

# **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

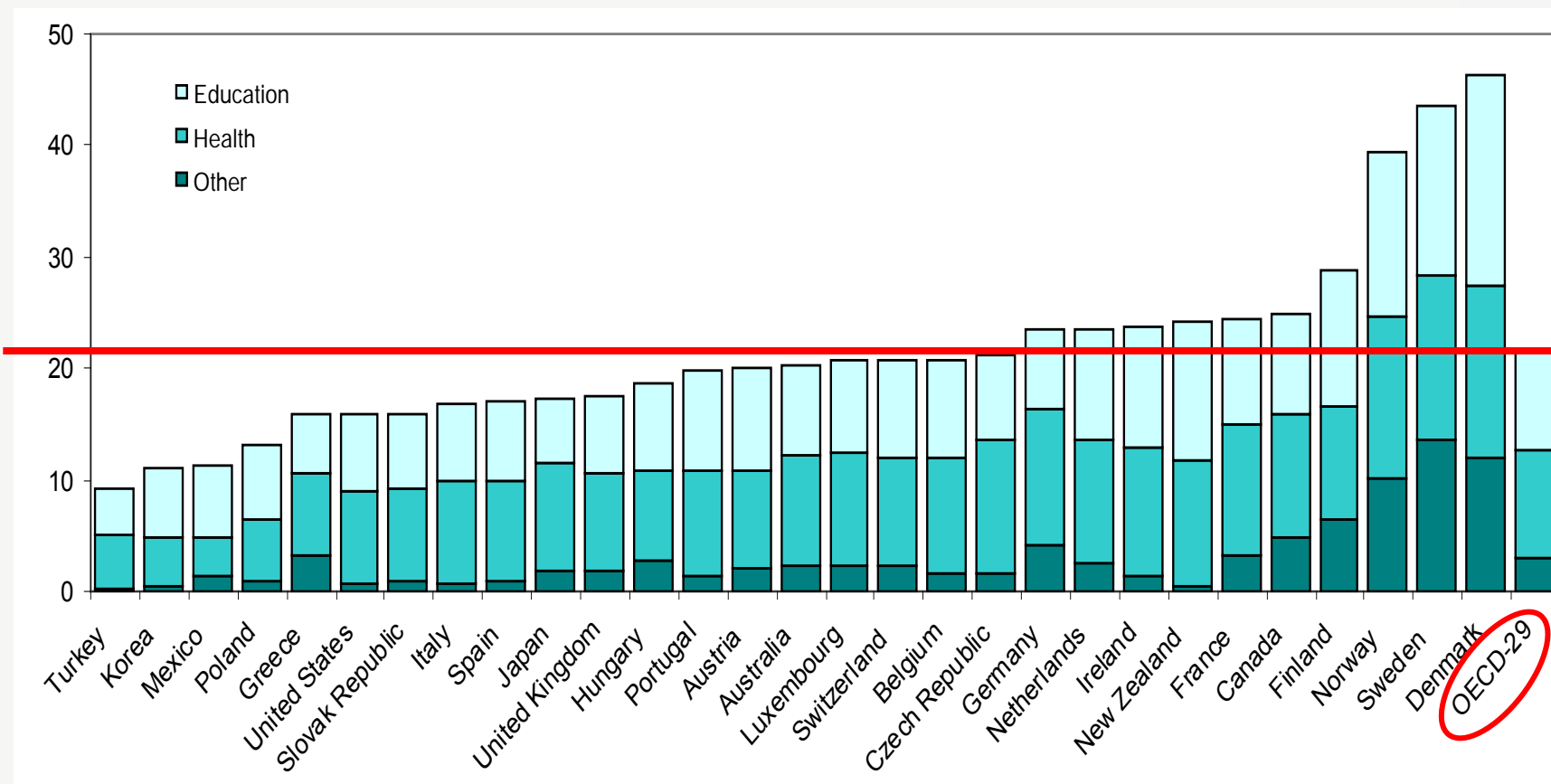
# Rationale for including non-cash income in welfare oriented empirical analyses

- 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
    - ✓ e.g., Meulemans, Cantillon (1993): BE; Yates (1994): AUS; Frick, Grabka (2003): GER, US, UK; Eurostat (1998, 2005) & Frick et al (2007): selected EU-countries;
  - 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

**1<sup>st</sup> Claim:** Include non-cash components in well-being measure

→ most relevant in cross-national research (e.g., Smeeding & Weinberg (2001); Canberra Group (2001))

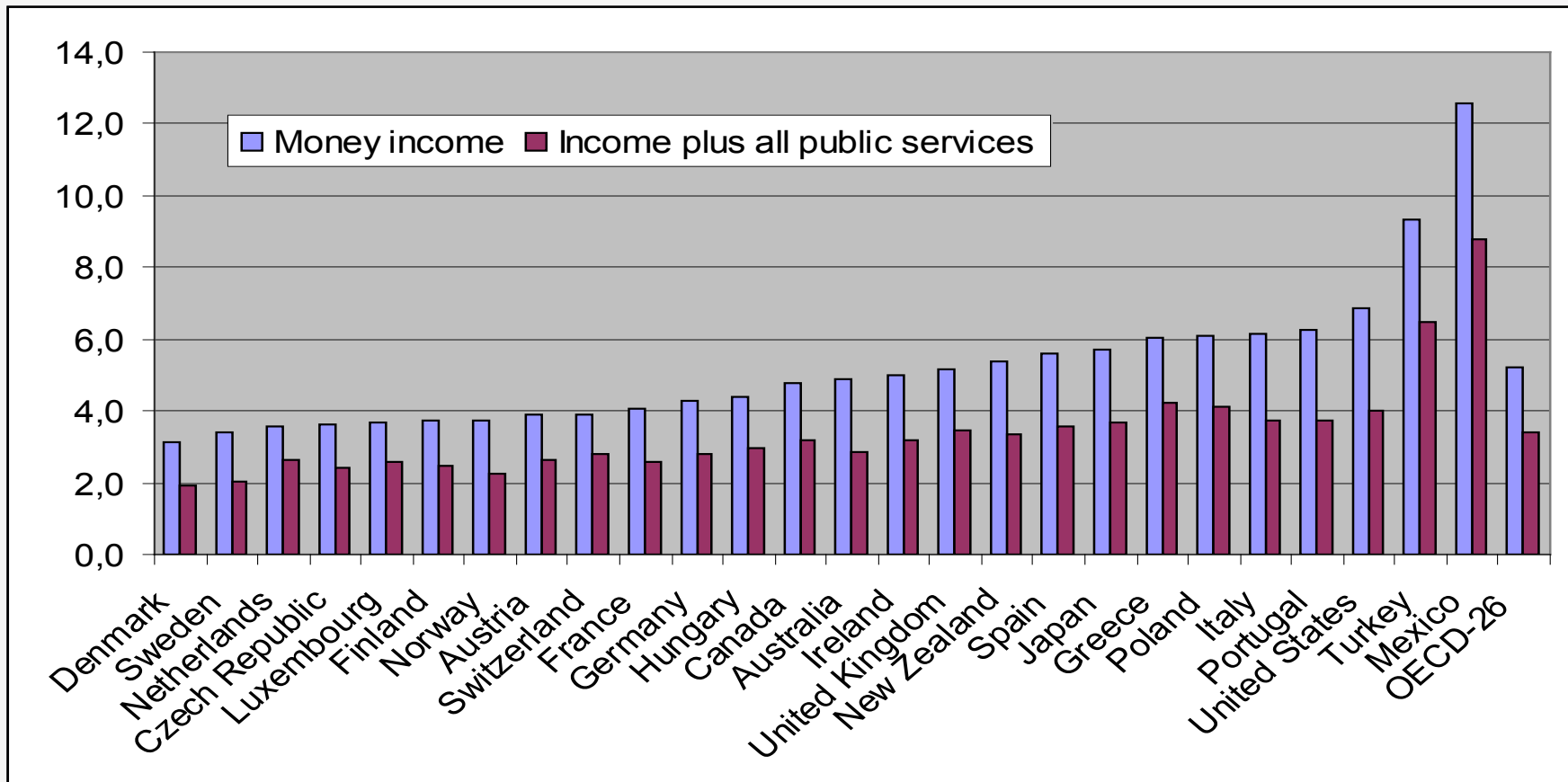
## Public expenditures for in-kind services in OECD countries in 2000 (as a % of household disposable income)



„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.)

## 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

**2<sup>nd</sup> Claim:** if those components depend on life cycle stages, include all  
(*as many as possible*) non-cash components simultaneously

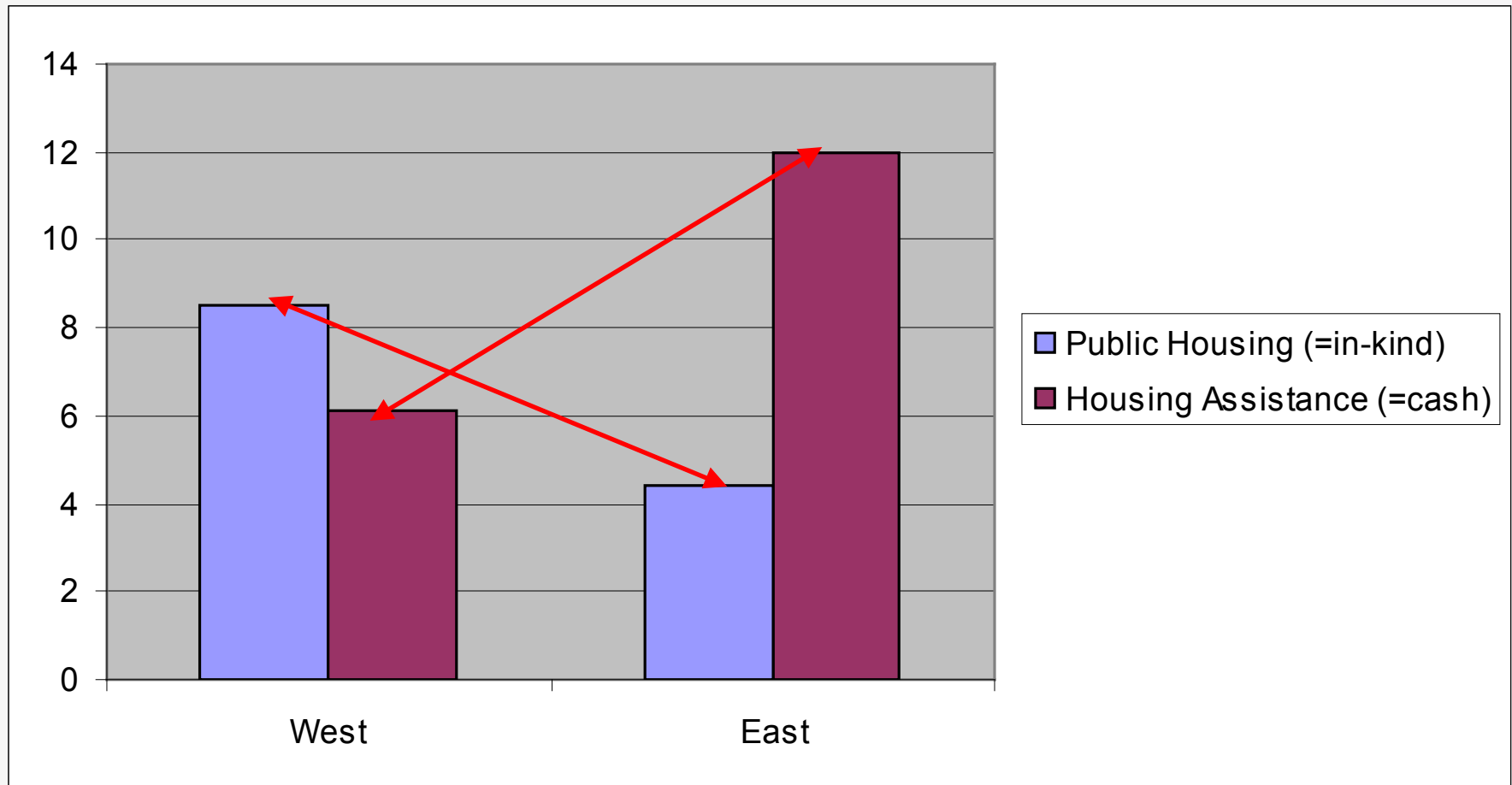
## Example: Housing tenure in selected EU countries

(Population in private households, %)

<i>Tenure status</i>	B	D	EL	IRL	I	NL	UK
(1) <i>Owner occupiers</i>	72,3	47,4	75,2	84,4	69,9	65,0	72,5
<i>thereof</i>							
(a) outright owner	33,9	23,2	62,4	39,7	55,7	5,7	25,4
(b) with outstanding mortgage	38,4	24,2	12,7	44,8	14,2	59,3	47,1
(2) <i>Tenants</i>	27,7	52,6	24,8	15,6	30,1	35,0	27,5
<i>thereof</i>							
(a) in private market (non-subsidized)	21,6	38,7	18,9	6,2	12,7	*	6,0
(b) rent-subsidized by direct public transfers in cash		3,9	0,3	0,0		6,7	1,9
(c) rent-subsidized due to living in social housing	4,5	4,0		7,7	5,5		17,8
(d) rent-subsidized by landlord (eg. family, employer)		3,4	0,1			27,7	0,7
(e) rent-free	1,6	2,7	5,5	1,6	11,9	0,5	1,1
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: Frick, Grabka, Smeeding, Tsakloglu (forthcoming).

## Example: Housing Policy Instruments in Germany (Share of all tenant households, %)



Source: Frick, Grabka, Groh-Samberg (2007).

# 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
- flat hourly housekeeper wage rate (4 Euro) vs. [8 Euro per hour] vs. [predicted wage] → Frick et al (2009)

## (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 € ---

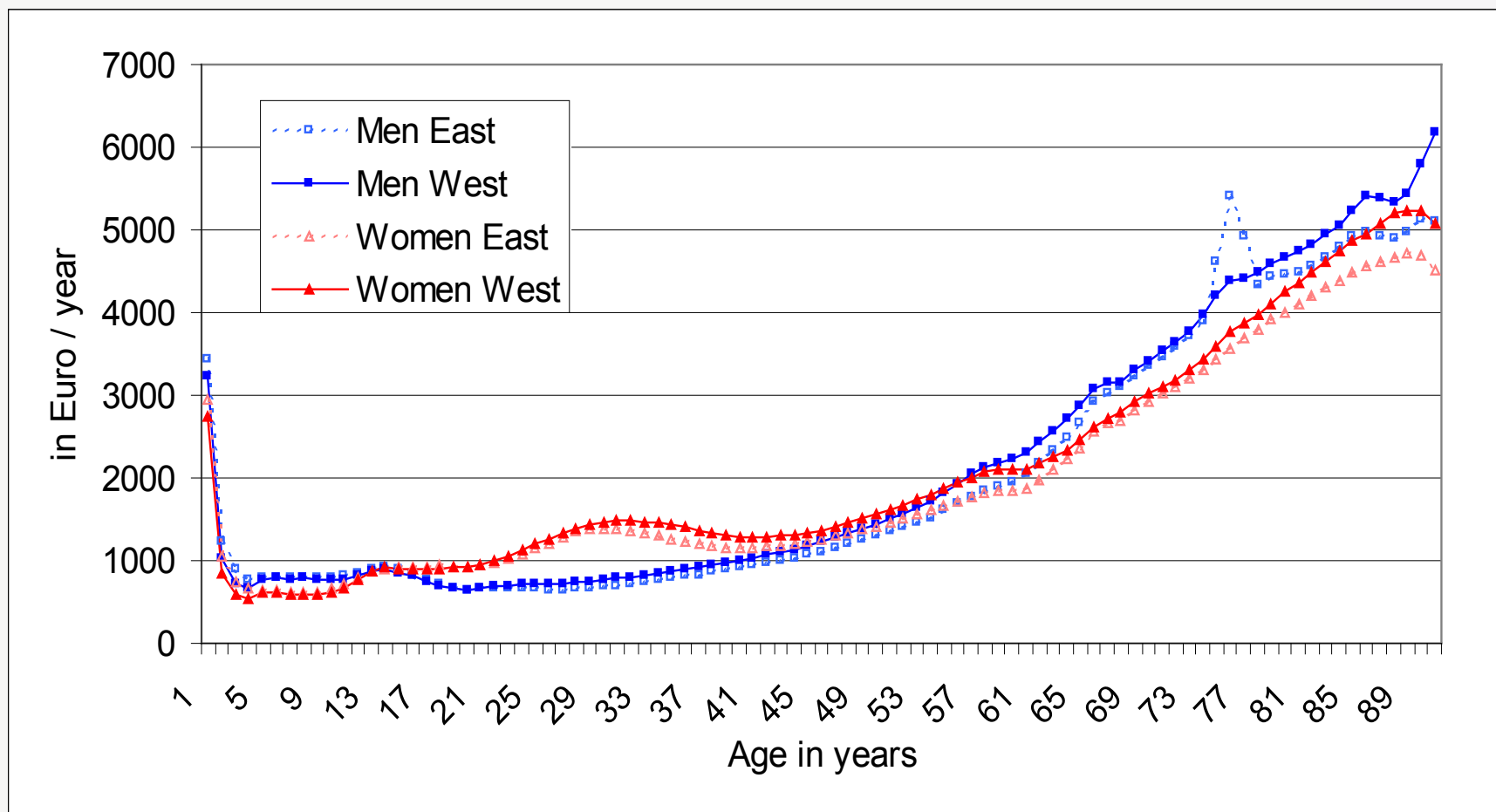
	Pre-Primary			Primary	Secondary Schools							Vocational		Tertiary	
	fulltime	parttime + lunch	parttime		orien- tation grades	lower sec.	inter- mediate sec.	school w multiple tracks	college track	compre- hensive school	special school	dual system	other	Applied Science s	Uni- versity
Schleswig-Holstein	5000	2800	2500	3600		4700	4400		5500		10800	2400	5900	4800	4000
Niedersachsen	6100	3400	3100	3900	4500	5200	4500		5600		11400	2000	5600	5600	6600
Nordrhein-Westfalen	5500	3000	2700	3700		5000	4000		5200	5600	11700	2100	5600	4900	4200
Hessen	5300	2900	2600	3600	4700	5500	4900		4800	5000	12200	2400	5500	4200	4700
Rheinland-Pfalz	4700	2600	2400	3800		5000	4000	4600	5300		9900	1900	5600	5100	4800
Baden-Württemberg	4600	2500	2300	3800		5100	4400		5800		13600	2300	6200	5800	6600
Bayern	4500	2500	2300	4100		5500	5000		6100		9300	2200	6400	5000	5800
Saarland	4900	2700	2400	3600				4100	4800	4500	11600	2200	5200	5400	5200
Hamburg	6100	3400	3100	5800		6300			6100	7100	14900	2800	6900	4500	6100
Bremen	6000	3300	3000	4200	4900	5300	4300		5500	5400	15200	2300	5800	5000	6900
Berlin	6200	3400	3100	4500	5500		4700		5500	6600	13500	2200	5300	4900	4800
Mecklenburg-Vorpommern	2900	1600	1400	3800		5200	3900	4400	4100		9200	1700	3900	7500	6100
Brandenburg	3900	2200	2000	3200	4300		3600		4100	4800	10900	2000	3100	7200	5700
Sachsen-Anhalt	4600	2500	2300	4500	4300			5000	4700		10500	1800	4800	7600	8800
Thüringen	3700	2000	1800	5300				5300	5300		10900	2100	5100	7200	7200
Sachsen	3400	1900	1700	4400				4300	4800		11300	1800	4100	6500	5900
Deutschland	5000	2800	2500	3900	4600	5200	4400	4700	5300	5600	11500	2100	5700	5400	5300

Sources: Federal Statistical Office, Schilling (2006)

## (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)



Source: Federal Statistical Office, 2002.

