Material deprivation in the EU

Revising the current indicators and exploring the deprivation order in EU countries

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- Since 2009, EU portfolio of commonly agreed social indicators includes measures of material deprivation (MD), conceived as an enforced lack of a combination of nine items depicting material living conditions.
- Why?
  - To complement income poverty figures
  - To better reflect differences in actual standards of living across EU (esp. since last enlargement)
- Since June 2010, importance of MD indicators has grown significantly: launch of Europe 2020 Strategy.

CURRENT MD INDICATORS AT THE EU LEVEL

- **Severely materially deprived** persons have living conditions very severely constrained by a lack of resources; the household in which they live experience at least 4 out of 9 following problems. They cannot afford: i) to pay rent or utility bills, ii) to keep home adequately warm, iii) to face unexpected expenses, iv) to eat meat, fish or a protein equivalent every second day, v) a week holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV, and/or ix) a telephone

- **Materially deprived** persons have living conditions severely constrained by a lack of resources; they experience at least 3 out of 9 problems.

REVISION OF EU MD INDICATORS

Why? Small number of items they are based on (due to small number of relevant items included in the core part of EU-SILC) + weak reliability of some of these items.

How?

- Consensus Eurobarometer survey (2007) on "how necessary are a large list of items to have a decent life in each country";
- Collection of additional "necessary" MD items in the 2009 thematic EU-SILC module on MD;
- EU Task-Force on MD worked on improving these indicators and on developing 1+ indicators focused on child MD [see Net-SILC2 paper: Guio, Gordon and Marlier (2012)]

CONCEPTUAL FRAMEWORK

- The approach we have followed is both theory and data driven.
- It leads to MD indicators covering some key aspects of living conditions which appear to be customary in the *whole EU* and from which some people are excluded *due to a lack of resources*.

➔ Our concept of MD is consistent with Townsend's theory of relative deprivation and with the definition adopted by the EU Council of Ministers in 1985.

➔ "The essential interest here is not so much in the individual items per se as in the underlying situation of more generalised deprivation that they can help to capture" (Marlier at al, 2007, p.177).

➔ Focus is on "*enforced lacks*", i.e. lacks due to insufficient resources NOT to lack due to choices (Mack and Lansley, 1985).

ANALYTICAL FRAMEWORK

Step by step, we have looked at…

- The dimensional structure of the whole set of items.
- The suitability of MD items for individual EU countries and for population sub-groups within countries, by looking at the extent to which people want/do not want a given item.
- The validity of each MD item, by ensuring that they all exhibit statistically significant relation with variables known to be correlated with MD (AROP, subjective poverty and health).
- The reliability of the scale (Cronbach's alpha) and of individual items (IRT).
- The additivity of MD items, by checking that someone say with an MD index score of 2 is in reality suffering from more severe MD than someone with a score of 1, i.e. that the MD index components add up.

13 items (out of 32 collected in 2009) are suitable, valid, reliable and additive measures of MD in all EU countries (see Guio, Gordon, Marlier (2012))

- 1) coping with unexpected expenses;
- 2) one week's annual holiday away from home;
- 3) avoiding arrears (in mortgage or rent, utility bills or hire purchase instalments);
- 4) a meal with meat, chicken, fish or vegetarian equivalent every second day;
- 5) keeping the home adequately warm;
- ~~6) a washing machine;~~
- ~~7) a colour TV;~~
- ~~8) a telephone;~~
- 9) a personal car.

1. to replace worn-out clothes by some new ones;
2. to afford two pairs of properly fitting shoes;
3. to have some pocket money;
4. to get a drink/meal at least monthly;
5. to have regular leisure activities;
6. to replace worn-out furniture;
7. to afford a computer and an internet connection.

