Broadening the view and zooming in: Accounting for non-cash and for imputed income in inequality analyses

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Measuring economic well-being may require more than just looking at a single monetary income measure …

➢ “broadening the view”
   i.e. include non-cash incomes in measure of economic well-being
   a) public transfers in-kind (education, health, social housing, …)
   b) private sources (imputed rental value for owner-occupied housing, home production, …)

➢ “zooming in”
   i.e., disentangle the effects of different types of investment income
   a) capital income
   b) imputed rent
Rationale for including non-cash income in welfare oriented empirical analyses

- **Standard approach:** \( U_i = f(Y_i) \)
  - Individual well-being is a function of monetary income
  - USA: include face value of food stamps (“near-cash”)

- **Range of non-cash income components w/ welfare relevance**
  - public transfers in-kind (e.g. subsidized education, health, public housing)
    - e.g. Friedman (1962) US; Smeeding et al. (1993): GER, SWE, CDN, NL; Barbaro (2003), Borgloh et al. (2007) GER; Antoninis & Tsakloglou (2001): GR
  - imputed rent (IR) for owner-occupied housing
  - home production
    - e.g., Jenkins, O’Leary (1996): UK
  - labor market: fringe benefits (e.g. private use of company cars, meal vouchers)
    - e.g., Pierce (2001): USA; Frick et al (2007): selected EU-countries

**1st Claim:** Include non-cash components in well-being measure

→ most relevant in cross-national research (e.g., Smeeding & Weinberg (2001); Canberra Group (2001))
Public expenditures for in-kind services in OECD countries in 2000 (as a % of household disposable income)

“other” include transfers and services to the elderly, survivors, disabled, unemployed, for housing, for social assistance, active labor-market policies

Source: OECD
Inequality impact of considering public services: S80:S20 share ratio before and after all public services

Rather strong impact in all countries: **OECD average: 5.2 → 3.4 (35% reduction)**

Little impact on country ranking (Greece: 20. → 24. / Poland: 21. → 23.)

Source: OECD
First conclusion:
- in-kind *public* transfers significantly reduce inequality
- no major changes in country rankings

However, ...
- does this approach sufficiently capture cross-country differences wrt national policy mixes of in-cash transfers and in-kind transfers?
- what about incorporation of *private* activities (e.g. imputed rent, home production, fringe benefits)

**Analytic and methodological challenges**
- how to value / monetarize non-cash components?
- how to consider eventual costs as to derive an appropriate *net* measure?
- identify beneficiaries (direct vs. indirect (=within private HH)) across life-course

2nd Claim: if those components depend on life cycle stages, include all (as many as possible) non-cash components simultaneously
**Example: Housing tenure in selected EU countries**

(Population in private households, %)

<table>
<thead>
<tr>
<th>Tenure status</th>
<th>B</th>
<th>D</th>
<th>EL</th>
<th>IRL</th>
<th>I</th>
<th>NL</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Owner occupiers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>thereof</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) outright owner</td>
<td>72,3</td>
<td>47,4</td>
<td>75,2</td>
<td>84,4</td>
<td>69,9</td>
<td>65,0</td>
<td>72,5</td>
</tr>
<tr>
<td>(b) with outstanding mortgage</td>
<td>33,9</td>
<td>23,2</td>
<td>62,4</td>
<td>39,7</td>
<td>55,7</td>
<td>5,7</td>
<td>25,4</td>
</tr>
<tr>
<td>(2) Tenants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>thereof</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) in private market (non-subsidized)</td>
<td>21,6</td>
<td>38,7</td>
<td>18,9</td>
<td>6,2</td>
<td>12,7</td>
<td>*</td>
<td>6,0</td>
</tr>
<tr>
<td>(b) rent-subsidized by direct public transfers in cash</td>
<td>3,9</td>
<td>0,3</td>
<td>0,0</td>
<td>6,7</td>
<td>1,9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) rent-subsidized due to living in social housing</td>
<td>4,5</td>
<td>4,0</td>
<td>7,7</td>
<td>5,5</td>
<td>27,7</td>
<td>17,8</td>
<td></td>
</tr>
<tr>
<td>(d) rent-subsidized by landlord (eg. family, employer)</td>
<td>4,5</td>
<td>3,4</td>
<td>0,1</td>
<td>1,6</td>
<td>11,9</td>
<td>0,5</td>
<td>0,7</td>
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<tr>
<td>(e) rent-free</td>
<td>1,6</td>
<td>2,7</td>
<td>5,5</td>
<td>1,6</td>
<td>11,9</td>
<td>0,5</td>
<td>0,7</td>
</tr>
<tr>
<td>Total</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
<td>100,0</td>
</tr>
</tbody>
</table>

