AGRODEP Training Session

Poverty Dynamics -Descriptive Statistics

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How to describe poverty dynamics?

To fully describe poverty dynamics, you may want to know

- How much time individuals have spent poor over a fixed time period
- How long is a poverty spell
- What are annual entry and exit rates
- Measure the extent of chronic vs transient poverty

Time spent poor over a fixed period of time

General idea

- Count the number of periods an individual is observed poor over a fixed time-period
  $=>$ documents persistence and recurrence of poverty
- Examine how these patterns have change over time, eventually by subgroup of the population

Time spent poor over a fixed period of time

Example: 4 years window-UK-1991-2007

%	Never Poor			Poor once			Three of Four times		
	1991	1997	2003	1991	1997	2003	1991	1997	2003
All	64	67	68	12	11	13	15	14	11

source: BHPS Data-UK, Jenkins, 2011

Time spent poor over a fixed period of time

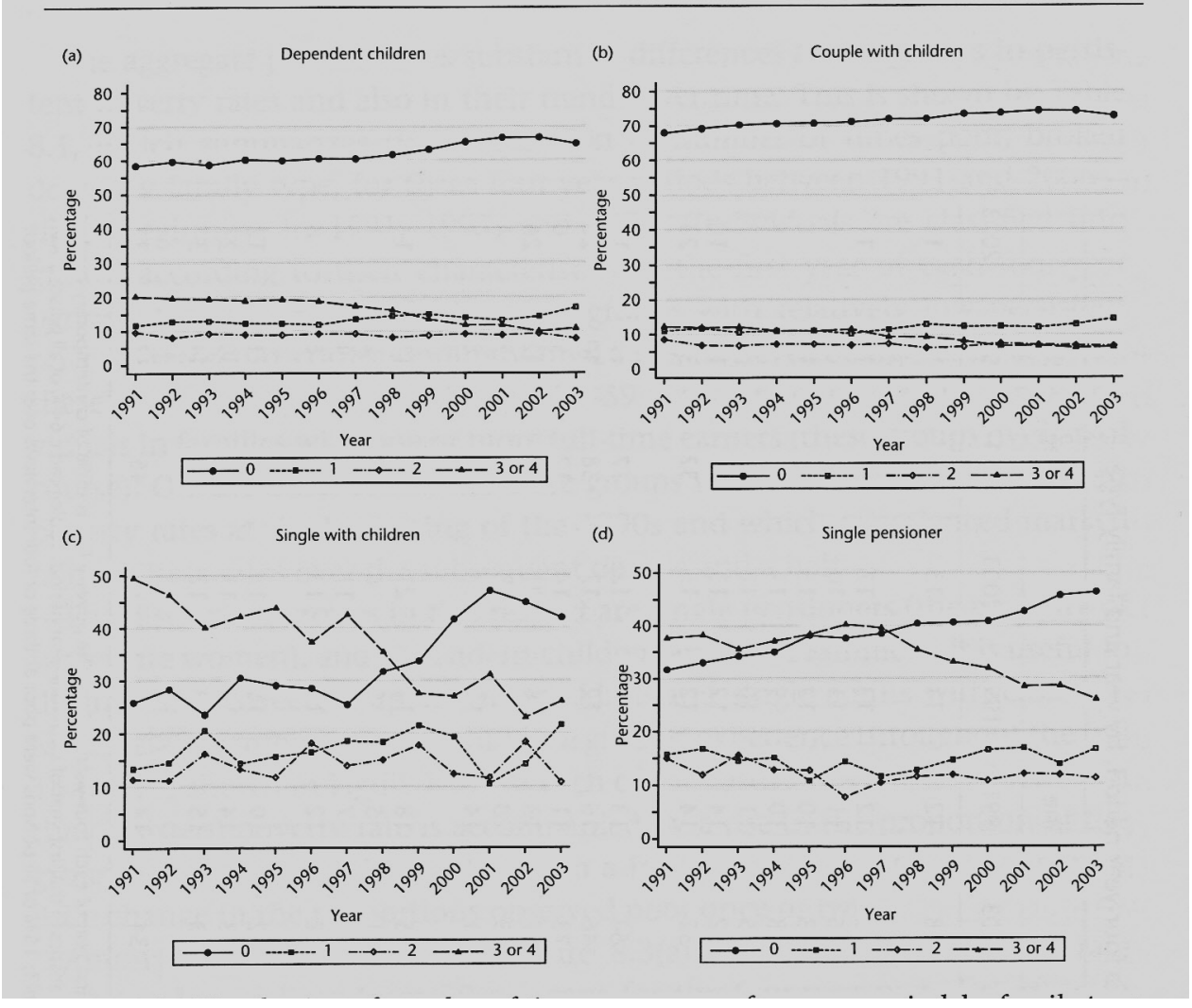
Example: 4 years window-UK-1991-2007 - Subgroup decompositions (poverty profiles)