HEAT MAP: NATIONAL INCIDENCE/EU AVERAGE (RATIO > 1 ➔ NATIONAL DISADVANTAGE)

	BG	RO	LV	HU	LT	PT	PL	SK	EL	MT	EE	SI	CY	CZ	DE	FR	IT	IE	BE	ES	UK	AT	FI	DK	NL	LU	SE
Inadequate warmth	7.1	2.4	1.8	1.0	2.7	3.2	1.8	0.4	1.8	1.2	0.2	0.6	2.1	0.6	0.6	0.7	1.2	0.4	0.6	0.7	0.7	0.3	0.1	0.1	0.1	0.0	0.1
Clothes	5.4	3.3	3.3	3.1	2.3	2.0	1.5	1.0	1.0	1.6	0.9	1.3	0.6	0.5	0.7	0.8	0.8	0.5	0.6	0.3	0.6	0.6	0.6	0.6	0.2	0.4	0.2
Computer & Internet	4.6	3.8	1.4	1.8	1.8	1.6	2.0	2.0	2.2	0.2	1.2	0.6	0.4	1.4	0.4	0.8	1.0	0.8	1.0	0.8	0.4	0.8	0.6	0.2	0.2	0.2	0.0
Meat, fish…	4.1	2.7	2.6	3.0	2.2	0.4	1.9	2.7	0.9	1.1	0.8	1.2	0.4	1.1	1.0	0.8	0.7	0.2	0.6	0.2	0.4	1.1	0.3	0.1	0.2	0.1	0.1
Shoes	3.7	3.0	3.3	1.0	0.7	2.3	1.0	1.0	0.3	0.3	0.7	0.7	0.3	0.3	1.0	1.3	0.7	0.7	0.3	0.3	0.7	0.3	0.3	0.3	0.3	0.3	0.0
Arrears	3.2	2.5	2.0	2.0	0.9	0.8	1.3	1.2	2.6	0.7	1.1	1.6	1.9	0.5	0.5	1.0	1.2	1.3	0.6	0.8	0.4	0.6	1.0	0.5	0.4	0.4	0.6
Drink/meal	3.0	3.8	1.6	2.6	1.7	1.5	0.9	0.6	0.4	1.3	0.6	0.4	0.3	0.2	1.5	0.4	0.7	0.6	0.7	0.5	0.7	0.5	0.1	0.1	0.1	0.3	0.5
Furniture	2.9	2.6	2.3	2.1	1.7	2.0	1.3	1.5	1.7	1.7	1.6	1.3	1.7	1.7	0.7	1.2	0.1	0.6	0.7	1.3	0.5	0.4	0.4	0.4	0.7	0.5	0.2
Car	2.8	5.2	2.9	2.3	1.7	1.1	1.6	2.1	0.9	0.2	2.0	0.3	0.1	1.1	0.7	0.4	0.2	1.0	0.8	0.4	0.6	0.6	0.9	0.9	0.4	0.2	0.2
Pocket money	2.8	2.9	1.9	2.1	1.9	1.4	1.2	1.1	0.6	0.8	0.7	0.6	0.3	0.7	0.8	0.8	1.0	0.8	0.6	0.6	1.0	0.7	0.1	0.3	0.3	0.4	0.2
Leisure activity	2.5	3.2	1.9	1.8	2.0	1.4	1.4	0.6	1.1	0.9	0.5	0.9	0.4	0.4	1.1	0.6	0.9	0.4	0.7	0.5	0.8	0.8	0.2	0.2	0.4	0.3	0.2
Unexpected expenses	1.7	1.2	2.0	2.1	1.5	0.8	1.4	1.0	0.8	0.8	0.9	1.2	1.1	1.1	1.0	0.9	0.9	1.4	0.7	0.9	0.9	0.7	0.8	0.7	0.5	0.7	0.5
Holidays	1.6	2.1	1.6	1.8	1.0	1.7	1.6	1.5	1.2	1.7	1.3	0.8	1.1	1.1	0.6	0.8	1.1	1.1	0.7	1.1	0.7	0.7	0.4	0.3	0.4	0.4	0.2

USING THE ALTERNATIVE INDICATOR (MD 5+) (GUIO & MARLIER, 2014)

- "*adds*" to the population identified by the current standard EU MD indicator a group of people who cumulates a large number of deprivations, encompassing "basic" and "social" items;
- "*drops*" from the population identified by the current standard indicator a group of people who have a high probability to suffer from a small number of deprivations and who are not severely deprived;
- "*keeps*" the more vulnerable population, either in terms of the number of items lacked (whatever the scale used) or in terms of the probability to lack each individual item in the list.