## (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

# Implementation in SOEP

## 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 spend on various activities over a normal working day
  - Categories: gardening, repairs, domestic work, child care and nursery care
    - exclusion of time spend 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)

# SOEP questionnaire 2002:

**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!

**Number  
of hours**

Job, apprenticeship, second job (including travel time to and from work) .....	<input type="text"/> <input type="text"/>
Errands (shopping, trips to government agencies, etc.) .....	<input type="text"/> <input type="text"/>
Housework (washing, cooking, cleaning) .....	<input type="text"/> <input type="text"/>
Child care .....	<input type="text"/> <input type="text"/>
Care and support for persons in need of care .....	<input type="text"/> <input type="text"/>
Education or further training (also school, university) .....	<input type="text"/> <input type="text"/>
Repairs on and around the house, car repairs, garden work .....	<input type="text"/> <input type="text"/>
Hobbies and other free-time activities .....	<input type="text"/> <input type="text"/>

# 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

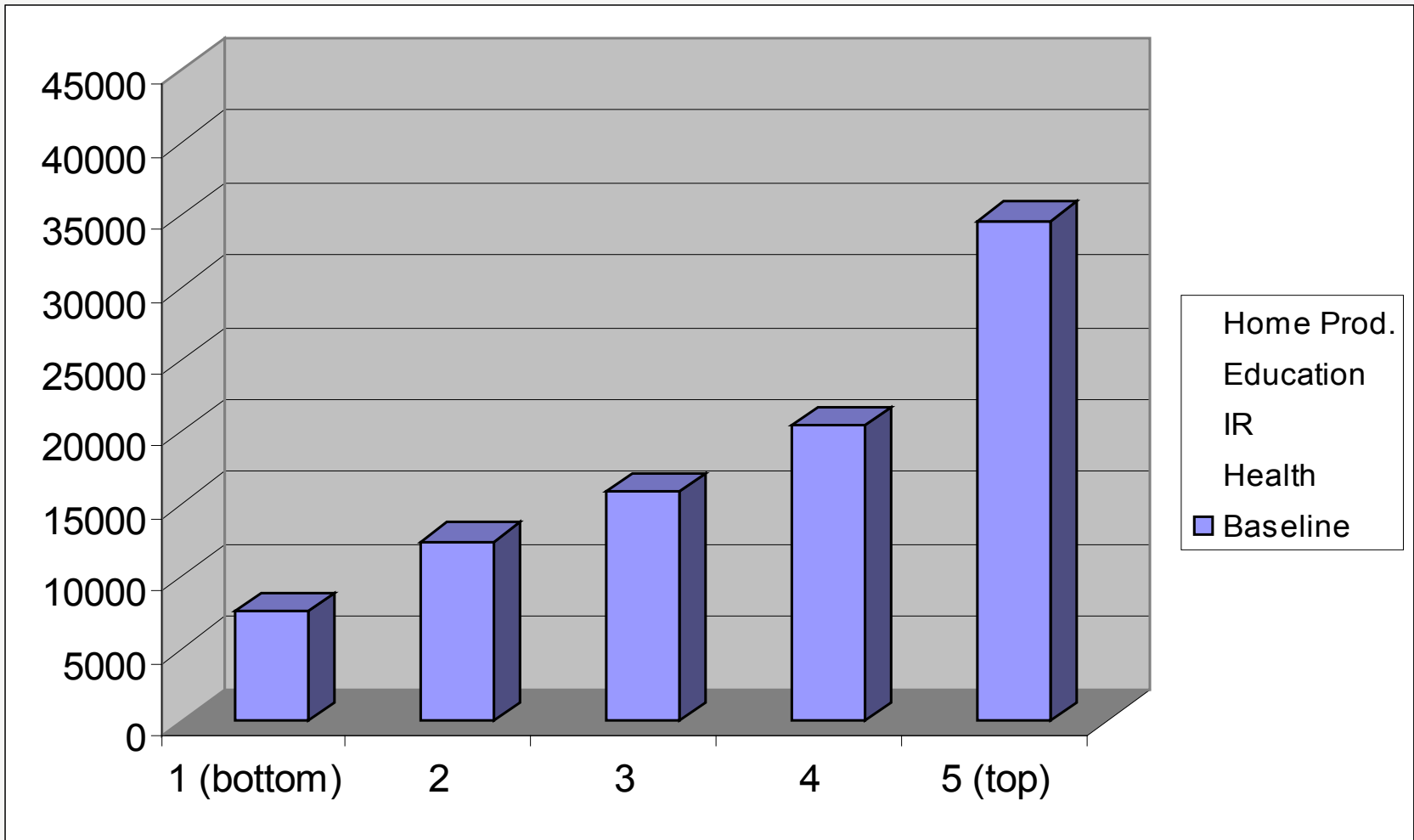
Baseline Model Quintile	Share of Beneficiaries*			
	Health	IR	Education	Home Prod.
1 (bottom)	100,0	40,8	49,6	98,5
2	100,0	42,2	49,1	99,3
3	100,0	46,7	50,7	99,7
4	100,0	47,3	42,9	99,4
5 (top)	100,0	50,3	35,7	99,0
All	100,0	45,4	45,6	99,2
N in Mil.	81.646			

\* Including indirect beneficiaries, i.e., persons profiting from transfers received by other household members.

Source: Frick et al. (2008)

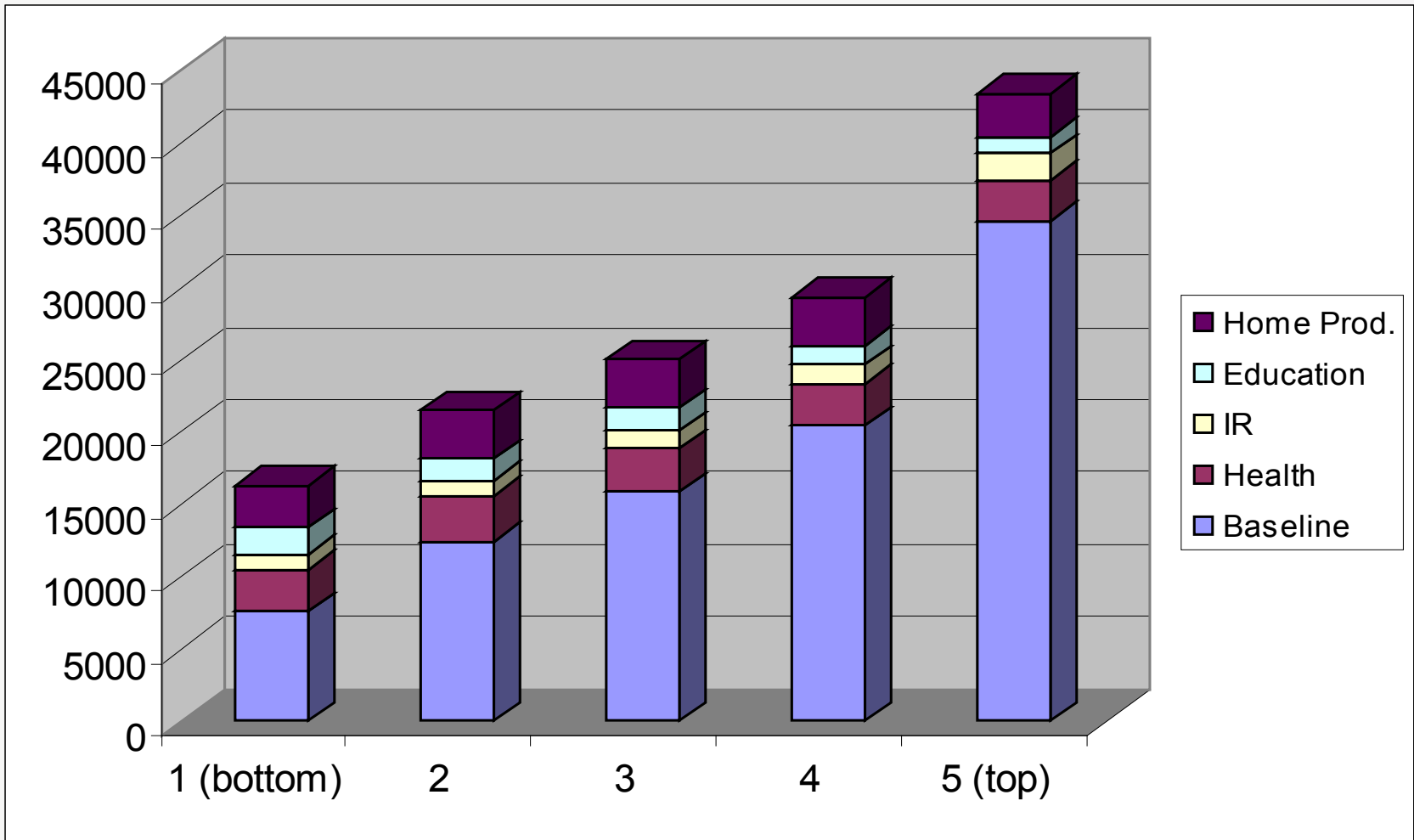
# Income portfolio in Germany 2002 by quintiles

## Absolute figures



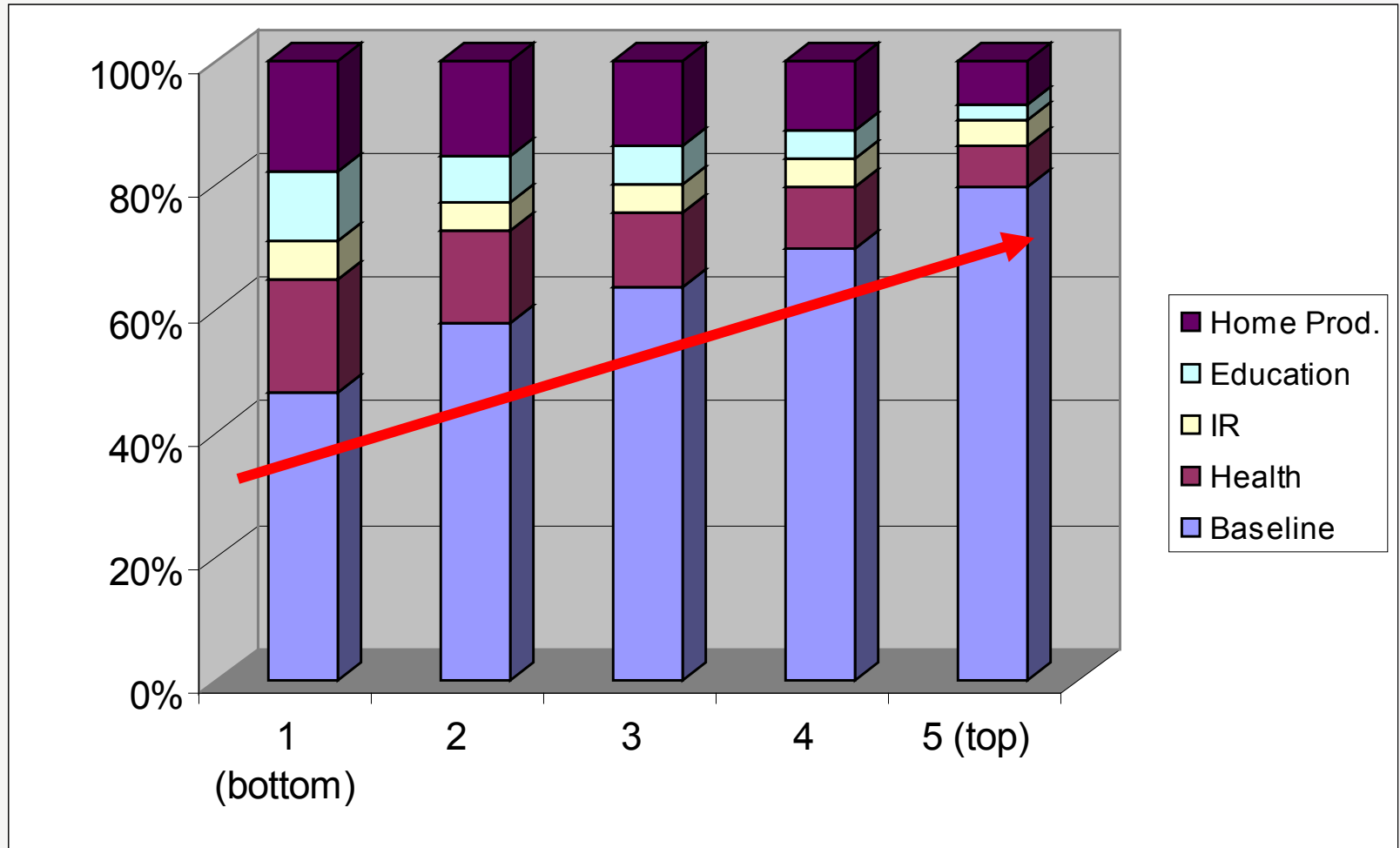
# Income portfolio in Germany 2002 by quintiles

## Absolute figures



# Income portfolio in Germany 2002 by quintiles

## Relative figures

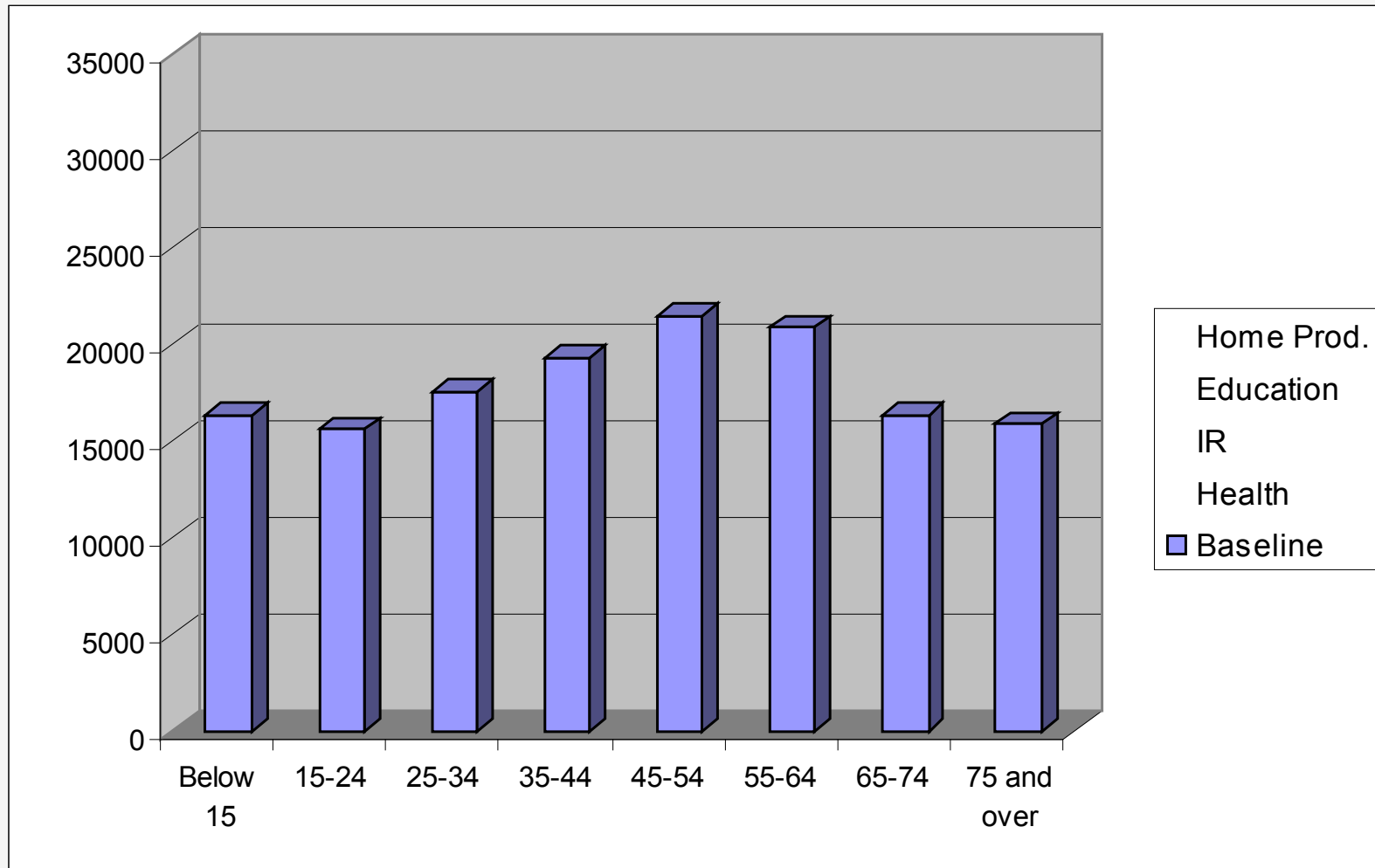


→ Non-cash matters more for bottom quintiles !

→ Health transfers & home production most relevant

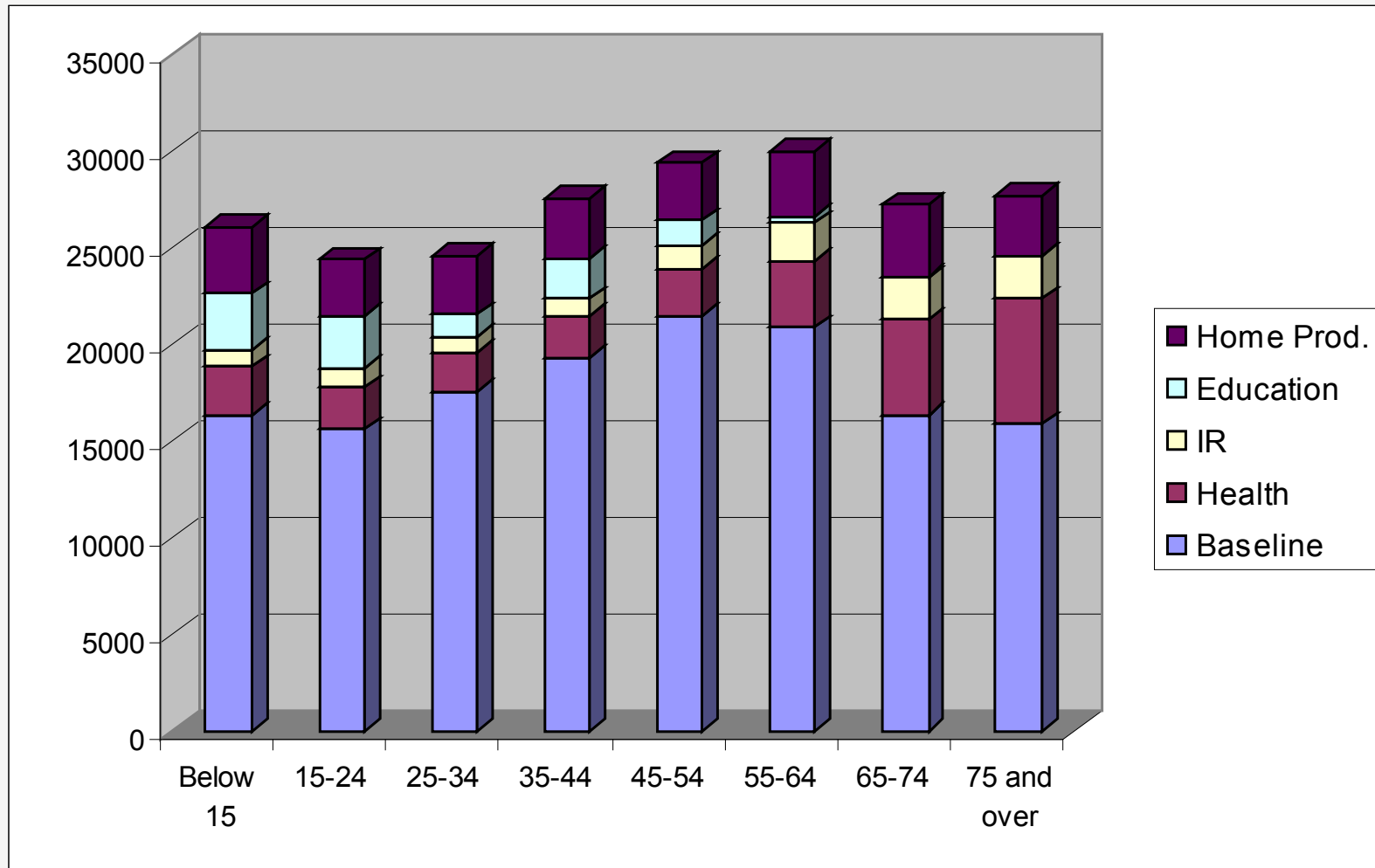
# Income portfolio in Germany 2002 by age

