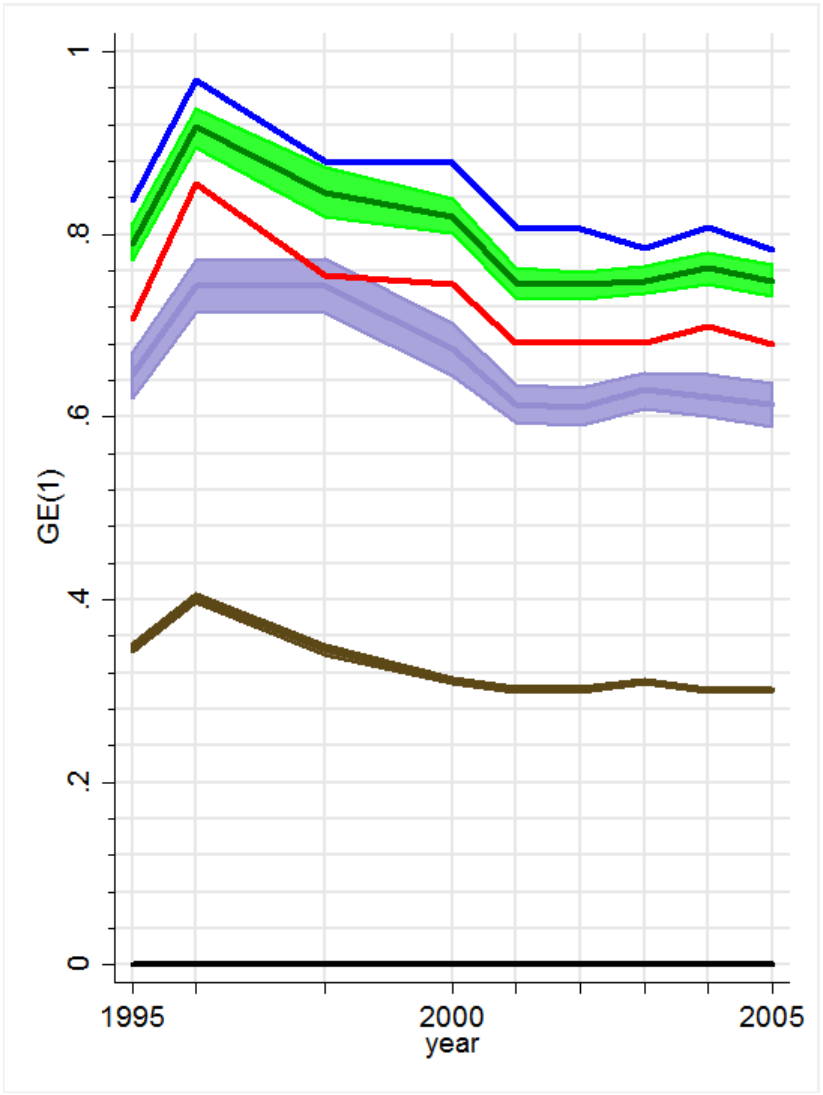
Decomposing well-being inequality



$$I(L,A) = \underbrace{(I(L,A) - I(L,\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(L,\widetilde{A}) - I(L,\overline{A}))}_{\substack{preference \\ heterogeneity}} +$$
$$\underbrace{(I(L,\overline{A}) - I(\widetilde{L},\overline{A}))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},\overline{A}) - I(\overline{L},\overline{A}))}_{\substack{outcome \\ inequality}}.$$

