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“Monetäre Weiterbildungserträge in Europa”

Institutional factors related to participation and
wage effects of job-related training

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Background and research question

- Job-related training & the skill driven transformation of work (Mayer, Solga 2008)
 - Synchronise LM needs and skills supplied by the workforce
 - Change in technology, product & service markets, demography ...
- Skill formation systems differ across countries
 - Training: access, volume, outcomes (share of productivity gains)
 - Basic pattern (OECD 2004, Brunello et al. 2007, Rubenson 2006 ...): Majority of job-related training is employer-provided, employees are willing to train, but not at their own cost
- What factors at the system level are related to cross-country differences in participation rates and wage effects?

Non-competitive models of training

- Empirical studies have challenged standard human capital theory (following Becker 1962)
 - Firms do invest in general skills (despite of poaching risks)
 - not (only) due to market imperfections (asymmetric info, credit market constraints), e.g. compressed wage structure stimulates firm investments
- Institutional arrangements related to welfare state regimes (Soskice 1999, Estevez-Abe et al. 2001)
 - Industrial relation systems (trade unions, minimum wages, taxes, social security systems, market competition and deregulation, labour protection, ...)
 - in relation to (secondary) schooling systems (general vs. specific skill regimes: signalling) and socioeconomic context, employment

Expected effects of industrial relation

- Unions, collective bargaining
 - Incentive for firms to invest due to compressed wage structure
 - Productivity gap (below minimum wage)
- Labour protection legislation
 - Incentive for firms because labour turnover is reduced (mobility costs)
 - New hires are more carefully selected (+/-)
- Competition and deregulation
 - Reduced participation and returns due to reduced rents
 - Increased: stimulation of innovation

Wage effects are high where participation is low (ECHP)

Existing evidence: heterogeneous effects

- Cross-country evidence is rare (Europe: only ECHP)
- Within - country effects of vocational training measures are heterogeneous according to individual characteristics and the particular form of training (LaLonde 1995, Pfeifer 2008, Wolter/Schiener 2009, Becker/Hecken 2005, Büchel/Pannenberg 2004)
 - Effects declines with age (in line with HC)
 - Lower effects for women, migrants
 - Higher/lower effects for the highest qualification levels
 - Employer initiated/financed training (during paid working hours), certified training, ...?

Estimating training effects: selection bias

- Selection into job-related training is not random
 - Participants differ from non-part. in observed and often in unobserved characteristics that are both related to training and income
 - Estimating without controlling for the bias might result in overestimation
- Techniques to adjust/reduce for the bias
 - Multivariate regression models
 - „Fixed-effects“ / „Fixed-Growth“-models / IV
 - **Matching**

Matching: Potential Outcome Framework

- Average treatment effect for the treated: difference between observed outcome and its counterfactual

$$ATT = E[Y^1 - Y^0 | T=1]$$

- When treatment assignment is not random, further assumptions are needed to estimate unobserved „potential outcome “: $E[Y^0 | T=1]$

- Ignorability of treatment assignment: conditional on observable covariates X , assignment is unconfounded when overlap exists

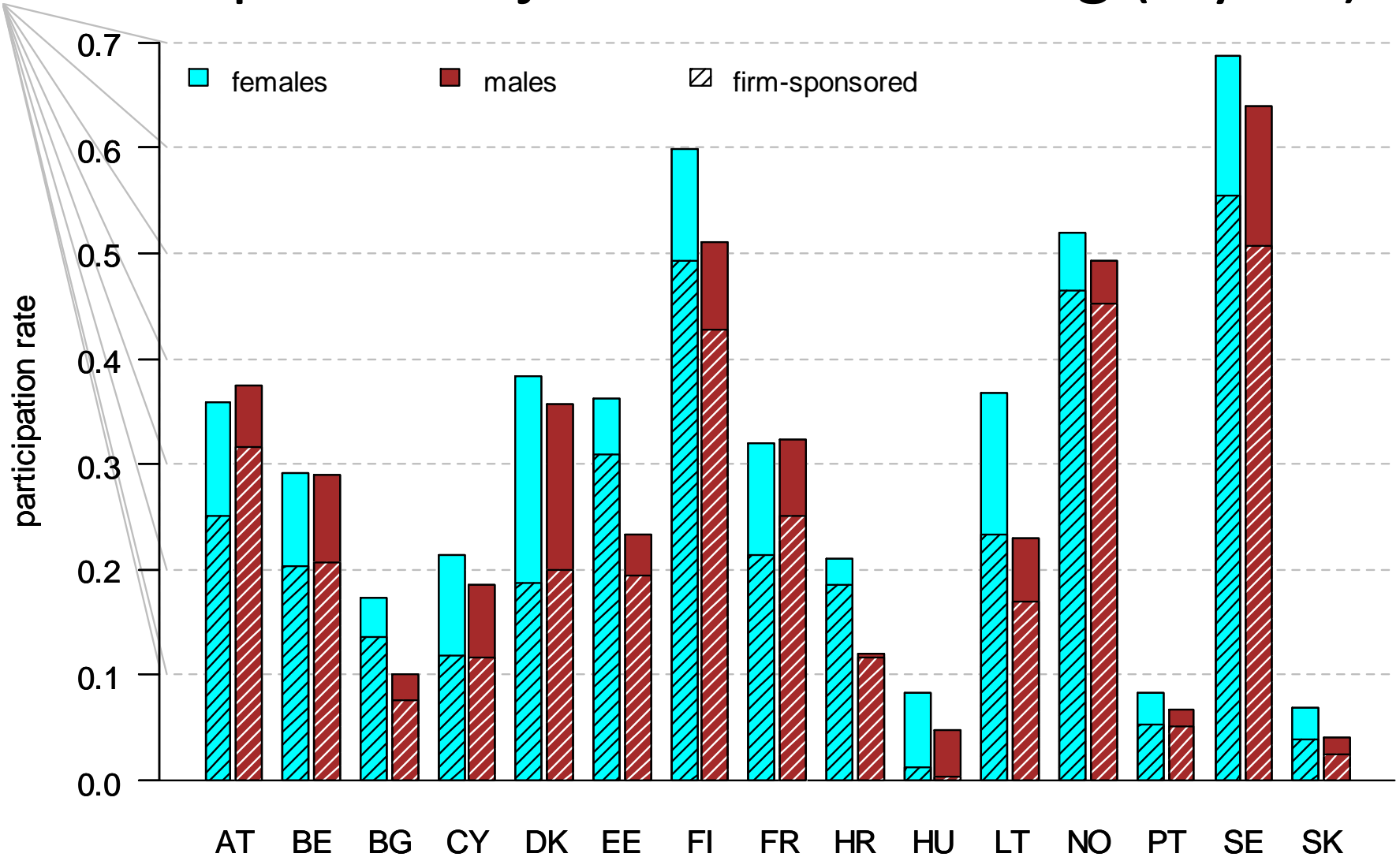
$$E[Y^0 | T=1, X] = E[Y^0 | T=0, X]$$

- What if treatment assignment is nonignorable?
 - Reducing selection bias through matching
 - sensitivity analysis to assess influence of hidden bias

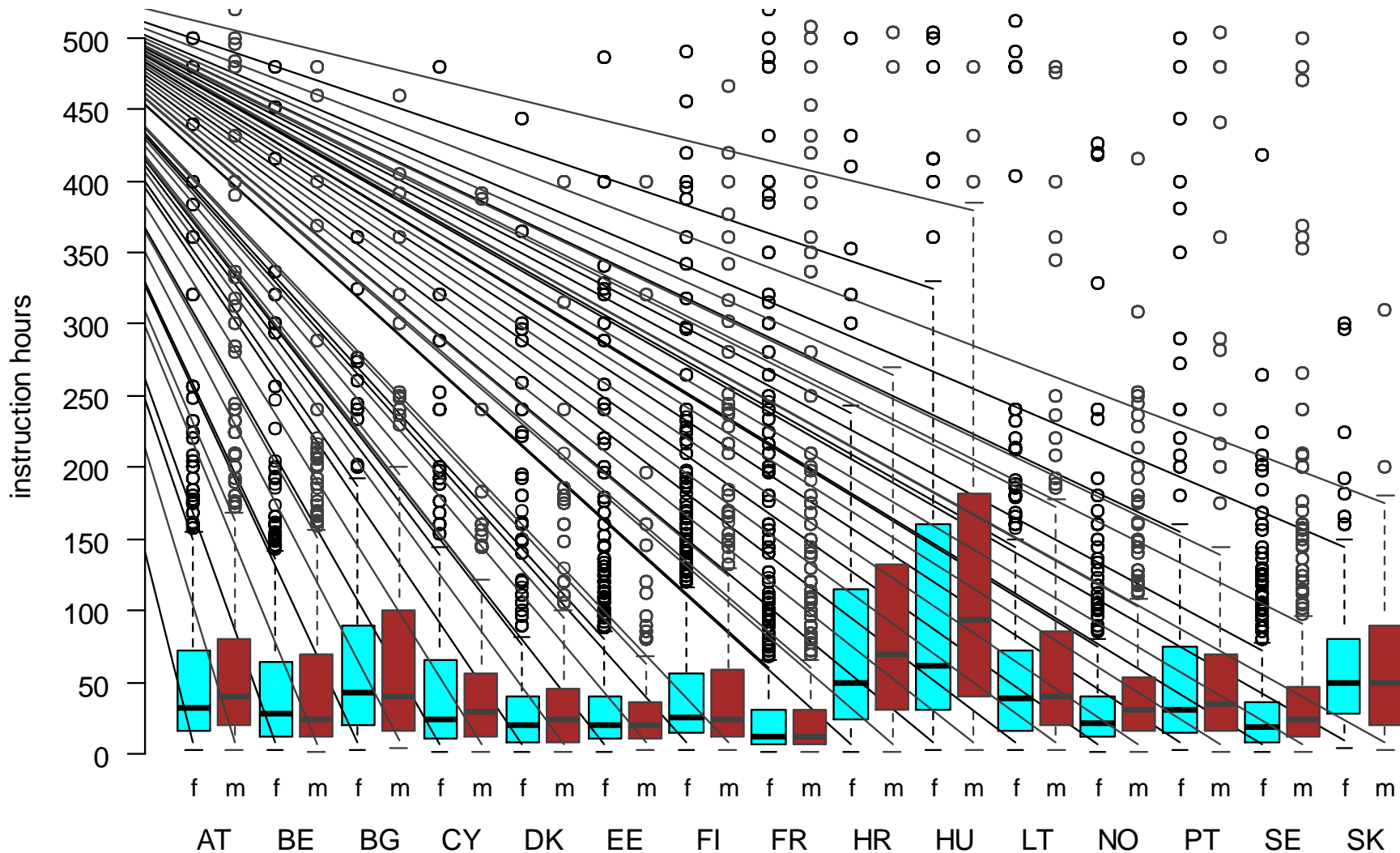
Data

- Part. and wage effects: AES (Adult Education Survey 2005-2007)
 - Stand alone survey: increased comparability of ET and background characteristics
 - Target population: employed persons aged 25 – 64, not in army (NACE), not in formal education, 2 years out of formal education
 - Dependent variable: ordinal number of income quintile (1:5)
 - Treatment: participation in job-related training within 12 month
 - Individual characteristics: gender, age, formal education (level + field), potential experience, migration (country of birth, citizenship), mothertongue, location of residence
 - Occupation before training: status, ISEI, contract
 - Current firm characteristics: industry (NACE), size, parttime
- Country level: Eurostat (LFS, SILC,...), OECD (labour cost,...), worker participation.eu

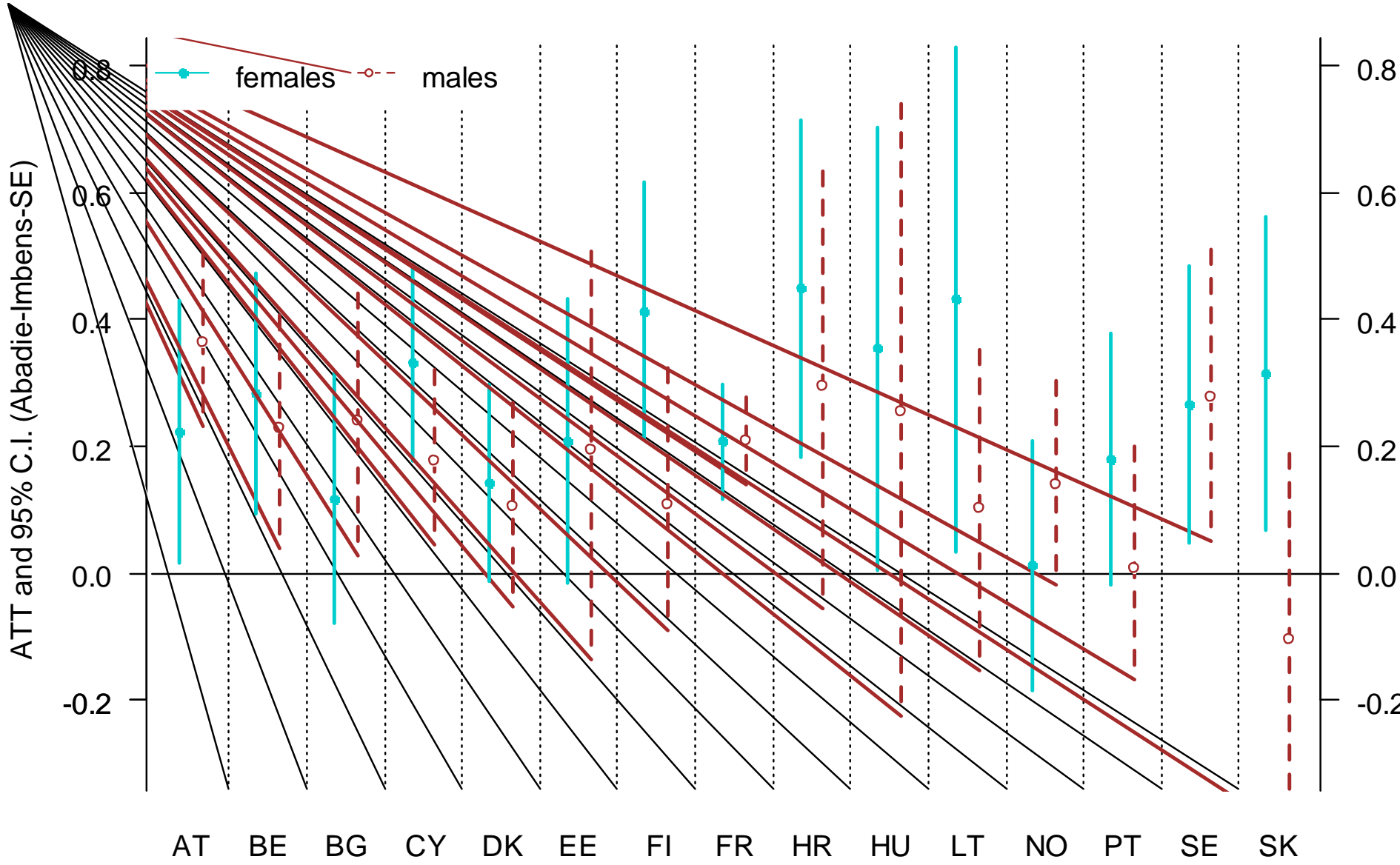
Participation in job-related training (1 year)



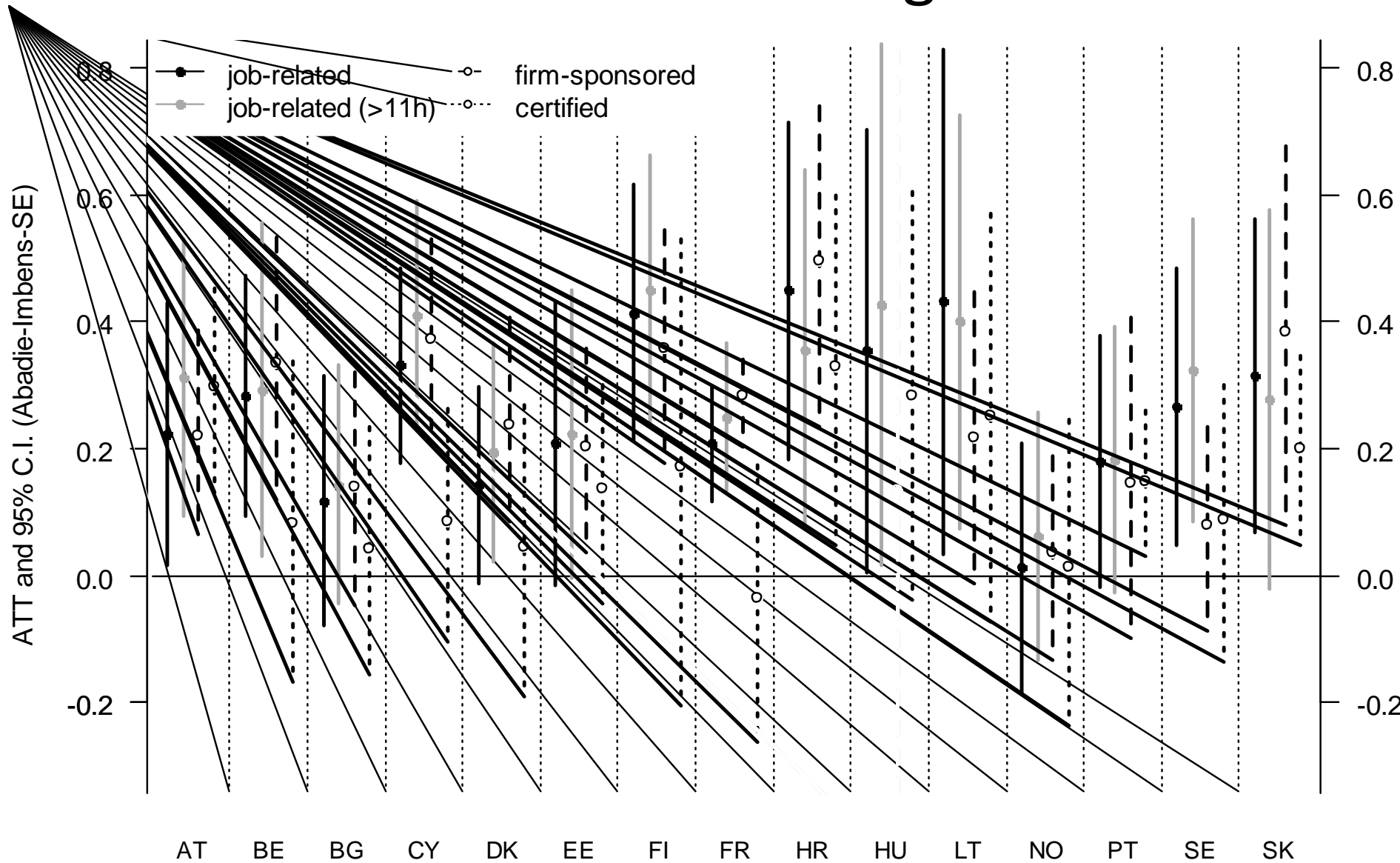
Instruction hours (job-related t.)