## Absolute figures



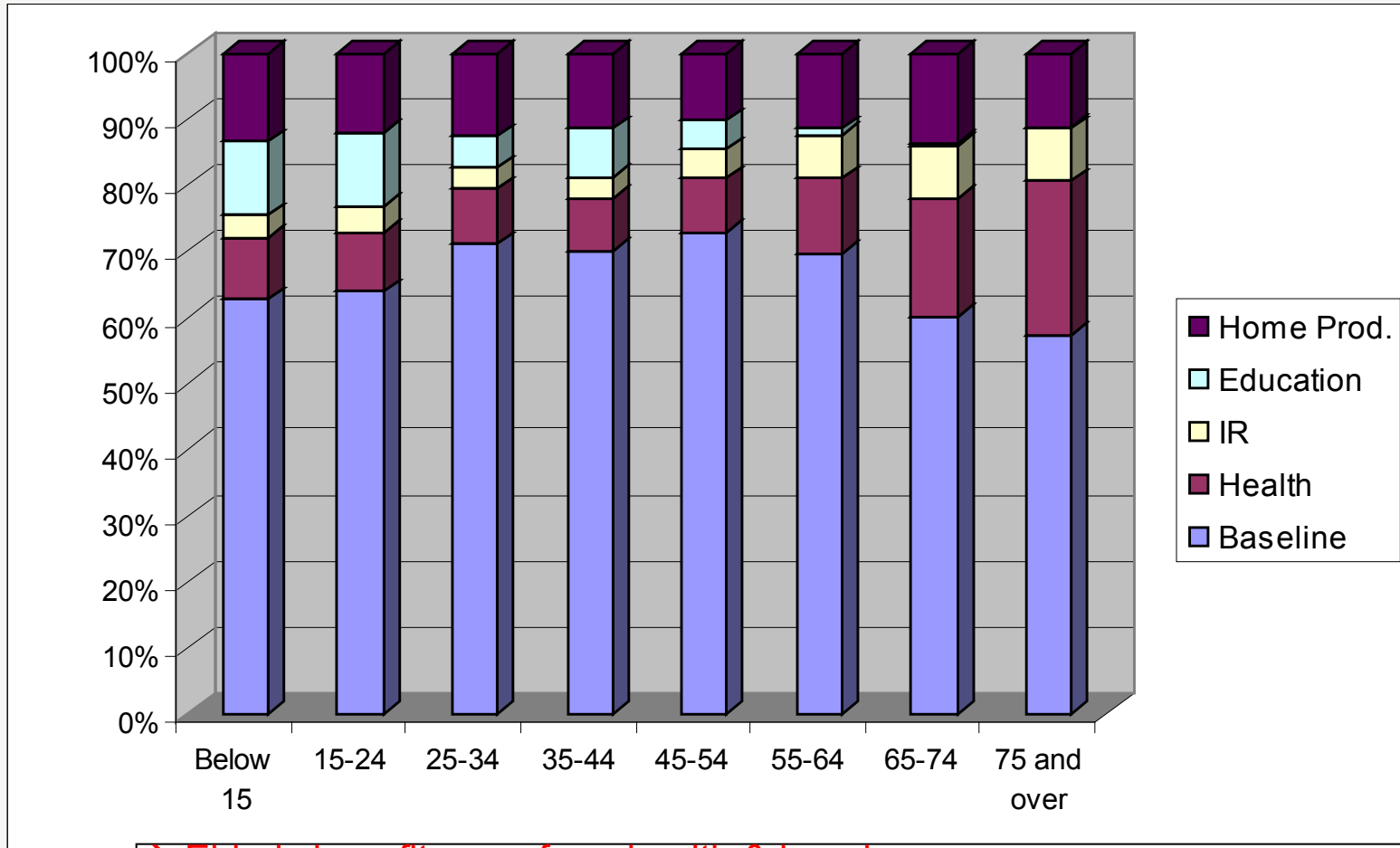
# Income portfolio in Germany 2002 by age

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## Relative figures



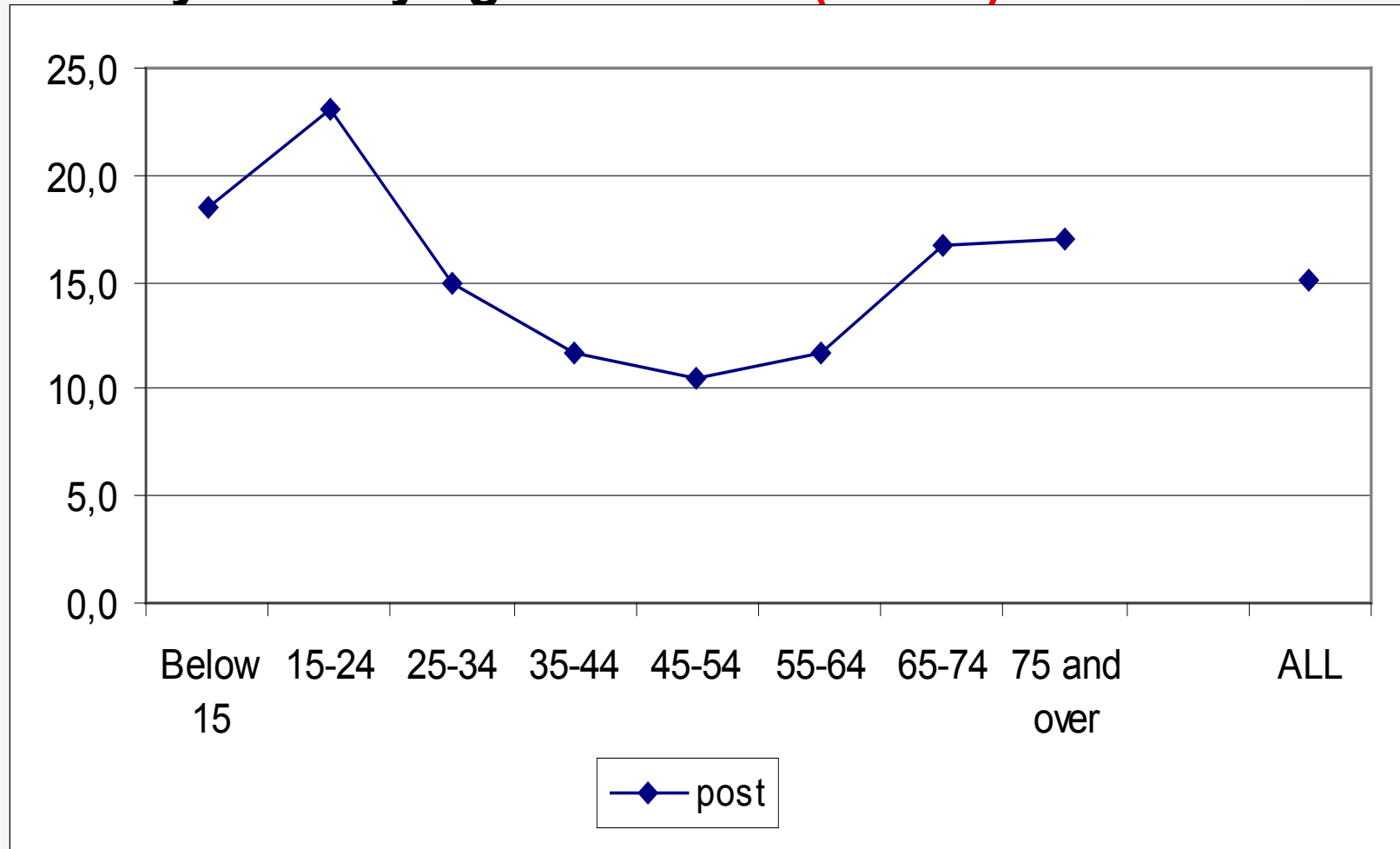
→ Elderly benefit more from health & housing while the younger groups benefit from educational transfers; home production is of similar importance across age groups.

## Inequality and poverty effects

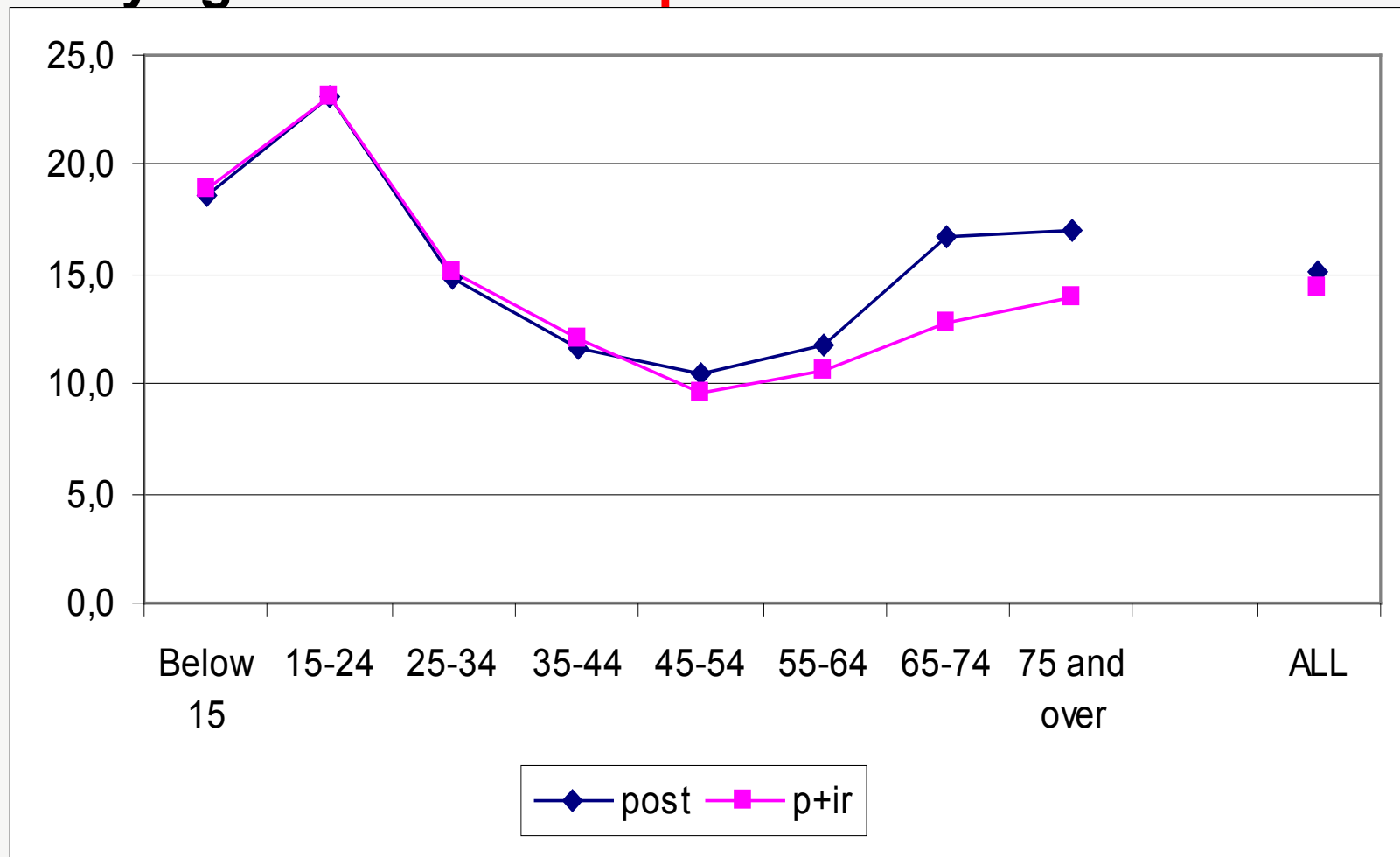
Inequality indices	Value of the Index		Proportional change in %				
	A baseline	B plus all transfers	C Health	D IR	E Education	F Home prod.	G All
<b>Gini</b>	0,2949	0,2306	-13,5	-1,9	-7,3	-13,9	<b>-28,8</b>
<b>Atkin. 0.5</b>	0,0762	0,0468	-25,1	-4,8	-13,6	-25,7	<b>-48,5</b>
<b>Atkin. 1.5</b>	0,2279	0,1274	-31,5	-9,6	-13,8	-31,3	<b>-53,5</b>
<b>MLD</b>	0,1594	0,0924	-28,6	-6,5	-14,8	-28,8	<b>-52,0</b>
<b>DR: 90/10</b>	3,66	2,61	-17,0	-3,3	-9,6	-17,7	<b>-34,5</b>
<b>DR: 90/50</b>	1,88	1,62	-8,0	-1,6	-5,6	-9,4	<b>-17,2</b>
<b>DR: 50/10</b>	1,95	1,61	-9,7	-1,7	-4,1	-9,2	<b>-20,8</b>
<b>FGT0</b>	15,14	9,02	-23,1	-4,9	-11,5	-19,7	<b>-51,3</b>
<b>FGT1</b>	4,38	1,97	-36,0	-8,7	-14,8	-33,7	<b>-67,5</b>
<b>FGT2</b>	2,08	0,68	-47,8	-14,8	-20,2	-45,0	<b>-79,2</b>

- General reduction in inequality and poverty due to inclusion of non-cash components. Health & home production most important.
- Stronger effects at the lower tail.

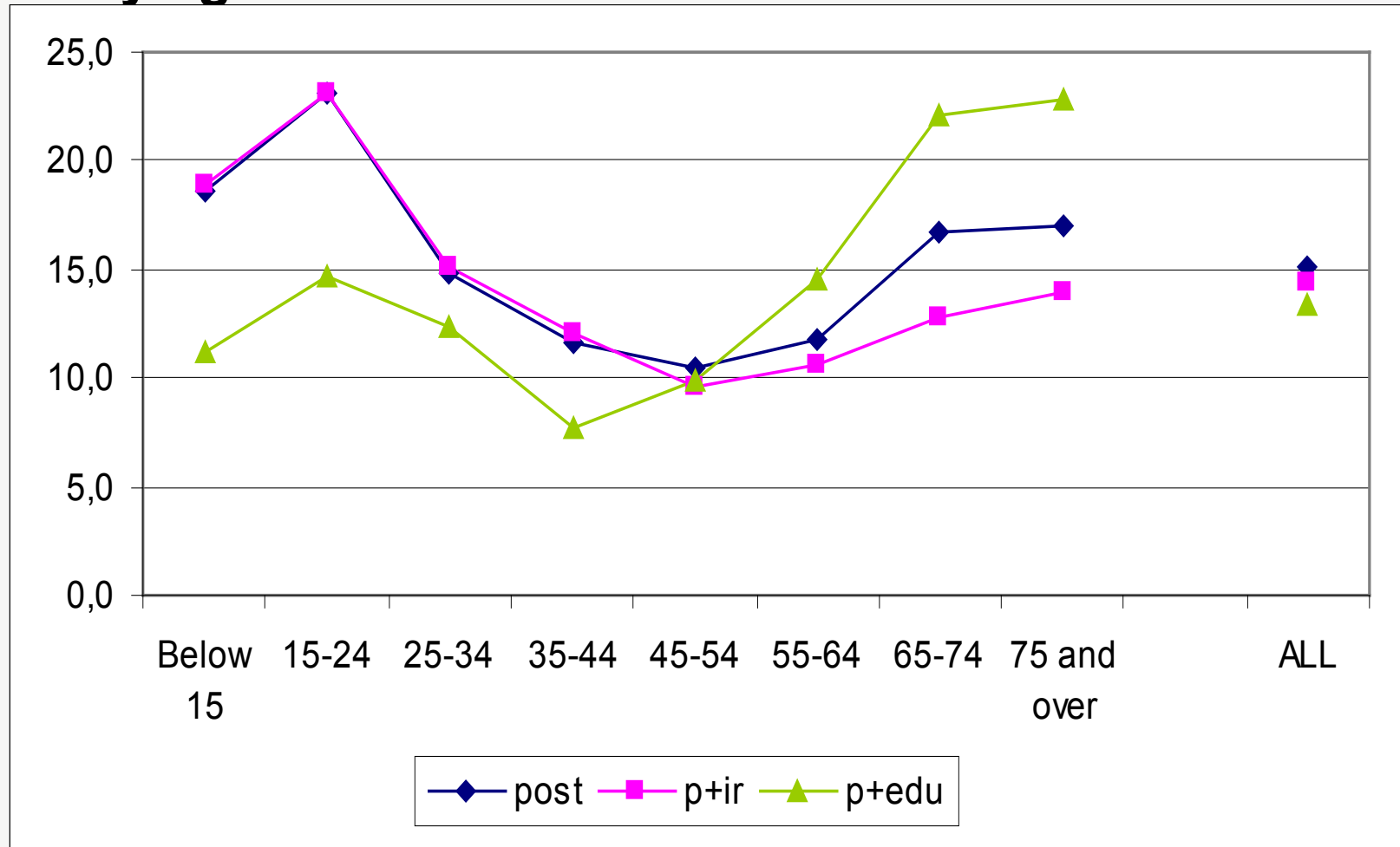
## Poverty effects (FGT0) of non-cash components in Germany 2002 by age: **Baseline (CASH)**



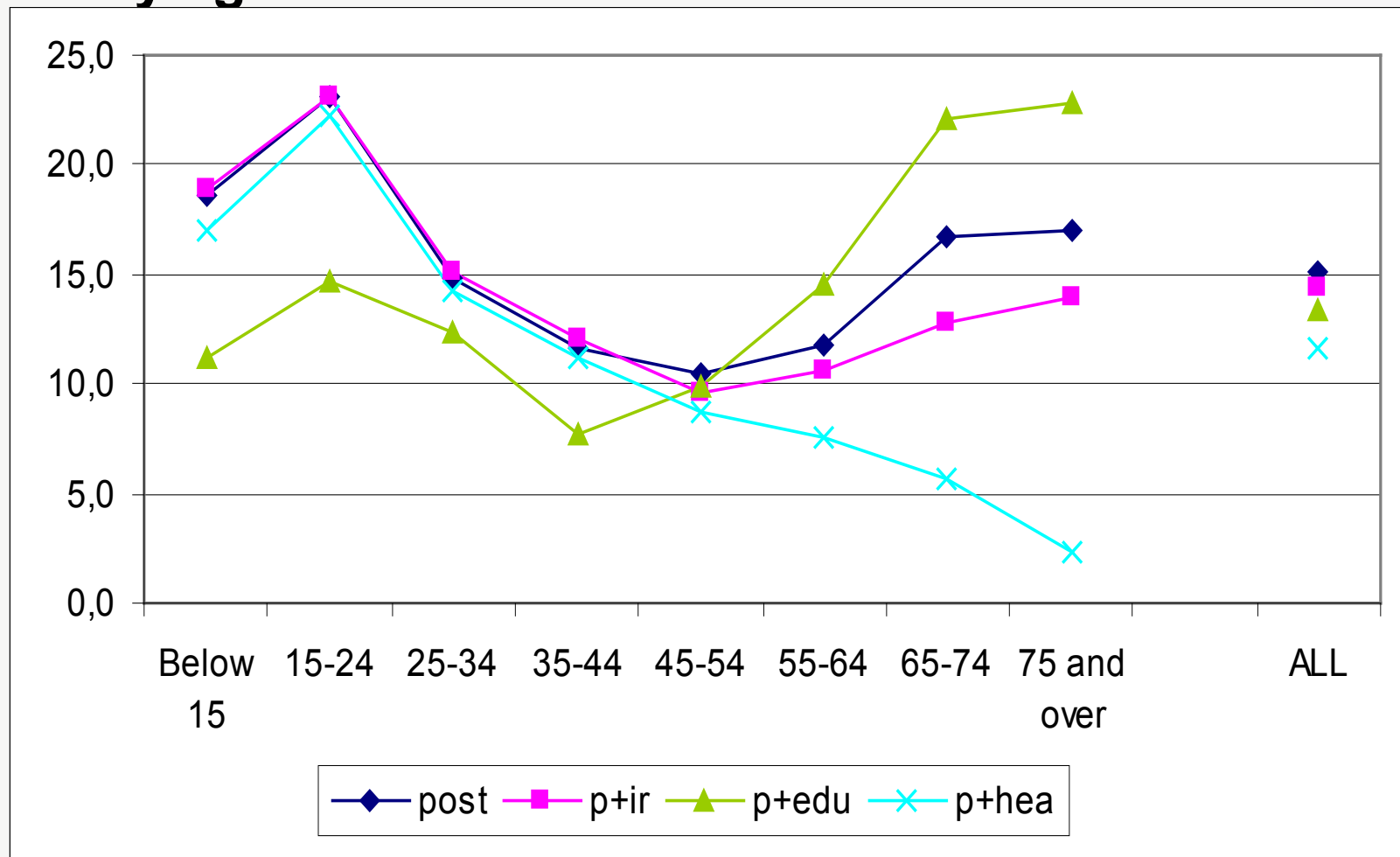
# Poverty effects of non-cash components in Germany 2002 by age: **Baseline + Imputed Rents**