Removing the outcome correlation decreases well-being inequality

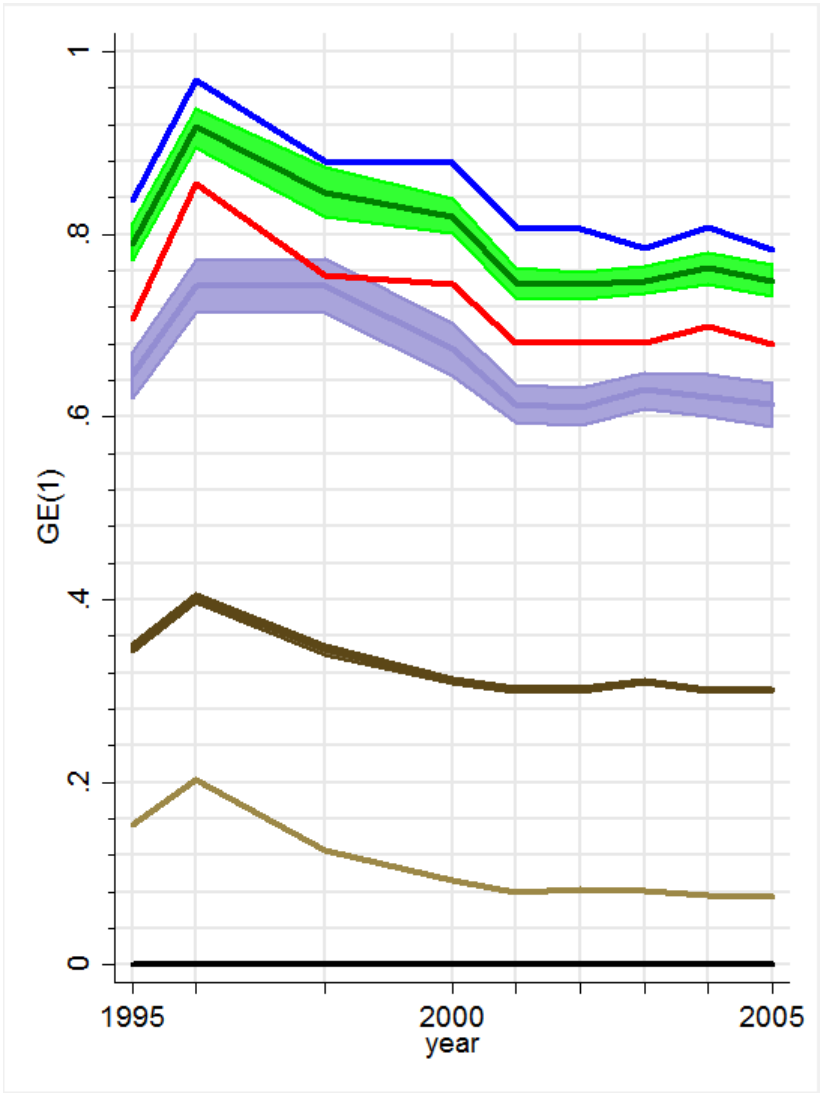
Decomposing well-being inequality



$$I(L,A) = \underbrace{(I(L,A) - I(L,\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(L,\widetilde{A}) - I(L,\overline{A}))}_{\substack{preference \\ heterogeneity}} +$$
$$\underbrace{(I(L,\overline{A}) - I(\widetilde{L},\overline{A}))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},\overline{A}) - I(\overline{L},\overline{A}))}_{\substack{outcome \\ inequality}}.$$

Equalizing expenditures decreases well-being inequality (a lot)

