Georg-August-Universität
Göttingen

Courant Research Centre
Poverty, Equity, and Growth in Developing
and Transition Countries

Gender earnings rift

Alexander Sohn

Discussant:
Stephan Klasen
University of Göttingen

Dresden, August 26, 2016

Introduction

- Large literature on the gender earnings gap:
  - Conditional on participation in SNA activities;
  - Selection issues (participation, hours, sectors);
  - How much of gap is discrimination?
- Separate literature on unequal time burden in non-SNA activities;
  - Based on time use data;
  - Large (quite persistent) gender gaps, esp. in care activities;

Contribution of Paper

- Combine the two literatures by estimating the total hourly earnings gap by including non-SNA work as work hours (with 0 pay);
- Additional consideration: distribution of earnings given characteristics as a form of risk or inequality which people dislike (or are inequality averse): are there gender differences?
  - Measure f/m ratio of Atkinson-type „equally distributed equivalent labor earnings rate“ given certain characteristics;
- Welfare/discrimination analysis: how large is the earnings gap considering 0 pay work and distribution given characteristics;

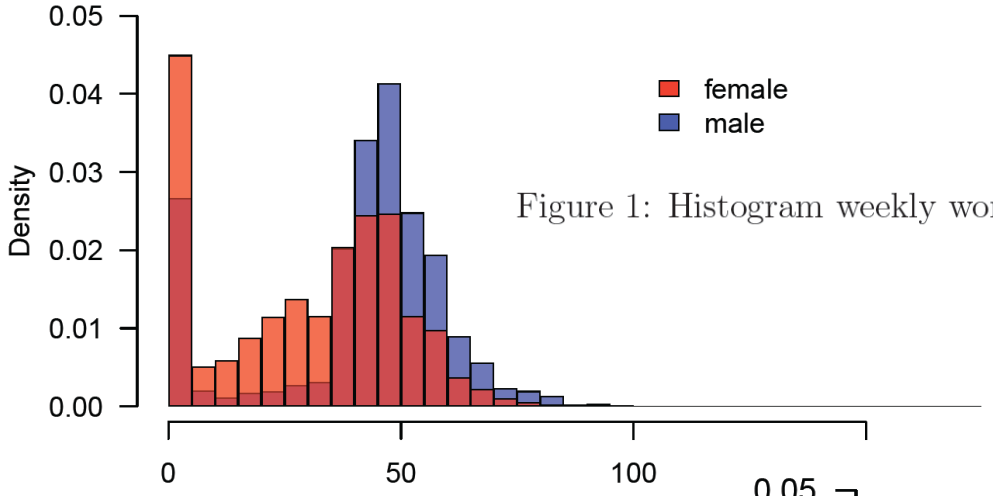


Figure 1: Histogram weekly working hours according to the conventional work definition.

