Financial work incentives and the long-term unemployed: the case of Belgium

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February 2020, JRC-Seville

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Introduction (I)

- Increasing the often inadequate out-of-work incomes for long term unemployed (LTU) might decrease their likelihood of transitioning to work → I study effect of changes in financial work incentives on this likelihood

- If there was an effect, increasing in-work benefits (or other policies) would be necessary to not lower this likelihood. Since this is costly, the targeting of those benefits could be increased

- As this would affect marginal tax rates, I also study hours reactions in the intensive margin

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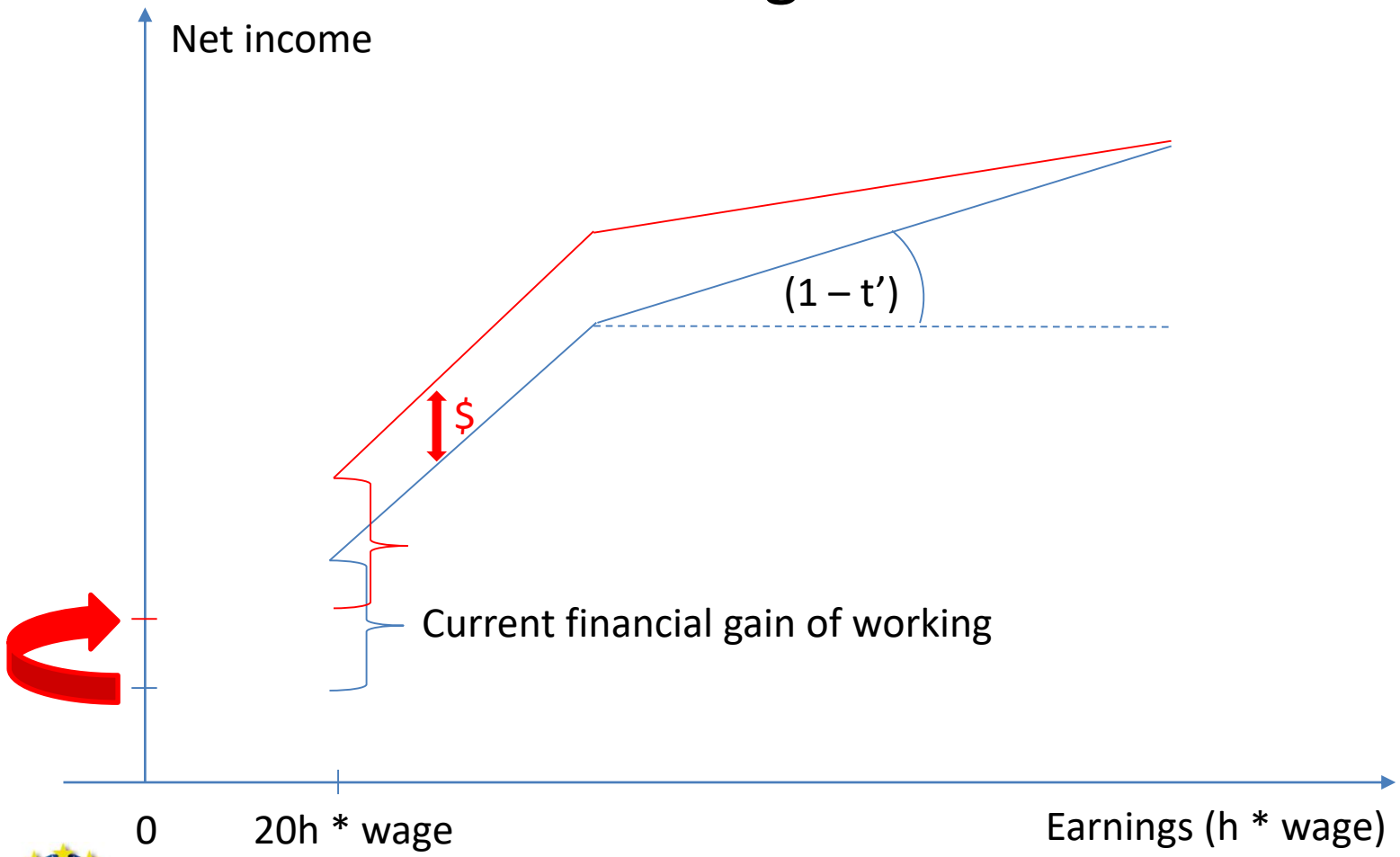
Introduction (II)