*Source: Frick, Grabka, Smeeding, Tsakloglu (forthcoming).*
Example: Housing Policy Instruments in Germany
(Share of all tenant households, %)

A case study for Germany:

- Definition of relevant areas …

- … and the associated non-cash income component

- Empirical application
  - compare “baseline” model (cash) with augmented income model
  - all income measures equivalized using OECD-scale (1;0.5;0.3)
  - income, inequality and poverty effects
    - (EU) relative income poverty concept: threshold at 60% of median income
    - “life course” (approximated by age groups)

- (Critical) summary
Areas and operationalization

(1) Education (public):
- non-cash transfers proxied by gov’t education related expenditures (all levels) per student and year
- make use of considerable heterogeneity across region (federal state) and type of institution

(2) Health (public):
- “insurance approach”: non-cash transfers proxied by health expenditures by age, gender & region

(3) Social Housing (public) and “Imputed rent” (private):
- Regression based rental equivalence approach (“opportunity cost approach”) based on market rents actually paid by private tenants
- out of sample prediction for owners and all subsidized tenants (paying less than market rent)
- detailed and consistent measure for home owners + tenants with reduced rent / rent-free

(4) Home production (private):
- “time use approach” – time spend on home activities: housework, errands, child and elderly care, repairs, gardening
(ad 1) The German Educational System

- predominantly public
  - As of 2002, only about 6% of all pupils attend private schools (on the rise)
  - less than 2% of all tertiary students attend private universities

- regional differences by Länder (federal states)
  - federal framing, but detailed educational policy is the responsibility of the Länder (variation of school forms)

- early and rigid selection at secondary level (“tripartism”)
  - pupils (resp. their parents) have to choose early (after grades 4 or 6) between three alternatives (low, intermediate, high)
  - after reaching academic maturity: choice for university vs. vocational education
Estimates of public education transfers per student and year

- **primary and secondary education** *(largely compulsory)*
  - public expenditures include school administration costs, investment costs and pension funds for teachers
  - separately for each federal state and school type

- **pre-primary education** *(non-compulsory)*
  - only children aged 3 and above
  - part-time slot = 50% of fulltime slot
  - deduction of private fees (we need a measure of net transfers)

- **tertiary education** *(non-compulsory)*
  - separately for universities and universities of applied sciences
  - excluding medical institutions (e.g. university-run hospitals) and expenditures for research and development (R&D)
### Matrix of assigned subsidies -- average spending per student in € ---

