

Gender inequality, measurement and evidence

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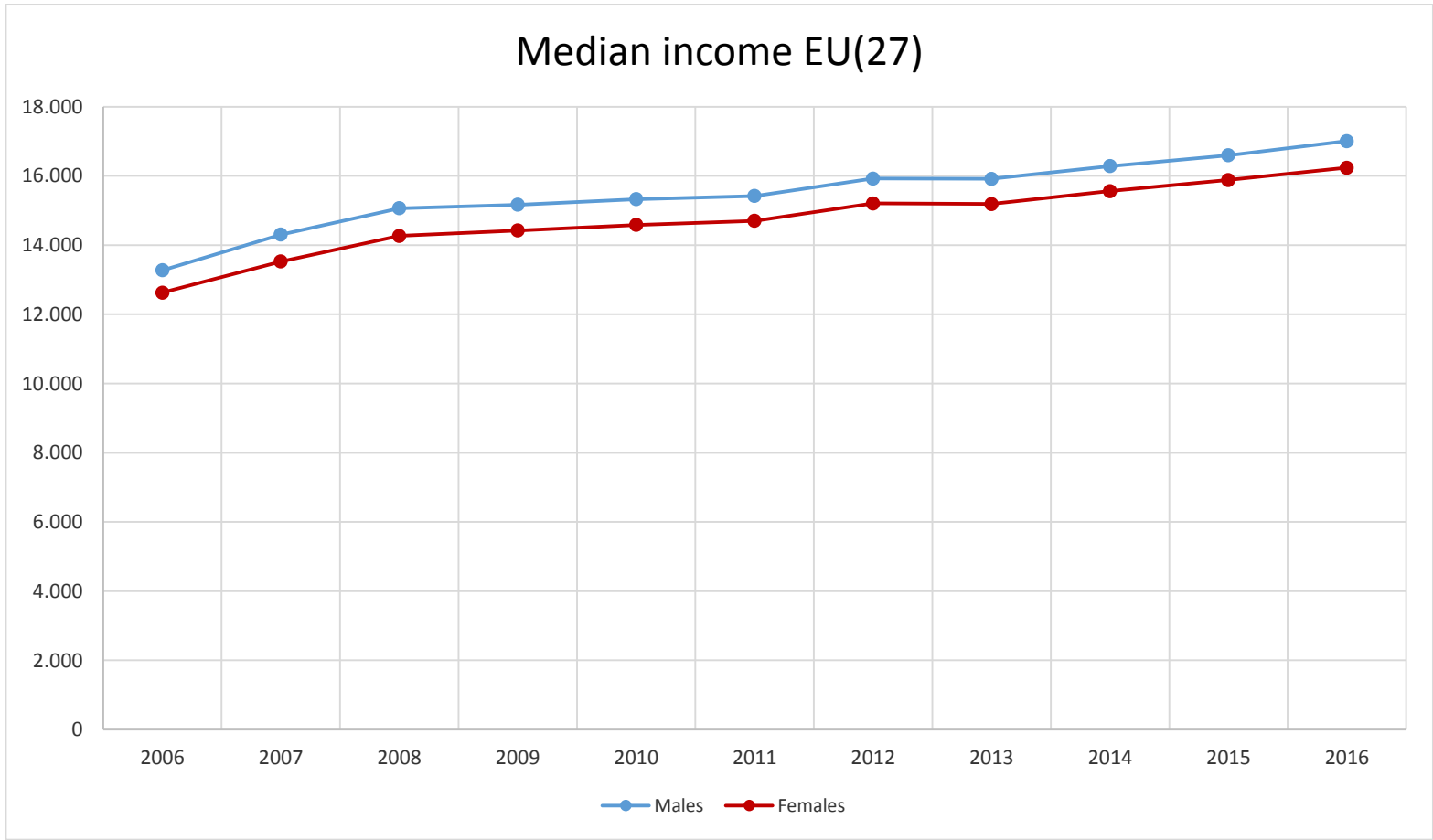
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Winter School on Inequality and Social Welfare Theory

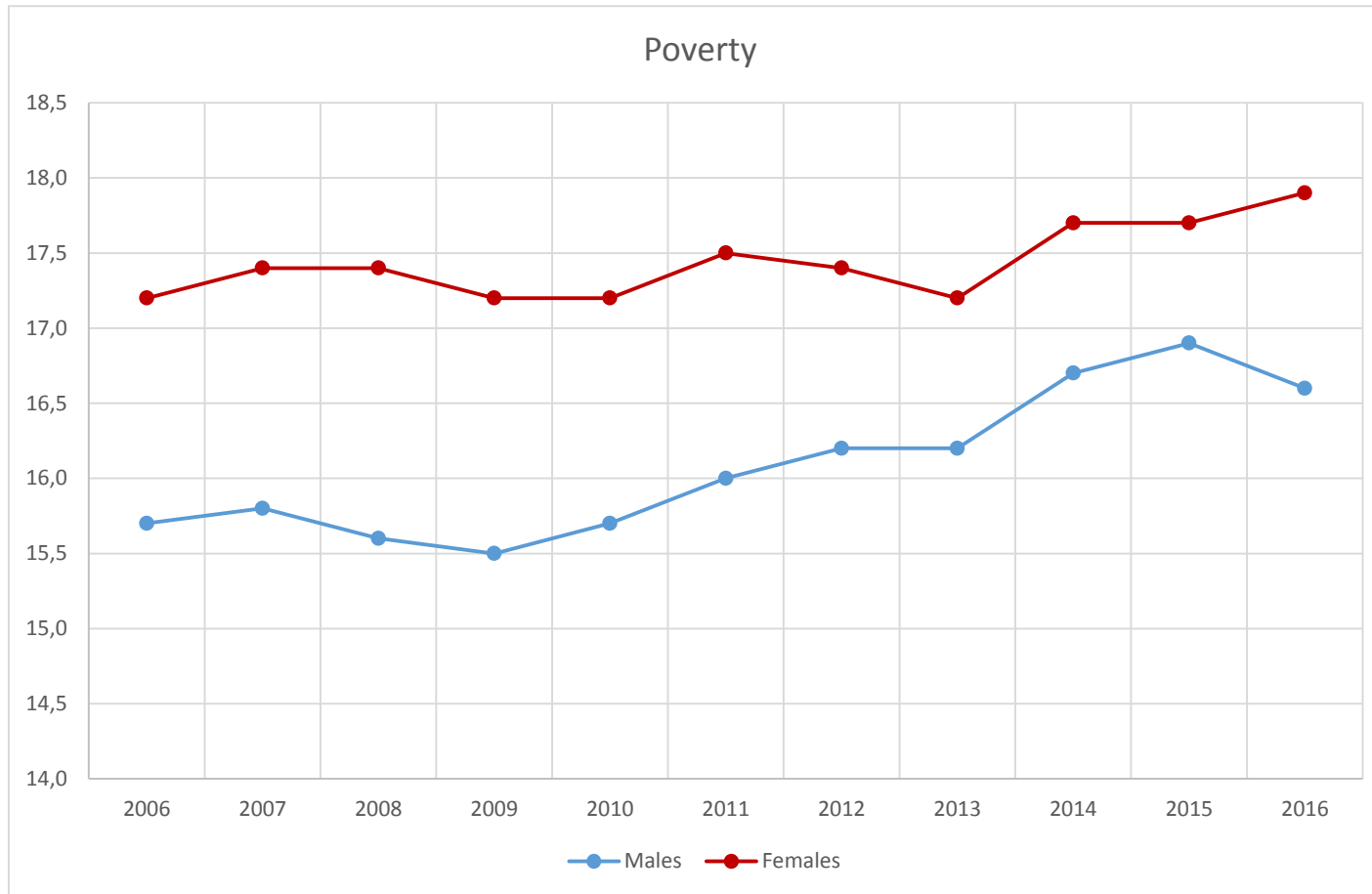
Canazei, January 2018

- There still exist differences in economic status of men and women.
- Usual indicator of well-being: income.
- We find evidence of lower incomes of women.



Source: Eurostat

At-risk-of-poverty rate by poverty threshold (60% median)



Source: Eurostat

Individual vs. Household income in UK

16-65, no students,
no retirees and no self-employed

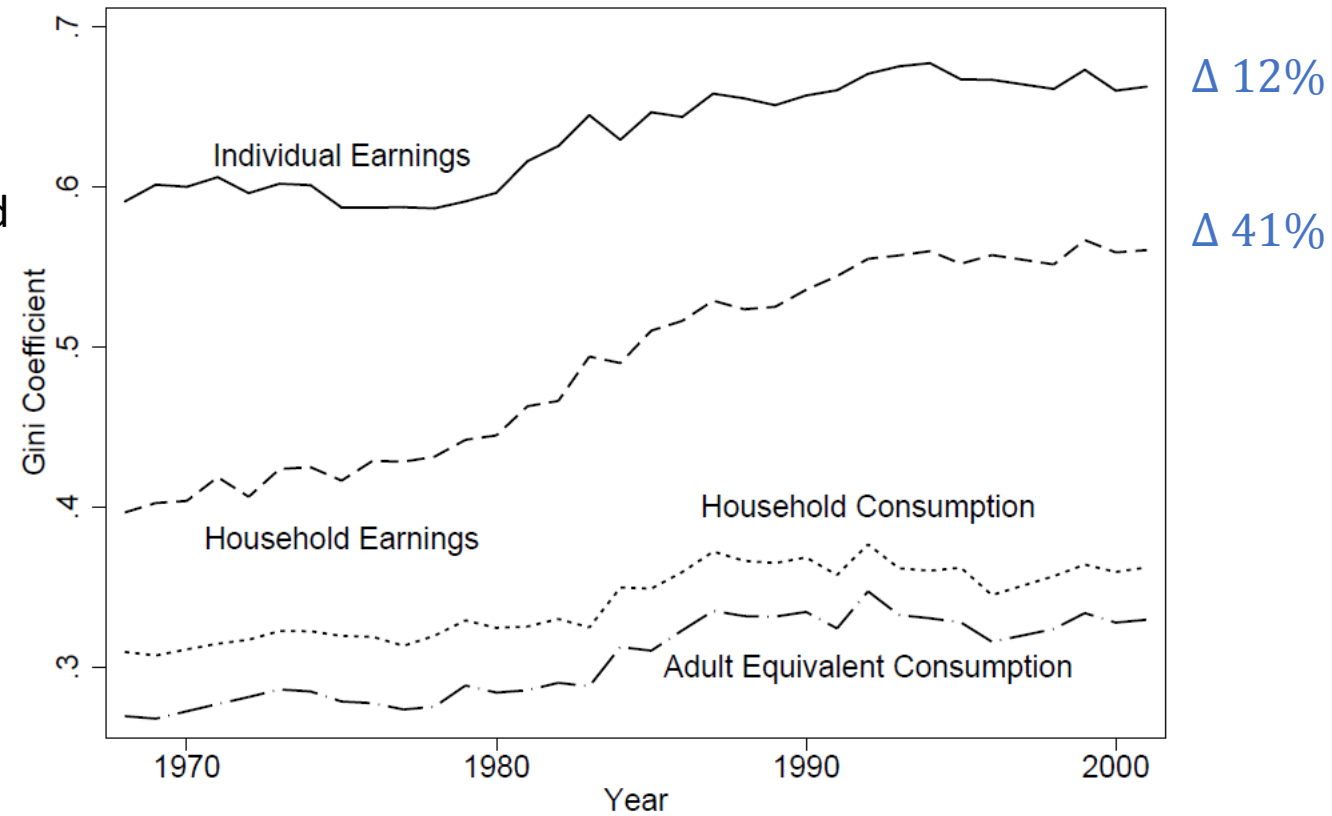
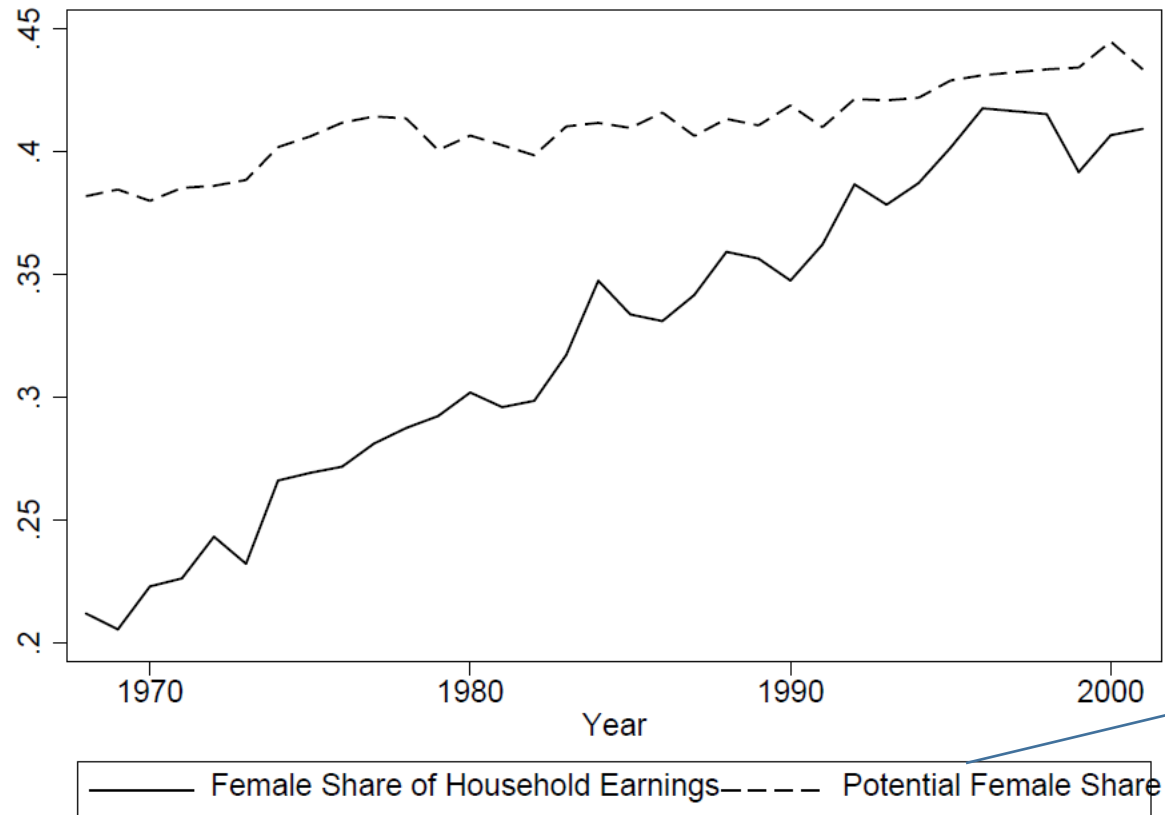


Figure 1: Trends in the Gini index for earnings and consumption.