Using both the 13 items (2009) and longitudinal data (2009-11), Guio & Pomati (2015):

- Explore which items people have to go without as their resources decrease/deprivation increases;
- To know whether the deprivation pattern differs between EU Member states and within each Member state ;
- To know whether using cross-sectional and longitudinal data highlights a similar deprivation pattern, and to check whether the pattern is independent of the methodological choices made to determine the rankings;

PERCENTAGE OF PEOPLE WHO CAN'T AFFORD EACH ITEM, BY LEVEL OF MD, EU

METHOD 1 (deprivation order – Deutsch and Silber (2008)):

- This method compares the deprivation order of each case in a dataset to all the possible orders.
- If two items (enforced lack of holidays and shoes), there are 2 possible orders of curtailment (holidays first then shoes, or shoes first then holidays). If the order is (Holidays, Shoes), then ➔ 3 possible patterns in data consistent with this order:

Holidays	Shoes
0	0
1	0
1	1

- We compare each case in our dataset to this pattern, and allocate errors to each case. We aggregate the total amount of error for each possible order and choose the order with the lowest error.

LONGITUDINAL EXTENSION

Important to extend the methodology to be used on panel data, because curtailment is by definition a temporal process which, ideally, to be fully understood necessitates panel data.

WAVE 1		WAVE 2	
Holidays	Shoes	Holidays	Shoes
0	0	0	0
0	0	1	0
1	0	0	0
0	0	1	1
1	0	1	0
1	1	0	0
1	0	1	1
1	1	1	0
1	1	1	1

LONGITUDINAL MD ORDER – 6 items

Cost of longitudinal extension: only six items available in longitudinal EU-SILC and method even more complex.

Results at EU level:

1. Holidays
2. Unexpected expenses
3. Meat/chicken/fish
4. Home warm
5. Arrears
6. Car

NATIONAL LONGITUDINAL MD ORDER

- Homogeneity across EU Member States
- Longitudinal order very close to cross-sectional order

		EU-27	AT	BE	BG	CY	CZ	DK	EE	ES	FI	HU	IT	LT	LU	LV	MT	NL	PL	PT	RO	UK
Holidays	CS	1	2	1	2	1	1	2	1	1	2	2	1	2	2	2	1	2	1	1	1	2
	LONGI	1	2	1	2	1	1	2	1	1	2	2	1	2	2	2	1	2	1	1	1	2
Unexp. expenses	CS	2	1	2	3	2	2	1	2	2	1	1	2	1	1	1	2	1	2	3	3	1
	LONGI	2	1	2	3	2	2	1	2	2	1	1	2	1	1	1	2	1	2	3	2	1
Meat/ chicken/ fish	CS	3	3	5	4	5	3	4	4	6	4	3	4	3	4	3	3	6	3	5	4	4
	LONGI	3	3	5	4	5	4	4	4	5	5	3	5	4	4	3	3	5	3	6	6	5
Home warm	CS	4	6	4	1	3	5	6	6	4	6	6	3	4	5	6	4	5	4	2	5	3
	LONGI	4	6	4	1	3	5	5	6	4	6	6	4	3	5	6	6	4	4	2	5	4
Arrears	CS	5	4	3	5	4	6	3	5	3	3	4	5	6	3	5	5	3	5	6	6	5
	LONGI	5	4	3	5	4	6	3	3	3	3	4	3	6	3	5	4	3	5	5	4	3
Car	CS	6	5	6	6	6	4	5	3	5	5	5	6	5	6	4	6	4	6	4	2	6
	LONGI	6	5	6	6	6	3	6	5	6	4	5	6	5	6	4	5	6	6	4	3	6

CROSS SECTIONAL ORDER – 13 ITEMS

➔MORE Items available but Deprivation order obtained by comparing deprivation pattern of people with different MD level at one point in time (EU-SILC 2009)

1. Holidays
2. Unexpected expenses
3. Furniture
4. Pocket Money
5. Leisure
6. Drink/meal out
7. Clothes
8. Meat/chicken/fish
9. Home warm
10. Arrears
11. Car
12. Computer/Internet
13. Shoes