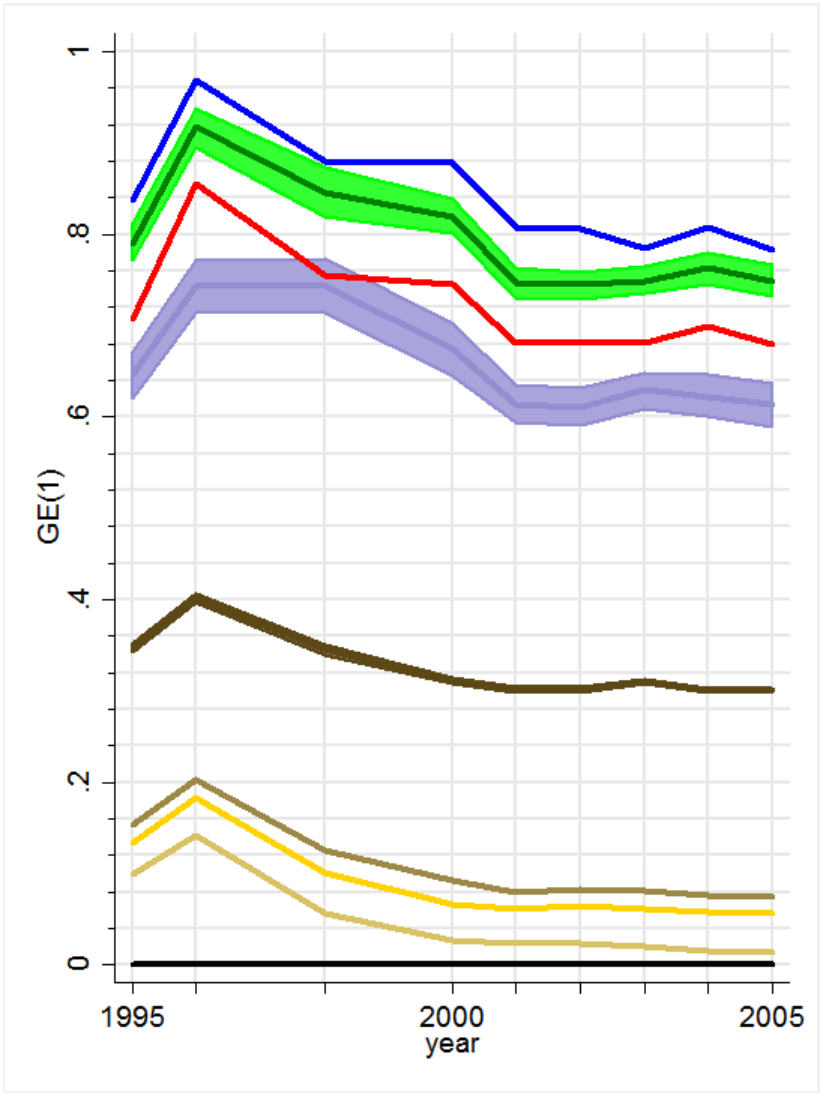
Decomposing well-being inequality



$$I(L,A) = \underbrace{(I(L,A) - I(L,\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(L,\widetilde{A}) - I(L,\overline{A}))}_{\substack{preference \\ heterogeneity}} +$$
$$\underbrace{(I(L,\overline{A}) - I(\widetilde{L},\overline{A}))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},\overline{A}) - I(\overline{L},\overline{A}))}_{\substack{outcome \\ inequality}}.$$