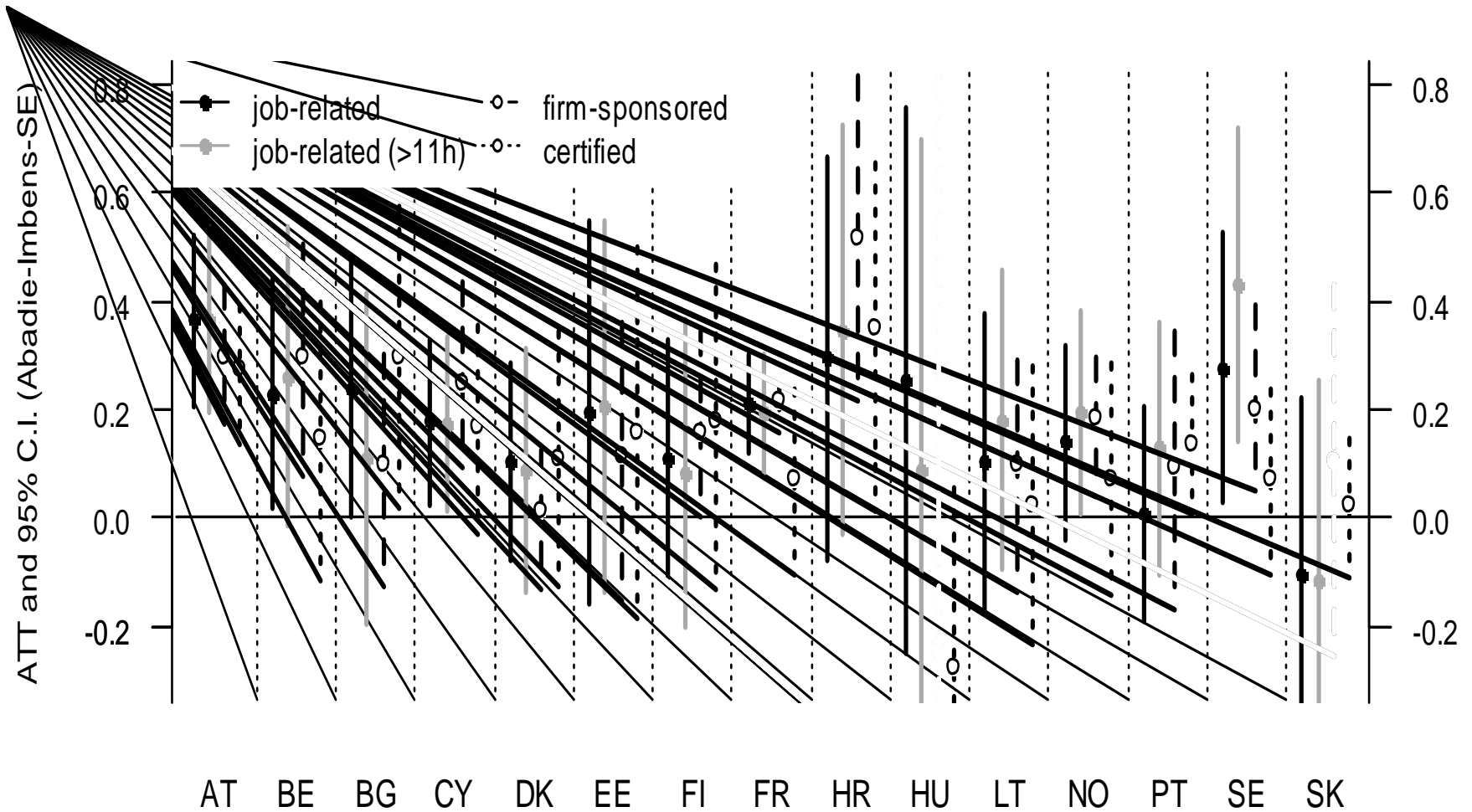
Effect of job-related training on income level



Different forms of training: females



Different forms of training: males

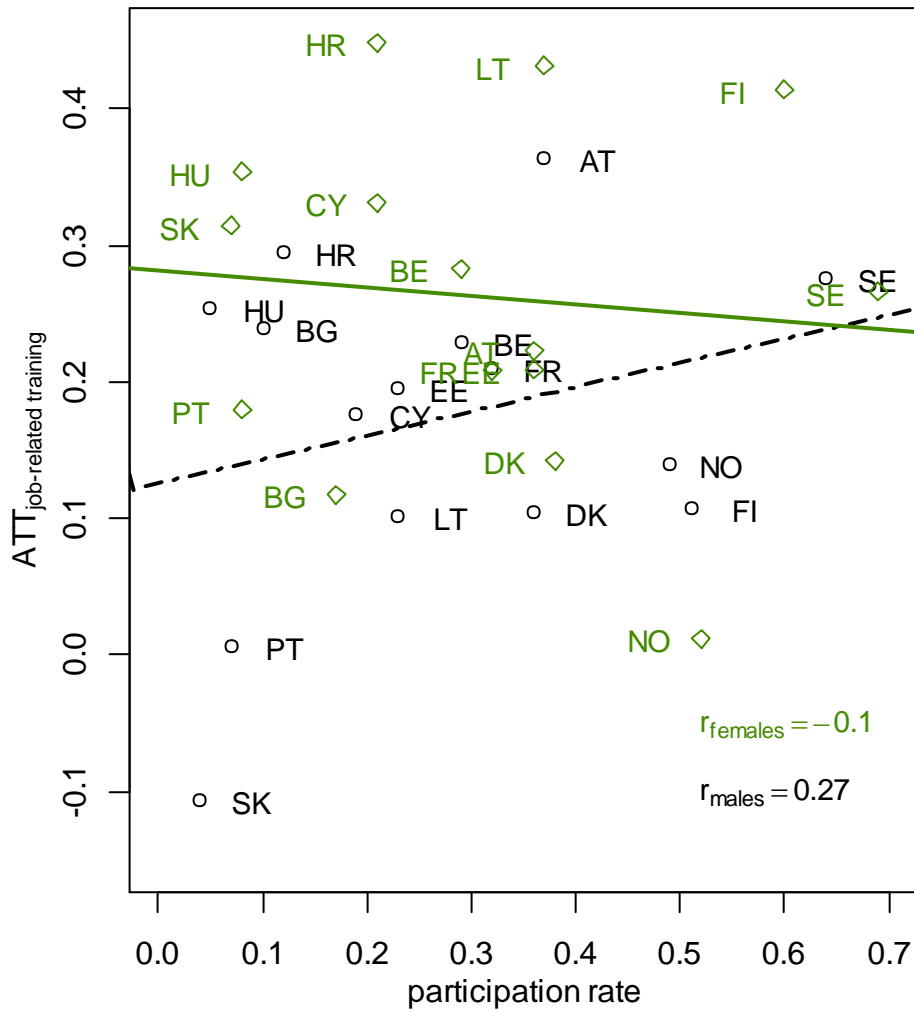


ATT – income effects for the trained

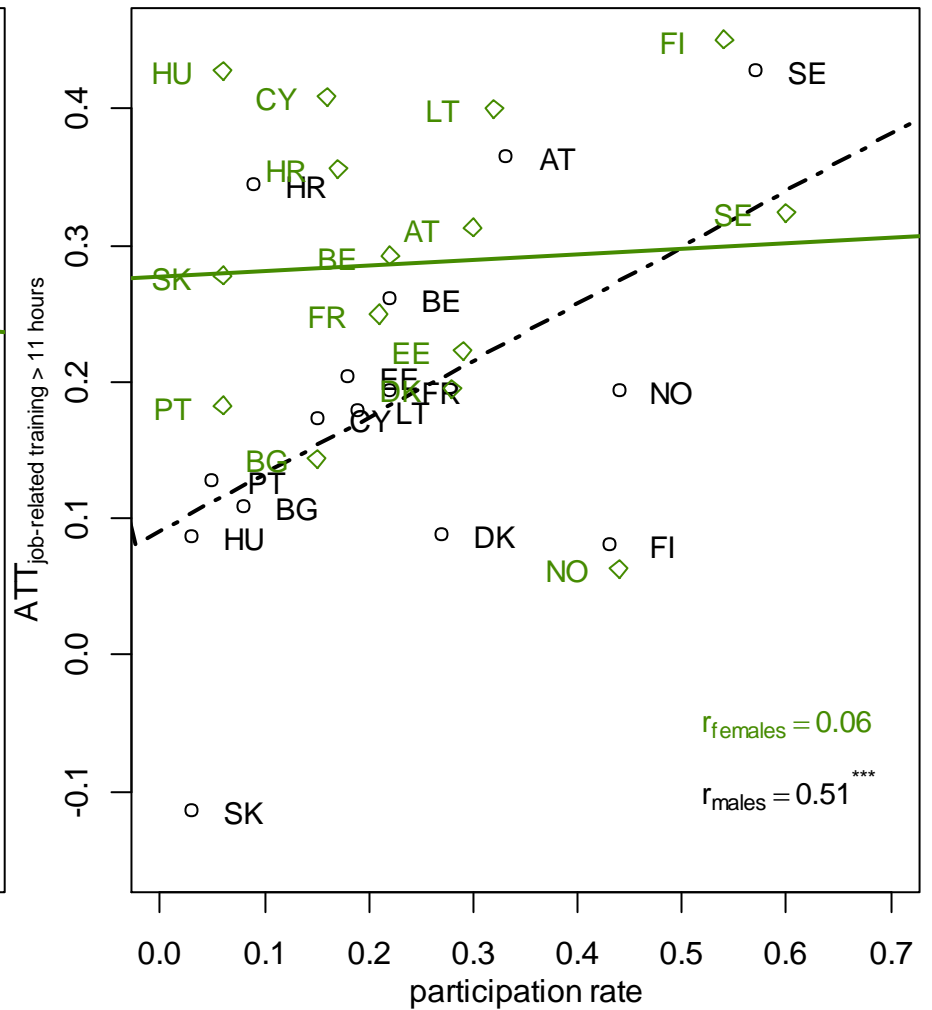
- Job-related training: positive estimates for females and males in almost all cnt
- Significant at robust SE, (normal SE), **rel. low sensitivity to hidden bias**
females: AT, BE, (BG), CY, (DK), FI, FR, HR, HU, (PT), LT, SE, SK;
males: AT, BE, BG, CY, (FI), FR, (HR), (NO), SE
- Sex: Higher effects for women (except AT)
- Forms: (slightly) higher effects of longer (>11 hours) and firm-sponsored tr., lower FX of certified (females), males mixed
- Education and age groups (f+m): different patterns across countries

