SMALL AREA METHODS FOR MONITORING OF POVERTY AND LIVING CONDITIONS IN EU

UNIVERSITÀ DI PISA

Jean Monnet Chair
European Commission

PISA, 8-10 MAY 2018

WORKSHOP “SMALL AREA METHODS AND LIVING CONDITIONS INDICATORS IN EUROPEAN POVERTY STUDIES IN THE ERA OF DATA DELUGE AND BIG DATA”

FINAL EVENT OF THE JEAN MONNET CHAIR SAMPLEU

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Table 2. Multidimensional poverty at a local level – how to synthetize the dimensions?
Pisa, May the 8th 2018
Coordinator: Achille Lemmi

Poverty: Cross-sectional, multidimensional, longitudinal, longitudinal and multidimensional
A presenter: Vijay Verma

1 Poverty and deprivation – a matter of degree
Monetary deprivation

$$\mu_{i,K} = \left(\frac{\sum_{\gamma=i+1}^{n} w_\gamma \mid X_\gamma > X_i}{\sum_{\gamma=2}^{n} w_\gamma \mid X_\gamma > X_1} \right)^{\alpha_K - 1} \left(\frac{\sum_{\gamma=i+1}^{n} w_\gamma X_\gamma \mid X_\gamma > X_i}{\sum_{\gamma=2}^{n} w_\gamma X_\gamma \mid X_\gamma > X_1} \right)$$

$i{:}1,\ldots,n\text{-}1\,;\ \mu_{n,k}=0$

Centro Camilo Dagum
Tuscan Interuniversity Centre
Advanced Statistics for Equitable and Sustainable Development

MAKSWELL
MAKing Sustainable development and WELL-being frameworks work for policy analysis

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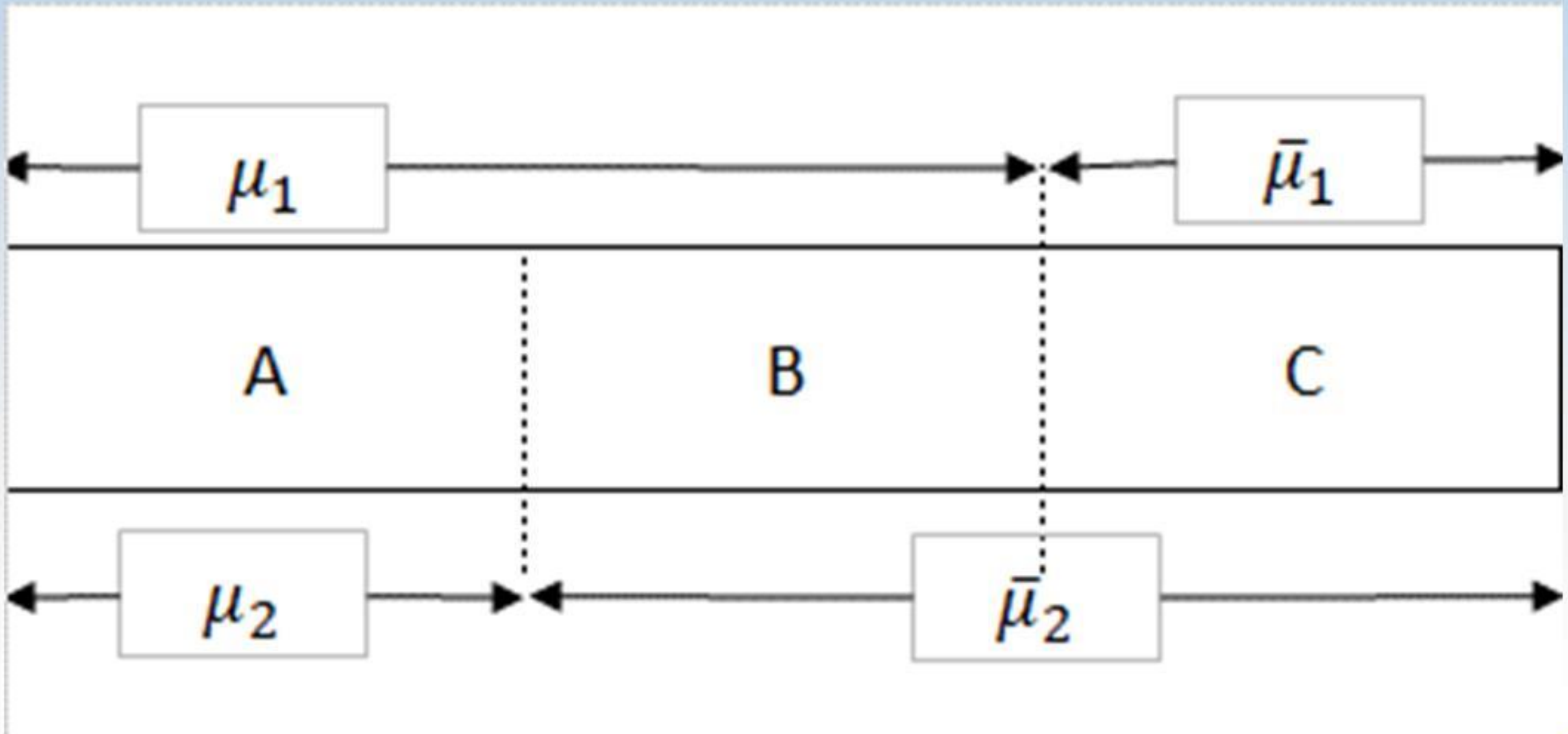
2 Poverty and deprivation – a matter of degree:

Non-monetary ('supplementary') deprivation

1. Identification of items of deprivation to be included in the analysis;
2. Transformation of the items into the [0, 1] interval;
3. Exploratory and confirmatory factor analysis to identify dimensions of deprivation;
4. Calculation of weights within each dimension (each group);
5. Calculation of scores for each dimension;
6. Calculation of an overall score and the parameter α of Eq. (1);
7. Construction of the fuzzy deprivation measures, both overall and separately in each dimension.

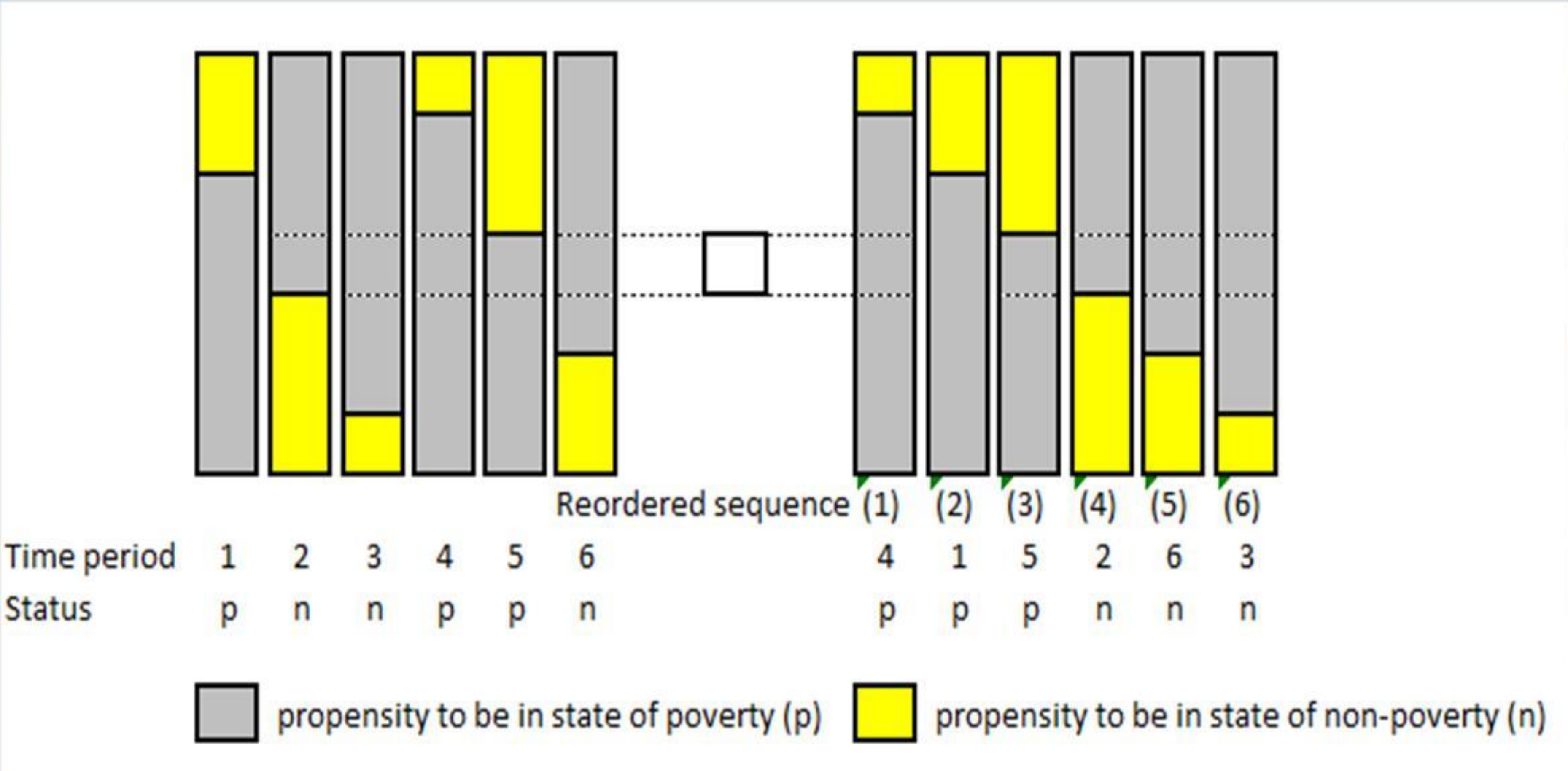
3 Constructing multidimensional / longitudinal measures: Intersection of dimensions or times



