

# Income loss after the death of a spouse depending on the survivor's labour participation and on fixed costs

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# Death of a spouse = economic risk (income loss)

- Not only but most notably for single-earner households
  - Household income often falls below the equivalence ratio
  - Without any compensation for such an income loss, those with no own income or with very low income struggle to survive after the spouse's death (see Latvia).
  - Income loss causes poverty even if the couple was not poor before death
  - Further problem: labor force participation of older workers is subject to many constraints
- Mainly concerned: Women since they often leave gainful activity in order to take up child care (EUROSTAT, national studies)

# Questions

- Effect of spouse's death on survivors with own income
  - Does the presence of own income reduce the financial vulnerability resulting from the spouse's death?
  - Does this effect depend on the household net income?
  - What is the relative advantage of a survivor with own income compared to a survivor with no own income, provided that both households had the same net income before the death of the spouse and provided that the survivor's own income equals the survivor benefits of the survivor with no own income?
- Effect of spouse's death on survivors with no own income
  - How do fixed costs such as costs on shelter, electricity and heating affect financial vulnerability of survivors with no own income?

# Assumptions

- Comparison of hypothetical households of spouses that are retirees of full retirement age.
- The households are assumed to have the same net income.
- Comparison of Austrian, German and U.S. social security system

# Survivors benefits in Austria

$s_g$  = survivor's own gross income,  
 $d_g$  = deceased spouse's gross income

$$p^* = \min \left( 0.6, \max \left( 0, \left( 0.7 - 0.3 \frac{s_g}{d_g} \right) \right) \right)$$

$$p = \begin{cases} \min \left( 0.6, \max \left( p^*, \frac{M-s_g}{d_g} \right) \right) & \dots \quad p^* d_g + s_g < M \\ \min \left( p^*, \max \left( 0, \frac{U-s_g}{d_g} \right) \right) & \dots \quad p^* d_g + s_g > U \\ p^* & \dots \quad \text{otherwise} \end{cases}$$

where

$$M = 1696.27 \text{ €} \qquad U = 8220 \text{ €}$$

Minimum benefit for single household  $L = 783.99 \text{ €}$ .

# Survivors benefits in Germany

$s_g$  = survivor's own gross income,

$d_g$  = deceased spouse's gross income

$$p = \max \left( 0; 0.55 - \frac{0.4 \cdot \max(0, s_g w - E)}{d_g} \right)$$

$$E = \begin{cases} 718.08 & \dots & \text{West Germany} \\ 637.03 & \dots & \text{East Germany} \end{cases}$$

$w = 0.87$  for social benefits, where only 60 % (2010) are due to taxation.

Subsistence level: If the appropriate cost for shelter and heating exceeds income minus € 359, the difference is provided as additional social benefit.

# Survivors benefits in the U.S.A.

$s_g$  = survivor's own gross income,  
 $d_g$  = deceased spouse's gross income

$$p = \begin{cases} 1 & \dots & d_g < s_g \\ 0 & \dots & \text{otherwise} \end{cases}$$

Minimum benefit by social security provisions to avoid very low income is available.

In U.S.A. spouse's benefits exist, i.e. the spouse of a retiree also gets some benefits depending on is/her own income.

# Advantage of own income?

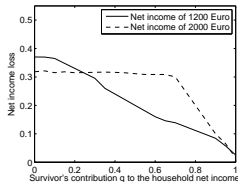
- Fixed household's net income  $x$
- Let  $q$  denote the survivor's contribution to the household's net income, i.e.  $s_n = q \cdot x$  and  $d_n = (1 - q) \cdot x$  such that  $x = d_n + s_n$ .
- How does net income loss  $NIL$  depend on  $q$ ?  
 $NIL$  = amount by which the survivor net income is below the household net income before the spouse's death

Technical aspects to be considered:

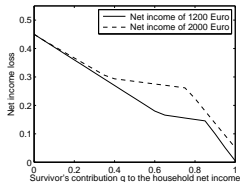
- Survivor benefits are derived from gross income.
- Attention: tax progression, joint filing, etc.
- U.S. households by a factor of 1.36 to account for different currencies.



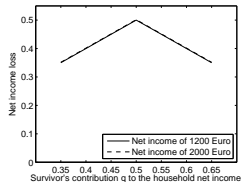
# Net income loss depending on household net income and contribution $q$ to household net income



(a) Austria



(b) Germany



(c) USA

Step size for  $q$  is 5%.

# Findings

All households have the same net income, but:

