

Towards a Multidimensional Poverty Index for Germany

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Outline

- ① Introduction
- ② Operationalization, Data, and Methods
- ③ Results
- ④ Concluding Remarks

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- 2 Operationalization, Data, and Methods
- 3 Results
- 4 Concluding Remarks

Motivation

The German context

- The current reports on poverty and wealth (RPW)
 - ① conceptually draw on capability approach and conditions of life approach
 - ② many poverty-relevant aspects are discussed and analysed
 - ③ however, mostly using marginal distributions of deprivation
 - ④ lack a summary measure
 - ⑤ recently found difficulties in operationalizing capability deprivations
- major labour market liberalization around 2005

Purpose of this proposal

- ① make poverty visible and bring into focus of policy makers
- ② subject specification to public discussion
- ③ complement the RPW with a summary good measure

Overview

- to bring poverty into focus
 - ① conceptually well-grounded framework: capability approach (CA)
 - ② sound methodological framework: Alkire Foster method (AFM)
 - ③ good data: German Socio-economic panel (SOEP)
- preview of results
 - ① several results found by earlier studies are reflected (**consistency**)
 - ② opposing trends in indicators are covered: more comprehensive picture (**value-added**)
 - ③ modest overlap in identification of poor between income- and MD measures (**relevance**)
- discussion on income as a dimension.

Related Literature

- Sen (1979, 1985, 1992, 1999) essentially developed the Capability Approach (CA). Other important contributions are Nussbaum (1995, 2001).
- Significant advances in (MD) poverty measurement (Tsui, 2002; Atkinson, 2003; Bourguignon and Chakravarty, 2003)
- Among other things the literature on material deprivation introduced a lot of variables in many data sets (Townsend, 1979; Yitzhaki, 1979; Whelan et al., 2014)
- Contributions aiming at measuring poverty and well-being in Germany Peichl et al. (2010); Rippin (2012)

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Operationalization

- importance of conceptual framework is emphasised by [Lazarsfeld \(1958\)](#); [Robeyns \(2003\)](#)
- Implications by the CA:
 - ① Poverty and well-being are inherently MD and functionings receive intrinsic importance.
 - ② Poverty as capability deprivation requires low functioning achievement **and** infeasibility of a higher one.
 - ③ Value judgements are to be revealed, such that they can be subjected to public debate and scrutiny.
 - ④ Income is a means and although important it is of instrumental relevance only.
- choice of dimensions and cutoffs is guided
 - ▶ inter alia by the RPW, [Stiglitz et al. \(2011\)](#), [OECD \(2011\)](#)

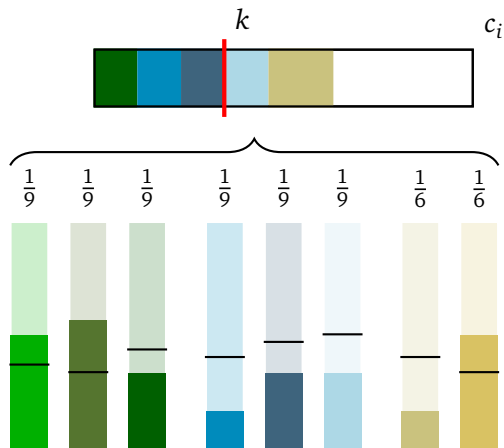
The Alkire-Foster Method

- Notation: y_i is the $1 \times D$ achievement vector of individual $i = 1, \dots, N$ in dimensions $d = 1, \dots, D$ with $y_{id} \geq 0$. See [Alkire and Foster \(2011a,b\)](#) for details.
- The identification function is $\rho_k(y_i, z) = \mathbb{1}(c_i \geq k)$ for $k = 1, \dots, D$ with $c_i = \sum_{d=1}^D \mathbb{1}(y_{id} \leq z_d)$ being the counting vector and z containing D deprivation cut-offs.
- Aggregation yields the adjusted headcount ratio $M_0 = \frac{1}{N} \sum_{i=1}^N c_i(k) = H \times A$ where $c_i(k) = \mathbb{1}(c_i \geq k)c_i$ is the censored counting vector, $H = q/N$ with $q = \sum_{i=1}^N \mathbb{1}(c_i \geq k)$ the headcount ratio, and $A = \sum_{i=1}^N c_i(k)/(qD)$ the average intensity.
- Note: Other measures of the FGT-class ([Foster et al., 1984](#)) can be applied as well.