%	Never Poor			Poor once			Three of Four	
Family Type	1991	1997	2003	1991	1997	2003	1991	1997
Pensioner couple	61	60	64	13	12	12	17	17
Single pensioner	32	38	46	16	12	17	38	40
Couple with children	68	72	73	11	11	14	12	9
Single with children	26	25	42	13	18	21	49	42
Couple, no children	84	86	83	8	7	8	3	3
Single, no children	71	74	71	14	12	13	8	8

source: BHPS Data-UK, Jenkins, 2011

Time spent poor over a fixed period of time

Example: 4 years window-UK-1991-2007



Time spent poor over a fixed period of time

Methodological issues

What is the best observation window?

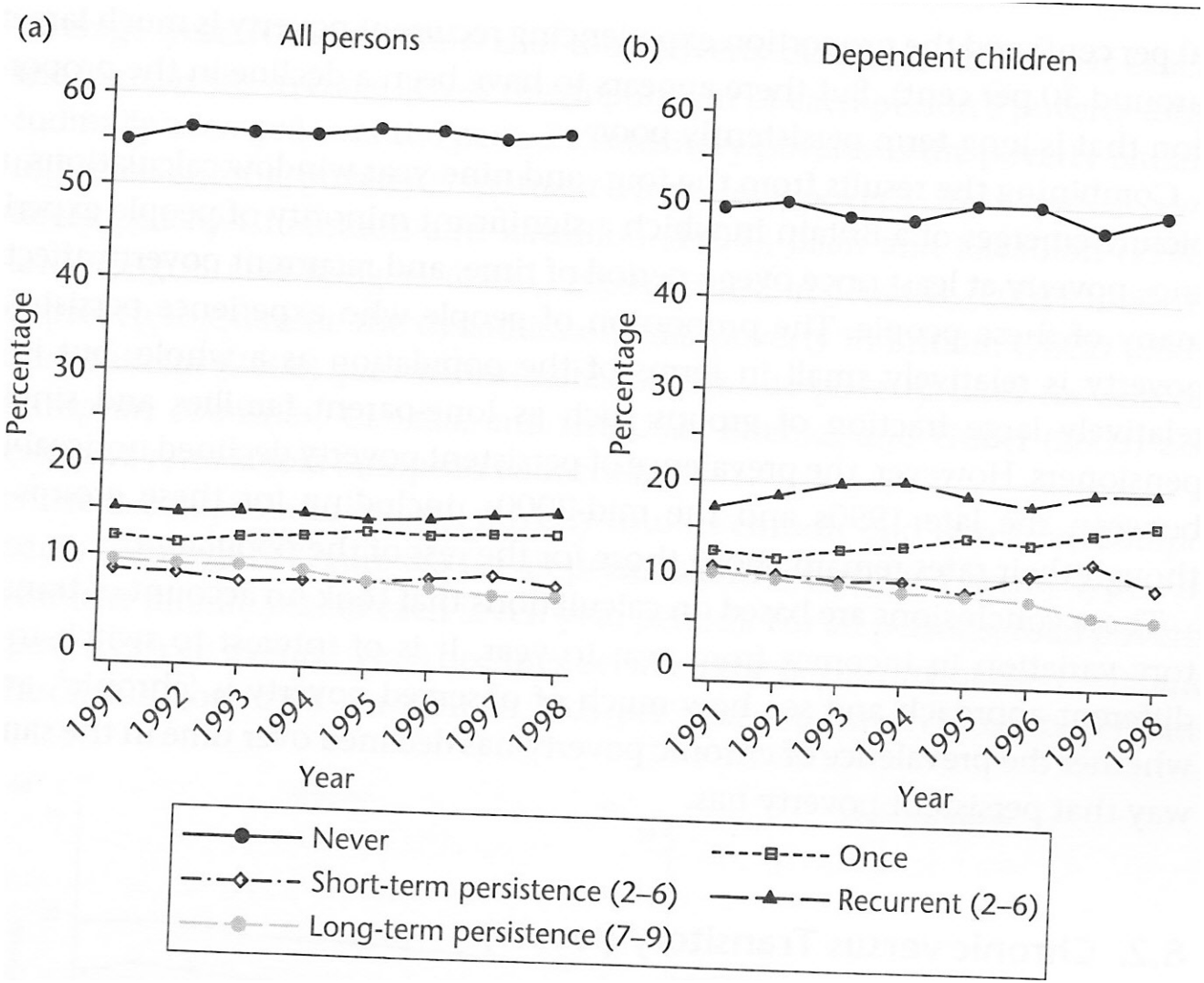
- Long window:
  - better enables to judge wether poverty is a temporary or a persistent/recurrent phenomenon

