Health inequality and the economic crisis: what do we know?

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Background and motivation

- Health unequally distributed by income in European countries
- Cross-country differences in 1996 and trends prior to 2008
- Since end of 2008: financial and economic crisis
- Health effects of crisis hard to identify because of lack of control ; before-after comparisons do not reveal counterfactual
- One study used SILC data (Vandoros *et a*l, *EJPH*, 2013) in a DID analysis of Greece vs Poland : Greeks experienced a significantly larger increase in the odds of reporting poor health after the crisis (odds ratio of 1.16)
- Question: what did the economic crisis do to inequalities in (self-reported) health by income in Spain? Increase or decrease?
- And in Portugal? And in Greece?
- What do you expect to be the answer?

A refresher: what was income-related health inequality (IRHI) in EU member states in 1996?

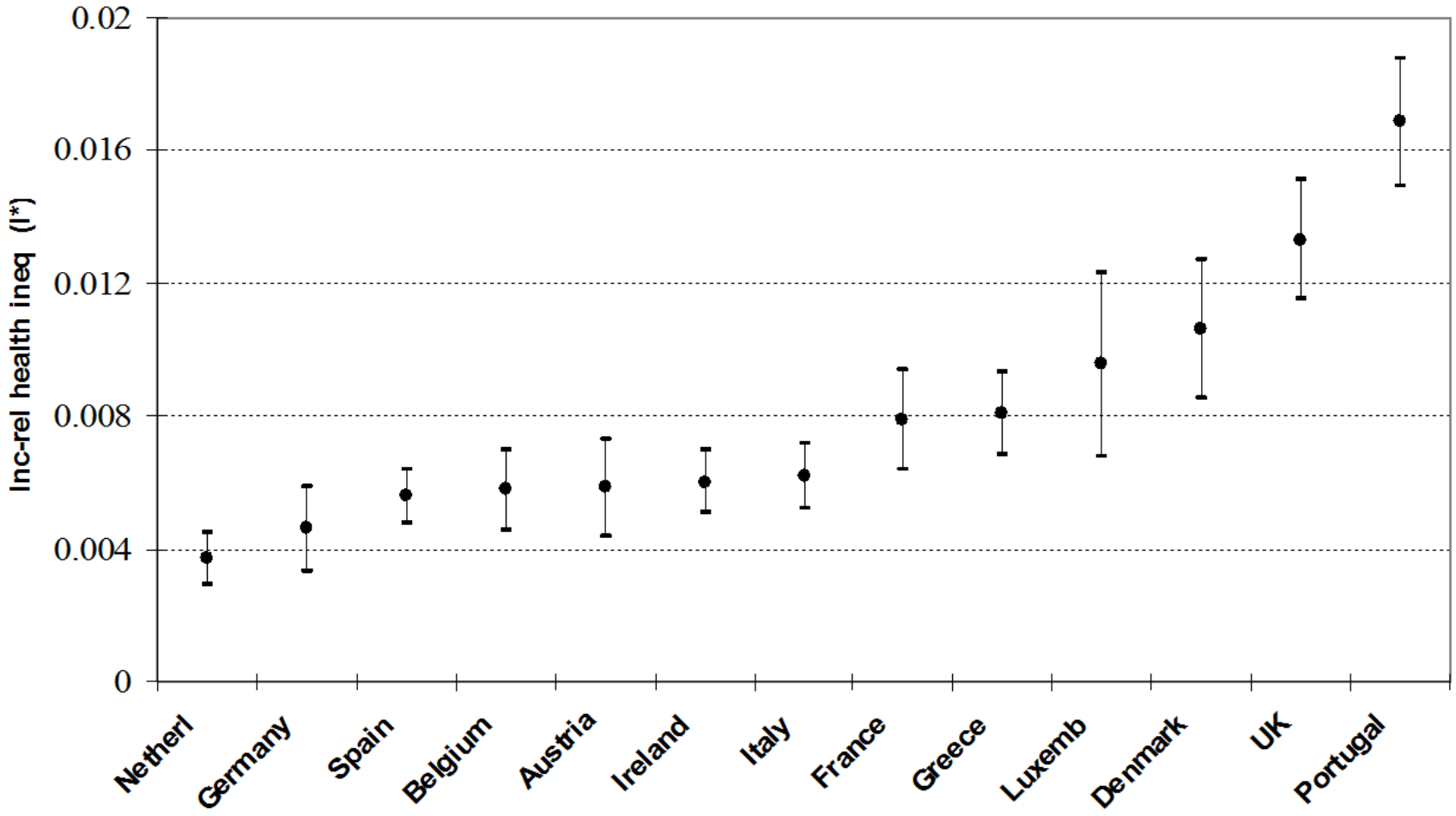
Van Doorslaer and Koolman (HE, 2004):

- Use ECHP data 1996 wave
- SAH mapped into health utility score (HUI)
- Concentration index of HUI
- Decomposition into ‘contributing factors’

Find that:

- Pro-rich inequality in all countries, but most in Portugal, less in Greece and even less in Spain
- Apart from income itself, (early) retirement or other inactivity (e.g. disability) contribute most

Inequality in SAH by income, EU countries (ECHP, 1996): in 1996, Spain showed a relatively low degree of IRHI