The Alkire-Foster Method

informal version

Identification



Aggregation:

- $q = \sum_i \mathbb{1}(c_i \geq k)$
- $H = \frac{q}{N}$
- $A = \frac{1}{qD} \sum c_i(k)$
- $M_0 = H \times A$

Selecting Dimensions

dimension	NB	ACMN	SSF	OECD	RPW	functioning
education	✓	✓	✓	✓	✓	✓
health	✓	✓	✓	✓	✓	✓
housing	(✓)	✓	✓	✓	✓	✗ (shelter, health, privacy)
social participation	✓	✓	✓	✓	✓	✓
political participation	✓		✓	✓	✓	✓
agency						✓
practical reason	✓				(✓)	✓
self-respect	✓					✓
employment	(✓)	✓	✓	✓	✓	✗ (self-respect, agency)
income		✓		✓	✓	✗ (multipurpose)
material deprivation	(✓)	✓	✓		✓	✗ (numerous, depends on items)
environment aspects	✓	✓	✓	✓	✓	✗ (health, shelter)
time (activities)			✓	✓	✓	✗ (multipurpose)
personal security	(✓)	(✓)	✓	✓	(✓)	(✓)

NB is [Nussbaum \(2001\)](#), ACMN is [Atkinson et al. \(2002\)](#), SSF is [Stiglitz et al. \(2011\)](#), OECD is [OECD \(2011\)](#)

- I use use PanelWhiz ([Haisken-DeNew and Hahn, 2010](#)) to extract SOEP data ([Wagner et al., 2007](#)).
- As some information is gathered only every other year, I merge two consecutive years into one period. Thus, the sample contains three periods: 2001/02, 2006/07, 2011/12, each consisting of 16,000-18,000 individuals.
- Subsequent analyses use inverse sampling probability weights to account for stratification.

Specification

Functioning	Deprivation Cut-off	Variable	Weight
Education	elementary schooling not completed or elementary schooling completed but no vocational qualification	dep_educ	1/12
	less than 10 books in household	dep_nbooks	1/12
Housing	house requires major renovation or is ready for demolition	dep_housecond	1/18
	neither of bath or shower, kitchen, warm water, toilet	dep_hhfacilities	1/18
	overcrowded (less than one room per person)	dep_overcrowded	1/18
Health	partially or severely disabled	dep_disability	1/18
	reporting 2/4 health issues	dep_healthidx	1/18
	body mass index larger than 30	dep_obesity	1/18
Practical Reason	reporting 2/4 goods missing for financial reasons	dep_matdep	1/18
	precariously employed (incl. temporary work)	dep_precemp	1/18
	none of life insurance, pension, owning the house or apartment, other house, financial assets, commercial enterprise, tangible assets	dep_wealth	1/18
Social Participation	5/7 activities performed <i>never</i> ; remaining at most <i>less than monthly</i>	dep_actindex	1/12
	never meeting friends	dep_meetfriends	1/12
Employment	unemployed	dep_unemp	1/6
	invol. hours worked < 30	dep_underemp	1/12