Illustration: budget constraint



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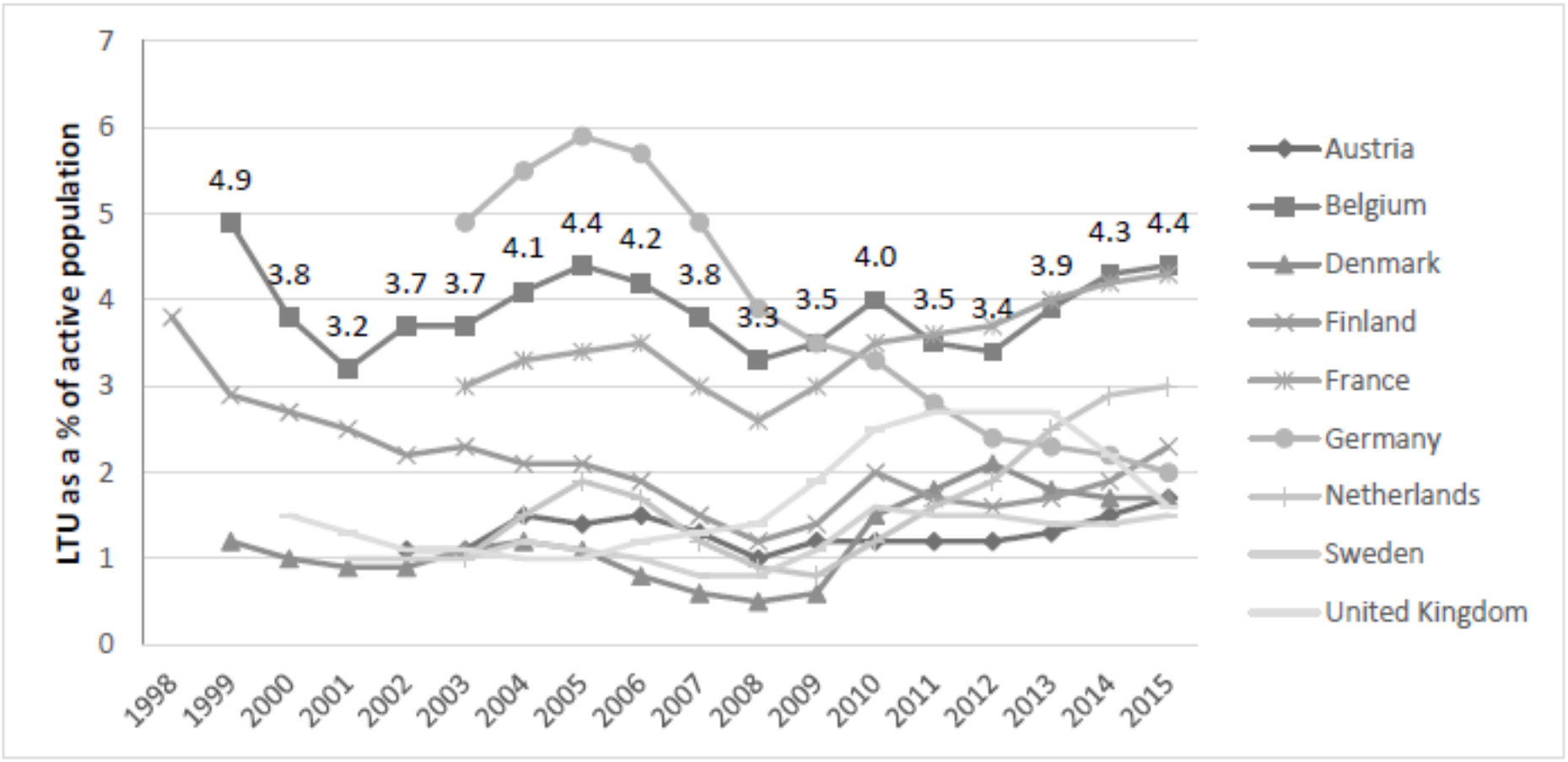
Introduction: Belgium

- Among NW EU, one of the highest LTU rates



Source: EUROSTAT

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Introduction: evaluation of incentives at the extensive margin

- Quasi-experimental exploiting long. policy group variation (diff-in-diff)
- Individual variation (for an increase in 10pp PTR):
  - Cross-sectional data (Kaliskova (2015): reg. in levels; women; EU; group-level sim. IV; effect of -2pp on prob. of E)
  - Panel data
    - Experiments
    - Survey/register:
      - Selin (2014): levels, women; SE bef/after ind. taxation 71 (eg top inc. PTR ↓ 40pp); IV based on husband pre-reform inc.); -8/-15pp.
      - Bartels & Pestel (2016): reg. in diffs.; LTU; DE 93-10 (eg Hartz); -0.8/-1.3pp.
      - Myself: BE + inc. effects + intensive

$$P(U_{it-1} \rightarrow E_{it}) = \gamma \Delta PTR_{it} + \boldsymbol{X'}_{itj}\boldsymbol{\beta}_j + \mu_t + \pi_t + \epsilon_{it}$$

Authors	Ctry.	Year	Size (pp MTR ↓)	Result (hrs/week)
Wilhelm (1998)	US	1986	top inc. MTR ↓ 22pp	Men inelastic
Klevmarken (2000)	SE	86-93	top inc. MTR ↓ 30pp	Men inelastic; Women -3.2
Thoresen & Vattø (2015)	NO	2006	top tercile ↓ 4pp	Women-Men -0.2

Data

- Stacked 7 two-year transitions between 05-12 from longitudinal EU Statistics on Income and Living Conditions (SILC). Sub-samples:
  - To maximise sample size, I analyse 2-year transitions looking (un)employment info in 3rd previous year to simulate UBs and control for very LTU (→1/2 of cross-sectional sample as EU-SILC is a 4-year rotational panel)
  - Couple or single households with somebody available for LM (not self-employed, (early) retired, disable, on leave, etc.)
  - Extensive margin: individuals U=12 months, remaining U=12 or transitioning to E > 6 (N=634)
  - Intensive margin: PT E=12 1st year (N=2325) and hours correspond to weekly hours at survey moment (PT because ↓EMTR, including discontinuity at FT)

- PTRs and EMTRs calculated with EM G3.0+ because they need counterfactual incomes (eg if I worked). I create longitudinal EUROMOD input files based on EU-SILC.