ATT and participation rates

Job-related training

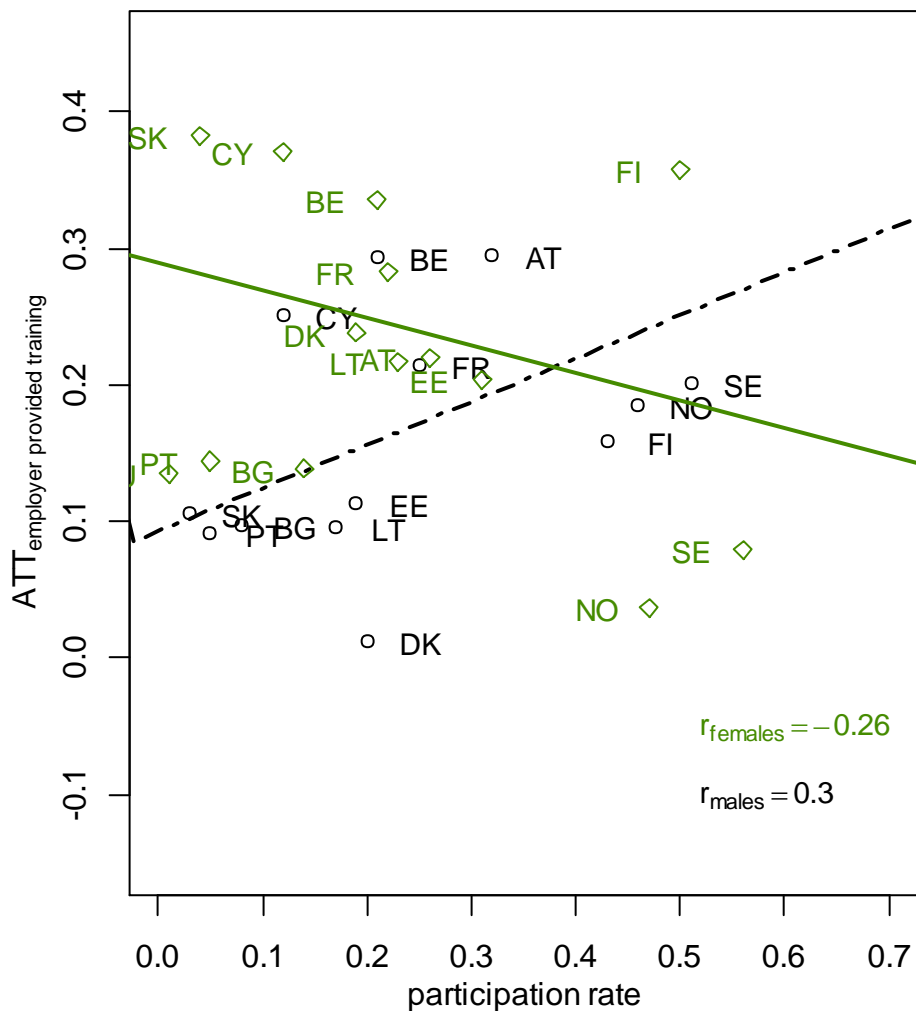


Job-related training > 11 instr. hours

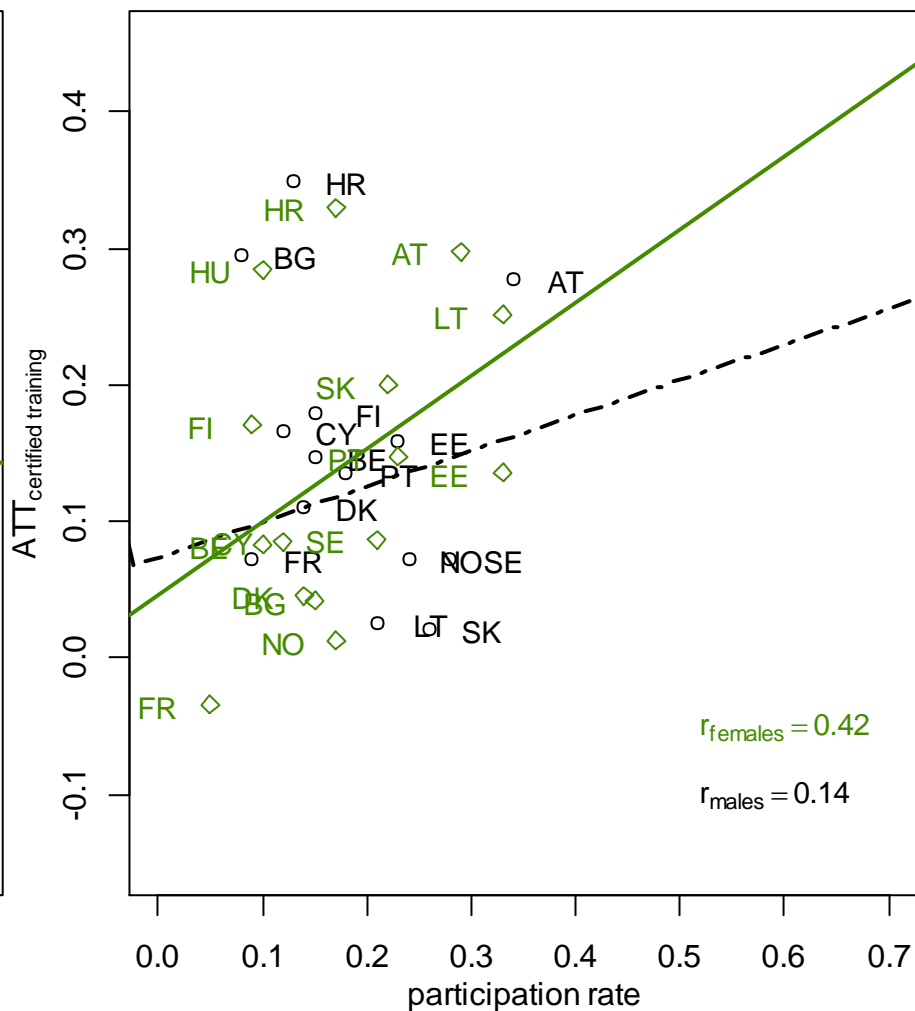


ATT and participation rates

Employer provided training



Certified training

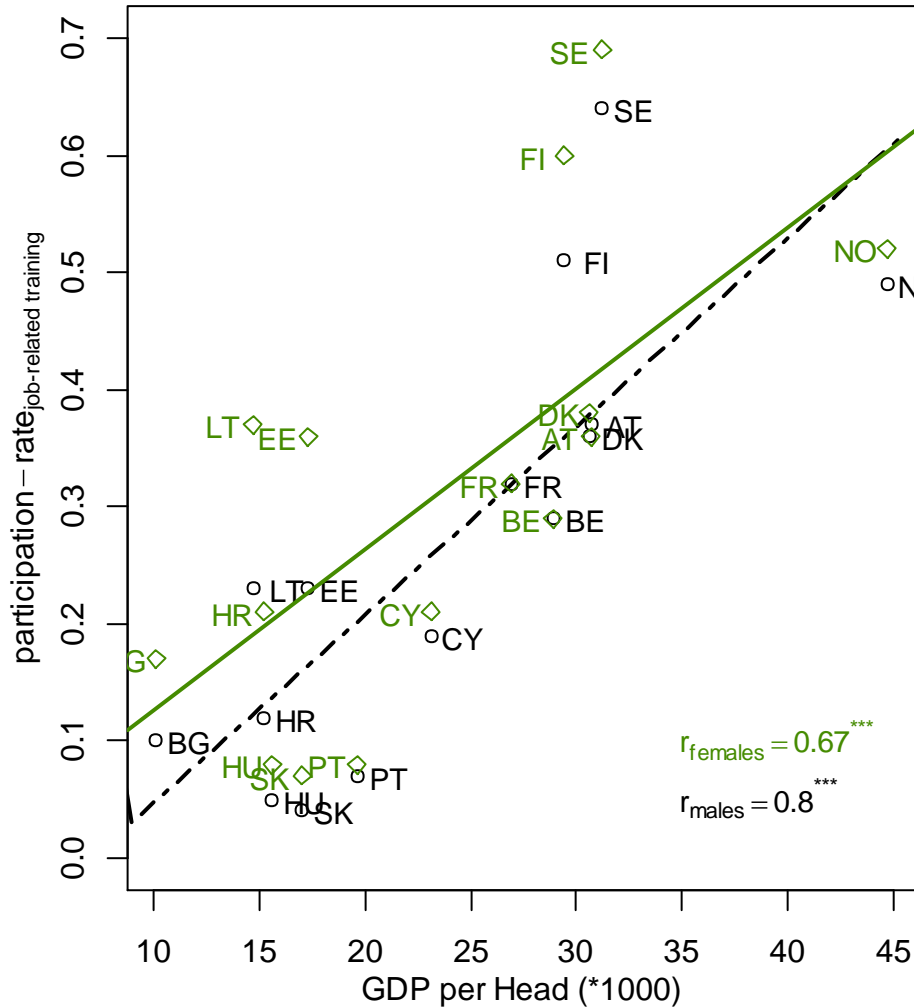


System factors, participation and ATT

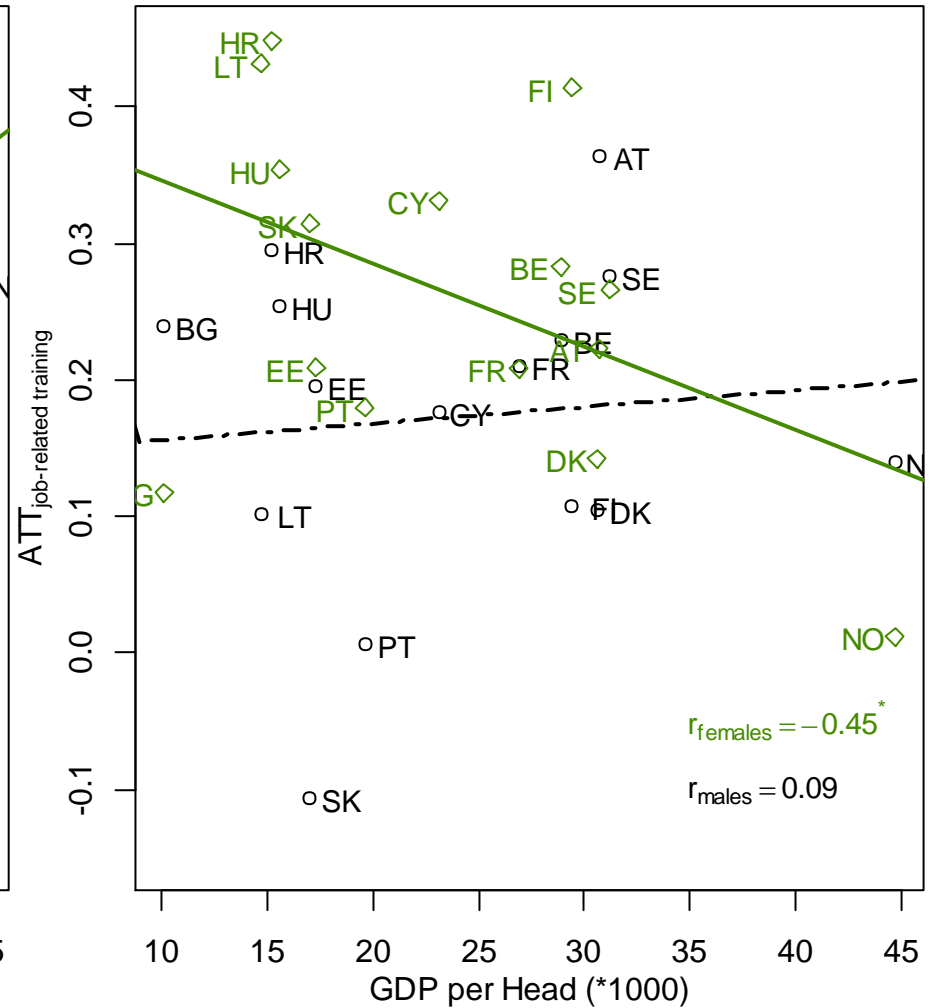
- Economic context, investment in human resources
 - GDP, R&D expenditure, private expenditure on education, ER & UR
- Industrial relations
 - LF exit age, Unionisation, bargaining, employment protection legislation, competition and deregulation
- Social condition
 - Social protection, economic strain, poverty risk, health
- Schooling system
 - Skill formation system (signalling), (vocational education, participation in education, quality of educational institutions)

National wealth: GDP per capita

Participation rates

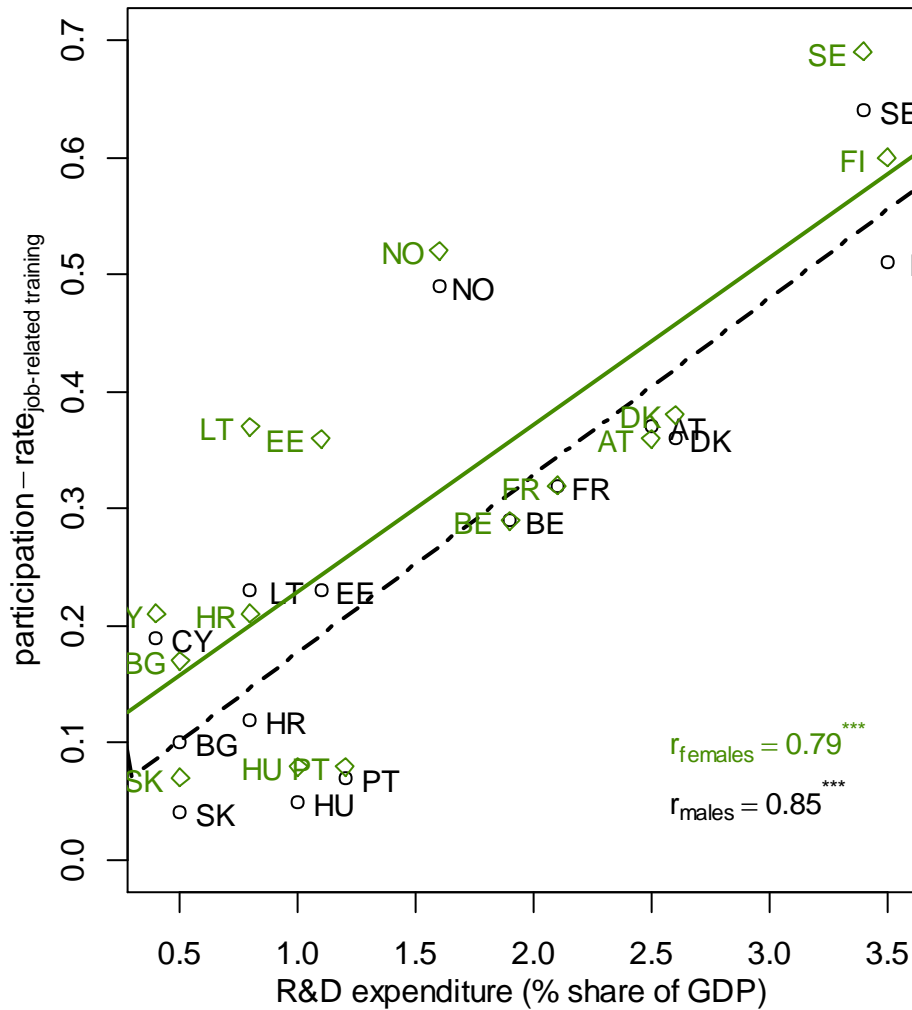


Income effects (ATT)

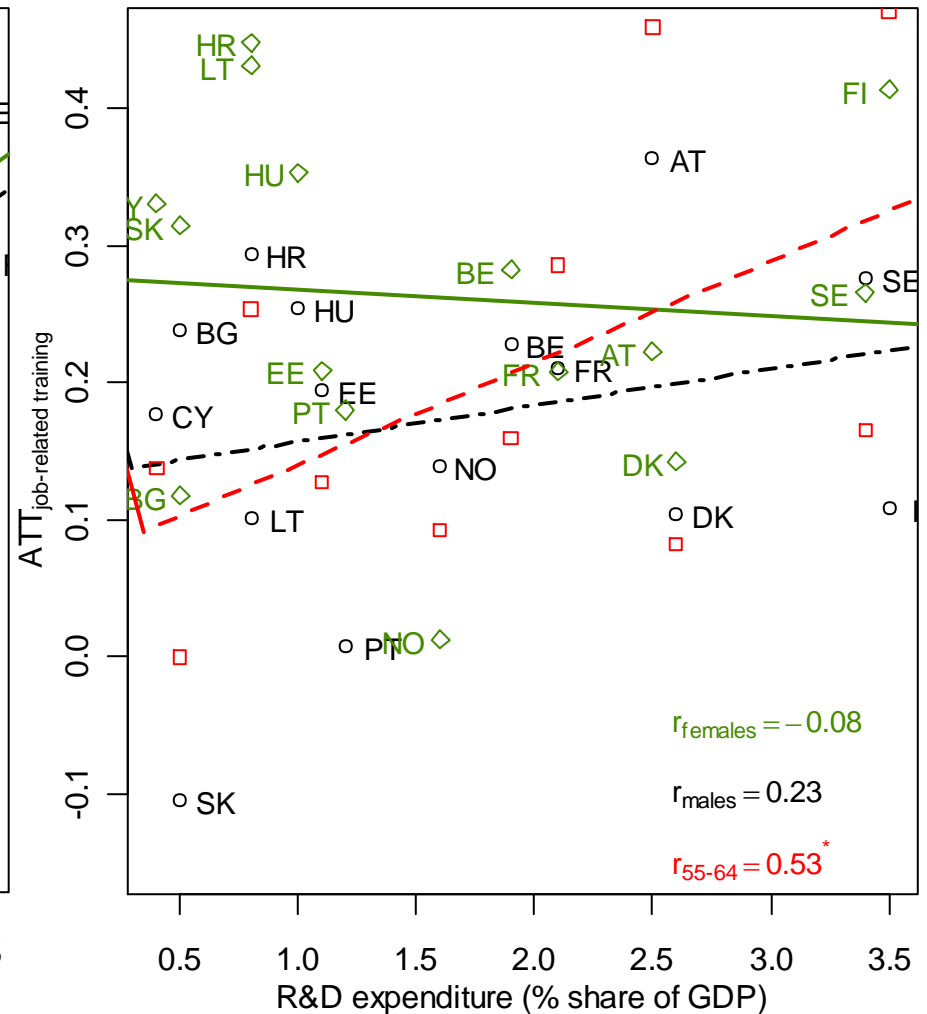


R&D expenditure (% share of GDP)

Participation rates

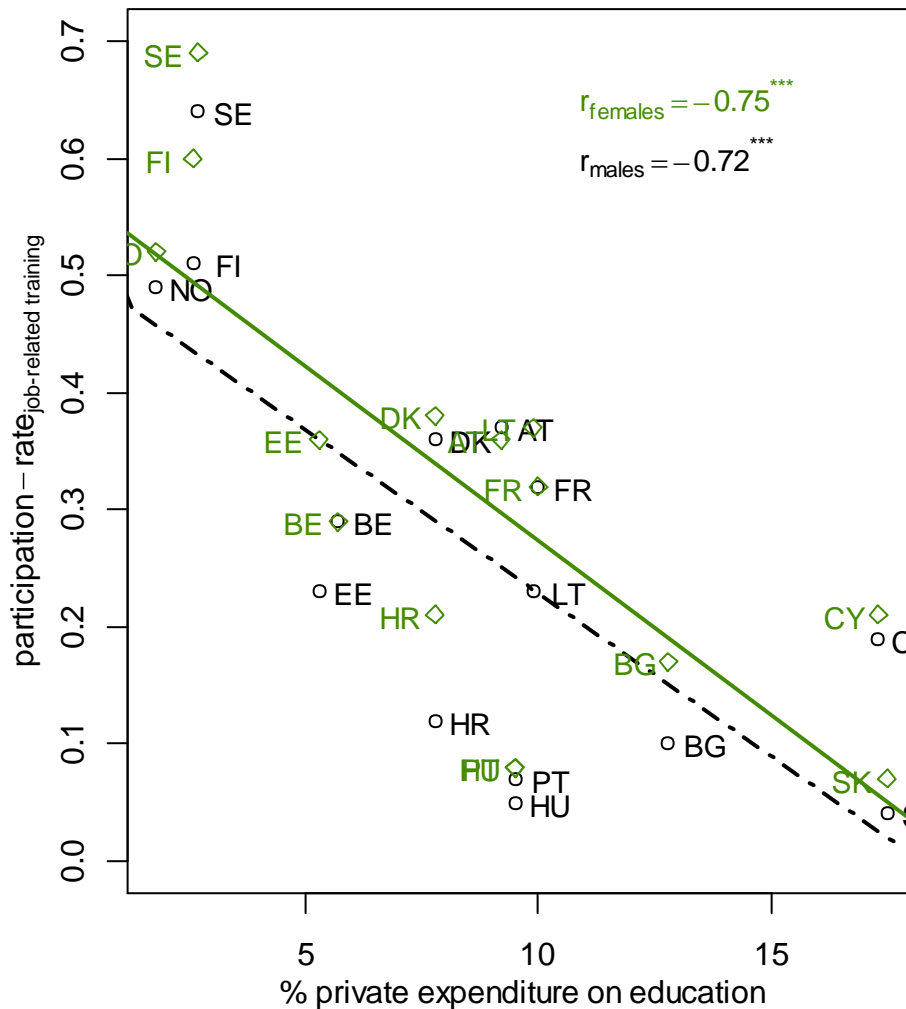


Income effects (ATT)