Details on subindices

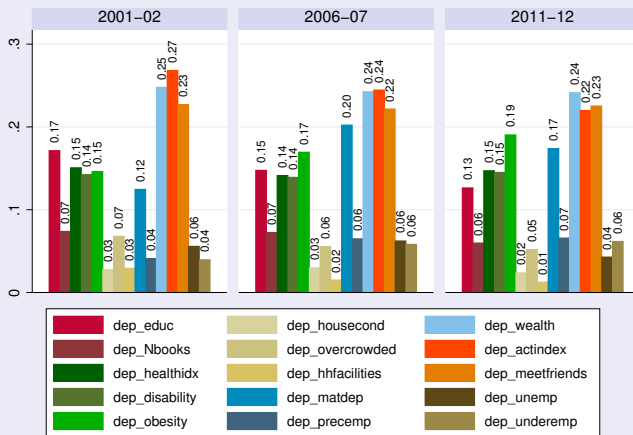
- 1 social participation (*weekly, monthly, less than monthly, never*)
 - ▶ Going to the movies, pop music concerts, dancing, disco, sports events
 - ▶ Going to cultural events (such as concerts, theater, lectures, etc.)
 - ▶ Doing sports yourself
 - ▶ Volunteer work in clubs or social services
 - ▶ Attending church, religious events
 - ▶ Helping out friends, relatives or neighbors
 - ▶ Involvement in a citizens' group, political party, local government
- 2 health
 - ▶ *strong* limitation when climbing stairs
 - ▶ *strong* limitation for tiring activities
 - ▶ physical pain occurred *always* or *often* during the last 4 weeks.
 - ▶ health condition limited *always* or *often* socially
- 3 material deprivation
 - ▶ no warm meal with meat or equivalent every other day
 - ▶ friends are not invited for dinner
 - ▶ no money is put aside for emergencies
 - ▶ worn out furniture is not replaced

Remarks on Specification: Practical Reason

- Nussbaum (2001) p.78
 - ▶ “All human beings participate (or try to) in the planning and managing of their own lives, asking and answering questions about what is good and how one should live. Moreover, they wish to enact their thought in their lives—to be able to choose and evaluate, and to function accordingly.”
- Operationalization draws on research summarized by Mullainathan and Shafir (2013)
 - ▶ individuals **focus** on making ends meet or are **captured** by their worries. Consequently, they **systematically** neglect other aspects in decision making.
 - ▶ lack of slack (and ‘deliberate’ slack \approx insurance against life’s vagaries)
 - (a) you have to choose (occupies cognitive resources)
 - (b) no room to fail
- Note: both the CA and experimental approach emphasize the poors’ role as agents rather than patients.