Source: Lise and Seitz (2011)



Large rise in inequality *between* households while a fall in inequality in the earnings distribution *within* households.

Reduction in gender wage gap
Rise in female labour supply

Share of labour earnings that would be contributed by the wife if both spouses worked full-time

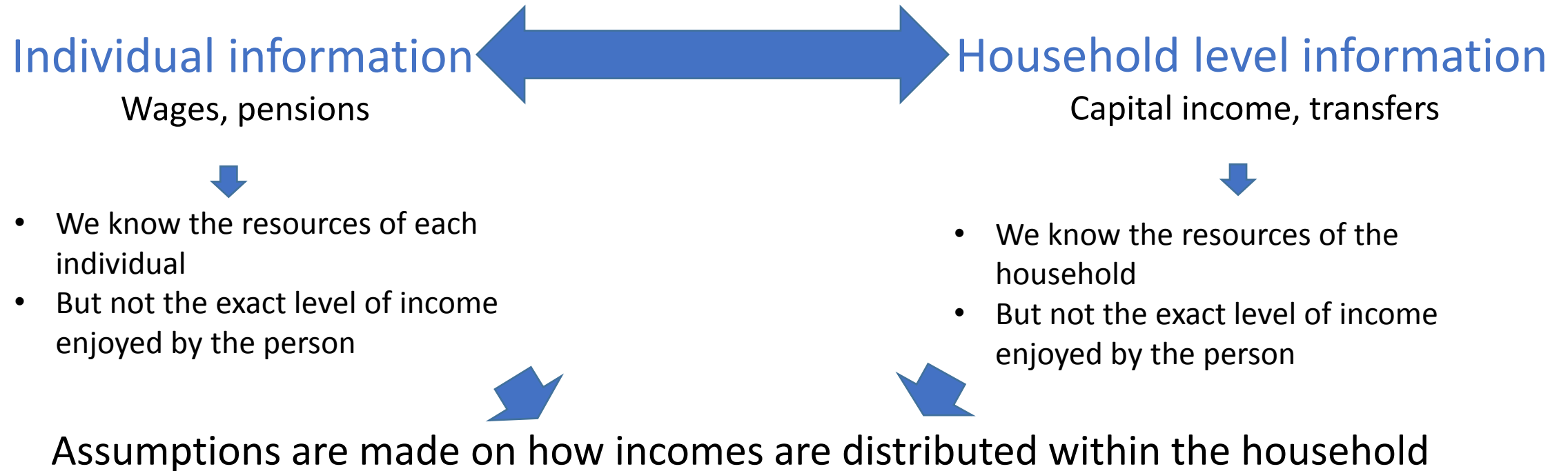
Figure 3: Fraction of actual household earnings provided by wife.

Source: Lise and Seitz (2011)

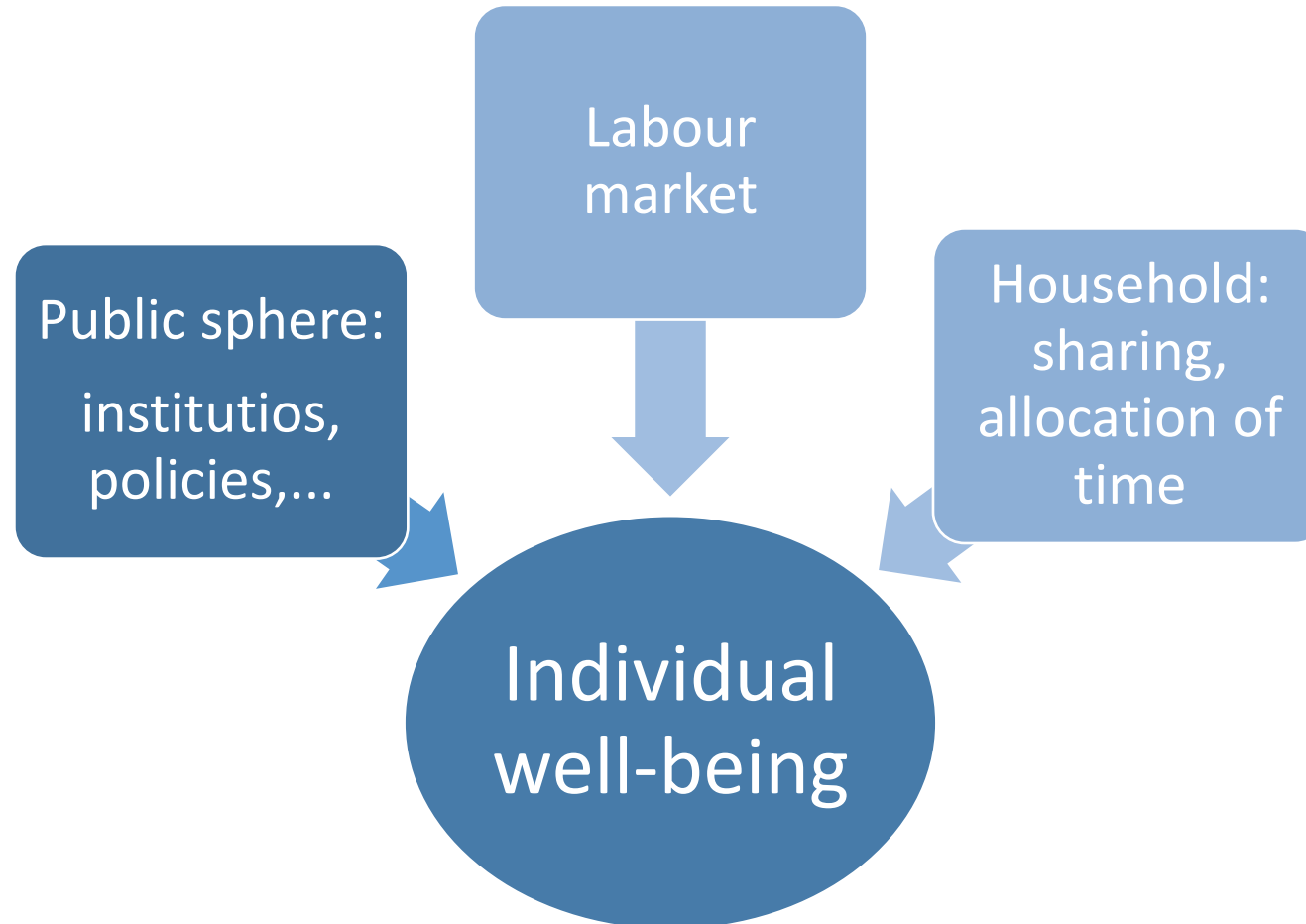
Outline

- 1. Measurement of individual income. Effects on the gender inequality measurement in the literature.
- 2. Information on intra-household distribution of resources: EUSILC 2010.
 - Recent empirical applications for gender poverty gap in EU
- 3. How financial regimens (intra-household distribution of resources and decision responsibilities) affect deprivation levels.

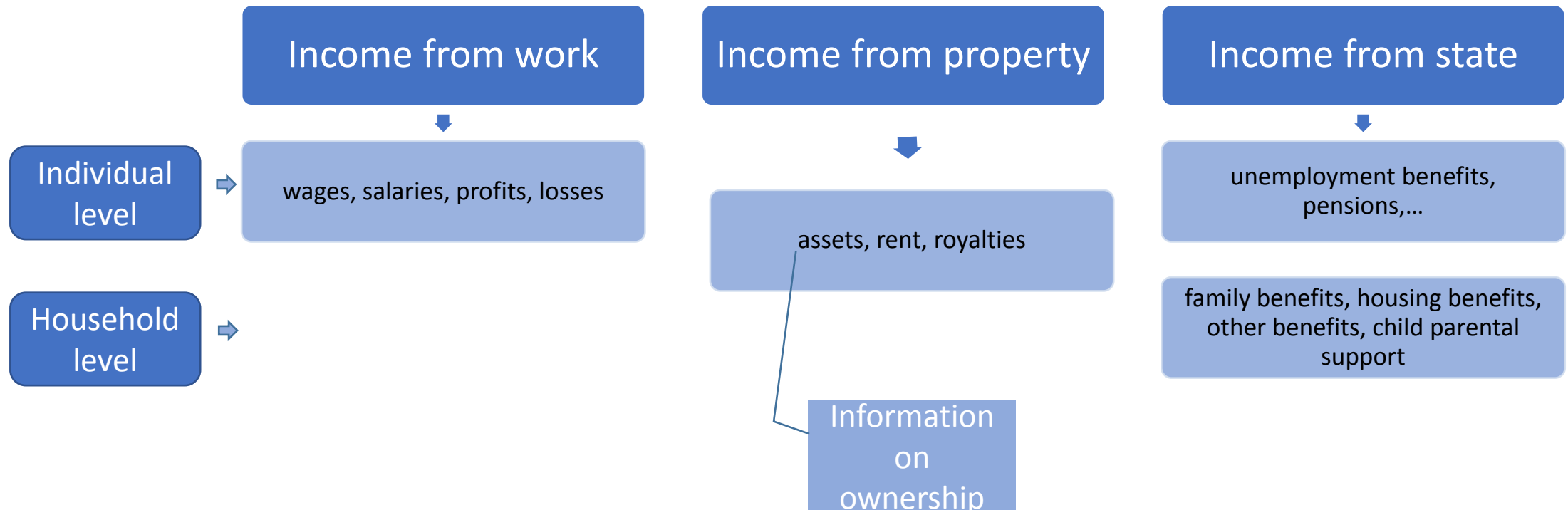
- Difference between individual income and household incomes.




- Many influences from household and public spheres



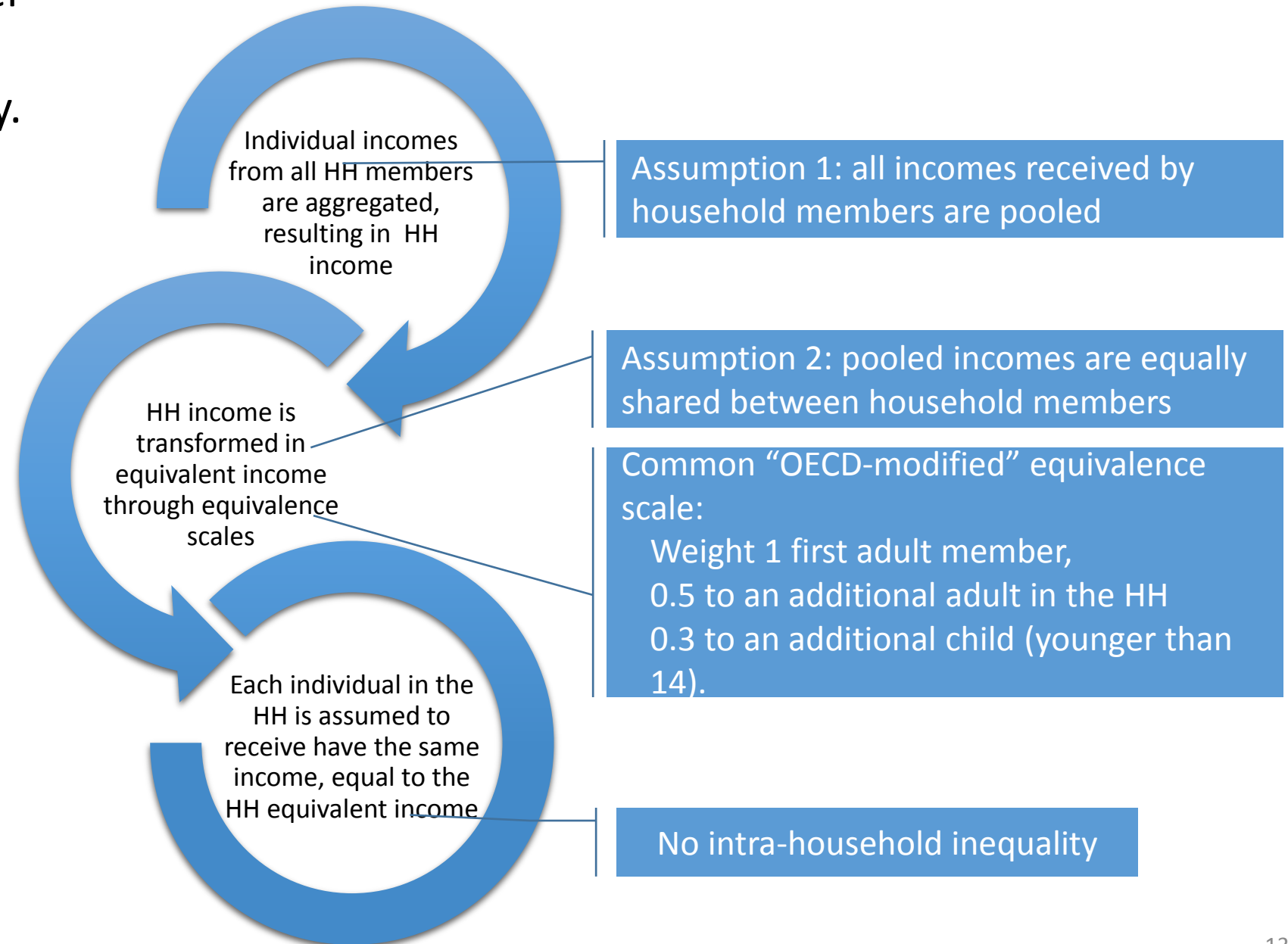
- Three main types of income in the household:



- What is the exact gender gap in well-being?  We need to account for individual well-being.
- We need information at household and individual level and about the interaction of individuals within the household.
- How to distribute household income between household members?