<table>
<thead>
<tr>
<th></th>
<th>Pre-Primary</th>
<th>Primary</th>
<th>Secondary Schools</th>
<th>Vocational</th>
<th>Tertiary</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>fulltime + lunch</td>
<td>parttime</td>
<td>orientation grades</td>
<td>lower sec.</td>
<td>intermediate sec.</td>
</tr>
<tr>
<td>Schleswig-Holstein</td>
<td>5000</td>
<td>2800</td>
<td>2500</td>
<td>3600</td>
<td>4700</td>
</tr>
<tr>
<td>Niedersachsen</td>
<td>6100</td>
<td>3400</td>
<td>3100</td>
<td>3900</td>
<td>4500</td>
</tr>
<tr>
<td>Nordrhein-Westfalen</td>
<td>5500</td>
<td>3000</td>
<td>2700</td>
<td>3700</td>
<td>4700</td>
</tr>
<tr>
<td>Hessen</td>
<td>5300</td>
<td>2900</td>
<td>2600</td>
<td>3600</td>
<td>4700</td>
</tr>
<tr>
<td>Rheinland-Pfalz</td>
<td>4700</td>
<td>2600</td>
<td>2400</td>
<td>3800</td>
<td>5000</td>
</tr>
<tr>
<td>Baden-Württemberg</td>
<td>4600</td>
<td>2500</td>
<td>2300</td>
<td>3800</td>
<td>5100</td>
</tr>
<tr>
<td>Bayern</td>
<td>4500</td>
<td>2500</td>
<td>2300</td>
<td>4100</td>
<td>5500</td>
</tr>
<tr>
<td>Saarland</td>
<td>4900</td>
<td>2700</td>
<td>2400</td>
<td>3600</td>
<td>4700</td>
</tr>
<tr>
<td>Hamburg</td>
<td>6100</td>
<td>3400</td>
<td>3100</td>
<td>5800</td>
<td>6300</td>
</tr>
<tr>
<td>Bremen</td>
<td>6000</td>
<td>3300</td>
<td>3000</td>
<td>4200</td>
<td>4900</td>
</tr>
<tr>
<td>Berlin</td>
<td>6200</td>
<td>3400</td>
<td>3100</td>
<td>4500</td>
<td>5500</td>
</tr>
<tr>
<td>Mecklenburg-Vorpommern</td>
<td>2900</td>
<td>1600</td>
<td>1400</td>
<td>3800</td>
<td>5200</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>3900</td>
<td>2200</td>
<td>2000</td>
<td>3200</td>
<td>4300</td>
</tr>
<tr>
<td>Sachsen-Anhalt</td>
<td>4600</td>
<td>2500</td>
<td>2300</td>
<td>4500</td>
<td>4300</td>
</tr>
<tr>
<td>Thüringen</td>
<td>3700</td>
<td>2000</td>
<td>1800</td>
<td>5300</td>
<td>4300</td>
</tr>
<tr>
<td>Sachsen</td>
<td>3400</td>
<td>1900</td>
<td>1700</td>
<td>4400</td>
<td>4300</td>
</tr>
<tr>
<td>Deutschland</td>
<td>5000</td>
<td>2800</td>
<td>2500</td>
<td>3900</td>
<td>4600</td>
</tr>
</tbody>
</table>

(ad 2) HEALTH: Institutional setting

- Majority of population in Germany (about 90%) is included in the social health insurance system (GKV)
  - in principle, compulsory for the entire population (excluding high income earners, self-employed, civil servants)
  - about 8% voluntarily insured
  - Funding: in principle, evenly split between employers and employees

- However, increasing relevance of private health insurance (PKV)
  - primary health care insurance (about 10%)
  - supplementary health care insurance (about 40% of GKV)

- Only very few without health insurance (ca. 200,000 individuals)

- Cross-nationally comparable data available from OECD “Health at a glance”
HEALTH: Age, sex and region adjusted health expenditures in Germany (social health insurance, GKV)

(ad 3) HOUSING and Imputed Rent (IR)

Standard procedure in welfare economics: Consideration of a fictitious income advantage from owner occupied housing because of …

- Housing costs saved due to living in (outright) home-ownership
- Return on private investment in real estate rather than in the financial market

→ consistent finding in the literature
  • Considering IR in the income measure reduces inequality and poverty
  • Owner-occupied housing = effective means of old-age provision

But who else benefits from IR and from public housing policies (in-kind):

- rent-free tenants (former owners w/ right of usufruct)
- tenants with below-market rent (social housing, employer provided housing)

→ IR is a required income component in EU-SILC as of wave 2007
European Commission: Definition of IR

“… imputed rent shall be imputed for all households that do not report paying full rent, either because they are owner-occupiers or they live in accommodation rented at a lower price than the market price, or because the accommodation is provided rent-free.

The imputed rent shall be estimated only for … main residence.

The value to impute shall be the equivalent market rent that would be paid for a similar dwelling as that occupied, less any rent actually paid, less any subsidies received …, less any minor repairs …

The market rent is the rent due for the right to use an unfurnished dwelling on the private market, excluding charges …”

Source: Commission Regulation No. 1980/2003
Alternative Methods to Determine Imputed Rent

1) **Capital-market approach** (e.g., PSID, BHPS, SOEP) – owners only
   - Fixed Interest on equity = house value minus outstanding debt
     (deduction of maintenance costs, depreciation)

2) **Self-assessment approach** (e.g. SOEP) – owners only
   
   And if you lived in this flat or house as tenant: what do you estimate would be the monthly rent without heating costs?

   About ..........     DM     Don't know  .................  