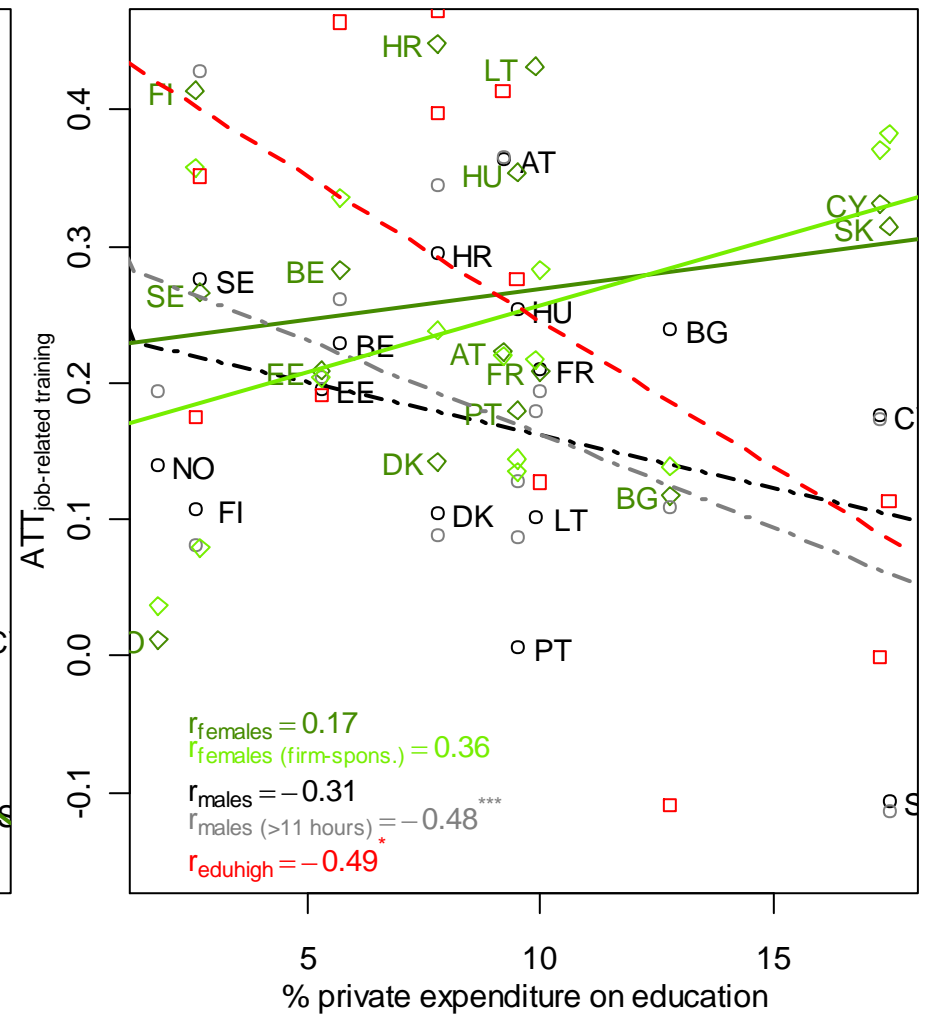


Private expenditure on education institutions (% of private and public sources)

Participation rates

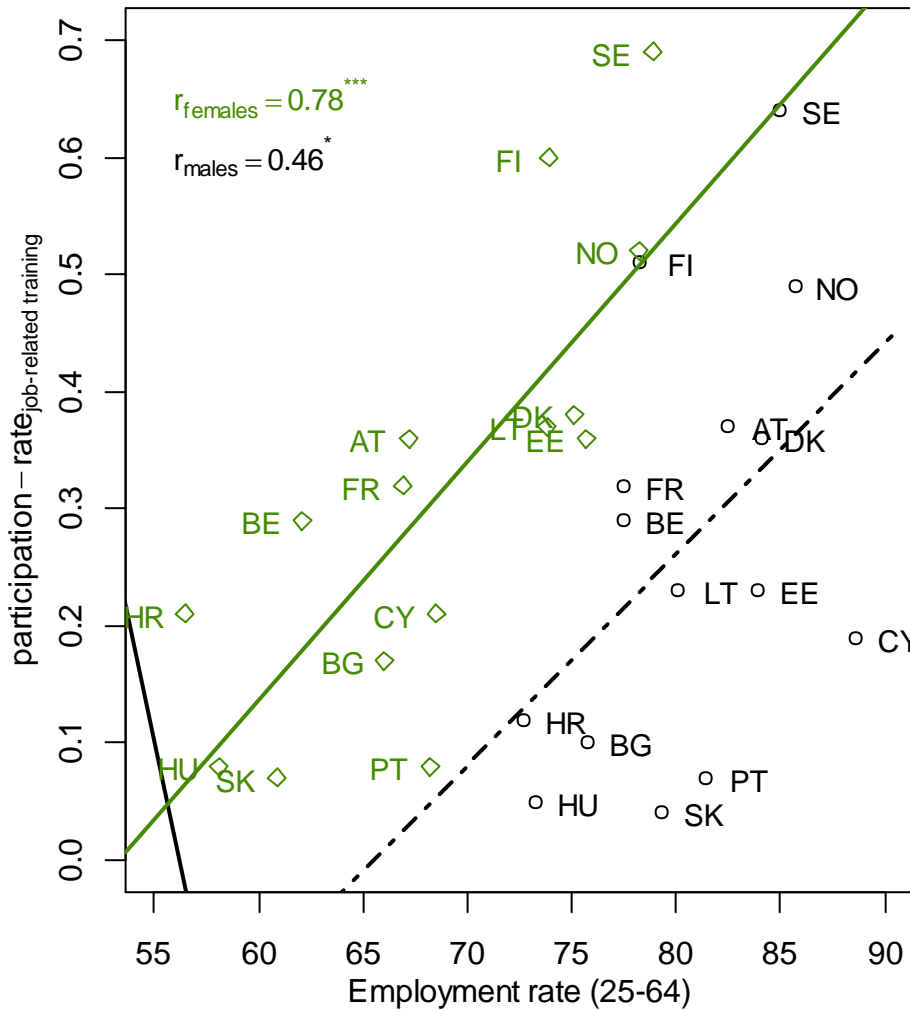


Income effects (ATT)

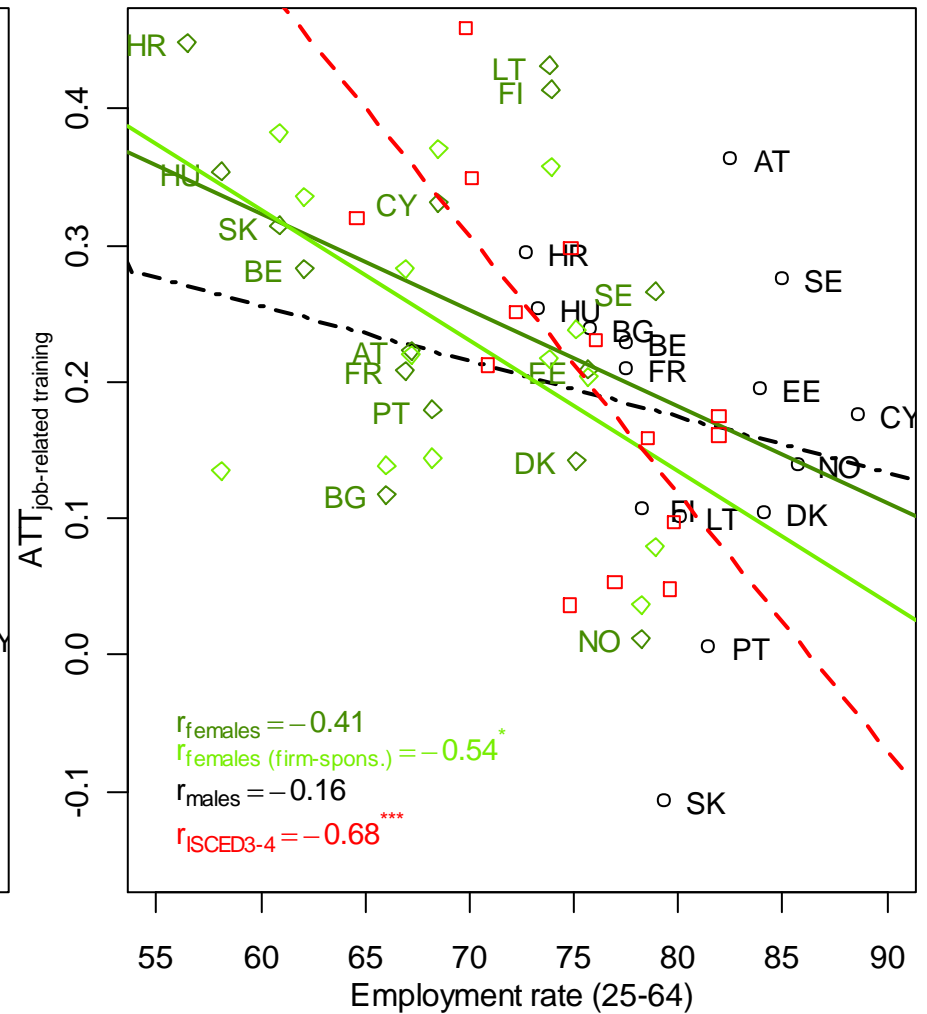


Employment rate (25-64)

Participation rates

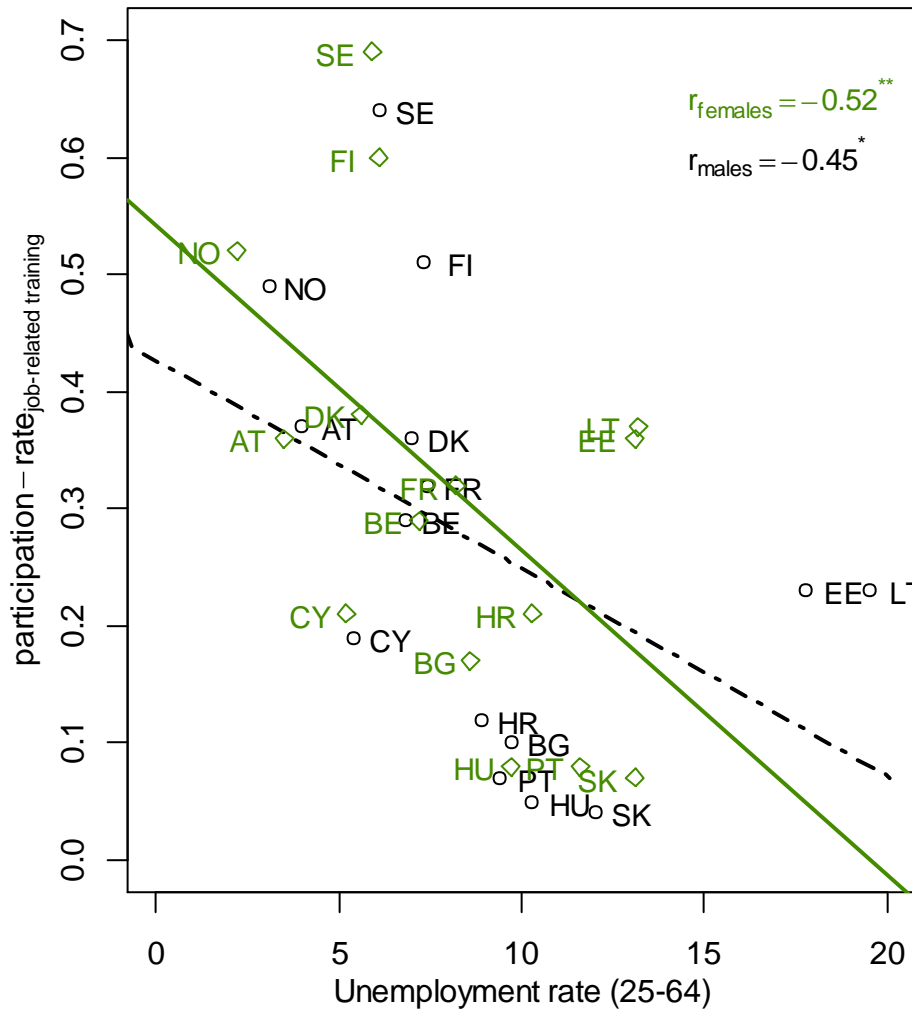


Income effects (ATT)

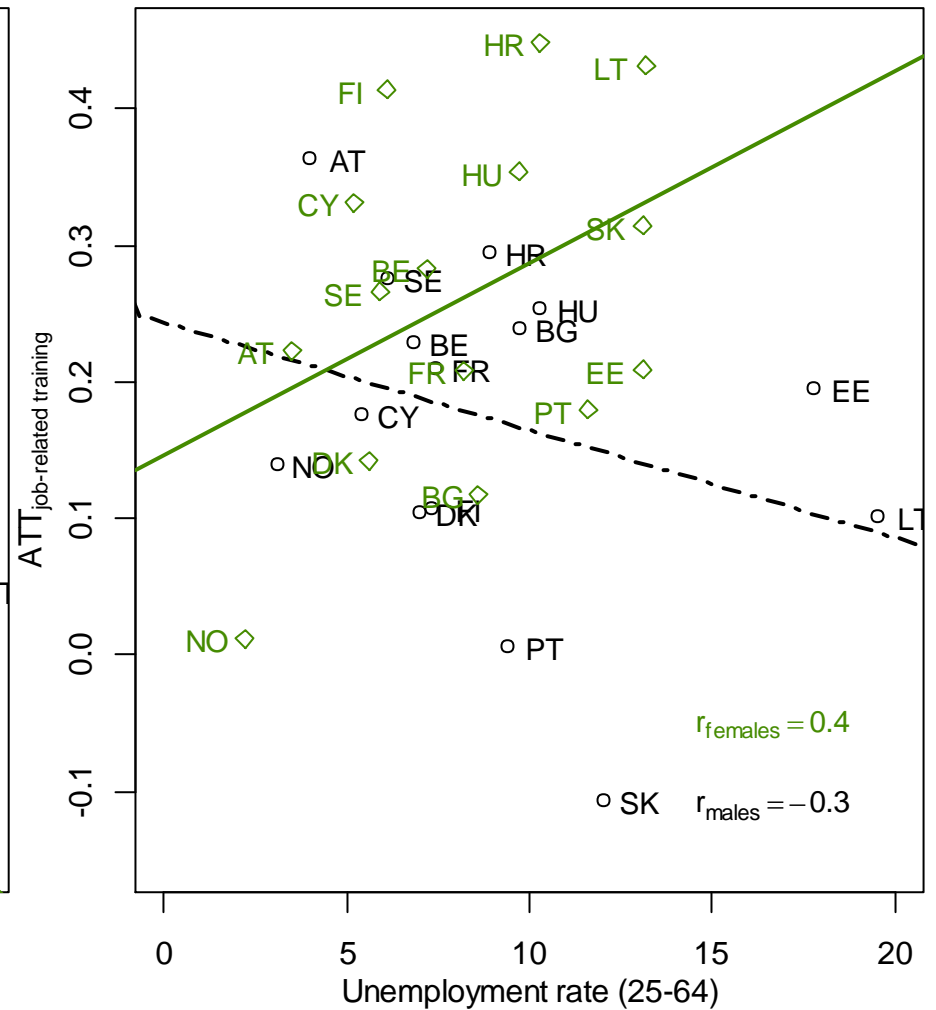


Unemployment rate (25-64)

Participation rates



Income effects (ATT)

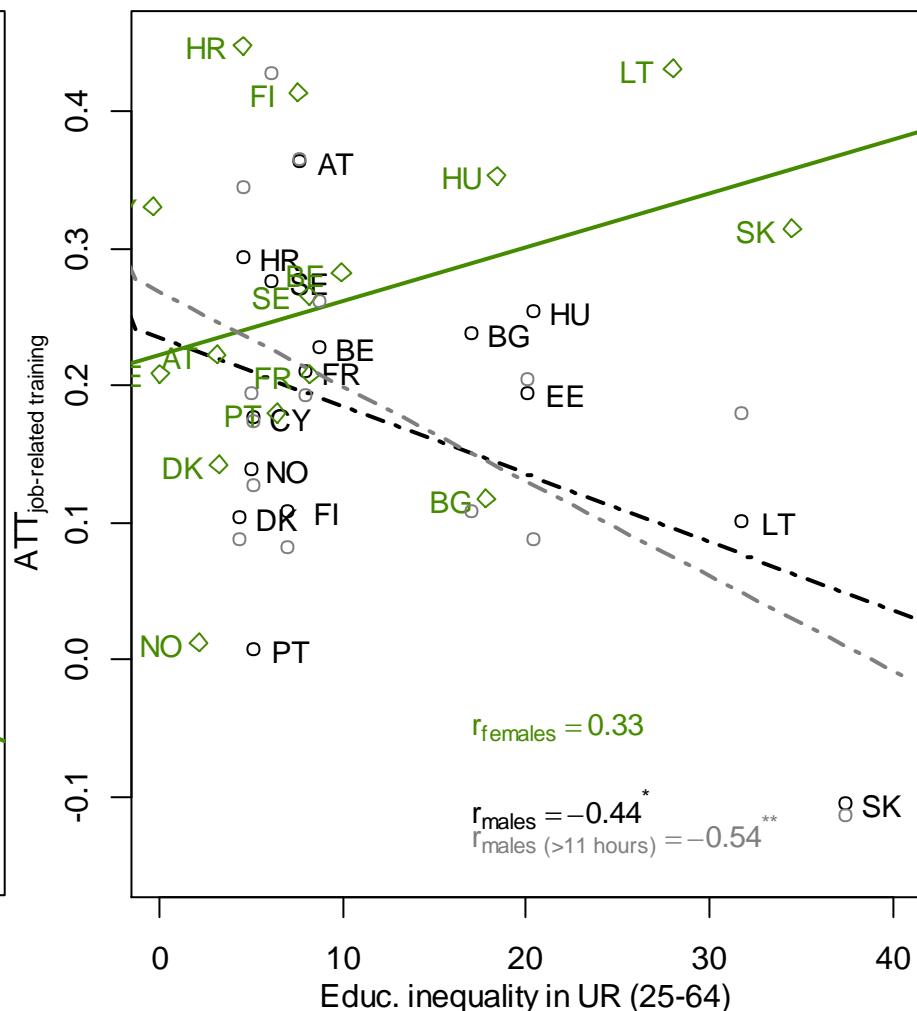
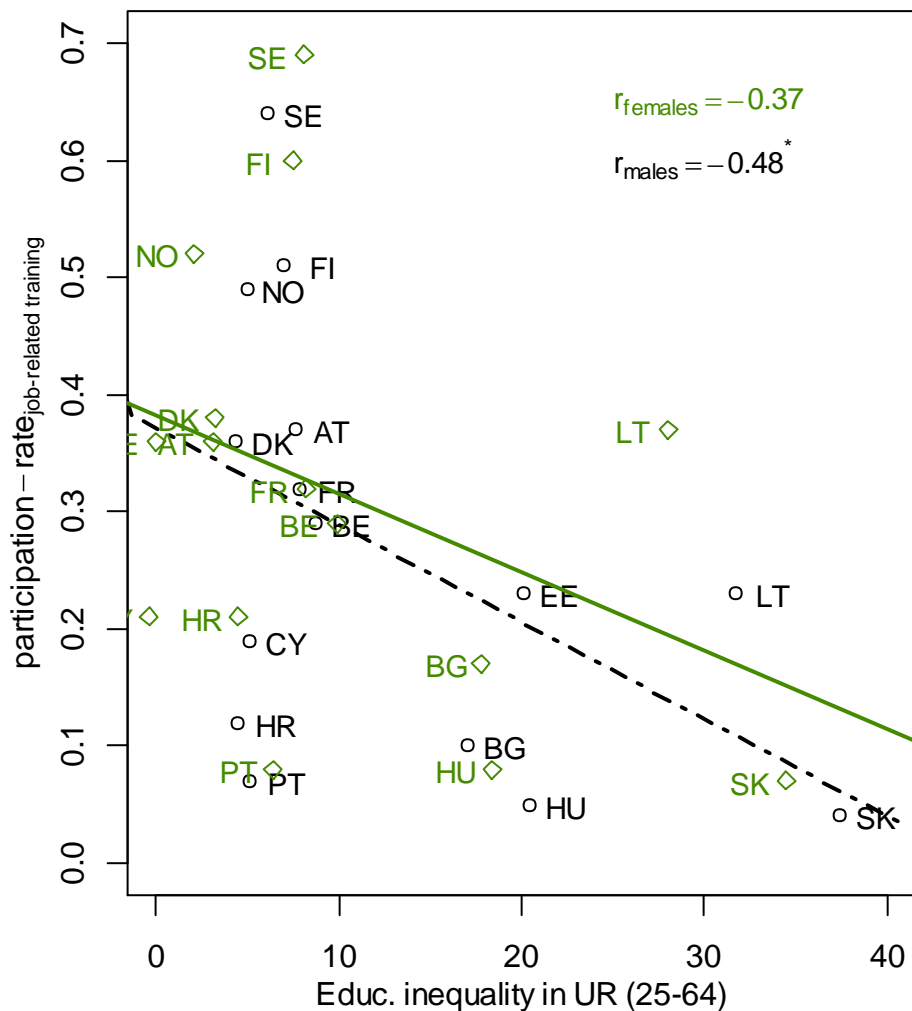