Equalizing health inequality decreases well-being inequality further

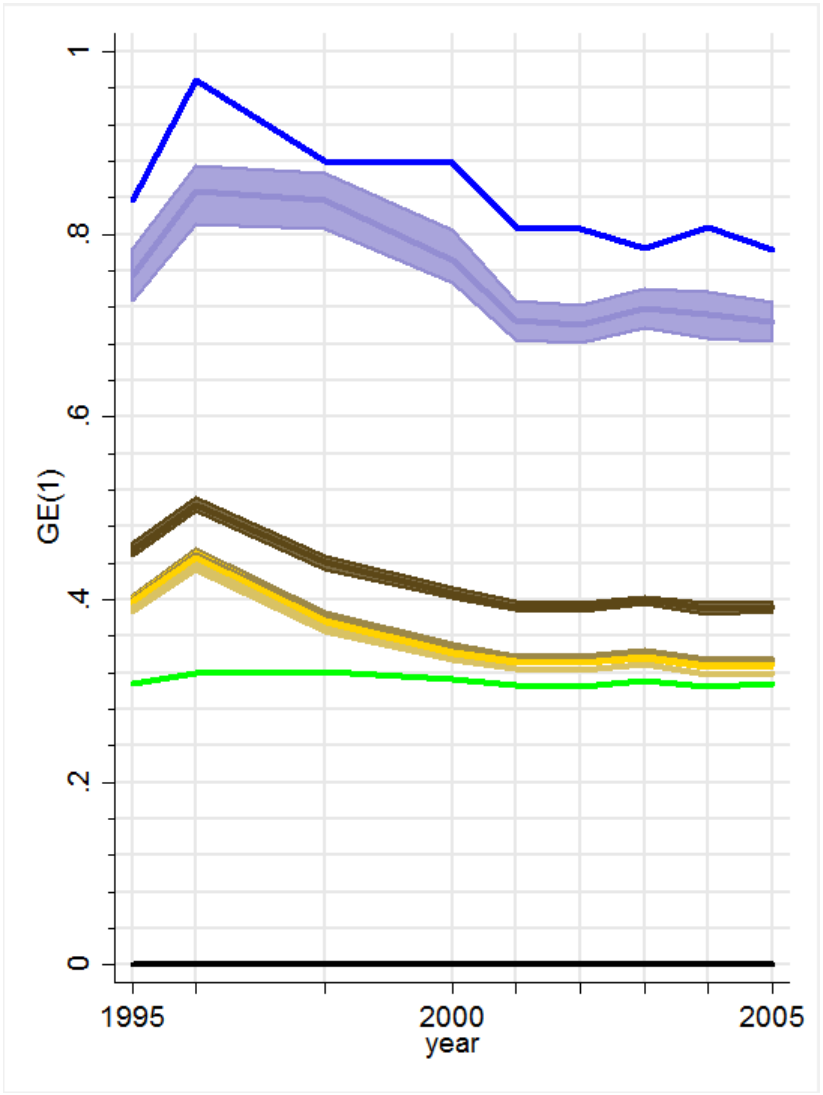
Decomposing well-being inequality



$$I(L,A) = \underbrace{(I(L,A) - I(L,\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(L,\widetilde{A}) - I(L,\overline{A}))}_{\substack{preference \\ heterogeneity}} +$$
$$\underbrace{(I(L,\overline{A}) - I(\widetilde{L},\overline{A}))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},\overline{A}) - I(\overline{L},\overline{A}))}_{\substack{outcome \\ inequality}}.$$

Note the spike of well-being inequality generated by wage arrears during the crisis