  But

  - Data may be unavailable
  - If available, the sample size is smaller so that the sample is less representative
  - Issues with demographic events (family formation and dissolution)
  - It is hard to examine change in trends of poverty dynamics
- Short windows: reverse the arguments for the long window
- Use long and short windows as complements if possible

Time spent poor over a fixed period of time

Example: 9 years window- UK-1991-2007



Time spent poor over a fixed period of time

Policy relevance

- Easily understood and transparent method
- But very incomplete:
  - Does not give any information nor on the duration of poverty and non-poverty spells
  - nor on poverty entry and exit rates
  - Left and right censoring issues

Time spent poor over a fixed period of time

Example: EU persistent poverty measure (European Commission, 2009)

- The **persistent at-risk-of-poverty rate** measures the proportion of persons in a country who are currently income poor and who were income poor in at least two of the preceding three years
  $=>$ requires at least 4 years of data on income
- **Policy relevance/justification:** Evidence about poverty persistence is an important complement to information about poverty prevalence at a point in time: it is widely agreed that poverty is worse for an individual, the longer he or she experiences it.

The spell approach

General idea

- Look at the distribution of the duration of poverty spells
  - How long is a poverty spell ?
  - How long until poverty re-entry?

  => to identify if poverty is chronic or transient
- Look at the probability to enter and to exit poverty by poverty spell duration (Life-table)
  => to identify duration dependence