- Difficulty to get precise information on individual well-being:
 - Tradition of surveys aimed at households or individuals, not at both levels.
 - Individual level data collection: complicated and costly.
 - Difficult to know who benefits of household incomes (family benefits or capital incomes).
 - Lack of information on the level of pooling of each individual: proportion of incomes kept apart for each individual.
 - Not information on share of pooled incomes enjoyed by each individual.

Biased estimates of gender inequality because ignore intra-household inequality.



- Deriving individual income from household level information making assumptions of income pooling and equal sharing within the household.



- Ignores intra-household inequality (not in single-person households).



- Biased estimates of gender inequality.

Type of Household EU(27) (2016)	% individuals
One person household	14.5
2 adults, no children, -65	13.2
2 adults, no children, one +65	12.1
Other HH no child	11.2
Single parent	4.7
2 adults +1 children	11.7
2 adults +2 children	15.9
2 adults +3 children	7.1
Other HH with children	9.6

85.5% of individuals in households in which we ignore intra-household inequality

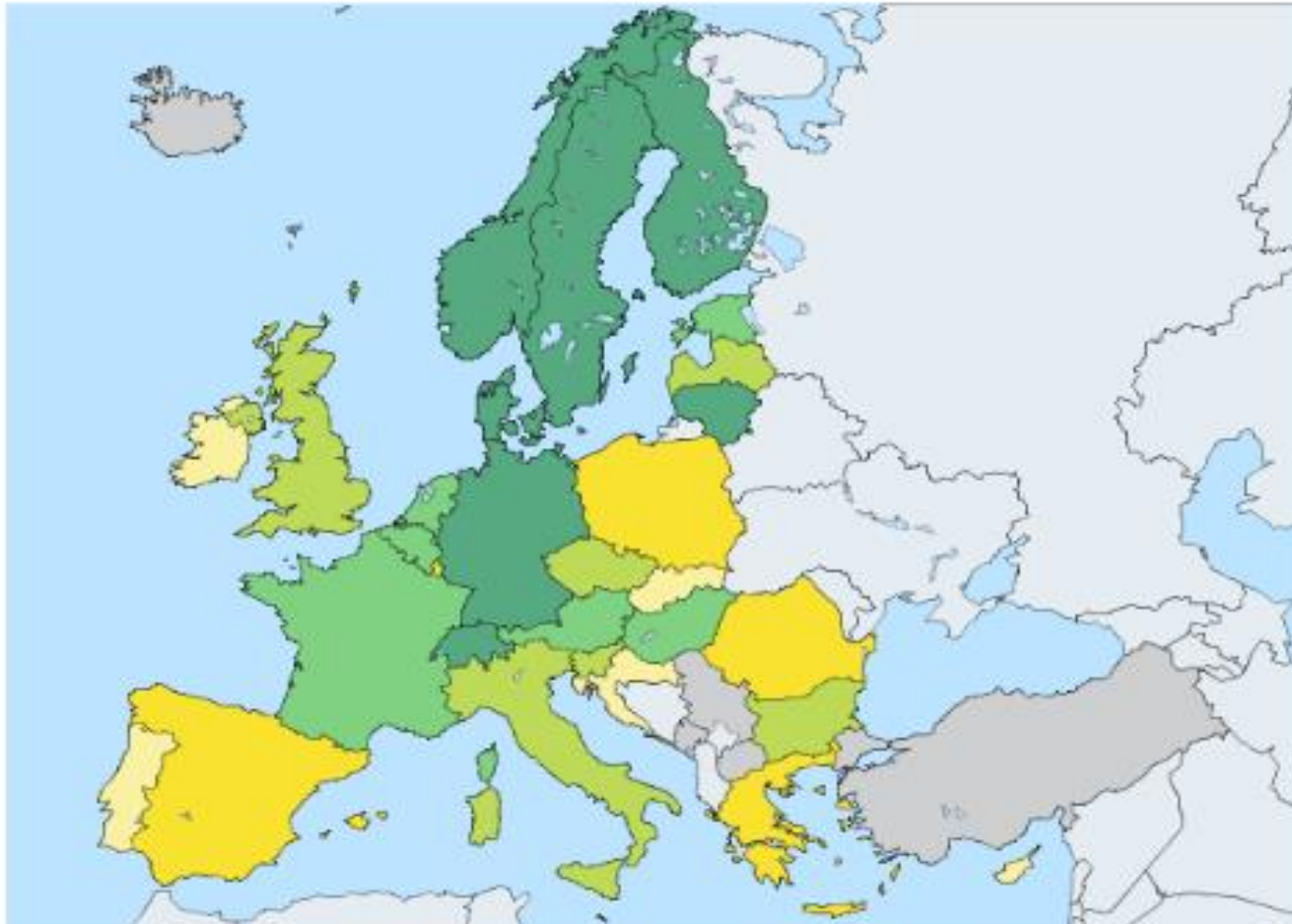
Implications for the assessment of inequality, especially between men and women

Source: Eurostat

Distribution of population by household types - EU-SILC survey

% - 2016

Single person



Not the same % of single households in all countries. Different bias in inequality measurement per country makes comparisons difficult.

Legend

7.7 - 8.8

8.8 - 11.0

11.0 - 13.8

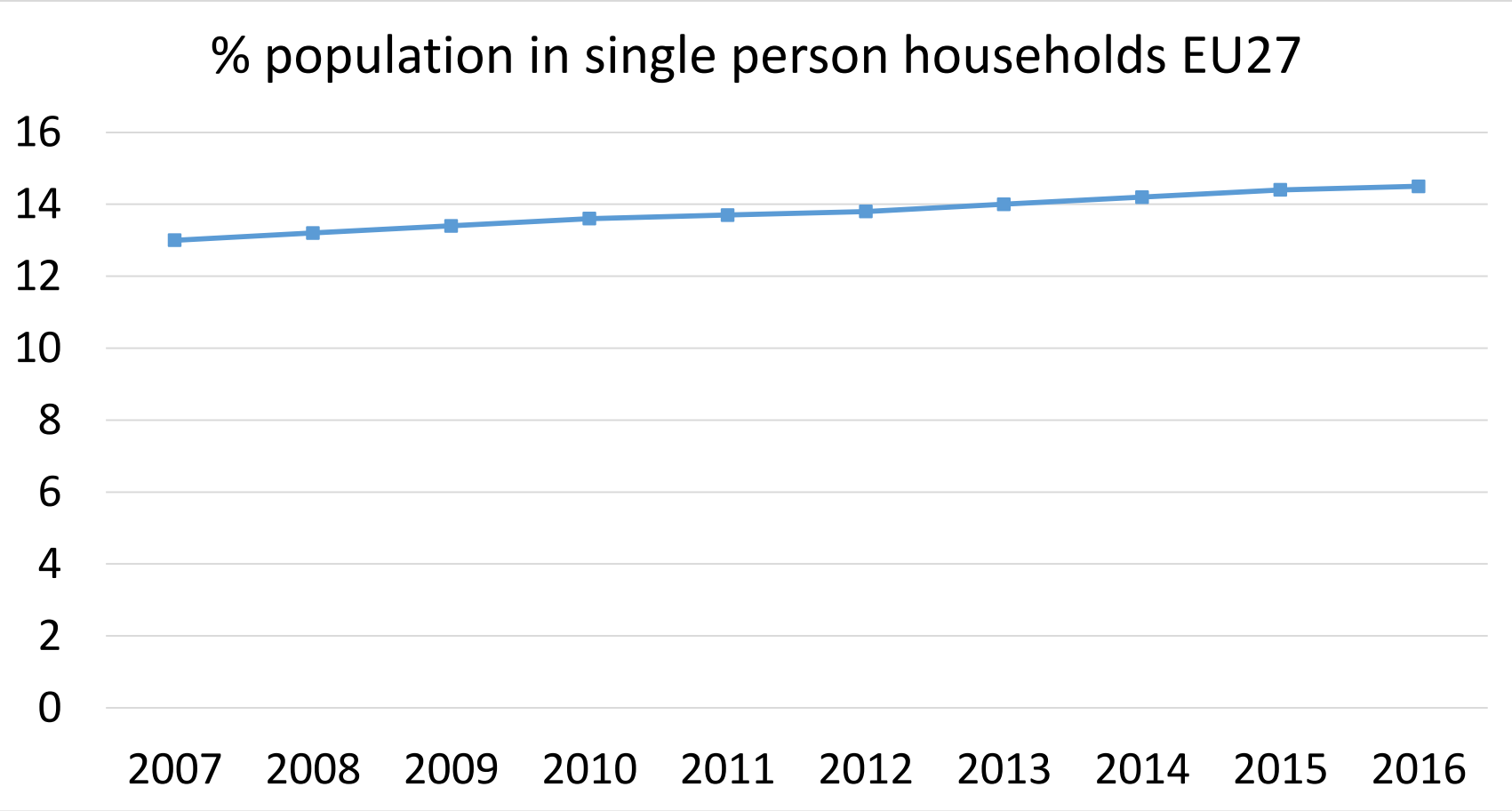
13.8 - 17.5

17.5 - 22.5

Not available

Minimum value:7.7 Maximum value:22.5

Source: Eurostat



Increasing number of
single person
households



Reduction of bias.
Still significant % of individuals in
no single households

- What the standard approach ignores when attributing an equal standard of living to each member of a household? Jenkins (1991)

$$Y_{eq} = \frac{w_f LM_f + w_m LM_m + NL}{n_{eq}}$$

w_i earnings rate.

LM_i time in labour market.

NL couples non labour market.

n_{eq} equivalent adults.

f females.

m males.