4 Four sequences defined by intersection of propensities in two dimensions / time points

Intersection	Area in Figure	Propensity	Fuzzy operation	Propensity using ordered $\mu_{(1)} \geq \mu_{(2)} \geq \cdots$
(1) $\mu_1 \cap \mu_2$	A	$\min(\mu_1, \mu_2)$	Standard	$\mu_{(2)}$
(2) $\mu_1 \cap \bar{\mu}_2$	$\max(0, B)$	$\max(0, \mu_1 + \bar{\mu}_2 - 1) = \max(0, \mu_1 - \mu_2)$	Bounded	together= $\mu_{(1)} - \mu_{(2)}$
(3) $\bar{\mu}_1 \cap \mu_2$	$\max(0, B)$	$\max(0, \bar{\mu}_1 + \mu_2 - 1) = \max(0, \mu_2 - \mu_1)$	Bounded	
(4) $\bar{\mu}_1 \cap \bar{\mu}_2$	C	$\min(\bar{\mu}_1, \bar{\mu}_2) = 1 - \max(\mu_1, \mu_2)$	Standard	$1 - \mu_{(1)}$
(5) $\mu_1 \cup \mu_2$	A+B	$\max(\mu_1, \mu_2)$	Standard	$\mu_{(1)}$

5 Many dimensions (multi-dimensional), many time periods (longitudinal)



6 Intersection

$$m_P = \min(\mu_t, t \in X_P)$$

$$\overline{m}_N = \min(\overline{\mu}_t, t \in X_N)$$

$$M_N = 1 - \overline{m}_N = \max(\mu_t, t \in X_N)$$

OVERLAP =

$$\max\left(0, m_P + \overline{m}_N - 1\right) = \max\left(0, m_P - M_N\right)$$

7 Examples of movements between the states of poverty and non-poverty

pattern	description	$\mu^L =$
pnp	Temporary exit from poverty: poor at time 1, non-poor at 2, again poor at 3	$max(0, min(\mu_1, \mu_3) - \mu_2)$
npn	Temporary fall into poverty: non-poor at time 1, poor at 2, again non-poor at 3	$max\left(0, \mu_2 - max(\mu_1, \mu_3)\right)$
Persistent poverty	Poor for at least P years during a period of T years	$\mu_{(P)}$