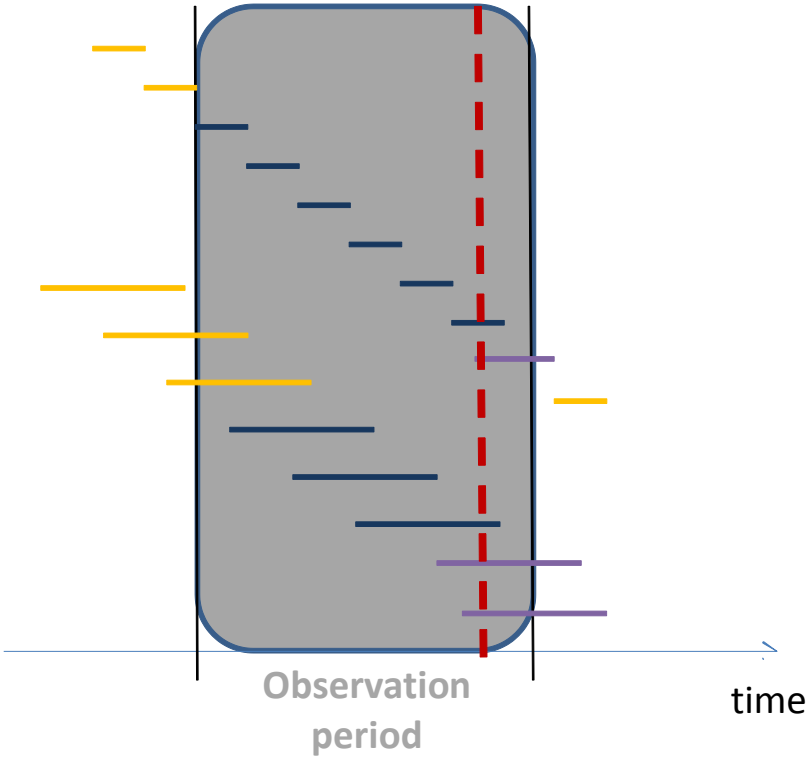
The spell approach

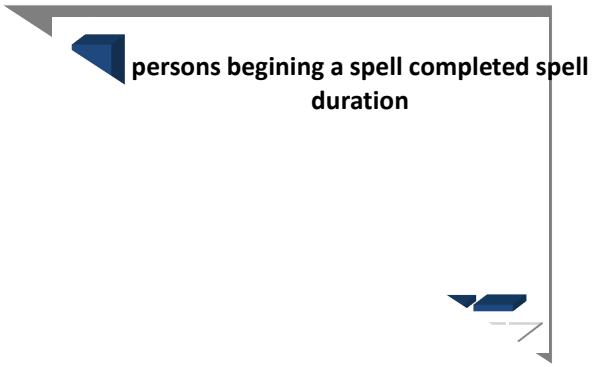
Main insights

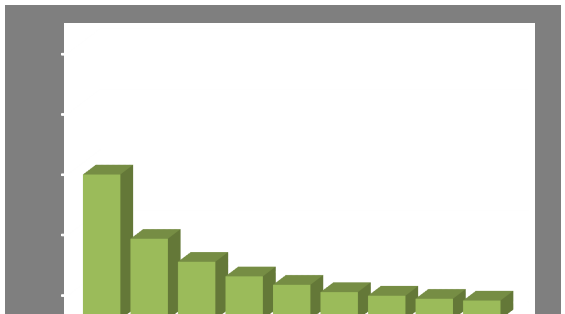
- Most of the people who are ever poor will have short stay in poverty
- But, the bulk of poor at a moment in time will have long stay in poverty

The spell approach

Distribution of spells







data issues

The spell approach

Calculation of exit probability by duration spent poor (Life table)

$$p_e = \frac{N_{exit}}{N_{poor_{t-1}}}$$

Poverty Duration, d	Poverty exit probability, p_e
1	0.445
2	0.285
3	0.246
4	0.208
5	0.197
6	0.145
7	0.128
8	0.074
9	0.083

The spell approach

- **Advantages**
  Easily understood and transparent measure of poverty dynamics
- **Limitations**
  - Pb linked to limited observation period
  - Left and right censoring
  - Spell durations give partial information on dynamics. They should be examined together with poverty exit and entry rates

Poverty entry and exit rates

General idea

- Complementary to other approaches: a increase in poverty can either arise from a decrease in exit rate or in increase in entry rate
- Formally, the exit rate is the fraction of people poor at t that are not poor at t+1 $s = \frac{nP_t}{P_{t-1}}$
- Similarly, the entry rate is the fraction on non-poor at t who become poor at t+1: $e = \frac{P_t}{nP_{t-1}}$