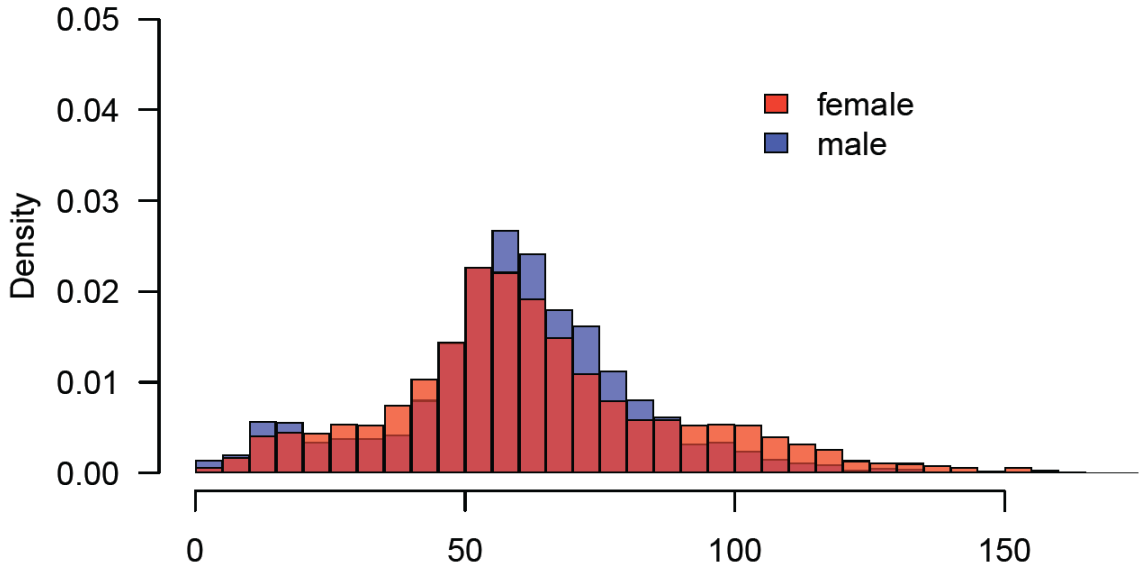
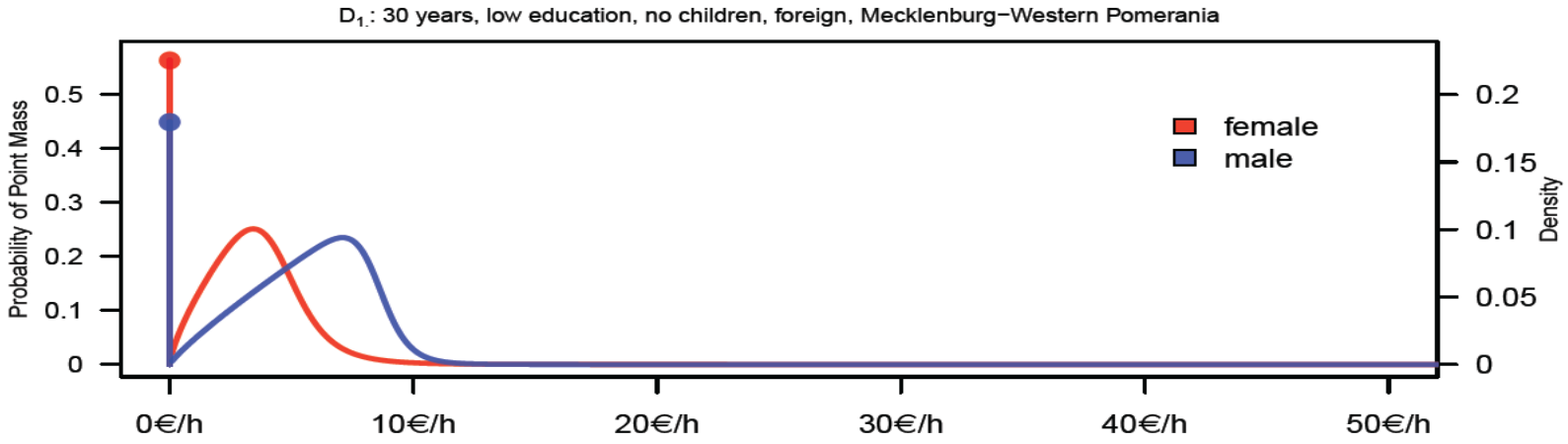