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Methodology (explained in detail later)

A. Operationalising financial incentives
   i. to participate in the LM with Participation Tax Rates (PTRs)
   ii. to work more with Effective Marginal Tax Rates (EMTRs)

B. Regression analysis
   i. Extensive margin: regressing prob. of taking up work on ΔPTRs over 2 consecutive years:

$$P(U_{it-1} \rightarrow E_{it}) = \Lambda\left(\gamma \Delta PTR_{it} + \mu_t + \boldsymbol{X'}_{itj}\boldsymbol{\beta}_j\right)$$

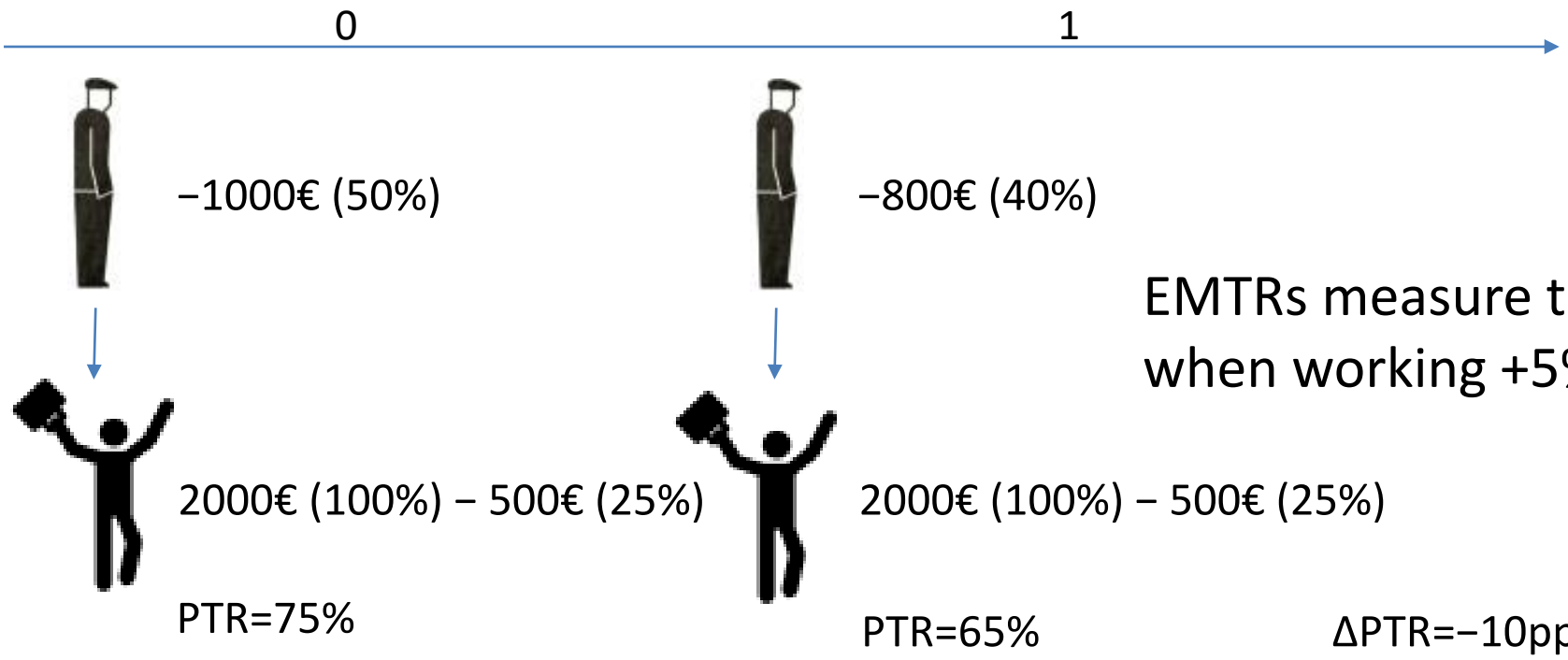
   i. Intensive margin:
      - $\Delta hours_{it} = \gamma \Delta EMTR_{it} + \mu_t + \boldsymbol{X'}_{itj}\boldsymbol{\beta}_j + \epsilon_{it}$

Methodology A: measuring incentives with participation tax rates (PTRs)

PTR = proportion of household earnings taken in tax and withdrawn benefits when moving to employment

E.g.: in year 0 gross earnings 2000€ (100%), taxes 500€ (=25%) and UB 1000€ (=50%):

$$\text{PTR} = \frac{500€ + 1000€}{2000€} = 75\% = 1 - \frac{1500€ - 1000€}{2000€} = 1 - 25\%$$



EMTRs measure the same when working +5% hours

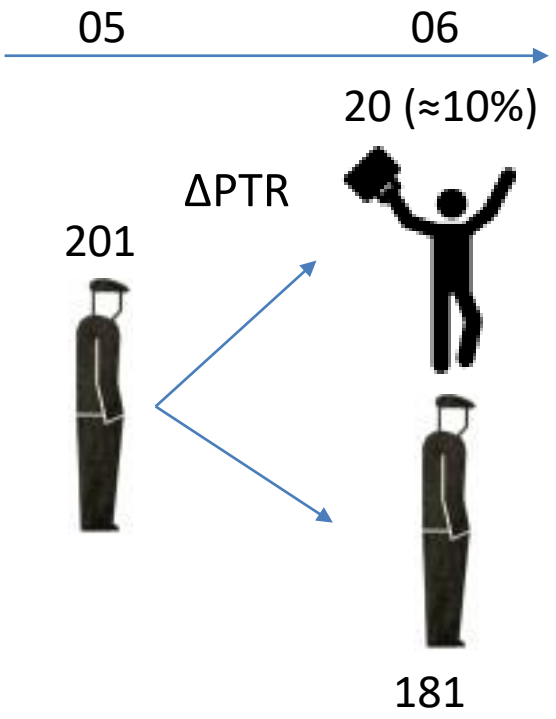
Methodology B: Regression analysis (I)

$$P(U_{it-1} \rightarrow E_{it}) = \Lambda(\gamma \Delta PTR_{it} + \mu_t + \boldsymbol{X'}_{itj}\boldsymbol{\beta}_j)$$

Control variables:

- Transition fixed effects μ_t controls for common changes (eg demand)
- Changes in:
  - Region-age-education-specific employment rates
  - Eq. hh incomes (income effects)
- 1st year (including interactions with ΔPTRs)
  - U whole previous year or more
  - Gender
  - Cohabitation
  - (observed) Income tercile
  - Age
  - Region (2nd year)