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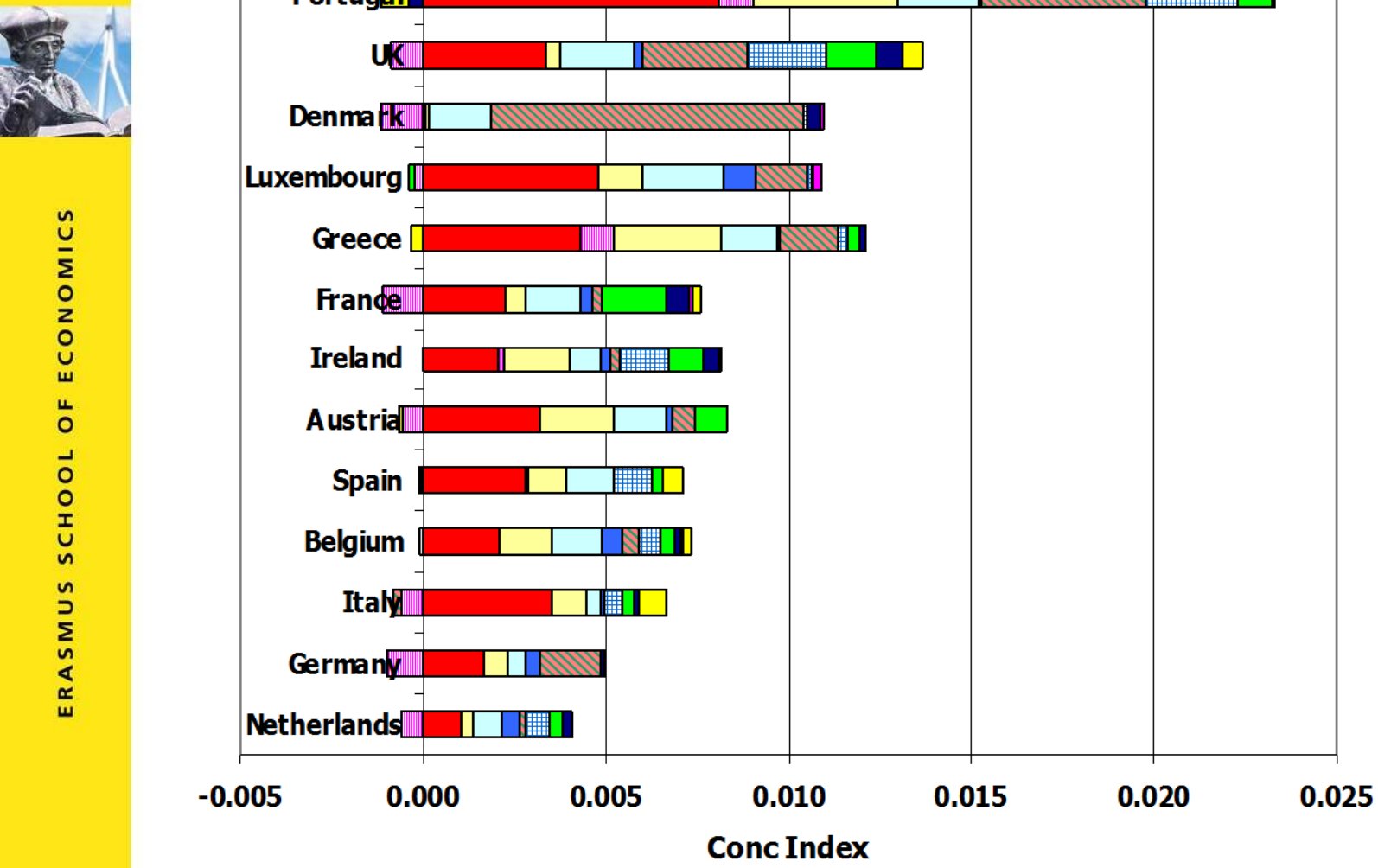
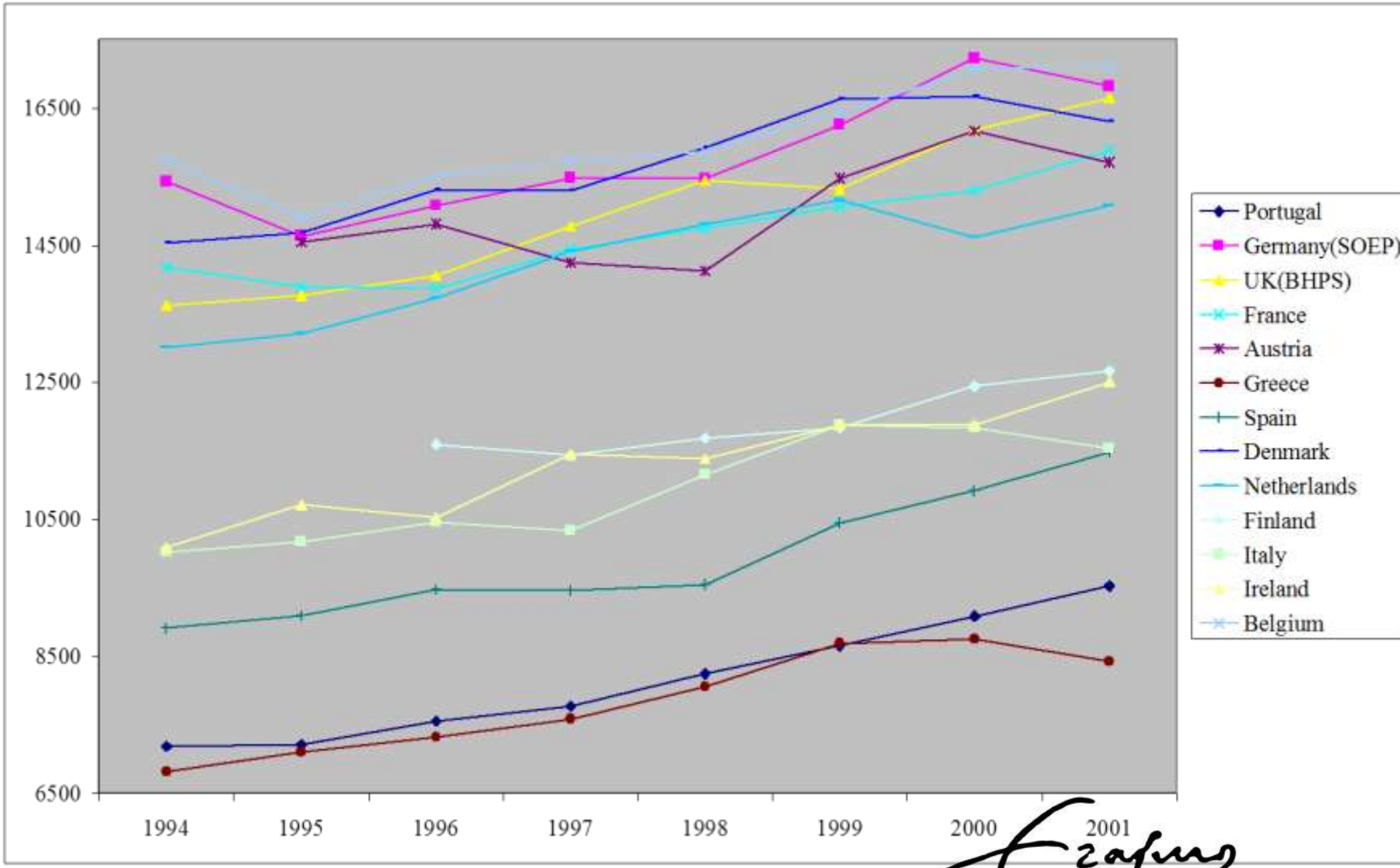
Which factors contributed to greater inequality?



