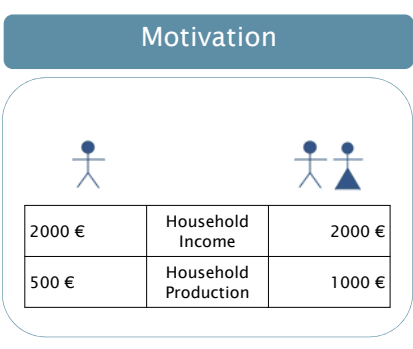


The Determination of Extended Income Equivalence Scales from Income Satisfaction and Time Use Data

Equivalence Scales

- Are used to make the economic well-being of differently structured households comparable.
- Indicate the percentage increase in income necessary to leave a household's welfare unchanged when additional members join that household.
- Are often limited to considering money incomes or expenditures as a proxy for the standard of living.
- Can be determined by calculating the increases in money incomes necessary for additional household members when holding income satisfaction constant.
- Tend to lose sight of the fact that a household's well-being does not depend on market consumption exclusively.



Extended Incomes

- Include money incomes and the proceeds from household production.
- Account for home production being a substitute for marketed goods and services.
- Their distribution has become a matter of growing interest in the literature (see e.g. Jenkins & O'Leary, 1996, Frick et al., 2012, Folbre et al., 2013).

"Arguably the equivalence scale rates for money income and the proceeds of household production should differ (...)"
(Jenkins & O'Leary, 1996, p.406)

Aim

- Appreciate the time spent on the production of non-pecuniary consumption possibilities for individuals within the household
- Estimate extended income equivalence scales that account for increases in a household's market and domestic production needs

Literature

	Monetary Equivalence Scales from SOEP Income Satisfaction Data			Equivalence Scales including Time Cost			
(1st adult = 1)	Schwarze (2003)	Van Praag & Ferrer-i-Carbonell (2004)	Biewen & Juhasz (2017)	Apps & Rees (2002)	Van Praag & Ferrer-i-Carbonell (2004)	Koulovatianos et al. (2009)	Gardes & Starzec (2017)
2nd Adult	0.34	0.23	0.35	0.57	0.52	0.95	0.31
1st Child to Couple	0.17	0.16	0.13	0.91	0.26	0.24	0.24
2nd Child to Couple	0.08	0.10	0.13	0.91	0.17	0.23	0.24

Data & Descriptive Statistics

German Socio-Economic Panel (SOEP)

- Eight waves between 2001 and 2015
- Restricted to adult respondents within „classical“ households
 - All of them below 60, neither unemployed, nor military recruits nor in training
- Exceptional in that it includes all necessary information to construct extended income equivalence scales

Sample Mean	Std. Dev.	N
6.60	2.10	37,395
1.57	0.50	23,823
0.81	1.04	23,823

Household Financial Wellbeing

Satisfaction with Household Income

Household Size and Structure

Number of Adults
Number of Children

Extended Income Equivalence Scales

Household Money Income

Real Net Monthly Household Income

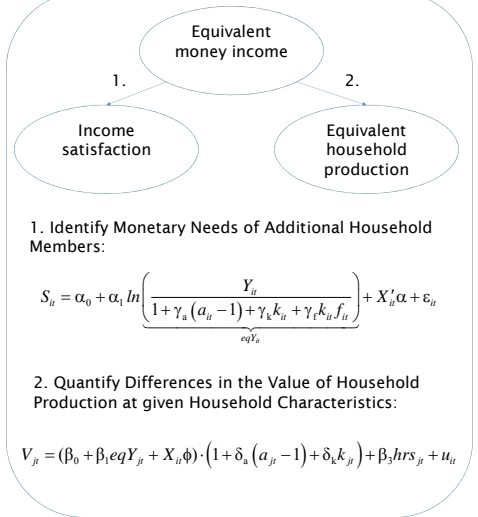
Household Production

Hours spent on Household Production on an Average Day

median hourly gross wage rates (Federal Employment Agency, 2016)

Mean Value of Household Production by Household Type							
1 Adult, No Children	1 Adult, 1 Child	1 Adult, 2 Children	1 Adult, 3 Children	2 Adults, No Children	2 Adults, 1 Child	2 Adults, 2 Children	2 Adults, 3 Children
1291.42 (755.16)	3432.29 (1899.53)	4151.91 (1927.54)	4875.95 (1940.05)	2926.94 (1301.12)	6696.53 (2652.18)	7300.55 (2495.73)	7559.94 (2342.87)

Model & Results



1. Money Equivalence Scales

Dependent Variable:	Satisfaction with Household Income
Equivalent Money Income	2.449*** (0.048)
Scale Parameter Adult	0.383*** (0.022)
Scale Parameter Child	0.129*** (0.011)
Scale Parameter Child * FT	0.070*** (0.019)
N	37,395
adj. R ²	0.254

Note: Standard errors in parentheses, clustered by households. Regressions also include a constant term, year and state fixed effects. Other exogenous variables are the respondent's age, age squared, sex, home ownership, education, residence in rural area, non-German nationality, presence of person in need of care. * p < 0.10, ** p < 0.05, *** p < 0.01

2. Household Production Equivalence Scales

Dependent Variable:	Value of Household Production
Equivalent Money Income	-0.137*** (0.010)
Average Hours of Employment	-227.107*** (9.291)
Scale Parameter Adult	1.095*** (0.031)
Scale Parameter Child	0.623*** (0.019)
N	23,823
adj. R ²	0.862

Note: Standard errors in parentheses, bootstrapped based on 1000 replications and clustered by households. Regressions also include a constant term, year and state fixed effects. Other exogenous variables are home ownership, residence in rural area, non-German household head, presence of person in need of care. * p < 0.10, ** p < 0.05, *** p < 0.01

Average Extended Income Equivalence Scale

1 Adult, No Children	1 Adult, 1 Child	1 Adult, 2 Children	1 Adult, 3 Children	2 Adults, No Children	2 Adults, 1 Child	2 Adults, 2 Children	2 Adults, 3 Children
1.000 (0.000)	1.422 (0.077)	1.815 (0.145)	2.200 (0.203)	1.650 (0.100)	2.164 (0.176)	2.520 (0.220)	2.858 (0.271)

Implications & Conclusion

- Additional household members cost significant amounts of time. Children receive a relatively higher weight in household production than in money incomes compared to adults.
- Household production equivalence weights are especially large for young children and for the first child to a household.
- Inequality in extended incomes is lower than in monetary incomes. It is especially low when the estimated extended income equivalence scale is applied.
- Extended income equivalence scales are sensitive to the choice of the money equivalence scale and the method used to assign monetary values to household production.