Educational inequality in UR (25-64)

$$(UR_{\text{ISCED0-2}} - UR_{\text{ISCED5-6}})$$

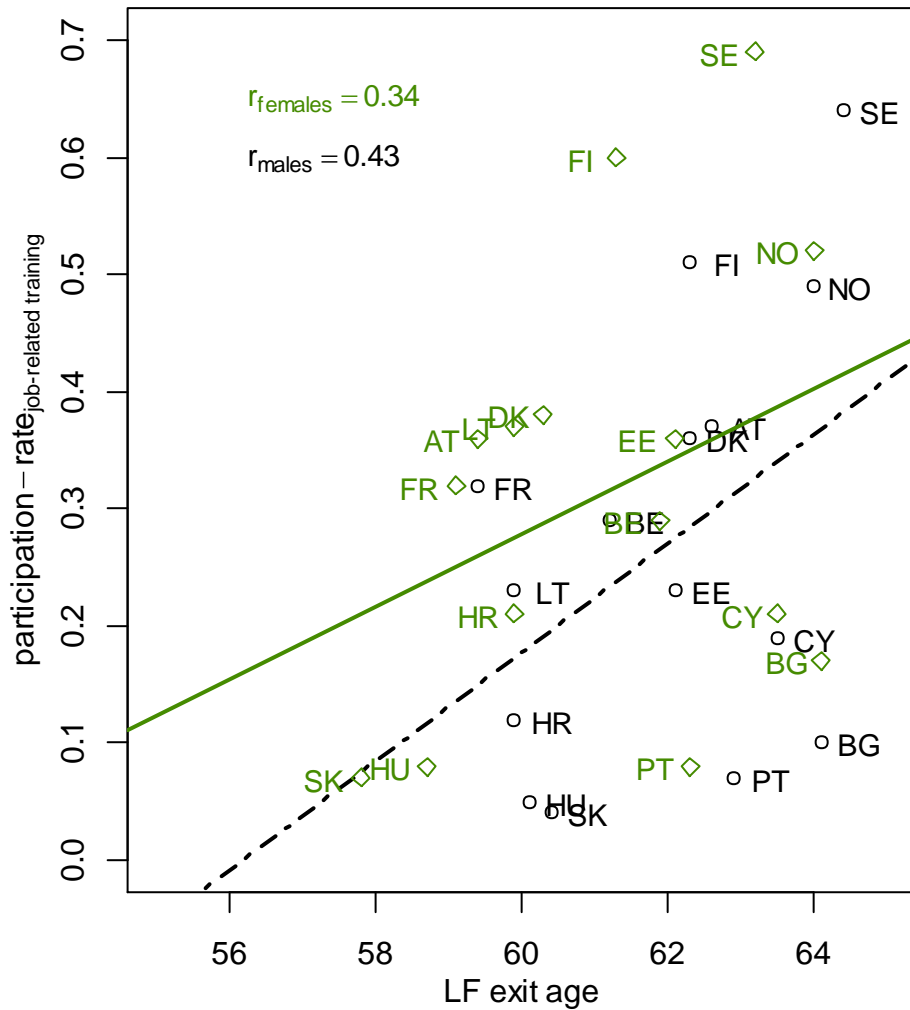
Participation rates

Income effects (ATT)

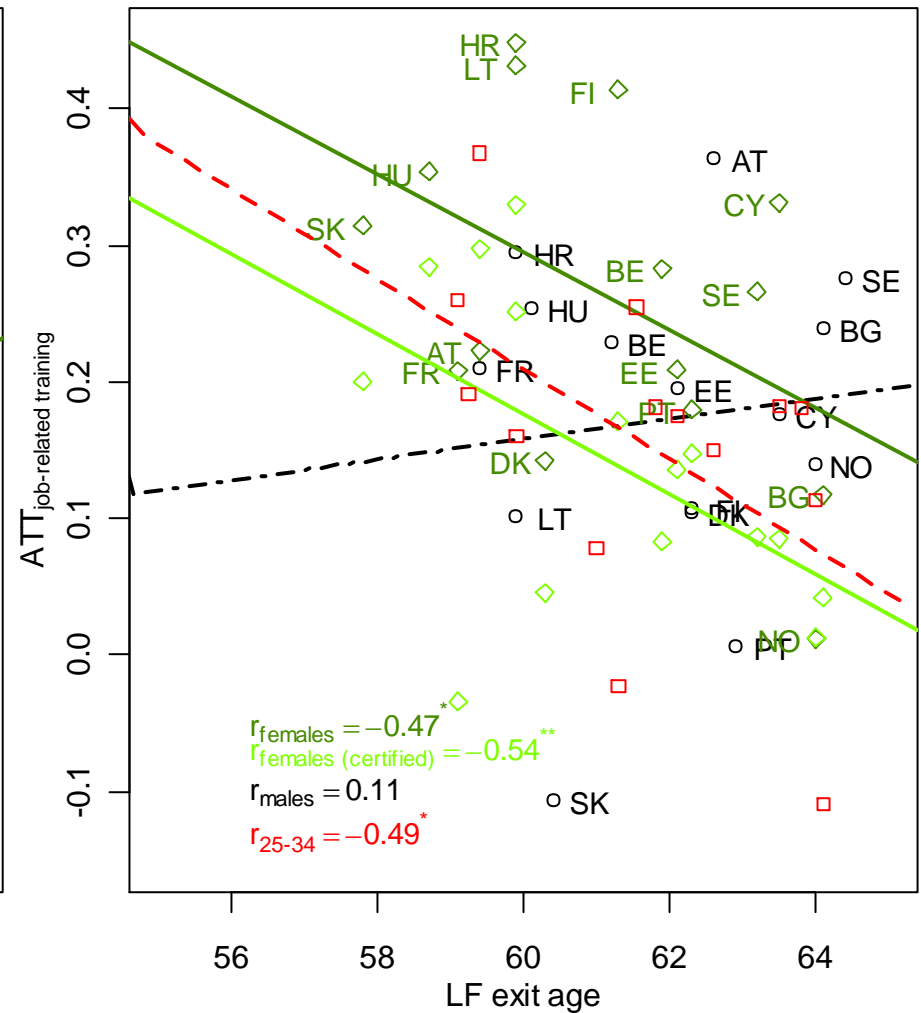


Average Labour force exit age

Participation rates

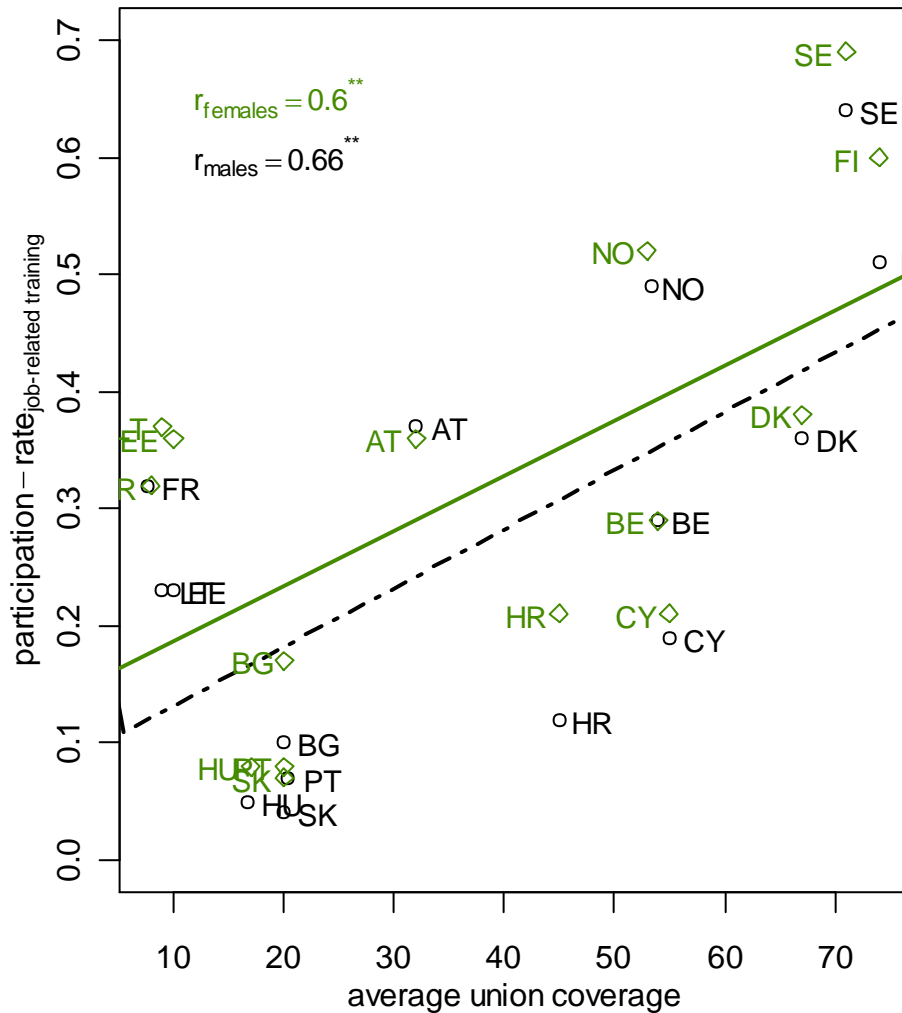


Income effects (ATT)

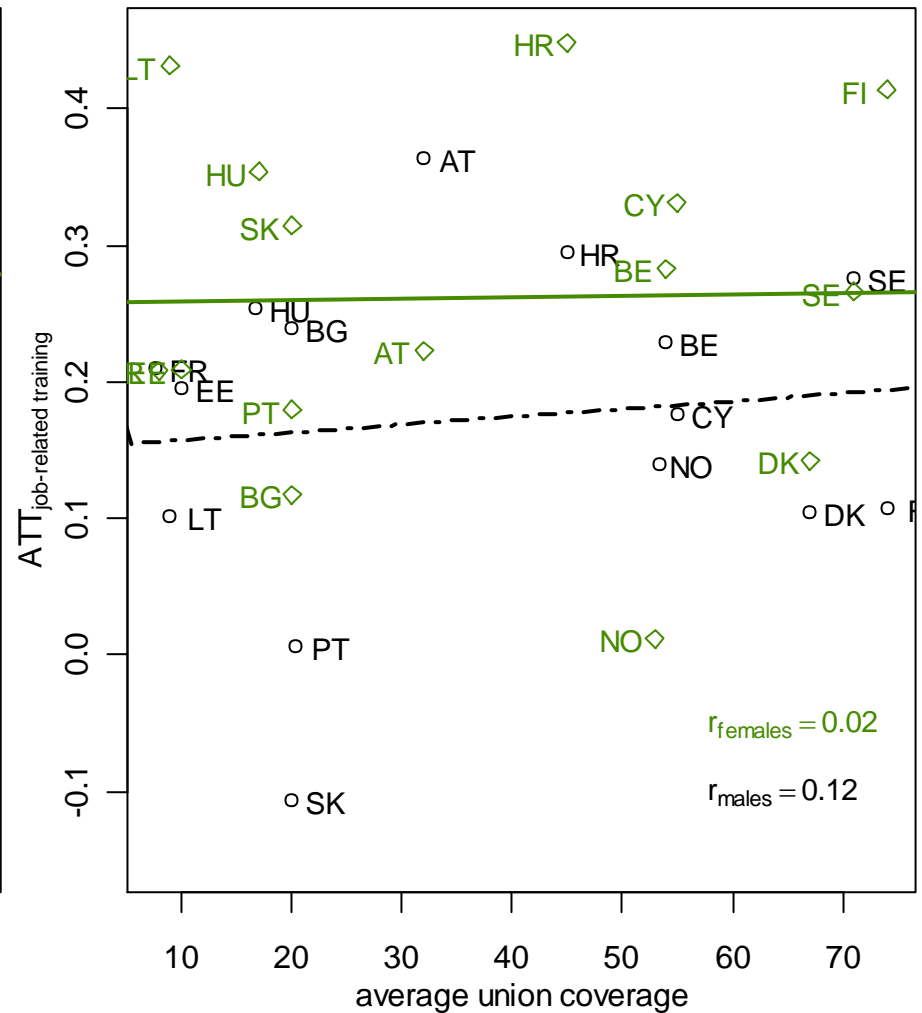


Union coverage

Participation rates

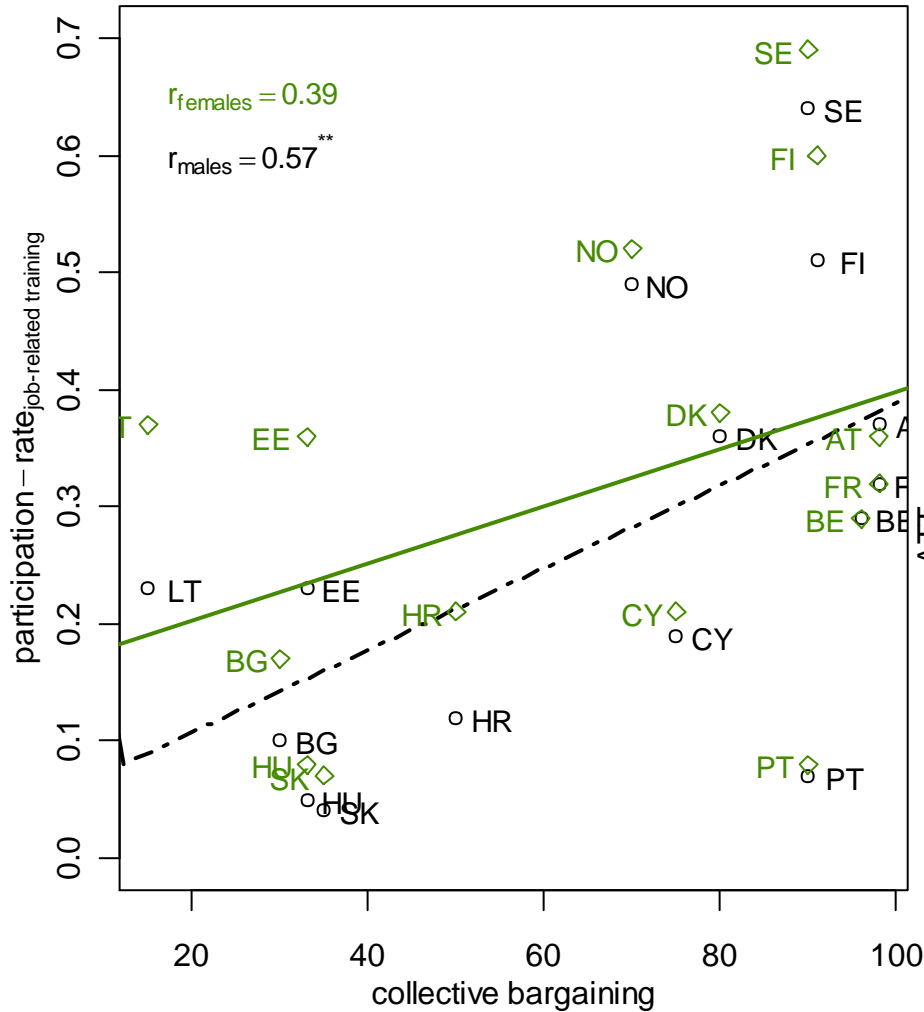


Income effects (ATT)

