



Modelling Implicit Equivalence Scales from tax-benefit systems in Germany, Italy, Poland and the UK

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Background

- Implicit equivalence scales (IES): Defined by the level of support which is redistributed to families of different structure through the tax and benefit system in a given country
- Research in that area: James Banks, Mike Brewer (2002); John Muellbauer, Justin van de Ven (2004); Justin van de Ven et al. (2015)

Motivations

- Check consistency of tax and benefit IES with scales used for the purpose of income distribution analysis and subjective equivalence scales
- Explore the effect of applying different equivalence scales on income distribution analysis
- Compare welfare systems' generosity across countries and for different family types

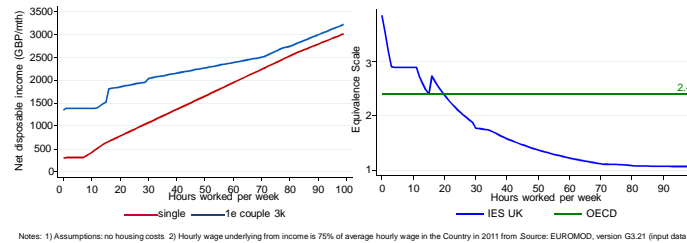
Modelling IES using EUROMOD

- EUROMOD:
 - ✓ Countries: DE, IT, PL, UK
 - ✓ Tax-benefit system from 30th of June 2011
 - ✓ Data: EU-SILC 2012 (FRS 2012/13 for the UK)
- Set of stylised households:
 - ✓ Single (reference household),
 - ✓ Lone parent with: 1 child, 2 children, 3 children
 - ✓ Couples without children (one or two earners),
 - ✓ Couples with: 1 child, 2 children, 3 children (one or two earners)
 - ✓ we don't model housing benefit & unemployment benefit

Budget constraints and IES calculation

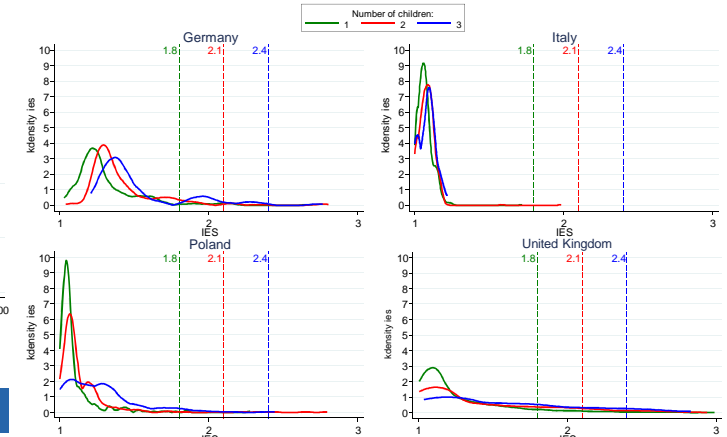
$$\frac{dispinc(HH_x)}{dispinc(HH_{ref})} = IES$$

Example: couple with 3children, 1 earner - United Kingdom



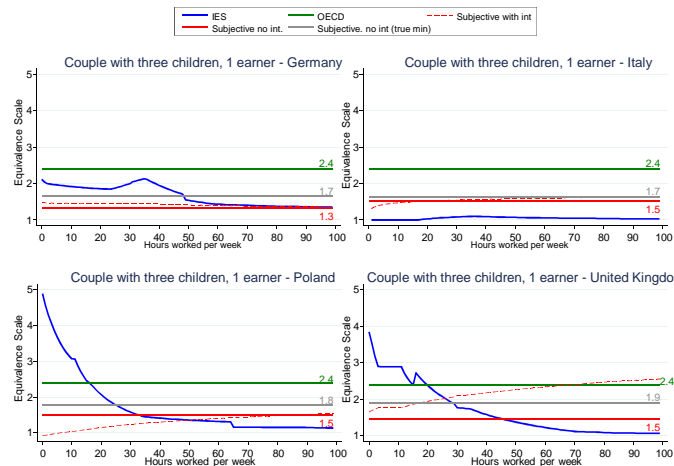
Notes: 1) Assumptions: no housing costs 2) Hourly wage underlying from income is 75% of average hourly wage in the Country in 2011 from Source: EUROMOD, version G3.21 (input data)

IES distributions



- The lowest proportions of one earner families with 1, 2, 3 children undercompensated by tax –benefit system (according to OECD scale) occur in the UK (88-91%) and Germany (94-97%)
- The proportion of the undercompensated families is the highest for families in Italy (100%) and Poland (99%)
- IES distribution peaks are the highest for German 1 earner families with 1, 2 and 3 children, with values of 1.22, 1.29 and 1.37 respectively

Comparing equivalence scales



- IES decreasing with household income for all family types and countries (except for Italy)
- OECD scale mostly above IES and subjective scales
- Increasing subjective scales in hours worked per week for IT, PL and the UK (not for DE)

Modelling subjective equivalence scales

- Information from "Income to Make Ends Meet" question in SILC and FRS
 - $\ln(Y_{min}) = \alpha_0 + \alpha_1 \ln(Y) + \alpha_2 A_1 K_1 + \alpha_3 A_1 K_2 + \alpha_4 A_1 K_3 + \alpha_5 A_2 K_0 + \alpha_6 A_2 K_1 + \alpha_7 A_2 K_2 + \alpha_8 A_2 K_3 + e$
 - $\ln(Y_{min}) = \alpha_0 + \alpha_1 \ln(Y) A_1 K_0 + \alpha_2 A_1 K_1 + \alpha_3 \ln(Y) A_1 K_1 + \dots + \alpha_{14} A_2 K_3 + \alpha_{15} \ln(Y) A_2 K_3 + e$
- where: Y_{min} – lowest monthly household income to make ends meet
 Y – monthly household disposable income
 $A_{1,2}$ – number of adults in household
 $K_{0,1,2,3}$ – number of children in household

Next steps

- Sensitivity of income distribution, at-risk of poverty measures to equivalence scales
- Calculation of IES isolated for tax system and benefit system, are such scales consistent?

References

- Banks, J. and Brewer, M. (2003): "Understanding the generosity of Government support to households with children", in Bradshaw, J., (ed.) Children and Social Security. International Studies on Social Security (8). Ashgate Publishing, Farnham, UK, pp. 103-118
- Bishop, J. A., A. Grodner, L. Haiyong, and I. Ahamdanech-Zarco (2014): "Subjective Poverty Equivalence Scales for Euro Zone Countries", *Journal of Economic Inequality*, Vol 12, p. 265-278
- Muellbauer, John, and Justin van de Ven (2004): "Estimating Equivalence Scales for Tax and Benefits Systems," Economics Papers 2004-W06, Economics Group, Nuffield College, University of Oxford.
- Van de Ven, J., N. Hérault and F. Azpitarte (2015): "Identifying Tax Implicit Equivalence Scales", Discussion Paper No. 444, National Institute of Economic and Social Research