-1	0	1



Methodology B: Regression analysis (II)

$$\Delta h_{it} = \gamma \Delta IV\_EMTR_{it} + \mu_t + \boldsymbol{X'}_{itj}\boldsymbol{\beta}_j + \epsilon_{it}$$

- Due to progressivity, ΔEMTRs can be endogenous → ΔIV_EMTRs: assuming person analysed did not change her behaviour (eg hours of work) (Gruber & Saez, 2002)
  - Same for income effects in both margins
  - Already kind of doing this because PTR includes both states and I use predicted earnings
- In addition, lagged hours tercile to control for mean reversion

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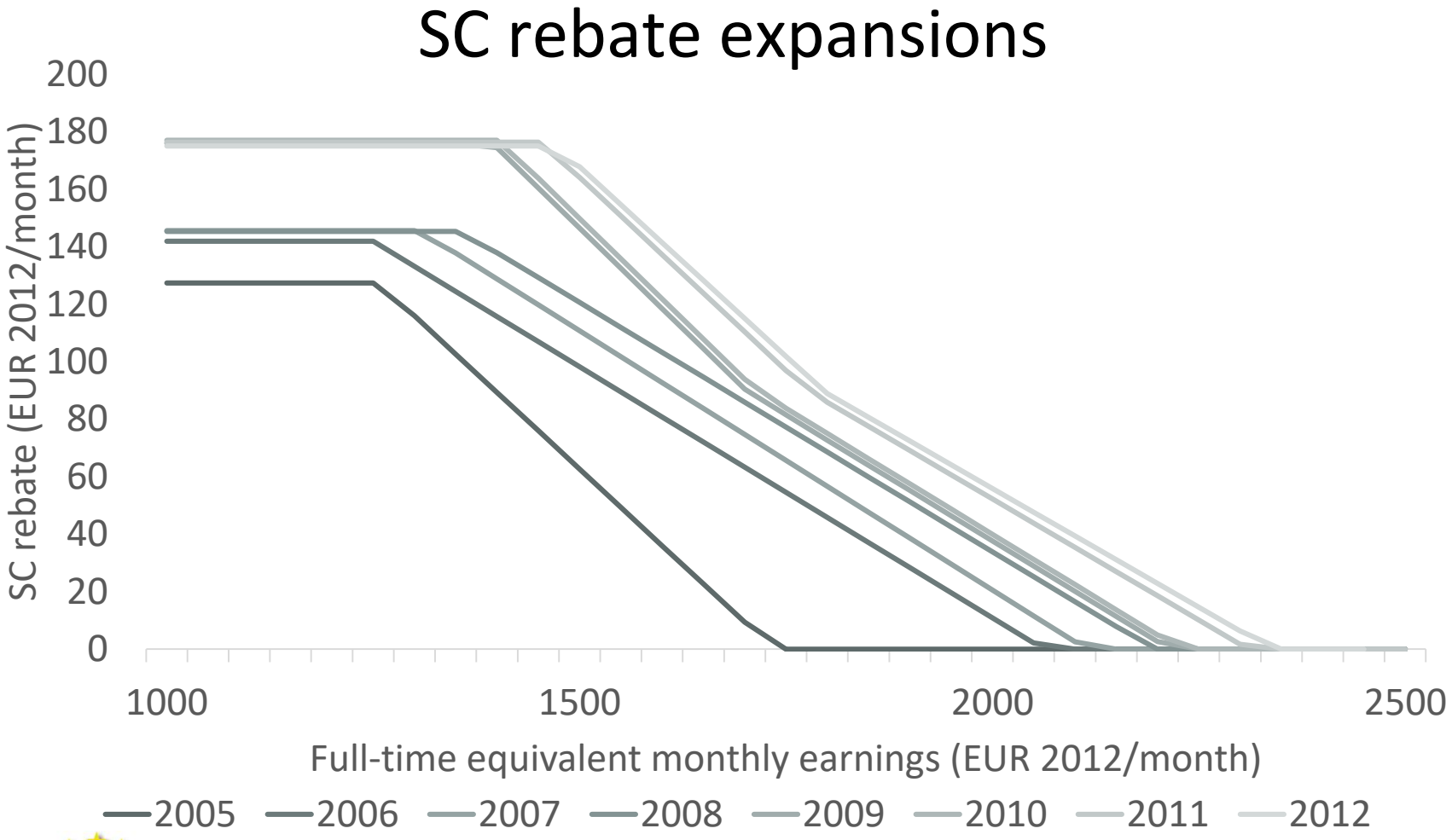
Policy variation (I)



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Policy variation (II)

Change in UB parameters in relation to changes in wage index (pp)

	05-06	06-07	07-08	08-09	09-10	10-11	11-12
Difference between the parameters of the 1st and 2nd year of a spell							
Max earnings to declare single				3.77	-12.31	-11.51	-13.86
Max earnings to declare head & cohabitating				3.77	-12.31	-8.61	-11.93
Replacement rate single	-10.55	-9.51	-7.18	-7.30	-5.60	-5.35	-5.77
Replacement rate cohabitating	-15.55	-14.51	-15.18	-19.10	-19.40	-20.35	-20.77
Max UB single	-15.53	-14.50	-9.19	-8.48	-19.75	-19.70	-21.11
Max UB head	1.45	2.50	2.84	3.77	-10.57	-10.42	-11.94
Max UB cohabitating	-26.37	-25.32	-31.51	-28.79	-40.17	-40.40	-41.54
Parameters of UBs that are the same since the 2nd year of a spell							
Max earnings to declare head & cohabitating					0.60	5.06	1.26
Replacement rate single	-0.55	0.49	2.82	-0.30	0.60	0.85	-0.77
Replacement rate cohabitating	-0.55	0.49	-0.18	-1.10	0.60	-0.35	-0.77
Max UB single	1.46	2.49	9.00	3.77	4.15	2.93	1.24
Max UB head and cohabitating	1.45	2.50	2.84	3.77	2.58	2.92	1.24

$$\Delta PTR = \frac{t_1(e*\alpha) + ub_1^{II}}{e*\alpha} - \frac{t_0(e) + ub_0^{I}}{e} =$$