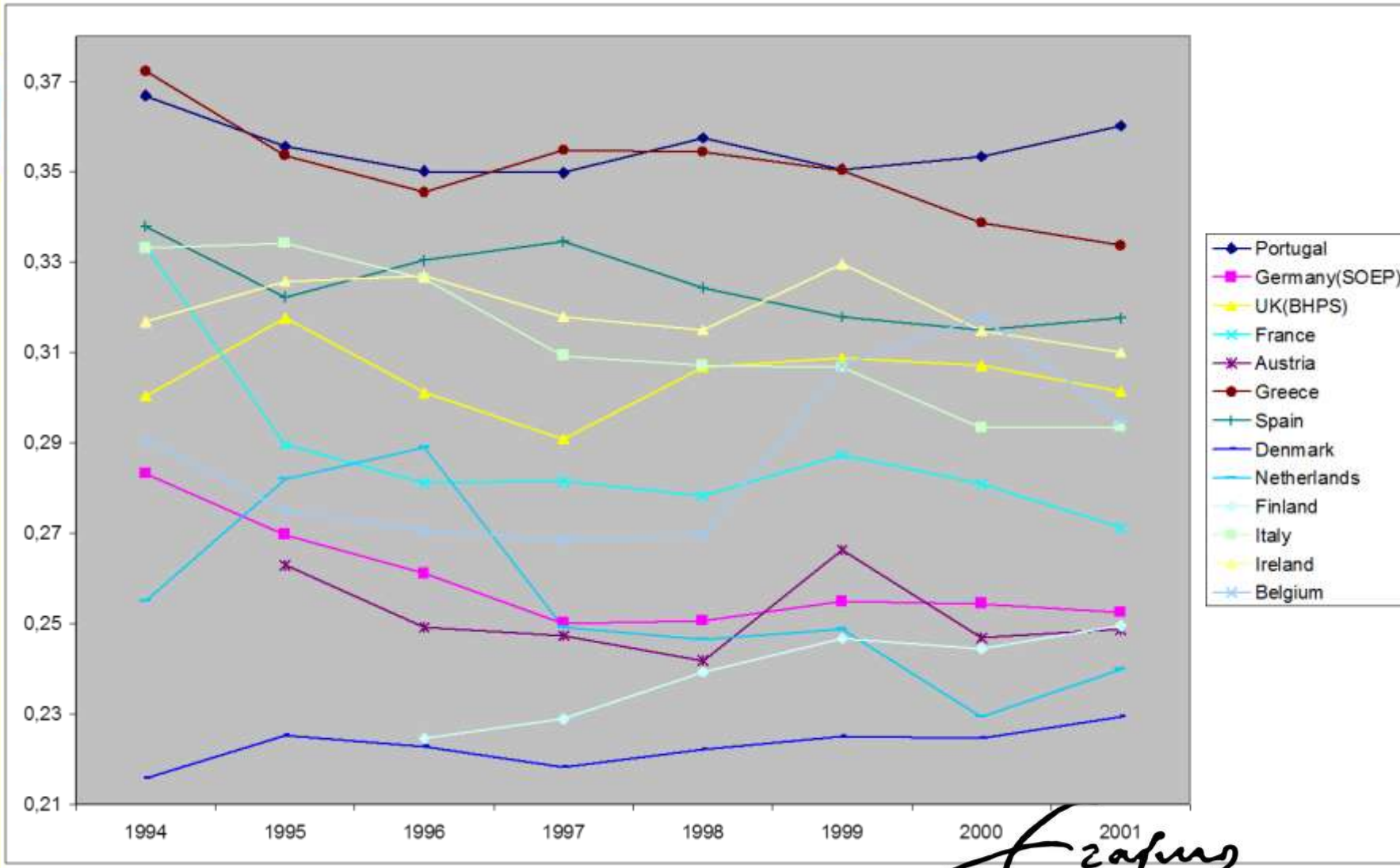
Decomposing changes in IRHI in Europe

- Van Ourti, van Doorslaer and Koolman (JHE, 2009):
  - Use ECHP panel data 1994-2001
  - To examine changes in IRHI (measured by CI) in relation to changes in income level (proportional growth) and (mean preserving) income inequality
  - And test predictions of theory
- Find that:
  - Shape of income-health relationship is crucial: in all EU countries, income elasticity of health rises with income
  - In this period of economic growth, only Finland experienced significant rise in IRHI because of rising income inequality
  - Smaller growth in IRHI in Spain, Greece and Portugal

Evolution of average disposable income per adult equiv in euros: a period of growth (ECHP 1994-2001)



Trends in income inequality (Gini index)



