Measuring material deprivation at EU level

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Workshop on "Measuring poverty – concepts, challenges and recommendations" (Beograd, 17th April 2015)

- **PART 1: Material deprivation (MD) in the EU portfolio of social indicators. Current use and interest (Anne-Catherine)**

- **PART 2: Revision of the EU MD indicator (Eric)**

PART 1: Material deprivation (MD) in the EU portfolio of social indicators

Current use and interest

Current MD indicators at EU level

▶ Since 2001, EU countries & the Commission have adopted a number of commonly agreed social indicators, *inter alia* to measure and monitor poverty & social exclusion

▶ Since 2009, the EU portfolio includes MD measures, conceived as an enforced lack of a combination of 9 items depicting material living conditions (see Guio, 2009)

▶ MD persons are persons living in a household which experience at least 3 out of the 9 following problems. They cannot afford:

- to eat meat, fish or a protein equivalent every second day,

- to pay rent or utility bills,

- to keep home adequately warm,

- to face unexpected expenses,

- a week holiday away from home,

- a car,

- a washing machine,

- a colour TV, and/or

- a telephone.

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**Why do we need EU MD indicators?**
- to complement income poverty figures (i.e. the EU "at risk of poverty (ARP)" indicator)
- to better reflect differences in actual standards of living across EU (esp. since the last EU enlargements to central and eastern European countries)

Income poverty (ARP) rate and threshold in **PPS** (2013)
(PPS = to take account of differences in costs of living across EU countries)

EU-SILC, 2013
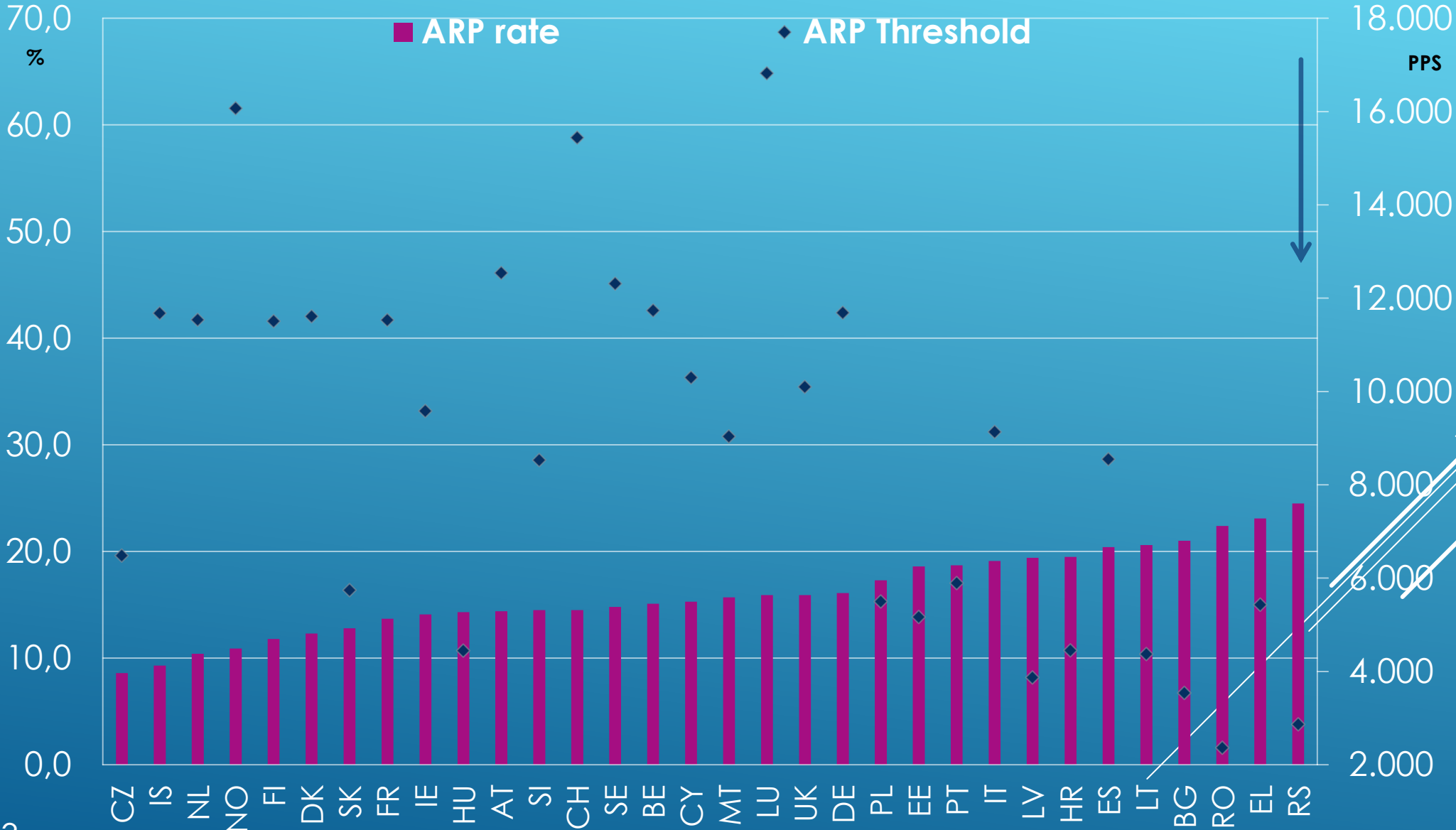
Income poverty (ARP) rate/threshold & MD rate (2013)

Legend: ■ ARP rate ■ MD rate ◆ ARP Threshold

EU-SILC, 2013
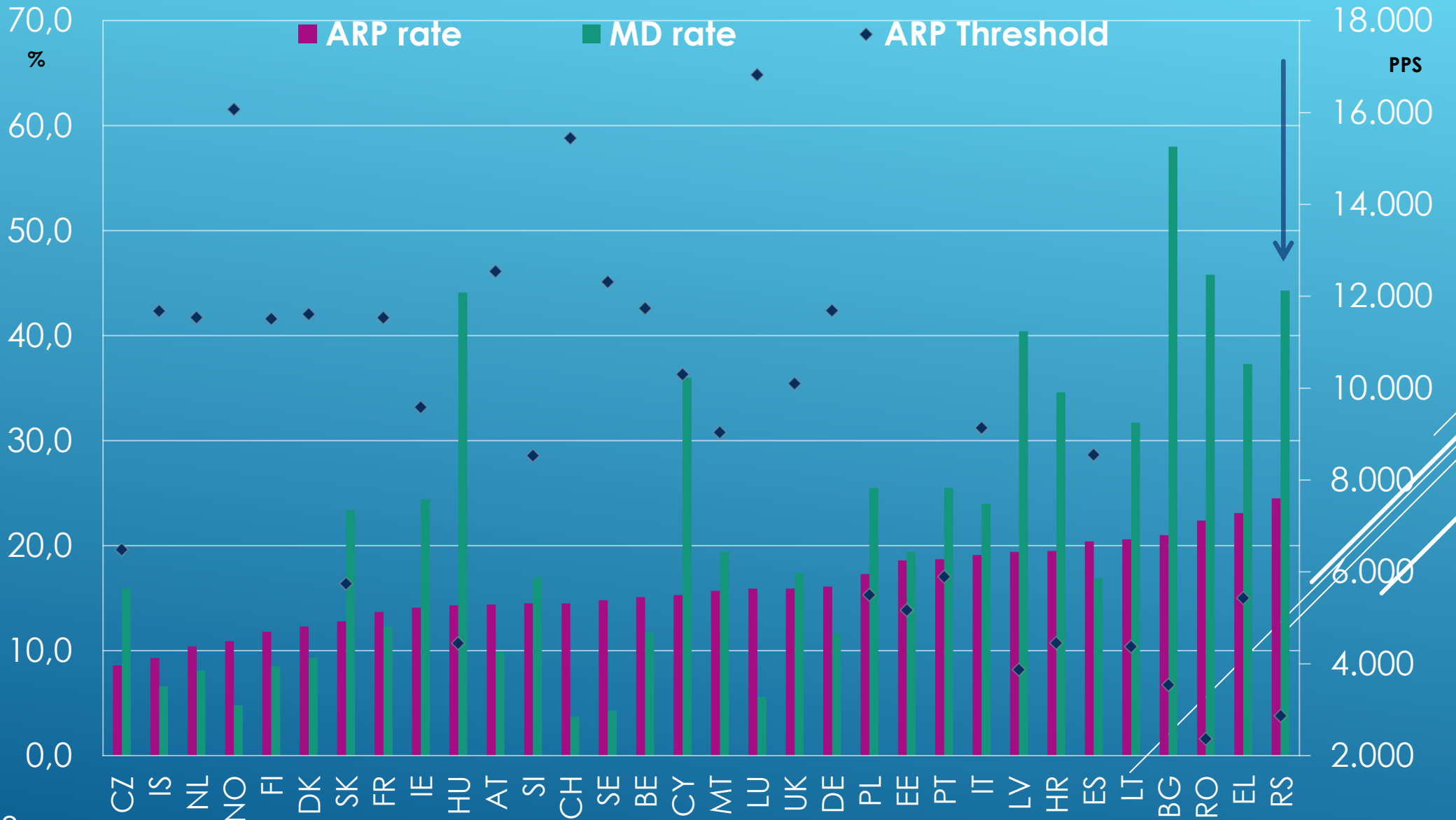
What does MD concretely mean? Some examples in Serbia (%)