3) **Rental Equivalence / Opportunity-cost approach** (e.g. ECHP, SOEP)
   - Estimation of market rent paid by private, unsubsidized tenants
     - Regression-based (mostly hot-deck)
     - Stratification (mostly using external information)
   - Out-of-sample prediction for owners and subsidized tenants
The “Regression-based Rental Equivalence” Approach

[a] Regression
- Dependent variable: log of monthly gross rent per square meter (excl. heating costs) of unsubsidized tenants in private market
- Covariates: Condition of building, Size of housing unit in square meters, Year of construction, Occupancy, Community Size, Regional information about levels of market rent, East-West-Germany, Type of house, Endowment, Income, Nationality
- Heckman selection model (selection into ownership) controlling for clustering effects at the regional level (county)

[b] Implementation
- apply regression estimates to otherwise comparable owner-occupiers and subsidized tenants (out of sample prediction)
- add a randomly chosen error term from the true distribution to preserve variance
- multiply anti-log of predicted rent by size of flat/house (square meters) and by 12 to get annual gross IR

[c] Deduction of relevant costs to achieve a net measure of IR
- Owner occupiers: Net IR = Gross IR minus costs (maintenance, operating, repair costs) minus interest payments on mortgages
- Renters in social housing and subsidized tenants with below market rent (incl. rent-free tenants):
  - IR = difference between currently paid rent and predicted market rent
  - IR = 0 if current rent > predicted market rent (no negative IR)
(ad 4) Home production

- Ideally, we want to derive a market value of goods and services produced for own consumption.
- In this paper, using data for Germany in 2002, we approximate the value of home production by means of time use data:
  - Hours spent on various activities over a normal working day.
  - Categories: gardening, repairs, domestic work, child care and nursery care.
    - Exclusion of time spent on leisure or recreational activities.
  - Multiply hours by an appropriate hourly wage rate yields an overall estimate of the value of home production (aggregation at HH level).
    - Control for diminishing marginal productivity, multi-tasking and
    - Flat hourly wage rate or “housekeeper wage” (4 Euro ≈ lowest wage paid for low-skilled work).
    - Predicted wage approach (avg. ≈ 8 Euro).
62. What does a typical weekday look like for you? How many hours per day do you spend on the following activities?

- Please give only whole hours.
- Use zero if the activity does not apply!

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job, apprenticeship, second job (including travel time to and from work)</td>
<td></td>
</tr>
<tr>
<td>Errands (shopping, trips to government agencies, etc.)</td>
<td></td>
</tr>
<tr>
<td>Housework (washing, cooking, cleaning)</td>
<td></td>
</tr>
<tr>
<td>Child care</td>
<td></td>
</tr>
<tr>
<td>Care and support for persons in need of care</td>
<td></td>
</tr>
<tr>
<td>Education or further training (also school, university)</td>
<td></td>
</tr>
<tr>
<td>Repairs on and around the house, car repairs, garden work</td>
<td></td>
</tr>
<tr>
<td>Hobbies and other free-time activities</td>
<td></td>
</tr>
</tbody>
</table>
What’s the “correct” fictitious wage?

- Conceptual and Empirical Problems:
  - quality and quantity of the outcome is unknown
  - individual’s productivity for the relevant activity is unknown

- “Flat Rate” Approach
  - “housekeeper wage”: market wage for similar types of activities (wages for “misc. services”)
  - Assumption: all individuals have similar productivity

- “Individual Predicted Wage” Approach
  - “Opportunity cost”: implicit wage derived from a person’s “true” wage realized at the labor market.
  - Problem: appropriate fictitious wage for not employed persons (students, pensioners, unemployed ….)?
  - (Heckman) Selection correction models may help (applicable for pensioners?)
  - Can Individuals work indefinite hours for their market wage? (paid overtime in Germany on decline!)

- We keep it simple!
  - conservative flat rate of 4 Euro per hour (~lowest grade rates for low qualified jobs)
  - Sensitivity analyses. flat hourly rate of 8 Euro (~discussed minimum wage) as well as a predicted wage approach

- Jenkins/O’Leary (1996) find little difference between flat rate and wage equation approach
Empirical Results

- Data: The German Socio-Economic Panel (SOEP)
- Observation year 2002 (cross-section)
- About 29,000 individuals (incl. children) in 12,000 private households
- Analysis Population: Individuals in private households
Share of beneficiaries from non-cash income components