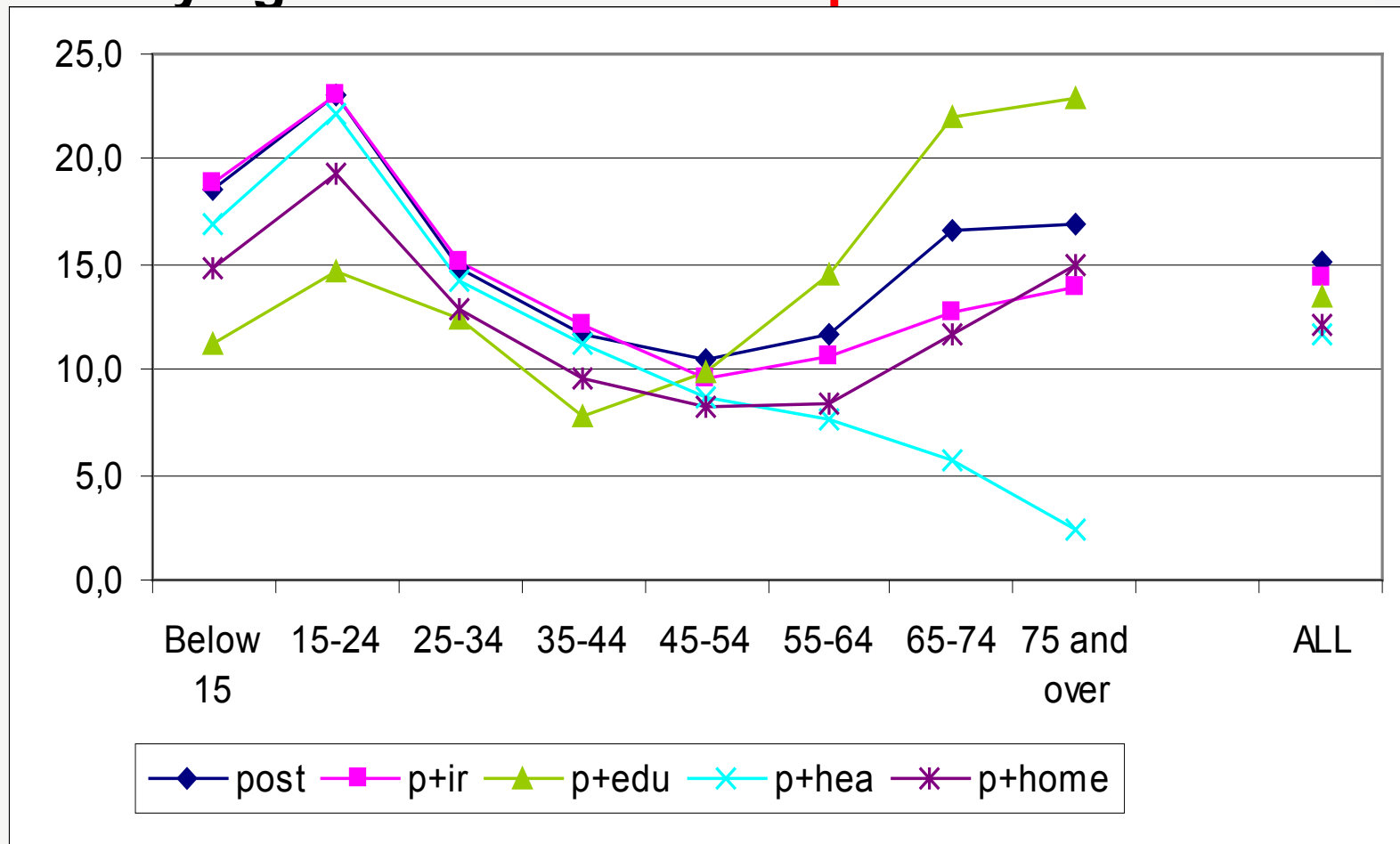
# Poverty effects of non-cash components in Germany 2002 by age: **Baseline + Education**



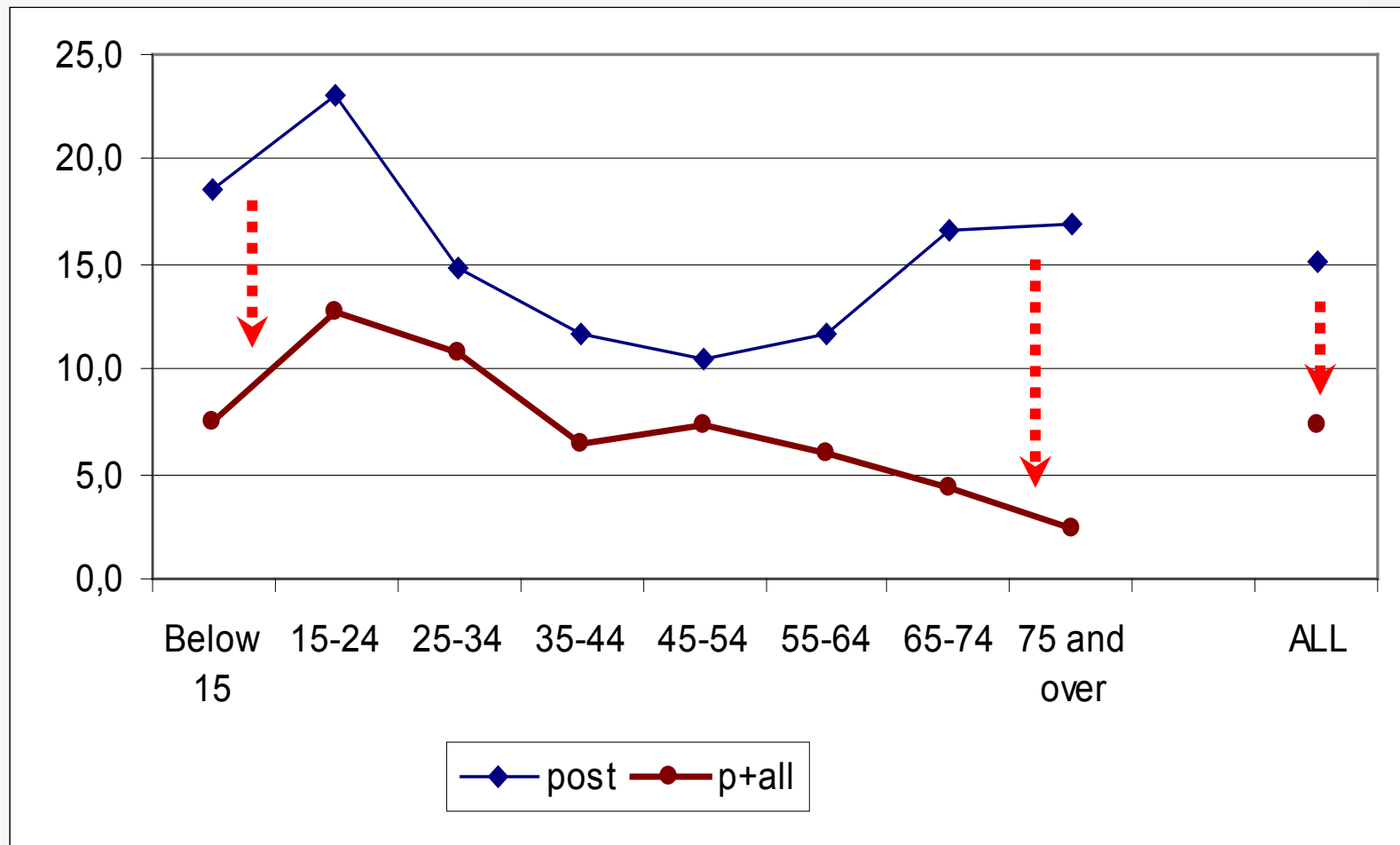
# Poverty effects of non-cash components in Germany 2002 by age: **Baseline + Health**



# 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 compont.**



# 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/> or Google “AIM-AP Essex”

## Two papers

### ➤ broadening the view

i.e. include non-cash incomes in measure of economic well-being

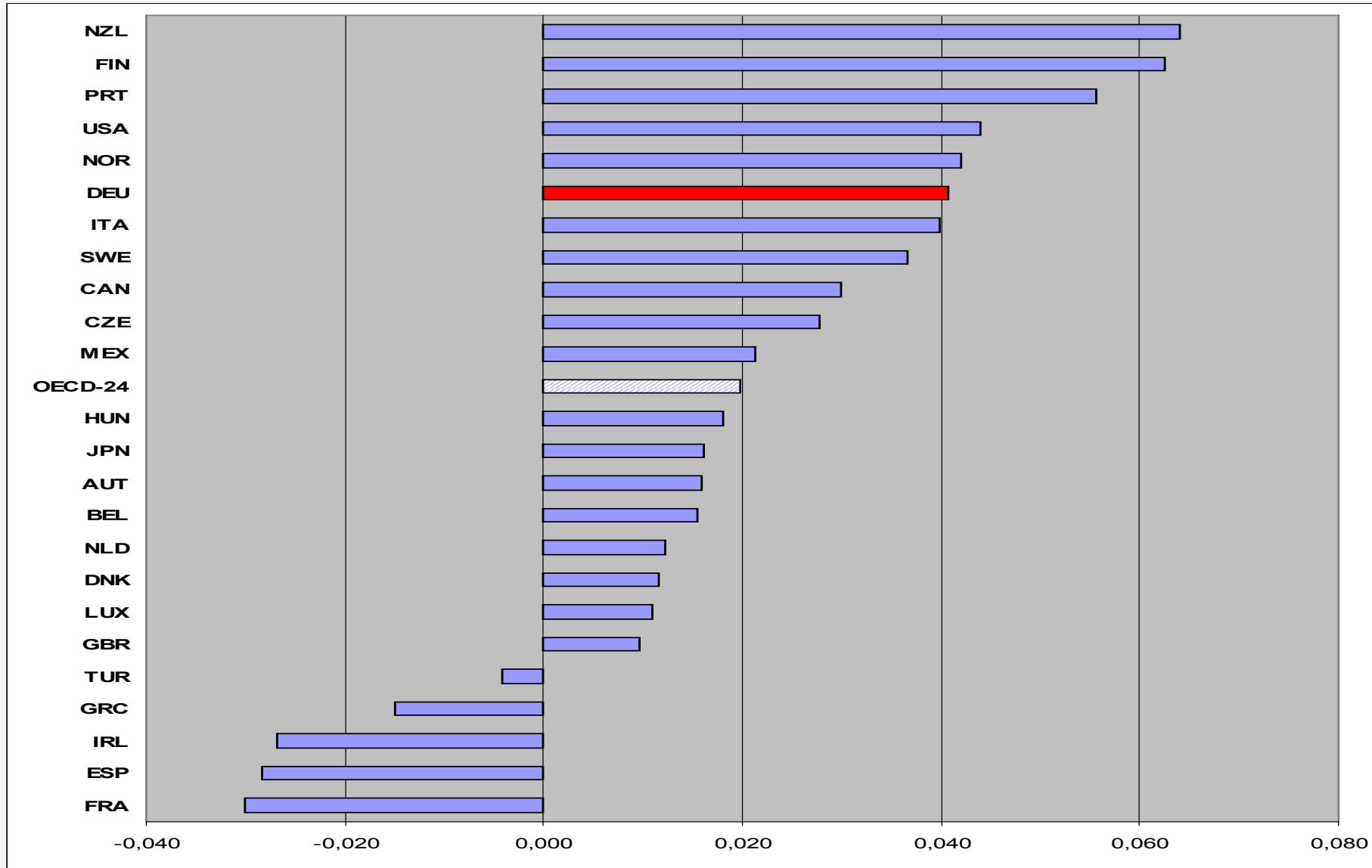
- a) public transfers in-kind (education, health, housing, ...)
- b) imputed rental value for owner-occupied housing
- c) home production

### ➤ zooming in

i.e., disentangle the effects of different types of investment income

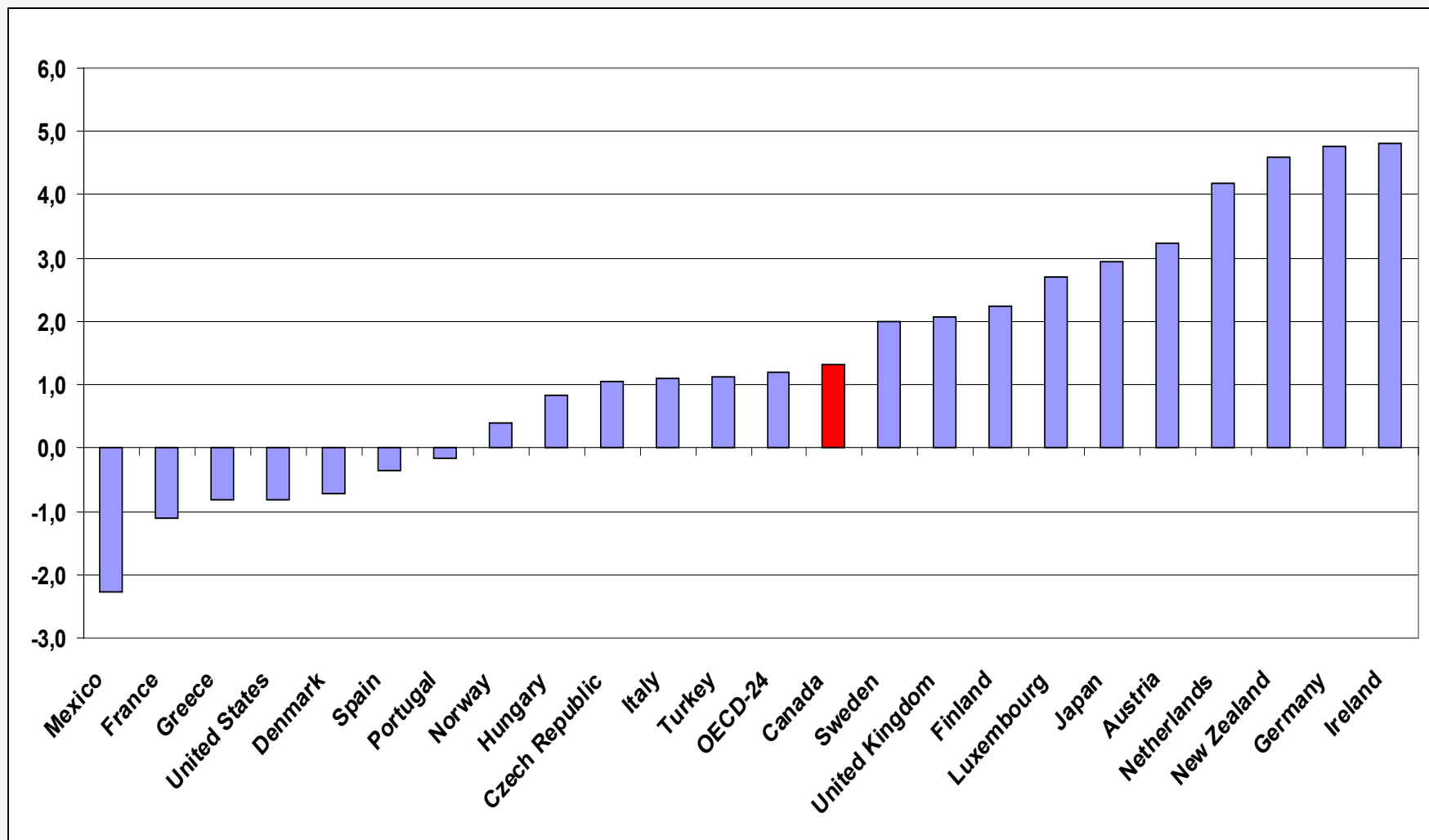
- a) capital income
- b) imputed rent

# Point Change in Gini (Mid-1980s to Mid-2000s)



Source: OECD 2008: Growing Unequal.

# Point Change in relative risk-of-poverty rates (Mid-1980s to Mid-2000s)



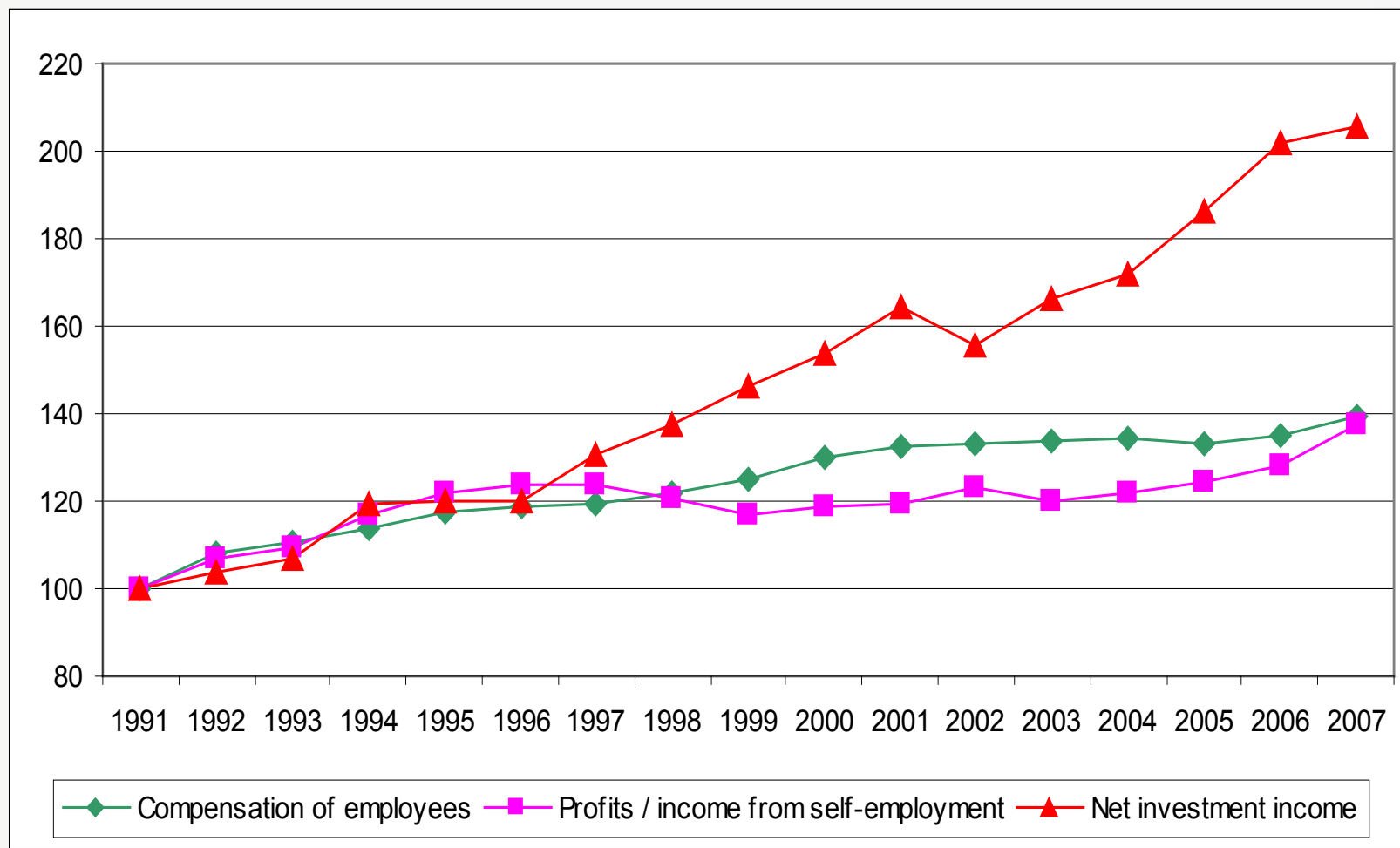
Source: OECD 2008

Note: Poverty thresholds are set at 50% of the median income of the entire country specific population.