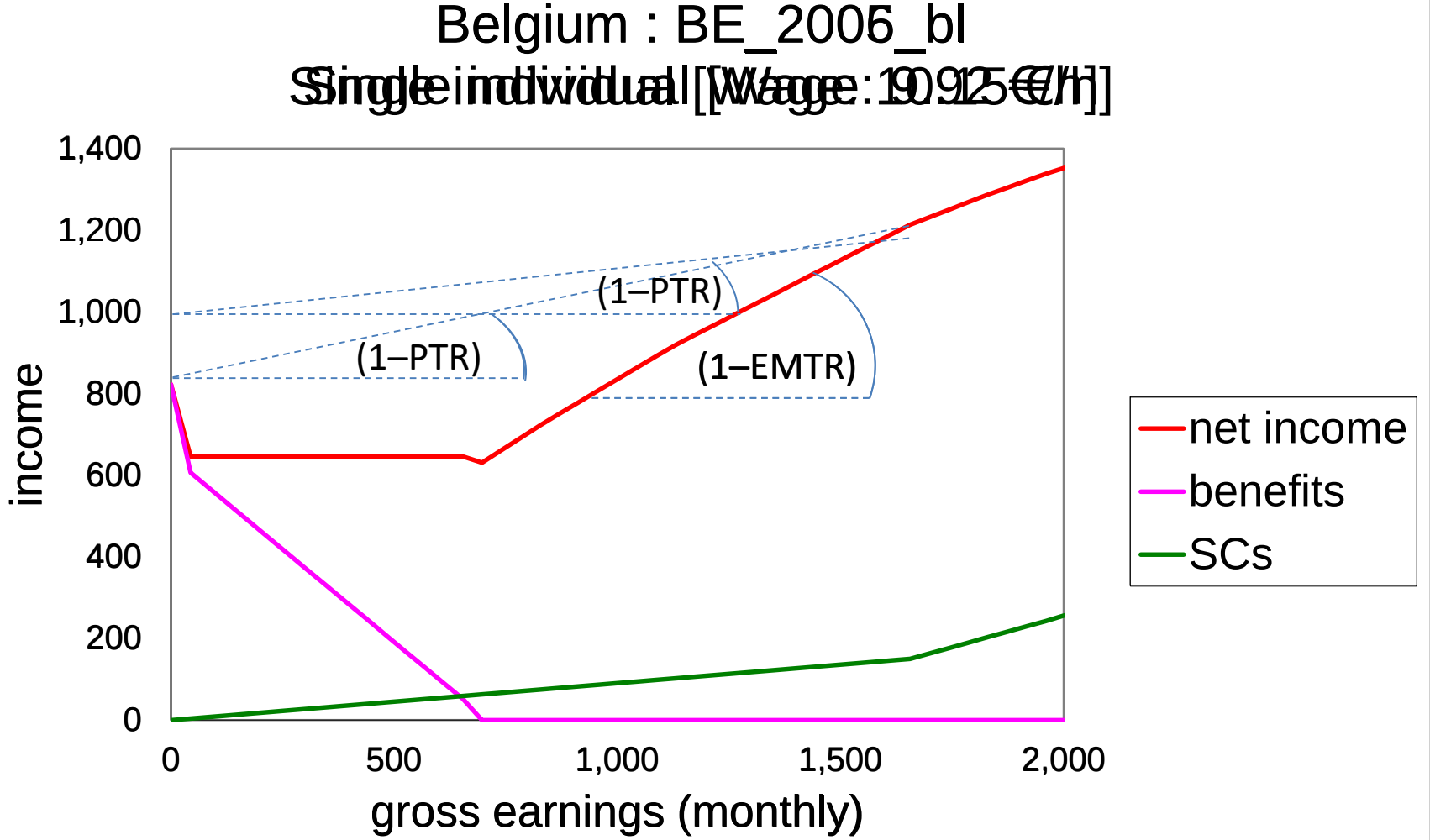
$$\underbrace{\left[\frac{t_1(e*\alpha)}{e*\alpha} - \frac{t_0(e)}{e}\right]}_{\Delta\text{tax contribution}} + \underbrace{\left[\frac{ub_1^{II}}{e*\alpha} - \frac{ub_0^{I}}{e}\right]}_{\Delta\text{UB contribution}}$$

$$If\ ub_1^{II} = ub_0^{I} * \alpha \rightarrow$$

$$\frac{ub_0^{I} * \cancel{\alpha}}{e * \cancel{\alpha}} - \frac{ub_0^{I}}{e} = 0$$

Policy variation (III)

Illustration of budget constraint change of hypothetical person



Policy variation (IV)

Decomposition of mean incentive changes

		05-06	06-07	07-08	08-09	09-10	10-11	11-12
Mean ΔPTR non-elig. for SC rebate		-0.2						
Mean ΔPTR elig. for SC rebate		-2.5						
Mean ΔPTR single	U<=2	-2.8	0.0	1.6	-2.8	-3.3	-2.2	-4.2
Mean ΔPTR head		-0.8	6.5	2.5	5.8	0.2	1.8	-4.7
Mean ΔPTR cohabitee		-7.3	-6.9	-4.0	-7.9	-14.3	-1.2	-8.8
ΔUB component single	U<=2	-1.6	0.7	-0.1	-2.4	-6.0	-4.0	-5.3
ΔUB component head		2.2	6.7	7.6	8.0	-0.4	-0.2	-2.9
ΔUB component cohabitee		-7.3	-5.9	-6.0	-7.4	-17.4	-0.6	-10.6
ΔUB component single	U>2	1.0	1.1	1.5	1.5	1.3	0.9	0.8
Mean IV1 ΔEMTR non-elig. for SC rebate		0.1						
Mean IV1 ΔEMTR elig. for SC rebate		-1.8						