Incidence of Deprivations

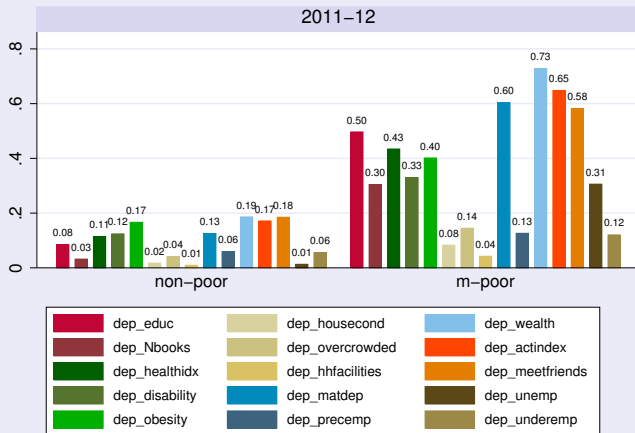
uncensored (or raw) headcounts



Graphs by period

deprivations: m-poor vs. non-poor

deprivation headcounts by poverty status



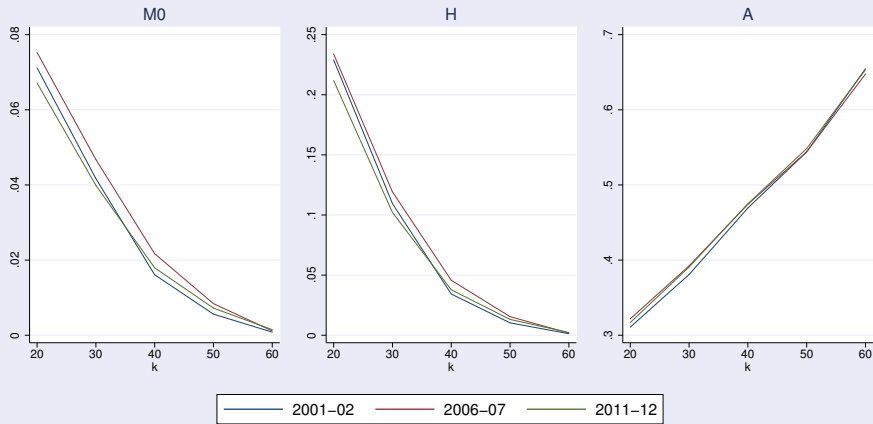
k=30

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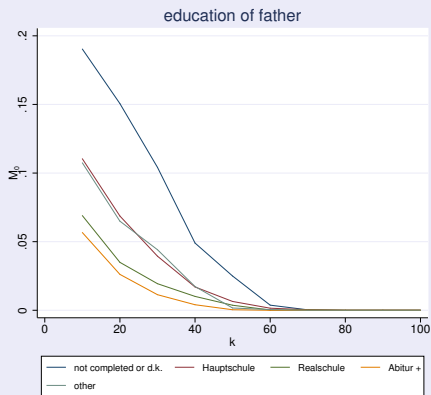
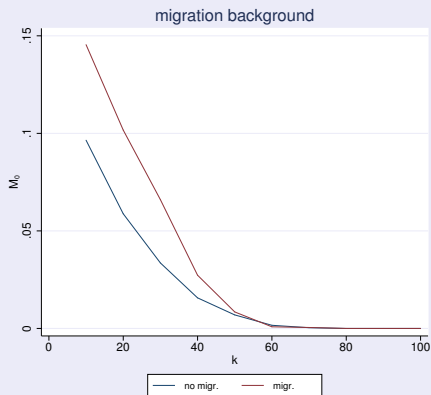
Aggregate Measures

adjusted headcount, censored headcount, and average intensity



Aggregate Measures II

adjusted headcount by subpopulations



period of analysis: 2011/2012

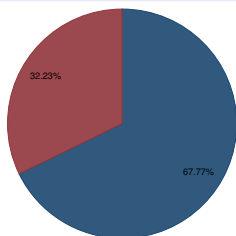
Note: in 2012 20% have a migration background, further population shares are: not completed 10%, Hauptschule 59%, Realschule 15%, Abitur 13%, other 3%.

Aggregate Measures III

- $M_0 = \sum_{g=1}^G \frac{N_g}{N} M_0$ with $\sum_{g=1}^G N_g = N$

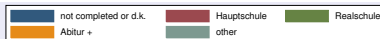
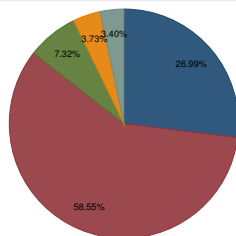
contributions to M_0 by subpopulations

migration background



Note: k=30, period of analysis: 2011-12

education of father

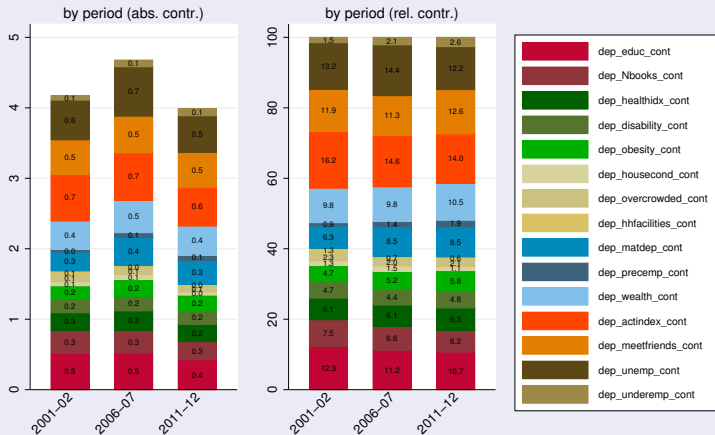


Note: k=30, period of analysis: 2011-12

- Note: people whose father has “low” education account for ca. 89% of the multidimensional poverty in 2011/2012.