Poverty entry and exit rate

Transition matrix

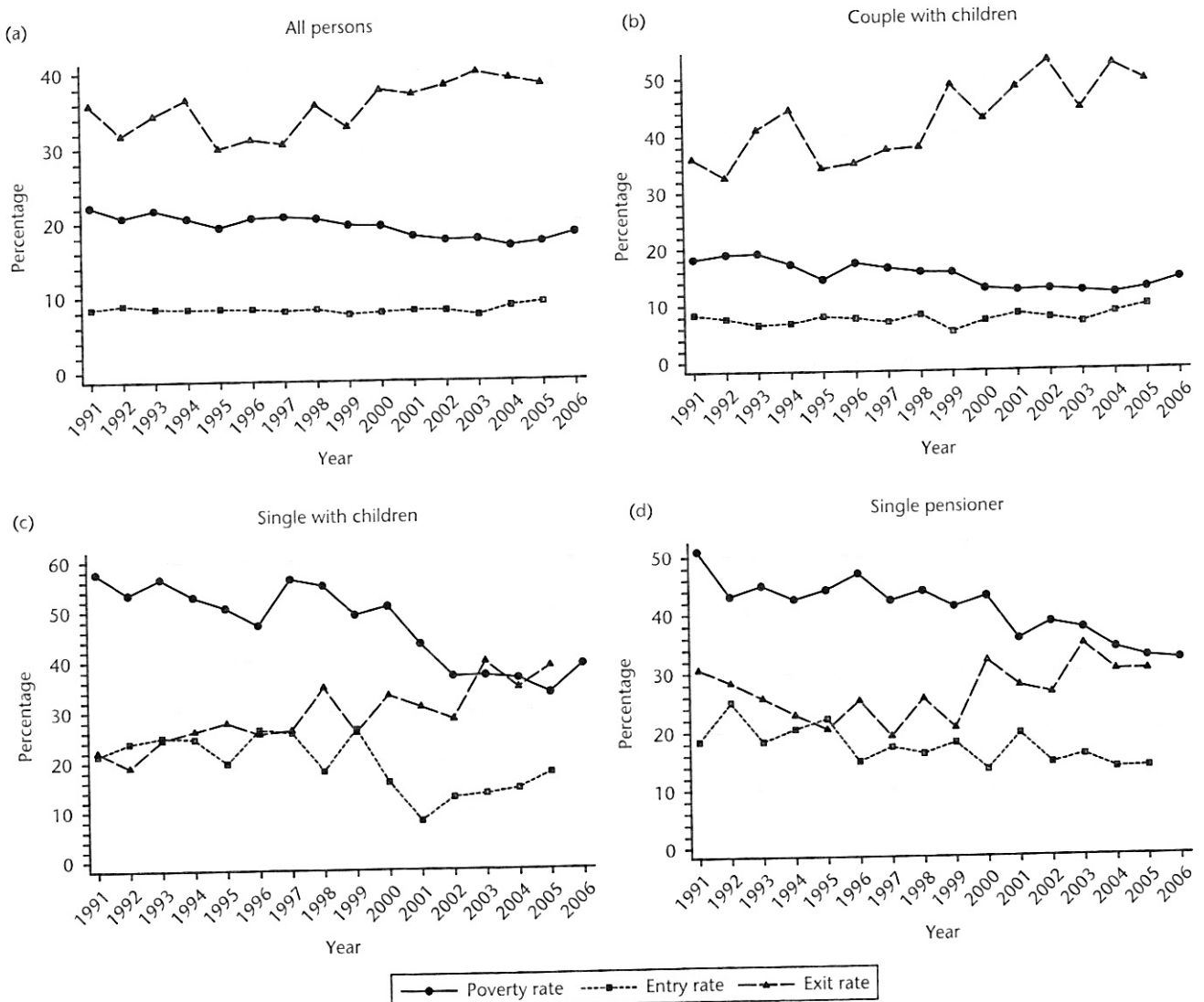
	Poverty status, year t	
Poverty status, year t-1	Not poor	Poor
(a) Complete Panel: Sample size=43626 observations, 16126 households		
Not poor	55,67	44,33
Poor	17,84	82,16
All	27,46	72,54
(b) Balanced Panel: Sample size=18545 observations, 6139 households		
Not poor	56,51	43,49
Poor	18,04	81,96
All	27,81	72,19