Policy variation (V)

Margin	Variable	Type of IV	Relevance (1st stage)		Test of exogeneity p-value
			Partial R-sq.	F	
Extensive	ΔPTR	IV2	0.216	23.58	0.275
	ΔEq. hh. income	IV2	0.072	25.87	0.005
Intensive	ΔEMTR	IV2	0.021	12.69	
		IV1	0.145	110.77	0.013
	ΔEq. hh. income	IV2	0.002	1.92	
		IV1	0.643	2,151.79	0.002

IV1: 'freezing' behaviour person analysed; IV2 'freezing' household

Descriptive statistics

	Extensive (LTU)			Intensive (PT)	
Observations	634			2625	
Weighted observations	1,321,174			4,356,634	
	Mean	SD	Mean U_E=1	Mean	SD
Transition U->E / ΔWeekly hours	0.09		1.00	1.57	5.66
ΔPTR/IV1 EMTR (pp)	-0.47	6.41	-4.62	-0.27	5.08
T1 PTR/IV1 PTR (pp)	75.50	15.20	73.50	52.77	7.26
U whole previous year or more	0.78		0.41		
Female	0.50		0.50	0.72	
Cohabitating	0.45		0.67	0.83	
T1 tercile 1	0.78		0.64	0.11	
ΔEmp. reg-age-edu (pp)	0.14	1.71	0.08	0.08	1.32
20-35	0.19		0.35	0.19	
35-50	0.33		0.54	0.56	
50-64	0.48		0.10	0.25	
IV2/1 ΔEq.inc. (monthly € 2012)	-10.47	51.05	-61.10	-2.78	131.60
T1 weekly hours				27.53	6.88