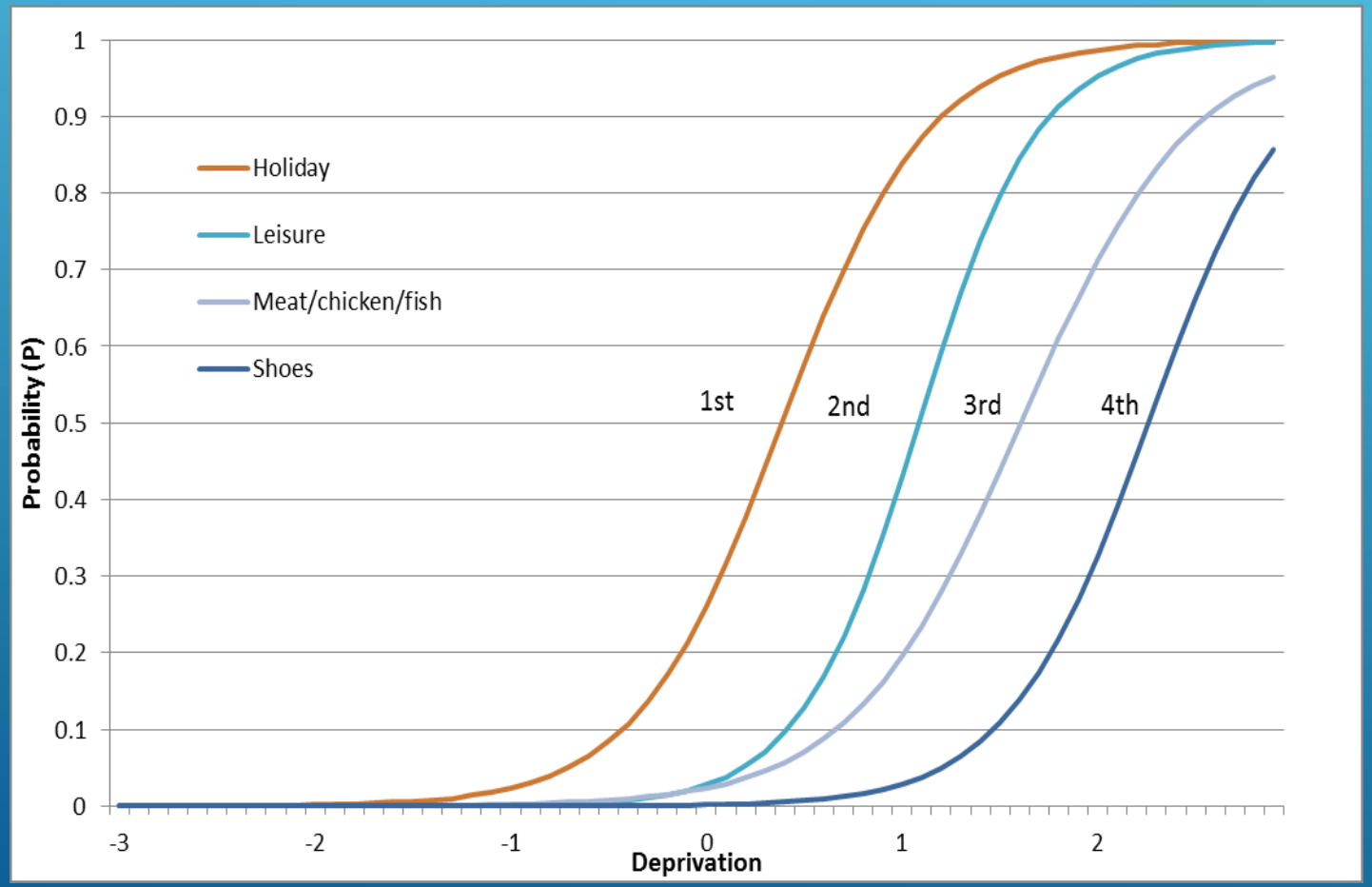
CROSS SECTIONAL MD ORDER EU COUNTRIES

	EU-27	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
Holidays	1	2	1	3	2	2	2	2	1	2	1	2	3	2	2	1	2	2	2	1	3	1	1	1	2	3	1	2
Unexp. expenses	2	1	2	4	3	3	1	1	3	3	3	1	2	1	1	2	1	1	1	3	1	2	8	7	1	1	3	1
Furniture	3	5	3	1	1	1	6	3	2	1	2	3	1	3	3	11	3	3	3	2	2	3	2	2	6	2	2	6
Leisure	5	3	4	8	6	6	4	6	7	6	5	7	5	5	7	4	4	5	5	5	4	4	5	4	5	5	7	4
Pocket money	4	4	6	6	8	5	5	5	5	8	4	6	4	6	5	3	5	4	6	6	5	5	4	5	4	7	6	3
Drink/ meal out	6	6	5	7	9	10	3	7	8	9	6	8	8	4	6	5	6	6	7	4	6	6	6	3	8	9	8	5
Clothes	7	8	7	5	7	9	8	4	6	7	8	5	7	7	13	6	7	7	4	7	7	7	7	8	7	6	9	7
Meat/ chicken/ fish	8	7	10	9	10	4	7	10	9	10	13	9	9	8	11	8	8	10	8	8	12	8	12	9	11	8	4	9
Home warm	9	12	9	2	4	11	9	12	13	5	9	12	11	11	9	7	9	11	11	9	11	9	3	10	12	10	13	8