- Other possibilities:

$$Y_{eq} = a_1(w_f LM_f) + b_1(w_m LM_m) + a_2 NL_f + b_2 NL_m +$$

$$\frac{(1-a_1)(w_f LM_f) + (1-b_1)(w_m LM_m) + (1-a_2)NL_f + (1-b_2)NL_m}{n_{eq}}$$

Incomes not pooled

Incomes pooled

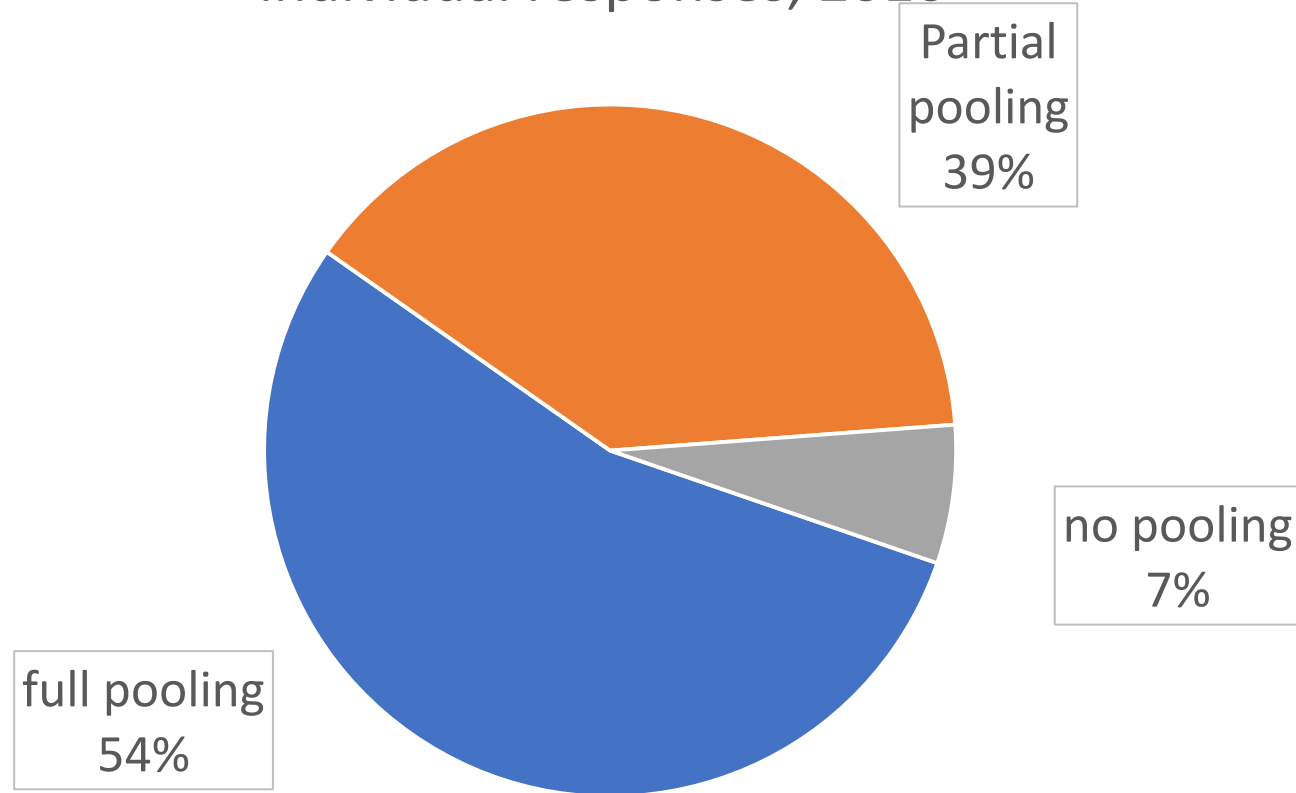
- Many options depending on a_1, b_1, a_2, b_2

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- No much information on intra-household distribution of resources.
- EU statistics on income and living conditions (EU-SILC) 2010 EU-SILC module on 'Intra-household sharing of resources'.
- Europeans (EU-27) that were living in households with at least two persons aged 16 years old and over.

Household pooling regimes based on individual responses, 2010



Note: Consistent responses only
Source: Ponthieux (2013)

Assumption of full income pooling
could be inappropriate

- Less likely to pool incomes:
 - Dual-earners couples
 - Unmarried couples
 - “Patchwork” families
- Full pooling likely to go down due to:
 - Decreasing marriage, increasing cohabitation.
 - Increasing divorces and recomposed families.
 - Increasing dual-earner households.

Full estimation of household allocation models:

- They adopt assumptions other than intra-household inequality.
 - Apply a form of minimal sharing restricted to the household's non-labour income.
 - Assume unequal transfers of income between the household members.
 - Assume an unequal sharing of the household market income.
 - Use of microsimulation, making different pooling assumptions by source of income.
- All these studies concludes:
 - women's shares of income tend to be dramatically lower,
 - women's rank in the distribution of incomes sinks to the bottom quantiles,
 - women's poverty risk rate is much higher whereas that of men is significantly reduced.
- Therefore, there are implications on gender inequality measurement.

Income poverty rates
are higher for women

Sharing assumption	Equal sharing of household income		Other assumption on sharing	
	Men	Women	Men	Women
<i>Women get 30% of the couple's market income</i>				
Borooah and McKee (1993) , United Kingdom, 1985, married couples				
% below 2/3 mean equivalent income	33	33	14	66
<i>Each adult keeps her/his own income^a</i>				
Phipps and Burton (1995) , Canada, 1986, married couples				
% below 50% median equivalent disposable income	10.5	10.5	4.5	28
<i>Each adult keeps her or his own income^a</i>				
Davies and Joshi (1994) , United Kingdom, 1986, married couples				
% below 20th percentile equivalent disposable income	15	15	11	52
<i>Women get 20% less than their equivalent income^a</i>				
Findlay and Wright (1996) , United States, 1985; Italy, 1986; all adults				
% below 50% median equivalent disposable income				
Italy	17.5	16.8	15.4	27.1
United States	17.0	22.6	15.9	30.3
<i>No sharing^a</i>				
Fritzell (1999) , Sweden, 1991, adults aged under 65				
% below 50% median equivalent disposable income	4	3.9	4.5	9.6

Source: Ponthieux and Meurs (2015)

- Some recent contributions. Corsi et al. (2016)
 - Propose an individualized measure of European poverty to highlight gender differences employing data from EU-SILC for the period 2007–2012.
 - Consider adult individuals (over 18).
 - Estimate at-risk-of-poverty rate.

Individual incomes

- Assume that are kept apart

Household incomes

- Assume that are equally shared

$$Y_{eq,i} = y_i + \frac{Y_C - T}{n_{eq}}$$

Individual income

Household income equally shared

Table 2 Men's and women's average yearly incomes in EU-27, 2012

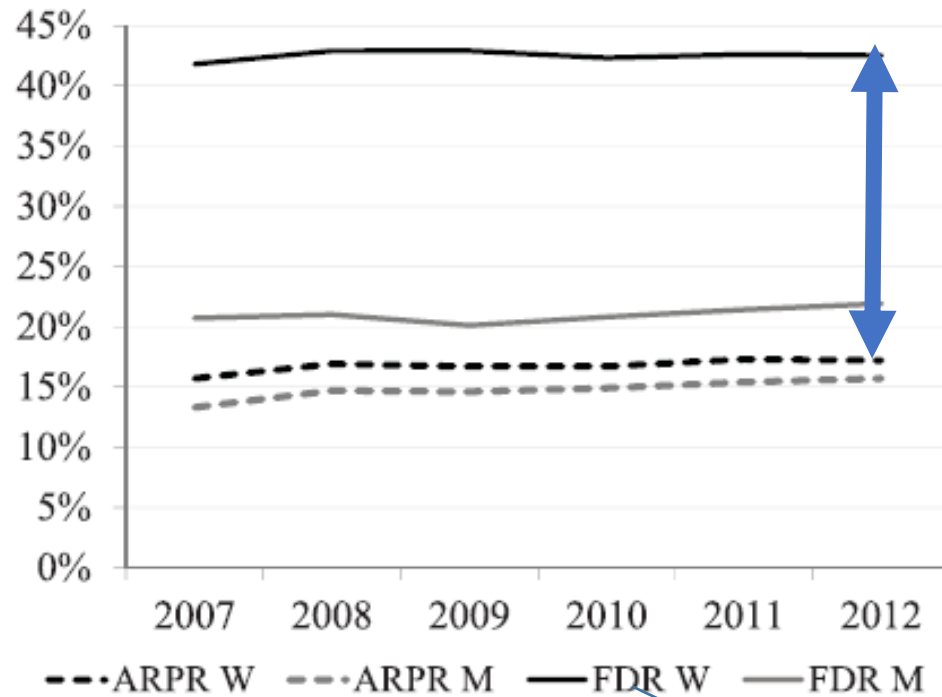
	<i>M</i>	<i>W</i>	<i>Gender gap</i>
Incomes reported at individual level (share)	87%	77%	
Country-specific median equivalent income	€ 15,447	€ 15,340	
Country-specific median individualized income	€ 11,642	€ 11,567	
Conventional Equivalent income	€ 18,145	€ 17,173	5%
Conventional Equivalent income before ST	€ 12,557	€ 11,071	12%
Conventional Equivalent income before ST exc. pensions	€ 16,916	€ 15,999	5%
Individualized Individualized income	€ 17,783	€ 9,353	47%
Individualized Individualized income before ST	€ 12,323	€ 5,256	57%
Individualized Individualized income before ST exc. pensions	€ 16,651	€ 8,391	50%

Notes: The gender income gap is computed as the difference between men's and women's average income, expressed as a percentage of men's average income.

Source: Corsi et al. (2016)

Share of incomes reported at the individual level is on average very high but lower for women than for men → Women have lower resources of their own

Individualized incomes highlight substantial gender differences



For women the difference between FDRs and ARPRs is systematically dramatically larger than for men.
 Equal sharing of HH incomes assumption results in underestimation of gender gaps in poverty

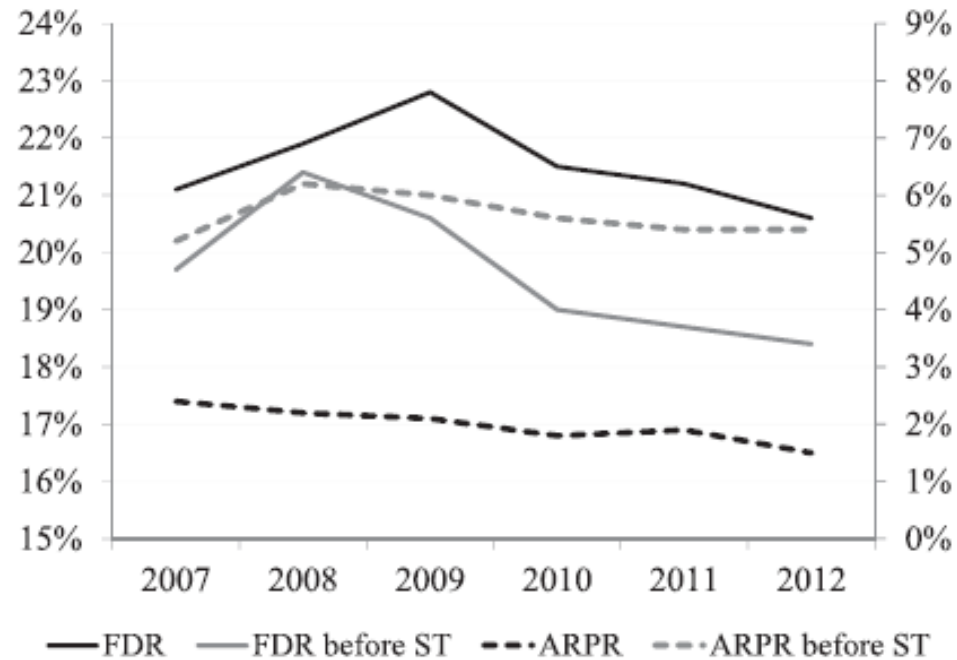
ARPR: lower bound of the estimate of women's poverty, under "optimistic" assumptions
 FDR: upper-bound estimate, under the "pessimistic" assumption of very little sharing of resources

Share of men and women whose individualized income is below 60% of their country's median individualized income

Figure 2 Men's and women's poverty and financial dependency rates (EU-27, 2007-12, %)

Source: Corsi et al. (2016)

Effect on the assessment of the role of state transfers



Decreasing trend in the gender gap, ARPR and FDR.

Opposite conclusion:

- STs reduce ARPR, and improve gender equality.
- STs reduce FDR but reduce gender equality.

Figure 3 Gender gaps in poverty and financial dependency (EU-27, 2007–12, %; FDR left-hand scale, ARPR right-hand scale)

Source: Corsi et al. (2016)

- Other recent contribution departing from full pooling: Ponthieux (2017)
 - Use of EUSILC module 2010.
 - Only couples (married or cohabitant, with or without children), i.e. households with a maximum of two decision-makers.
 - Same sex couples are excluded.

Table 9.1: Distribution of men and women living in couple-households by the share of personal income he/she keeps separate from the common pool, 2010

(%)

	With a personal income										No personal income	
	Men					Women					Men	Women
	all	>50 %	50 %	<50 %	none	all	>50 %	50 %	<50 %	none		
Belgium	11.6	3.3	3.2	8.5	73.4	12.1	4.3	3.7	8.8	71.1	4.1	20.4
Bulgaria	5.1	2.3	2.9	15.0	74.7	5.7	1.2	2.4	12.1	78.6	5.4	12.2
Czech Republic	4.6	6.7	6.9	10.3	71.5	6.8	5.8	6.8	8.0	72.6	0.9	3.9
Germany	3.5	6.5	4.2	7.0	78.8	5.4	6.7	6.4	6.7	74.7	1.3	11.1
Estonia	12.6	5.0	10.3	22	50.2	13.0	4.5	10.4	20.4	51.8	7.2	6.6
Ireland	2.0	5.5	8.7	17.9	65.9	13.9	5.7	8.8	12.4	59.3	n.a.	n.a.
Greece	9.2	4.1	5.4	25	56.3	7.9	4.6	5.8	23.9	57.9	1.4	26.5
Spain	1.4	1.6	3.0	4.2	89.7	1.5	1.4	3.8	4.8	88.4	2.3	27.8
Italy	3.9	2.6	4.8	26.6	62.0	4.7	3.2	6.2	25.3	60.6	3.5	31.7
Cyprus	2.0	3.2	3.1	44.1	47.6	2.6	4.0	5.2	41.2	47.0	2.8	24.4
Latvia	4.3	5.1	5.3	44.0	41.3	5.4	4.2	4.4	41.9	44.1	13.3	15.0
Lithuania	2.4	3.4	2.8	8.3	83.1	3.6	2.3	4.5	7.4	82.2	4.8	5.7
Luxembourg	5.2	6.2	4.2	9.7	74.8	8.7	5.9	5.2	10.4	69.8	0.9	21.4
Hungary	1.0	1.5	1.7	12.4	83.5	1.5	1.1	1.2	10.6	85.6	1.3	3.9
Malta	2.8	4.0	9.6	59.8	23.8	5.2	6.5	10.9	53.4	24.1	1.3	39.4
Austria	0.3	9.9	14.7	26.6	48.5	2.9	12.9	16.2	21.9	46.2	0.3	12.8
Poland	7.5	2.4	2.0	13.3	74.7	8.3	2.6	2.2	11.2	75.7	2.3	13.4
Portugal	7.5	3.1	2.8	11.2	75.4	8.4	2.7	2.0	10.1	76.8	3.0	16.6
Romania	9.0	4.5	4.0	48.7	33.8	9.3	4.2	4.8	46.3	35.5	2.2	20.3
Slovakia	3.6	4.3	3.8	45.4	43.0	4.5	4.0	3.9	40.7	46.9	2.6	4.8
United Kingdom	6.2	5.2	5.5	20.0	63.1	9.3	5.9	6.4	16.6	61.8	2.1	3.9
Mean %	5.0	4.3	5.2	22.9	62.6	6.7	4.5	5.8	20.7	62.4	3.1	16.1

Striking difference: proportion of women who report having no personal income.