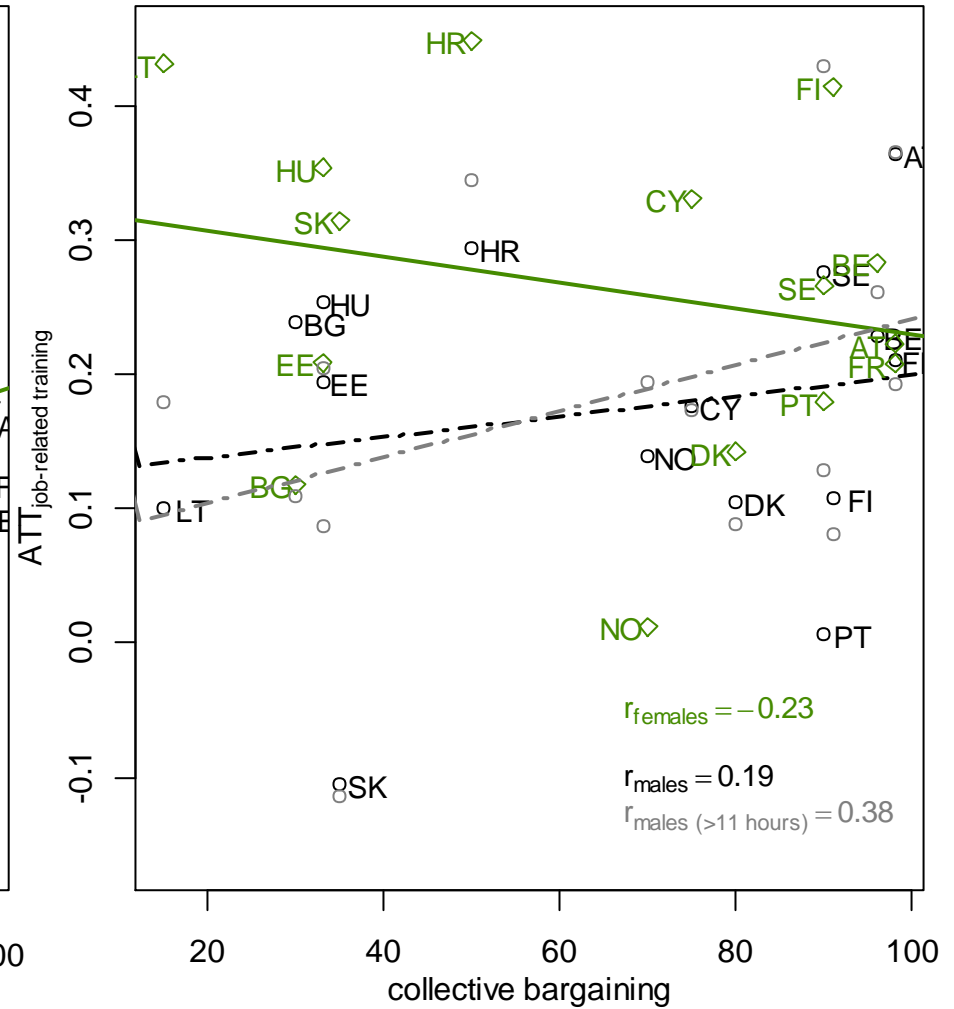


Collective bargaining

Participation rates

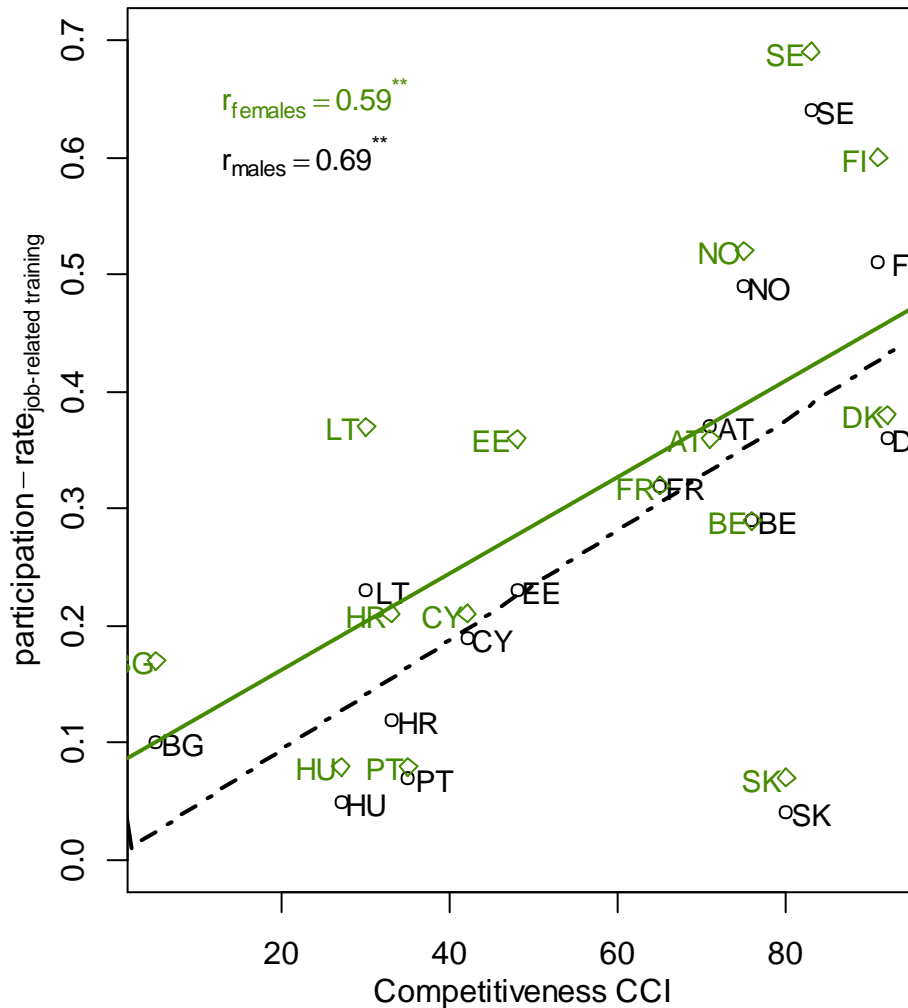


Income effects (ATT)

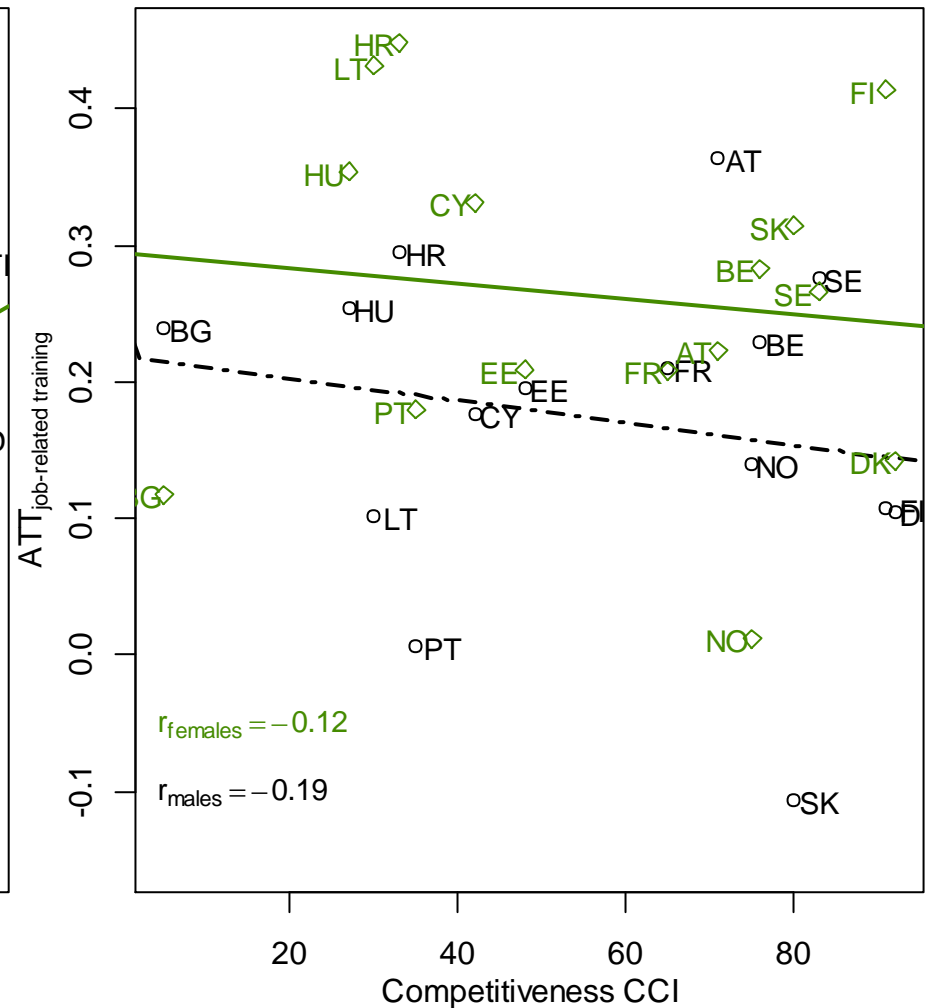


Competition and deregulation

Participation rates

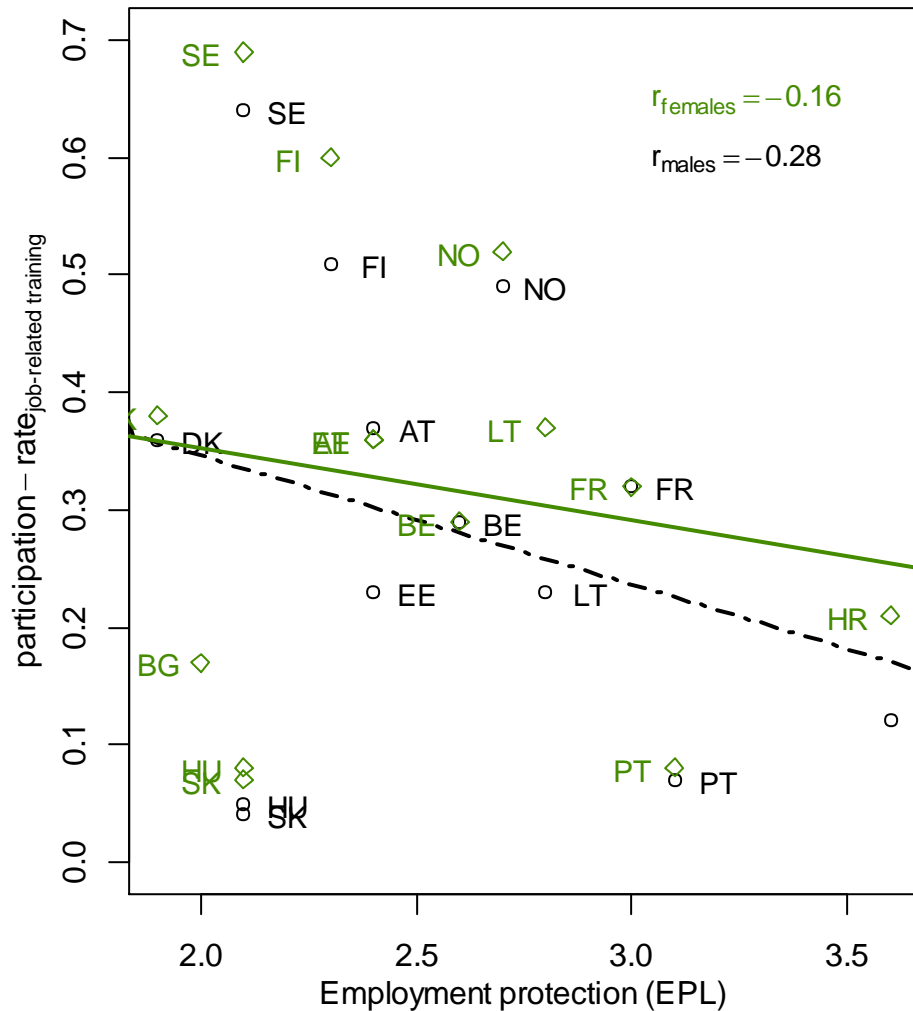


Income effects (ATT)

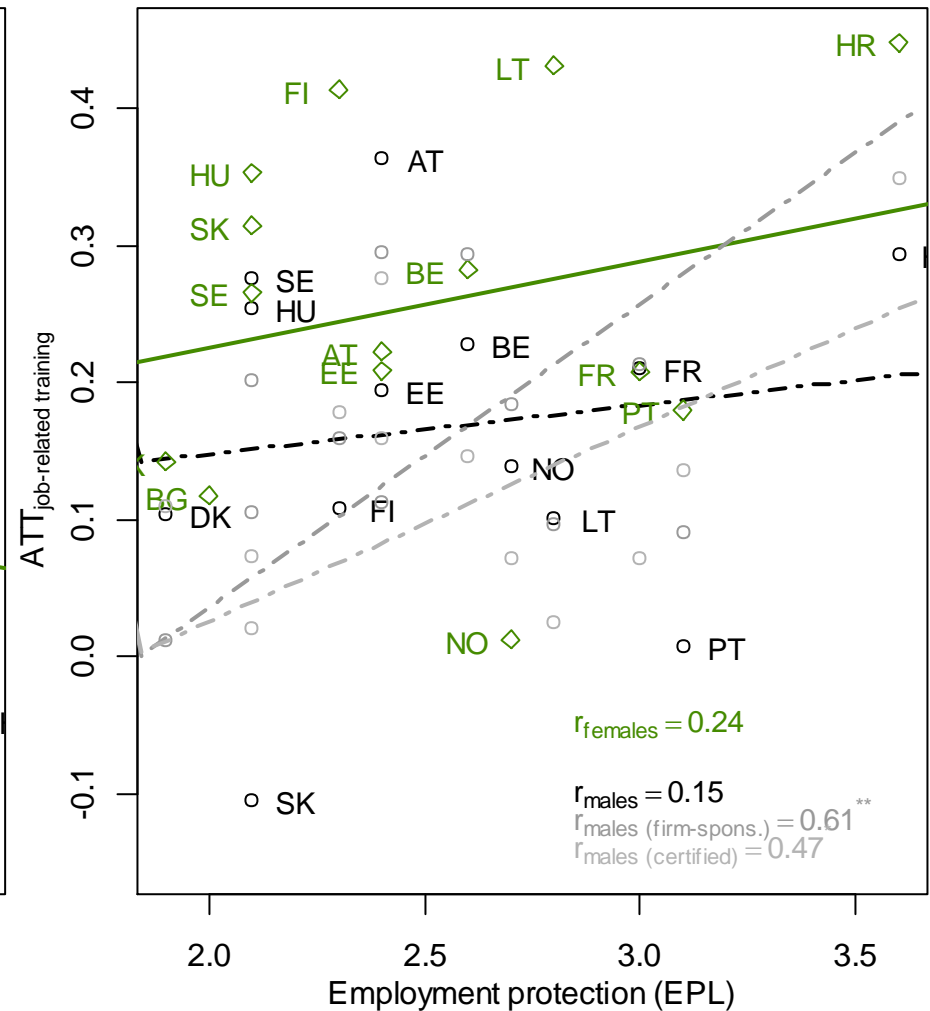


Employment protection leg. (EPL)

Participation rates

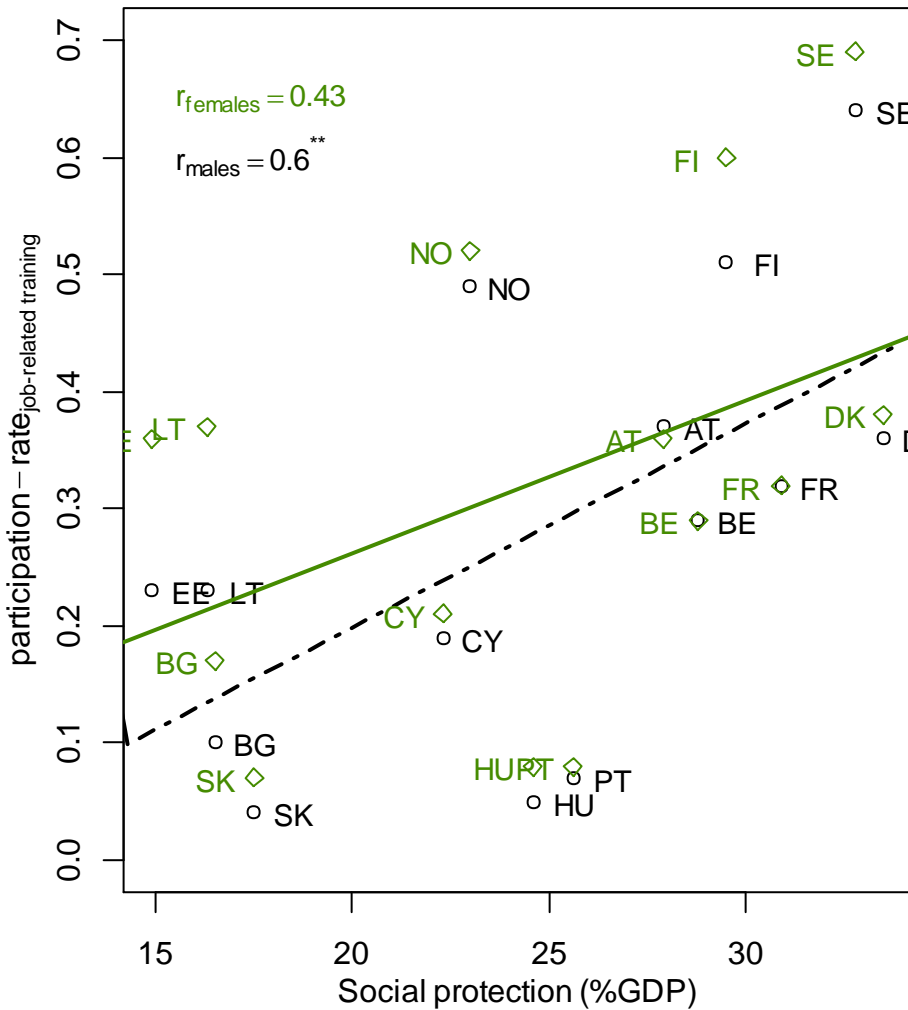


Income effects (ATT)