<table>
<thead>
<tr>
<th>Baseline Model Quintile</th>
<th>Share of Beneficiaries*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health</td>
</tr>
<tr>
<td>1 (bottom)</td>
<td>100,0</td>
</tr>
<tr>
<td>2</td>
<td>100,0</td>
</tr>
<tr>
<td>3</td>
<td>100,0</td>
</tr>
<tr>
<td>4</td>
<td>100,0</td>
</tr>
<tr>
<td>5 (top)</td>
<td>100,0</td>
</tr>
<tr>
<td>All</td>
<td>100,0</td>
</tr>
<tr>
<td>N in Mil.</td>
<td>81.646</td>
</tr>
</tbody>
</table>

* Including indirect beneficiaries, i.e., persons profiting from transfers received by other household members.
Source: Frick et al. (2008)
Income portfolio in Germany 2002 by quintiles

Absolute figures

Home Prod.
Education
IR
Health
Baseline

1 (bottom) 2 3 4 5 (top)
Income portfolio in Germany 2002 by quintiles

Relative figures

→ Non-cash matters more for bottom quintiles!
→ Health transfers & home production most relevant
Income portfolio in Germany 2002 by age
Absolute figures
Income portfolio in Germany 2002 by age

Absolute figures

- Home Prod.
- Education
- IR
- Health
- Baseline

Below 15 | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75 and over

0 | 5000 | 10000 | 15000 | 20000 | 25000 | 30000 | 35000

The German Socio-Economic Panel Study

DIW BERLIN
Elderly benefit more from health & housing while the younger groups benefit from educational transfers; home production is of similar importance across age groups.
## Inequality and poverty effects

<table>
<thead>
<tr>
<th>Inequality indices</th>
<th>Value of the Index</th>
<th>Proportional change in %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A baseline</td>
<td>B plus all transfers</td>
</tr>
<tr>
<td>Gini</td>
<td>0.2949</td>
<td>0.2306</td>
</tr>
<tr>
<td></td>
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<td>-13.5</td>
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<td></td>
<td></td>
<td>-1.9</td>
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<td>-7.3</td>
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<td>-13.9</td>
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<td>-28.8</td>
</tr>
<tr>
<td>Atkin. 0.5</td>
<td>0.0762</td>
<td>0.0468</td>
</tr>
<tr>
<td></td>
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<td>-25.1</td>
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<td>-48.5</td>
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<td>Atkin. 1.5</td>
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<td></td>
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<tr>
<td>DR: 90/10</td>
<td>3.66</td>
<td>2.61</td>
</tr>
<tr>
<td></td>
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<td>-17.0</td>
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<td></td>
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<td>-3.3</td>
</tr>
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<td></td>
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<td></td>
<td>-34.5</td>
</tr>
<tr>
<td>DR: 90/50</td>
<td>1.88</td>
<td>1.62</td>
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<tr>
<td></td>
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<td>-8.0</td>
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- General reduction in inequality and poverty due to inclusion of non-cash components. Health & home production most important.
- Stronger effects at the lower tail.
Poverty effects (FGT0) of non-cash components in Germany 2002 by age: Baseline (CASH)
Poverty effects of non-cash components in Germany 2002 by age: Baseline + Imputed Rents
Poverty effects of non-cash components in Germany 2002 by age: **Baseline + Education**

![Graph showing poverty effects by age group and components](image-url)
Poverty effects of non-cash components in Germany 2002 by age: Baseline + Health
Poverty effects of non-cash components in Germany 2002 by age: Baseline + Home production
Poverty effects of non-cash components in Germany 2002 by age: Baseline + all non-cash components.
Summary

- Economic well-being appears to be a function of both, *monetary* and *non-monetary* components

- Incorporation of (selected) non-cash components into welfare measure yields …
  - Strong increase in disposable income *(about 50% of monetary income)*
  - Strong reduction in inequality *(Gini reduced by about 30%)*
  - … and in relative poverty *(FGT0 reduced by about 50%)*

- *Overall re-distribution from economically active to the inactive population*

- Varying transfer dependency as well as capacity to produce private services across age groups *(“life course”)* argues for simultaneous consideration of all non-cash components
Discussion

- Quality of our empirical assessment
  - “housing & net Imputed Rent”: comprehensive and adequate measure combining income advantages for both owners and subsidized renters
  - “home production”: robust findings for “flat wage” vs. “predicted wage” approach (Frick et al. 2009)
  - “education”: consideration of heterogeneity of educational transfers. Indication for non-compulsory public transfers reducing intergenerational educational mobility (Frick et al. 2008)
  - “health” effects are massive (and dubious)

- Welfare interpretation:
  - Is it reasonable to make welfare comparisons using an expenditure-based approach for public health care and public education (inefficiencies == welfare gains) ?
  - Is it appropriate to apply the very same equivalence scale to cash and non-cash components – problem of needs and (conditional) scales (e.g. Zaidi & Burchardt 2005) ?