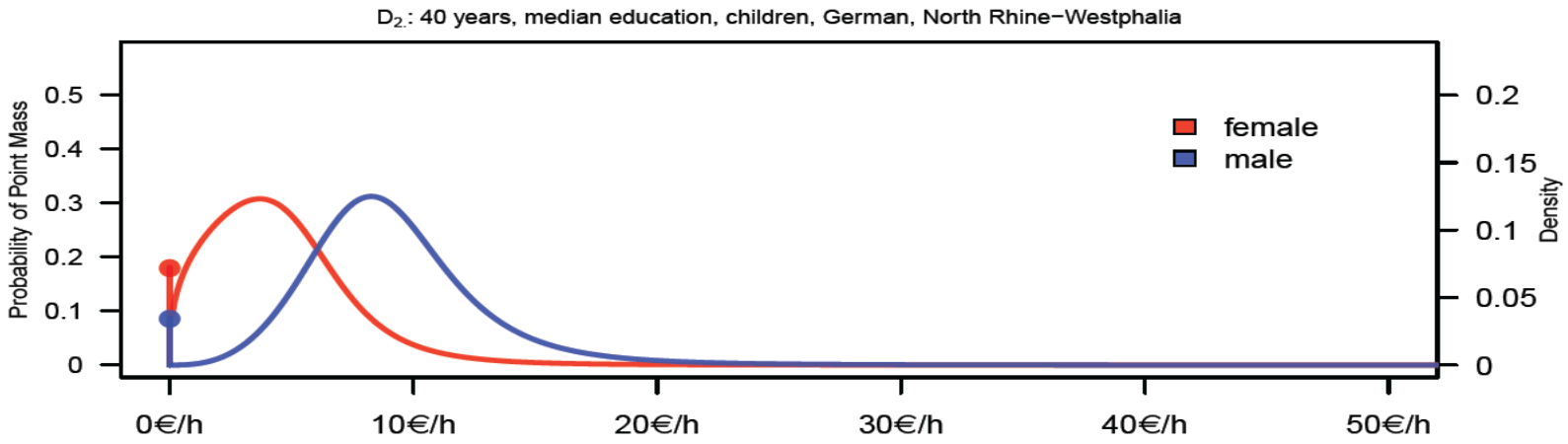
Figure 2: Histogram weekly working hours according to the Third Party Criterion.