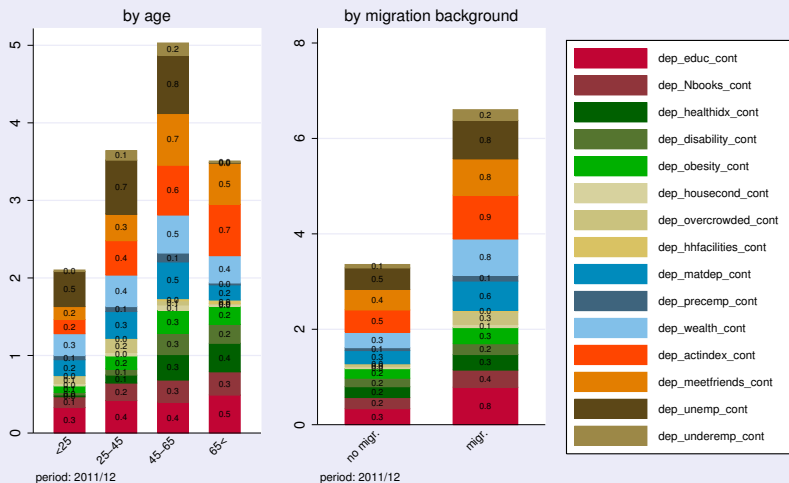
Dimensional Breakdown

- $M_0 = \sum_{d=1}^D \frac{w_d}{D} \underline{H}_d$, where $\underline{H}_d \equiv \frac{1}{N} \sum_{i=1}^N \mathbb{1}(c_i \geq k \wedge y_{id} \leq z_d)$



Note: $k=30$, absolute contributions to M_0 are multiplied by 100.

Dimensional Breakdown II

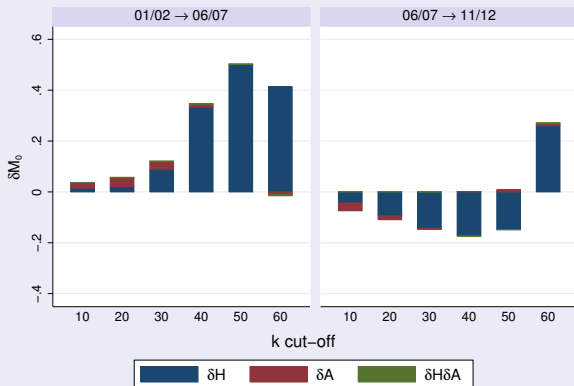


Note: $k=30$, absolute contributions to M_0 are multiplied by 100.

Analysing the changes

- $\delta M_0 = \delta H + \delta A + \delta H \times \delta A$

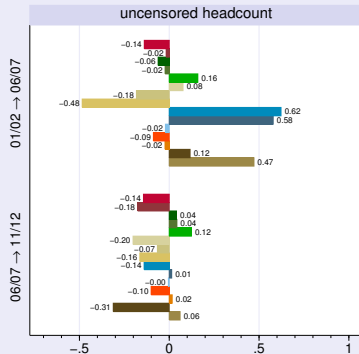
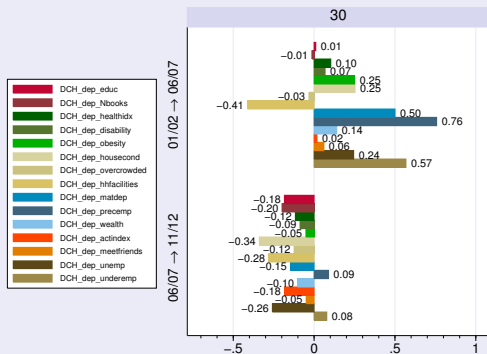
Decomposition of δM_0