Persons who live in a household that:	
Cannot afford paying for one week annual holiday away from home	67.2
Cannot afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day	30.6
Cannot afford unexpected financial expense (10,000 RSD)	50.1
Cannot afford to keep home adequately warm	18.3
Material deprivation rate (three or more items)	**44.3**

	2013	2014
Лица која живе у домаћинству које:		
Не може да приушти недељу дана одмора ван куће	67,2	68,4
Не може да приушти месо или рибу у оброку сваког другог дана (или њихову вегетеријанску замену)	30,6	26,1
Не може да приушти неочекивани трошак у износу до 10.000 динара који би био плаћен из буџета домаћинства	50,1	50,7
Не може да приушти адекватно загревање стана	18,3	17,1
Стопа материјалне ускраћености (три ставке или више њих)	**44,3**	**44,1**

Source: Statistical Office of the Republic of Serbia

IMPORTANT:

"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 et al, 2007, p.177)

Our focus is on "_enforced lacks_", i.e. lacks due to insufficient resources and NOT lacks due to choices (Mack and Lansley, 1985)

EUROPE 2020 STRATEGY AND SEVERE MD CONCEPT

▸ Since June 2010, the importance of MD indicators has grown significantly with the launch of the Europe 2020 Strategy and the adoption of the Social Inclusion target:
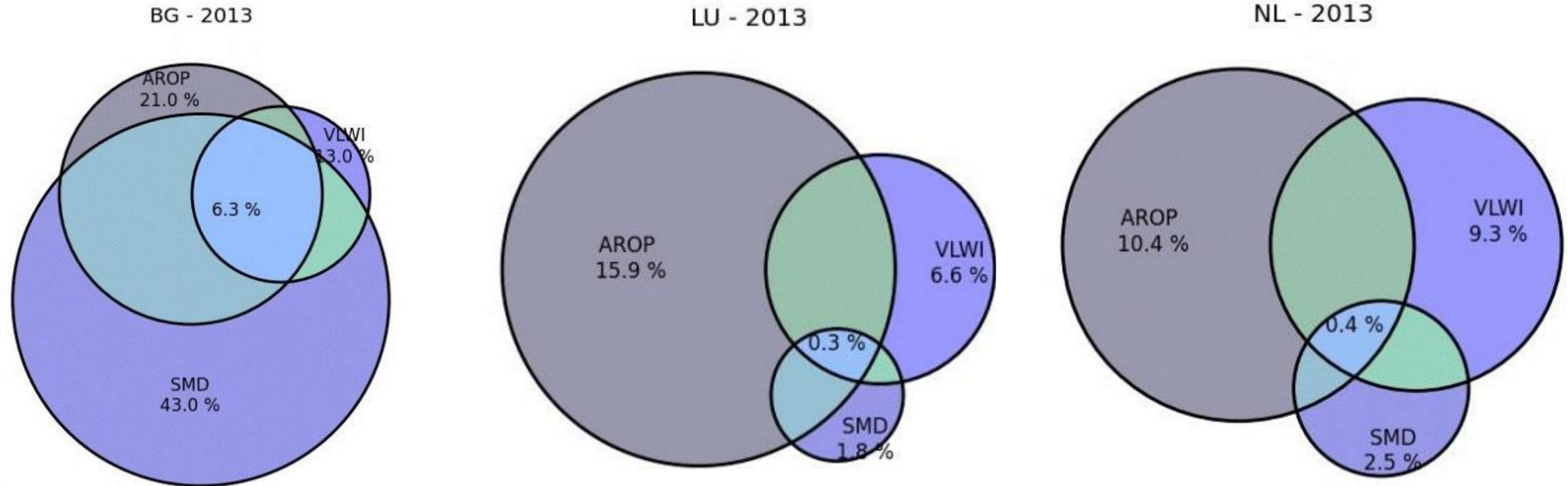
To reduce by at least 20 millions the number of people at risk of poverty or social exclusion (AROPE) in the EU by 2020

▸ AROPE people are people who live in households which are at risk of poverty and/or (quasi-)jobless and/or **severely** deprived

▸ **Severely** deprived persons have living conditions severely constrained by a lack of resources; they experience at least **four** out of the above 9 problems.

EUROPE 2020 "AT RISK OF POVERTY OR SOCIAL EXCLUSION" INDICATOR, 2013, %
VERY DIFFERENT CONFIGURATIONS ACROSS EU COUNTRIES: 3 EXAMPLES

BG - 2013

AROP 21.0 %
VLWI 13.0 %
6.3 %
SMD 43.0 %

LU - 2013

AROP 15.9 %
VLWI 6.6 %
0.3 %
SMD 1.8 %

NL - 2013

AROP 10.4 %
VLWI 9.3 %
0.4 %
SMD 2.5 %

NB: Only look at the **relative** size of the circles

Source: EU-SILC 2013.

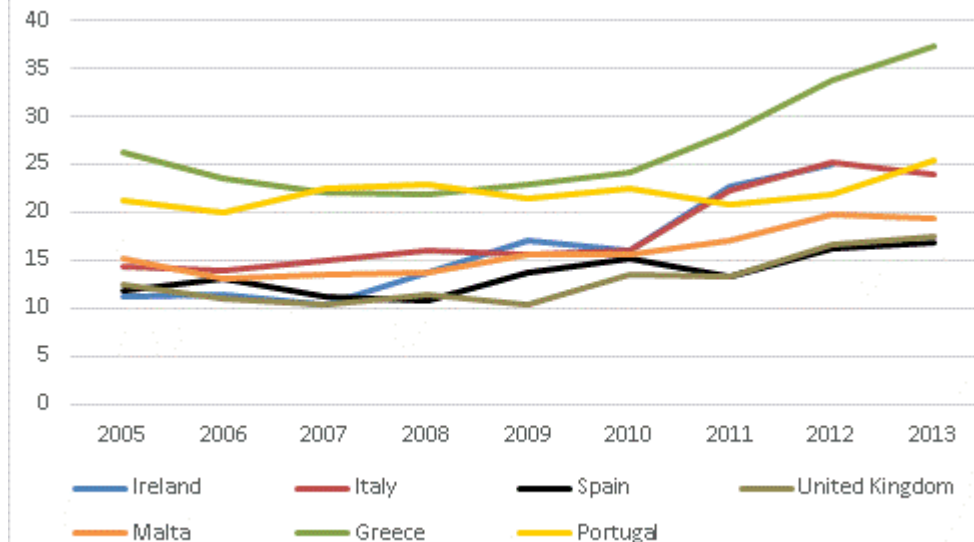# EUROPE 2020 "AT RISK OF POVERTY OR SOCIAL EXCLUSION" INDICATOR IN SERBIA (2013, %)
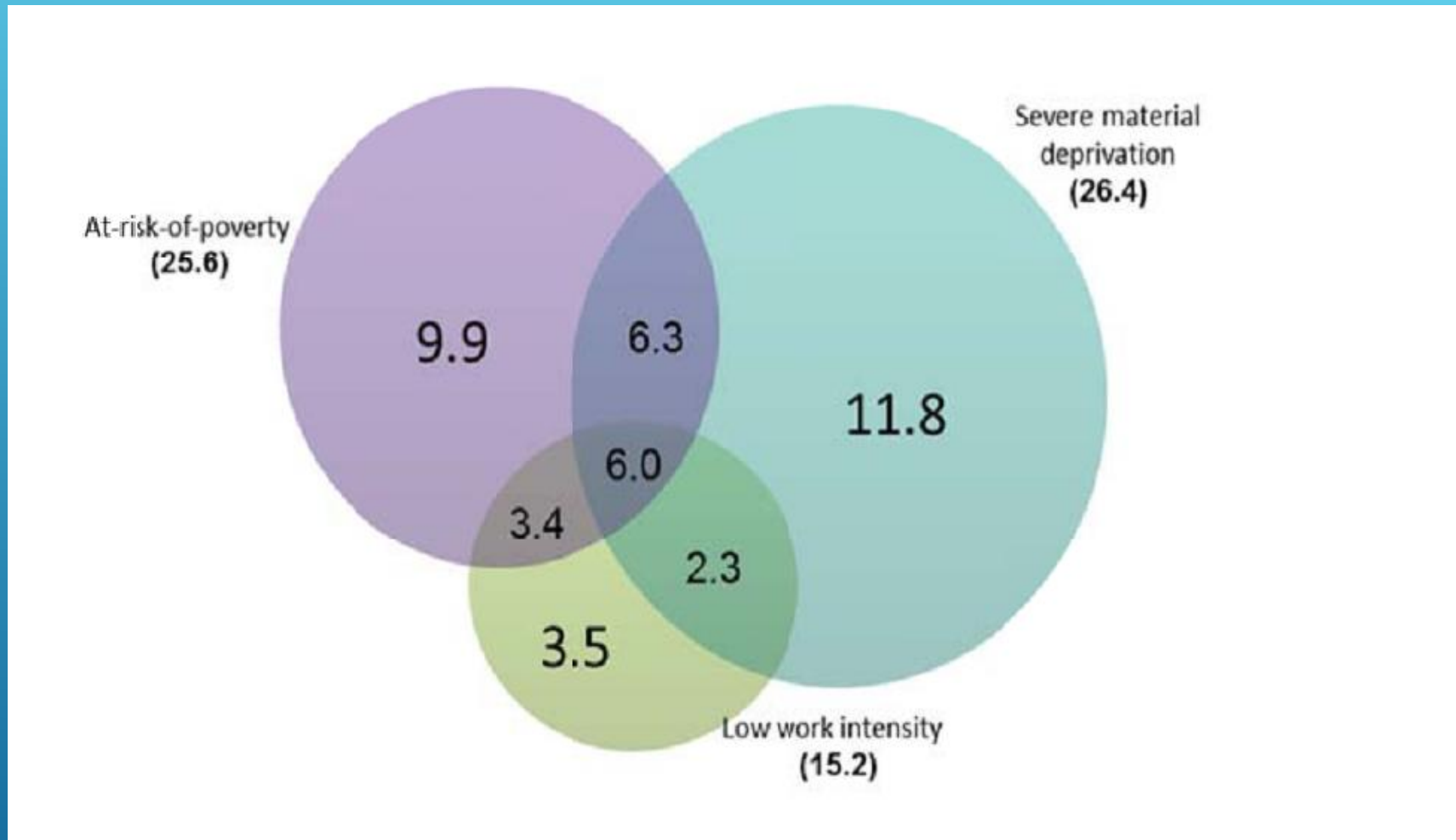
Source: Statistical Office of the Republic of Serbia