Car	11	10	11	11	12	7	12	11	4	12	12	10	12	10	8	13	10	12	9	11	9	11	10	6	9	12	5	12
Arrears	10	9	8	10	5	12	10	8	10	4	7	4	6	9	4	9	11	9	10	10	8	10	13	11	3	4	11	11
Computer Internet	12	11	12	12	13	8	13	13	11	11	10	11	13	12	10	10	12	13	12	12	13	12	11	12	13	11	10	13
Shoes	13	13	13	13	11	13	11	9	12	13	11	13	10	13	12	12	13	8	13	13	10	13	9	13	10	13	12	10
R	0.94	0.96	0.96	0.89	0.95	0.95	0.96	0.98	0.94	0.92	0.96	0.98	0.96	0.91	0.96	0.96	0.91	0.98	0.90	0.94	0.98	0.92	0.93	0.88	0.98	0.95	0.93	0.96

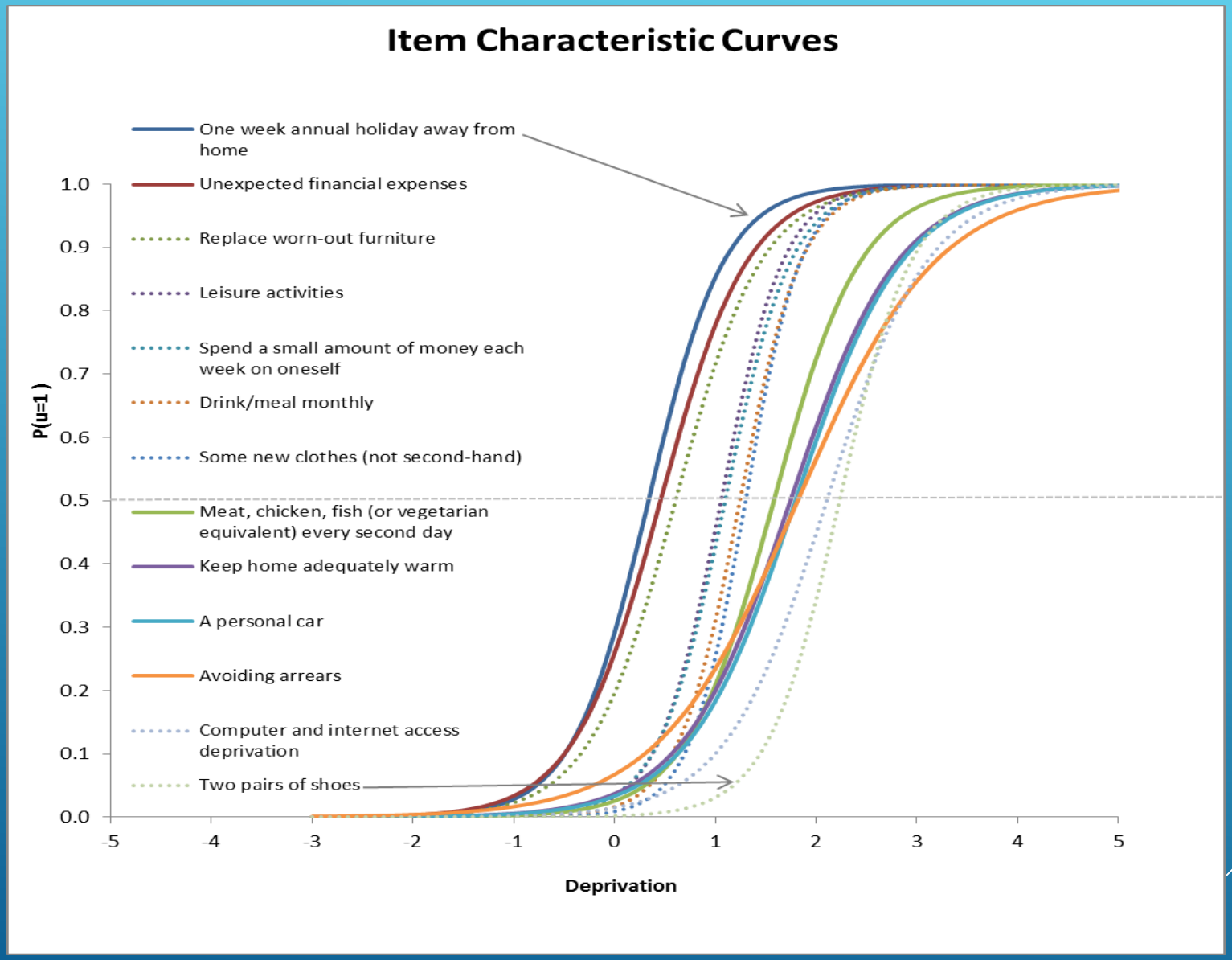
Item response theory (IRT) is a set of statistical models that describe the relationship between item responses and an unobserved latent trait, such as material deprivation.