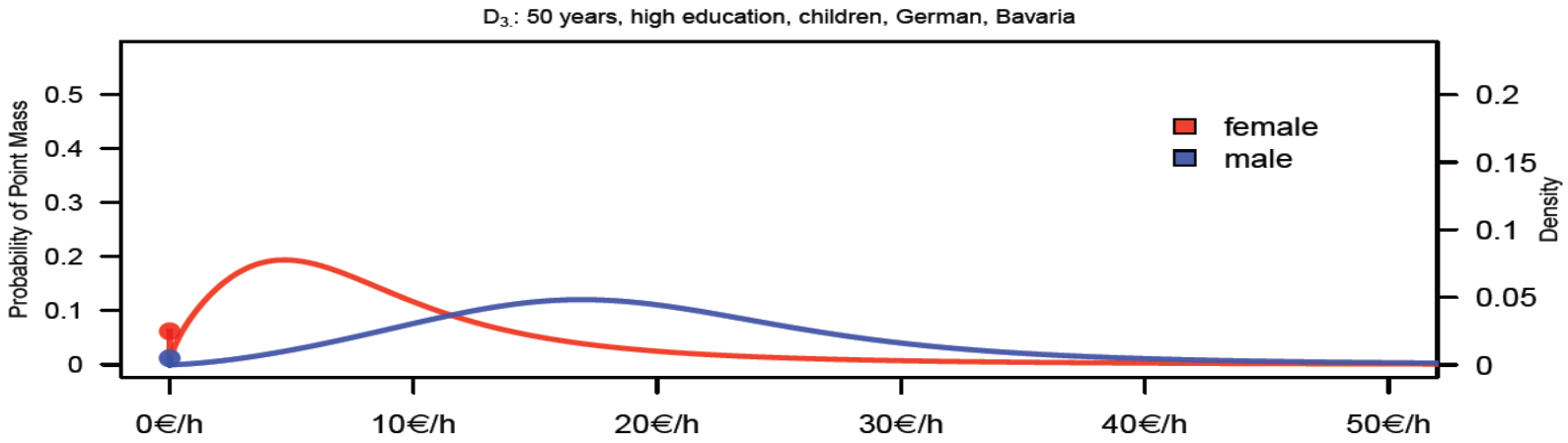
Some details

- GSOEP 2013, women and men aged 21-60
- Compare standard work definition (u0conv), expanded work definition of those in SNA employment (u0), and expanded work definition of everyone;
- Characteristics: age, education categories, presence of children, state;
- Estimate structured additive distributional regression to estimate both mean and density of earnings given characteristics;
- Two part estimation: logit of 0 earnings, then conditional earnings;
- Parametric assumption of conditional earnings distribution: Dagum distribution, estimating using Bayesian methods;
- Examine for subgroups (e.g. age groups, East/West, kids);
- Aggregate across groups to get to average earnings/welfare gap

$$\eta^{\theta_k} = \beta_0^{\theta_k} + \beta_1^{\theta_k} kids + \beta_2^{\theta_k} nat + \beta_3^{\theta_k} educ_2 + \beta_4^{\theta_k} educ_3 + \beta_5^{\theta_k} educ_4 + f_1^{\theta_k}(age) + heduc \cdot f_2^{\theta_k}(age) + f_{spat}^{\theta_k}(region),$$


D1.: 30 years, low education, no children, foreign, Mecklenburg−Western Pomerania
Probability of Point Mass
Density
female
male
0€/h
10€/h
20€/h
30€/h
40€/h
50€/h


D2.: 40 years, median education, children, German, North Rhine−Westphalia
Probability of Point Mass
Density
female
male
0€/h
10€/h
20€/h
30€/h
40€/h
50€/h


D3.: 50 years, high education, children, German, Bavaria
Probability of Point Mass
Density
female
male
0€/h
10€/h
20€/h
30€/h
40€/h
50€/h

5.1.2 Distributional measures of conditional wage distributions

	D_{1M}	D_{1W}	D_{2M}	D_{2W}	D_{3M}	D_{3W}
μ	3.17[2.52;3.91]	1.53[1.11;2.10]	8.45[7.55;9.41]	3.72[3.25;4.17]	20.13[17.69;22.97]	9.92[8.28;12.55]
G(ρ=2)	0.22[0.16;0.30]	0.29[0.23;0.36]	0.21[0.18;0.25]	0.34[0.31;0.38]	0.27[0.23; 0.32]	0.45[0.39; 0.52]
G(ρ=3)	0.79[0.73;0.83]	0.86[0.81;0.88]	0.42[0.37;0.46]	0.66[0.60;0.71]	0.40[0.34; 0.46]	0.64[0.58; 0.70]
G(ρ=4)	0.84[0.82;0.86]	0.84[0.80;0.86]	0.51[0.46;0.56]	0.76[0.71;0.81]	0.47[0.40; 0.53]	0.72[0.66; 0.77]
$\mathcal{W}(\rho$=2)	2.47[1.87;3.12]	1.08[0.78;1.53]	6.68[5.93;7.49]	2.43[2.09;2.82]	14.66[12.65;16.90]	5.40[4.57; 6.45]
$\mathcal{W}(\rho$=3)	0.68[0.45;1.00]	0.22[0.14;0.37]	4.94[4.28;5.66]	1.27[0.97;1.64]	12.12[10.21;14.18]	3.59[2.91; 4.30]
$\mathcal{W}(\rho$=4)	0.51[0.38;0.70]	0.25[0.20;0.32]	4.17[3.51;4.88]	0.88[0.63;1.19]	10.71[8.85;12.68]	2.78[2.20; 3.43]

Table 1: Some distribution measures for 3 conditional wage distributions

In all three types,women earn <50% of men, higher variance;