## 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)

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### **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****

## 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 (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.**

## Aim

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

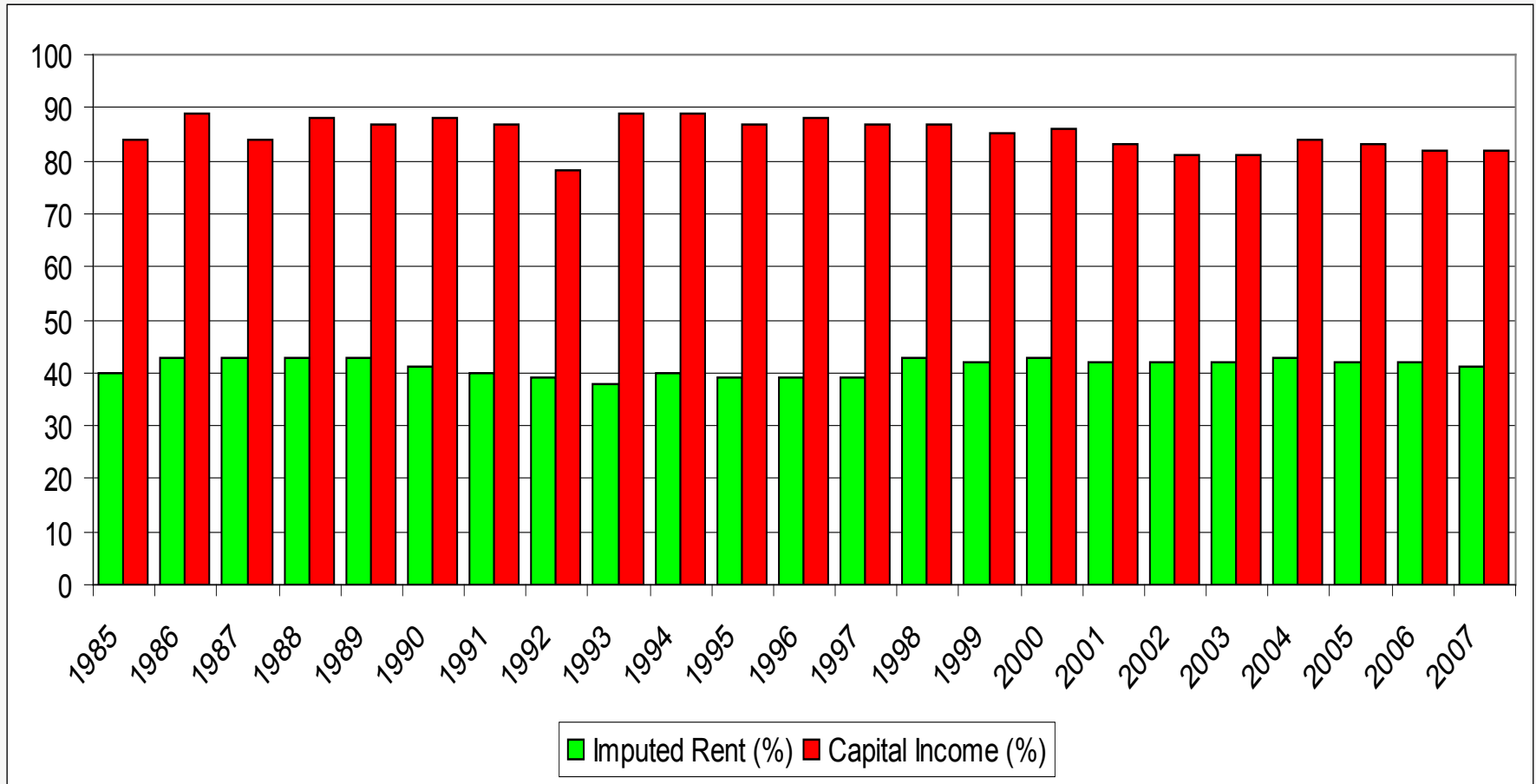
## Data

- **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

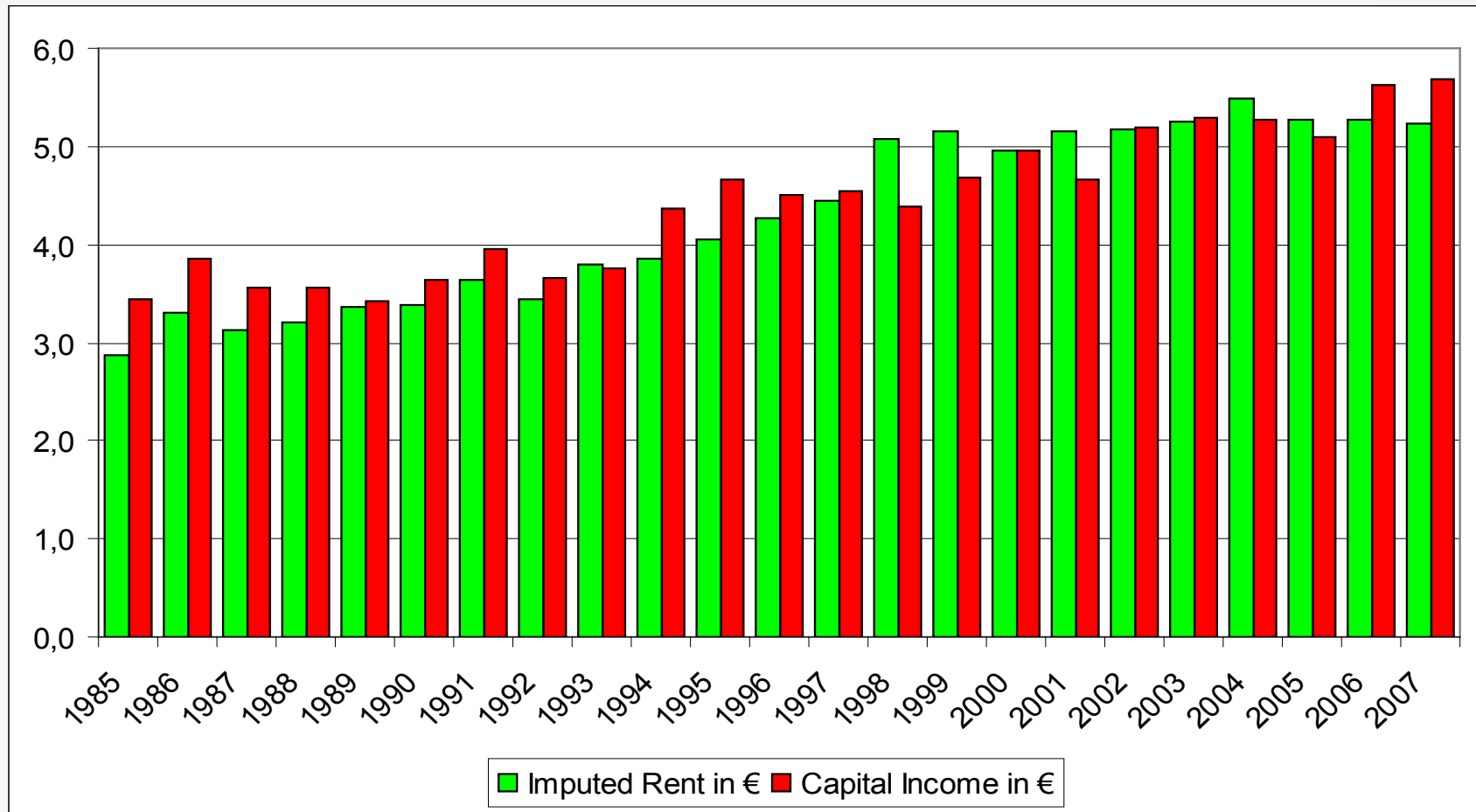
- **incidence & relevance of investment income (CI, IR)**
- **inequality decomposition by subgroups** (age groups)
- **factor decomposition**
- **income mobility**

## Population share holding CI / IR (in %)



Source: SOEP 1985-2007

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

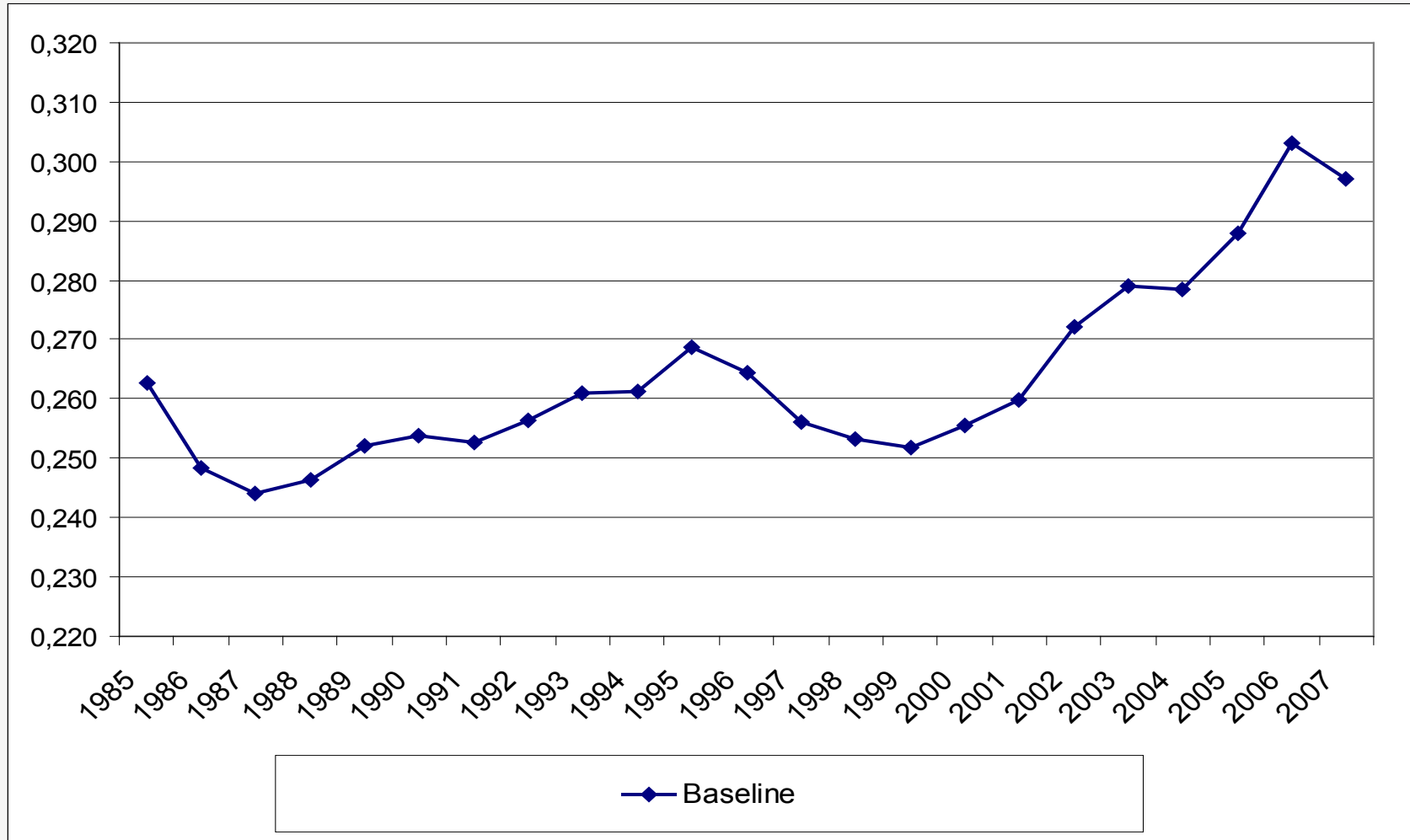


Source: SOEP 1985-2007

# Inequality (Gini)

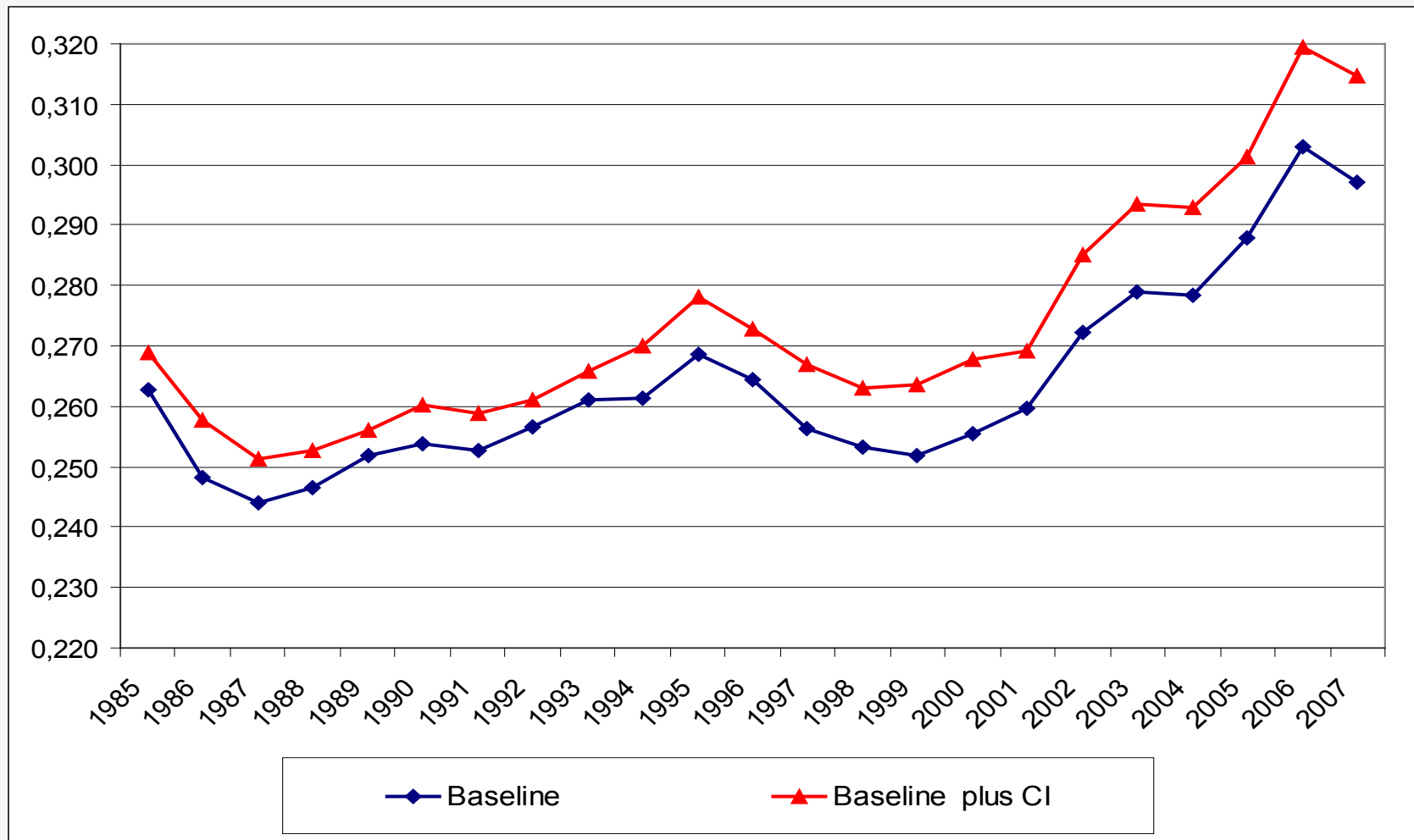
- Baseline Income = Post-Gov't Income excluding CI and IR
- OECD Equivalence Scale (1; 0.5; 0.3)
- Comparison of inequality in baseline income to augmented measures