Source: Ponthieux (2017)

In 14 of the 21 countries the majority of couples correspond to the standard assumption of full income pooling.

But other pooling regimes are frequent enough

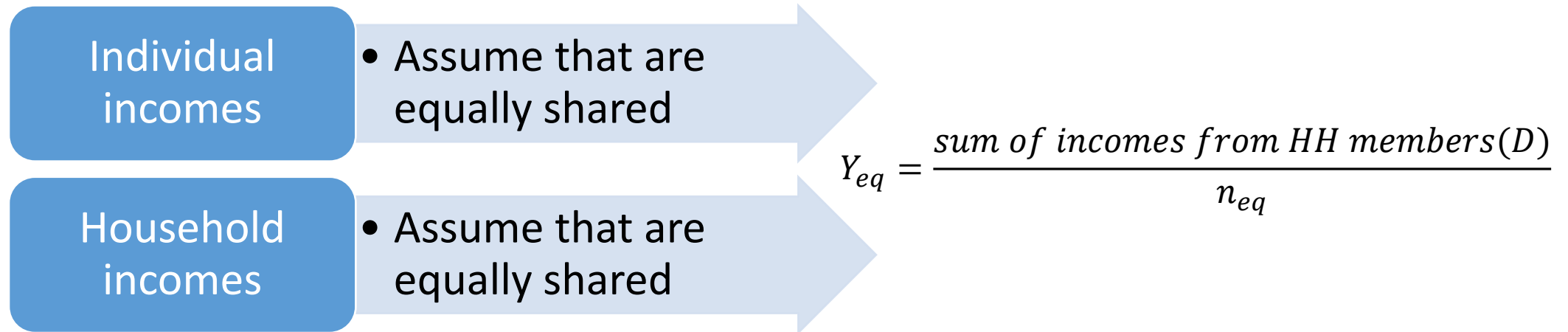
Table 9.2: Distribution of couples by pooling regime, 2010 (%)

	Both partners have personal incomes				One partner has no personal income			Couple's pooling regime (**)		
	and both keep:				and the other keeps (**):			Full pooling	Partial pooling	No pooling
	none(*)	some	all	other cases	none	some	all			
	a	b	c	d	e	f	g	a+e	b+d+f	c+g
Belgium	56.4	11.8	7.2	5.5	15.0	1.2	2.9	71.5	18.5	10.1
Bulgaria	62.9	12.0	3.5	7.2	10.5		3.9	73.4	22.2	4.4
Czech Republic	66.1	18.6	3.4	7.5		4.4		69.6	26.5	3.8
Germany	61.9	13.6	1.8	10.7	11.0		1.1	72.9	25.1	2.1
Estonia	39.1	27.5	9.0	12.0	8.1		4.2	47.2	42.1	10.6
Ireland	55.0	24.1		21.0	n.a.	n.a.	n.a.	55.0		45.0
Greece	36.2	21.1	4.8	10.3	17.3	8.0	2.3	53.6	39.4	7.1
Spain	61.1	6.7		2.8	27.9		1.5	88.9	9.9	1.2
Italy	36.7	18.9	1.7	10.2	21.3	10.0	1.2	58.0	39.1	2.9
Cyprus	30.3	33.3		10.6	13.8		11.9	44.2		55.8
Latvia	30.0	35.3	2.3	10.5	11.0		11.0	40.9	55.6	3.5
Lithuania	70.2	10.0	1.6	7.9		10.3		79.4	18.5	2.1
Luxembourg	52.4	15.6	4.1	5.8	19.9		2.1	72.3	23.3	4.3
Hungary	79.5	11.5		5.5		3.6		82.5		17.5
Malta	13.0	41.9		6.0	10.7		28.5	23.6		76.4
Austria	31.8	37.7		17.5	9.4	3.6	0.0	41.2		58.8
Poland	59.8	11.2	4.5	9.3	11.5	1.9	1.8	71.3	22.3	6.3
Portugal	59.0	10.4	4.5	8.1	13.8	2.6	1.6	72.8	21.1	6.1
Romania	23.5	40.2	5.4	9.7	7.9	11.0	2.4	31.4	60.9	7.7
Slovakia	35.7	40.9	2.3	15.2	3.0		2.9	38.7	58.5	2.8
United Kingdom	53.0	22.6	4.3	14.8	3.7		1.6	56.7	38.4	4.9
Mean %	48.3	22.1	3.1	9.7	11.6	5.1	1.0	59.3	36.6	4.1

Source: Ponthieux (2017)

- Ponthieux (2017) principle of the 'modified' equivalised income consists of applying the standard approach, but only to the pooled income instead of the total disposable income.
- Conventional and 'modified' approaches are equivalent in the case of 'full income pooling' couples.

- Standard approach:



- Then $Y_{eq,f} = Y_{eq,m} = Y_{eq,Ch} = Y_{eq}$

- Modified approach: personal incomes can be kept apart.

Individual incomes

- Assume SOME are kept apart, the rest are common and equally shared

Separate incomes: $y_f + y_m$

Pooled incomes:

$$P = (Y_f - y_f) + (Y_m - y_m) + Y_C - T$$

Y_C common incomes

T social security contributions and taxes

Then:

$$Y_{eq,P} = \frac{(Y_f - y_f) + (Y_m - y_m) + Y_C - T}{n_{eq}}$$

Household incomes

- Assume that are equally shared

- Dealing with EU-SILC 2010 module data.
 - Separate income: y_i that is the proportion of net income stated in the survey
 - Contributed income: $(Y_i - y_i)$ that is the proportion of net income stated in the survey

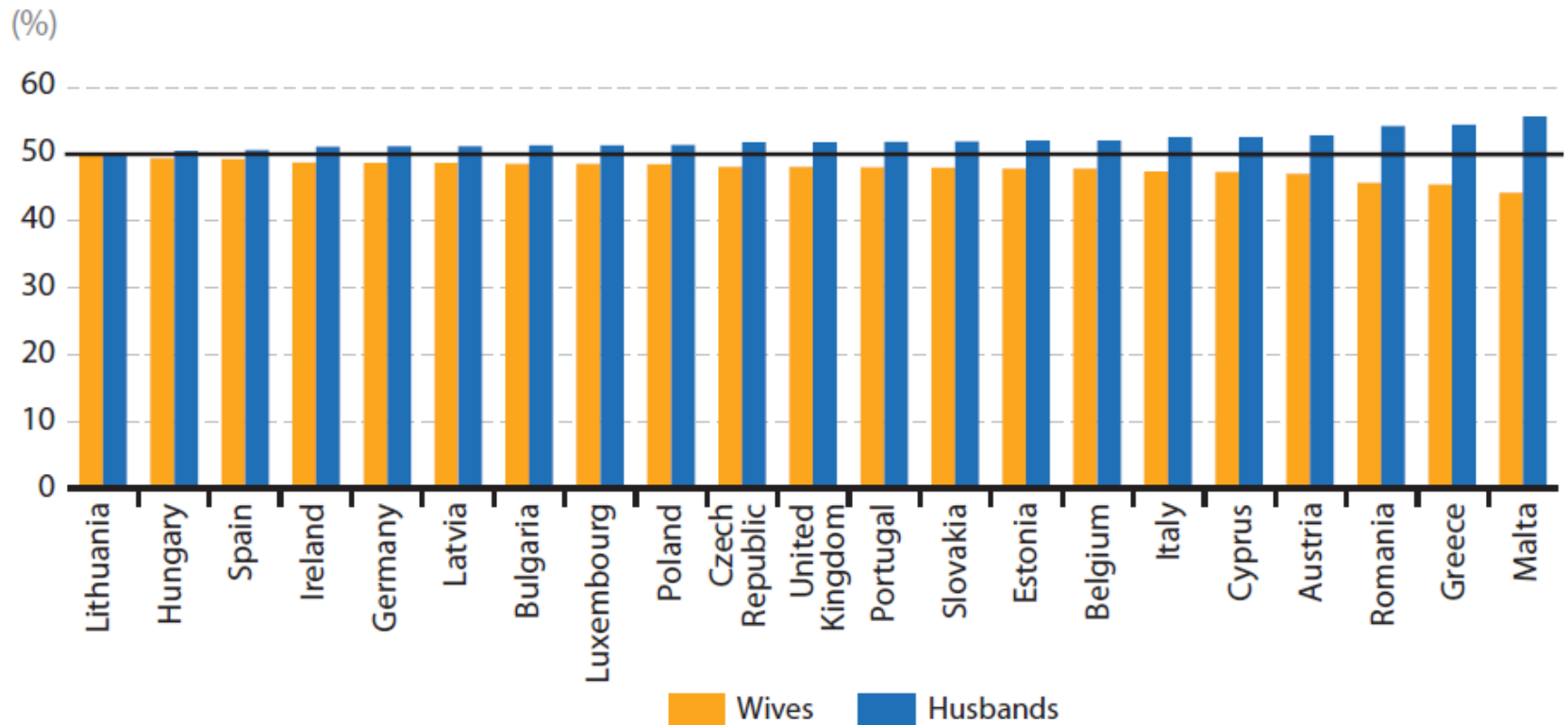
- Then

$$Y_{eq,f} = y_f + Y_{eq,P}$$

$$Y_{eq,m} = y_m + Y_{eq,P}$$

$$Y_{eq,Ch} = Y_{eq,P}$$

Figure 9.2: Intra-household distribution of modified equivalised income between partners, 2010



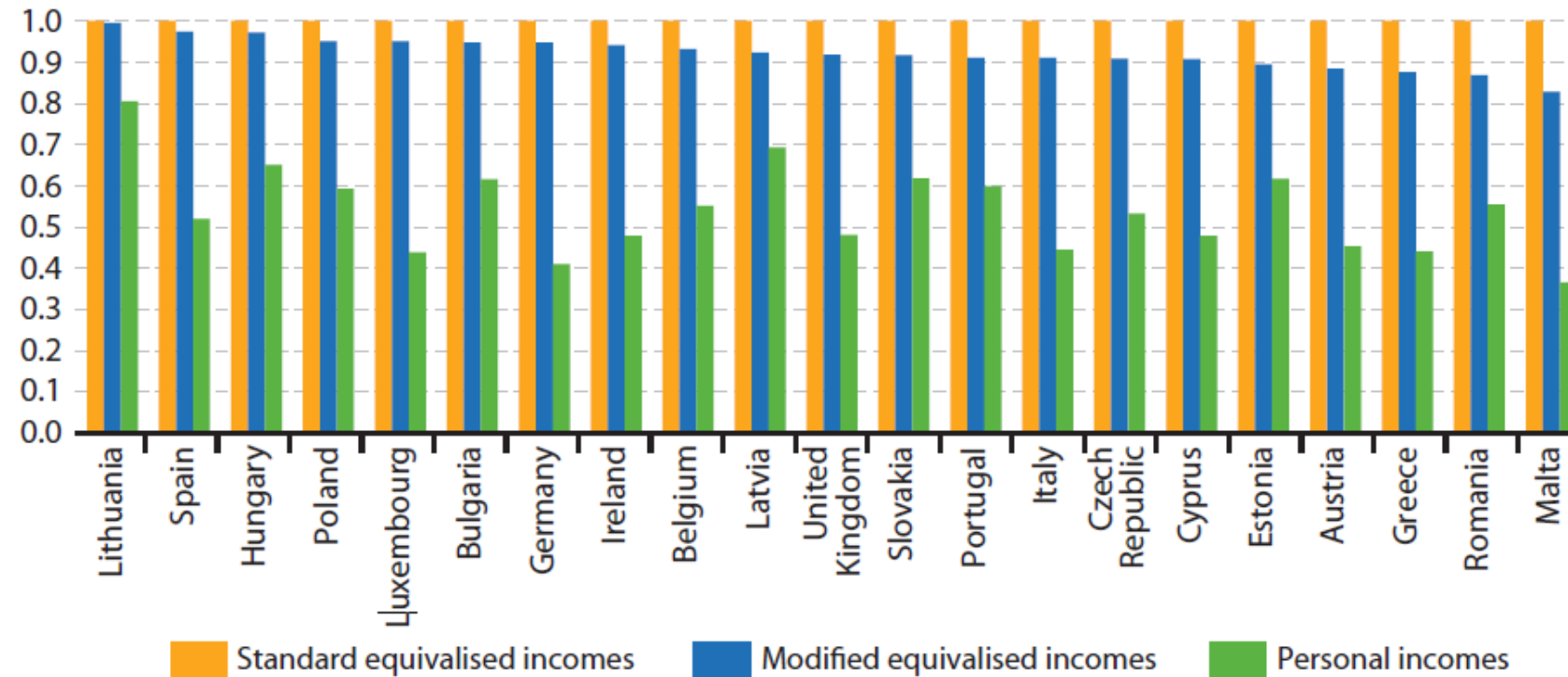
small difference between the wives' and husbands' shares of modified equivalised income

NB: Population: targeted couples.