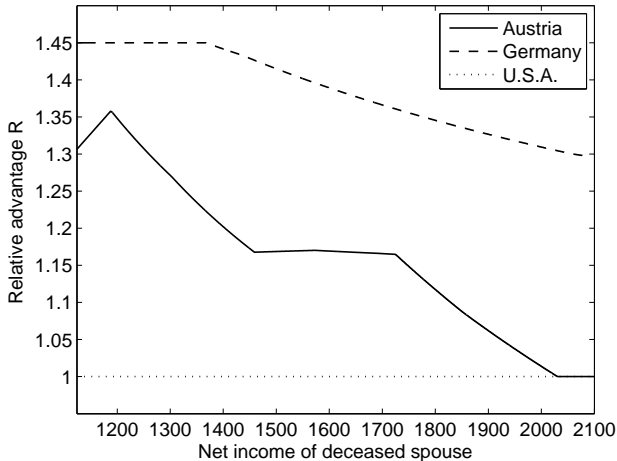
- Own income is advantageous especially for low income households in Austria and Germany
- In Austria  $NIL$  for  $q = 0$  is higher for low income households
- Large net income loss for  $q = 0$  in Germany
- Own income seems to be a disadvantage in the U.S.A., where  $NIL$  largest for  $q = 0.5$ .
- Economies of scale in consumption  $\Rightarrow$  the needs of a household do not increase proportionately to the size of the household
  - The OECD-modified equivalence scale of 1.5 justifies a 30 % loss in net income
  - In Austria and Germany income loss is above this level for small  $q$

# Relative net income loss

- What is the advantage of own benefits over no own benefits?
- Compare two households with the same net income  $x$  before death
  - Household 1: single-earner, where survivor net benefits are  $b_n^{(1)}$ .
  - Household 2: double-earner, where the survivor has own net income of  $s_n^{(2)} = b_n^{(1)}$  before death.
- After death of the spouse
  - Gross income of survivor 1 is  $t_g^{(1)} = b_g^{(1)}$
  - Gross income of survivor 2 is

$$t_g^{(2)} = s_g^{(2)} + b_g^{(2)} = b_g^{(1)} + b_g^{(2)}$$

# Relative net income loss $R = \frac{t_n^{(2)}}{b_n^{(1)}}$



# Findings

In Germany even for high household net income the relative advantage of own income remains over 30 %. This is quite startling since it shows that the group most in need of survivor benefits protection, i.e. people with no own income who depend on the spouse's support, and people in the low income segment, are not adequately protected.

# Survivors with no own income – Fixed costs

- A two-person household benefits from economies of scale in consumption, i.e. the needs of a household do not increase proportionately to the size of the household. This means that fixed costs in a 2-person household, such as shelter, electricity, heating, etc., are not simply twice those of a single-person household.
- However, equivalence scale is only a rough measure of needs across household size
- It certainly does not take into account variation in needs caused by differences in household net income
- For small income households fixed costs such as those for housing, heating and electricity form the major part of expenses
- These costs do not grow proportionately as income rises.

# Adjusted Net Income Loss

Households are compared by their adjusted net income loss after the spouse's death:

$$ANL = 1 - \frac{b_n - C}{d_n - C}$$

where  $b_n$  = survivor's net income after the spouse's death,  $d_n$  = the household's net income before death,  $C$  = the fixed costs.

# Linear Regression

- Estimate expenses  $C$  on shelter, electricity and heating in dependence of the household's net income  $N$  by linear regression

$$C = \beta_0 + \beta_1 N$$

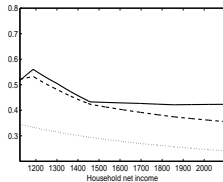
- For this purpose the expenses of retirees on housing, heating and electricity were taken from the Micro Census 2006 for Germany, from the 2003/2004 Consumer Expenditure Survey for Austria and the US Consumer Expenditure Survey 2008/2009.
- Regression coefficients obtained (p-value < 0.01)

	Austria	Germany	U.S.A.
Intercept	251.5	246.2	405.9
Slope	0.1216	0.1312	0.1187
R <sup>2</sup>	0.9606	0.9972	0.9773

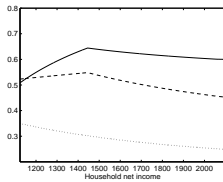


# Adjusted net income loss

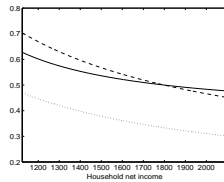
Adjusted net income loss (solid line), proportion of household net income spent on fixed cost before the death of the spouse (dotted line), proportion of survivor's net benefits spent on fixed cost after the death of the spouse (dashed line).



(d) Austria



(e) Germany



(f) USA

# Adjusted net income loss and household income in Germany

$d_n$	$b_n$	$C$	$\frac{C}{d_n}$	$\frac{C}{b_n}$	$ANL$
910,5000	747,4000	388,4000	0,4266	0,5197	0.3124
1138,1250	781,7293	422,7293	0,3714	0,5408	0.4982
1365,7500	816,0551	457,0551	0,3347	0,5601	0.6049
1593,3750	876,3563	491,3810	0,3084	0,5607	0,6507
1821,0000	1001,5500	525,7068	0,2887	0,5249	0,6326
2048,6250	1126,7438	560,0327	0,2734	0,4970	0,6193
2275,0833	1241,2708	594,1826	0,2617	0,4787	0,6105

# Findings

- Adjusted net income loss is very large for survivors in the low income segment
- In Germany this is compensated by a subsistence level.
- Austria: difference between minimum and maximum ANIL is 11.58 pp.
- Equivalence scale justifies income loss of 30 % – However, this is not justified for all survivors!
- ALARMING: In Austria an average worker's net retirement benefit is € 1120, in Germany € 1000, in the U.S.A. € 964. Most affected by the death of a spouse are people in the low income segment, and this is the majority of survivors.
- No reason that the existing survivor benefits prevent women from participating in the labour market.