## Gini-coefficient for baseline disposable income



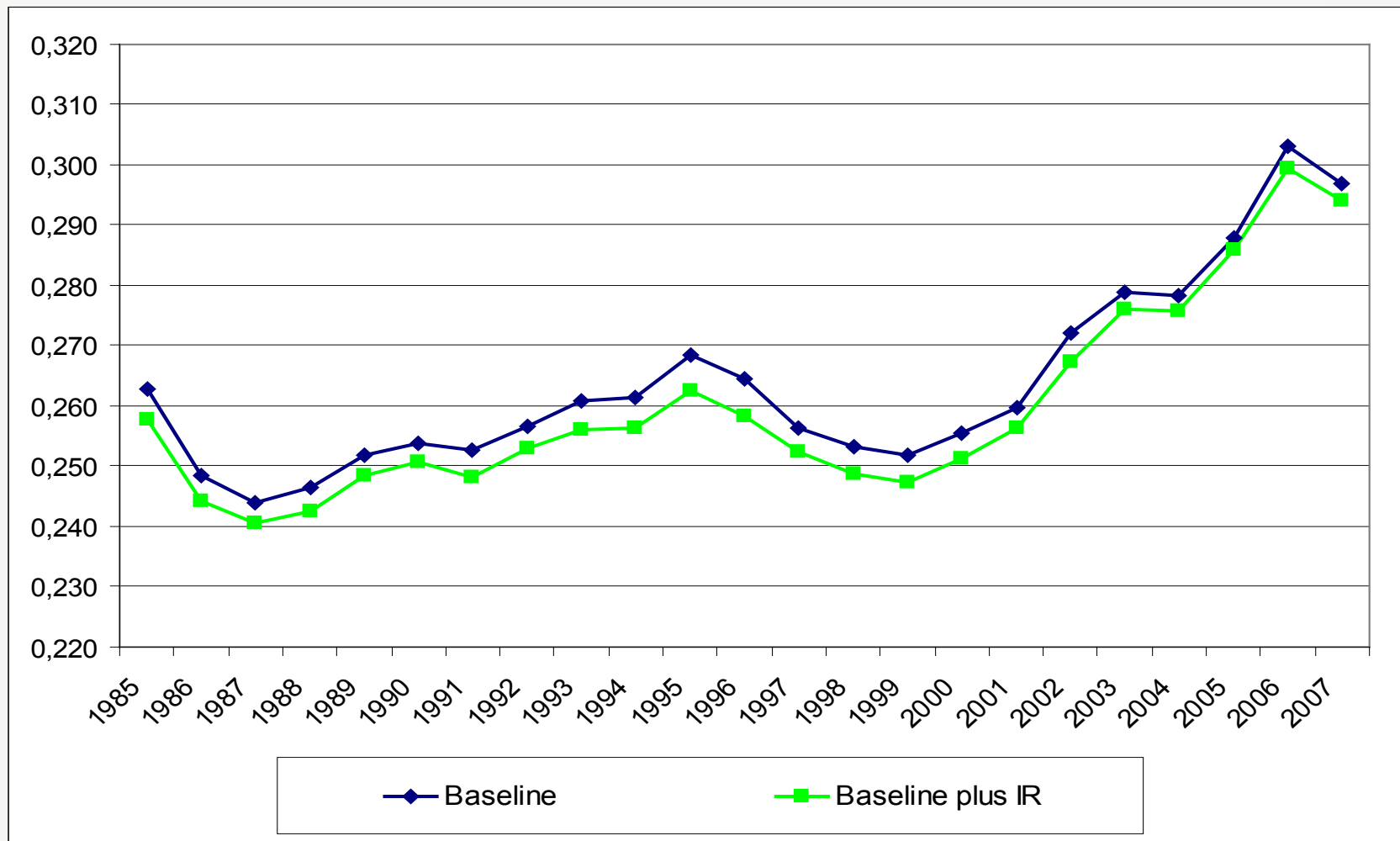
Source: SOEP 1985-2007

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



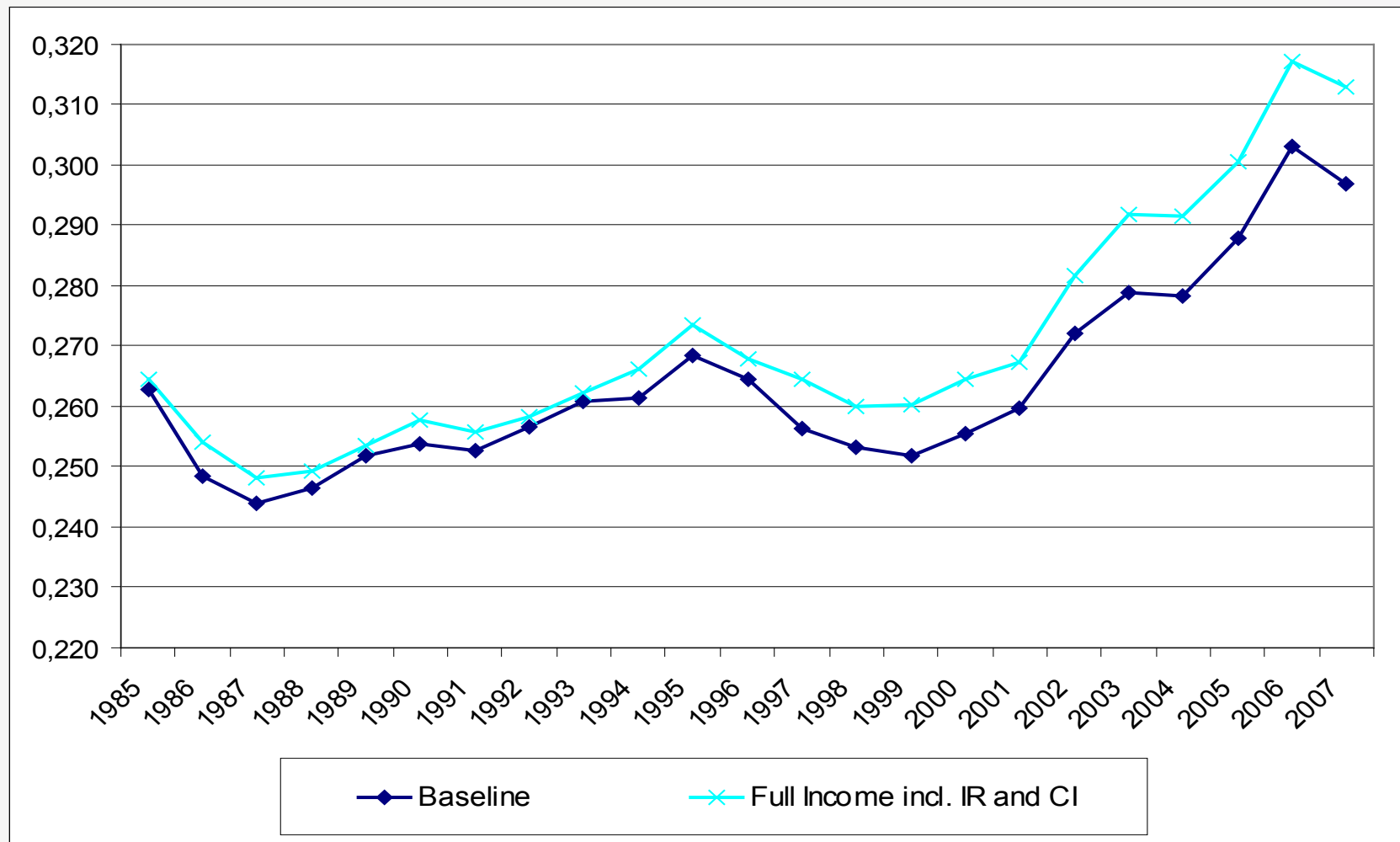
Source: SOEP 1985-2007

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



Source: SOEP 1985-2007

## Gini-coefficient for baseline disposable income plus CI and IR



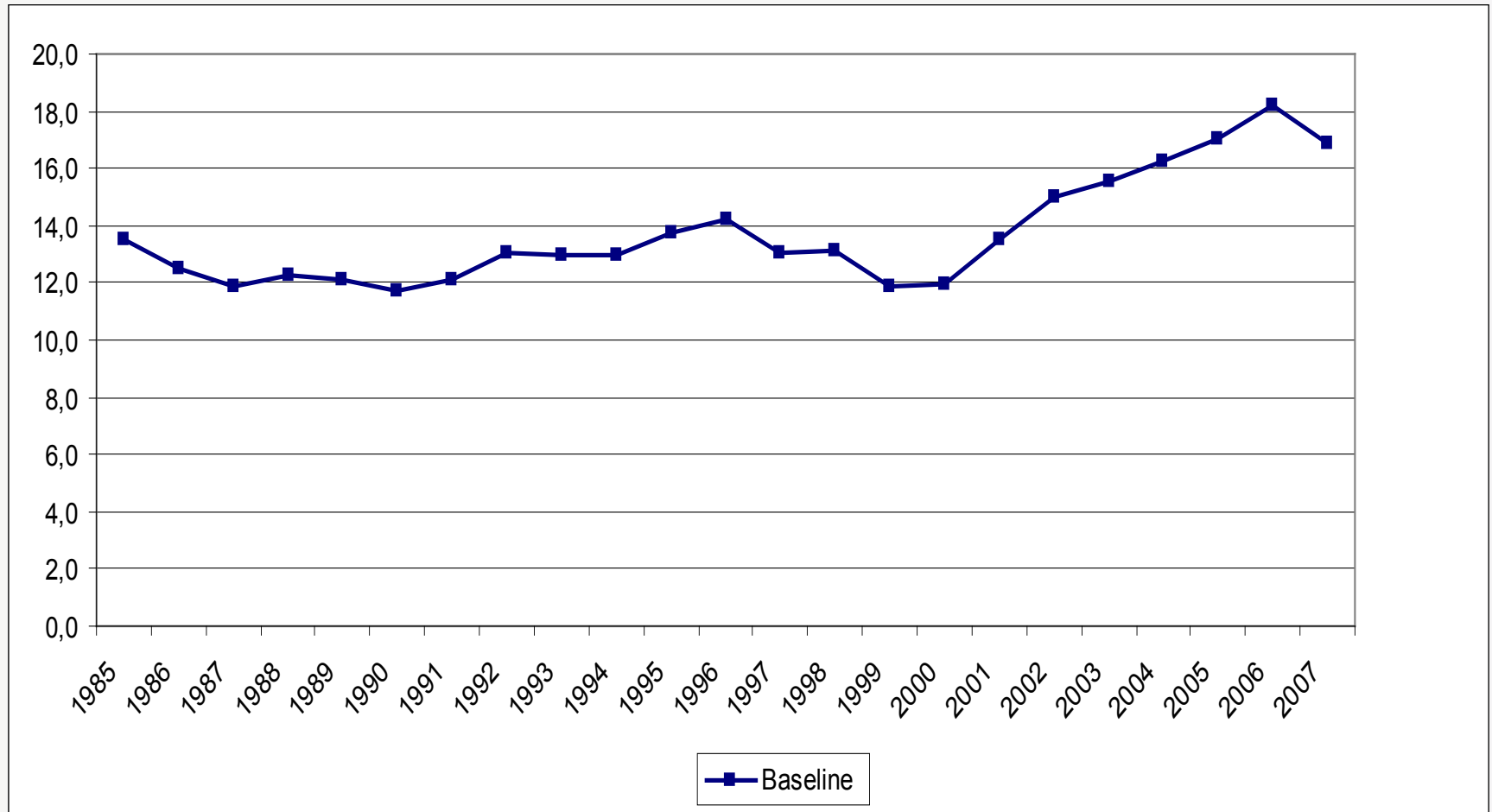
Source: SOEP 1985-2007

# 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

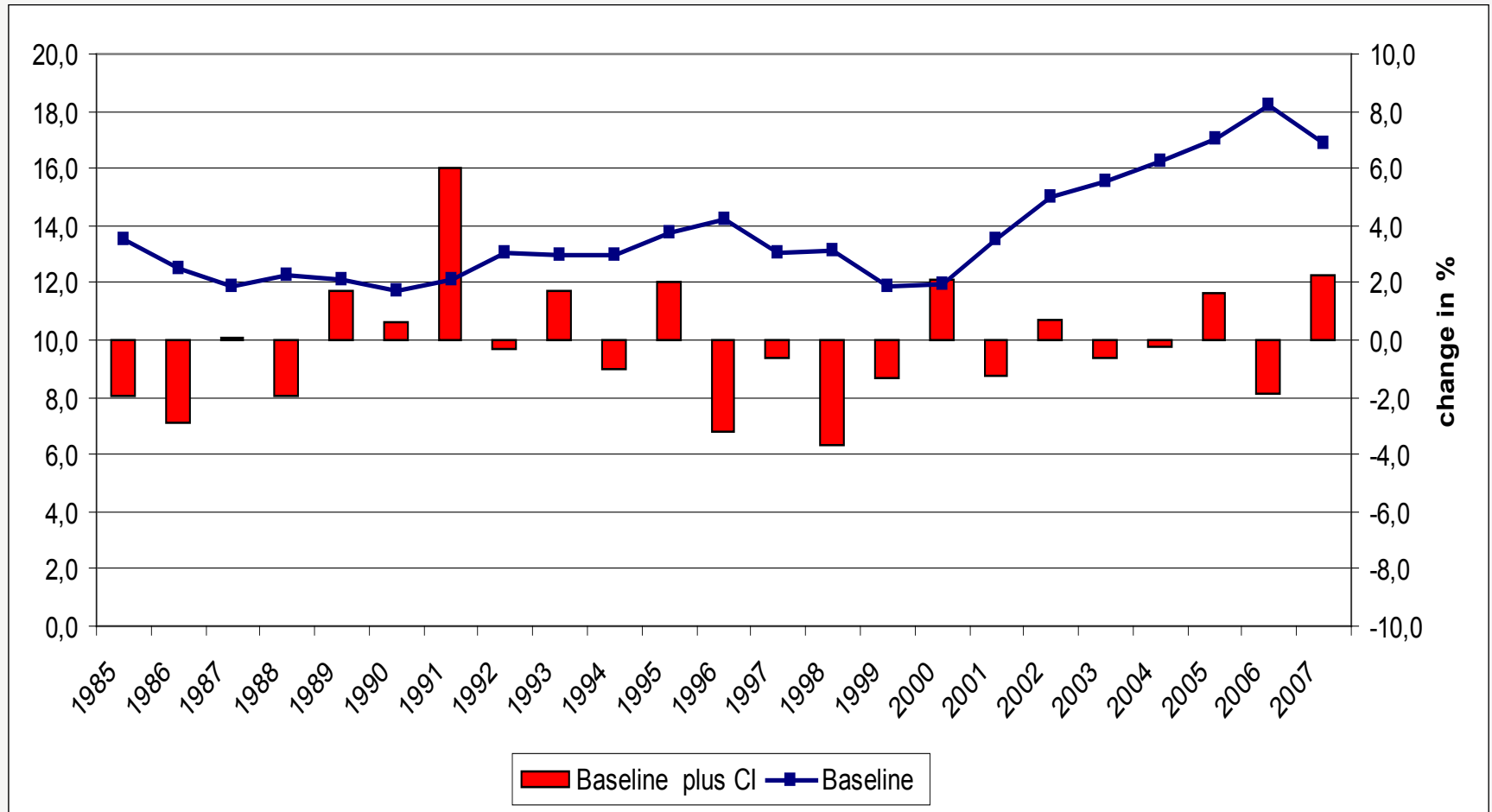
## FGT0 for baseline disposable income



Source: SOEP 1985-2007

# Relative Poverty Risk Rate

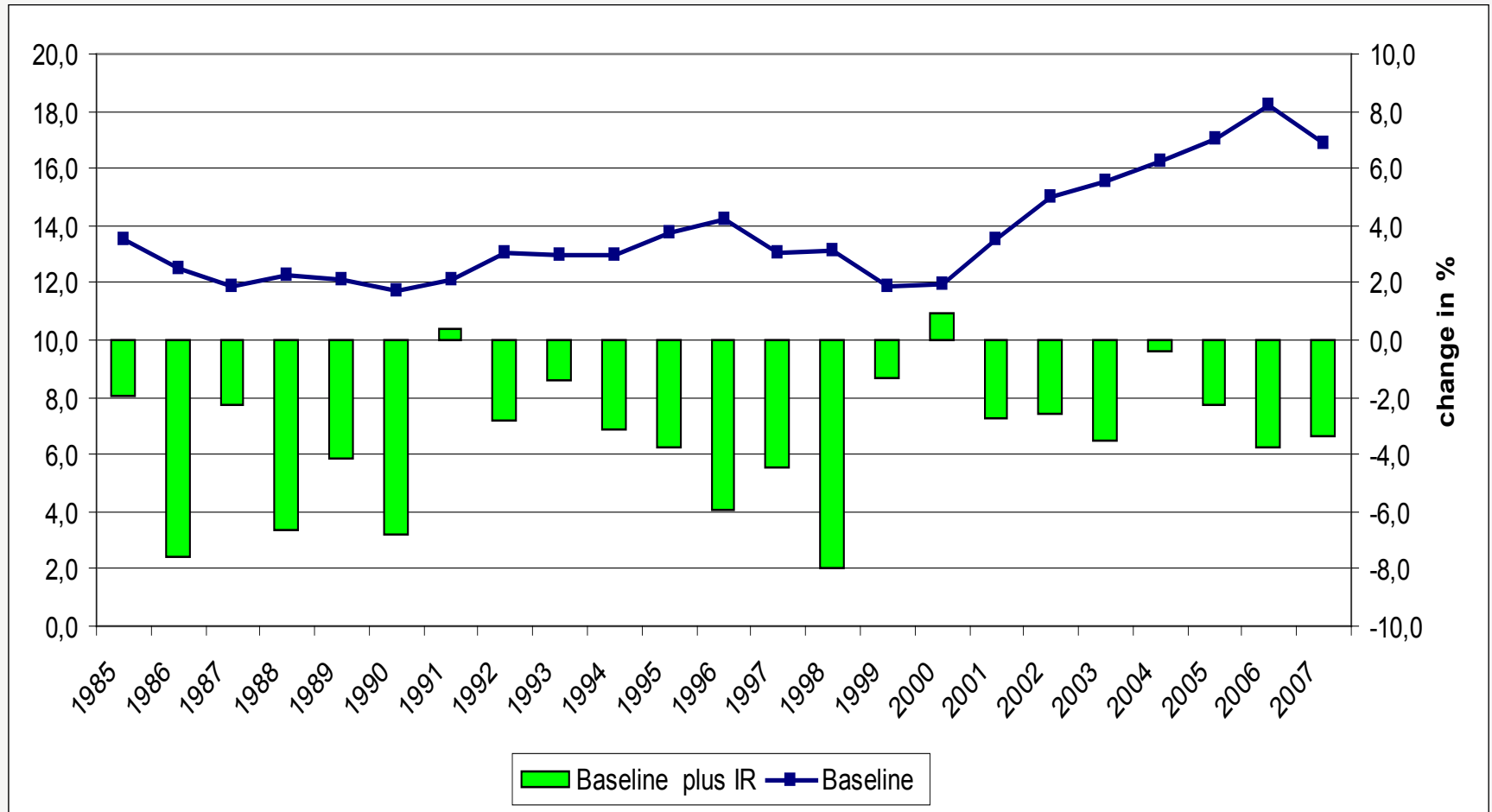
## FGT0 for baseline disposable income plus CI



Source: SOEP 1985-2007

# Relative Poverty Risk Rate

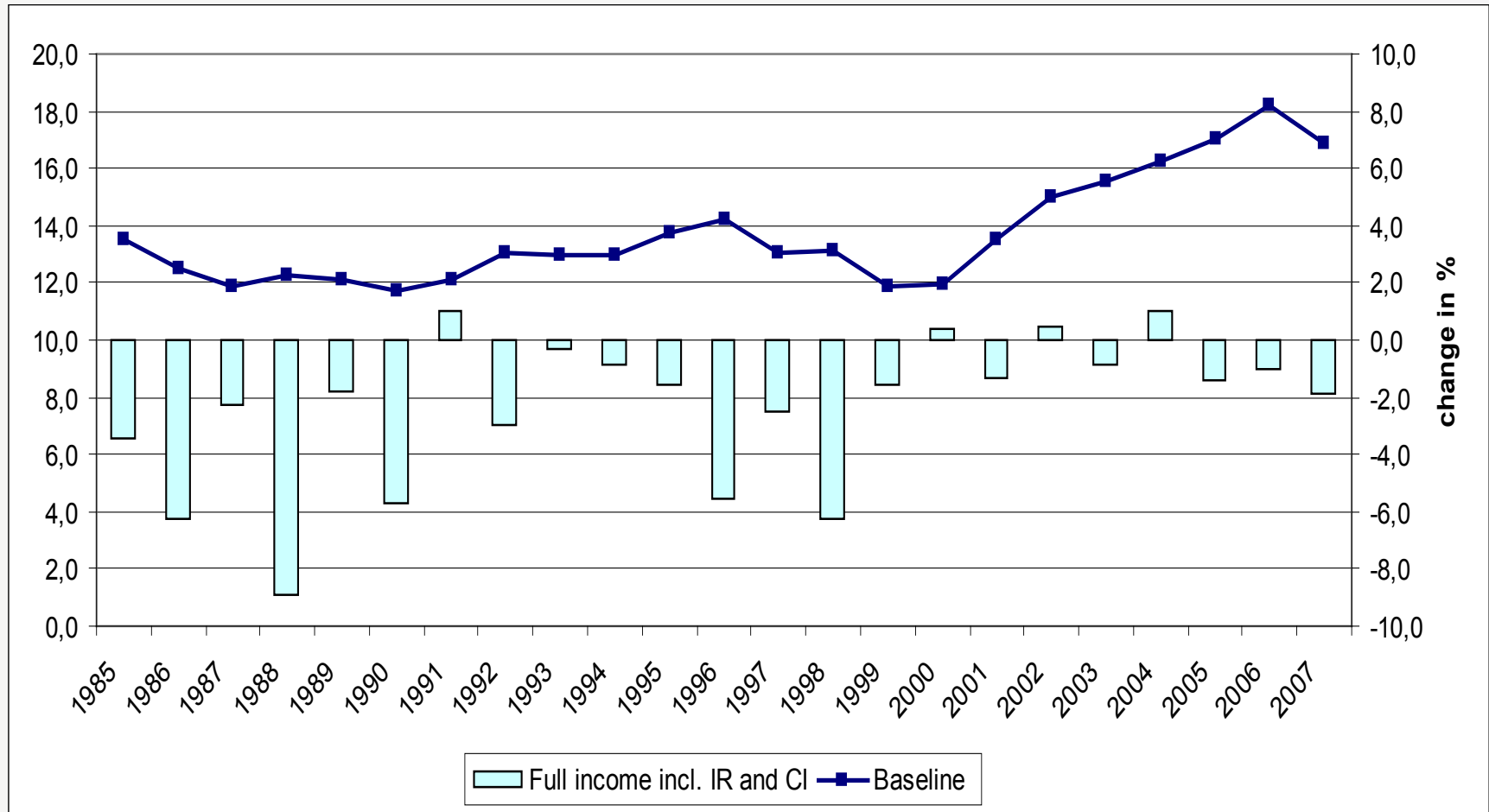
## FGT0 for baseline disposable income plus IR