The poverty line is evaluated at 988600 Fmg in 2001 (INSTAT, 2002) and is deflated by the national IPC for the other years.

Table 1: Poverty transition matrix, ROR surveys 1999-2006, pooled data

Poverty entry and exit rate

Evolution over time by group



Component approach

General idea

- Measuring the chronic and transient component of poverty
- Chronic component: the poverty level that would be observed if intertemporal variability in consumption has been smoothed out
- Transient Component: contribution of consumption variability to observed poverty

Component approach

Seminal papers

- Jalan and Ravaillion (1998) Determinants of Chronic and Transient Poverty. Evidence from Rural China.
- Ravaillion (1988). The poverty cost of welfare variability. The Economic Journal, Vol 98, Issue 393, Dec, pp 1171-1182.

Component approach

Formal writing

- Living standard stream:

$$y_i = (y_{i1}, ..., y_{it}, ...y_{iT})$$

- Intertemporal mean

$$\overline{y_i} = \sum_{t=1}^{T} y_{it}$$

- Household/ Individual total poverty

$$\begin{aligned} P_i &= \frac{1}{T} \sum_{t=1}^{T} (\frac{y_{it} - z}{z})^2 \text{ if } y_{it} \lessdot z \\ P_i &= 0 \text{ if } y_{it} \lessdot z \end{aligned}$$

Component approach

Formal writing

- Chronic Poverty

$$C_i = (\frac{\overline{y_i} - z}{z})^2 \text{ if } \overline{y_i} \lessdot z$$
$$C_i = 0 \text{ if } \overline{y_i} \lessdot z$$

