

Estimation of Joint Income-Wealth Poverty: A Sensitivity Analysis

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Introduction

- Poverty: situation of economic hardship, insufficient financial resources to guaranty a minimally acceptable standard of living
- Financial resources typically expressed in terms of yearly or monthly disposable income (in the developed world)
- Example: At-Risk-of-Poverty AROP measure (official poverty measure of Eurostat), which sets the poverty threshold at 60 per cent of national median equivalised disposable household.
- This income concept covers income from labour, pensions and social transfers as well as financial income such as interests, dividends, etc.
- Hence, apart from the direct income flow they generate, it neglects the role of assets (Azpitarte, 2011; Brandolini et al., 2010). Since there are also assets that generate little or no income flow this approach is not satisfying.

Introduction

- Some solutions: add imputed rent to account for housing
- Ok but not sufficient, savings and assets contribute to the standard of living. For instance, they assure economic and financial security because they can be used to face unexpected financial setbacks (converted into cash or used as collaterals).
- Also, financial liabilities might be incorporated in poverty measurement because they may make households much more vulnerable than their mere incomes suggest.

Need to include information on wealth in poverty measurement because it better reflects all the financial resources available to households.

Background literature

- **Two approaches** to measure poverty using income and wealth indicators.
- A first approach integrates the two financial resources into one single dimension by converting wealth into yearly annuities (see Brandolini et al., 2010; Short and Ruggles, 2005; Van den Bosch, 1998; Weisbrod and Hansen, 1968);

$$AY_t = Y_t + \left[\frac{\rho}{1 - (1 + \rho)^{-n}} \right] NW_{t-1} \quad (1)$$

AY_t : annualized income; Y_t income at year t ; NW_{t-1} : net worth at the beginning of year t ; ρ : interest rate; n : length of the annuity.

- Critiques:
 - ▶ it aggregates all available information so that it does not allow studying differences in income and wealth positions.
 - ▶ impose several assumptions on values of length and interest rate of the annuity.
 - ▶ operationally feasible, but may not reflect how households handle their assets in practice.

Background literature

- A second approach applies a two-dimensional framework by developing separate poverty lines for income and wealth (Kim and Kim, 2013; Azpitarte, 2012; Heady, 2008; Haveman and Wolff, 2004). Asset poverty line is a fraction of the official income poverty line.

Asset poverty: $NW_{t-1} < \alpha Z_t$

Income poverty: $Y_t < Z_t - r_t NW_{t-1}$

General findings

- Poverty estimates including wealth are much lower than the traditional income-based measures
- Poverty rates of the elderly are much more affected than those of the non-elderly
- The decline in poverty rates is much higher when the value of the households main residence is included than when only non-housing wealth is taken into account

Drawback: Dangerous to generalize because of the sensitivity of such indicators to different assumptions.

Aims of the paper

- Empirically review the robustness of the results to various measurement assumptions, such as the use of different poverty lines, wealth concepts, equivalence scales, interest rates.
- Highlight the sensitivity of the results in view of the age-biased features of asset-based measures of poverty.
- Highlight the sensitivity of the results in view of different institutional settings.

Data and methods

- First wave of the Eurosystem Household Finance and Consumption Survey (2010/11)
- Countries selected: Belgium and Germany
- These countries with similar living standards and income poverty rates, but with different levels and distributions of wealth, and which are differently correlated with income (weaker for Belgium than for Germany).

	Belgium	Germany
Median equivalised disposable income (*)	€19,313	€18,586
At-risk-of-poverty rate (*)	14.6%	15.5%
Median net wealth	€206,000	€51,000
Home-ownership rate	69.6%	44.2%

Is homeownership rate difference enough to say that you compare countries with different institutional settings?

Data and methods

- Unit of analysis: household where both partners are max 84.
- Number of observations?
- As for income you say 'The HFCS covers only gross incomes, which are not suitable for poverty analysis. However, for several countries these have been converted into disposable incomes using the tax-benefit microsimulation model EUROMOD (see Kuypers et al., 2015).... The income variable that is implemented in the two-dimensional approach refers to disposable income, while the income variable in the unidimensional approach covers only income from employment, self-employment, public and private pensions and social and private transfers.' why don't you use the same?
- As for wealth you say: 'net worth concept which does not include asset types such as human and social capital or the valuation of pension and social security wealth' so what does it include?