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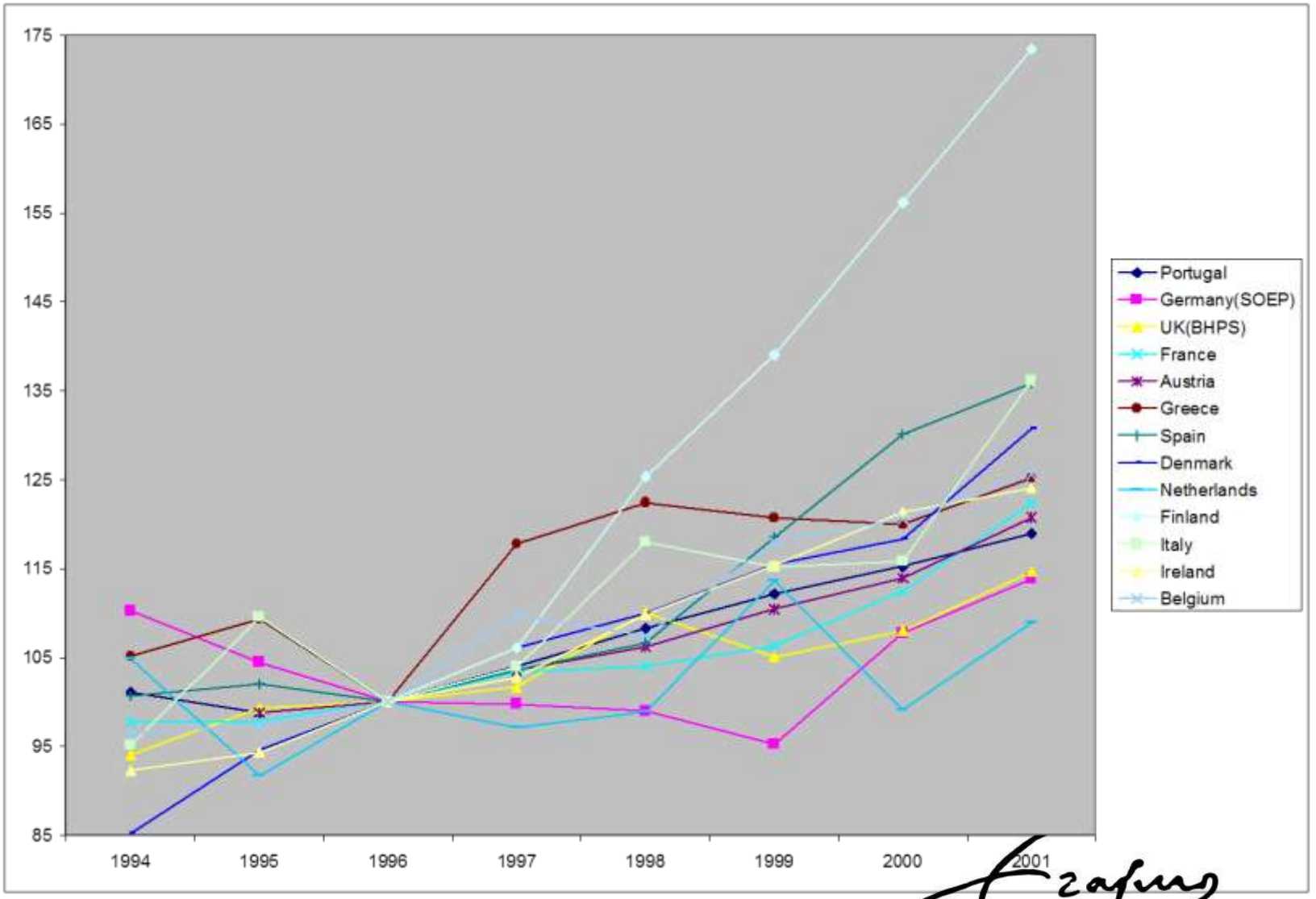
Evolution of income-related health inequalities (IRHI)



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Unravelling the association between the evolution of health disparities and the income distribution

- Baeten, van Ourti and van Doorslaer (2012):
  - *simplify* the latter decomposition by using Erreygers absolute concentration index (C_E)
  - *generalize* it by emphasizing the role of income mobility
  - use CHNS panel data to *apply* it to a decomposition of China's growth in the period 1991-2006
- Find that:
  - IRHI in China more than tripled (C_E rose from 0.013 to 0.041)
  - Not related to its double-digit income growth in that period
  - A bit to rising income inequality
  - But most of all to the downward income mobility of elderly, primarily the females, and primarily in rural areas
  - [or alternatively: upward mobility of young urban population]

Some of China is like this nowadays

Young urban professionals in China benefited more form the rapid economic growth in recent decades

But this is also still part of modern China

Older Cinese, especially women and especially in rural non-coastal areas, were “left behind” in the boom period

Mostly because of lacking income support in old age, either formal (through pensions), or informal (family support)

The cohort decomposition of Baeten et al (2012) is a powerful tool to examine changes in the joint distribution of income and health

- Based on Erreygers' version of the concentration index

$$C_E(h|y) = \frac{8}{n^2}\sum_{i=1}^{n} z_i h_i$$

- It uses a proportional income growth scenario (pg):

$$h_{it}^{pg} = \alpha + \phi\left(y_{it}^{pg}\right) + x_{it}'\beta \qquad y_{it}^{pg} = y_{i1}\left(Y_t / Y_1\right)$$

- to decompose income changes into proportional growth (=no change in inequality) and inequality change (=no growth)
- and into changes in the income ranking in the distribution
- And changes in characteristics (ageing, unemployment, disability, or other employment changes)

A change in C_E over time can be decomposed into four terms:

$$C_E(h_t \mid y_t) - C_E(h_1 \mid y_1) = \frac{8}{n^2}\left\{ \underbrace{\sum_{i=1}^{n} z_{i1}\left[\phi\left(y_{it}^{pg}\right) - \phi\left(y_{i1}\right)\right]}_{(1)} + \underbrace{\sum_{i=1}^{n}\left[z_{it}\phi\left(y_{it}\right) - z_{i1}\phi\left(y_{it}^{pg}\right)\right]}_{(2)} \right.$$
$$\left. + \underbrace{\sum_{i=1}^{n}\left(z_{it} - z_{i1}\right)\left(\sum_{k=1}^{K}\beta^k x_{it}^k\right)}_{(3)} + \underbrace{\sum_{i=1}^{n} z_{i1}\left[\sum_{k=1}^{K}\beta^k\left(x_{it}^k - x_{i1}^k\right)\right]}_{(4)} \right\}$$

(1) = proportional *income growth* (functional form ϕ is crucial);

(2) = mean-preserving changes in *income rank (and thus inequality)*

(3) = *income mobility* across non-income variables (weighted by their health association)

(4) = association between income rank in first period and health change (basically ageing).