TRENDS IN MD BEFORE AND DURING THE CRISIS
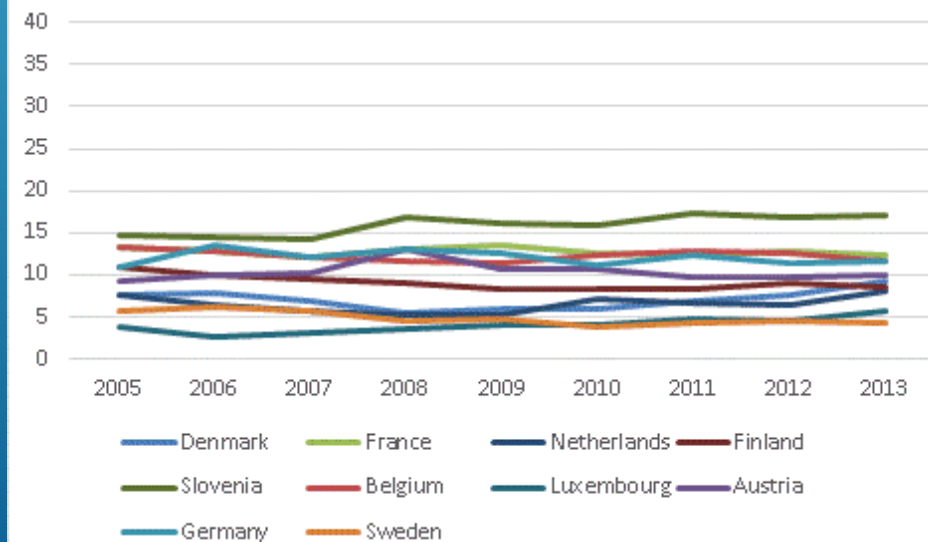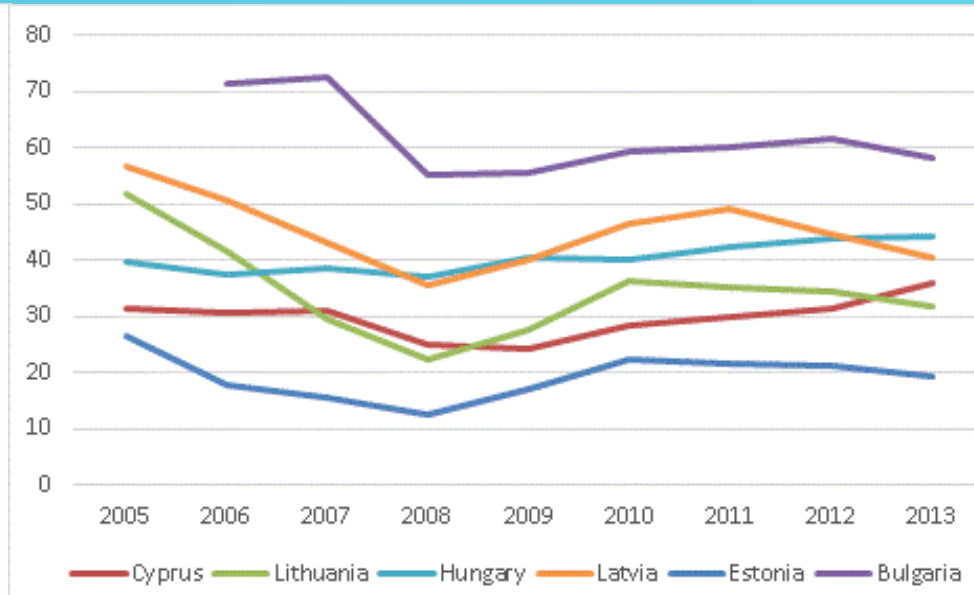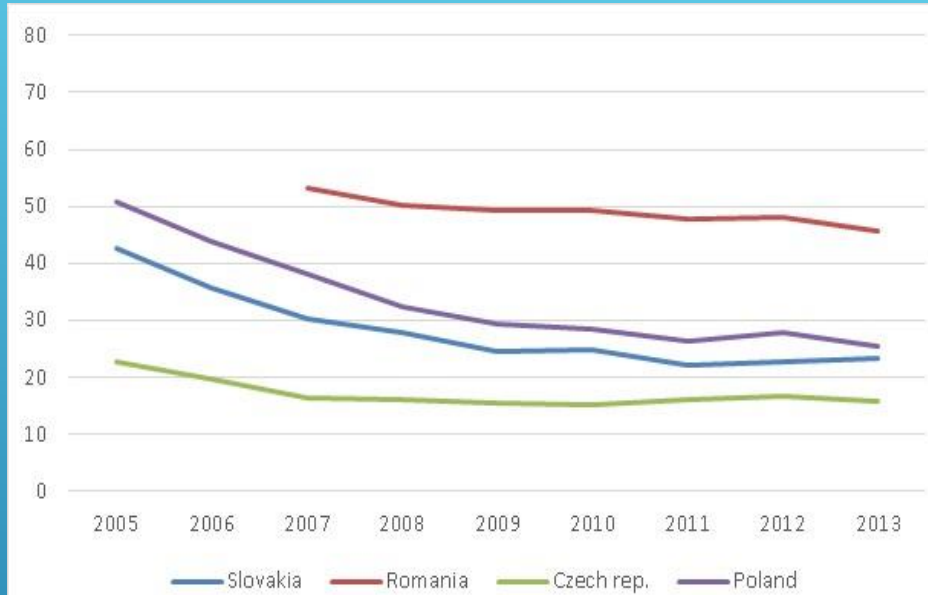
National trends in MD: 4 clusters of countries in the EU

SOURCE: EU-SILC 2013

DYNAMIC ASPECTS... FLUX VERSUS STOCKS (EU COUNTRIES, %)

■ MD at least once (2009-2012)   ■ Average MD rate (2009-2012)