$$P(X_{ij} = 1 \mid \theta_i, \beta_j, \alpha_j) = \frac{\exp(\alpha_j(\theta_i - \beta_j))}{1 + \exp(\alpha_j(\theta_i - \beta_j))}$$

θ=Deprivation
a=Discrimination
β=Severity



Deprivation severity associated with each item (Item Response Curves)



CHILD DEPRIVATION ORDER (IRT RESULTS, EU LEVEL)

1. Replace worn-out furniture (household item)
2. Annual holiday (children)
3. Leisure activity (children)
4. Avoiding arrears (household item)
5. Outdoor leisure equipment (children)
6. Invite friends to play and eat (children)
7. Indoor games (children)
8. School trips and school event that cost money (children)
9. Celebrations or special occasions (children)
10. Some new clothes (children)
11. A personal car (household item)
12. Books at home suitable for their age (children)
13. Fresh fruits & vegetables once a day (children)
14. Meat, chicken, fish (or vegetarian equivalent) every second day (children)
15. Keep home adequately warm (household item)
16. Computer & Internet access deprivation (household item)
17. Two pairs of shoes (children)
18. No place to do homework (children)

CONCLUSIONS

- The 13 items proposed by Guio, Gordon and Marlier (2012) are suitable, valid, reliable and additive measures of MD in all EU countries.
- As their resources decrease, households first cut back on their annual holidays, their saving to face unexpected expenses, new furniture, leisure and social activities and as their resources decrease even further they are unable to afford meals with proteins, a warm house, paying the bills, an internet connection and eventually even two pairs of all-weather shoes.
- Despite the large diversity in deprivation levels within the EU, there is a large degree of overlap between the deprivation orders of different countries across the EU, which is a remarkable result. The same is true for different household types within each country.
- This type of analysis is extremely important to confirm the validity and reliability of the EU deprivation measures. It shows that the 13 item scale can be used to understand the severity of material deprivation experienced by a given country or subgroup.

CONCLUSIONS

- The longitudinal analysis confirms that this pattern is also found when following the same people across time. CS order can be used as a proxy for longitudinal order.
- Our analysis also shows that questions on extreme deprivations such as two pairs of shoes are however needed in the longitudinal element of the EU-SILC to further corroborate the cross-sectional results and give a richer overview of the severity of deprivation.
- Results provide evidence against claims that poverty is the result of erratic spending or inefficient household budgeting: the vast majority of people shares a common deprivation trajectory.