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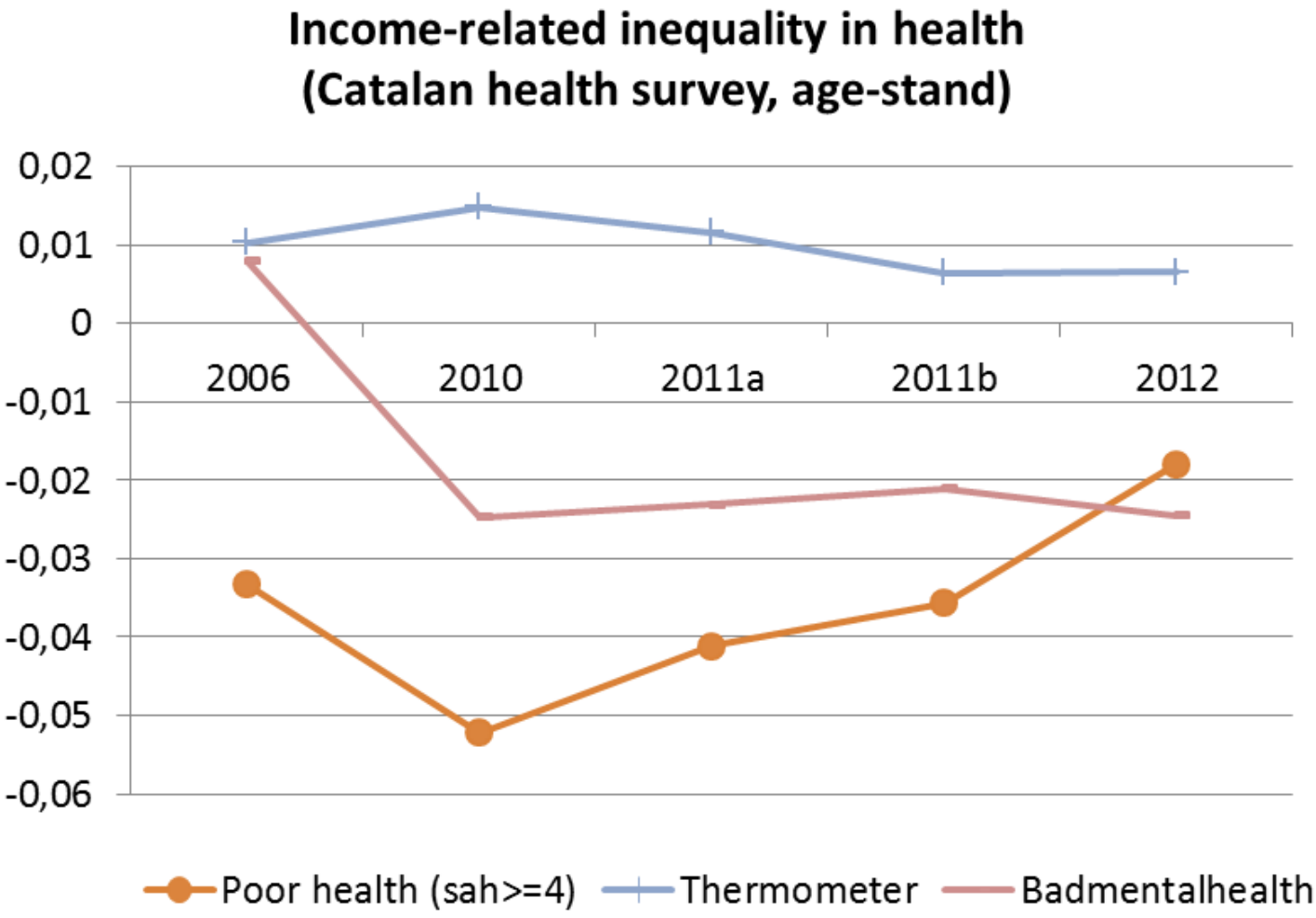
Did the crisis affect income-related health inequality (IRHI)? Not much in Catalonia until 2012



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Can this decomposition also be used to examine the consequences of the economic crisis in Europe?

- We need a panel that follows households/individuals over time
- Crisis started in late 2008
- Eurostat's *Survey of Income and Living Conditions* (SILC) panel follows households in all EU member states for four consecutive years
- Self-assessed health (SAH): very good, good, fair, poor, very poor
- Latest wave available:
  - For Spain: 2009-2010-2011
  - For Portugal and Greece: 2008-2009-2010