SOURCE: EU-SILC 2013 (AUTHORS' CALCULATIONS)
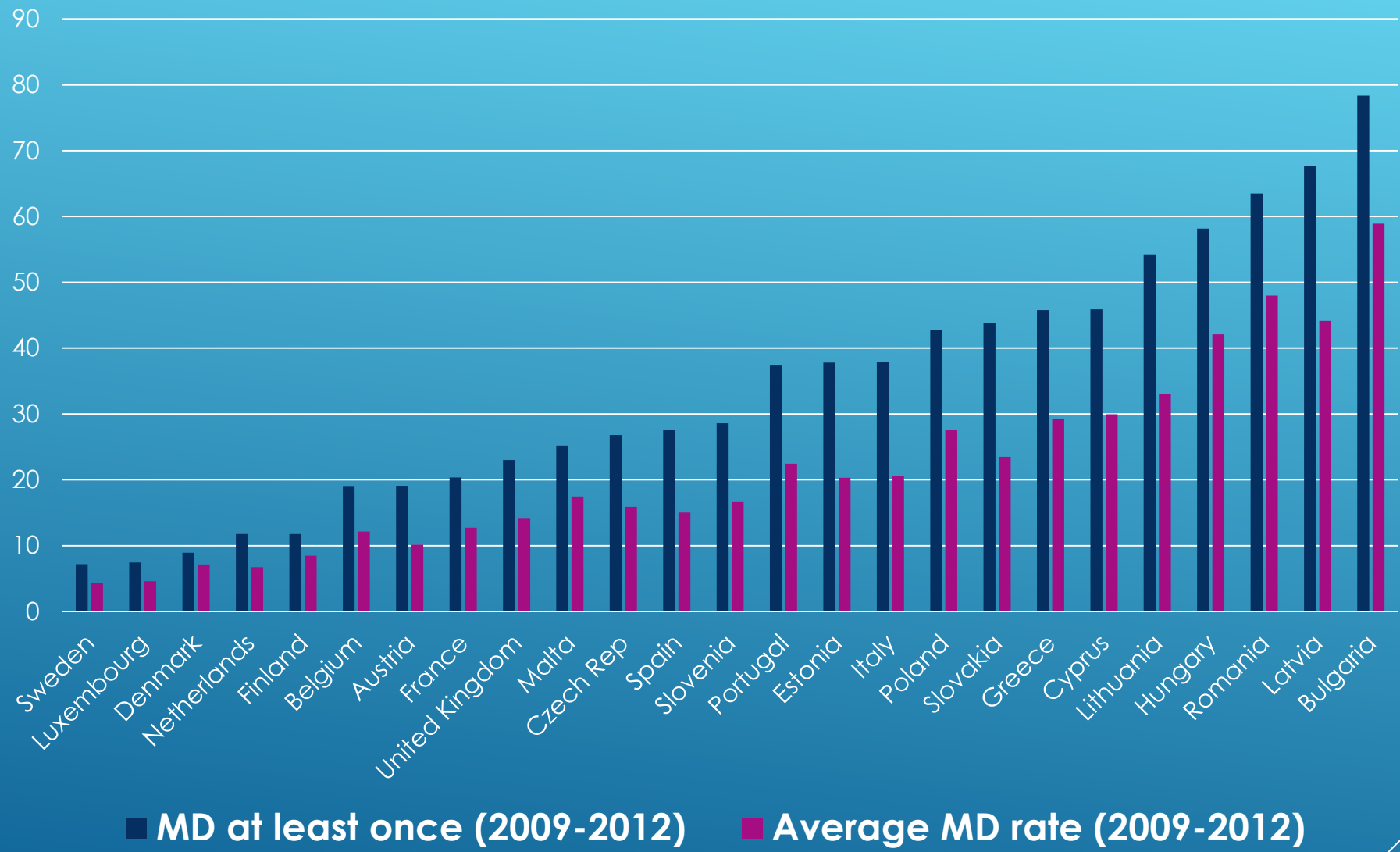
ENTRY AND EXIT RATES, YEAR-TO-YEAR AVERAGE (2009-2012)
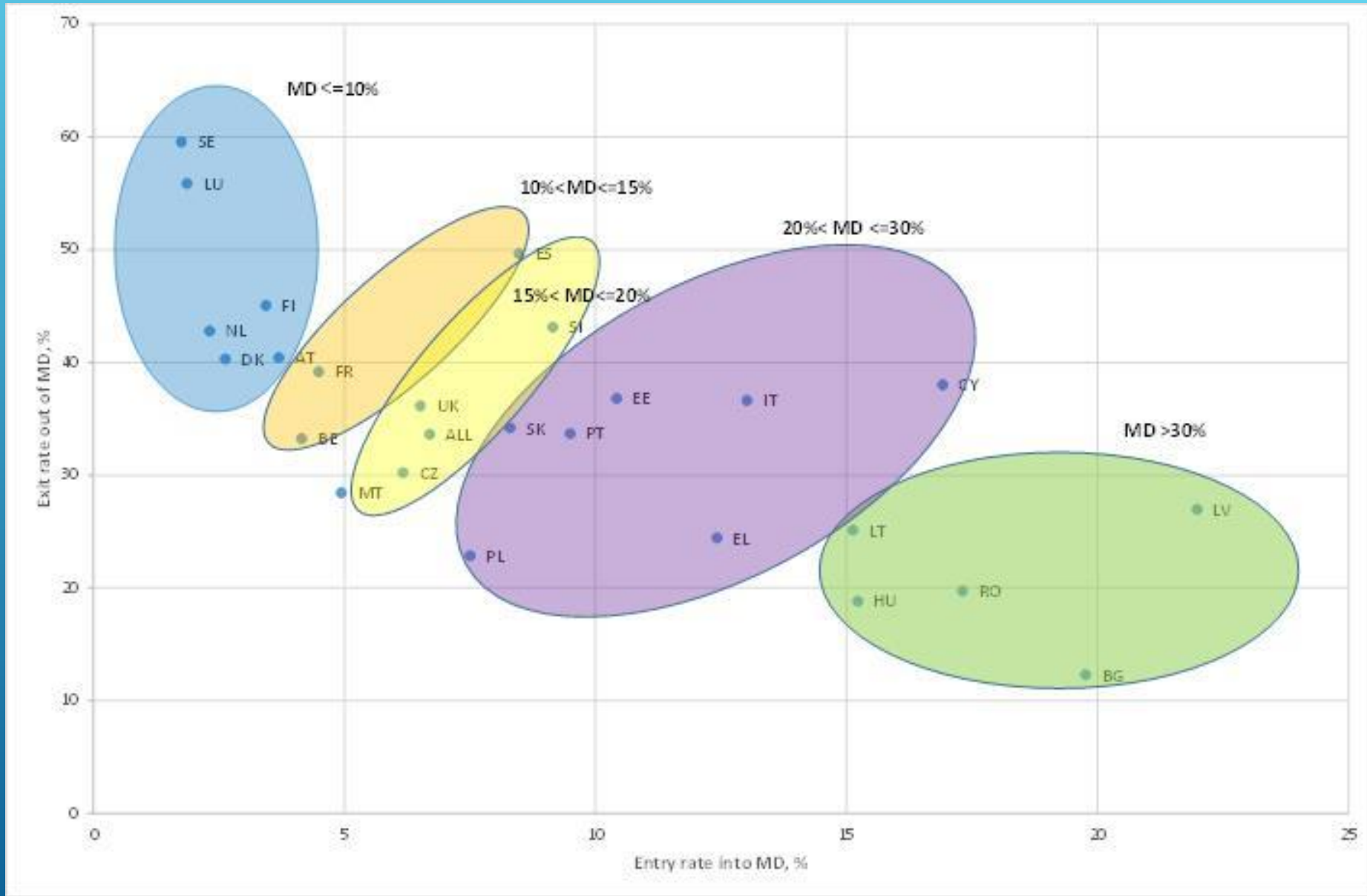
MD POSITIVELY CORRELATED WITH ENTRY RATE (2009-2012)

DYNAMIC ASPECTS… MD PERSISTENCE (2009-2012)
Degree of persistence proportionally higher among highly deprived countries & negatively correlated with exit rate
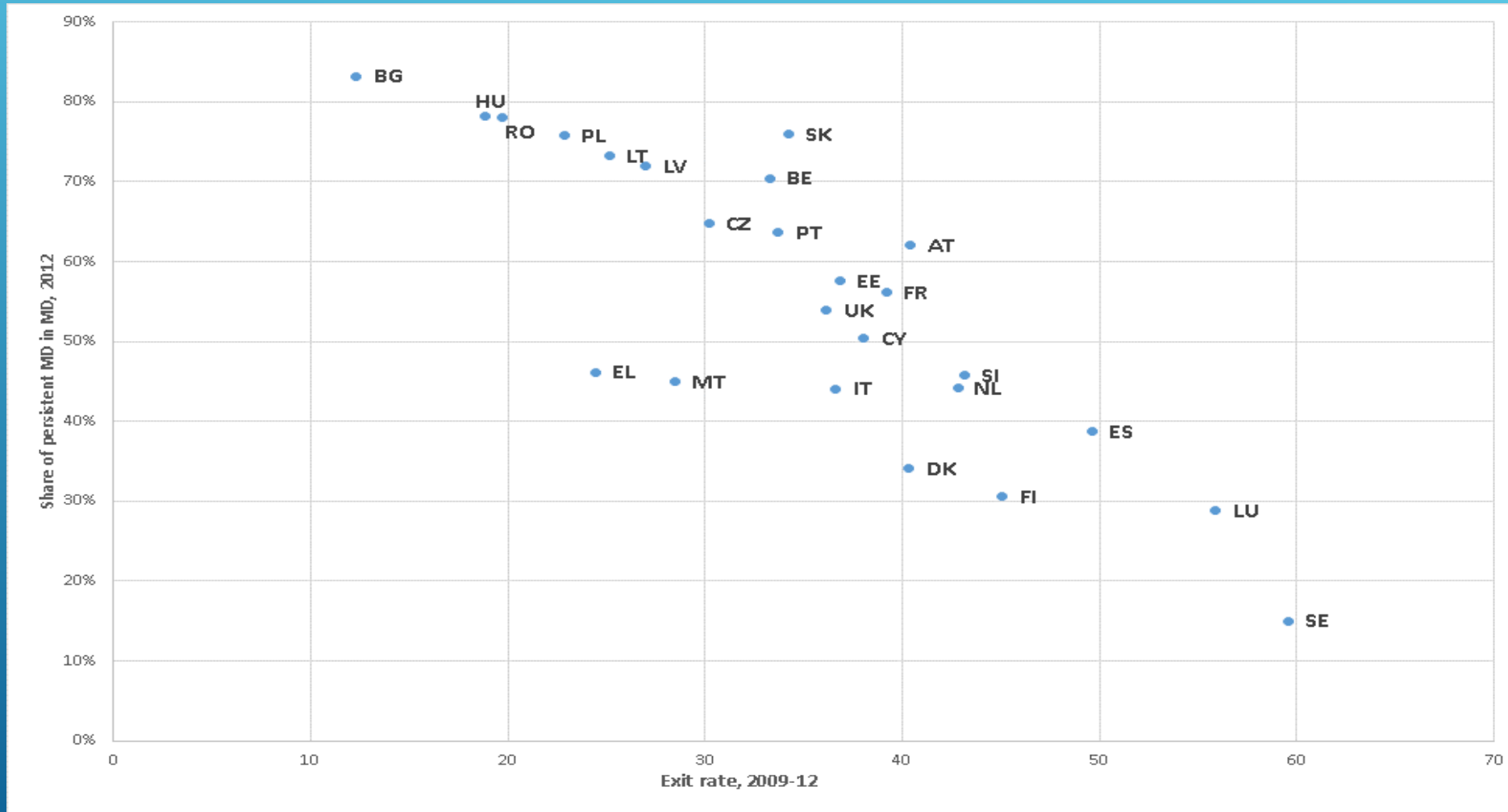
EVOLUTION OF ENTRY & EXIT RATES: EXAMPLES, 2006-2012