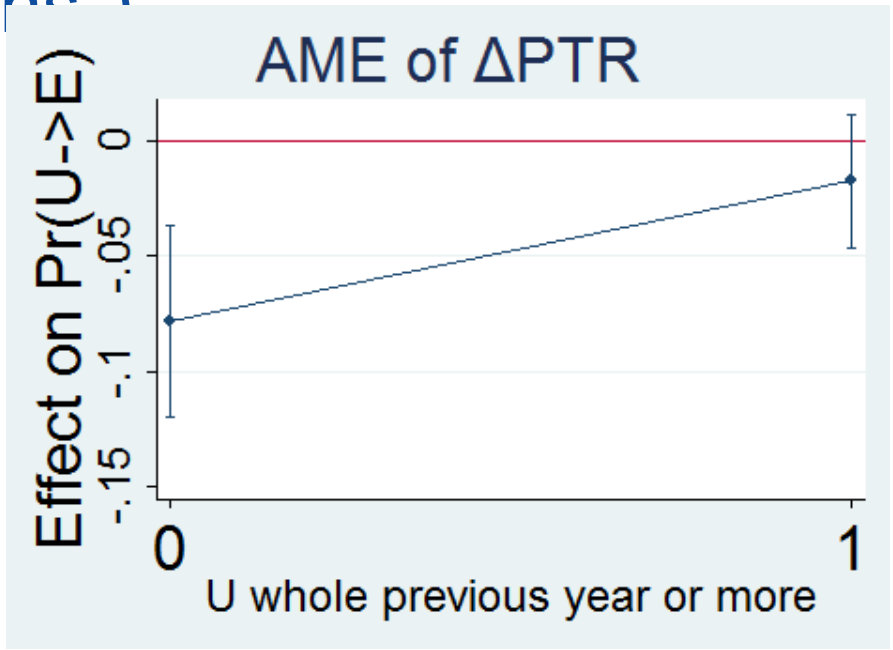
- 93% with UB as out-of-work income

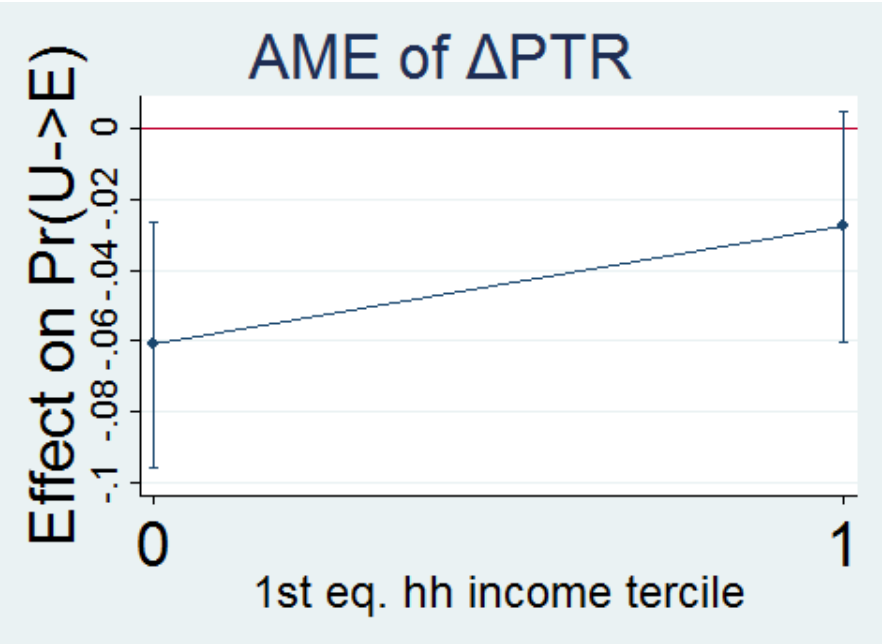
Results (selected): PTR

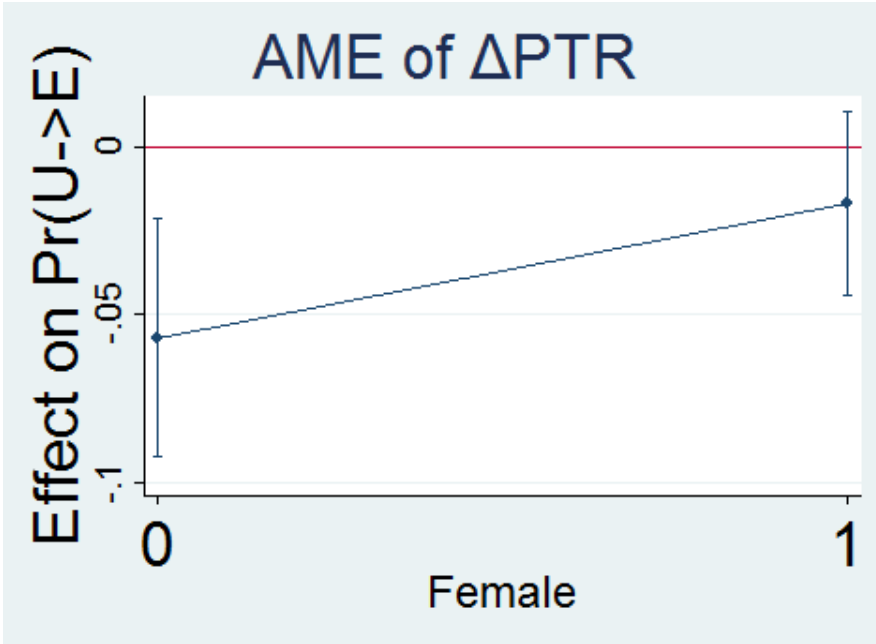
MODEL	(2)	(2)	(2)	(3)
	DV: U->E	DV: U->E	DV: U->E	DV: U->E
	logit	logit	logit	ivprobit
VARIABLES	odds	AME (contrasts)	AME (levels)	AME
Change in PTR (10 pp)	0.136***	-0.037**		-0.055
	[0.054 - 0.339]	[-0.061 - -0.013]		[-0.159 - 0.048]
Change in PTR * U whole previous year = 0	1.000		-0.078***	Omitted
	[1.000 - 1.000]		[-0.120 - -0.036]	
Change in PTR * U whole previous year = 1	1.761	0.061**	-0.017	
	[0.886 - 3.503]	[0.013,0.109]	[-0.046 - 0.012]	
Change in PTR * Female = 0	1.000		-0.057***	
	[1.000 - 1.000]		[-0.093 - -0.021]	
Change in PTR * Female = 1	1.927	0.040	-0.017	
	[0.955 - 3.886]	[-0.000,0.081]	[-0.044 - 0.011]	
Change in PTR * 1st eq. hh inc. tercile = 0	1.000		-0.061***	
	[1.000 - 1.000]		[-0.096 - -0.026]	
Change in PTR * 1st eq. hh inc. tercile = 1	1.611	0.033	-0.028	
	[0.656 - 3.954]	[-0.017,0.083]	[-0.060 - 0.005]	
Change in IV2 log eq. hh income (€ 2012)				-0.156
				[-1.271 - 0.958]
Baseline probability 9%				
Pseudo-R2	0.295			
N_sub	634	634	634	620

*** p<0.01 ** p<0.05 * p<0.1

Results: AME of ΔPTR by categories ("interactions")







Results (selected): EMTR

MODEL	(2)	(2)	(3)
	DV: hours change	DV: hours change	DV: hours change
VARIABLES	OLS	2SLS	2SLS
Change in observed/IV1 EMTR (10 pp)	1.638***	-2.297	-2.002
	[0.829 - 2.446]	[-6.452 - 1.859]	[-5.912 - 1.907]
Female	Omitted	-2.137***	Omitted
		[-2.710 - -1.565]	
1st eq. hh income tercile		-1.197**	
		[-2.020 - -0.374]	
20-35		1.353***	
		[0.692 - 2.013]	
50-64		-1.358***	
		[-1.829 - -0.887]	
Hours tercile = 1		1.725***	
		[1.056 - 2.394]	
Hours tercile = 3		-2.122***	
		[-2.612 - -1.632]	
Change in IV1 log eq. hh income (Euro 2012)			-1.362
			[-3.338 - 0.614]
R-squared	0.117	0.053	0.054
Adjusted-R2	0.109	0.044	0.044

*** p<0.01 ** p<0.05 * p<0.1, ref: 35-50, WA, 2nd hrs. tercile

Conclusion

- Main result in the extensive margin in the same direction as in the literature but larger. For an increase in PTRs of 10pp:

  Mine: -3.7 pp effect on prob. (baseline prob. 9%)

  Bartels & Pestel (2016)/Germany: ≈-1 pp

- To increase benefits for LTU while not reducing the likelihood of some groups taking up work, in-work benefits would be necessary (or other policies). There might be some room to raise the progressivity of in-work benefits to compensate for surges in expenditure.

- Next step: FE for groups defined by main policy changes
  - UB type (single, head, cohabitee)
  - FTE gross earnings which define eligibility for SC rebate

- (main) Limitations and avenues for further research:
  - Not large policy variation and it decreased MTRs
  - Register (panel) data in combination with micro-simulation (and in-kind services data)
  - More countries with EUROMOD, specially those with large policy changes

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Thank you

Questions, comments and suggestions?