Source: SOEP 1985-2007

# Relative Poverty Risk Rate

**FGT0 for baseline disposable income CI and IR**

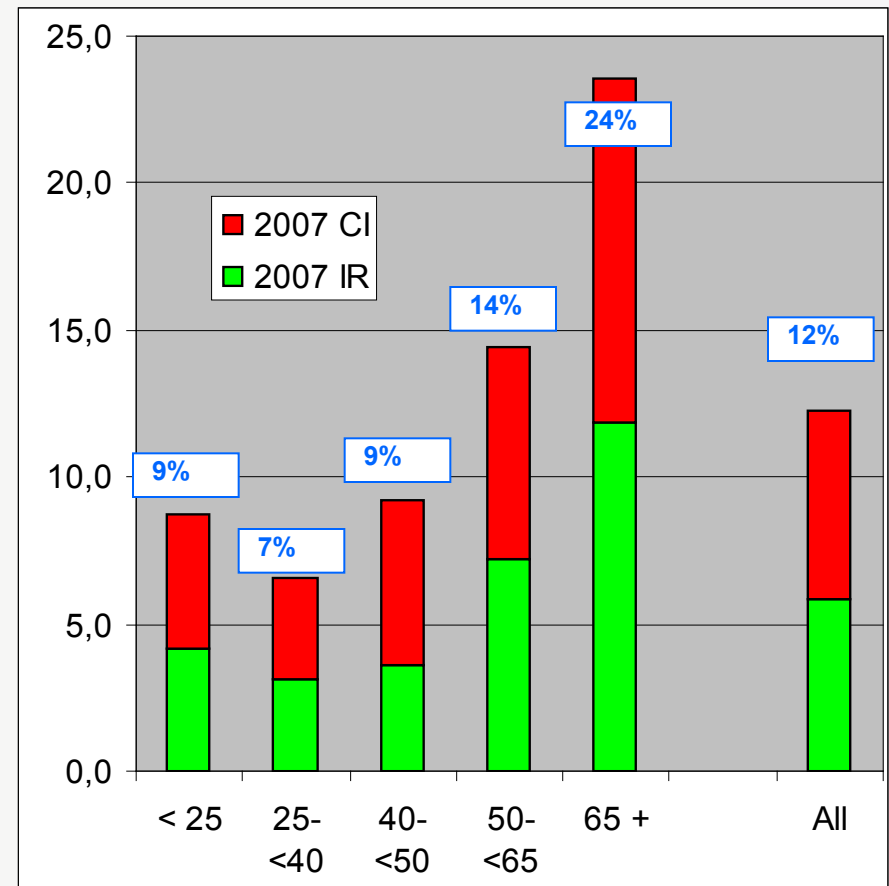
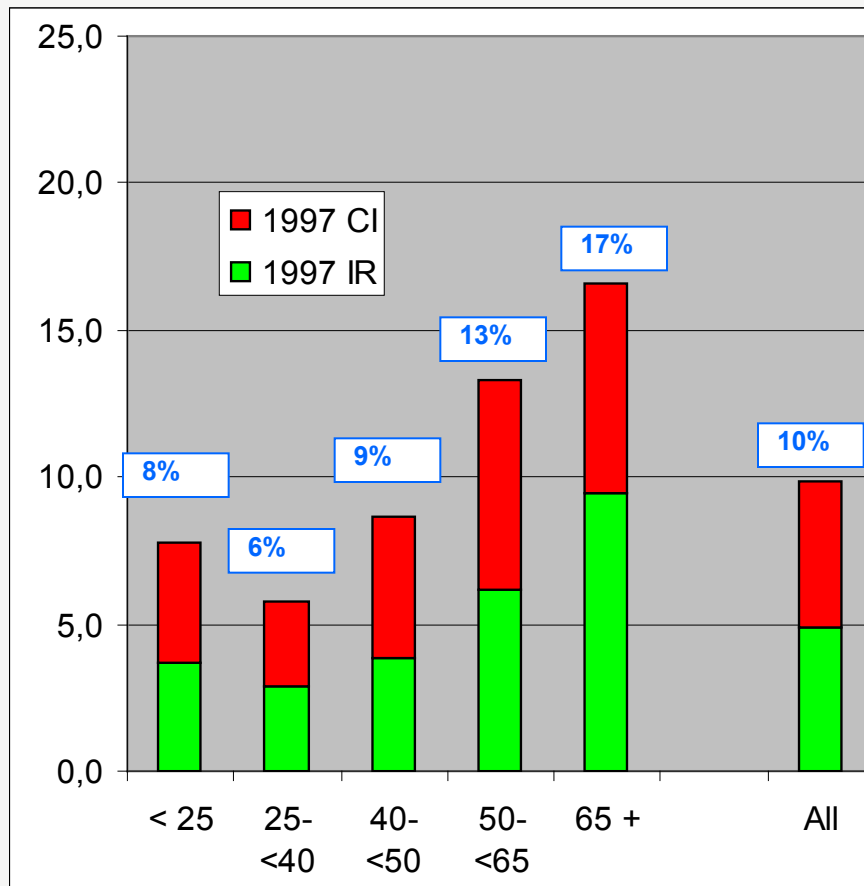


Source: SOEP 1985-2007

# Who „profits“ most from CI and IR ?

- Inequality decomposition by **age groups**
- Comparison of baseline and „full“ income inequality

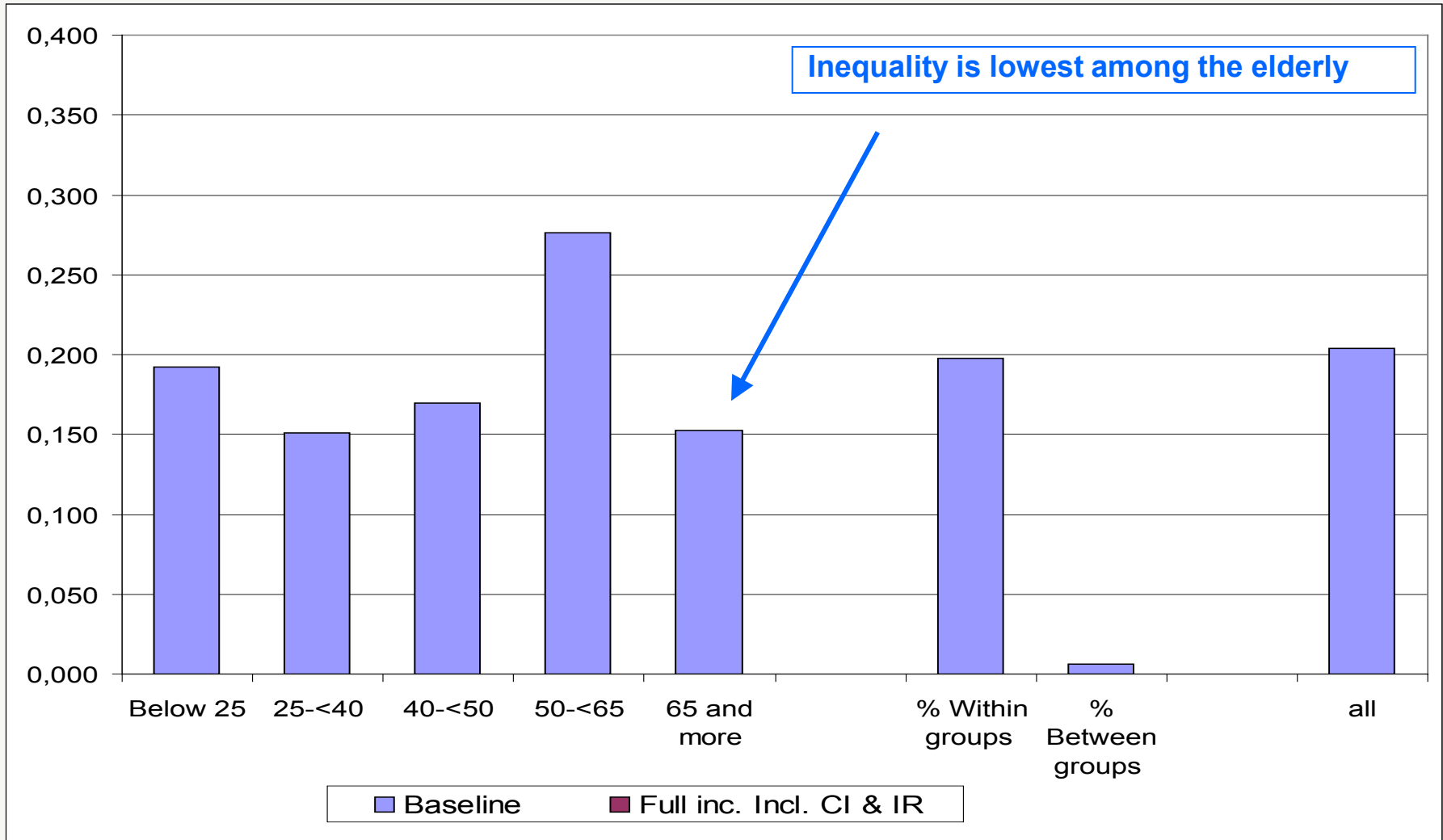
## CI & IR as a share of full disposable income by age group



Source: SOEP

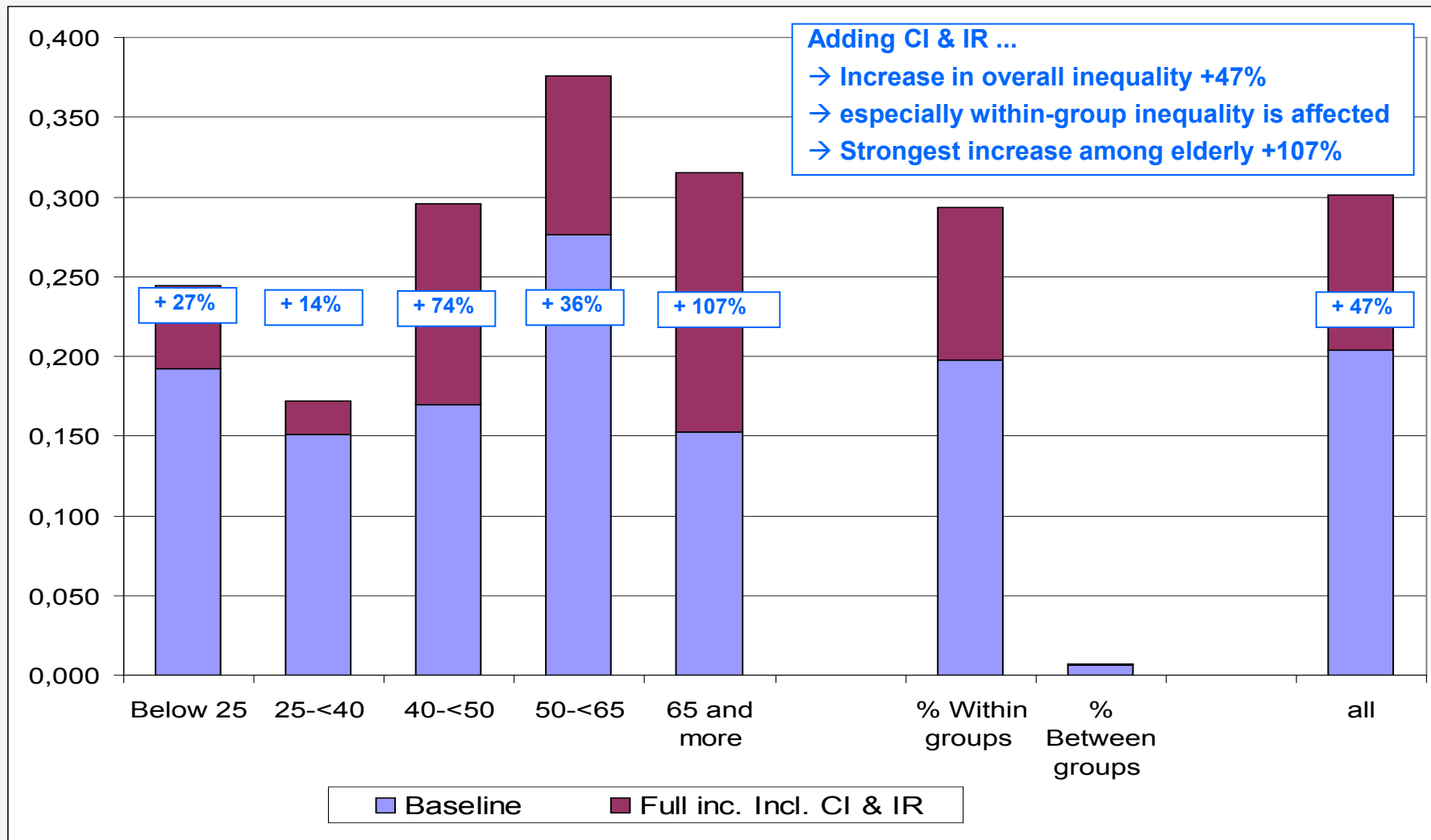
# Subgroup decomposition

## MLD by age groups 2007 – baseline income



# Subgroup decomposition

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



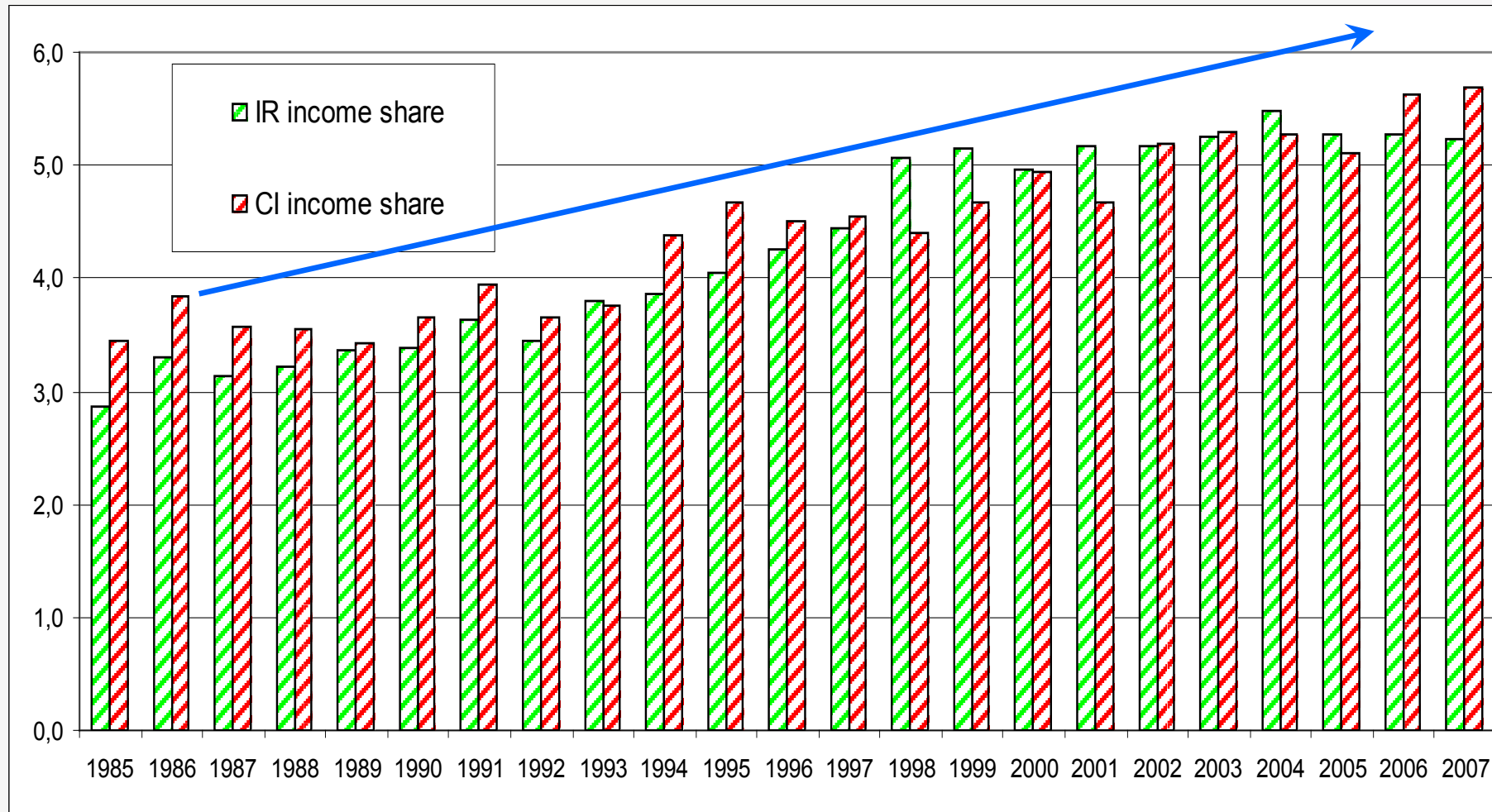
Source: SOEP 2007.

# What drives the picture: CI or IR ?

- Inequality decomposition by income component (Shorrocks 1982)