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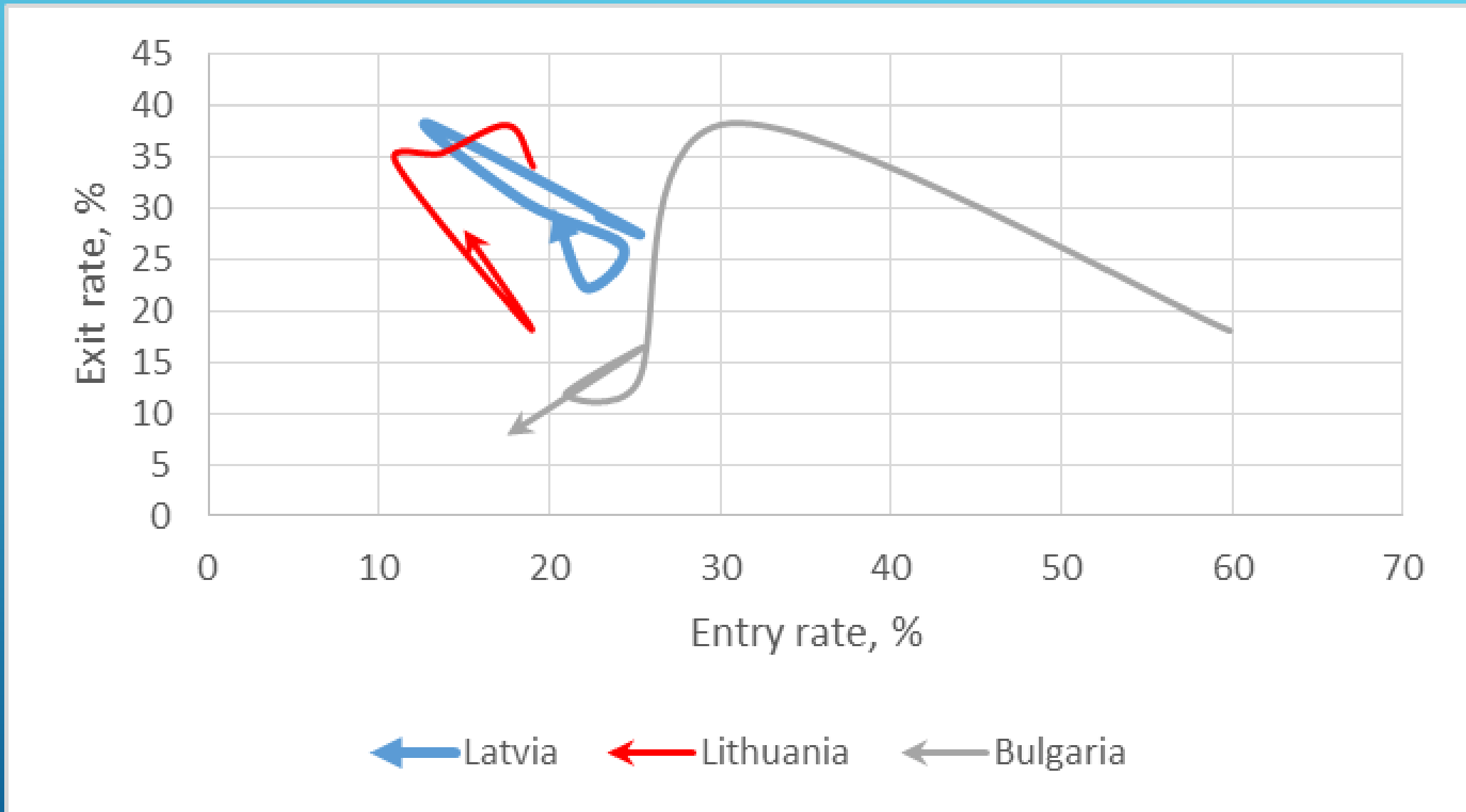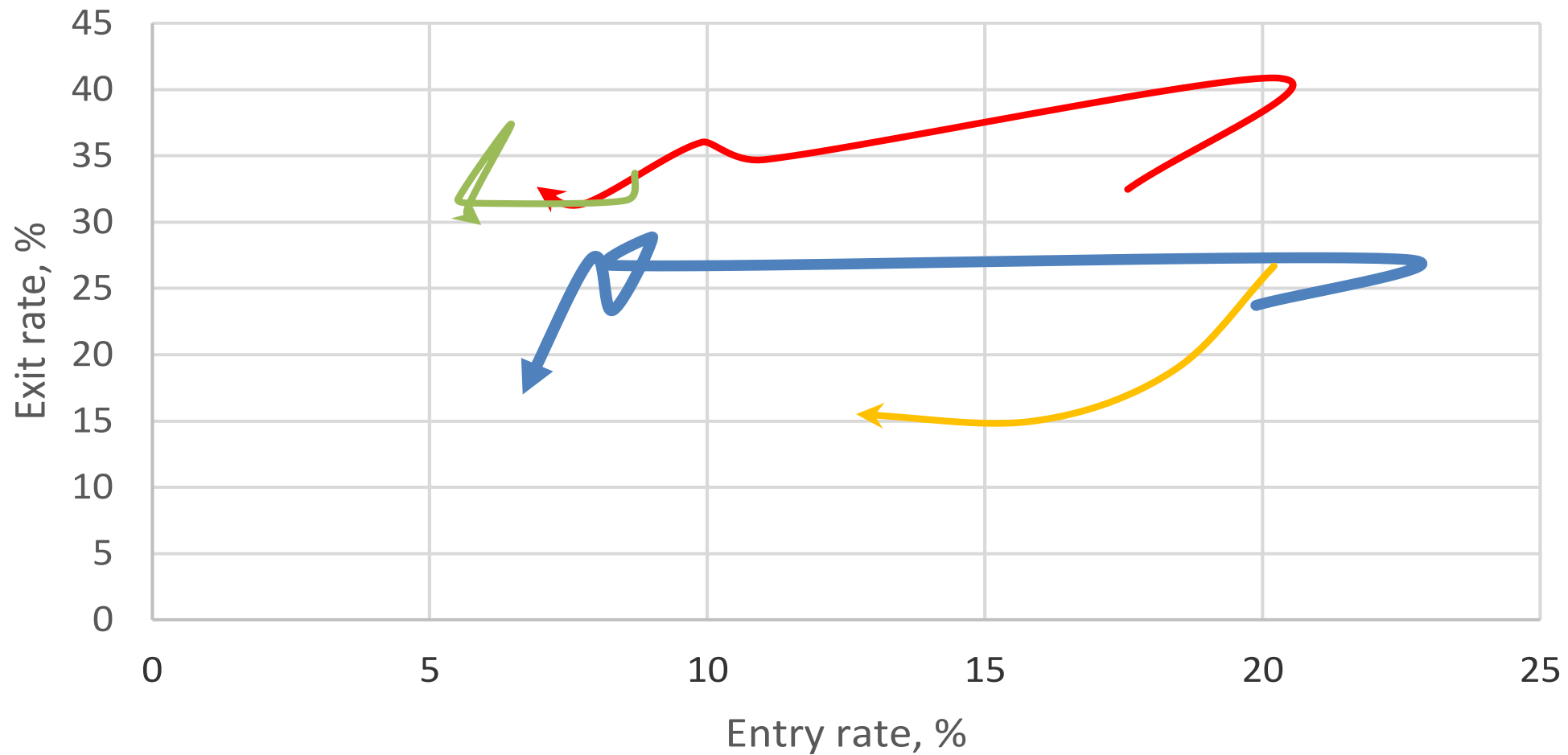
Chart — X axis: Entry rate, %. Y axis: Exit rate, %. Legend: Poland, Slovakia, Czech Rep, Romania.

IMPACT OF DIFFERENT TRIGGER EVENTS ON INCOME LOSS (> 20%) AND ENTRY INTO MD FOR PEOPLE AGED 18-59 YEARS, EU (ODDS RATIO, LOGISTIC REGRESSION, ROBUST STANDARD ERROR)