- Cross-national comparability of public policies in a given field (e.g. housing) may require pooling the relevant “non-cash & cash” components and analyze their joint impact (while we analyzed the non-cash impact only)

- Check AIM-AP website [http://www.iser.essex.ac.uk/msu/emod/aim-ap/](http://www.iser.essex.ac.uk/msu/emod/aim-ap/) or Google “AIM-AP Essex”
Two papers

- broadening the view
  - i.e. include non-cash incomes in measure of economic well-being
    - a) public transfers in-kind (education, health, housing, …)
    - b) imputed rental value for owner-occupied housing
    - c) home production

- zooming in
  - i.e., disentangle the effects of different types of investment income
    - a) capital income
    - b) imputed rent
Point Change in Gini (Mid-1980s to Mid-2000s)

Source: OECD 2008: Growing Unequal.
Source: OECD 2008
Note: Poverty thresholds are set at 50% of the median income of the entire country specific population.
Motivation

Reasons for rising income inequality in OECD countries

- Changes in labor income due to …
  - Skill-based technological change, SBTC (e.g. Card & DiNardo 2002)
  - Superstar-phenomenon, CEOs (Bebchuk & Grinstein 2005)
  - Rising unemployment (e.g. Frick & Grabka 2008)
  - Immigration (e.g. Borjas 2006)

- Changing demographic structures / population (e.g. Reed 2006)
  - Share of Immigrants ↑, single HH ↑, lone parents ↑,
  - Ageing societies (fertility ↓, life expectancy ↑)

- Changes in Income portfolios
  - Research gap: Impact of various income components on inequality
    → here: The role of investment income !!!
Development of income aggregates in the SNA in Germany (1991=100)

Source: own calculations based on SVR 2007/08.
Investment income = Capital income + Imputed Rent
(NB: Capital gains are not considered)
Definition

Investment income = Capital income + Imputed Rent
(NB: Capital gains are not considered)

Capital income (CI):

SNA: „income derived from a resident entity‘s ownership of domestic and foreign assets“

- income on equity (dividends, branch profits, distributed income of corporations, reinvested earnings, etc.)
- income on debt (interest)
- rent from land (less expenses)
- imputed income from net equity in life insurances / pension funds ≠ not captured in income surveys
- others (royalties etc.) ≠ rarely captured in income surveys
**Definition**

**Imputed Rent (IR):**

- Fictitious income advantage for owner-occupied housing
- Investment in real estate rather in the capital market
- IR in SNA = production activity → “mixed income”

- Beneficiaries: owners, tenants with reduced rent, rent-free
- Regression-based opportunity cost approach
- Deduction of all owner-specific costs (\textit{net} value)
Impact of separate components on inequality / poverty:

- **Capital income**: contribution to inequality about 2-3-times higher than its contribution to overall income (e.g. Jäntti 1997 (UK, USA), Becker 2000 (DE), Fräßdorf et al. 2008 (UK, USA, DE))

- **Imputed rent**: in general, inequality and poverty reducing effect (e.g. Yates 1994 (Australia); Frick & Grabka 2003 (US, UK, DE); Frick et al. 2007 (various EU countries); AIM-AP project 2006-2009)

However, no joint consideration of CI and IR.
Data & Methods

Aim

➢ comprehensive and time-consistent analysis of the impact of CI and IR on economic inequality and mobility

Data

➢ German Socio-Economic Panel (SOEP)
➢ representative panel study (2007: about 11,000 households)
➢ oversampling of high income households
➢ survey years 1985-2007 (East Germany 1992-2007)

Methods

➢ incidence & relevance of investment income (CI, IR)
➢ inequality decomposition by subgroups (age groups)
➢ factor decomposition
➢ income mobility
Incidence of CI & IR

Population share holding CI / IR (in %)

Source: SOEP 1985-2007
Relevance of CI & IR

CI & IR as a share of total disposable income (in %)

Source: SOEP 1985-2007
Inequality (Gini)