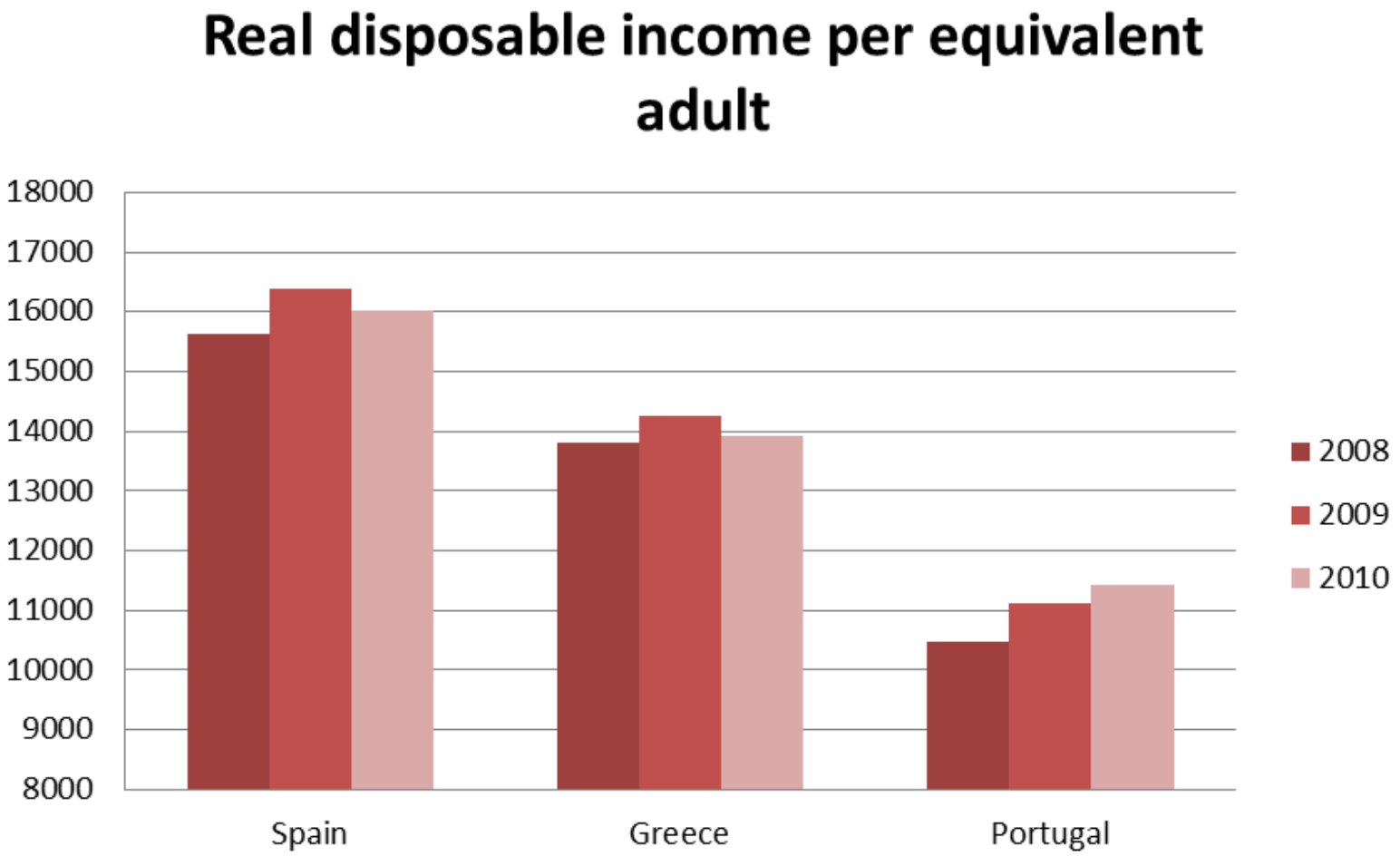
- Too early to see effects of the crisis?
- Let's have a look!

For three countries we estimate the following relationship by interval regression

$$h_{it}^{*} = a + f\left(y_{it}\right) + x_{it}'b + e_{it}$$

- Pooled ordered response model on SAH with external Canadian HUI response thresholds imposed
- $f\left(y_{it}\right)$ is second degree income polynomial (concave)
- Vector x includes:
  - 14 age-gender groups
  - 18 regions
  - 5 employment categories: employed, unemployed, retired, disabled, other
- No causal income effect but partial association in a cohort

Changes in mean cohort income?



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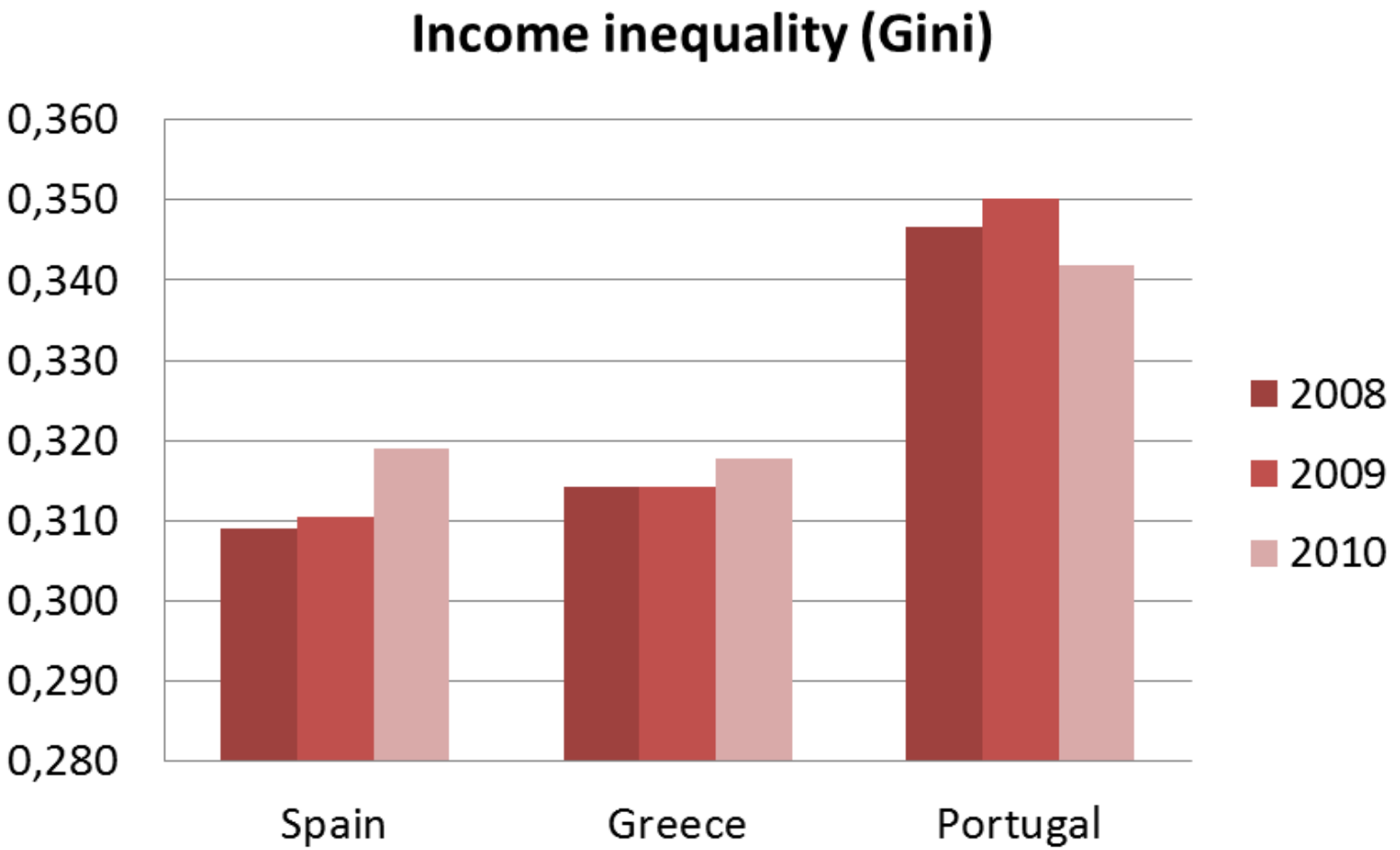
Changes in income inequality?