Income loss between 2008 and 2012
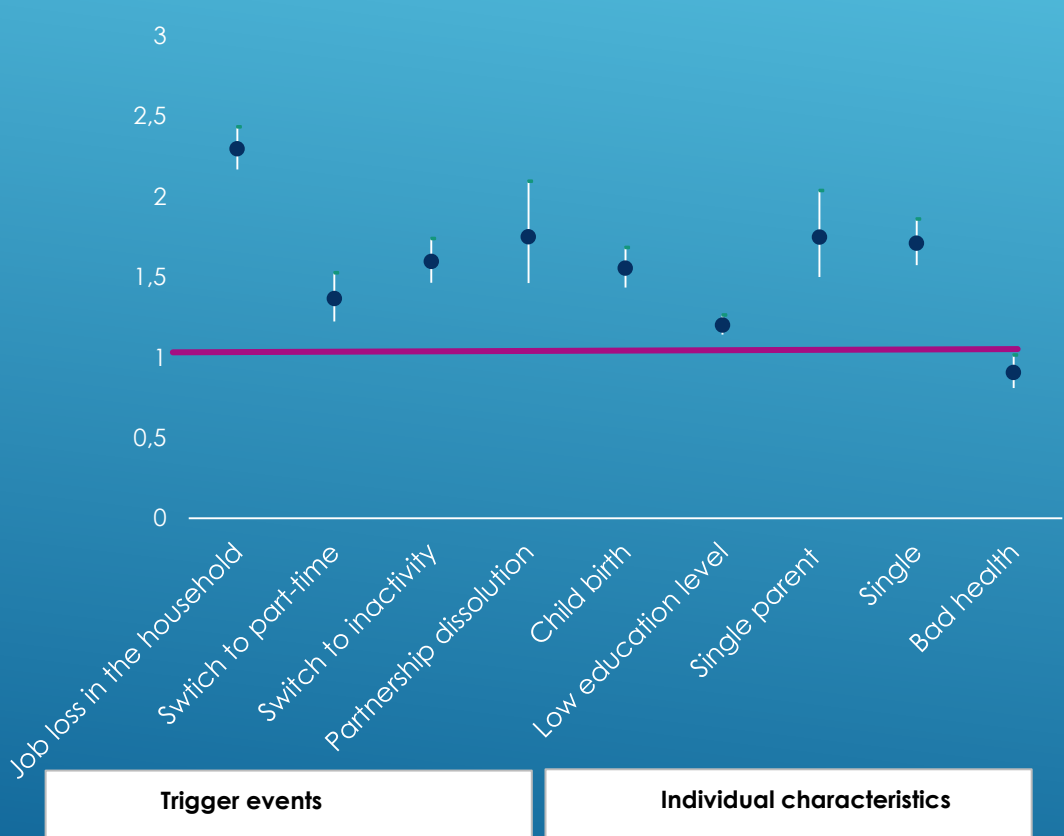
Entry into material deprivation

Trigger events — Individual characteristics

Main results…

▸ **Large diversity across EU of MD level <u>and</u> evolution during the crisis**

  ▸ **Some highly deprived countries caught up, even during the crisis**

  ▸ **Others highly deprived countries saw their positive trend brutally interrupted**

  ▸ **Some EU countries knew huge deterioration of living conditions, translated in increase in MD**

▸ **Both entry and exit rates matter to explain MD and MD persistence, as well as MD increases in most touched countries.**

▸ **Having a bad health, having a low income, being low educated, unemployed, single (with(out) children) are risk factors of entering into MD/ not exiting from MD.**

▶ PART 2: Revision of the EU MD indicator
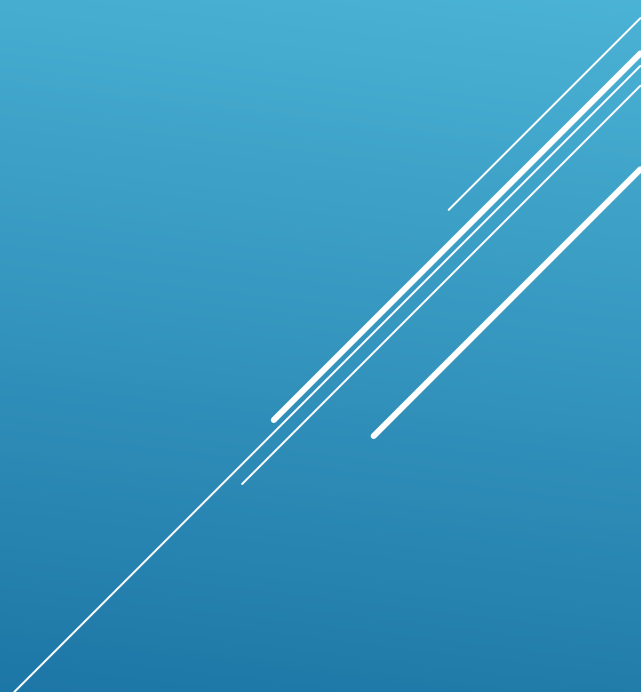
REVISION OF EU MD INDICATORS

Why? Current indicators are based on a small number of items (due to the small number of relevant items included in the core part of EU-SILC) & Some of these core items have a weak reliability

How?

▶ Consensus Eurobarometer survey (2007) asking about a large list of items "how necessary they are to live 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 with Net-SILC2 researchers on improving these indicators and also on developing indicators focused on child MD [Guio, Gordon and Marlier (2012)]

EU-SILC 2009: 33 potential items for measuring MD (M=module items)

Housing Deprivations
No hot running water (M)
Shortage of space
Darkness
Leaky roof, damp, etc.
No toilet
No bath
Overcrowding
High housing costs
Home warmth

Household Deprivations
Worn-out furniture (M)
Arrears
Incapacity to face unexpected expenses
Lack of meat, chicken, fish
Lack of Holiday
Telephone
Colour TV
Computer
Washing machine
Car
Internet (M)

Local Environment Deprivations
Litter lying around (M)
Vandalism (M)
Diff access to public transport (M)
Diff access to post, banks (M)
Noise
Pollution
Crime

Adult Deprivations
Some new Clothes (M)
Two pairs of shoes (M)
Some money for oneself (M)
Mobile phone (M)
Drink/meal monthly (M)
Leisure activities (M)

ANALYTICAL FRAMEWORK

Step by step, we have analysed…

▶ The **suitability** of each MD item 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 (income poverty [ARP], subjective poverty and health)

▶ The **reliability** of the MD scale (i.e. the internal consistency of the scale) and the **reliability** of the individual MD items

▶ The **additivity** of MD items, by checking that someone say with an MD index score of 2 is indeed suffering from more severe MD than s.o. with a score of 1, i.e. that the MD index components add up

SUITABILITY

Look at the % of people "wanting" each item (i.e. those who have the item or who would like to have it but cannot afford it [put differently: 100% of people minus those who do not have the item for other reasons]). **Why?**

1. to assess the degree of "importance" of each item at EU & country levels

2. to test the homogeneity of preferences across countries (are there national preferences?)

3. to test the homogeneity of preferences within each country (are there differences between groups within individual countries).

Results: all items pass the test, even if 'Leisure' is borderline. Yet, we decided **not** to exclude leisure because those who do not have leisure for "other reasons" include in fact people who do "want" leisure but are prevented from having leisure (e.g. because of lack of time due to caring responsibilities, because of work, of poor health, of difficulty of access etc.).

VALIDITY (Income poverty, Subjective poverty and Health)
Illustration: % enforced lack of holidays according to subjective poverty ➔ OK

Source: EU-SILC 2009 , authors' calculations
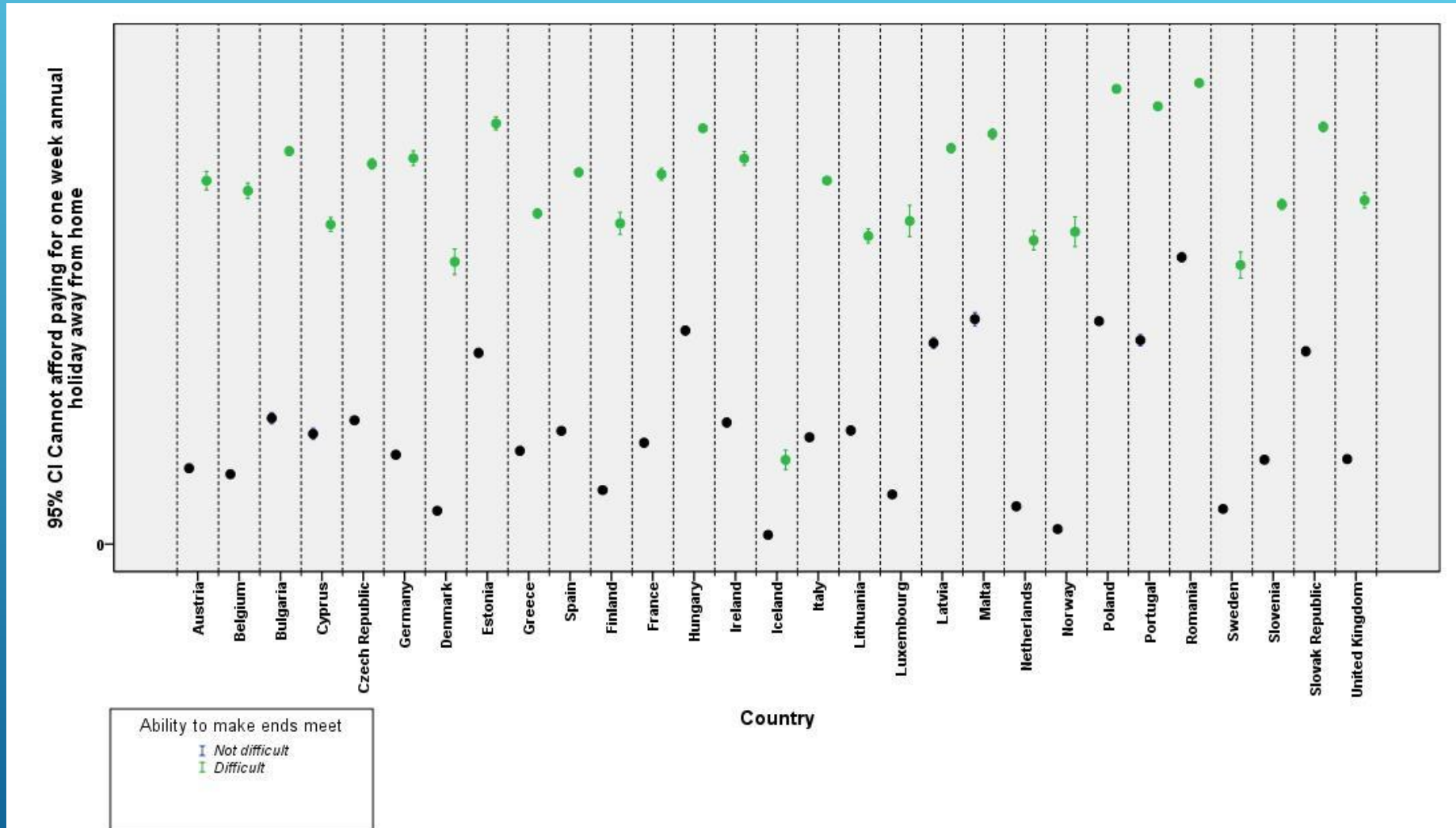
Number of countries with validity problems (i.e. non-significant relation between a given item and at least 2 of the following: income poverty, subjective poverty &health problems) ➜ 2 out