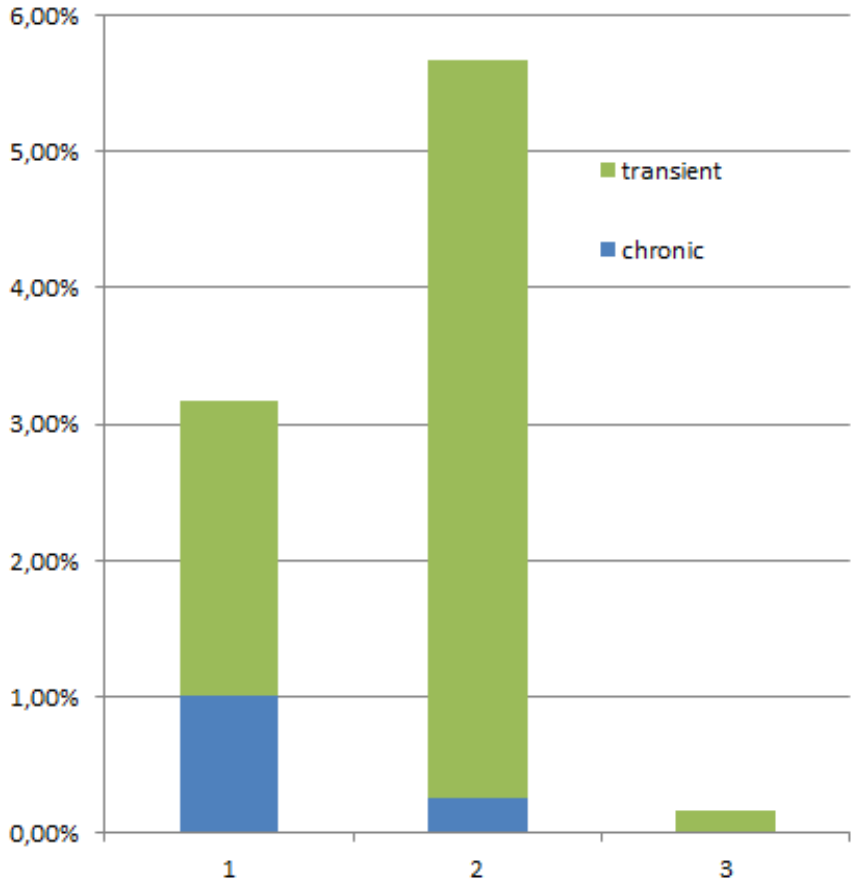
- Transient Poverty

$$T_i = P_i - C_i$$

Component approach

Illustrative example

Household	1	2	3
Period		living standard (l.s)	
1	0,9	1,2	1
2	0,8	0,5	1,3
3	0,8	1	0,9
4	0,7	0,7	1,2
5	1,3	1,1	1,7
6	0,9	1,2	1,7
Mean l.s.	0,9	0,95	1,3
Poverty line	1	1	1
Total poverty	3,17%	5,67%	0,17%
Chronic	1,00%	0,25%	0,00%
Transient	2,17%	5,42%	0,17%



Component approach

Relevance

- Appealing because of its simplicity
- Sub-group and sub period decomposition are possible (FGT index)

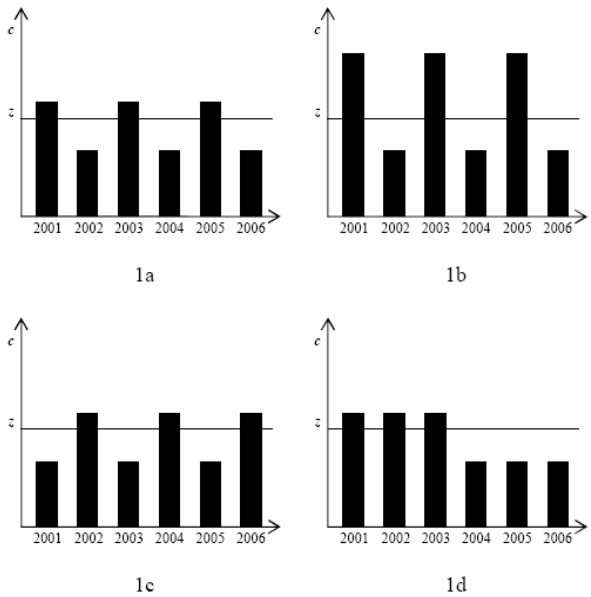
Component approach

Limitations

- What is the best observation window? No clear answers
- This approach is not sensitive to the duration in poverty $=>$ awkward situations (examples)
  $=>$ EDE approach: Duclos, Araar and Giles (2006)
- Transform longitudinal information into cross-sectional information (unless you have a very long panel)$=>$ limit trends and multivariate analyses possibilities

Intertemporal Poverty Measurement

General idea



Main issues:

- Compensation of poverty spells by non poverty spell
- Discount rates

  $\Longrightarrow$ the temporal aggregation hypotheses is an empirical issue

Trigger events

Seminal paper

- Bane and Ellwood (1986), Slipping into and out of poverty. The dynamics of poverty spells. *Journal of Human Resources 21(1):23*
- United states, annual panel data, 1970-1982
- Not multivariate, but arguably informative about the proximate drivers of transitions
- The steps of the methods:

1. Identifying poverty spell
2. Calculation of exit probability
3. Distribution of poverty spells
4. Identification of entry/ exit event

Trigger Events

General idea

- Mutually exclusive hierarchical classification