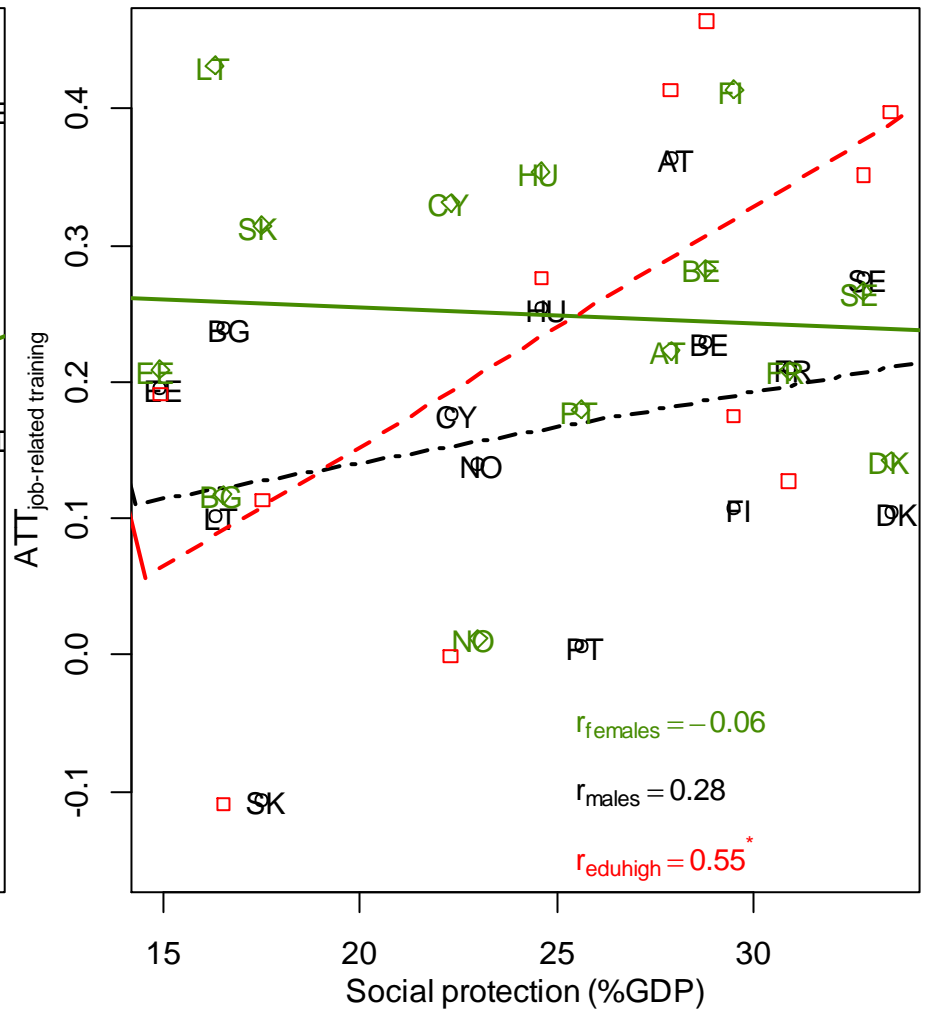


Social protection receipts (% of GDP)

Participation rates

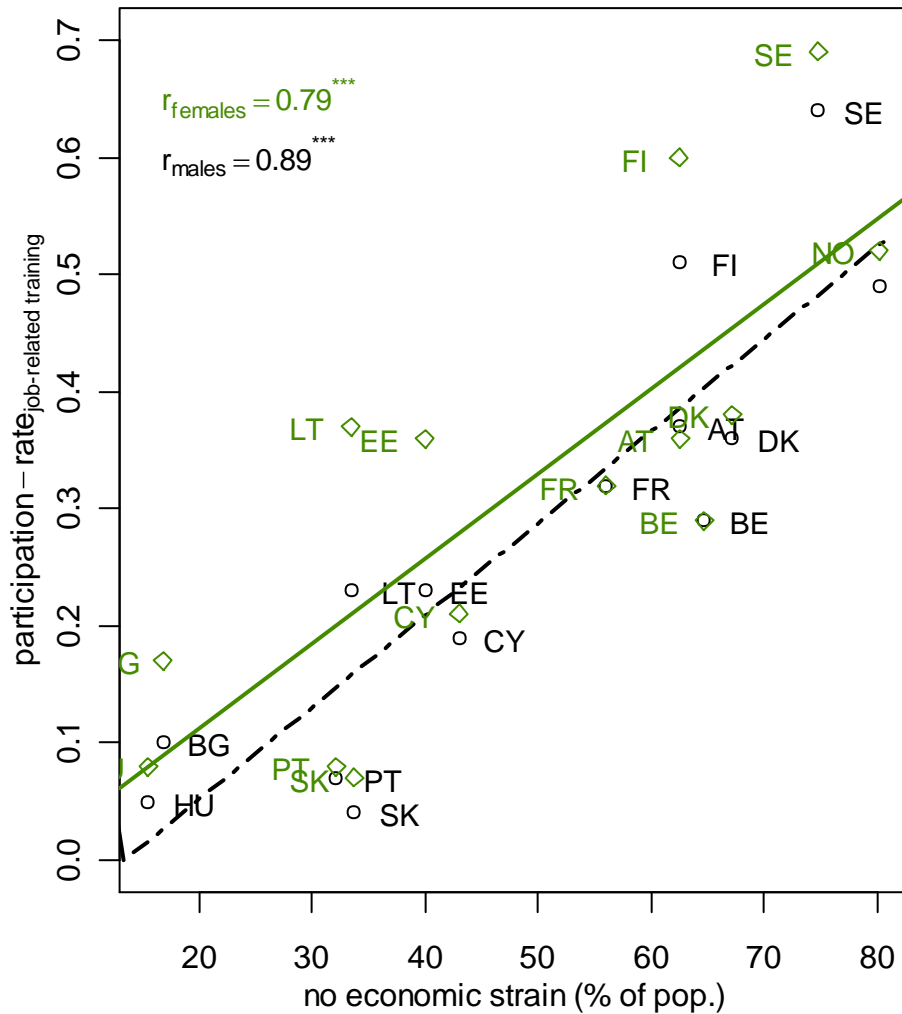


Income effects (ATT)

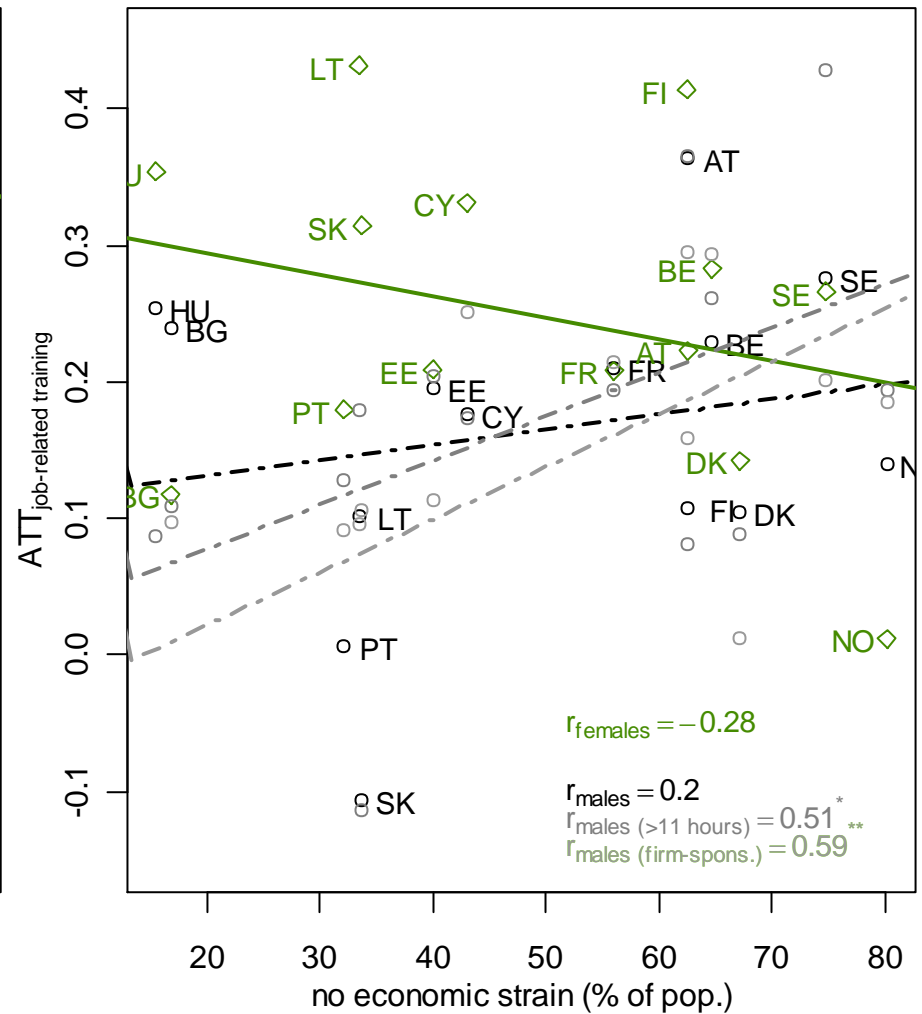


Economic strain (EU-SILC)

Participation rates



Income effects (ATT)

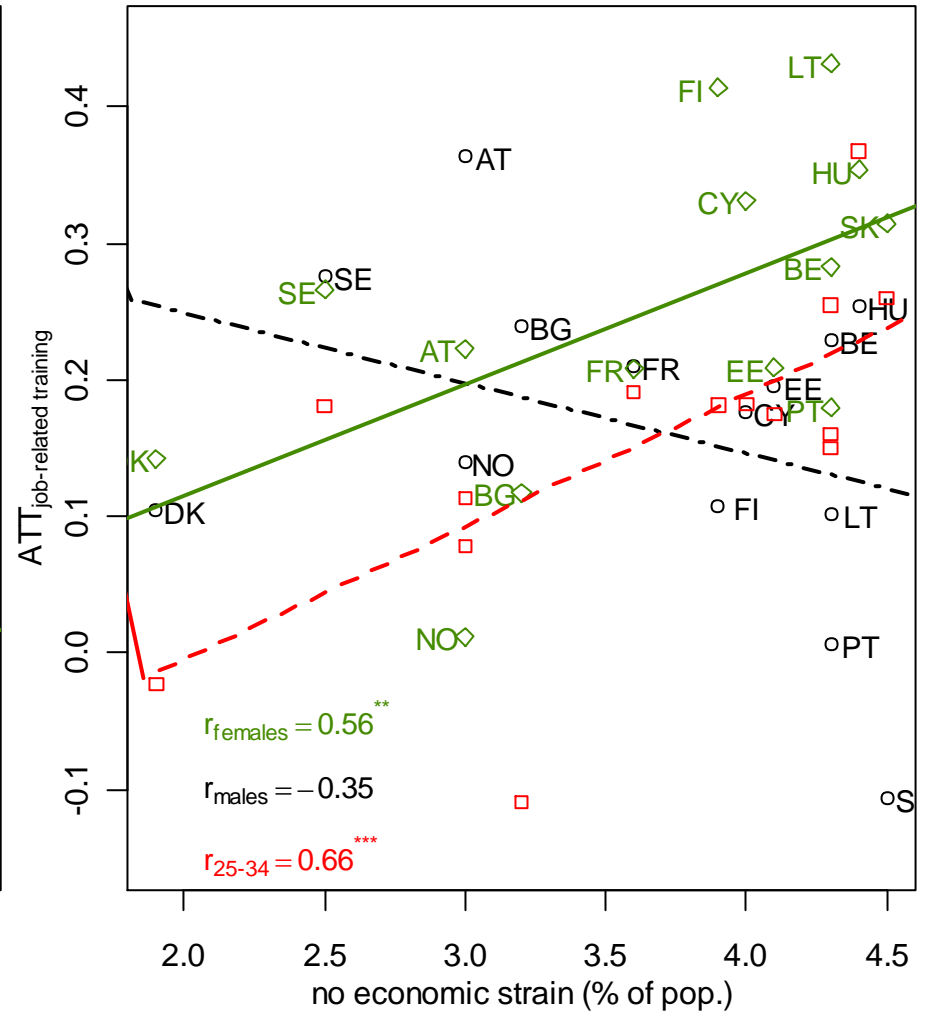
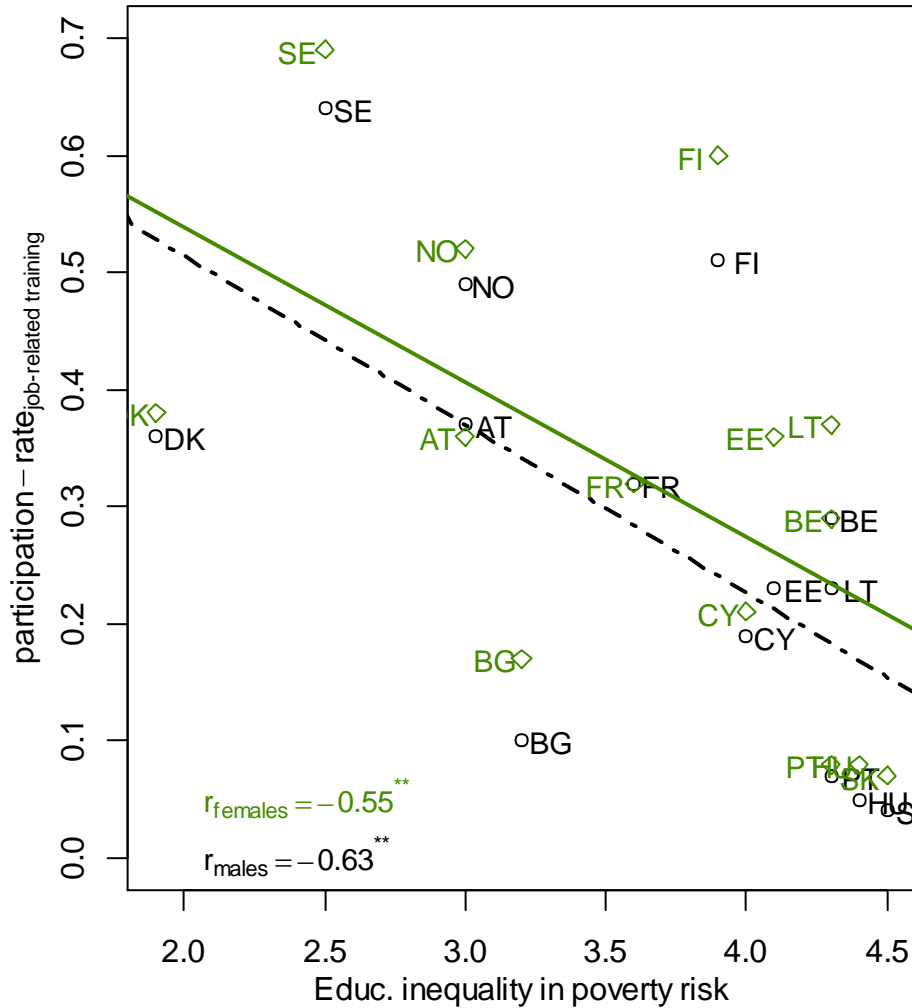


Educ. inequality in poverty risk

(poverty risk_{ISCED0-2} – poverty risk_{ISCED5-6})