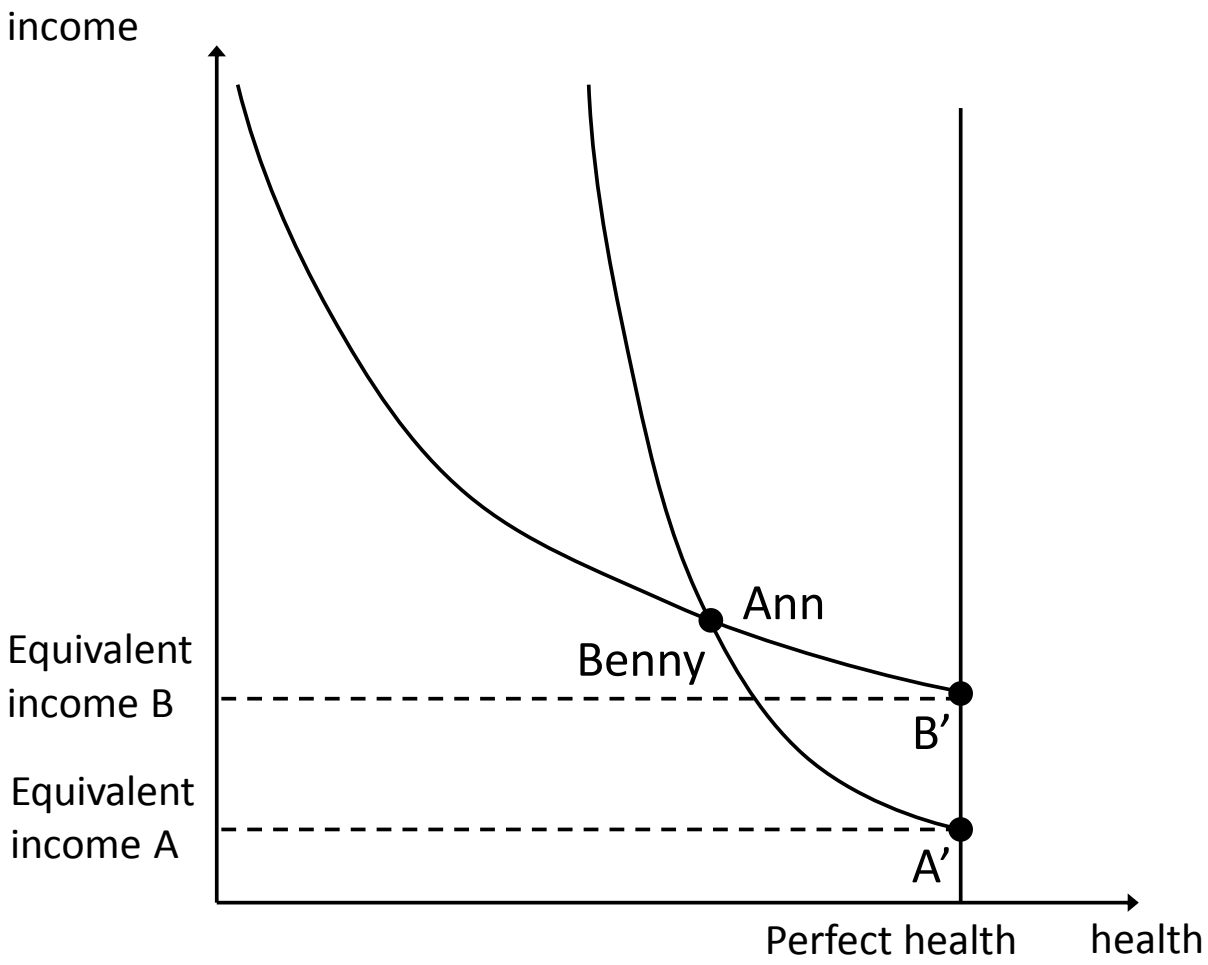
Decomposing well-being inequality



$$I(L,A) = \underbrace{(I(L,A) - I(\widetilde{L},A))}_{\substack{outcome \\ correlation}} + \underbrace{(I(\widetilde{L},A) - I(\overline{L},A))}_{\substack{outcome \\ inequality}} +$$
$$\underbrace{(I(\overline{L},A) - I(\overline{L},\widetilde{A}))}_{\substack{correlation \\ outcome-pref.}} + \underbrace{(I(\overline{L},\widetilde{A}) - I(\overline{L},\overline{A}))}_{\substack{preference \\ heterogeneity}}.$$

Considerable well-being inequality remains after all outcomes have been equalized

Equivalent income



Conclusion

- Can we construct an (operational) multidimensional well-being measure?

Conclusion

- Can we construct an (operational) multidimensional well-being measure? **YES**
- Is there a single silver bullet?

Conclusion

- Can we construct an (operational) multidimensional well-being measure? **YES**
- Is there a single silver bullet? **NO**
- Does the choice between the measures matters empirically?

Conclusion

- Can we construct an (operational) multidimensional well-being measure? **YES**
- Is there a single silver bullet? **NO**
- Does the choice between the measures matters empirically? **YES**

- Different measures take a different position on what are the most appealing principles. This is a value judgment.
- Let's be explicit about these value judgments, so that they are open to public scrutiny