Data and methods

- Both approaches require income in year t and net worth at the beginning of that year.
- Since the HFCS combines information on income during the last twelve months/calendar year and net worth at time of survey, there could be some resources that are represented in both income and net worth. This type of double counting exists with regard to income that is received during year t which is not consumed but instead saved or invested.
- Solution: exclude from wealth an amount equal to the income from financial investments, such as dividends, interests and rental income from property, because evidence shows that people are more likely to save from irregular income sources such as financial income than from regular wages and salaries.

Data and methods

- first approach

- ▶ $\rho : 2\%$
- ▶ Poverty line: official income poverty line (do you mean 60% of the median of equiv. hh disp. income?)

- second approach

- ▶ Income poverty line: retains its traditional interpretation (again, do you mean 60% of the median of equiv. hh disp. income?)
- ▶ Asset poverty line: $\frac{1}{4}$ of the income poverty line

Baseline results

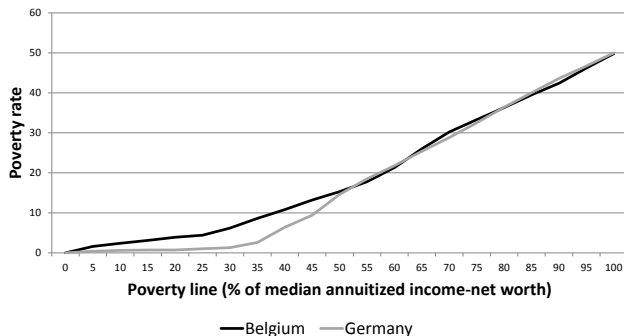
Poverty measure	All		Elderly (65-84)		Non-elderly (-64)	
	Belgium	Germany	Belgium	Germany	Belgium	Germany
Income poverty¹	17.1	18.5	14.2	16.6	18.1	19.2
Unidimensional	11.4	16.3	3.5	11.9	14.1	18.0
Two-dimensional						
Twice poor	6.2	9.7	1.4	5.7	7.9	11.3
Protected poor	10.9	8.7	12.8	10.9	10.2	7.9
Vulnerable non-poor	5.6	11.1	4.2	6.0	6.1	13.0

Sensitivity analysis: poverty line, first approach

- Should one use an adapted poverty line?
- The use of the income based poverty line compatible with the view that it reflects the true resources needed to sustain an acceptable living standard
- The use of an adapted poverty line more consistent with a fully relative approach, it is set to represent a standard level of resources

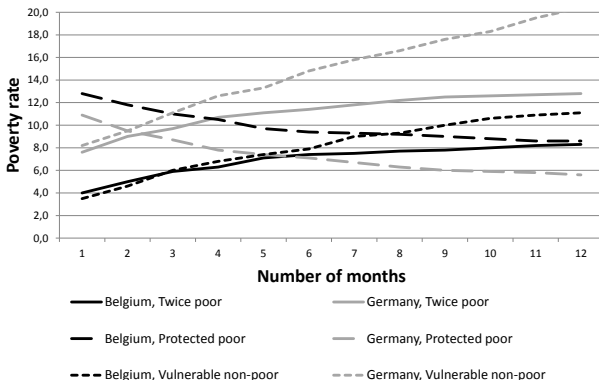
Sensitivity analysis: poverty line, first approach

- Poverty line: percentage of median equivalised income-net worth (what do you mean exactly? Is the median calculated on the distribution of income+net worth. It is not clear, because in the text you say '..as a percentage of median equivalized income + annuitized net worth' and under the table you write 'percentage of median annuitized income-net worth').



Sensitivity analysis: poverty line, second approach

- α is a measure of the length of the period an hh should use its wealth to be above the income poverty line
- Consider asset poverty line with varying between 1 and 12 months, that is a percentage of income poverty line varying between about 10% and 100%



Results

The longer households are supposed to sustain themselves at the official income poverty line the larger the number of twice poor and vulnerable non-poor and the lower the number of protected poor.