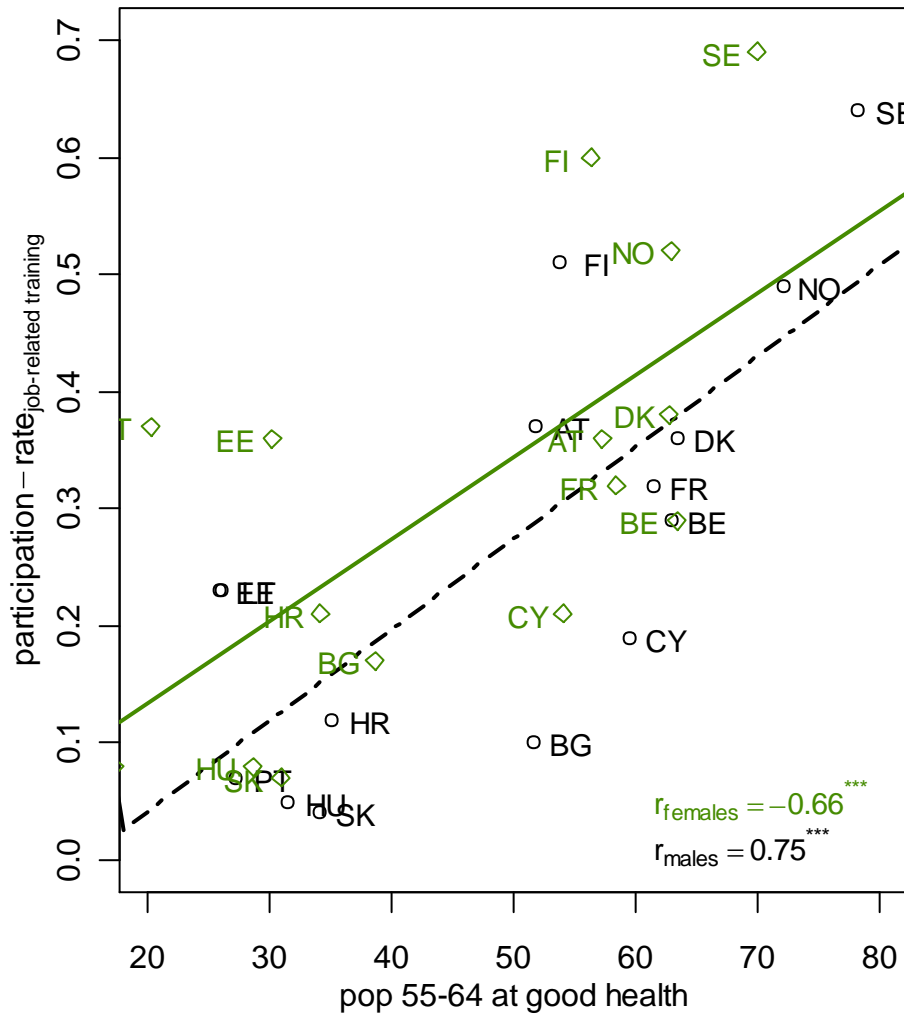
Participation rates

Income effects (ATT)

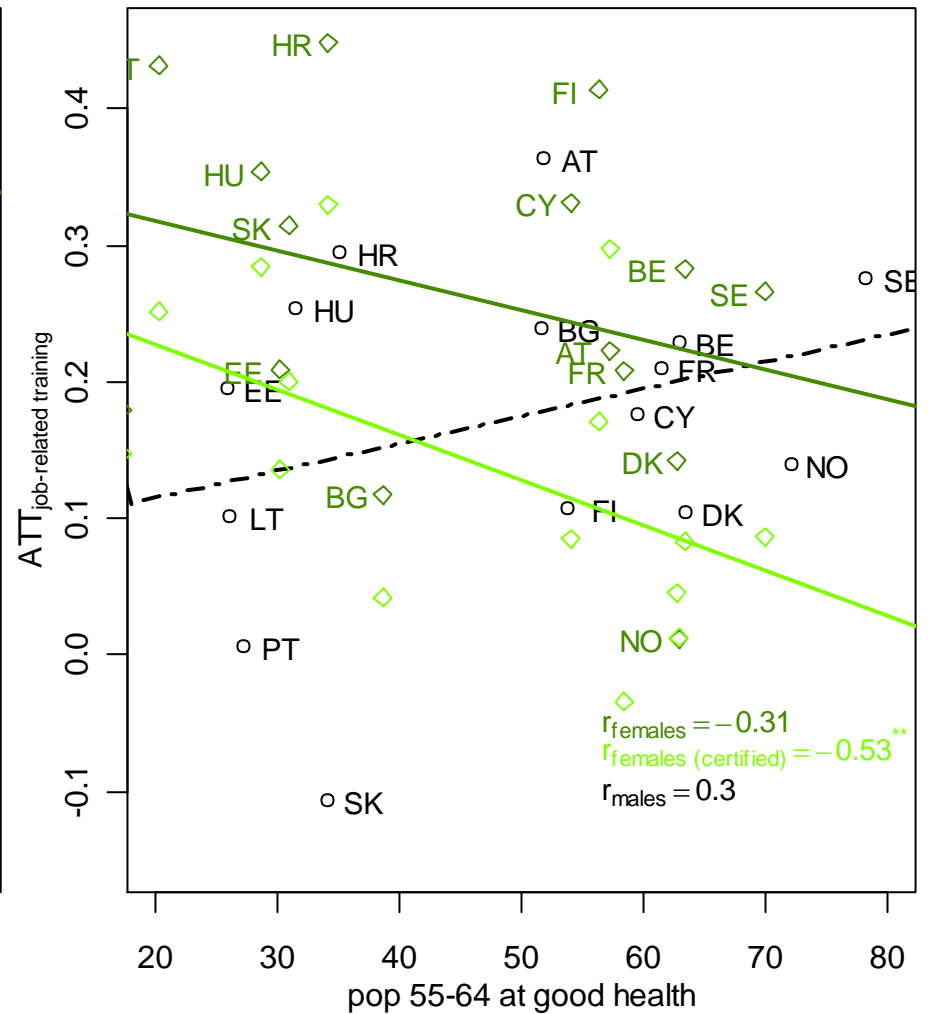


Population 55-64 at good health (EU-SILC)

Participation rates

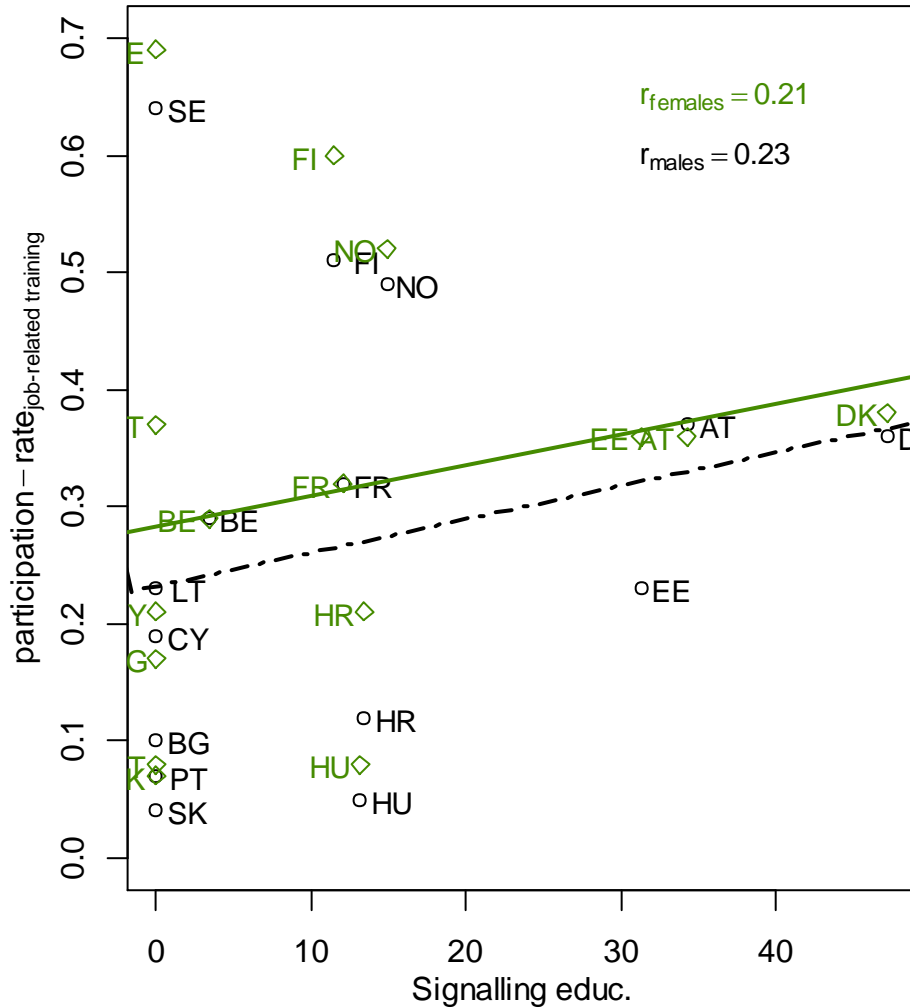


Income effects (ATT)

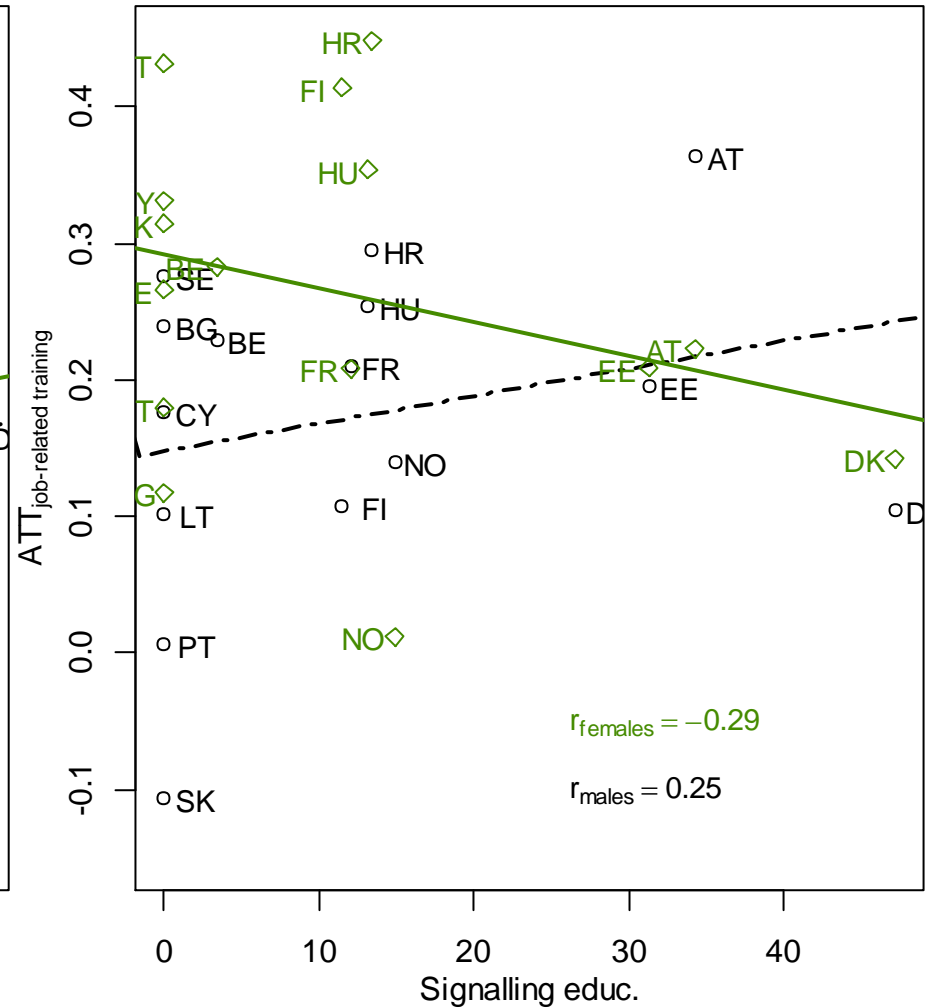


Educational signalling

Participation rates

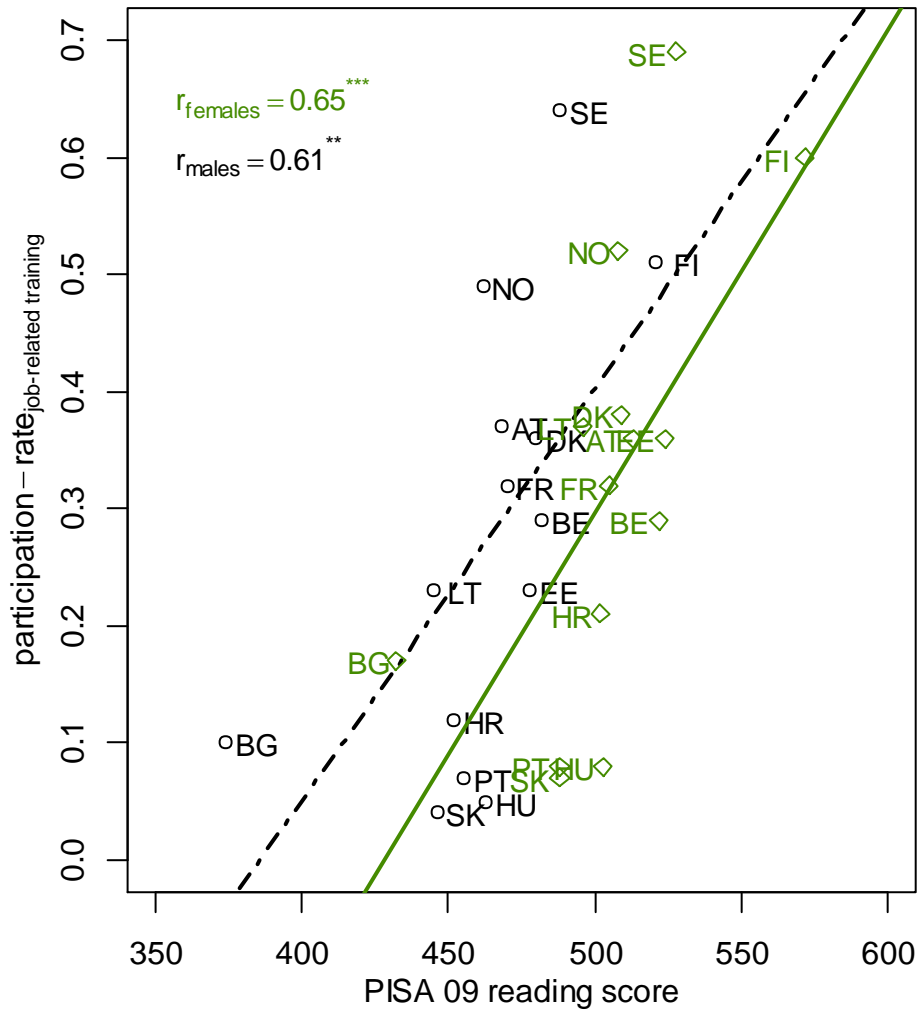


Income effects (ATT)

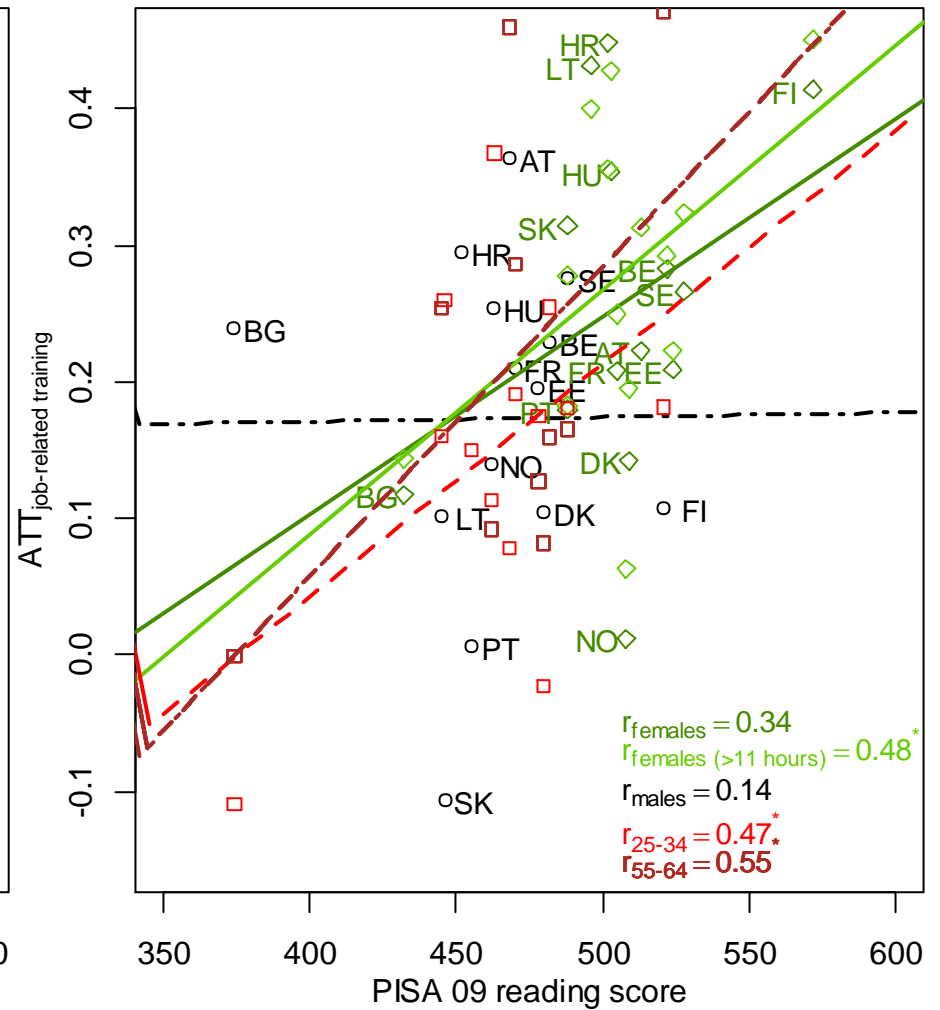


Quality of schooling (PISA)

Participation rates



Income effects (ATT)



Relation to system factors