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Methodology A: measuring incentives with participation tax rates

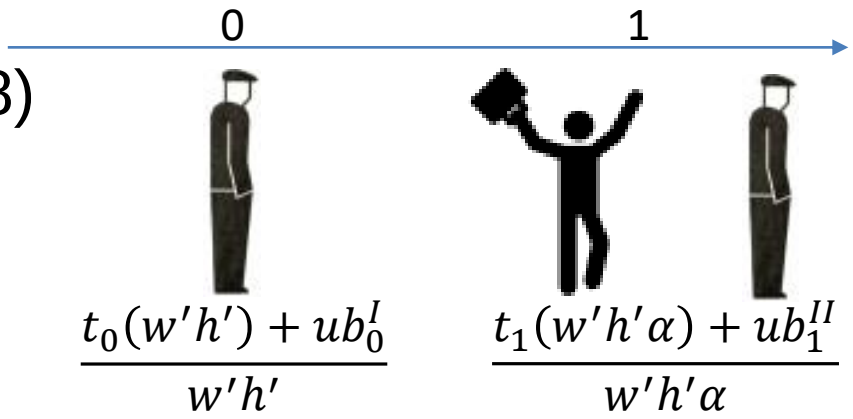
$$PTR_i = \frac{(hh\ (tax - ben)\ if\ i\ in\ work) + (hh\ (ben - tax)\ if\ i\ out\ of\ work)}{extra\ gross\ wage_i}$$

- Heckman wage model
- Matching most likely hours

(men 38h, women 20, 30 or 38)

- EUROMOD
- Separately for partners
- Using in 2nd year uprated
- earnings prediction from 1st year

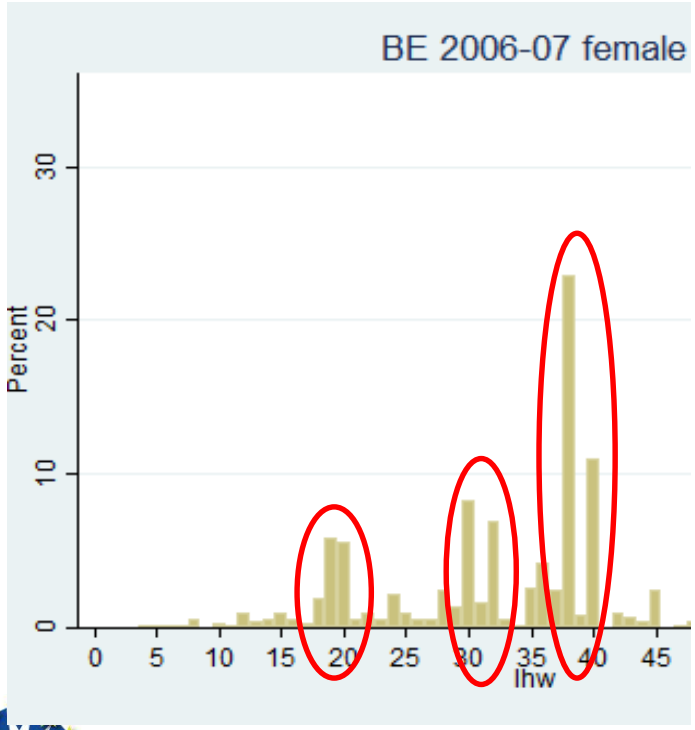
Eg:

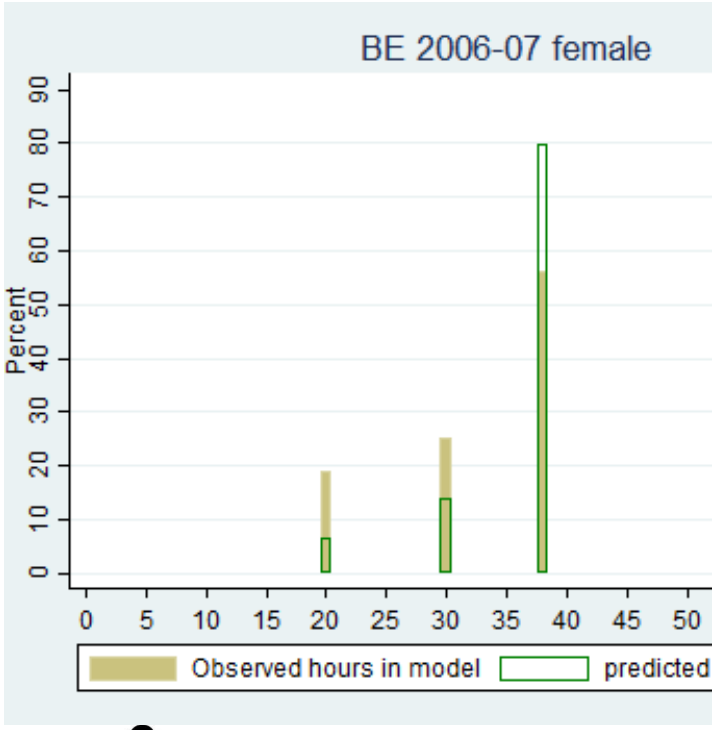


Methodology A: measuring incentives with participation tax rates

Matching most likely hours based on observables and highest predicted probability

- P(men [38,40]) > 50 % and for women:





Other limitations

- Hours declared at the moment of the survey might have changed in relation to yearly incomes
- PT and temporal UB are not simulated. No migration variable.
- No seniority variable to predict earnings. Nor scarring effects but it could be partially added.
- No error from predictions reduces variation in PTRs (adding random error from E people's variance assumes both variances are the same)
- (for recipients) month in U = months in UB, and other caveats of using EU-SILC (instead of BE-SILC)