- Baseline Income = Post-Gov’t Income excluding CI and IR
- OECD Equivalence Scale (1; 0.5; 0.3)
- Comparison of inequality in baseline income to augmented measures
Inequality

Gini-coefficient for baseline disposable income

Source: SOEP 1985-2007
Inequality

Gini-coefficient for baseline disposable income plus **Capital Income (CI)**

Source: SOEP 1985-2007
Inequality

Gini-coefficient for baseline disposable income plus Imputed Rent (IR)

Source: SOEP 1985-2007
Inequality

Gini-coefficient for baseline disposable income plus CI and IR

Source: SOEP 1985-2007
Relative Poverty Risk Rate (FGT0)

- Poverty line at 60 % of Median Income
- Comparison of poverty in baseline income to augmented measures
Relative Poverty Risk Rate

FGT0 for baseline disposable income

Source: SOEP 1985-2007
Relative Poverty Risk Rate

FGT0 for baseline disposable income plus CI

Source: SOEP 1985-2007
Relative Poverty Risk Rate

FGT0 for baseline disposable income plus IR

Source: SOEP 1985-2007
Relative Poverty Risk Rate

FGT0 for baseline disposable income CI and IR

Source: SOEP 1985-2007
Who „profits“ most from CI and IR?

- Inequality decomposition by age groups
- Comparison of baseline and „full“ income inequality
Relevance of CI & IR by age

CI & IR as a share of full disposable income by age group

Source: SOEP
Inequality is lowest among the elderly
Subgroup decomposition

MLD by age groups 2007 – baseline income plus CI and IR

Adding CI & IR ...
\[ \rightarrow \text{Increase in overall inequality } +47\% \]
\[ \rightarrow \text{especially within-group inequality is affected} \]
\[ \rightarrow \text{Strongest increase among elderly } +107\% \]

What drives the picture: CI or IR?

- Inequality decomposition by income component (Shorrock 1982)
Factor decomposition

Relative contribution of CI & IR to full income

Source: SOEP 1985-2007
Factor decomposition

Relative contribution of CI & IR to inequality and to full income

In recent years (prior to the financial crisis) about 1/3 of inequality is due to CI, less than 5% is due to IR

Source: SOEP 1985-2007
When top-coding CI, „only“ about 10% of inequality is due to CI.
How do CI and IR impact on income mobility?

- Shorrocks (1978) mobility measure, using Gini
Income Mobility

Shorrocks Mobility over 5 years, using Gini-index

Source: SOEP 1986-2007
Income Mobility

Shorrocks Mobility over 5 years, using Gini-index

Source: SOEP 1986-2007
Income Mobility

Sorrocks Mobility over 5 years, using Gini-index

Source: SOEP 1986-2007
Income Mobility

Shorrocks Mobility over 5 years, using Gini-index

Source: SOEP 1986-2007

Baseline
Baseline plus IR
Baseline plus CI
Full income incl. IR and CI

Source: SOEP 1986-2007
Summary

Comprehensive and consistent analysis of CI + IR

- **Inequality and poverty effects**
  - Baseline income: secular trend of increasing inequality
  - IR dampening effect vs. CI increasing effect

- **Mobility effects**
  - Baseline income: trend towards decreasing income mobility
  - IR exerts no relevant effect vs. CI re-inforces overall trend (esp. top incomes)

- **Inequality decomposition by age**
  - by 2007, CI & IR contribute to almost 25% of full income among those >65
  - inequality among the elderly doubles when considering CI & IR

- **Factor decomposition**
  - in recent years, CI’s inequality share is 7-times higher than its income share
  - top-coding reveals large measurement issues (volatility)
Conclusion

→ Quite different effects arising from two types of investment income (CI and IR)

➢ Relevance framework for policy recommendations
  ➢ Strong age dependency of CI and IR will most likely yield an increase in economic inequality, esp. among elderly (NB: Germany is a rapidly ageing society)
    ➢ impact of the financial crisis ?!
  ➢ Comparative research needs to consider differences in investment behavior as well as in institutional arrangements (incentive structures) across countries and welfare regimes which impact on the income-wealth nexus:
    ➢ income → savings → wealth portfolio → determines level, structure and volatility of returns on investment (CI and IR) → income portfolio
    ➢ indeed this may offer one argument for why private households in different countries appear to have been struck differently by the financial crisis
Thanks for your attention!
Comments welcome

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