	$D_{1.}$	$D_{2.}$	$D_{3.}$
$\Delta_{\mathbf{x}}$ for μ_0^{conv}	0.94[0.76;1.18]	0.75[0.67;0.84]	0.70[0.59;0.82]
$\Delta_{\mathbf{x}}$ for μ_0	0.61[0.47;0.81]	0.49[0.42;0.57]	0.52[0.42;0.68]
$\Delta_{\mathbf{x}}$ for μ	0.48[0.33;0.71]	0.44[0.37;0.52]	0.49[0.39;0.65]
$\Delta_{\mathbf{x}}$ for $\mathcal{W}(\rho{=}2)$	0.44[0.29;0.68]	0.36[0.30;0.44]	0.37[0.30;0.46]
$\Delta_{\mathbf{x}}$ for $\mathcal{W}(\rho{=}3)$	0.33[0.18;0.62]	0.26[0.19;0.34]	0.29[0.23;0.38]
$\Delta_{\mathbf{x}}$ for $\mathcal{W}(\rho{=}4)$	0.48[0.33;0.72]	0.21[0.15;0.30]	0.26[0.19;0.35]

Table 2: Ratios of male and female wage distribution measures

	μ_0^{conv}	μ_0	μ	$\mathcal{W}(\rho{=}2)$	$\mathcal{W}(\rho{=}3)$	$\mathcal{W}(\rho{=}4)$
Δ_a	0.79[0.75;0.82]	0.59[0.54;0.64]	0.54[0.49;0.59]	0.49[0.45;0.55]	0.42[0.37;0.48]	0.39[0.34;0.45]

Table 3: Average ratios of male and female wage distribution measures

	μ_0^{conv}	μ_0	μ	$\mathcal{W}(\rho{=}2)$	$\mathcal{W}(\rho{=}3)$	$\mathcal{W}(\rho{=}4)$
Δ_{21-30}	0.89[0.84;0.95]	0.72[0.64;0.80]	0.69[0.61;0.78]	0.70[0.61;0.81]	0.73[0.62;0.87]	0.69[0.59;0.84]
Δ_{31-40}	0.80[0.77;0.83]	0.59[0.54;0.64]	0.51[0.46;0.56]	0.44[0.40;0.49]	0.31[0.27;0.36]	0.27[0.24;0.31]
Δ_{41-50}	0.74[0.71;0.78]	0.56[0.52;0.61]	0.53[0.48;0.58]	0.47[0.43;0.51]	0.40[0.36;0.45]	0.37[0.33;0.42]
Δ_{51-60}	0.75[0.72;0.79]	0.53[0.49;0.58]	0.47[0.43;0.51]	0.41[0.37;0.45]	0.31[0.28;0.36]	0.29[0.26;0.33]

Table 4: Average ratios of male and female wage distribution measures

	μ_0^{conv}	μ_0	μ	$\mathcal{W}(\rho{=}2)$	$\mathcal{W}(\rho{=}3)$	$\mathcal{W}(\rho{=}4)$
$\Delta_{no\ kids}$	0.81[0.78;0.85]	0.65[0.59;0.71]	0.61[0.55;0.67]	0.57[0.51;0.63]	0.51[0.45;0.58]	0.47[0.42;0.54]
Δ_{kids}	0.72[0.69;0.75]	0.42[0.40;0.46]	0.35[0.31;0.38]	0.28[0.25;0.31]	0.17[0.14;0.20]	0.15[0.13;0.18]

Table 5: Average ratios of male and female wage distribution measures

	μ_0^{conv}	μ_0	μ	$\mathcal{W}(\rho{=}2)$	$\mathcal{W}(\rho{=}3)$	$\mathcal{W}(\rho{=}4)$
Δ_{West}	0.77[0.74;0.81]	0.57[0.53;0.63]	0.52[0.46;0.57]	0.47[0.42;0.52]	0.38[0.32;0.45]	0.36[0.30;0.42]
Δ_{East}	0.87[0.80;0.93]	0.68[0.60;0.76]	0.68[0.60;0.76]	0.63[0.55;0.71]	0.62[0.52;0.73]	0.56[0.47;0.67]