Sensitivity analysis: wealth concept, first and second approach

- Three different wealth concepts:
 - ▶ net worth: difference between total assets and total liabilities
 - ▶ non-housing wealth: disregards any wealth or debt related to the main residence
 - ▶ liquid assets: only takes into account assets that can be easily bought or sold without incurring substantial costs

Sensitivity analysis: wealth concept, first and second approach

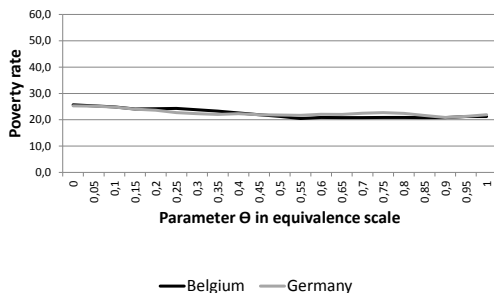
Poverty measure	Net worth		Non-housing wealth		Liquid assets	
	Belgium	Germany	Belgium	Germany	Belgium	Germany
Unidimensional	21.3	21.8	19.2	20.6	18.4	18.9
Two-dimensional						
Twice poor	6.2	9.7	7.5	10.2	10.3	12.4
Protected poor	10.9	8.7	9.6	8.3	6.8	6.1
Vulnerable non-poor	5.6	11.1	10.4	13.5	22.2	24.2

It is not possible to compare these results with baseline given the use of different poverty lines.

In fact, poverty should increase when we pass from net worth to liquid assets.

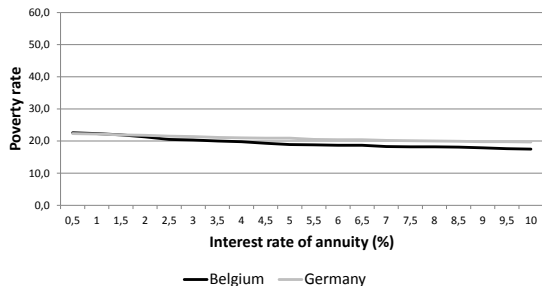
Sensitivity analysis: equivalence scales, first approach

- $e = \frac{1}{h^\theta}$, h : household size and $\theta \in [0, 1]$

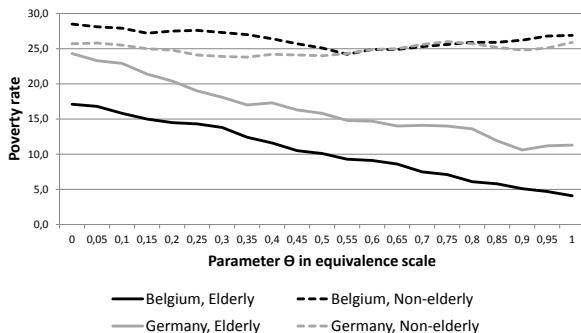


For completeness and coherence both approaches should be plotted

Sensitivity analysis: interest rate, first approach



Age structure and equivalence scale



Comments

- You discuss the age structure aspects on in relation to the baseline poverty rates and for the equivalence scale hence one of the aim of the paper not fully fulfilled.
- You discuss age structure in relation to different wealth concepts but you do not provide any figure.
- **For instance** 'Although we have shown in part 4 that the initial effect of taking wealth into account in poverty measurement has a larger impact on poverty rates among the elderly than among the non-elderly, the overall effect of different measurement assumptions appears to be relatively similar for the two groups', it would be fair to report the numerical results.
- **The same here:** 'However, when using the narrower wealth concepts discussed above the difference in poverty rates of the elderly and non-elderly diminishes somewhat.'
- **Section quite confused.** You start talking about age structure and different concepts of wealth than you turn to equivalence scales and again to wealth concepts. Then you discuss life cycle effects into the literature...

Main conclusions

- The authors show empirically that the general finding that poverty estimates including wealth are much lower than the traditional income-based measures depends on the way one calculates the poverty line. Poverty rates may increase as well as decrease after wealth is accounted for, substantially altering cross-country rankings.
- The inclusion of wealth has a great effect on the observed poverty incidence among young versus older households, yet any conclusion on the ratio between elderly and non-elderly poverty is again highly sensitive to the assumptions that are made.

More comments

- Be more precise in the intro about aims and especially contribution. Not all the aims seem to be achieved. In particular the analysis of age structure and the sensitivity of the results to different institutional settings
- You empirically discuss some drawback of this approach, that would be nice to propose some solution or to opt for some specific choice
- More focus on the ranking of countries is needed. The authors focus more on how poverty rates vary within each country when some parameters change but do not really focus on how the ranking of countries changes
- You should stress that such analysis requires (comparable and reliable) microdata on wealth, which are very difficult to obtain (LWS is very helpful in this respect, probably you can think at applying your analysis to such data that have also info on disposable income)
- Is it possible to work on more recent data or on trend over time?

More comments

- Try to avoid too many citations (I have counted 11 of them)
- Figure 1 should be described
- I would put the issues that you treat empirically into separate paragraphs and those that you just mentions and describe but without providing any analysis on a another paragraph (such as povery line in the second approach, length of annuity).