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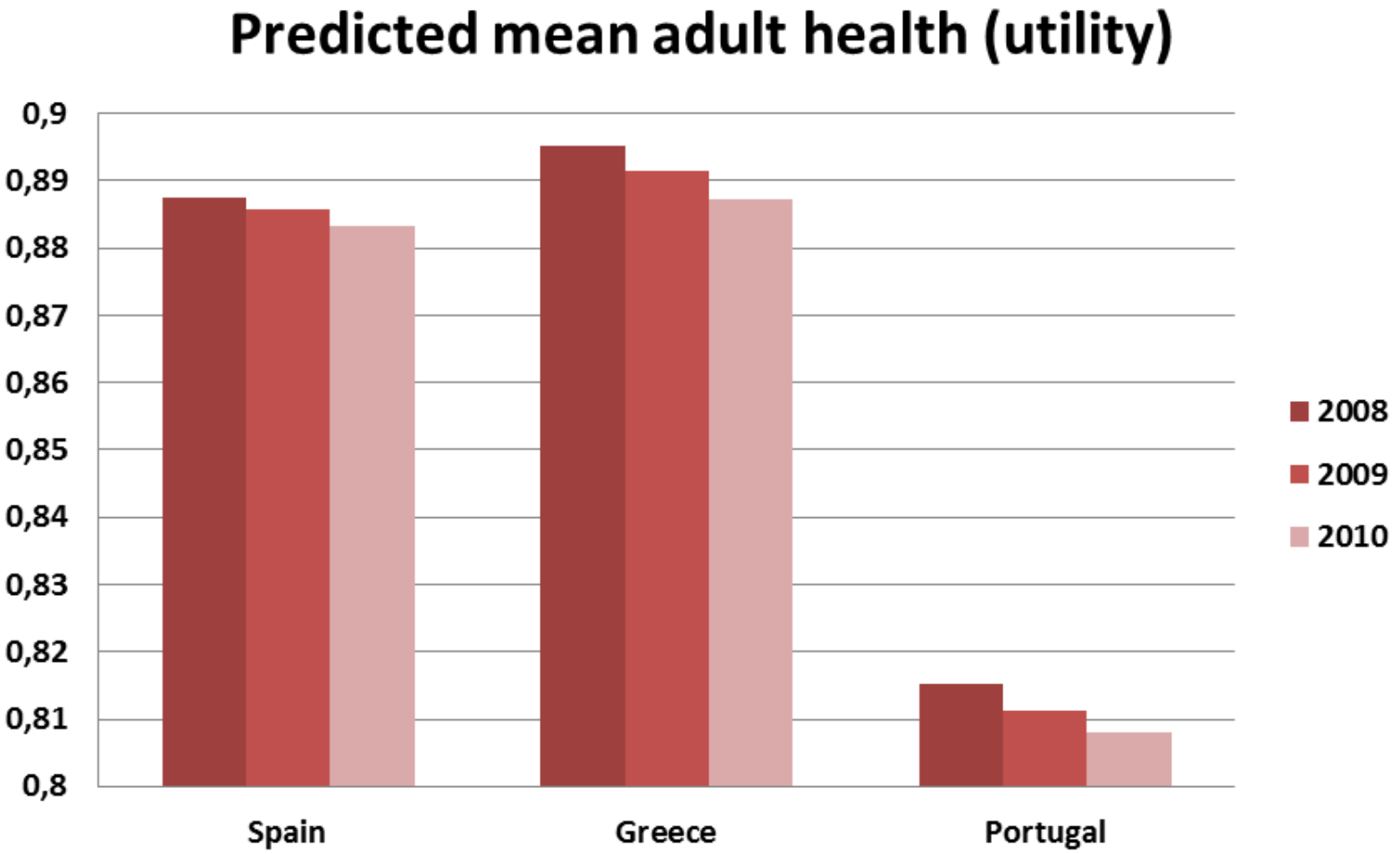
Mean cohort health?