Table 11: Average ratios of male and female wage distribution measures

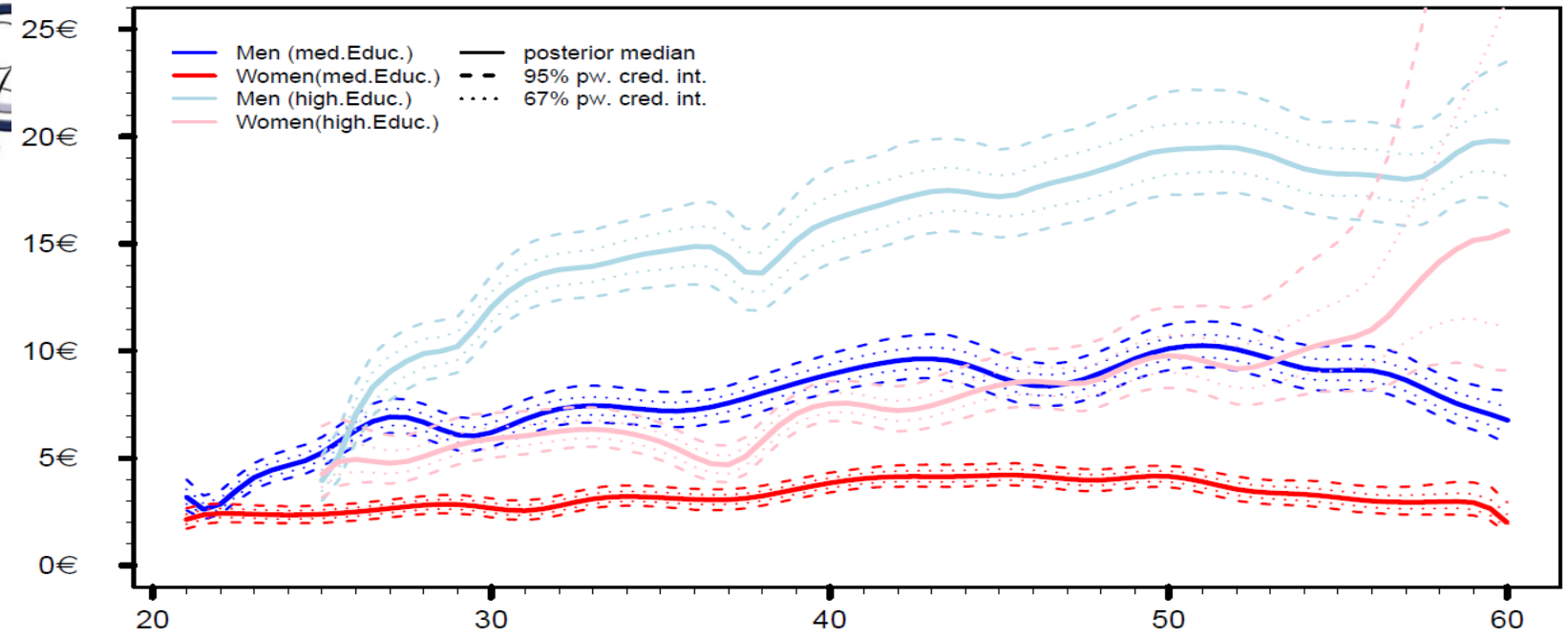
Issues

- Interesting, innovative analysis, apparently not done before;
- See this as a descriptive **earnings** analysis (not a **welfare** or **discrimination** analysis):
  - Whether non-working women are compensated or how one should value non-market work irrelevant (fact is: earnings are 0);
- Welfare analysis of distribution of earnings assumes spread of earnings entirely involuntary:
  - Whether to work or not, and what they earn if they work
- How free are women‘s choices?
  - Social expectations and roles;
  - Tax systems;
  - Role of pay gap in market work;