Graphs by change

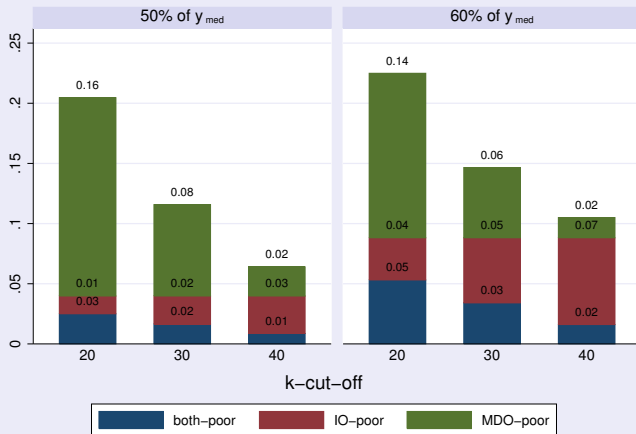
Analysing the changes II

Relative Changes in Indicators



Comparing MD- and inc-poverty measures

population shares identified as poor by respective measures



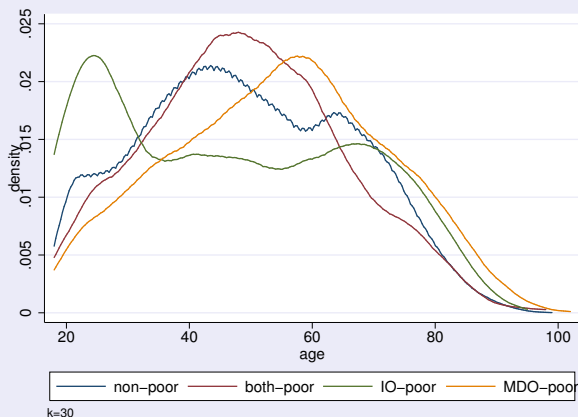
period of analysis: 2011–12; y is real net household equivalence income.

Discussion

- ① What exactly is the role of (un-) employment?
- ② Important Missing dimensions: agency, without shame, ...
- ③ Using MD-measures facilitate measurement in capability deprivation since they exploit the joint distribution in the identification step, and thereby support the “infeasibility”-assumption of not achieved functionings.
- ④ Should we add a lack of income as a dimension?
 - ▶ Does it add something or do we double count?
 - ▶ Are there missing dimensions we could capture using a lack of income?
 - ▶ Who are the only income-poor and what are their deprivations?
 - ▶ What type of cutoff (absolute vs. relative)?

Who are the only MD-poor and the only income-poor?

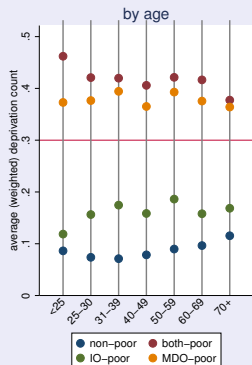
age distributions by poverty-status



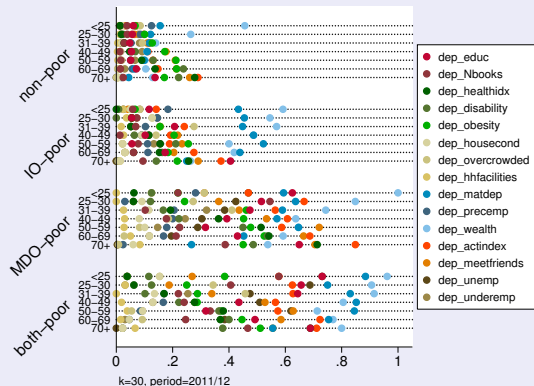
- Note: Persons aged < 30 represent $\sim 30\%$ of the income-poor only.

What are the deprivations of the inc-poor?

average deprivation count and raw headcounts



k=30, y-cut-off 60%, period of analysis: 2011/12



- including income as dimension we implicitly assign more weight to other strongly income driven deprivations as well.

Limits and Challenges

- homeless people are not covered by survey
- job quality is still crudely measured
- e.g., hidden unemployment goes undetected
- more emphasis on work, however, implies less weighted deprivation for retired (and the non-labour force more generally)
- variation in deprivations along life-cycle may justify additional separate measures

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Concluding Remarks

- 1 MD measures are **consistent with earlier findings**, e.g., that elderly or people with migration background suffer more poverty. Likewise, there is a strong association with fathers' education.
- 2 While the **structure of poverty** is remarkably stable over time, some people exhibit specific profiles of poverty (e.g., elderly or migrants).
- 3 Decomposing changes in MD poverty may **uncover opposing trends**, thus contributing to a better understanding of poverty.
- 4 Practical reason and social participation appear to be important dimensions.
- 5 A **modest overlap** between income and MD measures in identifying the poor, suggests income-only-based measures to be a weak proxy. Moreover, at least some of the only income-poor hardly lead a truly deprived life.

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