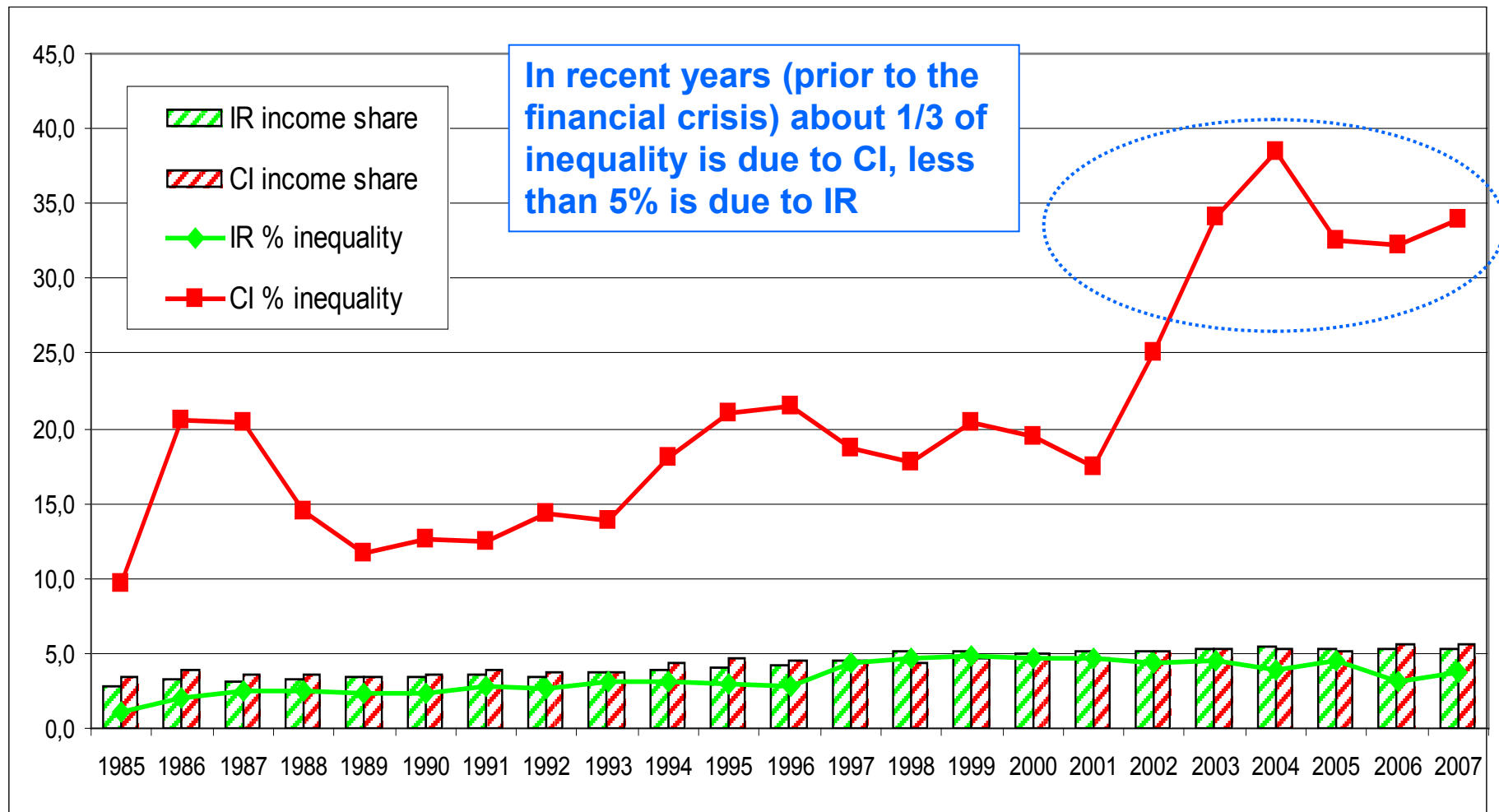
# Factor decomposition

## Relative contribution of CI & IR to full income



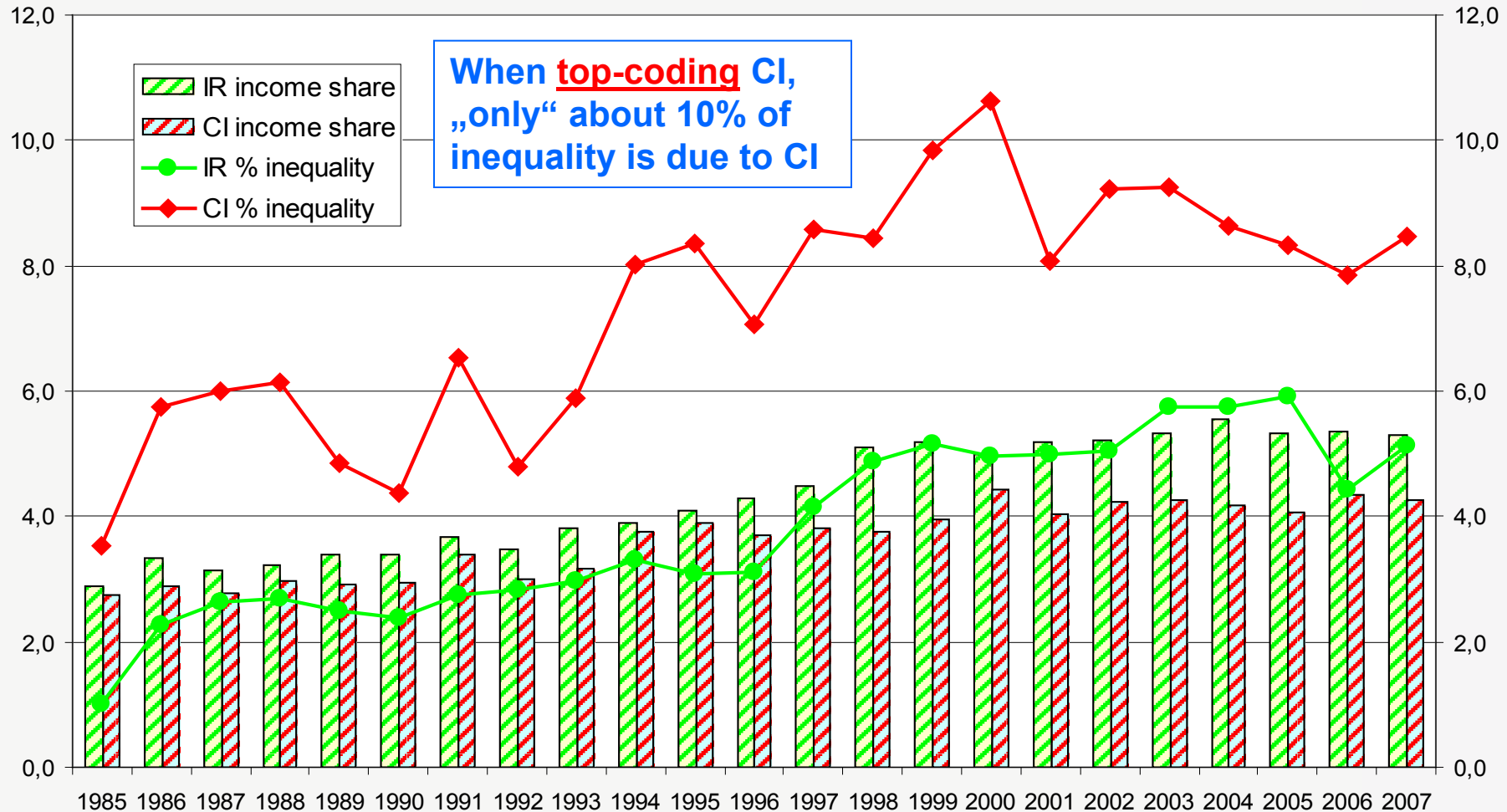
Source: SOEP 1985-2007

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



Source: SOEP 1985-2007

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

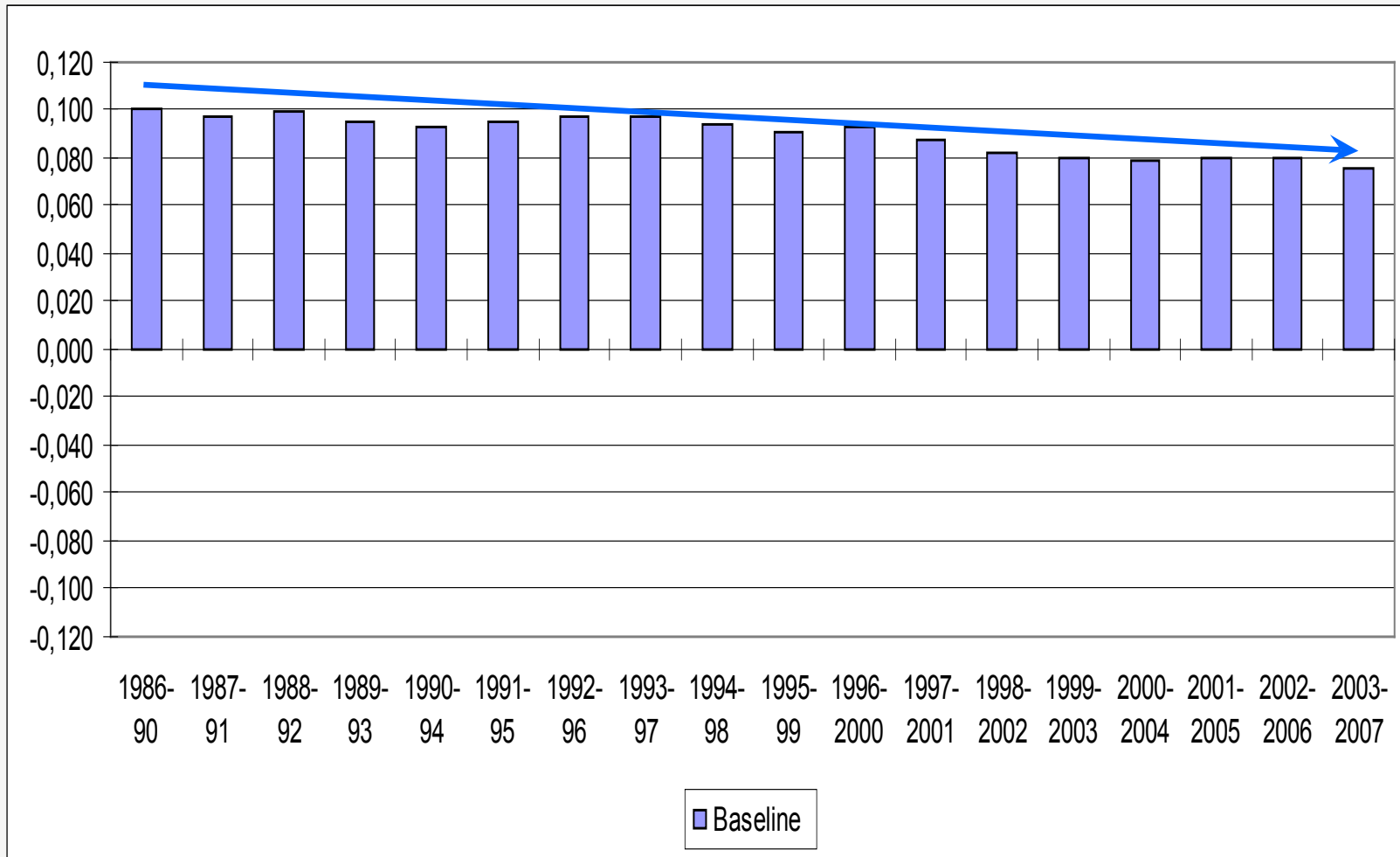


Source: SOEP 1985-2007 **applying a 1% Top Coding for CI**

# How do CI and IR impact on income mobility?

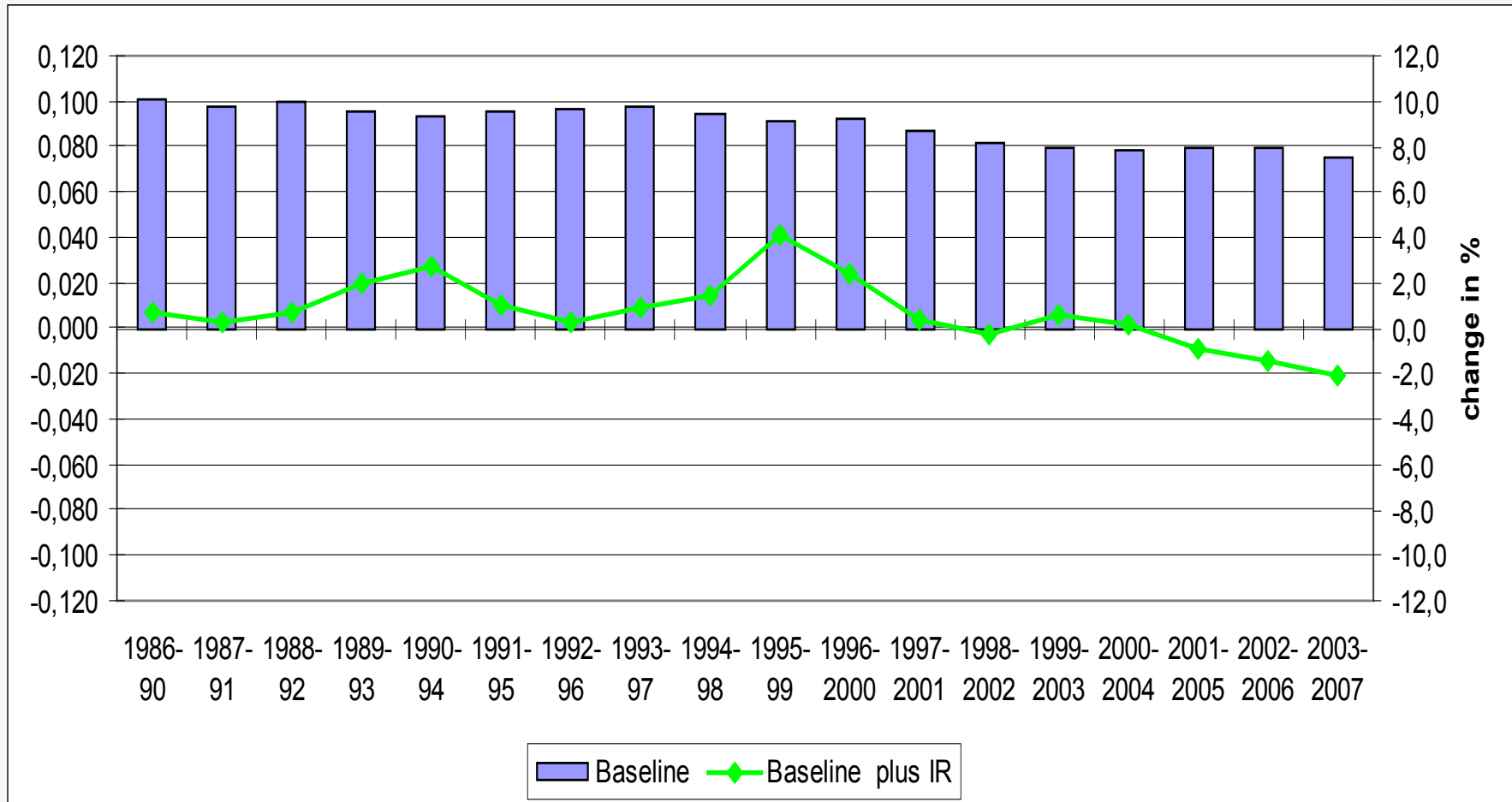
- Five year windows (1986-1990, ....., 2003-2007)
- Shorrocks (1978) mobility measure, using Gini

## Shorrocks Mobility over 5 years, using Gini-index



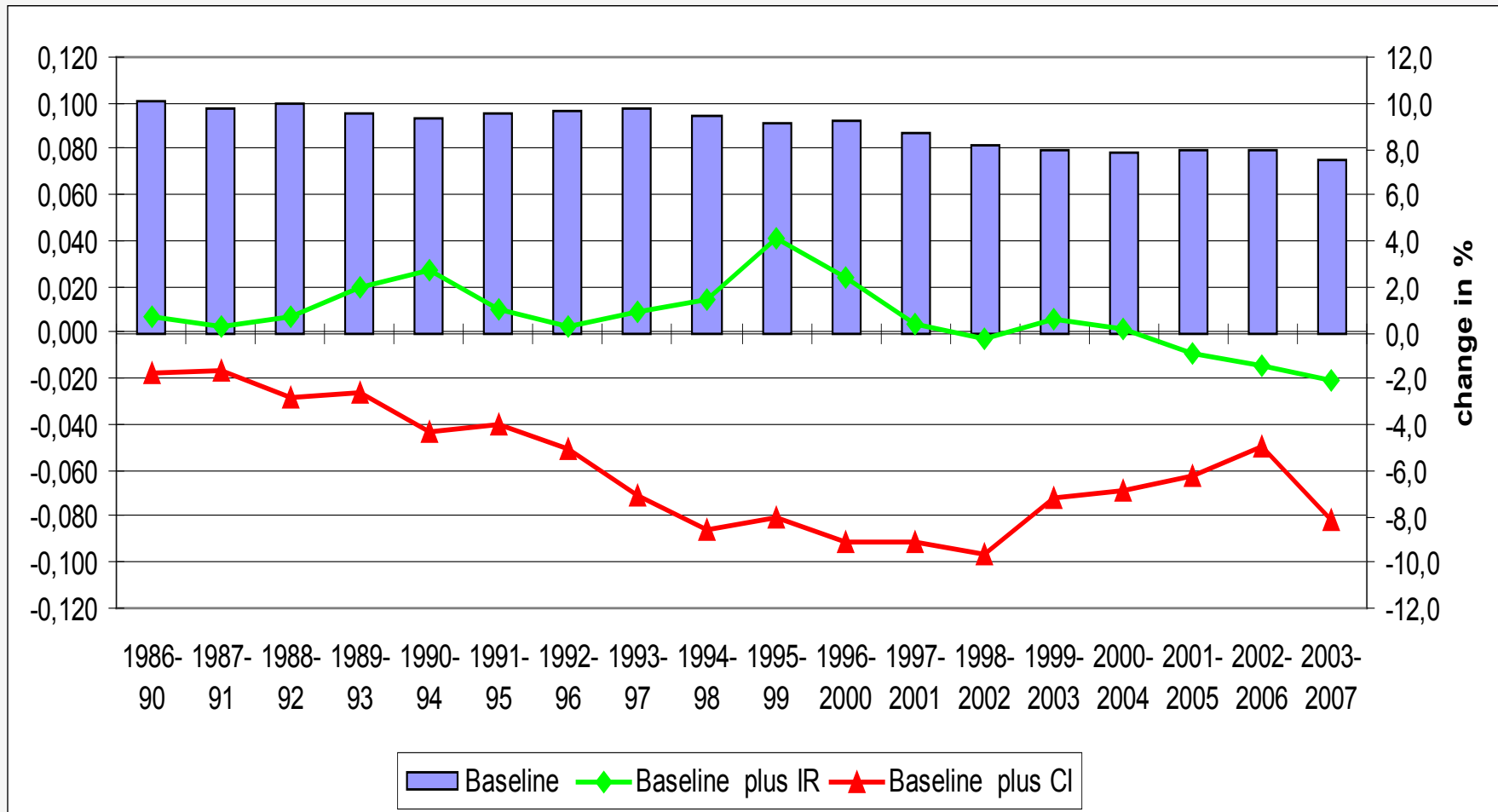
Source: SOEP 1986-2007

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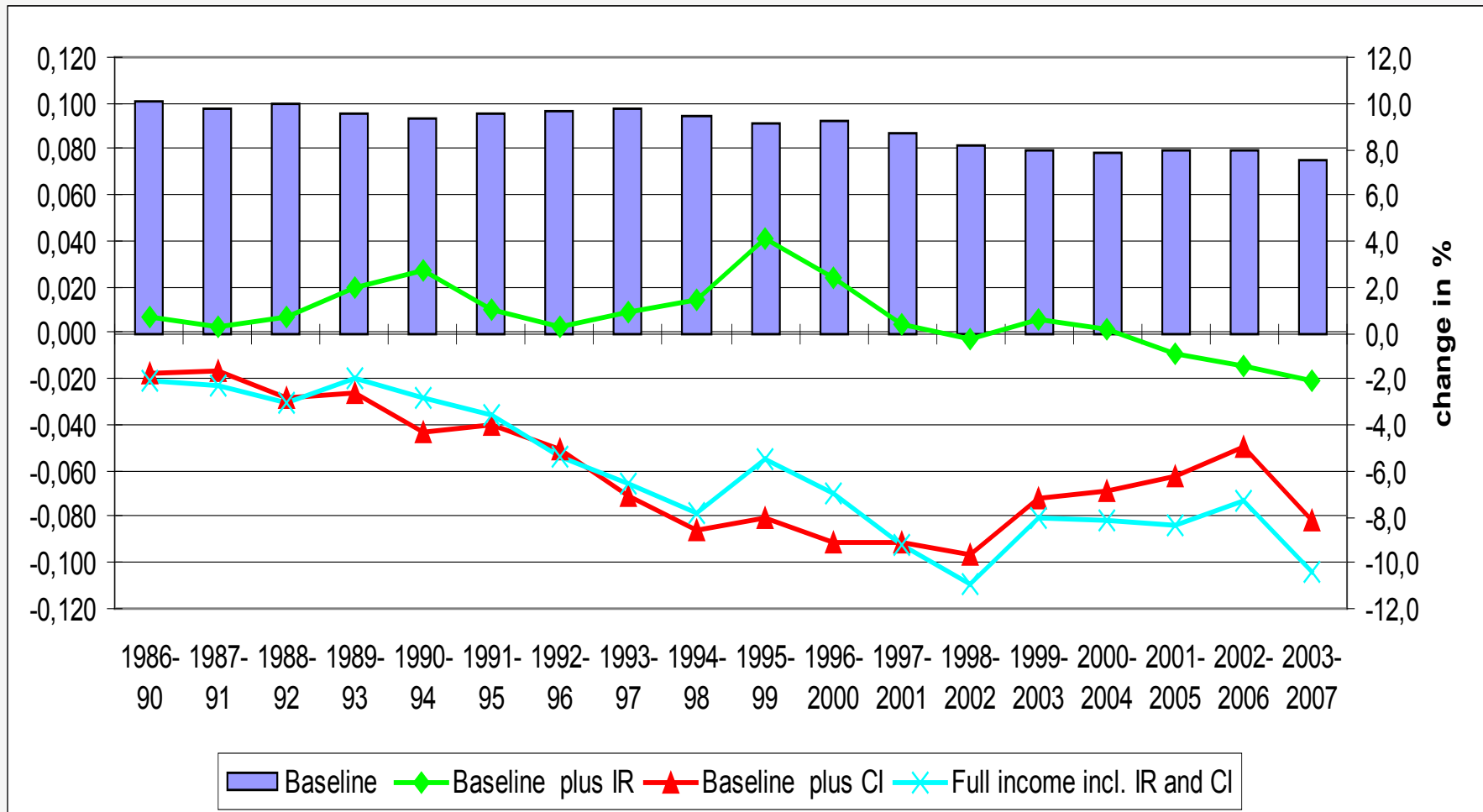
Source: SOEP 1986-2007

## Shorrocks Mobility over 5 years, using Gini-index



Source: SOEP 1986-2007

## Shorrocks Mobility over 5 years, using Gini-index



Source: SOEP 1986-2007

## 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)

- 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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