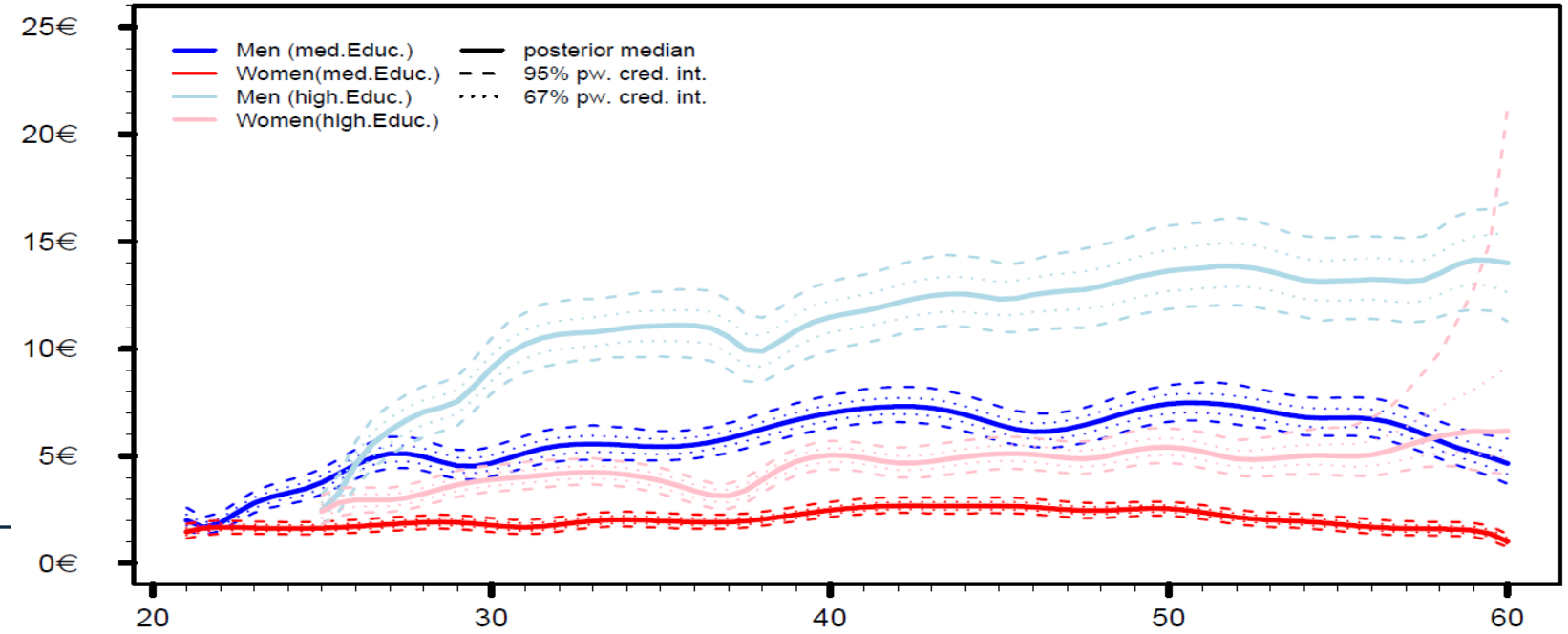
Some Further Issues

- 21 far too young a cut-off (education also involuntary?): 25 much better;
- Variance will depend on characteristics (more characteristics equal lower variance equal lower discrimination);
  - E.g. experience? Presence of children?
- Odd implication:
  - Highly educated women suffer greater inequality (and thus lower inequality-adjusted wages and more ‚discrimination') due to the larger gap between 0 and average positive earnings;
- Details on time use data:
  - Treatment of doing several activities at once? Double-counting of this non-market work?

Mean Earnings



EDELER (ρ=2)



5. Conclusions

- Very nice innovative analysis;
  - Truly new contribution to gender earnings gap literature;
- Statistical methods appropriate;
- More descriptive earnings gap paper: welfare analysis makes strong assumptions.