	Income poverty	Subjective poverty	Health	MSs with 2 validity problems (out of 3)
The person cannot afford (but would like to have):				
A mobile phone	0	1	1	
Some new clothes	0	0	0	
Two pairs of shoes	0	1	0	
Pocket money	0	0	0	
Drink/meal monthly	0	0	0	
Leisure activities	0	0	0	
The household's dwelling suffers from:				
Basic amenities	2	3	3	MT
Shortage of space	4	0	11	
Darkness	3	0	0	
Leaky roof, damp, etc.	0	0	0	
Litter lying around	8	0	2	MT
Vandalism	9	0	6	MT
Noise	5	1	2	
Pollution	8	0	5	IE,MT
Crime	8	1	3	AT
Overcrowding	1	0	8	
High housing costs	0	0	12	
The household cannot afford:				
To replace worn-out furniture	0	0	0	
A meal with meat, chicken or fish	0	0	0	
To face unexpected expenses	0	0	0	
To keep home adequately warm	0	0	0	
One week annual holiday away from home	0	0	0	
Avoiding arrears	0	0	0	
A washing machine (enforced lack)	0	0	10	
A colour TV (enforced lack)	**3**	**3**	**10**	**CY, EL, IE, LU**
A telephone (enforced lack)	**5**	**3**	**11**	**CY, DK, LU, NL**
A computer/internet (enforced lack)	0	0	4	
A personal car (enforced lack)	0	0	0	
The household has a (very) difficult access to:				
Public transport	7	4	1	AT, MT
Postal/banking services	5	2	3	FR, LU

RELIABILITY – TWO TESTS – CTT AND IRT

1) Reliability: Classical Test Theory

▸ Cronbach's Alpha assesses the internal consistency of a scale, i.e. how closely related a set of items are as a group

▸ A "high" value of Alpha is often used as evidence that the set of items measures an underlying (or "latent") construct. An Alpha of **0.70** or higher is considered as "satisfactory" in most social science research situations.

- ▶ Our Cronbach's Alpha analysis was performed at both country and EU levels.

- ▶ If omitted (one by one), some items increase the Alpha (i.e. increase the reliability). Problematic items are:

  - basic durables and basic commodities;

  - the two accessibility items;

  - local environment problems items;

  - high housing costs, dwelling too dark and overcrowding.

- ▶ This pattern is very consistent across countries: reliability problems tend to be concentrated on the same items

2) RELIABILITY: ITEM RESPONSE THEORY (IRT)

▸ IRT provides additional information on the reliability of each individual indicator included in the scale.

▸ It describes the relationship between a person's response to questionnaire items and an unobserved "latent trait" such as educational assessment, level of happiness… or amount of MD.

➔ 13 items (out of 33) successfully passed the suitability, validity and reliability tests

ADDITIVITY

▶ We expect that people who suffer from two deprivations (e.g. those who cannot afford both clothes and shoes) should live in households with (on average) significantly lower net equivalised incomes than those who only suffer from one deprivation (clothes or shoes deprivation only) or no deprivations. Similarly, those people suffering from one deprivation should have lower incomes than those with no deprivation. This should hold for all possible combinations of deprivation items.

▶ We used ANOVA model (second order interactions of MD items by level of equivalised disposable household income).

➔ All 13 MD items which passed the previous tests also passed the additivity test.

13 items (out of 33 collected in 2009) are suitable, valid, reliable and additive measures of MD in all EU countries) ➔ 6 of the current items & 7 new items

▸ 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.

CRONBACH'S ALPHA BY COUNTRY, CURRENT AND ALTERNATIVE SCALE (2009)

13-item scale   9-item scale
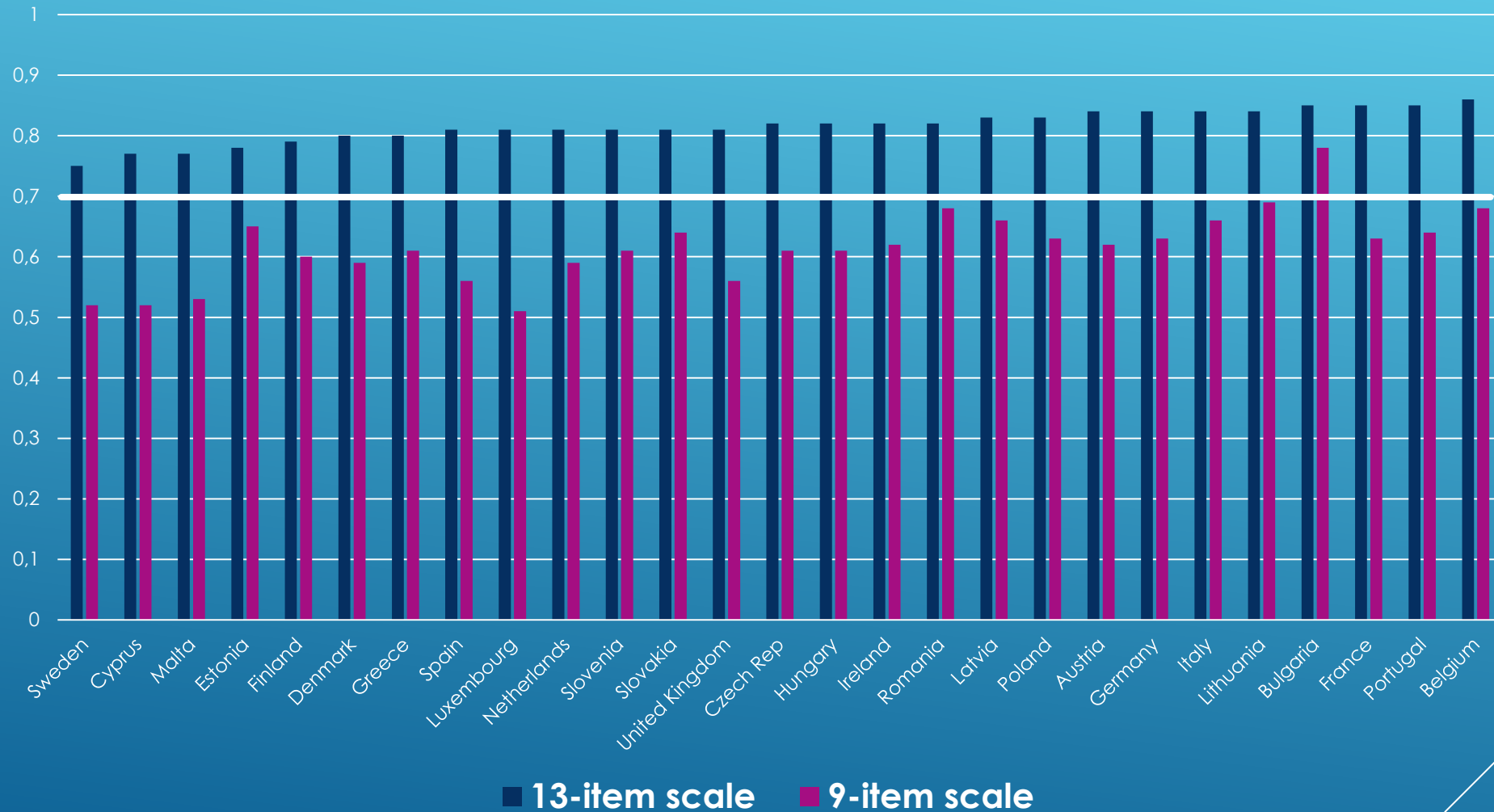
Source: EU-SILC 2009 , authors' calculations

HEAT MAP: NATIONAL INCIDENCE/EU AVERAGE FOR THE 13 ITEMS
(RATIO > 1 ➡ NATIONAL DISADVANTAGE)