Reading note: In Malta, wives get on average 43 % of couples' modified equivalised income, instead of 50 % with the standard approach.

Source: Ponthieux (2017)

Figure 9.3: Gender income ratios (women/men), 2010

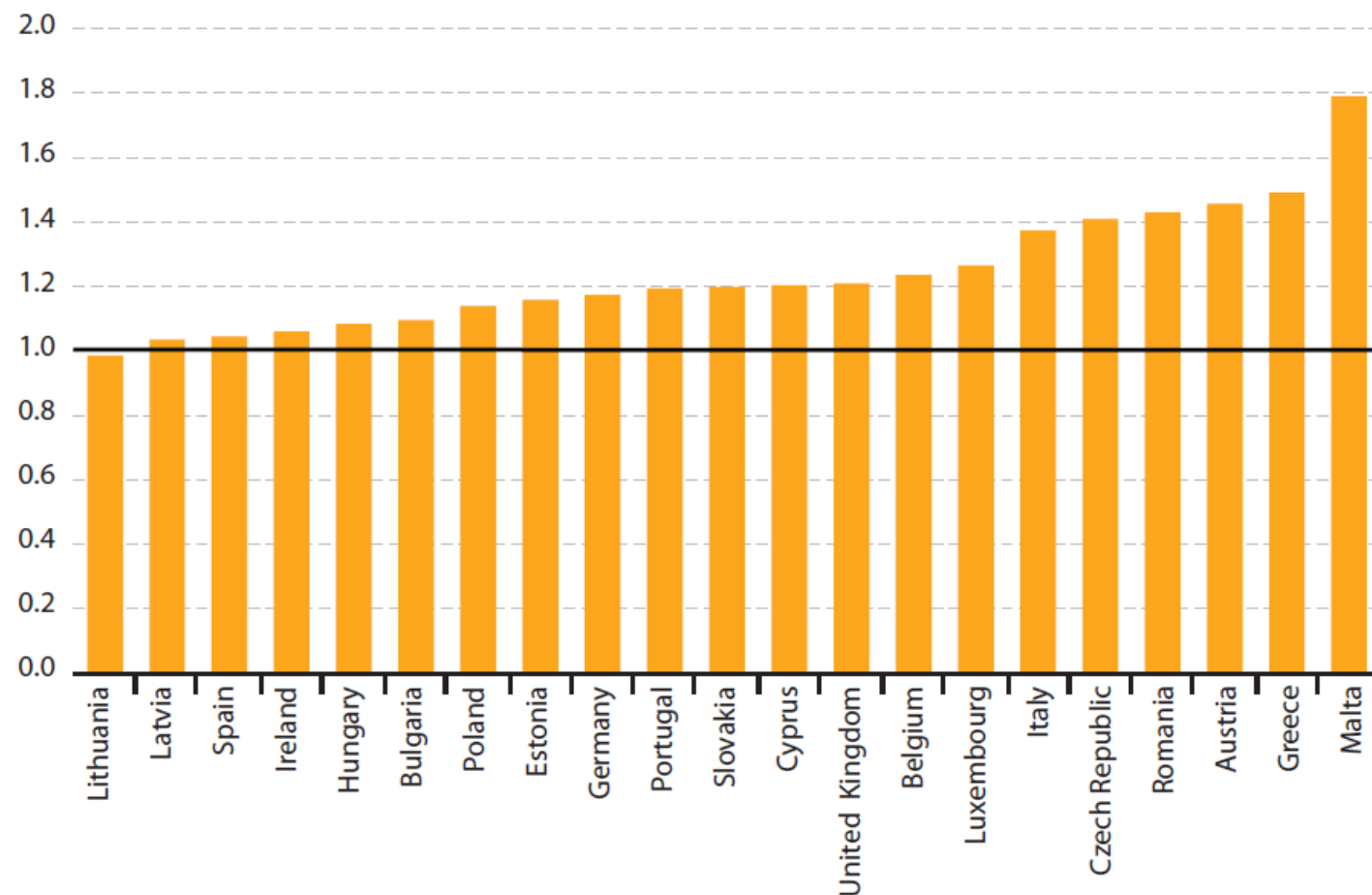


Standard-modified equivalised income difference: intra-couple differentials in personal incomes are counterbalanced by the distribution of couples' pooling regimes.

NB: Countries ordered by the gender ratio of equivalised modified incomes. Population: men and women of the targeted couples.
Reading note: In the Czech Republic, Estonia, Greece, Italy, Cyprus, Malta, Austria and Romania, the ratio (women to men) of modified equivalised income is 10 to 12 percentage points lower than the ratio of standard equivalised incomes, with ratios of personal incomes standing between 0.45 and 0.60.

Source: Ponthieux (2017)

Figure 9.4: Gender ratio (women/men) of 'modified' poverty risk, 2010



Women's 'modified' poverty risk is higher than men's. Deviating from the standard assumptions, by allowing for the possibility that incomes are not fully pooled, results in higher poverty risks for women than for men.

NB: Countries ordered by size of the gender ratio of at-risk-of-poverty rates. Population: adults of the targeted couples.

Reading note: In all countries except Lithuania, the women to men ratio of at-risk-of-poverty rates is greater (e.g. by 20 % in Portugal) than 1, which is the ratio obtained with the standard measure of equivalised incomes (represented by the horizontal line).

Source: Ponthieux (2017)

Conclusions

Results on the effect of intra-household distribution on income in the assessment of gender inequality reveals some limitations:

- Some income components are provided at household level and should be collected individual level to not incur in underestimation of gender inequalities. More individual-level information is encouraged.
- The use of equivalence scales assume equal sharing and ignores intra-household inequalities. Some alternatives should be tested.
- Policies that condition what an individual is entitled to with the resources of the household can reinforce inequalities between individuals and particularly the imbalance of resources between women and men. Recommendations for an individual-based right to social transfers is encouraged.

Conclusions

- Data availability on pooling does not overcome all problems:
 - Even when there is no income pooling transfers between partners can take place. No pool does not mean no sharing.
 - Income pooling does not mean equal sharing.
- Household incomes as well as incomes received by individuals may be poor indicators of economic well-being, but being able to assess unequal command over resources within the household is crucial for the assessment of economic well-being.

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Implications of intra-household allocation of resources on the level of deprivation

- Bárcena-Martín, E., Blázquez, M. and Moro-Egido, A. (2017) [Intra-household allocation of resources and household deprivation](#), Working Papers in Economic Theory 2017/03.
- Individuals with the same household income may suffer different deprivation levels.
- Analysis of the impact of different household financial regimes on deprivation in a number of European countries.
- Special module on intra-household sharing of resources included in the 2010 wave of EU-SILC dataset.

- Since the family involves an intra-household scheme of exchange and distribution of resources, different financial regimes within the household may, to some extent, explain the presence of specific types and levels of deprivation
- Empirical evidence suggests:
 - Individuals may have different preferences and may not pool their incomes.
 - Decision-making process in a family exerts an important influence on the intra-household dynamics and welfare of the household.

Literature review

Individual and household determinants of deprivation:

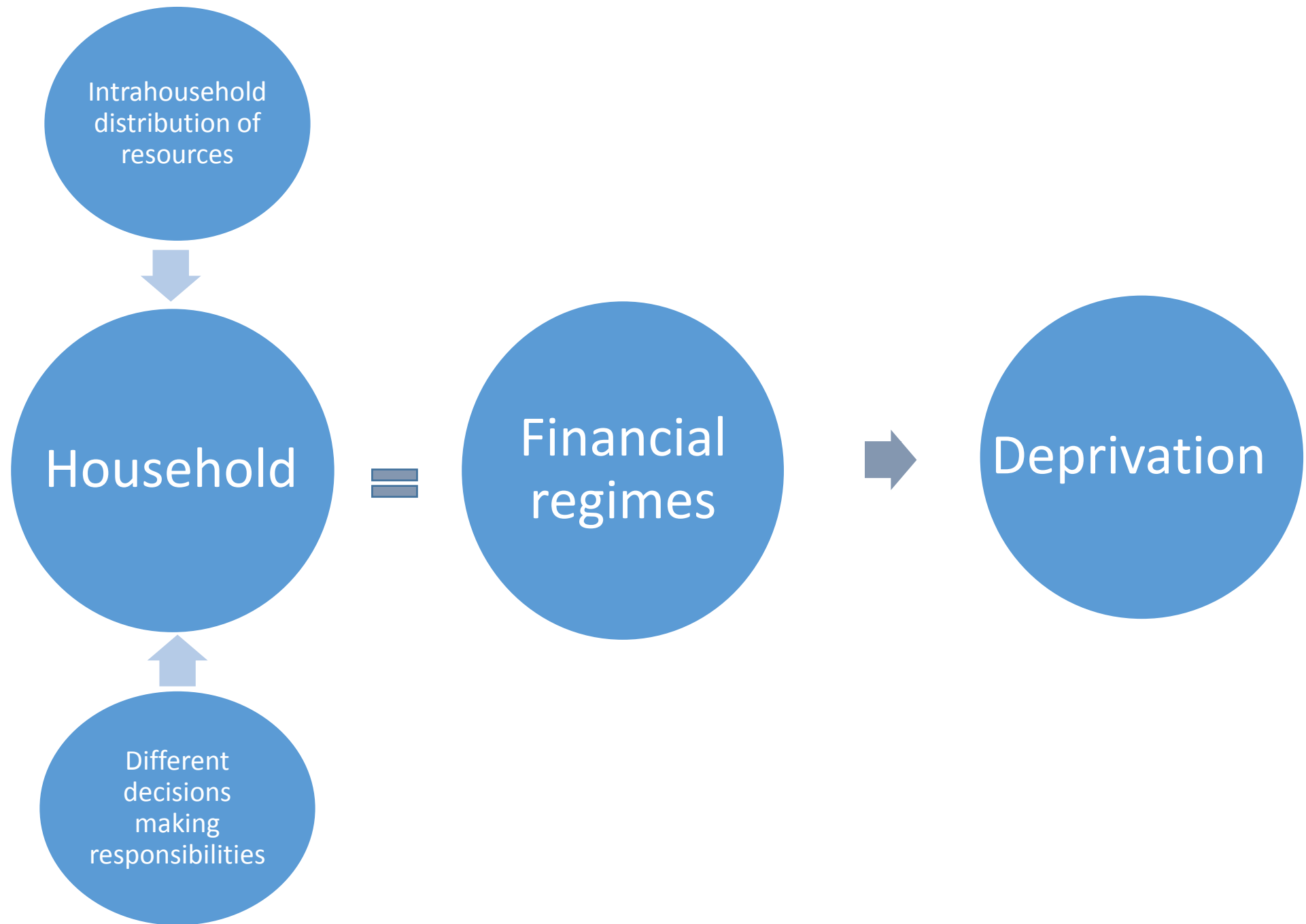
- Negative and weak relationship with income.
- Families with dependent children are especially vulnerable to material deprivation.
- No clear relationship with age (if any U-shaped).
- Higher education reduces deprivation.
- Households with one or more self-employed or employed workers generally present lower deprivation scores.

Literature review

- Studies rely on the assumption that family members act as if they maximize a single utility function (Samuelson, 1956; Becker, 1981), and thus ignored the potential for unequal power and resource distribution within households.
- Recent empirical studies suggest that the unitary approach is not always supported and that significant inequalities might exist within the same family (see, for instance, Fortin and Lacroix, 1997; Clark et al., 2002 and Ward-Batts, 2008; Dietrich, 2008 for China; Bonke and Uldall-Poulsen, 2005; among others).

Literature review

- New literature based on non-unitary models (mainly collective models)
 - Each household member is characterized by his or her own utility function.
 - Decisions are seen as the outcome of some bargaining process (Bourguignon and Chiappori, 1992; Chiappori, 1992, 1997).
 - An important distinction has been made between responsibility for the management of household resources and control of (major) household decisions (Pahl, 1989; Wilson, 1987).



Data

- The 2010 module on intra-household sharing of resources of the EUSILC.
- Sample: heterosexual couples, with or without children, for 24 countries.
- We eliminate couples with inconsistent responses on the decision-making variables.
- We end up with 84,269 observations.

Deprivation

- D_i : Deprivation Index (12 *Items*) (Guio et al., 2009)
 - Economic strain: to keep home adequately warm; to afford paying for one-week annual holiday away from home; to afford a meal with meat, chicken, fish every second day; to face unexpected financial expenses.
 - Durables: to have a telephone; a color TV; a computer; a washing machine; a personal car.
 - Housing: to have leaking roof/damp walls/floors/foundation or rot in window frames; no bath/shower; no indoor flushing toilet for sole use of the household.