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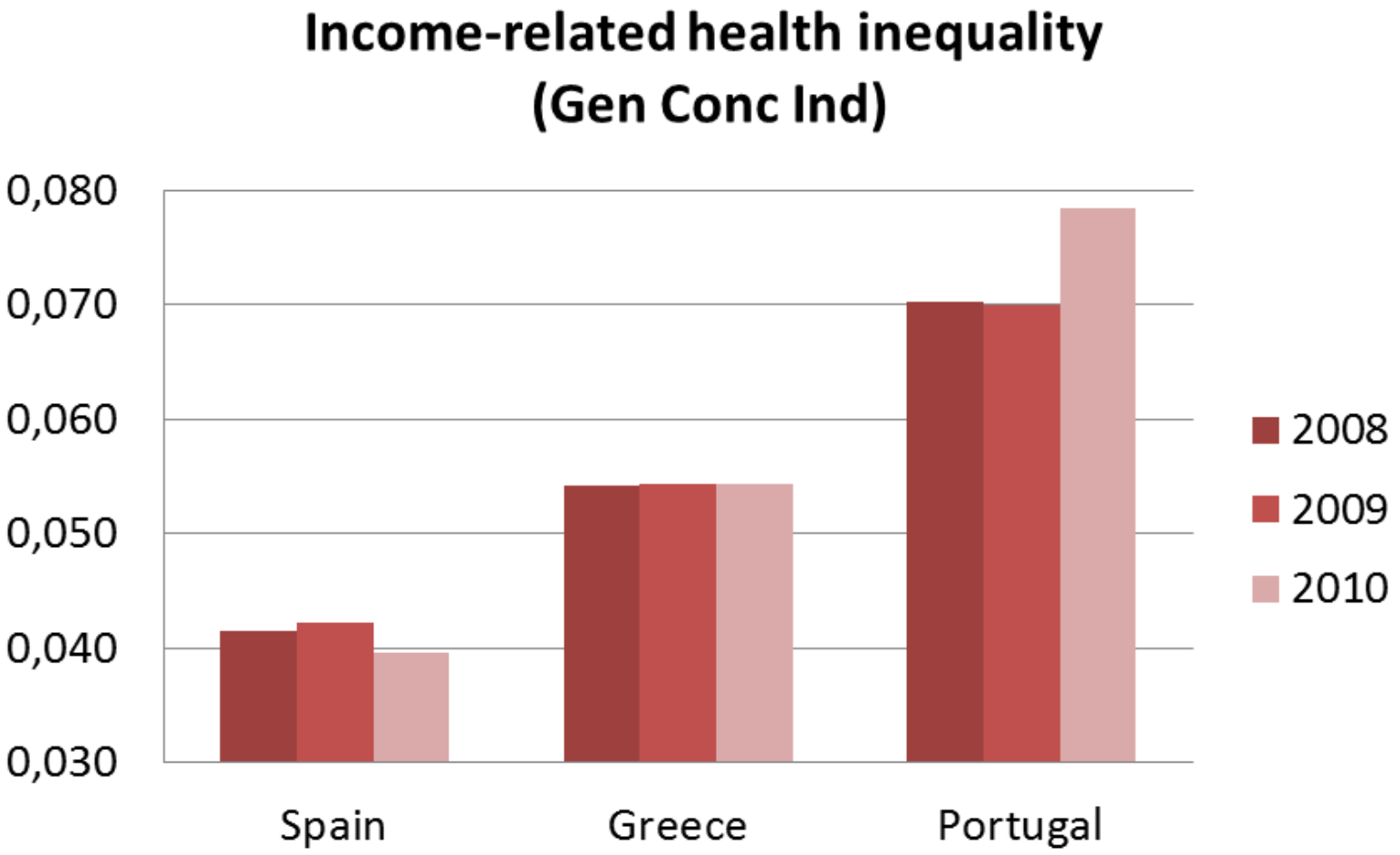
Income-related health inequality?



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Decomposing the change in IRHI

	Spain	Greece	Portugal	Spain
	2010 vs 2008			2011 vs 2009
Change ín IRHI (ECI)	**-0,0019**	**0,00006**	**0,0082**	**-0,0041**
term1: prop inc growth	0,0003	0,0001	0,0034	-0,0008
term2: inc ineq	0,0007	-0,0002	-0,0001	0,0009
term3: income mobility	**-0,0034**	**-0,0012**	**0,0042**	**-0,0044**
term4: categ mobility	0,0004	0,0014	0,0007	0,0002

Not (negative) income growth or inequality but rather income mobility (term 3) most important driver of IRHI

Why?

Which age groups move up or down in the income distribution?

Age group	Spain		Greece		Portugal	
	Income 2010	%Δ (2010-09)	Income 2010	%Δ (2010-09)	Income 2010	%Δ (2010-09)
Female 16-25	15.094	**-2,11%**	11.841	-4,79%	10.901	**14,22%**
Male 16-25	14.841	**-2,42%**	12.677	-4,88%	10.726	**6,56%**
F 26-35	17.205	**-4,08%**	14.759	-2,29%	12.356	**4,77%**
M 26-35	17.286	**-4,78%**	15.169	-5,31%	12.430	**8,62%**
F 36-45	15.782	**-3,11%**	14.015	-0,50%	11.005	**4,99%**
M 36-45	16.843	**-2,65%**	14.527	-0,24%	11.036	**4,21%**
F 46-55	16.864	**-2,89%**	15.377	-5,35%	11.993	0,71%
M 46-55	16.751	**-2,90%**	14.546	-5,31%	11.393	0,02%
F 56-65	17.275	-0,83%	15.255	1,68%	12.567	0,05%
M 56-65	17.956	-0,30%	16.422	-2,81%	12.843	0,99%
F 66-75	14.488	0,52%	12.385	2,74%	11.069	0,70%
M 66-75	15.586	0,41%	14.365	5,93%	12.437	1,57%
M 75+	13.168	0,59%	11.402	-2,90%	10.561	2,94%
F 75+	12.842	-0,60%	10.752	-4,13%	8.918	2,34%

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Which employment groups move up or down?

	Spain		Greece		Portugal	
Employment status	**Income 2010**	**%Δ (2010-09)**	**Income 2010**	**%Δ (2010-09)**	**Income 2010**	**%Δ (2010-09)**
Employed	18.820	**-1,60%**	15.995	**-0,94%**	12.752	**3,25%**
Unemployed	11.610	**-9,39%**	10.271	**-10,93%**	7.977	**-3,92%**
Retired	15.326	**0,23%**	12.950	**-1,57%**	11.301	**1,55%**
Disabled	13.366	-1,42%	10.936	-4,59%	8.292	-0,45%
Other	13.515	-1,79%	12.129	-1,72%	9.754	8,03%

Conclusions

- The economic crisis has only started to affect household disposable incomes in 2010
- Little or no effect on self-reported health (as expected) of the cohort
- IRHI went down in Spain, no change in Greece and up in Portugal.
- Who guessed this correctly at the start?
- Changes in income rank more important
- Age and employment groups were affected differently in different countries
- In Spain, the 65+ group improved its income rank compared to the young adults who moved down in the income distribution
- Retirement incomes less crisis affected than (un)employment incomes in Spain
- The opposite was true in Portugal (until 201): employment income rose more than retirement incomes

What does this mean? Que pasa?

- Income-related health inequality = health-related income inequality
- Association between health and income rank is more determined by income protection as a function of health than by effects of income (rank) on health
- Austerity policies differentially affect and protect incomes of various population groups
- Pension (and other benefits) schemes seem more important than health spending for IRHI in southern European welfare states
- Pensions hit harder in Greece and Portugal than in Spain (until 2011)?
- Clearly, protection of old-age income is dependent on sustainable way of financing pensions