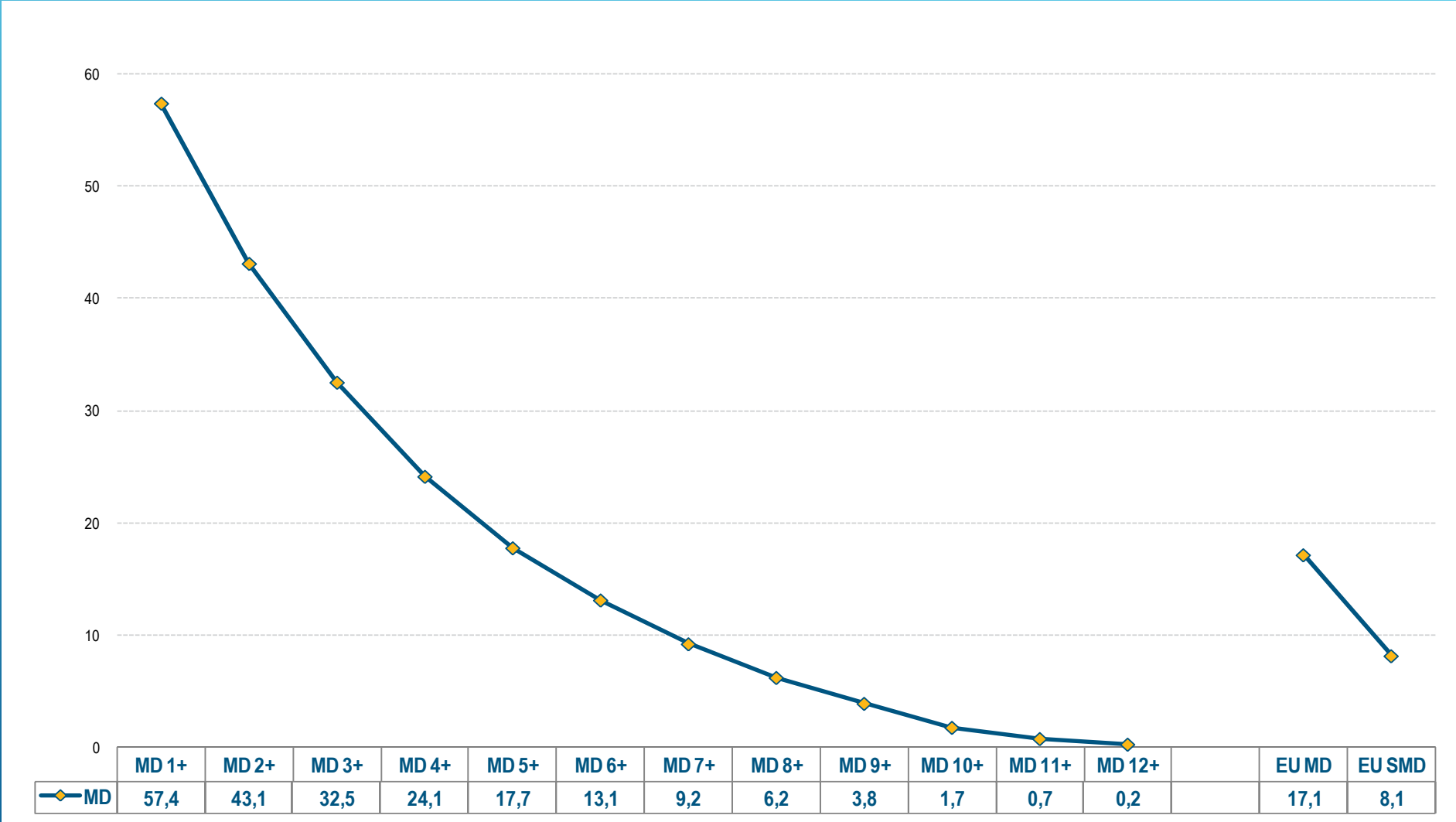|	BG	RO	LV	HU	LT	PT	PL	SK	EL	MT	EE	SI	CY	CZ	DE	FR	IT	IE	BE	ES	UK	AT	FI	DK	NL	LU	SE
Inadequate warmth	7.1	2.4	1.8	1.0	2.7	3.2	1.8	0.4	1.8	1.2	0.2	0.6	2.1	0.6	0.6	0.7	1.2	0.4	0.6	0.7	0.7	0.3	0.1	0.1	0.1	0.0	0.1
Clothes	5.4	3.3	3.3	3.1	2.3	2.0	1.5	1.0	1.0	1.6	0.9	1.3	0.6	0.5	0.7	0.8	0.8	0.5	0.6	0.3	0.6	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	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	0.5	0.1	0.5	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	0.9	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	0.7		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

Source: EU-SILC 2009 , authors' calculations

MD rates (%) according to different MD thresholds (comparison between the alternative13-item MD indicator and the current MD indicator), EU-27, 2009

	MD 1+	MD 2+	MD 3+	MD 4+	MD 5+	MD 6+	MD 7+	MD 8+	MD 9+	MD 10+	MD 11+	MD 12+		EU MD	EU SMD
MD	57,4	43,1	32,5	24,1	17,7	13,1	9,2	6,2	3,8	1,7	0,7	0,2		17,1	8,1

Source: EU-SILC 2009 , authors' calculations

IMPACT OF MOVING FROM CURRENT TO ALTERNATIVE MD INDICATOR (%, 2009)
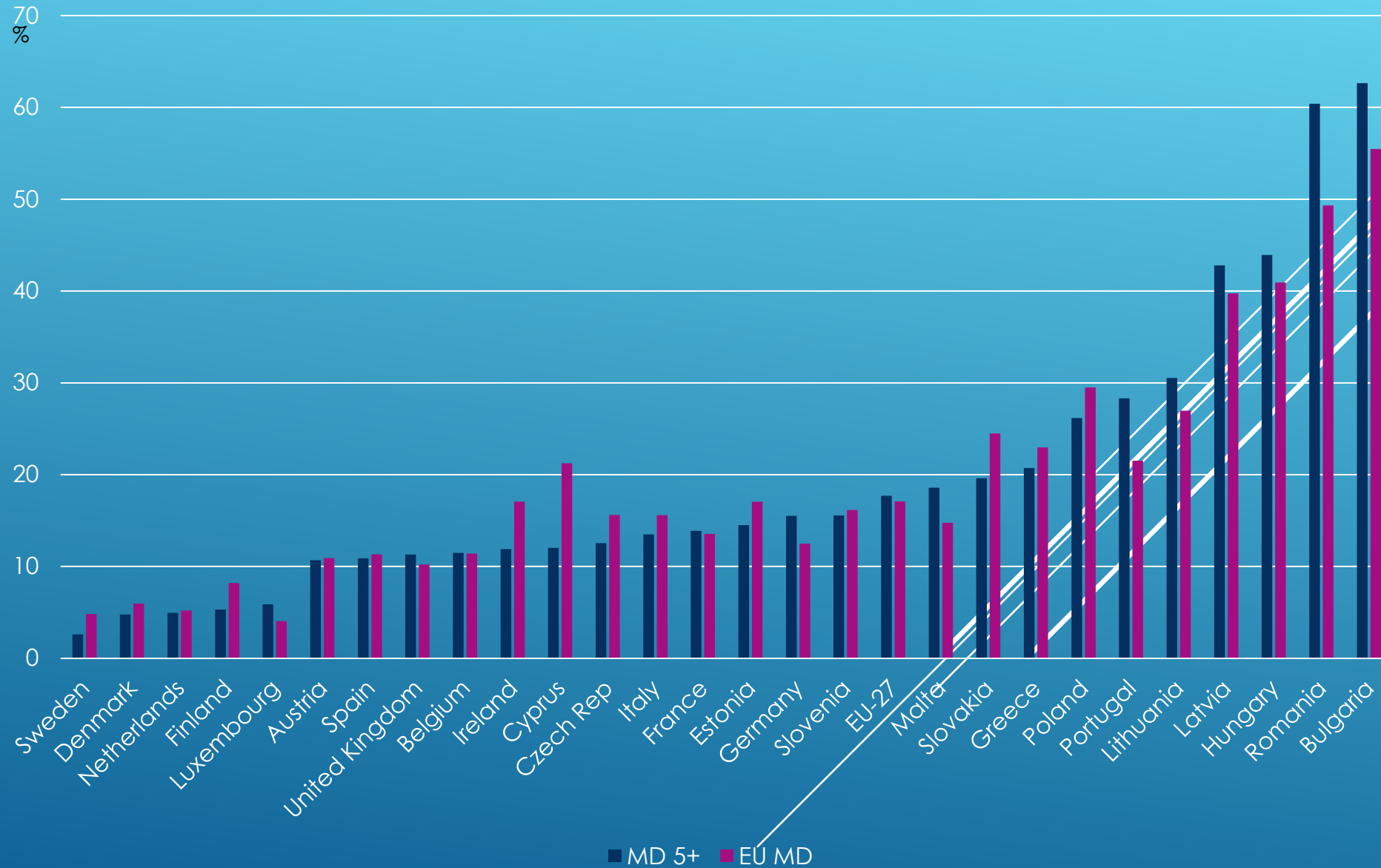
Source: EU-SILC 2009 , authors' calculations

DEPRIVATION ORDER?

Guio & Pomati (2015) and/or Deutsch, Guio, Pomati and Silber (2014) have explored which items people have to go without as MD increases:

➢ Does the deprivation order differ between EU countries and within each country for different household types?

➢ Using cross-sectional and longitudinal data, is there a similar deprivation pattern for the 6 items available in both CS and longitudinal dimensions?

DEPRIVATION ORDER
(2009 cross-sectional data)

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

MD ORDER IN 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

CONCLUSIONS

▸ Robustness: The 13 items proposed by Guio, Gordon and Marlier (2012) are suitable, valid, reliable and additive measures of MD in all EU countries.

▸ MD order: 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.

▸ MD order: Despite the large diversity in MD levels within the EU, there is a large degree of overlap between the MD orders of different countries across the EU, which is a remarkable result. The same is true for different hhd types within each country.

CONCLUSIONS

▶ The analysis also shows that questions on extreme deprivations such as two pairs of shoes are needed in the longitudinal element of EU-SILC to further corroborate the cross-sectional results and give a richer overview of the severity of MD.

▶ Results provide evidence against claims that poverty is the result of erratic spending or inefficient hhld budgeting: the vast majority of people share a common MD trajectory.