Deprivation

- D_i : Deprivation Index (**Aggregation**)

for each item we define a dichotomous indicator I_{ij} :

$$I_{ij} = \begin{cases} 0 & \text{affordability} \\ 1 & \text{non affordability} \end{cases} \quad \text{for } i = 1, \dots, N; \quad j = 1, \dots, J$$

and deprivation level is:

$$D_i = \sum_{j=1}^J w_j I_{ij}$$

that equals 0 if a person lacks no items and increases with the number of items the individual lacks.

Deprivation

- Mean levels of deprivation 

Country	Overall Deprivation Index
CH	0,025
LU	0,036
DE	0,045
BE	0,046
FR	0,047
UK	0,048
AT	0,049
IE	0,062
MT	0,064
ES	0,066
CZ	0,067
IT	0,069
EL	0,079
SK	0,079
PT	0,084
CY	0,09
HR	0,091
EE	0,095
PL	0,096
HU	0,113
LT	0,131
LV	0,154
BG	0,194
RO	0,21
TOTAL	0,072

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The Model

$$D_i = \gamma_0 + \mathbf{W}_i' \gamma_1 + \mathbf{Z}_i' \gamma_2 + \mathbf{C}_i' \gamma_3 + \varepsilon_i$$

- Z_i : Socioeconomic variables
 - *Income*: household annual equivalent disposable income
 - *Child*: dummy to identify the presence of children
 - *Dual*: both members of the couple are working either full or part time
 - *H_Young*: when the mean age of the couple is less than 35
 - *H_Middle*: when the mean age of the couple is from 35 to 65
 - *H_Old* (reference category)
 - *H_Tertiary* and *H_Secondary* : 0 if None of the members of the couple have tertiary education or secondary education; 1 if only one of them has tertiary or secondary education; and 2 if both have tertiary or secondary education.
 - *H_Chronic*: number of household members suffering from chronic diseases.
 - *H-Marital*: dummy for legal consensual unions

The Model

- C_i : Country specific fixed effects

$$D_i = \gamma_0 + \mathbf{W}_i' \gamma_1 + \mathbf{Z}_i' \gamma_2 + \mathbf{C}_i' \gamma_3 + \varepsilon_i$$

The Model

- W_i : Financial Regimen

$$D_i = \gamma_0 + \mathbf{W}_i' \gamma_1 + \mathbf{Z}_i' \gamma_2 + \mathbf{C}_i' \gamma_3 + \varepsilon_i$$

Income pooling: How are the incomes you receive in your household dealt with?

- ***Reg1*** all incomes are treated as common resources
- ***Reg2*** not all incomes are treated as common resources

The Model

- W_i : Financial Regimen

$$D_i = \gamma_0 + \mathbf{W}_i' \gamma_1 + \mathbf{Z}_i' \gamma_2 + \mathbf{C}_i' \gamma_3 + \varepsilon_i$$

Financial decision-making: "Who in your couple is generally more likely to take decisions on" in five areas: i) shopping; ii) children expenses; iii) furniture, etc.; iv) borrowing; v) saving


- ***Dec_f*** if females have most decision-making responsibilities
- ***Dec_m*** if males have most decision-making responsibilities
- ***Dec_s*** if decisions are shared

The Model

$$D_i = \gamma_0 + \mathbf{W}_i' \gamma_1 + \mathbf{Z}_i' \gamma_2 + \mathbf{C}_i' \gamma_3 + \varepsilon_i$$

- \mathbf{W}_i : Financial Regimen

Financial decision-making: Watson et al. (2013):

- The average across the items that range from 0 (responsibility for decision making in none of the areas) to 10 (responsibility for decision making in all areas).
- A score from 4 to 6  shared responsibility
 - adults are jointly responsible for each of the areas
 - an almost even division of responsibilities between them (e.g., one is responsible for shopping and the other is responsible for decisions on savings).

The Model

$$D_i = \gamma_0 + \mathbf{W}_i' \gamma_1 + \mathbf{Z}_i' \gamma_2 + \mathbf{C}_i' \gamma_3 + \varepsilon_i$$

\mathbf{W}_i : Financial Regimen

Variable	Description	Mean values
<i>Reg1_DecS</i>	All income pooling and decisions shared (<i>Reference</i>)	41,66%
<i>Reg1_DecF</i>	All income pooling and decisions mainly female	31,58%
<i>Reg1_DecM</i>	All income pooling and decisions mainly male	5,42%
<i>Reg2_DecS</i>	Not All income pooling and decisions shared	9,46%
<i>Reg2_DecF</i>	Not All income pooling and decisions mainly female	9,74%
<i>Reg2_DecM</i>	Not All income pooling and decisions mainly male	2,15%

The Model

$$D_i = \gamma_0 + \mathbf{W}_i' \gamma_1 + \mathbf{Z}_i' \gamma_2 + \mathbf{C}_i' \gamma_3 + \varepsilon_i$$

➤ Linear model. Cluster robust standard errors

\mathbf{W}_i : Financial Regimen → Endogeneity problem

➤ **Deb and Trivedi (2006)** : Two set of equations:

➤ Choice of financial regime (selection)

➤ Intensity of deprivation (outcome).

(The selection and the outcome equations are linked via observed and unobserved characteristics).

The Model

Deb and Trivedi (2006) :

Selection equation

- multinomial choice model for the household financial regimen (selection)
- Let U_{ij}^* denote the indirect utility associated with the j th choice ($j=1, \dots, J$)

$$U_{ij}^* = \mathbf{X}_i' b_j + \sum_{k=1}^J \alpha_{jk} m_{ik} + h_{ij}$$

- X_i includes the exogenous variables plus the instruments
- m_{ik} , incorporate unobserved characteristics common to deprivation and household decisions regarding the financial regimen (independent of η_{ij})
- η_{ij} are i.i.d. error terms

The Model

Deb and Trivedi (2006) :

Selection equation

- Let b_j be the binary variables representing the observed choices
- The probability of any type of financial regime can be represented as:

$$\Pr(\mathbf{b}_i | \mathbf{X}_i, \mathbf{M}_i) = g \left(\mathbf{X}_i' b_1 + \sum_{k=1}^J \alpha_{1k} m_{ik}, \mathbf{X}_i' b_2 + \sum_{k=1}^J \alpha_{2k} m_{ik}, \dots, \mathbf{X}_i' b_J + \sum_{k=1}^J \alpha_{Jk} m_{ik} \right) \quad \mathbf{b}_i = [b_{i1}, b_{i2}, \dots, b_{iJ}]$$

where g is a multinomial probability distribution

Some restrictions are imposed: each choice is affected by a unique latent factor

The Model

Deb and Trivedi (2006) :

Outcome equation

$$D_i = g_0 + \sum_{j=1}^J \alpha_j d_j b_{ij} + \sum_{j=1}^J \alpha_j /_j m_{ij} + \mathbf{z}_i' g_2 + \mathbf{C}_i' g_3 + e_i$$

Where:

- \mathbf{z}_i is the set of exogenous covariates
- d_j denotes the selection effects relative to the control

Results

Validity of instruments

- Instruments: measure within-household inequalities concerning education and income (following Vogler (1994), Lyngstad et al. (2011), and Mader and Schneebaum (2013)).
 - ***Income_F*** and ***Income_M***: Dummies to capture female or male earning more income than her/his partner
 - ***Education_F*** and ***Education_M***: Dummies to capture female or male with higher level of education than her/his partner
- They have useful predictive power and hence are *relevant*.
- We test for the exogeneity of the financial regimes, and they are not exogenous.

Results

	Reg1_DecF	Reg1_DecM	Reg2_DecS	Reg2_DecF	Reg2_DecM	Deprivation
<i>Reg1_DecF</i>						-0.008*** (0.001)
<i>Reg1_DecM</i>						0.001 (0.004)
<i>Reg2_DecS</i>						0.043*** (0.011)
<i>Reg2_DecF</i>						-0.007* (0.004)
<i>Reg2_DecM</i>						-0.000 (0.003)
<i>Child</i>	0.505*** (0.094)	0.103* (0.056)	-0.455*** (0.068)	0.043 (0.164)	-0.238*** (0.090)	0.009*** (0.002)
<i>Income</i>	-0.005 (0.045)	0.118 (0.092)	0.486*** (0.099)	0.592*** (0.102)	0.522*** (0.143)	-0.058*** (0.010)
<i>Dual</i>	-0.244*** (0.088)	-0.255*** (0.031)	0.216*** (0.058)	-0.024 (0.143)	-0.313** (0.141)	-0.015*** (0.003)
<i>H_Young</i>	-0.040 (0.133)	0.106 (0.089)	0.849*** (0.174)	0.448** (0.215)	0.864*** (0.229)	0.037*** (0.005)
<i>H_Middle</i>	0.158 (0.122)	0.002 (0.100)	0.753*** (0.118)	0.864*** (0.163)	0.956*** (0.147)	0.023*** (0.003)
<i>H_Chronic</i>	0.038 (0.047)	0.130*** (0.044)	-0.065 (0.056)	0.103 (0.069)	0.098 (0.069)	0.012*** (0.001)
<i>H_Marital</i>	0.270** (0.118)	-0.049 (0.096)	-1.286*** (0.241)	-1.044*** (0.210)	-1.340*** (0.255)	-0.019*** (0.004)
<i>H_Secondary</i>	-0.149 (0.099)	-0.215*** (0.080)	-0.231** (0.108)	-0.401** (0.163)	-0.351*** (0.083)	-0.021*** (0.005)
<i>H_Tertiary</i>	-0.272*** (0.094)	-0.206** (0.087)	-0.078 (0.142)	-0.506** (0.211)	-0.296** (0.133)	-0.032*** (0.005)
<i>Income_F</i>	0.066 (0.041)	0.255*** (0.069)	0.333*** (0.068)	0.385*** (0.119)	0.032 (0.069)	
<i>Education_F</i>	0.090 (0.056)	-0.217** (0.103)	-0.072* (0.041)	0.212*** (0.065)	-0.342** (0.163)	
<i>Income_M</i>	0.306*** (0.057)	0.317*** (0.056)	0.173 (0.115)	0.350*** (0.123)	0.297** (0.141)	
<i>Education_M</i>	0.012 (0.025)	0.196** (0.087)	-0.080* (0.045)	-0.035 (0.052)	0.144** (0.072)	
<i>Country Fixed Effect</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Const.</i>	-0.679 (0.534)	-3.522*** (0.811)	-4.459*** (0.915)	-5.965*** (0.948)	-6.514*** (1.266)	0.649*** (0.100)

Results

	Reg1_DecF	Reg1_DecM	Reg2_DecS	Reg2_DecF	Reg2_DecM	Deprivation
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<i>Country Fixed Effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Const.</i>	-0.679 (0.534)	-3.522*** (0.811)	-4.459*** (0.915)	-5.965*** (0.948)	-6.514*** (1.266)	0.649*** (0.100)

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<i>H_Chronic</i>	0.038 (0.047)	0.130*** (0.044)	-0.065 (0.056)	0.103 (0.069)	0.098 (0.069)	0.012*** (0.001)
<i>H_Marital</i>	0.270** (0.118)	-0.049 (0.096)	-1.286*** (0.241)	-1.044*** (0.210)	-1.340*** (0.255)	-0.019*** (0.004)
<i>H_Secondary</i>	-0.149 (0.099)	-0.215*** (0.080)	-0.231** (0.108)	-0.401** (0.163)	-0.351*** (0.083)	-0.021*** (0.005)
<i>H_Tertiary</i>	-0.272*** (0.094)	-0.206** (0.087)	-0.078 (0.142)	-0.506** (0.211)	-0.296** (0.133)	-0.032*** (0.005)
<i>Income_F</i>	0.066 (0.041)	0.255*** (0.069)	0.333*** (0.068)	0.385*** (0.119)	0.032 (0.069)	
<i>Education_F</i>	0.090 (0.056)	-0.217** (0.103)	-0.072* (0.041)	0.212*** (0.065)	-0.342** (0.163)	
<i>Income_M</i>	0.306*** (0.057)	0.317*** (0.056)	0.173 (0.115)	0.350*** (0.123)	0.297** (0.141)	
<i>Education_M</i>	0.012 (0.025)	0.196** (0.087)	-0.080* (0.045)	-0.035 (0.052)	0.144** (0.072)	
<i>Country Fixed Effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Const.</i>	-0.679 (0.534)	-3.522*** (0.811)	-4.459*** (0.915)	-5.965*** (0.948)	-6.514*** (1.266)	0.649*** (0.100)

Results

	Reg1_DecF	Reg1_DecM	Reg2_DecS	Reg2_DecF	Reg2_DecM	Deprivation
<i>Reg1_DecF</i>						-0.008*** (0.001)
<i>Reg1_DecM</i>						0.001 (0.004)
<i>Reg2_DecS</i>						0.043*** (0.011)
<i>Reg2_DecF</i>						-0.007* (0.004)
<i>Reg2_DecM</i>						-0.000 (0.003)
<i>Child</i>	0.505*** (0.094)	0.103* (0.056)	-0.455*** (0.068)	0.043 (0.164)	-0.238*** (0.090)	0.009*** (0.002)
<i>Income</i>	-0.005 (0.045)	0.118 (0.092)	0.486*** (0.099)	0.592*** (0.102)	0.522*** (0.143)	-0.058*** (0.010)
<i>Dual</i>	-0.244*** (0.088)	-0.255*** (0.031)	0.216*** (0.058)	-0.024 (0.143)	-0.313** (0.141)	-0.015*** (0.003)
<i>H_Young</i>	-0.040 (0.133)	0.106 (0.089)	0.849*** (0.174)	0.448** (0.215)	0.864*** (0.229)	0.037*** (0.005)
<i>H_Middle</i>	0.158 (0.122)	0.002 (0.100)	0.753*** (0.118)	0.864*** (0.163)	0.956*** (0.147)	0.023*** (0.003)
<i>H_Chronic</i>	0.038 (0.047)	0.130*** (0.044)	-0.065 (0.056)	0.103 (0.069)	0.098 (0.069)	0.012*** (0.001)
<i>H_Marital</i>	0.270** (0.118)	-0.049 (0.096)	-1.286*** (0.241)	-1.044*** (0.210)	-1.340*** (0.255)	-0.019*** (0.004)
<i>H_Secondary</i>	-0.149 (0.099)	-0.215*** (0.080)	-0.231** (0.108)	-0.401** (0.163)	-0.351*** (0.083)	-0.021*** (0.005)
<i>H_Tertiary</i>	-0.272*** (0.094)	-0.206** (0.087)	-0.078 (0.142)	-0.506** (0.211)	-0.296** (0.133)	-0.032*** (0.005)
<i>Income_F</i>	0.066 (0.041)	0.255*** (0.069)	0.333*** (0.068)	0.385*** (0.119)	0.032 (0.069)	
<i>Education_F</i>	0.090 (0.056)	-0.217** (0.103)	-0.072* (0.041)	0.212*** (0.065)	-0.342** (0.163)	
<i>Income_M</i>	0.306*** (0.057)	0.317*** (0.056)	0.173 (0.115)	0.350*** (0.123)	0.297** (0.141)	
<i>Education_M</i>	0.012 (0.025)	0.196** (0.087)	-0.080* (0.045)	-0.035 (0.052)	0.144** (0.072)	
<i>Country Fixed Effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Const.</i>	-0.679 (0.534)	-3.522*** (0.811)	-4.459*** (0.915)	-5.965*** (0.948)	-6.514*** (1.266)	0.649*** (0.100)

Results

	Reg1_DecF	Reg1_DecM	Reg2_DecS	Reg2_DecF	Reg2_DecM	Deprivation
<i>Reg1_DecF</i>						-0.008*** (0.001)
<i>Reg1_DecM</i>						0.001 (0.004)
<i>Reg2_DecS</i>						0.043*** (0.011)
<i>Reg2_DecF</i>						-0.007* (0.004)
<i>Reg2_DecM</i>						-0.000 (0.003)
<i>Child</i>	0.505*** (0.094)	0.103* (0.056)	-0.455*** (0.068)	0.043 (0.164)	-0.238*** (0.090)	0.009*** (0.002)
<i>Income</i>	-0.005 (0.045)	0.118 (0.092)	0.486*** (0.099)	0.592*** (0.102)	0.522*** (0.143)	-0.058*** (0.010)
<i>Dual</i>	-0.244*** (0.088)	-0.255*** (0.031)	0.216*** (0.058)	-0.024 (0.143)	-0.313** (0.141)	-0.015*** (0.003)
<i>H_Young</i>	-0.040 (0.133)	0.106 (0.089)	0.849*** (0.174)	0.448** (0.215)	0.864*** (0.229)	0.037*** (0.005)
<i>H_Middle</i>	0.158 (0.122)	0.002 (0.100)	0.753*** (0.118)	0.864*** (0.163)	0.956*** (0.147)	0.023*** (0.003)
<i>H_Chronic</i>	0.038 (0.047)	0.130*** (0.044)	-0.065 (0.056)	0.103 (0.069)	0.098 (0.069)	0.012*** (0.001)
<i>H_Marital</i>	0.270** (0.118)	-0.049 (0.096)	-1.286*** (0.241)	-1.044*** (0.210)	-1.340*** (0.255)	-0.019*** (0.004)
<i>H_Secondary</i>	-0.149 (0.099)	-0.215*** (0.080)	-0.231** (0.108)	-0.401** (0.163)	-0.351*** (0.083)	-0.021*** (0.005)
<i>H_Tertiary</i>	-0.272*** (0.094)	-0.206** (0.087)	-0.078 (0.142)	-0.506** (0.211)	-0.296** (0.133)	-0.032*** (0.005)
<i>Income_F</i>	0.066 (0.041)	0.255*** (0.069)	0.333*** (0.068)	0.385*** (0.119)	0.032 (0.069)	
<i>Education_F</i>	0.090 (0.056)	-0.217** (0.103)	-0.072* (0.041)	0.212*** (0.065)	-0.342** (0.163)	
<i>Income_M</i>	0.306*** (0.057)	0.317*** (0.056)	0.173 (0.115)	0.350*** (0.123)	0.297** (0.141)	
<i>Education_M</i>	0.012 (0.025)	0.196** (0.087)	-0.080* (0.045)	-0.035 (0.052)	0.144** (0.072)	
<i>Country Fixed Effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Const.</i>	-0.679 (0.534)	-3.522*** (0.811)	-4.459*** (0.915)	-5.965*** (0.948)	-6.514*** (1.266)	0.649*** (0.100)

Results

	Reg1_DecF	Reg1_DecM	Reg2_DecS	Reg2_DecF	Reg2_DecM	Deprivation
<i>Reg1_DecF</i>						-0.008*** (0.001) ←
<i>Reg1_DecM</i>						0.001 (0.004)
<i>Reg2_DecS</i>						0.043*** (0.011)
<i>Reg2_DecF</i>						-0.007* ← (0.004)
<i>Reg2_DecM</i>						-0.000 (0.003)
<i>Child</i>	0.505*** (0.094)	0.103* (0.056)	-0.455*** (0.068)	0.043 (0.164)	-0.238*** (0.090)	0.009*** (0.002)
<i>Income</i>	-0.005 (0.045)	0.118 (0.092)	0.486*** (0.099)	0.592*** (0.102)	0.522*** (0.143)	-0.058*** (0.010)
<i>Dual</i>	-0.244*** (0.088)	-0.255*** (0.031)	0.216*** (0.058)	-0.024 (0.143)	-0.313** (0.141)	-0.015*** (0.003)
<i>H_Young</i>	-0.040 (0.133)	0.106 (0.089)	0.849*** (0.174)	0.448** (0.215)	0.864*** (0.229)	0.037*** (0.005)
<i>H_Middle</i>	0.158 (0.122)	0.002 (0.100)	0.753*** (0.118)	0.864*** (0.163)	0.956*** (0.147)	0.023*** (0.003)
<i>H_Chronic</i>	0.038 (0.047)	0.130*** (0.044)	-0.065 (0.056)	0.103 (0.069)	0.098 (0.069)	0.012*** (0.001)
<i>H_Marital</i>	0.270** (0.118)	-0.049 (0.096)	-1.286*** (0.241)	-1.044*** (0.210)	-1.340*** (0.255)	-0.019*** (0.004)
<i>H_Secondary</i>	-0.149 (0.099)	-0.215*** (0.080)	-0.231** (0.108)	-0.401** (0.163)	-0.351*** (0.083)	-0.021*** (0.005)
<i>H_Tertiary</i>	-0.272*** (0.094)	-0.206** (0.087)	-0.078 (0.142)	-0.506** (0.211)	-0.296** (0.133)	-0.032*** (0.005)
<i>Income_F</i>	0.066 (0.041)	0.255*** (0.069)	0.333*** (0.068)	0.385*** (0.119)	0.032 (0.069)	
<i>Education_F</i>	0.090 (0.056)	-0.217** (0.103)	-0.072* (0.041)	0.212*** (0.065)	-0.342** (0.163)	
<i>Income_M</i>	0.306*** (0.057)	0.317*** (0.056)	0.173 (0.115)	0.350*** (0.123)	0.297** (0.141)	
<i>Education_M</i>	0.012 (0.025)	0.196** (0.087)	-0.080* (0.045)	-0.035 (0.052)	0.144** (0.072)	
<i>Country Fixed Effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Const.</i>	-0.679 (0.534)	-3.522*** (0.811)	-4.459*** (0.915)	-5.965*** (0.948)	-6.514*** (1.266)	0.649*** (0.100)


Results

	Reg1_DecF	Reg1_DecM	Reg2_DecS	Reg2_DecF	Reg2_DecM	Deprivation
<i>Reg1_DecF</i>						-0.008*** (0.001)
<i>Reg1_DecM</i>						0.001 (0.004)
<i>Reg2_DecS</i>						0.043*** (0.011)
<i>Reg2_DecF</i>						-0.007* (0.004)
<i>Reg2_DecM</i>						-0.000 (0.003)
<i>Child</i>	0.505*** (0.094)	0.103* (0.056)	-0.455*** (0.068)	0.043 (0.164)	-0.238*** (0.090)	0.009*** (0.002)
<i>Income</i>	-0.005 (0.045)	0.118 (0.092)	0.486*** (0.099)	0.592*** (0.102)	0.522*** (0.143)	-0.058*** (0.010)
<i>Dual</i>	-0.244*** (0.088)	-0.255*** (0.031)	0.216*** (0.058)	-0.024 (0.143)	-0.313** (0.141)	-0.015*** (0.003)
<i>H_Young</i>	-0.040 (0.133)	0.106 (0.089)	0.849*** (0.174)	0.448** (0.215)	0.864*** (0.229)	0.037*** (0.005)
<i>H_Middle</i>	0.158 (0.122)	0.002 (0.100)	0.753*** (0.118)	0.864*** (0.163)	0.956*** (0.147)	0.023*** (0.003)
<i>H_Chronic</i>	0.038 (0.047)	0.130*** (0.044)	-0.065 (0.056)	0.103 (0.069)	0.098 (0.069)	0.012*** (0.001)
<i>H_Marital</i>	0.270** (0.118)	-0.049 (0.096)	-1.286*** (0.241)	-1.044*** (0.210)	-1.340*** (0.255)	-0.019*** (0.004)
<i>H_Secondary</i>	-0.149 (0.099)	-0.215*** (0.080)	-0.231** (0.108)	-0.401** (0.163)	-0.351*** (0.083)	-0.021*** (0.005)
<i>H_Tertiary</i>	-0.272*** (0.094)	-0.206** (0.087)	-0.078 (0.142)	-0.506** (0.211)	-0.296** (0.133)	-0.032*** (0.005)
<i>Income_F</i>	0.066 (0.041)	0.255*** (0.069)	0.333*** (0.068)	0.385*** (0.119)	0.032 (0.069)	
<i>Education_F</i>	0.090 (0.056)	-0.217** (0.103)	-0.072* (0.041)	0.212*** (0.065)	-0.342** (0.163)	
<i>Income_M</i>	0.306*** (0.057)	0.317*** (0.056)	0.173 (0.115)	0.350*** (0.123)	0.297** (0.141)	
<i>Education_M</i>	0.012 (0.025)	0.196** (0.087)	-0.080* (0.045)	-0.035 (0.052)	0.144** (0.072)	
<i>Country Fixed Effect</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Const.</i>	-0.679 (0.534)	-3.522*** (0.811)	-4.459*** (0.915)	-5.965*** (0.948)	-6.514*** (1.266)	0.649*** (0.100)





When couple members keep part of their incomes separately, the worse situation is that in which decision making is shared

Results

- How much extra income would have to be given to the household to exactly compensate for a specific financial regime other than the reference category in terms of deprivation?
 - **Reg1_DecS**  **Reg2_DecS**: the negative effect in terms of deprivation could be offset by a 52.4 percent increase in own household income (for the sample average income, this variation amounts to €9,506)

Results

- How much extra income would have to be given to the household to exactly compensate for a specific financial regime other than the reference category in terms of deprivation?
 - **Reg1_DecS**  **Reg1_DecF**: the reduction in terms of deprivation could be equivalent to a **14.8 percent increase in own household income** (for the sample average income, this variation amounts to **€2,685**)
 - **Reg1_DecS**  **Reg2_DecF**: the reduction in terms of deprivation could be equivalent to a **12.8 percent increase in own household income** (for the sample average income, this variation amounts to **€2,329**)

Conclusions

- Interesting insight on the role that income pooling and decision making within the household play in determining material deprivation.
- Pooling all incomes and sharing decisions, once controlling for the effects of other socio-economic determinants, is associated with lower levels of deprivation.
- The financial regimen where females have most decision responsibilities is associated with similar low levels of deprivation.

Conclusions

- The worst situation in terms of household deprivation is that in which couple members keep part of their incomes separately and decisions are shared.
- Household deprivation level is influenced by what is happening within the household in terms of income pooling and decision making.
- *As far as possible, it is crucial to take into account the pooling decisions as well as the decision-making processes and power relations within the family in designing policies to reduce deprivation.*

Gender inequality, measurement and evidence

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Winter School on Inequality and Social Welfare Theory

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